Draft Environmental Impact Statement/ Environmental Impact Report

Littlerock Reservoir Sediment Removal Project

[SCH No. 2005061171]

Prepared for:

USDA Forest Services

Palmdale Water District

May 2016

Littlerock Reservoir Sediment Removal Project

State Clearinghouse #2005061171

To: Readers of the Draft Environmental Impact Statement/Environmental Impact Report

From: Jeffrey Vail, Forest Supervisor, USDA Forest Service

Matt Knudson, Palmdale Water District, Assistant General Manager

Subject: Notice of Availability, Draft Environmental Impact Statement/Environmental Impact Report for the Proposed Littlerock Reservoir Sediment Removal Project

Date: May 6, 2016

The U.S. Department of the Agriculture (USDA) Forest Service, as Lead Agency under the National Environmental Policy Act, and the Palmdale Water District, as Lead Agency under the California Environmental Quality Act, are seeking public comment on a joint Draft Environmental Impact Statement/Environmental Impact Report (Draft EIS/EIR) for consideration of the Littlerock Reservoir Sediment Removal Project.

Proposed Action/Project. The proposed action is to construct a concrete grade control structure within Littlerock Reservoir, haul sediment from behind the dam to nearby quarry sites, and maintain the storage capacity through annual sediment removal. The US Forest Service would approve the project on National Forest System lands by issuing an amendment to the existing Special Use Permit for Littlerock Dam and Reservoir. The project would restore the Littlerock Reservoir to 1992 water storage and flood control capacity and preserve habitat for the arroyo toad by preventing sediment loss and headcutting of the stream channel. The Draft EIS/EIR describes the proposed action and evaluates and describes the environmental impacts associated with construction and operation, identifies those impacts that could be adverse, and presents mitigation measures, which, if adopted by the Forest Service, Palmdale Water District, or other responsible agencies, would avoid or minimize those impacts. The Draft EIS/EIR has determined that the proposed action or alternatives may cause significant impacts to the following resources: air quality, traffic, and recreation and land use. The Draft EIS/EIR also evaluates alternatives to the proposed action; these alternatives include the following:

- *Alternative 1*: Reduced Sediment Removal Intensity Alternative. This alternative would reduce the intensity of proposed construction activities (e.g., amount of annual sediment removed, number of daily truck trips) through an extension of the construction schedule.
- *Alternative 2: No Action/No Project Alternative.* This alternative would not alter the existing conditions at the Reservoir. No grade control construction or sediment removal would occur. The Reservoir would eventually be filled with sediment and the Little Rock Creek stream flow would not be impounded. Continued sediment deposition could also compromise the long-term integrity of the Dam, requiring removal.

Availability of Draft EIS/EIR. The Draft EIS/EIR will be available for review at the following four locations:

USFS, Angeles National Forest
Santa Clara/Mojave Rivers Ranger District
33708 Crown Valley Road
Acton, CA 93510
(661) 296-2808
Hours: 8 a.m. to 4:30 p.m.
(Monday through Friday)

Angeles National Forest
Supervisor's Office
701 N Santa Anita Ave.
Arcadia, CA 91006
(626) 574-1613
Hours: 8 a.m. to 4:30 p.m.
(Monday through Friday)

Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550
(661) 947-4111
Hours: 8 a.m. to 5 p.m.
(Monday through Friday)

Littlerock Library
35119 80th Street East
Littlerock, CA 93543
(661) 944-4138
Hours: 11 a.m. to 7 p.m. (M-T)
10 a.m. to 5 p.m. (W-Sat)

Copies of the Draft EIS/EIR on CD or a separately bound Executive Summary may be requested by e-mail at LSRP@aspeneg.com. An electronic copy of the Draft EIS/EIR, and the latest project updates and information, are available for review on the Palmdale Water District's Project website at: http://www.palmdalewater.org/about/new-development-projects/district-projects/ or at the USDA Forest Service website at: http://data.ecosystem-management.org/nepaweb/nepa_project_exp.php?project=13657.

Written comments on the Draft EIS/EIR. Written comments will be accepted for 45 days following the date that a Notice of Availability is published in the **Federal Register**. The expected dates for the comment period are May 6 –June 20, 2016.

The Forest Service decision for the portion of the project occurring on National Forest System lands is subject to administrative review by the Forest Service Regional Office, in accordance with 36 CFR 218. Only those who submit timely and specific written comments during a public comment period are eligible to request this administrative review. Please see the legal notice posted to the websites above, or contact the Forest Service for specific questions on commenting and administrative reviews.

Written comments on the Draft EIS/EIR should be sent to:

USDA Forest Service/ Palmdale Water District
c/o Aspen Environmental Group
5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301
E-mail: LSRP@aspeneg.com

Comments may also be submitted at the public meeting, or hand delivered during normal business hours to the offices listed above.

Public Meeting. The Forest Service and Palmdale Water District will hold a Draft EIS/EIR public meeting on May 19, 2016. The public meeting is an opportunity for interested parties to receive information, ask questions and share concerns, or provide written comments on the Draft EIS/EIR. The meeting will be open-house format with project documents and information available, and staff from each lead agency present. Only written comments will be accepted at the meeting. Details on the public meeting are as follows:

Draft EIS/EIR Public Meeting	
Location	Palmdale Water District, Board Room
Date	May 19, 2016
Time	6 pm to 9 pm
Address	2029 East Avenue Q Palmdale, CA 93550

Proyecto para Eliminar Sedimento de la Represa Littlerock

Centro de Información Estatal #2005061171

A: Lectores del borrador Informe de Impacto Ambiental y Declaración de Impacto Ambiental

De: Jeffrey Vail, Supervisor Forestal, Servicio Forestal USDA
Matt Knudson, División de Agua de la ciudad de Palmdale, Asistente Gerente General

Tema: Aviso de disponibilidad, borrador Informe de Impacto Ambiental y Declaración de Impacto Ambiental para el Proyecto para Eliminar Sedimento de la Represa Littlerock

Fecha: 06 de mayo de 2016

El Departamento de Agricultura de los Estados Unidos (USDA), Servicio Forestal, como agencia líder según la Ley Nacional de Política Ambiental y la División de Agua de la ciudad de Palmdale, como agencia líder del Estado según la Ley de Calidad Ambiental de California, invitan comentarios públicos sobre el borrador Informe de Impacto Ambiental y Declaración de Impacto Ambiental (Borrador EIS/EIR por sus siglas en inglés) para el Proyecto para Eliminar Sedimento de la Represa Littlerock.

Proyecto Propuesto. La acción propuesta es construir una estructura de control de grado de hormigón en la Represa de Littlerock, transportar sedimento de detrás de la represa a canteras cercanas, y mantener la capacidad de almacenamiento a través de la extracción anual de sedimento. El Servicio Forestal aprobaría el proyecto en tierras del sistema nacional forestal con una modificación del existente permiso especial de uso de la Represa Littlerock. El proyecto restaurará la capacidad de la Represa Littlerock para almacenar agua y controlar inundaciones de 1992 y preservará el hábito del sapo arroyo por prevenir la pérdida de sedimento y la erosión del cauce del arroyo. El borrador EIS/EIR describe la acción propuesta y evalúa y describe los impactos ambientales asociados con la construcción y operación del proyecto, identifica los impactos que podrían ser adversos y presenta medidas de mitigación, que, si fueran adoptadas por el Servicio Forestal, División de Agua de la cuidad de Palmdale u otras agencias responsables, evitarían o minimizarían los impactos. El borrador EIS/EIR ha determinado que la acción propuesta o las alternativas podrían causar impactos significativos a los siguientes recursos: calidad del aire, tráfico y recreación y uso de la tierra. El borrador EIS/EIR también evalúa alternativas a la acción propuesta que son las siguientes:

- Alternativa 1: Alternativa para Reducir la Eliminación del Sedimento. Esta alternativa sería para reducir la intensidad de la construcción de la acción propuesta (por ejemplo, reducir la cantidad de sedimento eliminado anualmente, reducir el número de viajes de camiones diariamente) a través de una extensión del calendario de construcción.
- Alternativa 2: No Tomar Acción/No Hacer el Proyecto. Esta alternativa no cambiaría las condiciones actuales en la represa. No ocurría la eliminación de sedimento ni la construcción del control de grado. Eventualmente se llenaría la represa con sedimento y el Arroyo Little Rock no sería capturado. A largo plazo, el depósito de sedimento podría afectar la estabilidad del embalse, requiriendo su retiro.

Disponibilidad del borrador EIS/EIR. El borrador EIS/EIR estará disponible para revisar en los siguientes cuatro lugares:

USFS, Bosque Nacional de Angeles
Distrito de Santa Clara/Mojave River
33708 Crown Valley Road
Acton, CA 93510
(661) 296-2808
Horario: 8 a.m. a 4:30 p.m.
(Lunes a Viernes)

USFS, Bosque Nacional de Angeles
Oficina del Supervisor
701 N Santa Anita Ave.
Arcadia, CA 91006
(626) 574-1613
Horario: 8 a.m. a 4:30 p.m.
(Lunes a Viernes)

División de Agua de la cuidad de Palmdale	Biblioteca Littlerock
2029 East Avenue Q Palmdale, CA 93550 (661) 947-4111 Horario: 8 a.m. a 5 p.m. (Lunes a Viernes)	35119 80th Street East Littlerock, CA 93543 (661) 944-4138 Horario: 11 a.m. a 7 p.m. (Lunes y Martes) 10 a.m. a 5 p.m. (Miércoles a Sabado)

Se puede solicitar copias del borrador EIS/EIR en CD o un resumen ejecutivo en papel por correo electrónico a LSRP@aspeneg.com. Una copia electrónica del borrador EIS/EIR y las noticias más recientes sobre el proyecto están disponibles en la página web del proyecto de la División de Agua de la ciudad de Palmdale al: http://www.palmdalewater.org/about/new-development-projects/district-projects/, o en el sitio web del Servicio Forestal al: http://data.ecosystem-management.org/nepaweb/nepa_project_exp.php?project=13657.

Comentarios escritos sobre el borrador EIS/EIR. Se aceptarán comentarios escritos para 45 días después de la fecha de publicación del Aviso de Disponibilidad en el **Registro Federal**. Las fechas previstas para el período de comentar son mayo 6 – junio 20, 2016.

La decisión del Servicio Forestal sobre la parte del proyecto que ocurre en la tierra del Bosque Nacional está sujeto a ser revisado por la Oficina Regional de Servicio Forestal, según la ley 36 CFR 218. Sólo aquellos que presentan comentarios escritos específicos durante el período de comentario público son elegibles para solicitar esta revisión administrativa. Por favor vea el aviso legal publicado en los sitios web arriba o contacte el Servicio Forestal para preguntas específicas acerca de comentarios y la revisión administrativa.

Comentarios escritos sobre el borrador EIS/EIR pueden ser enviados a:

USDA Forest Service / Palmdale Water District
c/o Aspen Environmental Group
5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301
Correo electrónico: LSRP@aspeneg.com

También se puede presentar comentarios en la reunión pública, o entregarlos personalmente a las oficinas mencionadas anteriormente durante el horario de negocios normal.

Reunión pública. El Servicio Forestal y la División de Agua de la ciudad de Palmdale tendrán una reunión pública a cerca del borrador EIS/EIR el 19 de mayo de 2016. La reunión pública es una oportunidad para personas interesadas para recibir información, hacer preguntas y compartir preocupaciones, o para ofrecer comentarios escritos a cerca del borrador EIS/EIR. La reunión será de formato informal con información y documentos acerca del proyecto, y con empleados de cada agencia. Solo se aceptarán comentarios escritos en la reunión. Detalles de la reunión pública son los siguientes:

Reunión pública de borrador EIS/EIR	
Localidad	División de Agua de la ciudad de Palmdale, Sala de Juntas
Fecha	19 de mayo de 2016
Horario	6 p.m. a 9 p.m.
Dirección	2029 East Avenue Q Palmdale, CA 93550

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT
Draft Environmental Impact Statement/
Environmental Impact Report
County of Los Angeles, California

Lead Agencies:	**USDA Forest Service**
	Palmdale Water District
Responsible Official:	**THOMAS A. CONTRERAS** **FOREST SUPERVISOR** **Angeles National Forest** **701 N. Santa Anita Avenue** **Arcadia, CA 91006**

For Information Contact:

LORRAINE GERCHAS **PROJECT MANAGER** **Angeles National Forest** **701 N. Santa Anita Avenue** **Arcadia, CA 91006** **(626) 574-5281**	**MATT KNUDSON** **ASSISTANT GENERAL MANAGER** **Palmdale Water District** **2029 East Avenue Q** **Palmdale, CA 93550** **(661) 456-1018**

Abstract: Palmdale Water District has applied for a special use authorization from the Forest Service to construct a grade control structure and to remove sediment from Littlerock Reservoir, located within the boundaries of the Santa Clara Mojave Rivers Ranger District of the Angeles National Forest in northern Los Angeles County. The proposed action would restore the Reservoir to 1992 water storage and flood control capacity through annual sediment removal, as well as preserve habitat for the arroyo toad by constructing a grade control structure that prevents sediment loss and headcutting of the stream channel. This Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) evaluates the following alternatives to provide a full comparison for consideration by the decision makers and the public:

- Proposed Action/Project: Involves the construction of a grade control structure within the Reservoir at Rocky Point, annual excavation and total removal or approximately 1,165,000 cubic yards of accumulated sediment, and ongoing annual sediment removal of 38,000 cubic yards per year.
- Reduced Sediment Removal Intensity Alternative: Seeks to reduce the intensity of construction activities of the proposed action through an extension of the construction schedule.
- No Action/ No Project Alternative: Would not alter the existing conditions at the Reservoir. No construction or sediment removal would occur.

As the federal lead agency in compliance with the National Environmental Policy Act, the Forest Service must identify a preferred alternative, which is the alternative that the Forest Service believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors (46 Fed. Reg.

18026). The preferred alternative need not be identified until the Final EIS, and may be determined on the basis of the Draft EIS and public and agency comments. In accordance with NEPA (40 CFR Section 1502.14(e)), the Forest Service will identify its preferred alternative for the Proposed Action/Project in the Final EIS.

Reviewers should provide the Forest Service with their comments during the review period of the draft environmental impact statement. This will enable the Forest Service to analyze and respond to the comments at one time and to use information acquired in the preparation of the final environmental impact statement, thus avoiding undue delay in the decisionmaking process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 553 (1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement. City of Angoon v. Hodel (9th Circuit, l986) and Wisconsin Heritages, Inc. v. Harris, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Comments on the draft environmental impact statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

Send Comments to:	**USDA FOREST SERVICE/** **PALMDALE WATER DISTRICT** **c/o Aspen Environmental Group** **5020 Chesebro Road, Suite 200** **Agoura Hills, CA 91301** **LSRP@aspeneg.com**
Date Comments Must Be Received:	**June 20, 2016**

Littlerock Reservoir Sediment Removal Project
Draft Environmental Impact Statement/ Environmental Impact Report

[SCH# 2005061171]

Lead Agencies:

Palmdale Water District

USDA Forest Service

With Technical Assistance by:

May 2016

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Appendices

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All figures are presented in the back of each section.

Executive Summary

ES.1 Introduction

The USDA Forest Service, Angeles National Forest, must consider whether to issue a special use authorization for the Littlerock Reservoir Sediment Removal Project that has been proposed by Palmdale Water District (PWD). The proposed action would: (1) restore the Littlerock Reservoir to 1992 water storage and flood control capacity, and would maintain that capacity through annual sediment removal; and (2) preserve habitat for the arroyo toad (*Anaxyrus californicus*) through construction of a grade control structure. The Forest Service has prepared an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act to review the potential impacts from the proposed action prior to approving the requested authorization. PWD has also taken into account the environmental impacts of the proposed action through its preparation of an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act. Based on these requirements, a joint EIS/EIR has been prepared under the direction of both lead agencies to satisfy the permitting and decision-making requirements of each agency prior to project approval.

The proposed action would be primarily located within the Littlerock Reservoir, which is a man-made feature formed by the impoundment of water by the Littlerock Dam. The Reservoir is located within the boundaries of the Santa Clara Mojave Rivers Ranger District of the Angeles National Forest, approximately 10 miles southeast of the City of Palmdale and four miles south of the community of Littlerock in northern Los Angeles County. Up to 10,000 cubic yards of sediment that is excavated from the Reservoir would be temporarily stored at a 21-acre site owned by PWD in unincorporated Los Angeles County, allowing for future use (recycling) of the material. However, the majority of removed sediment would be stored at existing quarries within the City of Palmdale.

As discussed in Section A.2 (Purpose and Need) of this EIS/EIR, the proposed action is needed in order to increase PWD's water storage capacity. Littlerock Reservoir is a critical part of the larger water resource, treatment, and distribution system operated by PWD to provide service to customers in the City of Palmdale and the surrounding unincorporated communities. The Reservoir also provides debris control and flood protection for downstream areas; however, siltation and sedimentation has resulted in a substantial reduction in water storage and flood control capacity. The Reservoir was constructed in 1924 with an initial design capacity of 4,300 acre-feet. By 1991, the capacity of the Reservoir had been reduced by siltation to approximately 1,600 acre-feet. As a result of the 1992 Littlerock Dam and Reservoir Restoration Project, the height of the Dam was raised to increase the reservoir capacity by approximately 1,723 acre-feet with a surface area of nearly 100 acres. Preliminary calculations conducted by PWD indicate that the Reservoir capacity continues to be reduced at a rate of approximately 30 to 40 acre-feet per year. PWD proposed an excavation of sediment from the reservoir as a part of the 1991/1992 Littlerock Dam and Reservoir Restoration Project EIS/EIR. This portion of the Project was not implemented, however, due to the presence of federally endangered arroyo toad upstream of River Station 4,235. PWD proposes to excavate sediment from the reservoir and construct a grade control structure at, or just downstream of River Station 4,235, also known as Rocky Point.

ES.2 Alternatives

The issues summarized in Section ES.1 led the PWD and the Forest Service to develop alternatives to the proposed action, which include the following:

- **Reduced Sediment Removal Intensity Alternative (Alternative 1).** Alternative 1 would reduce the intensity of construction activities through an extended construction schedule. Under this alternative, the initial sediment removal period would begin on July 1 (annually) instead of after Labor Day (with the proposed action). Sediment removal activities would occur 5 days per week, instead of 6 (with the proposed action). A minimum of 13 years would be required to restore the Reservoir to 1992 design water storage and flood control capacity, instead of 7 to 12 years (with the proposed action).
- **No Action/No Project Alternative.** Under this alternative, sediment removal activities would not occur. Sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually. Continued sediment deposition could compromise the long-term integrity of the Dam. In this event, the California Department of Water Resources Division of Safety of Dams could require the Dam to be breached or demolished. Demolition of the Dam would eliminate water impoundment at the Reservoir and downstream flood-control. Future demolition of the Dam would also require the removal of approximately 2.8 million cubic yards of sediment and dam concrete, which would result in a project similar to, but larger, than the proposed action.

Each of the alternatives is described in detail in Section B, including the process for selection of Project alternatives (see Sections B.4.3 and B.4.5), and the steps and rationale for elimination of certain alternatives from further analysis (see Sections B.4.4 and B.4.6).

ES.2.1 Comparison of Alternatives

Tables ES-1 and ES-2 summarize the environmental impacts that would occur from selection and implementation of each of the alternatives. A full analysis of the impacts from each alternative is presented in Sections C.2 through C.13 (Affected Environment and Environmental Consequences) of this EIS/EIR, while Section C.14 (Comparison of Alternatives) provides of summary comparison of the alternatives for each issue area.

ES.2.2 Federal Lead Agency Preferred Alternative and CEQA Environmentally Superior Alternative

Federal Lead Agency Preferred Alternative

In accordance with NEPA requirements, the "preferred alternative" is a preliminary indication of the federal responsible official's preference of action, which is chosen from among the Littlerock Reservoir Sediment Removal Project alternatives. The preferred alternative may be selected for a variety of reasons (such as the priorities of the particular lead agency) in addition to the environmental considerations discussed in a Draft EIS. In accordance with NEPA (40 CFR Section 1502.14(e)), the Forest Service will consider the conclusions of the Draft EIS as well as public and agency comments in order to identify its preferred alternative in the Final EIS. In addition to the preferred alternative, the federal lead agency is also required to identify an "environmentally preferable alternative" in the Record of Decision for the EIS (40 CFR Section 1505.2(b)). In contrast to the preferred alternative, the environmentally preferable alternative is the alternative that will promote the purposes expressed in NEPA's Section 101. Typically, this is the alternative that would cause the least environmental damage as well as preserve natural resources related to cultural and historical values. Therefore, the preferred alternative identified in a Final EIS may not be the same as the environmentally preferable alternative identified in the ROD. The NEPA environmentally preferable alternative is subject to all mitigation measures applicable to National Forest System (NFS) lands identified in Section C (Affected Environment and Environmental Consequences).

Based on the analysis in this Draft EIS/EIR, and as discussed in Section C.15.1 (NEPA Environmentally Preferred Alternative), the environmentally preferable alternative would be the Reduced Sediment Removal Intensity Alternative (Alternative 1). In accordance with NEPA (40 CFR Section 1502.14(e)), the Forest Service will identify its preferred alternative (likely to be the same as the environmentally preferable alternative) in the Final EIS/EIR.

CEQA Environmentally Superior Alternative

In accordance with CEQA requirements, an “environmentally superior alternative” must be identified among the alternatives analyzed in an EIR. The environmentally superior alternative is the alternative found to have an overall environmental advantage compared to the other alternatives based on the impact analysis in the EIR. If the environmentally superior alternative is the No Project Alternative, State CEQA Guidelines Section 15126.6(e)(2) requires the EIR to identify an environmentally superior alternative from among the other alternatives.

As discussed in Section C.15.2 (CEQA Environmentally Superior Alternative), Alternative 1 was expressly developed as a modification to the proposed Project’s annual sediment removal schedule in order to reduce the intensity of daily construction activities by extending the annual sediment removal period. By doing this, it would reduce the severity of impacts associated with air quality, traffic, and noise. Based upon the analysis in this Draft EIS/EIR, PWD has identified the Reduced Sediment Removal Intensity Alternative (Alternative 1) as the CEQA Environmentally Superior Alternative.

ES.3 Environmental Consequences

A summary of the environmental impacts that would occur as a result of the Littlerock Reservoir Sediment Removal Project are included in Tables ES-1 and ES-2. Section C (Affected Environment and Environmental Consequences) of this EIS/EIR describes the direct and indirect impacts of the proposed action and alternatives for each issue area, as well as the mitigation included to avoid or substantially reduce adverse impacts. The unavoidable adverse impacts that would remain after mitigation are also discussed in the Section C analyses. Section D (Cumulative Effects) of this EIS/EIR defines the cumulative scenario for each issue area and discusses the incremental impact of the proposed action and alternatives when considered with other cumulative projects.

Table ES-1. Comparison of Impacts by Alternative

Resource	Proposed Action	Alternative 1	No Action/ No Project Alternative (Alternative 2)	NFS Lands Affected
Air Quality and Climate Change	Average daily PM10 emissions would exceed the AVAQMD emissions thresholds during excavation (Impact AQ-2). Operation air pollutant emissions estimates are below the AVAQMD emissions thresholds (Impact AQ-3). GHG emissions are below AVAQMD GHG emission thresholds (Impact GHG-1).	All construction and operation air pollutant emissions estimates are below the AVAQMD emissions thresholds (Impacts AQ-2 and AQ-3). GHG emissions are below AVAQMD GHG emission thresholds, but would be slightly higher than for the proposed action due to the higher efficiencies associated with the proposed action's higher daily volume sediment hauling (Impact GHG-1).	Air pollutant emissions from eventual Dam removal construction activities may exceed AVAQMD emissions thresholds. The hauling and disposal of sediment and Dam debris that may result from dam removal would generate GHG emissions similar to, but likely greater in quantity, than that of the proposed action or Alternative 1.	Yes
Biological Resources	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects on: • Riparian habitat or other sensitive natural community (Criterion BIO1); • Fully protected, endangered, or threatened species (Criterion BIO2); • Candidate, sensitive, or special-status species (Criterion BIO3); • Federally protected wetlands (Criterion BIO4); and • Migratory species or wildlife corridors (Criterion BIO5).	Extended construction schedule would increase the likelihood of disturbing nesting birds and disturbing pupping season for ringtail (Criterion BIO2). Draining the Reservoir earlier in the season may have greater impacts to arroyo toads (Impact BIO-6).	Eventual removal of sediment and demolition of the Dam would involve an intensive construction effort that would create greater impacts to biological resources above and below the Dam (i.e., native vegetation, wildlife, jurisdictional resources) than would occur from the proposed action or Alternative 1.	Yes
Cultural Resources	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects on cultural resources (Impacts C-1 and C-2).	Alternative 1 would incorporate identical SPCs as the proposed action, and would avoid and/or minimize adverse effects on cultural resources (Impacts C-1 and C-2).	In the event that removal of sediment and demolition of the Dam were to occur, it is likely that SPCs similar to the proposed action would be implemented to avoid and/or minimize adverse effects on cultural resources.	Yes
Geology and Soils	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects due to seismic or geologic hazards (Impact G-1), or from soil erosion, slope instability, or slope failure (Impact G-2).	Fewer workers would be exposed to risks associated with unstable slopes than under the proposed action, but risks would occur over a longer period of time (Impact G-1). Soil disturbance would be less than under the proposed action, but would occur over a longer period of time (Impact G-2).	Demolition of the Dam and sediment removal would involve more earth movement than under the proposed action, and may require working on or near steeper slopes. Direct impacts to soils and risks to construction workers may be greater than under the proposed action or Alternative 1.	Yes
Hazards and Public Safety	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects to public health, including risk from hazardous material spills (Impact HAZ-1) or unsafe highway conditions (Impact HAZ-5).	Fewer workers would be exposed to risks associated with hazardous materials, but risks would occur over a longer period of time (Impact HAZ-1). Fewer disposal trucks would be utilized, which could lead to a slight reduction in unsafe highway conditions (Impact HAZ-5).	Excavation and demolition of the Dam would require the use of hazardous materials that may contribute to soil, groundwater, or surface water contamination. As the degree to which SPCs would be incorporated into this future project is unknown, impacts may be greater than under the proposed action or Alternative 1.	Yes

Table ES-1. Comparison of Impacts by Alternative

Resource	Proposed Action	Alternative 1	No Action/ No Project Alternative (Alternative 2)	NFS Lands Affected
Hydrology	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects associated with groundwater supply, erosion and siltation, or flooding (Criteria H1 through H3).	Alternative 1 would incorporate identical SPCs as the proposed action to avoid and/or minimize adverse effects associated with groundwater supply, erosion and siltation, or flooding (Criteria H1 through H3).	May contribute to a decline in groundwater levels from a greater reliance on alternative water sources (i.e., groundwater and State Water Project) (Impact H-1). Loss of water storage capacity in the Reservoir would increase the risk of flood hazard downstream of the Dam (Impact H-3).	Yes
Noise	The proposed action would incorporate SPCs to avoid and/or minimize adverse noise impacts from mobile and stationary sources (Impacts N-1 and N-2), and to minimize impacts to sensitive receptors (Impacts N-3 and N-4).	Reduction in daily truck trips would reduce the amount of mobile noise occurring per day, but would increase the overall number of days per year that noise is generated (Impact N-1). Reduction in daily truck trips would reduce the overall daily frequency of potential vibration, but would increase the number of days where temporary vibration may be generated (Impact N-4).	Excavation and demolition of the Dam would generate construction noise. As the degree to which SPCs would be incorporated into this future project is unknown, impacts may be greater than under the proposed action or Alternative 1.	Yes
Recreation and Land Use	After the Project's initial construction and excavation during the summer and fall of the first year, annual closure of the Reservoir would occur after Labor Day until mid-November to January, for a minimum of 7 years up to 12 years (Impact L-1). Truck trips would create nuisance impacts to nearby residences (Impact L-2).	Construction and excavation would require annual closure of the Reservoir during the peak summer period (beginning July 1st of each year until mid-November to January) for a minimum of 13 years (Impact L-1). Reduction in daily truck trips would lessen the daily nuisance impacts to nearby residences, but would lengthen the time that disturbances would occur (Impact L-2).	Future excavation and demolition of the Dam would require an intensive construction effort that would create greater disturbances to residences along the truck routes and disposal sites than under the proposed action or Alternative 1 (Impact L-2). Removal of the Dam would result in the irreversible loss of a recreational resource (Impact L-3).	Yes
Transportation and Traffic	Number of truck trips would be 480 trips (240 round trips). Truck traffic under the proposed action would adversely affect the intersection of Pearblossom Highway and Avenue T (Impact T-1). The proposed action would create excessive traffic delays at the stop sign on northbound Cheseboro Road at Pearblossom Highway (Impact T-1).	Number of truck trips would be reduced to 180 trips (90 round trips). No adverse impact would occur at the intersection of Pearblossom Highway and Avenue T (Impact T-1). Traffic delays at the stop sign on northbound Cheseboro Road at Pearblossom Highway would still occur, but impacts would be reduced (Impact T-1).	Future excavation and demolition of the Dam would require an intensive construction effort that would involve a greater number of truck trips than under the proposed action or Alternative 1.	Yes
Visual Resources	The proposed action would not greatly alter the existing visual landscape and would avoid adverse effects on visual resources (Criteria VIS1 and VIS2).	Alternative 1 would be identical to the proposed action in that it would not greatly alter the existing visual landscape and would avoid adverse effects on visual resources (Criteria VIS1 and VIS2).	In the event that the Reservoir became filled with sediment, construction of a downstream flood-control channel may be required. Future flood control facilities could result in visual contrast and adverse visual impacts.	Yes

Table ES-1. Comparison of Impacts by Alternative

Resource	Proposed Action	Alternative 1	No Action/ No Project Alternative (Alternative 2)	NFS Lands Affected
Water Quality and Resources	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects associated with waste discharge and hazardous material spills (Impacts WQ-1 and WQ-2).	Alternative 1 would incorporate identical SPCs as the proposed action to avoid and/or minimize adverse effects associated with waste discharge and hazardous material spills (Impacts WQ-1 and WQ-2).	In the event that the Dam would be breached or demolished, downstream erosion and sedimentation would occur. As the degree to which SPCs would be incorporated into this future project is unknown, impacts may be greater than under the proposed action or Alternative 1.	Yes
Wildfire Prevention and Suppression	The proposed action would incorporate SPCs to avoid and/or minimize interference with wildfire suppression activities or risk of wildfire ignition (Impacts WF-1 through WF-3).	Alternative 1 would incorporate identical SPCs as the proposed action to avoid and/or minimize interference with wildfire suppression activities or risk of wildfire ignition (Impacts WF-1 through WF-3).	In the absence of construction or excavation activities, no impacts or conflicts with fire prevention and suppression activities would occur. However, In the event that the Dam would be demolished, Alternative 2 would incorporate identical SPCs as the proposed action to avoid and/or minimize interference with wildfire suppression activities or risk of wildfire ignition (Impacts WF-1 through WF-3).	Yes

Table ES-2. Summary of Significant CEQA Impacts and Mitigation Measures

Impact	Impact Significance			Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	
Air Quality and Climate Change				
AQ-2: The Project's Construction Emissions Would Exceed AVAQMD Significance Criteria	Class III	Class III	Class I	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
GHG-1: The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold	Class III	Class III	Class I	SPC GHG-1 (Recycle Construction Wastes)
GHG-2: The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.	Class III	Class III	Class I	SPC GHG-1 (Recycle Construction Wastes)
Biological Resources				
BIO-1: The Project would result in temporary and permanent losses of native vegetation.	Class III	Class III	No impact* Class II**	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program)
BIO-2: The Project would result in the establishment and spread of noxious weeds.	Class III	Class III	No impact* Class II**	SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program)
BIO-3: The Project would cause the loss of foraging habitat for wildlife or result in disturbance to wildlife in adjacent habitat.	Class III	Class III	No impact* Class II**	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan)
BIO-4: The Project would result in disturbance to nesting birds or raptors.	Class III	Class III	No impact* Class II**	SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-1b (Worker Environmental Awareness Program)
BIO-5: The Project could disturb endangered, threatened, or proposed plant species or their habitat.	Class III	Class III	No impact* Class II**	SPC BIO-5 (Conduct Preconstruction Surveys for State and federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan)

Table ES-2. Summary of Significant CEQA Impacts and Mitigation Measures

Impact	Impact Significance			Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	
BIO-6: The Project would result in loss or disturbance to arroyo toads.	Class III	Class III	No impact* Class II**	SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures) SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring) SPC BIO-6c (Seasonal Surveys During Water Deliveries) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) SPC WQ-1 (Prepare Spill Response Plan)
BIO-7: The Project could result in the loss of California condors.	Class III	Class III	No impact* Class II**	SPC BIO-7 (Monitor Construction and Remove Trash and Microtrash) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-8: The Project could disturb nesting willow flycatchers, southwestern willow flycatchers, least Bell's vireos, or their habitat.	Class III	Class III	No impact* Class II**	SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-9: The Project would disturb Swainson's hawks.	Class III	Class III	No impact* Class II**	SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table ES-2. Summary of Significant CEQA Impacts and Mitigation Measures

Impact	Impact Significance			Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	
BIO-10: The Project would result in disturbance to Bald or Golden Eagles.	Class III	Class III	No impact* Class II**	SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-11: The Project would result in disturbance or loss of habitat for the ringtail.	Class III	Class III	No impact* Class II**	SPC BIO-11 (Conduct Focused Surveys for Ringtail and Avoid Denning Areas) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-12: The Project would result in the loss of candidate, Forest Service Sensitive, or special-status plant species.	Class III	Class III	No impact* Class II**	SPC BIO-5 (Conduct Preconstruction Surveys for State and federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive plants and Avoid Any Located Occurrences of Listed Plants) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-13: The Project could result in the loss of Shoulderband Snails or San Emigdio Blue Butterfly.	Class III	Class III	No impact* Class II**	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table ES-2. Summary of Significant CEQA Impacts and Mitigation Measures

Impact	Impact Significance: Proposed Action	Impact Significance: Alt. 1	Impact Significance: Alt. 2: No Action	Mitigation Measures/SPC
BIO-14: The Project could result in mortality or injury to southwestern pond turtles or a disruption of nesting habitat.	Class III	Class III	No impact* Class II**	SPC BIO-14 (Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-15: The Project could result in injury or mortality for two-striped garter snakes.	Class III	Class III	No impact* Class II**	SPC BIO-15 (Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-16: The Project could result in injury or mortality for Coast Range newts.	Class III	Class III	No impact* Class II**	SPC BIO-16 (Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) SPC WQ-1 (Prepare Spill Response Plan) SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP])

Table ES-2. Summary of Significant CEQA Impacts and Mitigation Measures

Impact	Impact Significance			Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	
BIO-17: The Project could result in injury or mortality of terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.	Class III	Class III	No impact* Class II**	SPC BIO-17 (Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) SPC WQ-1 (Prepare Spill Response Plan) SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP])
BIO-18: The Project would result in the loss of suitable burrowing owl habitat.	Class III	Class III	No impact* Class II**	SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-19: The Project could disturb Forest Service Sensitive or California Species of Special Concern birds.	Class III	Class III	No impact* Class II**	SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table ES-2. Summary of Significant CEQA Impacts and Mitigation Measures

Impact	Impact Significance			Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	
BIO-20: The Project could result in mortality of, and loss of habitat for, special-status bat species.	Class III	Class III	No impact* Class II**	SPC BIO-20 (Survey for Maternity Colonies or Hibernaculum for Roosting Bats) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-21: The Project could result in mortality of, and loss of habitat for, special-status mammals.	Class III	Class III	No impact* Class II**	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-22: The Project could result in mortality of American badgers or desert kit fox.	Class III	Class III	No impact* Class II**	SPC BIO-22 (Conduct Surveys for American Badger and Desert Kit Fox and Avoid During the Breeding Season) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-23: The Project would disturb Nelson's bighorn sheep.	Class III	Class III	No impact* Class II**	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC FIRE-1 (Curtailment of Activities) SPC FIRE-2 (Preparation of a Fire Plan) SPC FIRE-3 (Spark Arrester Requirements)

Table ES-2. Summary of Significant CEQA Impacts and Mitigation Measures

Impact	Impact Significance: Proposed Action	Impact Significance: Alt. 1	Impact Significance: Alt. 2: No Action	Mitigation Measures/SPC
BIO-24: The Project could result in the loss of wetland habitats.	Class III	Class III	No impact* Class II**	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) SPC WQ-1 (Prepare Spill Response Plan)
BIO-25: The Project would interfere with established wildlife migratory corridors.	Class III	Class III	No impact* Class II**	Not Applicable
BIO-26: The Project would result in effects to Management Indicator Species.	Class III	Class III	No impact* Class II**	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures) SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring) SPC BIO-6c (Seasonal Surveys During Water Deliveries)
Cultural Resources				
C-2: Implementation of the Project could uncover, expose, and/or damage human remains.	Class I	Class I	No impact	SPC CUL-3 (Unidentified Human Remains Discovery Procedures)
Geology and Soils				
G-1: The Project would expose people or structures to potential substantial adverse effects due to seismic or geologic hazards.	Class III	Class III	Class I	SPC GEO-1 (Geotechnical Investigation)
G-2: The Project would cause or be affected by substantial soil erosion, slope instability, or slope failure.	Class III	Class III	Class I	SPC GEO-1 (Geotechnical Investigation) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)
Hazards and Public Safety				
HAZ-1: Hazardous material use and transport may result in spills that contaminate Reservoir water or groundwater, or endanger public health	Class III	Class III	Class I	SPC WQ-1 (Prepare Spill Response Plan)

Table ES-2. Summary of Significant CEQA Impacts and Mitigation Measures

Impact	Impact Significance			Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	
HAZ-2: Project activities would result in Littlerock Dam safety or degradation issues	Class III	Class III	Class I	None
Hydrology				
H-1: The Project would deplete groundwater supplies downstream of the dam	Class III	Class III	Class I	None
H-3: The Project would alter Little Rock Creek flow volumes downstream of the dam, and otherwise alter stream flow characteristics, increasing the potential for flooding.	Class IV	Class IV	Class I	None
Noise				
N-1: Noise from mobile sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances	Class III	Class III	Class I	SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) SPC NOI-2 (PWD Site Buffer Requirements)
N-2: Noise from stationary sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances	Class III	Class III	Class I	None
N-3: Temporary construction activities may occur outside allowable hours and substantially disturb sensitive receptors	Class III	Class III	Class I	None
N-4: Vibration from temporary construction equipment use could substantially disturb sensitive receptors	Class III	Class III	Class I	SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) SPC NOI-2 (PWD Site Buffer Requirements)
Recreation and Land Use				
L-1: Project construction and excavation would preclude or disturb existing recreational resources.	Class II	Class I	NA	Mitigation Measure L-1a: Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer Mitigation Measure L-1b: Provide Compensation to Forest Service for Lost Recreational Opportunity SPC LAND-2 (Design Grading to Accommodate OHV Access)

Table ES-2. Summary of Significant CEQA Impacts and Mitigation Measures

Impact	Impact Significance: Proposed Action	Impact Significance: Alt. 1	Impact Significance: Alt. 2: No Action	Mitigation Measures/SPC
L-2: Sediment transport and disposal would preclude or disturb existing uses along the truck route and disposal sites.	Class I	Class I	Class I	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) SPC NOI-2 (PWD Site Buffer Requirements)
L-3: Increased sedimentation of the Reservoir would contribute to the long-term degradation of a recreational resource.	NA	NA	Class I	None
Transportation and Traffic				
T-1: Exceed, either individually or cumulatively, an established level of service standard for roadways, highways, and intersections utilized by the Project	Class II	Class II	Class III* Class I**	Mitigation Measure T-1 (Restrict Haul Truck Movements during PM Peak Period) SPC TRA-1 (Prepare Traffic Control Plan)
T-2: Result in inadequate emergency response	Class II	Class II	Class III	Mitigation Measure T-1 (Restrict Haul Truck Movements during PM Peak Period) SPC TRA-1 (Prepare Traffic Control Plan)
Water Quality				
WQ-1: The Project would violate water quality standards or waste discharge requirements, or otherwise degrade water quality	Class III	Class III	Class I	SPC WQ-1 (Prepare Spill Response Plan) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

Notes:
* Assumes the Dam remains stable
**Assumes the Dam becomes unstable and requires demolition
NA = Not Applicable

ES.3.1 Major Conclusions

Many of the technical issue area analyses determined that impacts associated with the proposed action and Alternative 1 would be identical for the grade control construction and for operation and maintenance excavation activities. Notable differences among the impact discussions were attributed to the extended schedule for restoring the Reservoir to design capacity under Alternative 1. Major conclusions include the following:

- **Air Quality and Climate Change-** Compared with the proposed action, Alternative 1 would reduce the number of daily truck trips and reduce the daily and annual air pollutant emissions during the excavation construction phase. However, the total Project-life GHG emissions would be higher for Alternative 1 than the proposed action. The No Action/No Project Alternative would likely eventually result in temporarily increased short-term and annual (for one year or more) air quality impacts when compared to both the proposed action and Alternative 1.
- **Biological Resources-** The Project was developed to restore the water storage and flood control capacity of the Reservoir while avoiding biological resource impacts to the federally endangered arroyo toad. The proposed construction of a grade control structure preserves arroyo toad habitat by preventing sediment loss and headcutting upstream of Rocky Point, where critical arroyo toad habitat has been identified. While necessary to avoid adverse impacts to arroyo toad during Project implementation, the grade control structure is also considered beneficial as it provides long-term stability to upstream arroyo toad habitat that could otherwise be eroded. Additionally, as discussed in Section B.2.3.2, all non-native fish would be removed from the Reservoir as part of the proposed action and Alternative 1. The removal of non-native fish species would improve habitat conditions for arroyo toad and other native species. Given that non-native fish tissue samples from the Reservoir show a large number of contaminants at high levels, removal of these fish during the Project's first year of sediment excavation would create a beneficial effect on birds and other wildlife that would otherwise be at risk from ingesting contaminated fish.

  Compared with the proposed action, Alternative 1 would result in greater potential for adverse impacts to nesting birds because sediment removal activities would commence during the nesting season. Alternative 1 would also have greater impacts to aquatic species including arroyo toads, southwestern pond turtle, and two-striped garter snake because of the need to drain the Reservoir in June rather than after Labor Day. Under the No Action/No Project Alternative, should future removal of the Dam and accumulated sediment be required, such a project would likely result in greater impacts to biological resources compared to either the proposed action or Alternative 1.
- **Noise-** Alternative 1 would reduce the amount of mobile noise occurring per day compared to the proposed action, but would increase the overall number of days that activities would generate noise. Under the No Action/No Project Alternative, should future removal of the Dam and accumulated sediment be required, such a project would likely require extensive construction that would generate noise at a similar or greater intensity as the proposed action.
- **Recreation and Land Use-** Compared with the proposed action, Alternative 1 may double the number of years that the Reservoir would be closed to the public, and would include annual closures during the peak summer period. The No Action/No Project Alternative would limit the future water-based recreational opportunities at the Reservoir due to the reduction of Reservoir capacity from annual sediment accumulation, and may result in the permanent closure of the Reservoir if the Dam were to be removed or the Reservoir become filled with sediment.

- **Transportation and Traffic-** Compared with the proposed action, Alternative 1 would reduce the number of daily truck trips and eliminate the afternoon peak period impact at the intersection of Pearblossom Highway and Avenue T during the initial sediment removal phase. Under the No Action/No Project Alternative, should future removal of the Dam and accumulated sediment be required, such a project would likely result in increased traffic impacts when compared to both the proposed action and Alternative 1.

ES.3.2 Areas of Controversy

Public input on the focus and content of the EIS/EIR was sought during the Project's scoping period that commenced on March 7, 2014 and ended on April 15, 2014. A public scoping meeting was held on March 25, 2014. Comments that were received during the scoping period identified the following concerns:

- Potential impacts to sensitive plants and wildlife, and to sacred sites in the Project area;
- Existing fish and soil contamination in the Reservoir;
- Risk of exposure to Valley Fever;
- Number of truck trips and other construction-related traffic; and
- The need for best management practices and mitigation measures to reduce Project impacts.

The key issues that were identified during scoping are further described in Section F.1 (Public Participation and Notification) of this EIS/EIR, and are addressed throughout the impact discussions as appropriate (see Section C [Affected Environment and Environmental Consequences]).

ES.3.3 Issues to be Resolved

PWD has a standing agreement with the California Department of Water Resources' (DWR) under the Davis-Grunsky Act. In 1992, DWR provided grant funds for the Littlerock Dam and Reservoir Restoration Project, which obligates PWD to do the following:

- Phase I: Strengthen and enlarge Littlerock Dam to correct for seismic and spillway deficiencies. This phase was completed in 1994; and
- Phase II: Restore the lost water supply and water storage benefits of Littlerock Reservoir. This phase would be completed by the proposed action.

The DWR agreement also requires PWD to maintain a minimum recreation pool (i.e., 500 acre-feet in volume, and 3,228 feet in elevation) in the Reservoir throughout the recreation season (ending Labor Day each year) as long as sufficient surface flows from Little Rock Creek are available (DWR, 1998). However, in June 2014, PWD stated its plan to address the current statewide drought by diverting water from Littlerock Reservoir to Lake Palmdale for treatment and distribution to customers, beginning July 1, 2014 through August 2014 until the Reservoir was completely empty. The PWD diversion plan was determined consistent with the DWR contract per Article A-26 (Force Majeure) of that contract, which provides exceptions to the stated obligations in the event of an "Uncontrollable Force" such as a drought (DWR, 1998).

It should also be noted that Forest Service Land Management Plan identifies the Reservoir as a non-recreation special use and therefore the Reservoir is not a designated recreation area. Recreational opportunities have not been consistently available to the public, and currently the Reservoir is closed to public access. Based on these factors, PWD has been discussing the potential for DWR to lift the minimum recreation pool obligation of the agreement. As of the writing of this document, discussions with DWR are ongoing, and as such PWD will continue to be subject to its obligations and responsibilities under its agreement with DWR. However, during these discussions, DWR has indicated that a temporary suspension to the minimum pool obligation starting in July (as proposed in Alternative 1) would be considered for purposes of restoring the Reservoir's water storage capacity.

A. Purpose and Need for Action

The Palmdale Water District (PWD) and the USDA Forest Service (Forest Service) have prepared a joint Environmental Impact Statement (EIS) and an Environmental Impact Report (EIR) referred to as an EIS/EIR for the Littlerock Reservoir Sediment Removal Project proposed by PWD. This joint EIS/EIR has been prepared under the direction of the PWD, as the lead agency under California law, and the Forest Service as the lead agency under federal law to comply with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

A.1 Overview of Proposed Action/Project and Alternatives

The Littlerock Dam and Reservoir are located on Little Rock Creek below the confluence of Santiago Canyon in the Angeles National Forest (ANF) (see Figure B-1 [Regional Project Location and Sediment Removal Truck Routes]). The PWD operates the Littlerock Reservoir as a local surface water impoundment, and water is conveyed from the reservoir to Lake Palmdale. Inflow into the Reservoir is seasonal and varies widely depending on stream flows and snowmelt within the watershed. The Reservoir was constructed in 1924 with an initial design capacity of 4,300 acre-feet. By 1991, the capacity of the Reservoir had been reduced by siltation to approximately 1,600 acre-feet. As a result of the 1992 Littlerock Dam and Reservoir Restoration Project, the height of the Dam was raised to increase the reservoir capacity by approximately 1,723 acre-feet with a surface area of nearly 100 acres. Preliminary calculations conducted by PWD indicate that the Reservoir capacity is further reduced at a rate of approximately 30 to 40 acre-feet per year (WCC, 1992). PWD proposed an excavation of sediment from the reservoir as a part of the 1991/1992 Littlerock Dam and Reservoir Restoration Project EIS/EIR. This portion of the Project was not implemented, however, due to the presence of federally endangered arroyo toad (*Anaxyrus californicus*) upstream of River Station 4,235. PWD proposes to excavate sediment from the reservoir and construct a grade control structure (proposed action or proposed project) at, or just downstream of River Station 4,235, also known as Rocky Point.

A.2 Purpose and Need

Both the NEPA Regulations (Section 1502.13) and the CEQA Guidelines (Section 15124[b]) require that the purpose, objectives, and need for a proposed action be described in the EIS/EIR. The description of project purpose should state the specific objectives of the proposed action, whereas the statement of need should discuss the broader underlying need to which an agency is responding.

A.2.1 Statement of Purpose and Objectives

The proposed action purpose and PWD's objectives for implementing the proposed action include the following:

- Restore the Reservoir to 1992 water storage and flood control capacity, and maintain that capacity through annual sediment removal; and
- Preserve habitat for the arroyo toad (*Anaxyrus californicus*) through construction of a grade control structure that prevents sediment loss and headcutting of the stream channel upstream of Rocky Point.

A.2.2 Project Need

The Project is needed to increase PWD's water storage capacity. Littlerock Reservoir is a critical part of the larger water resource, treatment, and distribution system operated by PWD to provide service to customers in the City of Palmdale and the surrounding unincorporated communities (USFS, 1997). The Reservoir also provides debris control and flood protection for downstream areas, as well as recreational opportunities, fish and wildlife enhancement, and serves as a historical and cultural resource. Additionally, Little Rock Creek upstream of the Reservoir provides habitat for the federally endangered arroyo toad (*Anaxyrus californicus*). Siltation and sedimentation has resulted in a substantial reduction in water storage and flood control capacity. Previous plans for sediment removal from the Reservoir, however, posed potential risks for "take" of arroyo toad and degradation of arroyo toad habitat upstream of the Reservoir beyond the Rocky Point area.

By constructing a grade control structure at or just downstream of River Station 4,235 (the Rocky Point area) prior to the removal of sediment from the Reservoir, any headcutting or sediment loss due to sediment removal activities would be limited to the area downstream and would not affect the stream channel upstream of the grade control structure. Consequently, because Project effects to the stream channel upstream of River Station 4,235 would be minimized, the risk of "take" of arroyo toad through habitat degradation would also be minimized.

A.3 Agency Use of this Document

As indicated in the Project Overview (Section A.1), the proposed action is located on land administered by the Forest Service that is referred to as National Forest System (NFS) land. The PWD would require a Special Use Authorization from the Forest Service to implement the proposed action. In order to consider approval of the requested authorization, the Forest Service will prepare an Environmental Impact Statement (EIS) pursuant to NEPA that identifies the proposed action's potential impacts. PWD will also take into account the environmental impacts of the proposed action through its preparation of an Environmental Impact Report (EIR) pursuant to CEQA. Based on these requirements, a joint EIS/EIR has been prepared under the direction of both agencies to satisfy the permitting and decision-making requirements of each agency prior to project approval. NEPA and CEQA also require that the EIS/EIR development process include public notice of the proposed action, and address concerns that the public may have regarding the proposed action.

A.3.1 Decision Framework for U.S. Forest Service

Littlerock Dam and Reservoir are operated and maintained by PWD, pursuant to a Forest Service special use permit. The proposed action includes an application from PWD for a special use authorization from the Forest Service to construct the proposed grade control structure and to remove sediment from the Reservoir. The Forest Supervisor, as the Responsible Official for the preparation of the EIS, will decide whether to permit the proposed activities or an alternative to the proposed action on NFS lands. If approved, the EIS will include mitigation measures that have been adopted to reduce or avoid impacts, which will be guided by a mitigation monitoring, reporting, and compliance program intended to ensure enforcement of measures.

A.3.2 Decision Framework for Palmdale Water District

Prior to making a decision on the proposed action, PWD will prepare an EIR pursuant to CEQA requirements that will evaluate the environmental impacts from the proposed action and alternatives, and will identify feasible mitigation measures for potentially significant impacts. Per CEQA Guidelines (Section 15097(a)), a mitigation monitoring program must also be adopted for an EIR to ensure measures are implemented.

In addition to its responsibility to review the proposed action as the CEQA Lead Agency, PWD must ensure the proposed action's compliance with a California Department of Water Resources' (DWR) contract. In 1992, PWD entered into an agreement with the DWR under the Davis-Grunsky Act to partially fund the cost of the Littlerock Dam and Reservoir Restoration Project, which included the following two phases:

- Phase I: Strengthen and enlarge Littlerock Dam to correct for seismic and spillway deficiencies. This phase was completed in 1994; and
- Phase II: Restore the lost water supply and water storage benefits of Littlerock Reservoir. This phase would be completed by the proposed action.

The DWR agreement requires PWD to maintain a minimum recreation pool (i.e., 500 acre-feet in volume, and 3,228 feet in elevation) in the Reservoir throughout the recreation season (ending Labor Day each year) as long as sufficient surface flows from Little Rock Creek are available (DWR, 1998). However, in June 2014, PWD stated its plan to address the current statewide drought by diverting water from Littlerock Reservoir to Lake Palmdale for treatment and distribution to customers, beginning July 1, 2014 through August 2014 until the Reservoir was completely empty. The PWD diversion plan was determined consistent with the DWR contract per Article A-26 (Force Majeure) of that contract, which provides exceptions to the stated obligations in the event of an "Uncontrollable Force" such as a drought (DWR, 1998).

PWD will continue to be subject to its obligations and responsibilities under the DWR contract, which will guide its design and management of the proposed action.

A.3.3 Authorizing Actions

Several other federal, State, and local agencies will rely on information in this EIS/EIR to inform them in their decision over issuance of specific permits related to Project construction or operation. Under CEQA, a public agency with discretionary approval authority over a portion of a project is a responsible agency, while under NEPA a federal agency with similar discretionary approval over a project is a cooperating agency (14 CCR 15096; 40 CFR 1508.5). In addition to a special use authorization from the Forest Service, PWD may be required to obtain permits from the following cooperating or responsible agencies: U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, California Department of Fish and Wildlife, Antelope Valley Air Quality Management District, Lahontan Regional Water Quality Control Board, County of Los Angeles, and City of Palmdale.

Table A-1 lists the federal, State, and local permits and authorizations required for the proposed action.

Table A-1. Federal, State, and Local Permits and Authorizations

Agency	Permit/Approval
USDA Forest Service	Special Use Authorization
U.S. Fish and Wildlife Service	Biological Opinion in compliance with Section 7 of the Endangered Species Act
U.S. Army Corps of Engineers	Section 404 Permit in compliance with the Clean Water Act (see 404(b)(1) Evaluation Summary in Appendix F)
California Department of Fish and Wildlife	Section 2081 Incidental Take Permit in compliance with the California Endangered Species Act
	Lake and Streambed Alteration Agreement

Table A-1. Federal, State, and Local Permits and Authorizations

Agency	Permit/Approval
Lahontan Regional Water Quality Control Board	Section 401 Certification in compliance with the Clean Water Act
	Section 402 Permit in compliance with the Clean Water Act
Antelope Valley Air Quality Management District	Permit to operate
County of Los Angeles	Conditional Use Permit for sediment storage
	County agreement regarding road damage and repairs
City of Palmdale	Conditional Use Permit for sediment disposal
	City agreement regarding road damage and repairs

As discussed in Section C.1 (Introduction to Affected Environment and Environmental Consequences), the Forest Service and PWD have pre-emptive jurisdiction over the proposed action and no local discretionary permits or local plan consistency evaluations are required for the proposed action or alternatives. However, the sites identified to receive the sediment removed from the Reservoir would be required to obtain any necessary permits from local jurisdictions. Additionally, the Forest Service and PWD, in accordance with NEPA and CEQA (respectively), have included evaluation of local land use plans in this document in cases where these local plans and policies would help reduce or eliminate an environmental impact.

A.4 Overview of the Environmental Review Process

Both NEPA and CEQA encourage agencies to prepare a single joint environmental assessment document, because the environmental review process under both laws are similar and somewhat parallel. Therefore, the Forest Service and PWD will direct the preparation of a joint EIS/EIR for the Littlerock Reservoir Sediment Removal Project proposed by PWD. Under the direction of the Forest Service as the federal lead agency, and PWD as the lead agency under California law, a Draft and a Final EIS/EIR will be prepared to comply with NEPA and CEQA. However, the Forest Service and PWD will take separate decision actions on the EIS/EIR prepared for the proposed action.

After the completion of the EIS/EIR, the Forest Service will issue a Draft Record of Decision (ROD) that states the Forest Service's determination on issuance of the Special Use Permit/Authorization and the rationale for that decision. The Draft ROD is subject to administrative review under the Forest Service predecisional administrative review process (36 CFR 218).

In compliance with CEQA requirements, PWD will determine the adequacy of the Final EIS/EIR and, if adequate, will certify the document as complying with CEQA. If PWD approves the Project with significant and unmitigable impacts, it must state why in a "Statement of Overriding Considerations," which would be included in PWD's decision on the document.

Section F.1 (Public Participation and Notification) of this document describes the public scoping process for the Project. Section F.4 (Distribution of the EIS/EIR) includes a detailed discussion of the public review period, EIS/EIR document availability, and opportunities to provide public comment on the Project.

A.5 Reader's Guide to this Document

A.5.1 EIS/EIR Organization

The organization of this EIS/EIR is listed below. Please note that all figures are included at the end of their respective sections.

- **Executive Summary.** A summary description of the proposed action, the alternatives, and their respective environmental impacts is included.
- **Section A (Purpose and Need for Action).** A brief overview of the proposed action, purpose and need for the Project, and the public agency use of the EIS/EIR is described.
- **Section B (Description of Proposed Action/Project and Alternatives).** Detailed descriptions of the proposed action and alternatives to the proposed action are presented. The process for selection of Project alternatives is described along with the steps and rationale for elimination of certain alternatives from further analysis.
- **Section C (Affected Environment and Environmental Consequences).** A detailed description of the affected environment and regulatory framework is presented for each technical issue area, followed by a comprehensive analysis of proposed action impacts and impacts of the Project alternatives. Mitigation measures are presented that would help reduce or minimize any potential impacts resulting from implementation of the Project.
- **Section D (Cumulative Effects).** This section identifies past, present, and reasonably foreseeable future actions in the Project vicinity that help define the cumulative scenario for each issue area. The cumulative analysis discusses the incremental impact of the proposed action and Project alternatives when considered with other cumulative projects.
- **Section E (Other Federal Requirements and CEQA Considerations).** A summary of all significant and unavoidable impacts resulting from the Project is provided as well as a discussion of long-term implications. This section also describes how the Project has been developed in accordance with the requirements of federal environmental regulations.
- **Section F (List of Preparers and Persons Consulted).** This section describes the public scoping process, as well as the distribution and availability of the EIS/EIR and the public comment period. A list of the EIS/EIR authors and the agencies or individuals contacted during preparation of the EIS/EIR is included.
- **Section G (References).** This section lists the research conducted in preparation of the document.
- **Section H (Glossary and Acronyms).** Definitions to terms and abbreviations used in the EIS/EIR are provided.
- **Section I (Index).** An index of important or useful subjects is provided for ease in locating information in the EIS/EIR.
- **Appendices.** Technical background information used in preparation of the EIS/EIR is included.

A.5.2 Topics not Relevant to the EIS/EIR

Both NEPA and CEQA provide guidance on focusing the environmental analysis on information or data that is relevant to the EIS or EIR (FSH 1909.15, Chapter 23.3[6]; CEQA Sections 21061, 15126.2[a], 2011). If an issue or topic is found to be irrelevant to the proposed action, it is not to be included in the impact discussion. The following topics were not considered relevant to this EIS/EIR:

- **Paleontology.** The bedrock surrounding the Reservoir is Lowe Granodiorite. While there is some recent alluvium, there is no presence of geologic units that would have any paleontological sensitivity (Dibblee and Ehrenspeck, 2001).
- **Public Services/Utilities.** The Project would not generate any additional population that could affect the capacity of local public service or utility providers. Potential impacts associated with sediment disposal are discussed in Section C.6 (Hazards and Public Safety).
- **Socioeconomics/Environmental Justice.** No housing is located within the Littlerock Recreation Area. Census tracts that would be traversed or located within one-half mile of any proposed vehicle travel route do not contain more than 50 percent minority population, nor do they contain more than 50 percent low-income population (U.S. Census Bureau, 2000). The Project would not disproportionately affect minority or low-income populations. An environmental justice screening analysis and a discussion of the Project's compliance with Executive Order 12898 is provided in Section E.2.5.
- **Wilderness.** Project activities would not be located within or adjacent to a designated Wilderness Area. Potential impacts to other recreational resources are discussed in Section C.9 (Recreation and Land Use).

B. Description of Proposed Action/Project and Alternatives

B.1 Project Site Location

The proposed action would be primarily located within the Littlerock Reservoir (Reservoir), along public roads used as haul routes, and in large quarries west of the community of Littlerock. The Reservoir is a man-made feature formed by the impoundment of water by the Littlerock Dam. Figure B-1 illustrates the regional vicinity of the Project. The Reservoir is located within the boundaries of the Santa Clara Mojave Rivers Ranger District of the Angeles National Forest (ANF). Regionally, the Reservoir is located approximately 10 miles southeast of the City of Palmdale and 4 miles south of the community of Littlerock in the northern Los Angeles County area. Figure B-2 shows the Littlerock Reservoir and relevant proposed action areas, as described below in Section B.2.

B.2 Overview of the Proposed Action/Project

Within the notice of intent (NOI) and notice of preparation (NOP) dated March 19, 2014 to notify interested parties of the preparation of this environmental impact statement (EIS) and environmental impact report (EIR), key portions of the proposed action (Project) were described as:

- The removal of approximately 1,000,000 cubic yards of sediment from the Reservoir; and
- Construction of a mostly subterranean grade control structure that would span approximately 260 feet of channel (bank to bank) just downstream of Rocky Point. The maximum depth of the structure would be approximately 80 feet underground. The subterranean portion of the structure would extend downstream approximately 200 feet.

Since publication of the NOI and NOP, additional refinements to Reservoir topographical maps and analysis of sediment inflow to the Reservoir has increased the estimated amount of sediment necessary to the restore the Reservoir to 1992 design storage capacity. Additionally, further engineering of the grade control structure has resulted in different dimensions than what was presented in the NOI and NOP. These changes are identified below and analyzed within this EIS/EIR.

B.2.1 Overview of the Project

The proposed action consists of the following three components:

- Construction of a subterranean grade control structure within the Reservoir at Rocky Point.
- Total initial removal of approximately 1,165,000 cubic yards of accumulated sediment from within the Reservoir to restore 1992 design water storage and flood control capacity. This initial removal period would occur over a 7 to 12 year timeframe and would include annual restoration activities.
- Ongoing annual sediment removal (estimated at 38,000 cubic yards per year) to maintain Reservoir design capacity, including annual restoration activities.

These three Project actions are necessary to restore and preserve the Reservoir capacity, which has been substantially reduced over time by the deposition of sediment behind Littlerock Dam during seasonal inflows. The 1992 design capacity of the Reservoir is 3,500 acre-feet (af) of water storage. Currently, the Reservoir storage capacity has been reduced to approximately 3,037 af because of sediment buildup. The USDA Forest Service's (Forest Service) proposed action is to amend an existing PWD permit to allow for construction of the grade control structure and update an existing operations and maintenance (O&M) plan for the Reservoir.

Public Access Restrictions

As discussed in Section C.9 (Recreation and Land Use) within this EIS/EIR, the Littlerock Dam and Reservoir are authorized on National Forest System (NFS) lands by a special use authorization, considered a non-recreation special-use. Palmdale Water District (PWD) is authorized to lower the Reservoir to a “minimum” pool level after Labor Day, using the water for beneficial potable water needs. In drought years, PWD can lower the Reservoir earlier with approval by the California Department of Water Resources. One of the few recreational opportunities available during these periods is use of the lowered Reservoir bed as an OHV area, which was last opened in 2013. Use of this OHV area is assessed annually by the Forest Service, based on weather and water levels. The Reservoir is currently physically closed to public access to protect public health and safety, but no official Forest Service Closure Order has been issued. This means the entry gate is closed and locked but it is not illegal to enter the area.

The Reservoir would be closed to the public during proposed action activities. This is necessary for public safety. As discussed above, when the Reservoir is lowered, OHV within the Reservoir bed is one of the few recreational opportunities available. This area would be under construction and unavailable for OHV use. As discussed in more detail later in this section, closures of the Reservoir to the public are anticipated to be from:

- July through November the first year of Project activities for grade control structure construction;
- Labor Day to when seasonal water refill of the Reservoir suspends construction activities (estimated between mid-November and January) for initial sediment removal activities (7 to 12 years) to restore the Reservoir to 1992 design capacity; and
- After Reservoir restoration, as-needed between Labor Day to when seasonal water refill of the Reservoir suspends construction activities (estimated between mid-November and January) for ongoing sediment removal activities to maintain Reservoir design capacity.

B.2.2 Grade Control Structure

Before sediment removal can occur, a grade control structure would be constructed within the Reservoir at an area known as Rocky Point. Construction of the grade control structure is necessary to ensure that sediment removal will not result in degradation to designated critical habitat for the arroyo toad located immediately upstream of Rocky Point by inducing head-cutting (lowering) of the channel bed upstream of the structure. This location of the proposed grade control structure and arroyo toad habitat is depicted in Figure B-2.

The grade control structure would be constructed of soil cement (or roller-compacted concrete) derived from natural sand materials from the reservoir bed, simulating a natural, but hardened, ground surface. The primary structure will be a subterranean dam-like structure, with the top being flush with, or slightly above, the existing Reservoir bottom. Soil cement bank protection would extend laterally from the primary structure, as well as along the west upstream bank, to protect adjacent side slopes. This soil cement structure plus adjacent bank protection would span approximately 250 to 476 feet of channel (bank to bank) with a maximum depth of approximately 56 feet underground. The subterranean portion of the structure would extend downstream approximately 112 feet at approximately 2-to-1 slope. Figures B-3 and B-4 show a conceptual cross section of the primary grade control structure and a plan view of the overall structure, respectively.

Because the grade control structure and most of the adjacent bank protection would be constructed below grade, only the upper lip of the structure (at the greatest point upstream) would be visible when the reservoir water level is lowered (approximately 8 feet by 200 feet). Soil cement bank protection adjacent to the structure and on the west bank upstream of the structure would extend approximately 9 feet above the reservoir bed as shown in Figures B-3 and B-4. Figure B-5 depicts a visual simulation of the completed grade control structure when the Reservoir water level is lowered, thus exposing the upper lip of the structure.

B.2.2.1 Grade Control Construction

Construction of the grade control structure would begin in July of 2017, with the Reservoir lowered to a level allowing full access to the site. Construction is currently estimated to take approximately 20 weeks to complete. Construction would typically occur between 7:00 a.m. and 7:00 p.m., 6 days per week (no work on Sundays or federal holidays). Temporary night construction may be necessary during large volume soil cement activities and due to an earlier sundown during the fall months. Any necessary night work would be conducted consistent with the Standard Project Commitments (SPCs) identified in Appendix A (as discussed below in Section B.3) and is not expected to extend very far into the evening hours. It is anticipated that night construction may be needed for up to 14 nights.

Disturbance Areas

Construction activities would disturb a section of channel and adjacent bank up to 500 feet wide in a direction perpendicular to stream flow, and up to 470 feet wide in the direction parallel to the flow of the creek. The total disturbance during construction would be approximately 3.5 acres for the grade control structure and would extend approximately 175 feet into designated critical habitat for the arroyo toad (as shown on Figure B-2). It is important to note that a majority of this construction disturbance occurs in an area that may be underwater in any given year as the reservoir fills.

Excavation for the grade control structure would require the movement of approximately 96,000 cubic yards of material. This material would not be transported off site, but would be stockpiled within the downstream bed of the Reservoir and then used for soil cement base and backfill as the grade control structure is built.

All equipment would be stored within the existing paved areas shown in Figure B-2 when not in use at the grade control structure site. Construction staging areas would occur within these paved areas as well.

Water Diversion

Construction of the grade control structure may require diversion of subsurface and surface flows around the construction area in the reservoir bed at Rocky Point. Subsurface flows will likely be collected by installing a series of dewatering wells to a maximum depth of approximately 70 feet in the reservoir bed along the upstream and downstream limits of construction. These wells will pump subsurface water into a temporary pipeline that will convey the water around the construction site to be discharged into the reservoir bed downstream of the construction. Wells are expected to be approximately 4 to 6 inches in diameter and spaced in a line at 3- to 10-foot intervals upstream and downstream of the excavation perimeter (as shown in Figure B-3).

Intermediate wells may be necessary along the cut slope between the primary wells and the bottom of the excavation, within the main disturbance area. All dewatering wells would be temporary, removed after construction, and the ground restored to the pre-construction condition. Dewatering water would be pumped to the reservoir bed surface downstream of the construction site.

During normal rain events and stream inflow to the Reservoir, surface water flows would be collected by temporary coffer dam (referred to as a Flow Control Berm on Figure B-4) and diverted by gravity-flow surface pipeline or pumped surface pipeline around the work area.

Soil Cement

The grade control structure and adjacent bank protection would require approximately 9,285 cubic yards of soil cement. To provide slurry for the grade control structure soil cement, a portable concrete batch plant would be stationed within the paved Project staging area nearest Rocky Point (refer to Figure B-2). Sand for the soil cement would come from excavated material, which would first be fed through a portable rock screener for sorting. Portland cement and flyash would be obtained from off-site commercial sources and trucked to the staging area. Flyash is one of the residues generated by coal combustion, typically from power plants. The United States Environmental Protection Agency (EPA) published in December 2014 a final rule, which establishes that coal flyash is not to b45 e classified as a hazardous waste. Almost half of the flyash produced is recycled and used as a partial replacement for Portland cement in concrete production to improve the workability. Cementitious materials would be stored on site for use in construction of the grade control structure.

Soil cement mixture would be transported in trucks from the batch plant to the grade control site. Needed water would be obtained from the Reservoir and transported by truck or temporary pipeline. The excavation would be filled as the structure grows. As discussed in Appendix A, SPCs will ensure that potential contaminants from equipment and all construction activities occurring on paved parking areas (including cement water) do not enter the Reservoir or stream channel.

Construction Equipment

The anticipated maximum equipment necessary for construction of the grade control structure would include:

- Portable Concrete Plant (1) – 400 ton/hour capacity
- Portable Rock Screener (1) – 400 ton/hour capacity
- Roller compactor (1)
- D9 Bulldozers (2)
- Forklift (1) – 10-ton
- Grader/Spreader (1)
- Front End Loaders (1) – 6 yard capacity
- Excavators (1), with multiple attachments
- Water Trucks (1) – 4,600 gallon capacity
- Articulated Trucks (3) – 12-yard capacity
- Brush chipper/shredders and chain saws
- Generators and dewatering pumps (up to 12) and possibly lights (for any necessary temporary nighttime construction, assumed up to 14 working days)

Cleanup and Restoration

Construction debris would be removed from the site and transported to the Antelope Valley Recycling and Disposal Facility. Disturbed channel areas would be returned to pre-construction conditions. Restoration activities that would occur after construction of the grade control structure are described within Section B.2.5.

Grade Control Construction Summary

Table B-1 provides a summary of the proposed grade control structure and construction.

Table B-1. Grade Control Structure Summary
• A permanent structure of soil cement at Rocky Point and extending from bank to bank. The structure would prevent head cutting (erosion) upstream of Rocky Point, preserving arroyo toad habitat.
• Constructed mostly below grade, with only the top or upper lip of the structure and some adjacent bank protection visible in the stream surface and adjacent banks after completion.
• Temporary ground disturbance of approximately 3.5 acres. Permanent disturbance after construction would consist of the crest of the grade control structure that remains visible above grade (approximately 8 feet by 200 feet), plus bank protection adjacent to the structure. Total area of visible (above ground) soil cement bank protection after construction, including the grade control structure crest, is approximately 0.34 acres.
• Construction duration of 20 weeks to begin in July and extend through the fall.
• Construction equipment would be operated up to 12 hours per day, 6 days a week, with night construction possibly required for a maximum of 14 nights.
• Workforce ranging in size from 9 to 14 persons.
• Maximum of 30 daily worker vehicle trips and 6 daily truck delivery trips

B.2.3 Initial Annual Sediment Removal – Restore to 1992 Design Capacity

B.2.3.1 Overview

Upon completion of the grade control structure, PWD would remove approximately 1,165,000 cubic yards of sediment from the Reservoir bottom, restoring the Reservoir to 1992 design capacity. Sediment would be removed annually during a temporary closure of the Reservoir starting in 2017 after Labor Day until seasonal water refill of the Reservoir suspends removal efforts (estimated between mid-November and January). The Reservoir would be closed to the public during this period.

It is estimated that under a maximum removal schedule, approximately 7 to 12 years of annual sediment removal would be required to achieve 1992 design capacity of the Reservoir. This excavation rate assumes that 16, 12-cubic-yard-capacity dump trucks, with associated necessary off-road equipment, are working a total of 60 days annually between Labor Day and mid- to late November each year to remove a total of 166,430 cubic yards of sediment each year. It is estimated that there is an annual inflow rate of 38,000 cubic yards of new sediment into the Reservoir (loss of 23 af of water storage annually), Therefore, the net annual increase in Reservoir capacity during each of the 7 to 12 years of initial annual sediment removal is approximately 80 af.

The above maximum sediment removal scenario is utilized to represent worst-case potential for environmental impacts. However, unknown variables (such as annual dump truck availability, seasonal rainfall during the removal period, sediment recycling/reuse at civil projects more distant than the proposed disposal sites) may occur. Therefore, it is likely the initial disposal period could extend up to 10 to 12 years to achieve 1992 design capacity.

Sediment removal activities would involve the excavation of material from inside the Reservoir bed, within the disturbance area shown in Figure B-2. Sediment removal will not alter the Reservoir footprint, but will simply deepen the Reservoir within the excavation area shown in Figure B-2. The excavation area starts just upstream of the Dam and extends 4,500 feet upstream of the Dam. The maximum excavation depth would be approximately 14 feet approximately 800 feet upstream of the Dam. The new channel bottom would taper upstream to the existing grade at the upstream limits of excavation. This disturbance area is contained entirely within the Reservoir inundation area.

B.2.3.2 Annual Sediment Removal Activities

Biological Surveys and Vegetation Clearing

PWD would conduct pre-construction surveys and establish exclusion areas before commencing annual sediment removal to reduce potential impacts to sensitive biological resources. Refer to Appendix A for SPCs related to preconstruction survey requirements, the establishment of any annual temporary exclusion areas, and biological monitoring during annual sediment removal. Vegetation clearing within the sediment removal area may be required annually. PWD would salvage vegetation for future restoration efforts or dispose of vegetation at an approved landfill accepting organic material, such as the Antelope Valley Recycling and Disposal Facility. If any emergent vegetation is removed, focused preconstruction nesting surveys for birds would be conducted to ensure there is no loss of nesting birds or their young.

Removal of Invasive Fish Species. The Littlerock Reservoir does not support any species of native fish. Based on sampling, creel census surveys, and biological surveys conducted in the Reservoir, only non-native species have been detected. Many of these species have been observed in designated Critical Habitat for arroyo toad located upstream of the Reservoir. Furthermore, the Lahontan Regional Water Quality Control Board (Lahontan RWQCB) found fish within the Reservoir to be contaminated with Mercury, and are currently designated unsafe for consumption by the California Office of Environmental Health Hazard Assessment (LRWQCB, 2014). As part of this Project, additional fish tissue samples were taken. The results of these tests are provided in Appendix D and discussed in Section C.3 (Biological Resources). In order to improve habitat conditions for arroyo toad and other native species, all non-native fish will be removed from the Reservoir during sediment removal activities.

During the first year of sediment removal, all water will be diverted from the Reservoir in order to strand non-native fish. A qualified biologist will supervise this activity and be available to inspect for any native reptiles or amphibians. If present, these species will be collected and relocated to upstream areas. Fish carcasses will be immediately collected and disposed in an approved landfill accepting such waste to ensure no adverse odor is created and to prevent other species of wildlife from consuming the fish. As discussed in Appendix A (Standard Project Commitments), no less than 120 days prior to the first year of sediment removal, the Palmdale Water District shall coordinate with the authorized officer for the ANF to develop consensus on methods of removing non-native fish from the Reservoir (SPC LAND -2).

Based on PWD's recent tests of fish from the Reservoir (refer to Appendix D), the mercury and PCB levels found would not classify them as Class I hazardous waste. Because each individual fish killed would not be tested, it is assumed all fish could potentially be contaminated. Consistent with applicable regulations for the disposal of contaminated waste, all removed fish would disposed at a licensed facility (likely the nearest Class III landfill, Antelope Valley Landfill in Palmdale). In the event this determination changes, fish would be disposed of at Laidlaw Landfill in Kern County, the nearest Class I landfill.

Prior to each subsequent annual sediment removal period, after water has been diverted from the Reservoir, a biologist will determine if any invasive fish species are present and will assess the need for additional fish removals. The Reservoir is not currently listed for recreational fish stocking by the California Department of Fish and Wildlife (CDFW). Therefore, after several annual sediment removal periods, no fish would likely remain within the Reservoir.

Water Diversion

To provide access to the full excavation area, PWD would first divert water for beneficial use from the Reservoir lowering to a dead pool level (resulting in a pool between the furthest downstream excavation area and the Dam). As surface flows from rainfall begin to refill the Reservoir, a coffer dam and/or temporary pipeline may be required to pass low stream flows around the work area as sediment removal moves upstream later in the fall within the excavation area.

Construction Access

Access to and from the sediment removal area would occur from the existing boat ramp and other existing access points located on the west side of the Reservoir (as shown in Figure B-2). Access road preparation would involve:

1. Providing and marking access roads and travel paths for construction equipment; and
2. Clearance or grading of the road surface to accommodate necessary travel within the Reservoir.

Sediment removal operations would require traffic control (flagmen) stationed near the boat ramp and gated entrance to the Reservoir on Cheseboro Road. Additional locations for temporary traffic signal/flagmen may be required between these two points. However, this segment of roadway would be closed to public access during the annual closure period.

Disposal of Removed Sediment

Excavated sediment would be loaded into trucks and hauled to off-site locations. Sediment may first be stockpiled within the excavation area if drying is needed. PWD will first seek to recycle excavated material as feasible, likely for use on PWD and other municipal projects within Palmdale and the surrounding area. All excavated sediment would be trucked off site to one of two locations (refer to Figure B-1):

- **Exhausted mining pits at existing quarries within Littlerock.** The majority of removed sediment would be used for backfilling exhausted mining pits at existing sand and gravel mines located in the community of Littlerock, approximately 6 miles north of the Dam (as shown in Figure B-1). Currently, 6 individual quarries operate within this area, including Holiday Rock, AV Aggregate, Robertson's, Granite Construction Company, Hi-Grade Materials Company, and Vulcan Materials Company. Exhausted pits at these locations have capacity that exceeds 1,200,000 cubic yards. PWD will coordinate with these quarries on an annual basis to determine the exhausted pit(s) that will receive sediment for spreading and backfill. Disposal of material within the exhausted pits will require that the selected mining operation, or operations, submit for a major modification to their new Conditional Use Permit (CUP) or that a new CUP application be submitted. Additionally, the City of Palmdale Office of Mine and Reclamation would require notification of the major modification to the approved Reclamation Plan(s).
- **PWD-owned property on 47th Street East, just north of the California Aqueduct.** This 21-acre site is shown in Figure B-1. A small portion in the northeast corner of this site would be used for temporary sediment storage, allowing for future use (recycling) of material. Sediment would be stored at this location only for the short-term, allowing for recycling of the material for other civil projects and PWD uses (should stockpiling the material at the recycle location not be allowed at the time of removal from the Reservoir). This site has an at-grade truck access and disturbed staging area on 47th Street. Sediment storage would occur only in depressions located in the northeast portion of the site, ensuring the greatest distance from adjacent residences, ephemeral streams, and the California

Aqueduct. Furthermore, stockpiled sediment material would not be mounded above the existing grade of 47th Street. The amount of excavated sediment stored at this location would likely vary from year to year as reuse is evaluated annually. However, the amount of material temporarily stored at this location would not exceed 10,000 cubic yards. PWD will annually evaluate the amount of material that can be recycled. It is also likely that some material could be trucked directly to the site of reuse. The storage area would require clearing of vegetation that would not be restored so the site is available for temporary sediment storage and recycling.

Sediment removed from the Reservoir consists of a combination of fine sediments, sand, coarse gravels, and cobble. Disposal of the materials would follow federal regulations and policies for the appraisal and sale of commercial mineral materials, if applicable. In September of 2014, sediment from the Reservoir was tested to identify any potential contaminants. Sediment samples were taken at eleven (11) different locations within the proposed removal area. Sediment was tested both from the surface and at a depth of 4-6 feet at each of the eleven locations. No sediment tested contained pesticides, polychlorinated biphenyl (PCB) congeners, or mercury levels exceeding method detection limits (MDL) or above levels normal within soils. These results are provided in Appendix D.

Construction Equipment, Materials, and Schedule

Construction equipment staging would occur within the existing paved surface parking lots within the Littlerock Reservoir, as shown in Figure B-2. All staging, temporary employee parking, and material storage activities would occur in previously disturbed or paved areas. No fuel or mobile equipment would be stored within the Reservoir.

Typical equipment required for annual sediment removal includes, but is not limited to, loaders, dozers, dump trucks, excavators, and water trucks. PWD proposes to use front-end loaders and 12-yard capacity dump trucks to haul material off site for disposal. The following provides approximate equipment types and numbers utilized during annual sediment removal:

- D9 Bulldozers (2)
- Grader (1)
- Sweeper (1)
- Front End Loader (1) – 6 yard capacity
- Excavators (1)
- Dump Trucks (16) – 12 yard capacity
- Water Truck (1) – 4,600 gallon capacity
- Fuel Truck (1)
- Maintenance Truck (1)
- Brush chipper/shredders and chain saws

Construction equipment would be operated only between 7:00 a.m. and 7:00 p.m., up to 6 days a week (no activities occurring on Sundays or federal holidays). Saturday activities may be restricted in order to minimize impacts to residents along Cheseboro Road between the Reservoir and the sediment disposal site (e.g., no work every first and third weekend). With a daily workforce of approximately 30 personnel, including dump truck drivers, over 60 working days of excavation would be required to perform annual sediment removal. In addition, there would be a few days of clearing, staging, and cleanup before and after each of the annual excavation events.

Cleanup and Restoration

Upon cessation of annual sediment removal, all disturbed areas will be restored (refer to Section B.2.5, below). Construction debris would be removed from the site and transported to the Antelope Valley Recycling and Disposal Facility. Disturbed channel areas would be returned to pre-construction conditions.

Annual Sediment Removal Summary

A summary of annual sediment removal activities restoring the Reservoir capacity is shown in Table B-2.

Table B-2. Summary of Annual Sediment Removal to Restore Reservoir Capacity
• Excavation of approximately 1,165,000 cubic yards of accumulated sediment to restore Littlerock Reservoir to 3,500 af of water storage capacity.
• Temporary annual closure of the Reservoir starting after Labor Day until seasonal water refill of the Reservoir suspends removal efforts (estimated between mid-November and January).
• Sediment removal activities would occur during daylight hours up to 12 hours per day Monday through Saturday (no work on Sundays or federal holidays)
• Maximum annual disturbance of approximately 30 acres within the Reservoir bed.
• Equipment staging within paved parking areas along Reservoir.
• Maximum of 480 (240 round trip) dump truck trips per day. Requires the use of 16 dump trucks.
• Annual restoration of disturbed areas.
• Minimum duration of approximately 7 years, up to 12 years, to restore 1992 design capacity.

B.2.4 Ongoing Annual Sediment Removal – Operation and Maintenance

Current estimates indicate Reservoir capacity is reduced by siltation at an average annual rate of approximately 38,000 cubic yards of sediment per year, amounting to a loss of approximately 23 acre-feet of water capacity annually. Therefore, upon restoring the Reservoir to 1992 capacity, an average of 38,000 cubic yards of sediment would be removed from the Reservoir annually. The actual amount of sediment removed from the Reservoir would be based on the expected amount of sediment deposition that occurred during each year's winter storms.

Annual O&M sediment removal would occur for the life of the Reservoir similar or identical to that discussed below in Section B.2.5. However, because annual O&M sediment removal would need to remove an average of only 38,000 cubic yards of sediment per year, it may have a shorter annual duration when compared to initial restoration sediment removal. This would depend on the number of dump trucks used. Table B-3 provides a summary of O&M sediment removal.

Table B-3. Summary of Operation and Maintenance Sediment Removal
• Approximately 38,000 cubic yards of sediment removed from the Reservoir annually (actual amount removed would be based on the expected amount of sediment deposition carried into the Reservoir during each year's winter storms)
• Would occur sometime after Labor Day and be finished prior to mid-November of each year
• Sediment removal activities would occur during daylight hours up to 12 hours per day Monday through Saturday (no work on Sundays or federal holidays)
• Maximum annual disturbance of approximately 15 acres within the Reservoir bed.
• Maximum of 180 (90 round trip) dump truck trips per day. Requires the use of 6 dump trucks.

B.2.4.1 Annual Return to Reservoir Minimum Pool Level

Currently, the Reservoir has a minimum pool obligation that was put in place by the California Department of Water Resources (DWR) to help facilitate recreation at the Reservoir through Labor Day. After water is diverted from the Reservoir for beneficial drinking water use, the minimum pool is reestablished in the fall or early winter by inflow at varying times (depending on inflow rate). Based on analysis of inflow records from 1931 to 2005, inflow is generally sufficient under current conditions to fill the Reservoir to minimum pool by mid-December, with a normal range of October to February. In very dry years, the Reservoir may not reach minimum pool level at all. The minimum pool is not defined by a volume of water in the Reservoir, but rather when the Reservoir water level reaches an elevation of 3231.

After the Reservoir has been restored to design capacity, the topography of the Reservoir will be changed such that the volume of water required to fill the minimum pool to Elevation 3231 will be increased. Based on past inflow records, the Reservoir will require approximately ten days to two weeks longer, on average, to refill to minimum pool level under with-project conditions compared to without-project conditions. This typically occurs between January and March when seasonal rain and snowmelt occurs and refills the Reservoir to minimum pool depths.

B.2.5 Annual Sediment Removal Site Clean-up and Restoration

B.2.5.1 Reservoir and Shoreline Restoration Activities

Following the excavation and removal of sediment from the Reservoir, the area would be graded to smooth the Reservoir bottom and remove any scars resulting from the excavation activities. Any construction debris would be removed from the site and transported to the Antelope Valley Recycling and Disposal Facility. It should be noted that the majority of the disturbed area would be Reservoir inundation area that is highly disturbed.

Any disturbances along the shoreline or other areas outside the Reservoir inundation area (sediment stockpiling, construction equipment storage, and staging areas) would be restored. Native seed mixes and live plant material would be planted in areas that contained vegetation disturbed during construction of the grade control structure or sediment removal activities. Reseeding would be focused primarily on disturbed areas outside or adjacent to the Reservoir inundation area. Within the Reservoir inundation area, limited seeding may occur to stabilize soil and control dust as outlined in the Habitat Restoration Plan (see Appendix A).

In targeted areas outside the reservoir inundation area, where any persistent native vegetation is removed for proposed action activities, the area would be revegetated and restored to its previous state. Noxious weed controls including washing of ground-disturbing equipment and removal of weeds prior to disturbance would be implemented to ensure that restored areas are not colonized by invasive plants. Appendix A presents general guidelines for revegetation. Site restorations would begin immediately following the cessation of construction activities concurrent with appropriate planting conditions and permit requirements.

B.2.5.2 Roadway and Parking Area Restoration Activities

At the completion of grade control structure construction and annual sediment removal activities, PWD contractors would restore all internal Reservoir access roads, parking areas, and travel paths to equal or better conditions as they existed prior to activity commencement. Further specifics pertaining to road and paved parking area restoration are provided in Appendix A. In summary, these activities include:

Initial Repair Work

- Road repair will be completed after Grade Control Structure construction and before the first year of sediment removal.
- Road repair will be completed from the upper use of the road used during Grade Control Structure construction down to the border of National Forest System lands, and parking areas utilized for construction staging will be resealed/repaved as necessary.

- Initial road repairs will be completed in a manner that will allow the road to handle the increase in truck traffic without the need to complete repairs more than once every 10 years.

Ongoing Repair Work

- Pothole repair, minor resealing, and crack sealing will be completed on an as needed basis to maintain road integrity between major resurfacing events.
- Resealing or repaving of all parking area used during annual sediment removal as necessary.
- Necessary maintenance (resurfacing, pothole repair, crack sealing, etc.) of the access road located below the Dam would also occur. This is required for annual inspection and to repair any damage caused by seasonal storm flows.

B.3 Standard Project Commitments

PWD has developed SPCs as part of its Project activities (see Appendix A). Appendix A includes the detailed list of SPCs. Adherence to all SPCs identified in Appendix A is considered part of the proposed action, and the SPCs include the commitments PWD will incorporate during all proposed action activities, if selected by the lead agencies in their respective decision documents.

The SPCs identified in Appendix A were developed to proactively protect sensitive resources at the Reservoir and reduce environmental impacts associated with Project activities. PWD and its contractors will follow SPCs at all times during all Project activities. SPCs can also evolve to become better as improvements are discovered. A number of the SPCs have been developed to specifically protect natural resources (plants, fish and wildlife, and for cultural resources). SPCs include, among other things, pre-construction flagging of sensitive resource areas and the need for other restrictions. In making final decisions on the Project, the lead agencies are allowed to weigh the feasibility and need for these SPC's, and may not make all of them applicable to the Project. If any of the SPC's are not selected, the rationale for excluding them shall be provided in the decision document, along with a determination that the impacts of the Project are still within the scope of those described in the EIS/EIR.

All Project personnel would be subject to an annual training that covers applicable SPCs, environmental laws and regulations, and applicable agency requirements. Adherence to all applicable SPCs would be included as part of PWD's written contract with any contractor selected to conduct proposed Project activities. Prior to conducting Project activities, PWD personnel would review the SPCs with the selected contractor to ensure the intent and background of each procedure is clearly understood. In addition, PWD and Forest Service personnel (or representatives) would monitor the contractor during activities and conduct follow-up inspections of the job site at periodic intervals after the work had been completed.

B.4 Development and Screening of Alternatives

B.4.1 NEPA and CEQA Requirements for Alternatives Assessment

NEPA and CEQA both require consideration of a reasonable range of alternatives to the proposed action. In addition, CEQA requires the consideration of how to avoid or substantially lessen any of the significant or adverse effects caused by the Project. The following section describes the process and information used in screening potential alternatives, and determining the reasonable range. For background on these requirements, please consult NEPA and CEQA regulations, either online or by request from the lead agencies. The Forest Service has not identified an Agency Preferred Alternative in this Draft EIS/EIR. One will be identified in the Final EIS/EIR.

B.4.2 Issues Raised During Scoping Process

Public or agency scooping comments regarding the proposed action and alternatives are included in Table B-4.

Table B-4. Scoping Issues Relevant to all Issue Areas

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
In addition to obtaining required permits and conducting monitoring, the EIS/EIR must include other BMPs and mitigation measures to reduce Project impacts.	Proposed mitigation measures to reduce impacts are included within Draft EIS/EIR Section C environmental analyses. SPCs to reduce environmental impacts are identified in Appendix A.
Streambed and lakebed alteration and/or discharge of fill material to a surface water may require a Clean Water Act (CWA) §401 water quality certification for impacts to federal waters or dredge and fill waste discharge requirements for impacts to non-federal waters.	As identified within Appendix A, PWD will obtain all necessary permits applicable to Project activities would be obtained prior to activities. Copies of all permits applicable to activities within National Forest System lands will be provided to the Forest Service. A list of necessary permits is provided in Section A.4 (Authorized Actions) of this EIS.
Land disturbance of more than 1 acre may require a CWA, §402(p) storm water permit [e.g., National Pollutant Discharge Elimination System (NPDES) General Construction Storm Water Permit, Water Quality Order (WQO) 2009-0009-DWQ].	As identified within Appendix A, PWD will obtain all necessary permits applicable to Project activities would be obtained prior to activities. Copies of all permits applicable to activities within National Forest System lands will be provided to the Forest Service.
Water diversion or dewatering activities may be subject to discharge and monitoring requirements per NPDES General Permit, Limited Threat Discharges to Surface Waters (Board Order R6T-2008-0023), or General Waste Discharge Require-ments for Discharges to Land with a Low Threat to Water Quality (WQ0-2003-0003).	As identified within Appendix A, PWD will obtain all necessary permits applicable to Project activities would be obtained prior to activities. Copies of all permits applicable to activities within Forest Service lands will be provided to the Forest Service.
The Draft EIS/EIR should evaluate these alternatives to stabilize Little Rock Creek upstream of the dam: ▪ Stream channel stabilization practices, including various types of revetments, grade control structures, and flow restrictors. ▪ Bioengineering techniques that reduce flow velocities and scour by increasing sediment deposition. ▪ Structural practices, both direct and indirect, that protect or rehabilitate eroded streambanks. ▪ Vegetative methods used in conjunction with or over structural methods.	The Project includes installation of a grade control structure to stabilize the stream channel upstream. While they may generally limit erosion along streambanks, the other suggested alternatives and practices are not considered sufficient to meet the Project's purpose and need of restoring reservoir capacity.
The Draft EIS/EIR should evaluate the feasibility of constructing an inline debris/sediment basin to capture sediment upstream of the reservoir over the short and long term.	These alternatives were evaluated but eliminated from further consideration, as discussed in Section B.4.6.
The EIS/EIR should include a discussion of the long-term maintenance plan to maintain the established baseline conditions. Include specific routine and non-routine activities such as dredging and recontouring, and the thresholds that will trigger when maintenance activities are warranted.	Long-term operations and maintenance activities associated with the Project are identified in Section B.2.4.
Department of Fish and Wildlife	
The EIS/EIR should include a complete discussion of the purpose and need for, and description of, the Project, as well as a range of feasible alternatives that are fully considered and evaluated in the EIS/EIR and that avoid or minimize impacts to sensitive biological resources.	Section A.2 provides the purpose and need of the Proposed Action. Section B.2 provides a description of the Proposed Action/Project. Alternatives evaluated in detail and those eliminated from further consideration are included in Sections B.4.5 and B.4.6, respectively.

Table B-4. Scoping Issues Relevant to all Issue Areas

Comment	Consideration in the EIS/EIR
City of Palmdale	
The project description indicated that sediment would be transported off-site to properties owned by the PWD or locations accepting sediment for placement and spreading. A Temporary Use Permit for Stockpiling will be required for this activity. No undisturbed land can be used to store/stockpile sediment and any stockpiling cannot exceed three feet in height of material.	These requirements are included in Section B.2.3.2 as part of the Project.
Alternative 1 (Long Term Closure of the Reservoir), as described in the NOP, does not specify where sediment will be transported in order to maintain Reservoir storage capacity. The method of disposal of sediment must be discussed as part of Alternative 1.	This alternative has been removed from further consideration and is not analyzed within this EIS/EIR.
The existing mining operations that are referred to in Alternative 2 (per the NOP) as a potential site for sediment disposal are operating under a Conditional Use Permit (CUP). Any disposal or infill of any material within the open pits will require the selected mining operation(s) to submit for a major CUP modification or to apply for a new Conditional Use Permit. The Office of Mine and Reclamation will be notified of major modification to the approved Reclamation Plan(s). Alternative 2 also identifies the potential for slurry pipelines to transport sediment to selected quarry pit(s). An encroachment permit will be required for any work to be done in the public right-of-way.	These requirements are included in Section B.2.3.2 as part of the Project.
U.S. Army Corps of Engineers, Los Angeles District	
Project activity may require a U.S. ACOE permit. An application for a Department of the Army permit is available at: http://www.usace.army.mil/Portals/2/docs/civilworks/permitapplication.pdf	As identified within Appendix A, PWD will obtain all necessary permits applicable to Project activities would be obtained prior to activities, including an individual 404 Permit from the U.S. ACOE (see 404(b)(1) Evaluation Summary in Appendix F). Copies of all permits applicable to activities within National Forest System lands will be provided to the Forest Service. A list of necessary permits is provided in Section A.4 (Authorized Actions) of this EIS.

B.4.3 Alternatives Screening Methodology

Alternatives have been considered in a manner to foster meaningful public participation and informed decision making. The alternatives screening process for this EIS/EIR consist of two primary steps, which are developed and intended to fulfill the requirements of NEPA Regulations (40 CFR 1502.14), the Forest Service Handbook Section 14 (USFS, 2012), and CEQA Section 15126:

Develop clear descriptions of each alternative to allow for comparative evaluation:

- Consider alternatives suggested by participants in scoping and public involvement activities;
- No specific number of alternatives is required or prescribed. Develop other reasonable alternatives fully and impartially; and
- Ensure that the range of alternatives does not prematurely foreclose options that might protect, restore, and enhance the environment.

Evaluate each alternative using the following criteria:

- Reasonable alternatives should fulfill basic project purpose and need objectives, and policy and regulatory objectives;
- Potential to avoid or substantially lessen the significant adverse effects of the proposed action;
- Potential for provision of clear environmental advantages over the proposed action; and
- Technical and regulatory feasibility.

When developing alternatives, among the factors taken into account when addressing the feasibility of alternatives are:

- Environmental impacts,
- Site suitability,
- Economic viability,
- Availability of infrastructure,
- Regulatory limitations,
- Jurisdictional boundaries, and
- The project proponent’s ability to reasonably acquire, control, or otherwise have access to lands necessary to implement an alternative.

An environmental review document need not consider an alternative whose effects cannot be reasonably identified, whose implementation is remote or speculative, and that would not achieve the basic project objectives. If an alternative clearly does not provide potential overall environmental advantage as compared to the proposed action, it is eliminated from further consideration. Alternatives have been evaluated to identify elements that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area.

For the screening analysis, the technical and regulatory feasibility of potential alternatives was assessed at a general level. Alternatives were deemed infeasible due to significant technical obstacles, regulatory restrictions, cost, and other factors rather than by the degree of environmental impact resulting from activities associated with the Alternatives.

This screening analysis does not focus on relative economic factors of the alternatives (as long as they are economically feasible) given the guidance provided by both CEQA and NEPA. Instead, alternatives capable of eliminating or reducing significant environmental effects have been considered even though they may "impede to some degree the attainment of the project objectives, or would be more costly” (CEQA Guidelines Section 15126.6(b)).

B.4.4 Summary of Screening Results

Alternatives identified by PWD, Forest Service, EIS/EIR preparers, and the public are summarized below according to the determination made for analysis (i.e., retained for full analysis or dismissed from further consideration). The alternatives include a modification to the annual sediment removal schedule and the No Action/No Project Alternative.

B.4.4.1 Alternatives Fully Analyzed in the EIS/EIR

Alternatives were assessed for their ability to reasonably achieve the Project objectives and reduce the significant environmental impacts of the Project. Based on these screening criteria, the following alternatives were selected for detailed analysis in the EIS/EIR:

- Reduced Sediment Removal Intensity Alternative
- No Action/No Project Alternative

B.4.4.2 Alternatives Eliminated from Full Consideration in the EIS/EIR

Infeasible alternatives and alternatives that clearly offered no potential for overall environmental advantage were removed from further detailed analysis in this EIS/EIR. Based on the screening criteria described in Section B.4.3 (Alternatives Screening Methodology) the following alternatives were eliminated from full consideration:

- Slurry Excavation Alternative
- Forest Service Side Canyon Alternative
- Sediment Excavation Alternatives
- Disposal Site Alternatives
- Raising the Spillway Alternative

B.4.5 Description of Project Alternatives Evaluated in the EIS/EIR

B.4.5.1 Reduced Sediment Removal Intensity Alternative (Alternative 1)

Under Alternative 1, construction of the grade control structure would be identical to that of the proposed action. Once restored, ongoing sediment removal to maintain Reservoir capacity would be identical to that of the proposed action. Therefore, this alternative only differs from the proposed action during the initial (restorative) sediment removal. Alternative 1 seeks to reduce certain environmental impacts (primarily air quality and traffic) by:

- Starting the initial sediment removal period on July 1 (annually), instead of after Labor Day.
- Sediment removal activities would occur 5 days per week, instead of 6 (with the proposed action).
- Restoring the Reservoir to 1992 design water storage and flood control capacity within a minimum of 13 years, instead of 7 to 12 years (with the proposed action).

Alternative 1 requires approval by the California Department of Water Resources (DWR) allowing PWD to drawdown the Reservoir (for beneficial use) to dead pool level starting on July 1 for the entire duration of sediment removal years to achieve 1992 design water storage capacity. Currently, PWD is required to maintain a minimum Reservoir pool until Labor Day. PWD has coordinated with DWR on this possibility, which has been found as feasible by the DWR. For example, due to the current severe drought conditions, DWR authorized early drawdown of the Reservoir in July of 2014. DWR is in the process of determining the feasibility of early drawdown during sediment removal restoring the Reservoir to 1992 design capacity.

Site preparation, disturbance area, construction staging/access, and annual restoration activities would be the same under Alternative 1 as that described for the proposed action during initial/restoration sediment removal. However, the amount of equipment used, weekly construction scheduling, and construction workforce would be reduced when compared to the proposed action. While these reductions would reduce air quality emissions and the number of daily truck trips, it would double the number of years needed to restore the Reservoir to 1992 capacity. Therefore, this alternative seeks to reduce the intensity of construction activities of the proposed action.

A summary of the key differences between Alternative 1 and the proposed action is shown in Table B-5.

Table B-5. Summary Comparison of Alternative 1 against the Proposed Action

	Alternative 1	Proposed Action
Grade Control Structure Construction	Identical to proposed Project	Begin in July of 2017 and take approximately 20 weeks to complete
Initial/Restoration Sediment Removal		
Amount of sediment removed to restore Littlerock Reservoir to 1992 water storage capacity	Approximately 1,400,000 cubic yards.	1,165,000 cubic yards
Temporary annual closure period	Starting July 1 until seasonal water refill of the Reservoir suspends removal efforts (estimated between mid-November and January).	Starting after Labor Day until seasonal water refill of the Reservoir suspends removal efforts (estimated between mid-November and January).
Weekly work schedule	Up to eight hours per day Monday through Friday (no work on weekends or federal holidays)	Up to 12 hours per day Monday through Saturday (no work on Sundays or federal holidays)
Number of dump trucks utilized per day	6	16
Maximum number of truck trips per day	180 (90 round trips)	480 (240 round trips)
Number of years to achieve 1992 water storage capacity	Minimum of 13 years	7 to 12 years
Ongoing annual O&M sediment removal	Identical to proposed Project	Removal of approximately 38,000 cubic yards starting after Labor Day

B.4.5.2 No Action/No Project Alternative

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually. Should the Reservoir be filled with sediment to the Dam spillway, sediment accumulated behind the Dam would be approximately 7.4 million cubic yards. As Reservoir capacity is lost each year, PWD would be forced to acquire additional water from other sources to supply communities within PWD’s service territory.

Continued sediment deposition could compromise the long-term integrity of the Dam. In this event, the California Department of Water Resources (DWR) Division of Safety of Dams could require the Dam to be breached. In addition, as the Reservoir would no longer function as a viable water storage facility, it would not be in compliance with the ANF Special Use Permit under which it currently operates. Subsequently, the Dam would be demolished per the conditions identified in the ANF's Special Use Permit. Demolition of the Dam would result in the elimination of the potential for water impoundment at the Reservoir and permanent loss of this potable water source. While 7.4 million cubic yards of sediment would accumulate within the Reservoir, demolition of the Dam is estimated to only require the removal of approximately 2.8 million cubic yards of sediment and dam concrete. Such a scenario would result in a project similar to, but larger, than the proposed Project and restore Little Rock Creek stream flow through the existing Reservoir.

Either scenario potentially occurring under the No Action/No Project Alternative would also eliminate any downstream flood-control benefit the dam currently provides. It would result in 23 acre-feet per year of sediment, which is currently held by the Dam, being transported naturally by flows into the downstream bed of Little Rock Creek, with potential associated reductions in flood conveyance capacity of the creek and in-stream structures such as road crossings and alteration of the in-stream habitat.

Either scenario potentially occurring under the No Action/No Project Alternative would also lead the existing Reservoir area becoming similar to upstream conditions. Riparian vegetation would be expected to recruit along the margins of the active channel and may eventually develop into a mature riparian community. Other areas of the Reservoir likely would be similar to alluvial fan communities and consist of a mosaic of upland and various riparian vegetation depending on the scour regime associated with the creek. Should this occur, the Reservoir area may develop characteristics that would support habitat for the arroyo toad and other riparian and floodplain associated species.

B.4.6 Description of Alternatives Eliminated from Further Consideration

Initial feasibility studies and constraint analyses have been conducted for various alternatives to the proposed Project since 2004. Through ongoing studies regarding their viability and/or fundamental environmental advantages or disadvantages, the alternatives were grouped into the following categories:

- Alternatives that were developed as part of the Project design;
- Alternatives that were further studied but ultimately eliminated from analysis in the EIS/EIR; and
- Alternatives that were eliminated earlier in the development of the Project due to unresolvable conflicts, issues of feasibility, or anticipated environmental degradation without any advantages over the proposed Project.

Section B.4.6.1 describes the alternatives that were studied in detail but have been eliminated from further consideration in the EIS/EIR. Section B.4.6.2 discusses the alternatives that were eliminated during preliminary analysis of the Project.

B.4.6.1 Alternatives Considered but Eliminated from Full Analysis

Slurry Excavation Alternative

Alternative Description. The Slurry Excavation Alternative would construct a slurry line to transport dredged sediment from Littlerock Reservoir to the exhausted quarry pits within Palmdale (along Avenue T) for disposal, and would require a water return pipeline between the Reservoir and the quarries. This alternative would consist of the following components:

- a floating dredge that could reach a depth of approximately 50 feet below the water surface;
- a slurry pipe (approximately 12 inches in diameter) that would either be constructed on the surface or buried along the existing roadway right-of-way. The pipeline would extend approximately 33,500 feet from Littlerock Dam to the disposal pit, and from the disposal pit to Little Rock Creek for pit dewatering; and
- booster pumps (approximately 8) that would move the slurry along the 6-mile pipeline to the disposal pits. Power delivery to the booster pumps may require reconductoring the existing power line.

Project Objectives/Purpose and Need. The Slurry Excavation Alternative could remove enough sediment to restore the Reservoir to its 1992 design water storage and flood control capacity. The total excavation amount would depend upon the number of years permitted for slurry activities, the capacity of available sediment disposal sites, and cost of slurry operations.

Feasibility. Preliminary analysis has indicated that quarry sites would require sediment stockpile and processing, and water collection and pumping facilities for slurry excavation (Aspen Consulting Engineers, 2007). Quarry sites that would be used for collecting initial slurry sediment would need to accommodate a sediment volume that could be as much as 10 times greater than dry excavated sediment, due to the added volume of the water used in the slurry operation. Ultimately, this water would be pumped out of the quarry during pit dewatering, with the final volume of disposed sediment being the same as with proposed trucking removal. Another constraint with slurry operations is a high set-up cost that includes acquiring a dredge, pipeline, booster pumps, and associated equipment (e.g., motor, control equipment). Compared with the cost of trucking operations for sediment removal, the Slurry Excavation Alternative would become cost effective only with large-volume excavation (i.e., minimum of 1,500,000 cubic yards) (Aspen Consulting Engineers, 2007).

Environmental Advantages/Disadvantages. The use of dredging and a slurry pipeline to remove sediment would lessen some of the anticipated adverse effects of proposed trucking operations, such as air emissions, traffic impacts, and restrictions to recreational uses. However, there are a number of disadvantages to slurry operations in lieu of proposed trucking activities, which include:

- Pipeline Construction – Approximately 3 months would be required to construct a slurry pipeline from the Reservoir to the quarry and from the quarry to Little Rock Creek. Impacts from pipeline construction and operation could include: emissions from construction equipment, construction-related dust, noise from construction equipment and booster pumps, soil erosion, contamination of surface waters, impacts to native vegetation along pipeline route, barriers to wildlife movement, traffic impacts during construction along public roads, and potential conflicts with existing utilities;
- Ongoing Use of a Dredge – The dredge would remain at the Reservoir for a minimum of 4 months (February 1 to May 31) each year, with the potential scenario of remaining onsite for up to 9 months (November to August) depending on the hydrology of the Reservoir in any given year. It is likely that the dredge would not be stored at the Reservoir during non-dredging months, but would be considered a permanently recurring feature for annual sediment removal;
- Water Delivery – Use of a slurry would require substantial water use from the Reservoir, which may impact PWD's water deliveries during slurry operations;
- Water Discharge Permit – Slurry water would be pumped via two pipelines: (1) from the Reservoir to the sediment disposal pit(s), and (2) from the disposal pit(s) to Little Rock Creek;
- Sediment Disposal – A slurry alternative must involve a large-volume of excavated sediment (minimum of 1,500,000 cubic yards) in order to be cost-effective; however, the added volume of water during slurry activities would require an initial disposal pit capacity up to ten times greater than the capacity needed for the dry excavated sediment; and
- Complexity – Slurry operations are common in coastal harbors and large navigable waters, but not in variable desert lakes such as the Reservoir. Given the climate of the Project area, an ongoing obstacle that would arise from a slurry is the variability of scheduling operations that depend on existing Reservoir volume, seasonal inflow to the Reservoir, and coordination with PWD's water deliveries. Ultimately, the amount of excavated sediment that could be expected each year would be less certain with the use of slurry excavation than with the use of trucking.

Alternative Conclusion: *ELIMINATED*. This alternative would meet the Project objectives/purpose and need, and would lessen the adverse effects to air quality and traffic from proposed trucking operations. However, these advantages would be offset by the following:

- Impacts from pipeline construction and operation;
- The alternative's reliance on large amounts of water and its creation of an additional waste stream (i.e., slurry water); and
- The high set-up cost of slurry operations, and the uncertainty in scheduling excavation activities and estimating the excavation amount in any given year.

Given these additional constraints and uncertainty, the Slurry Excavation Alternative has been eliminated from further consideration.

Forest Service Side Canyon Alternative

Alternative Description. The Forest Service Side Canyon Alternative was developed to mitigate the Project's air quality and traffic impacts resulting from trucking of removed sediment off site. This alternative would transport excavated sediment to a 25-acre canyon on National Forest System lands that is to the west of, and adjacent to, the Reservoir. Clean sediment would be spread within the canyon, while any contaminated materials (identified through a sediment testing program) would be transported to an approved hazardous material storage facility. Haul routes for trucks would be sited from the canyon towards two Reservoir access points (i.e., boat ramp and Rocky Point). Within the canyon, truck access roads would be graded and sediment would be dumped and spread at the lowest elevations first, until the canyon would be filled and re-contoured to match adjacent slopes. Under this alternative, all non-contaminated sediment would be disposed of within the canyon and there would be no trucking to disposal sites identified north of the Project area (i.e., 47th Street East property, exhausted mining pits at local quarries).

Construction of the grade control structure at Rocky Point and sediment removal activities at the reservoir would be identical to the proposed Project.

Project Objectives/Purpose and Need. The Forest Service Side Canyon Alternative would remove enough sediment to restore the Reservoir to its 1992 design water storage and flood control capacity, thereby meeting Project objectives and the purpose and need.

Feasibility. The Forest Service Side Canyon Alternative was identified as a possible sediment disposal site during preliminary Project feasibility analyses in 2012. Use of the side canyon on National Forest System lands would require a special use authorization from the Forest Service, as well as an amendment to the Forest Land Management Plan that identifies the land use zone encompassing the side canyon as suitable for sediment disposal. In 2013, the Forest Service determined that the proposed alternative was not consistent with the Land Management Plan, and would result in additional habitat loss and other adverse environmental impacts. The side canyon is no longer a feasible sediment disposal site.

Environmental Advantages/Disadvantages. The Forest Service Side Canyon Alternative would divert trucking from city and county roads. Adverse traffic impacts to Cheseboro Road, State Route 138, and Avenue T would not be subject to heavy-duty truck traffic under this alternative; consequently, residential and commercial land uses along the aforementioned roads would not be exposed to the same extent of construction-related nuisance impacts such as air quality, noise, and traffic.

Given the location of trucking routes within National Forest System lands, this alternative would impact recreational use of the Project area and Forest Service roadways. Temporary closure of the Reservoir would be similar to the proposed action, with both the alternative and the proposed action creating a short-term preclusion of recreational facilities. However, due to the proximity of the side canyon to the Reservoir, this alternative would require less time for initial sediment excavation activities and for annual sediment removal. It is likely that full closure of the Reservoir for sediment excavation would be of shorter duration under this alternative in comparison to the proposed Action.

Despite the advantages to the Forest Service Side Canyon Alternative, the alternative would be inconsistent with Forest Service policy directives. Sediment disposal is no longer considered a compatible use with National Forest System lands, and this alternative site would not be granted a special use authorization.

Alternative Conclusion. ***ELIMINATED.*** The Forest Service Side Canyon Alternative would meet the Project objectives/purpose and need, and would lessen traffic and land use impacts along public roadways near off-site sediment disposal sites. However, this alternative is not consistent with the ANF Land Management Plan, and would increase habitat loss on NFS lands, therefore it has been eliminated from further consideration.

Inline Debris/Sediment Basin to Capture Sediment Upstream of the Reservoir over the Short and Long Term Alternative

As identified in Table B-4, the Lahontan RWQCB proposed this alternative during Project scoping.

Project Objectives/Purpose and Need. This alternative would still require the implementation of the Proposed Action or Alternative 1 to ensure enough sediment can be removed to restore the Reservoir to its 1992 design water storage and flood control capacity, thereby meeting Project objectives and the purpose and need.

Feasibility. It is assumed the purpose of this alternative is to construct a catch basin to capture annual sediment inflow upstream of the Reservoir after being restored to 1992 design capacity. Because this alternative would still require the implementation of the grade control structure and sediment removal activities proposed under the Proposed Action or Alternative 1 to restore design capacity, such a basin would need to be constructed upstream of the proposed grade control structure location.

Environmental Advantages/Disadvantages. While technically feasible, this alternative would require the construction of the sediment catch basin and access roads through Designated Critical Habitat for Arroyo Toad. Such an alternative is considered environmentally infeasible. Furthermore, the construction of such a sediment catch basin at this location would only replace the removal of sediment under operation and maintenance within the Reservoir inundation area under the Proposed Action or Alternative 1. The area proposed for ongoing sediment removal under the Proposed Action or Alternative 1 is highly disturbed, does not contain Designated Critical Habitat, and is already served by existing roads and access points.

Alternative Conclusion. ***ELIMINATED.*** This alternative would still require full implementation of either the Proposed Action or Alternative 1 to meet the Project objectives/purpose and need of restoring the Reservoir to 1992 design capacity. It would only alter the location of ongoing sediment removal occurring under operation and maintenance activities of the Proposed Action or Alternative 1. However, this alternative is not feasible given such a catch basin and access roads would need to be constructed upstream of Rocky Point in Designated Critical Habitat for Arroyo Toad. Therefore, it has been eliminated from further consideration.

B.4.6.2 Alternatives Eliminated During Preliminary Project Analysis

Sediment Excavation Alternatives

In 2005, a Hydrologic and Sediment Transport Analysis for Littlerock Reservoir examined the feasibility and potential effects of removing a range of sediment quantities during initial excavation, followed by subsequent excavations of varying amounts (Aspen Environmental Group, 2005). The following alternatives were considered in that report:

- Excavation Alternative A: Excavate 270,000 cubic yards of sediment from the reservoir, utilizing a steep cut slope with an approximate 80-foot bottom width and 5:1 side slopes. Remove an additional 54,000 cubic yards annually.
- Excavation Alternative B: Excavate 270,000 cubic yards of sediment from the reservoir, utilizing a flatter cut slope with an approximate 200-foot bottom width and 5:1 side slopes. Remove an additional 54,000 cubic yards annually.
- Excavation Alternative C: Excavate 540,000 cubic yards of sediment from the reservoir, utilizing a steep cut slope with an approximate 80-foot bottom width and 5:1 side slopes. Remove an additional 270,000 cubic yards every 5 years.
- Excavation Alternative D: Excavate 540,000 cubic yards of sediment from the reservoir, utilizing a flatter cut slope with an approximate 200-foot bottom width and 5:1 side slopes. Remove an additional 270,000 cubic yards every 5 years.

Preliminary analysis of Excavation Alternatives A through D indicated that these scenarios would contribute to substantial channel degradation and dramatic fluctuations in the channel bed elevations. The study was used to determine the Project components that would minimize adverse impacts to the Reservoir and to Little Rock Creek, which have been developed into the components for the proposed action (Project). No further consideration has been given to these initial excavation alternatives.

Disposal Site Alternatives

During the initial development of the proposed action, other sediment disposal sites were examined to determine feasible alternatives for disposing the excavated sediment. These sites included the following:

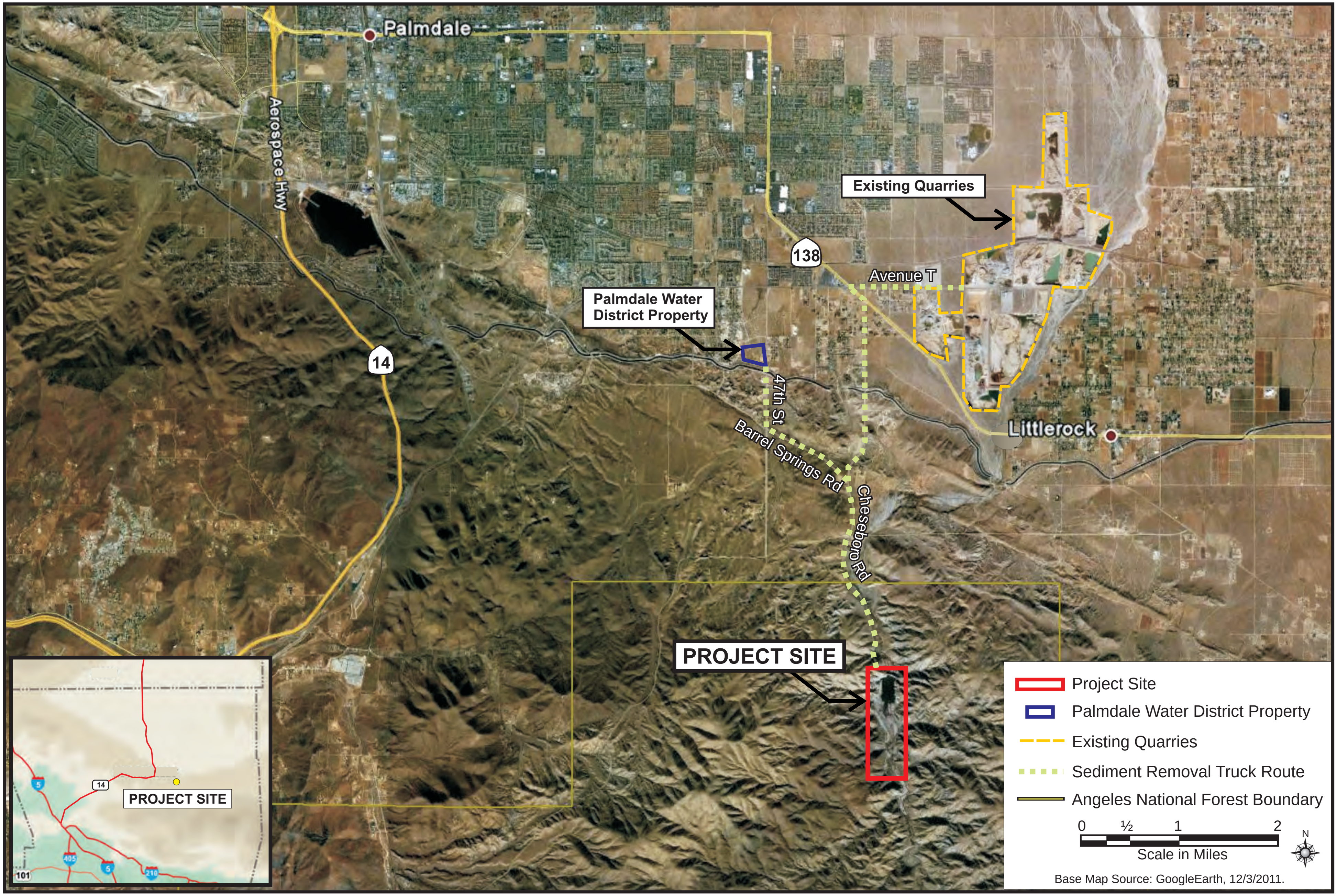
- **Mount Emma Road Site:** This 20-acre site is owned by the PWD, and is located on the southwest corner of Mount Emma Road and Cheseboro Road. The site has a significant southward slope and is bisected by an existing Southern California Edison right-of-way and transmission line. Only a portion of the site would be available for sediment disposal.
- **Lancaster Landfill:** This site is operated by the Los Angeles County Department of Public Works. Public Works determined that the Project's excavated sediment could not be used for daily cover at the landfill. A significant amount of sand would be needed to cap the landfill when it closes, although the total amount of Reservoir sediment that could be used for this purpose is uncertain. While the planned closure of the landfill was August 2012, it is still in operation.

As indicted in the list above, the additional sites were found to have site restrictions, incompatible land uses, or insufficient or unknown capacity that would make them infeasible or undesirable for sediment disposal. These alternative sites were eliminated from further consideration in the Project analysis.

Raising the Spillway Alternative

Initial Project analysis conducted in 1993 considered the feasibility of raising the height of Littlerock Dam to increase the capacity of the Reservoir (WCC, 1993). The components of this alternative included: (1) construction of a roller-compacted concrete buttress to strengthen the Dam, and (2) raising the crest of the existing Dam and spillway to increase reservoir storage.

While raising the spillway and the height of the Dam would temporarily increase the capacity of the Reservoir, it would not address the ongoing accumulation of approximately 38,000 cubic yards of sediment per year that continues to limit the Reservoir's water storage and flood control capacity. This alternative was eliminated from further consideration due to its inability to meet the Project objectives of restoring the Reservoir to its 1992 design water storage and flood control capacity.



Regional Project Location and Sediment Removal Truck Routes

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure B-1

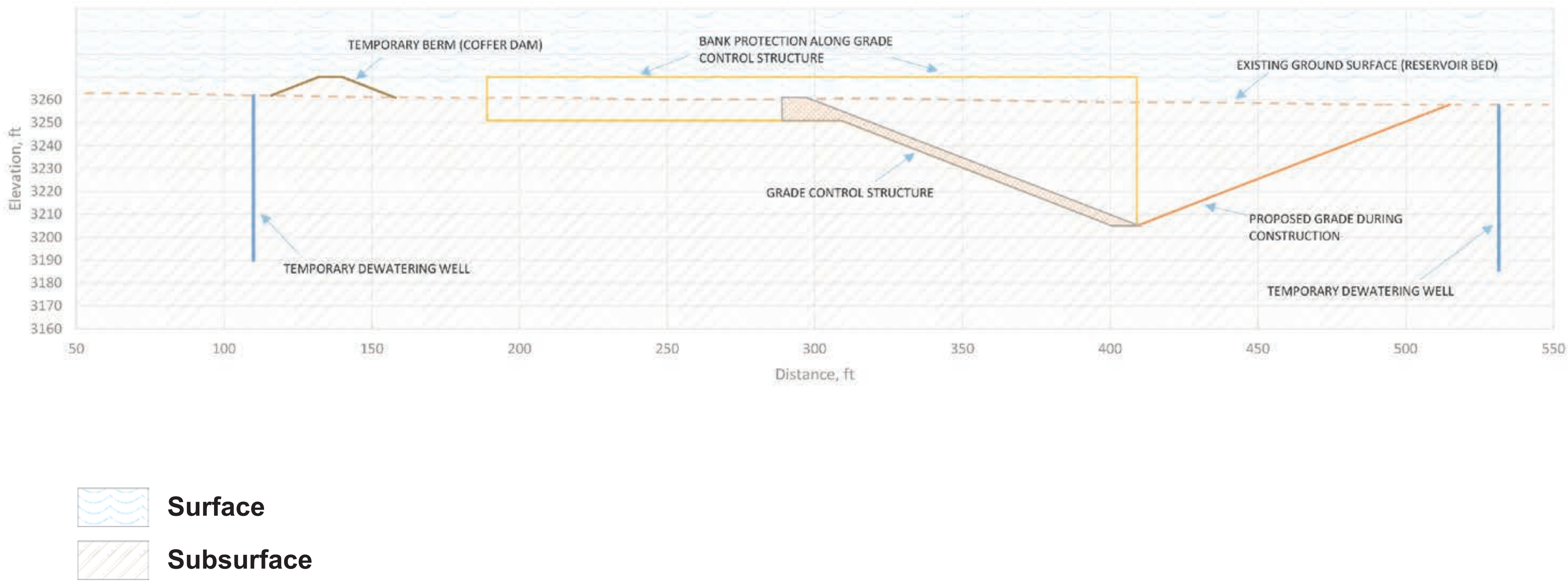
May 2016

Littlerock Reservoir
Project Overview Areas

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure B-2

May 2016

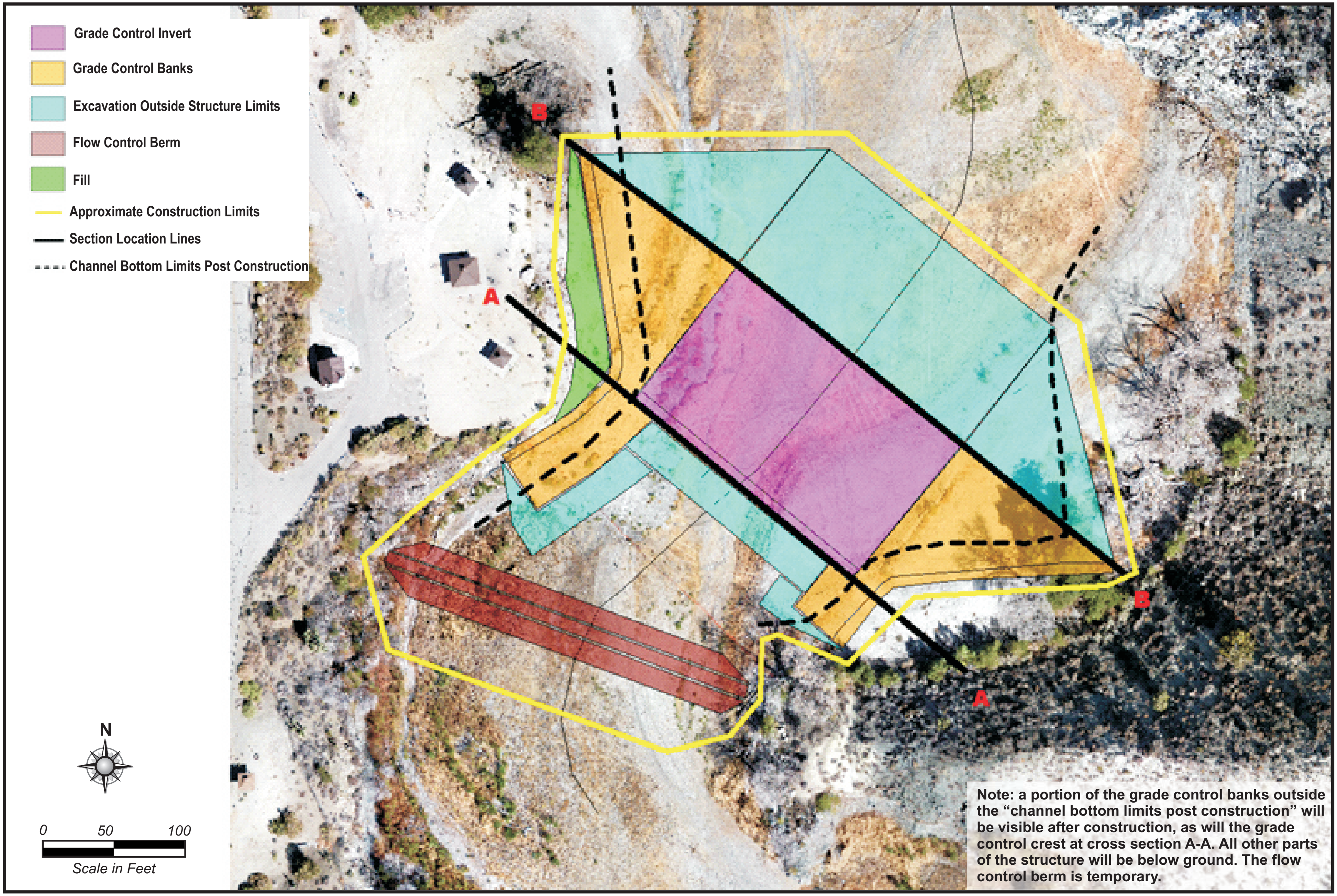


Grade Control Structure Side Profile

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure B-3

May 2016



Grade Control Structure Concept Plan View

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure B-4

May 2016

Grade Control Structure Surface Visual Simulation

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure B-5

May 2016

C. Affected Environment and Environmental Consequences

C.1 Introduction

Section C includes analyses of the 12 technical issue areas listed below:

- Air Quality and Climate Change
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Public Safety
- Hydrology
- Noise
- Recreation and Land Use
- Transportation and Traffic
- Visual Resources
- Water Quality and Resources
- Wildfire Prevention and Suppression

Within each of the technical issue areas listed above, discussion of Project impacts is organized according to the following major subheadings:

- Affected Environment
- Regulatory Framework
- Issues Identified During Scoping
- Environmental Consequences, including direct and indirect impact analyses, CEQA Conclusions, and mitigation for the proposed Project and alternatives, including the No Action Alternative.
- Impact Summary

C.1.1 Affected Environment

The affected environment has been described in each issue area to encompass the proposed action and alternatives, including site preparation; construction activities; sediment removal, transport, and disposal; and operation and maintenance. The extent of the affected environment evaluated, or study area, can differ between issue areas. Study areas were determined by geographic extent of anticipated project-related impacts.

NEPA requires that the EIS shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration (40 CFR 1502.15). However, NEPA has no direct guidance regarding when the establishment of a baseline for determining the significance of an impact when preparing an EIS should occur. For the purpose of this EIS/EIR document, and pursuant to CEQA Guidelines (Section 15125[a]), the environmental setting, or affected environment, used to determine the impacts associated with the proposed action and alternatives is based on the environmental conditions that existed in the project area in March 2014, at the time the Notice of Preparation (NOP) was distributed and the Notice of Intent (NOI) was published (see Section A.4).

As part of Section C (Affected Environment), the regulatory framework applicable to the proposed action is presented within each issue area section. Project activities predominantly would occur on National Forest System lands, with sediment transport routes traversing public rights-of-way in unincorporated Los Angeles County and the City of Palmdale. Consideration to the zoning ordinances of the County of Los Angeles and the City of Palmdale is given in the impact analyses provided in Section C. However, the Forest Service and PWD have pre-emptive jurisdiction over the proposed action and no local discretionary permits or local plan consistency evaluations are required for the proposed action or alternatives. As the action involves construction related to a water storage facility, under California

Government Code Section 53091(e), "Zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water…" However, the sites identified to receive the sediment removed from the Reservoir would be required to obtain any necessary permits from local jurisdictions (refer to Standard Project Commitments in Appendix A). Additionally, the Forest Service and PWD, in accordance with NEPA and CEQA (respectively), have included evaluation of local land use plans in this document in cases where these local plans and policies would help reduce or eliminate an environmental impact. The issue area discussions in Section C (Regulatory Framework) present applicable federal, State, and local plans and policies, as well as a discussion of the proposed action's consistency with each applicable plan or policy described.

C.1.2 Environmental Consequences

Section C examines the environmental consequences associated with the proposed action and alternatives to the proposed action, including the No Project/No Action alternative. Analysis within each issue area includes consideration of the proposed action and alternatives, which are described fully in Section B of this EIS/EIR.

The purpose of identifying the potential environmental impacts and the associated mitigation is to provide information about the proposed action's environmental effects to decision makers and the public that can be used in deliberations about whether or not to approve the proposed action or one of the alternatives. The information contained in this EIS/EIR will also be used by regulatory agencies that would need to issue permits for the construction of the proposed action if approved by the Lead Agencies.

Pursuant to NEPA, the intent of the environmental impact analysis is to provide a scientific and analytic basis for comparing the alternatives. The analysis also identifies any adverse environmental effects that cannot be avoided should the Project be implemented and presents mitigation measures to minimize adverse environmental impacts (40 CFR 1502.16). Environmental effects will include direct, indirect, as well as residual or unavoidable impacts that would remain after mitigation measures have been applied.

A significant impact is defined by CEQA as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project" (State CEQA Guidelines Section 15382). In comparison, NEPA states that "'Significantly' as used in NEPA requires considerations of both context and intensity…" (40 CFR 1508.27). Significance criteria, or thresholds, serve as a benchmark for determining if a project action will result in a significant adverse environmental impact when evaluated against the baseline.

For the CEQA analysis, impact significance is discussed for each issue area under the subheading "CEQA Significance Conclusion," and is identified according to the following classification:

- Class I: Significant impact that cannot be mitigated to a level that is not significant. Class I impacts are significant adverse effects that cannot be mitigated below a level of significance through the application of feasible mitigation measures. Class I impacts are significant and unavoidable.
- Class II: Significant impact that can be mitigated to a level that is not significant. A Class II impact is a significant adverse effect that can be reduced to a less-than-significant level through the application of feasible mitigation measures.
- Class III: Adverse, but not significant. A Class III impact is a minor change or effect on the environment that does not meet or exceed the criteria established to gauge significance.
- Class IV: Beneficial impact. Class IV impacts represent beneficial effects that would result from project implementation.

Although guidance provided by CEQA and NEPA are used to help determine the level of severity of impacts, the determination of impact significance is based on the independent judgment of the Lead Agencies. The establishment of any criteria used to evaluate the level of severity of impacts is also the responsibility of the Lead Agencies. Some impact categories in this document lend themselves to scientific or mathematical analysis and, therefore, to quantification, while others are more qualitative, and issue areas such as Air Quality have significance criteria that are established by regulatory agencies.

Each environmental impact identified is associated with a specific threshold, which is used to evaluate the level of severity of the impact. Potential mitigation measures are proposed for adverse impacts, where feasible. The PWD has incorporated mechanisms into the description of its proposed project to avoid or reduce impacts from project construction and operation. These mechanisms are referred to as standard project commitments (SPCs) in this EIS/EIR, and are considered in the analysis of impacts and the determinations of impacts. In the assessment of identified impacts, SPCs have been assumed to be part of the proposed project and, therefore, are not included as mitigation measures. The SPCs are considered a commitment by the PWD and implementation of each SPC will be monitored by the PWD if the proposed project or an alternative is approved. The SPCs that are considered necessary to reduce potential impacts are listed in Appendix A (Standard Project Commitments).

C.2 Air Quality and Climate Change

This section presents information on ambient air quality conditions in the vicinity of the Project site and identifies potential impacts to air quality as a result of the construction and operation of the Project. As discussed in Section B (Description of Proposed Action/Project and Alternatives), construction activities restoring the Reservoir storage capacity are estimate to last 7 to 12 years for the proposed Project and a minimum of 13 years for Alternative 1. To ensure worst-case impacts are evaluated, the emission estimates utilized within this section assumed a 7-year construction scenario for the proposed Project and a 13-year construction scenario for Alternative 1. While construction activities may last longer, these durations represent worst-case daily and total emissions. The air quality and greenhouse gas (GHG) emission calculations assumptions and methodologies are provided in Appendix B.

C.2.1 Affected Environment

C.2.1.1 Air Quality

The Project is located in the southwestern part of the Antelope Valley Air Quality Management District (AVAQMD). Additionally, a portion of the Project is located on National Forest Service (NFS) lands within the Angeles National Forest (ANF).

Greenhouse gases cause global climate change impacts, and GHG emissions impacts are not localized near the area of emissions but rather are a long-term globally cumulative impact phenomenon.

C.2.1.2 Meteorological Conditions

The climate of northern Los Angeles County is characterized by hot, dry summers and mild to cold winters with seasonally heavy precipitation that occurs primarily during the winter months. Summer typically has clear skies, high temperatures, and low humidity. The prevailing strong winds in the Project area are generally out of the west and southwest (AVAQMD, 2011). A monthly climate summary for Littlerock, California, was selected to characterize the climate of the project area. As described in Table C.2-1, average summer (June-September) high and low temperatures in the study area range from 97°F to 60°F, respectively. Average winter (December-March) high and low temperatures in the study area range from 67°F to 37°F. The average annual precipitation is 6.77 inches with over 70 percent occurring between December and March.

Table C.2-1. Littlerock Monthly Average Temperatures and Precipitation

	Temperature		Precipitation
Month	Maximum	Minimum	Inches
January	58°F	37°F	1.24
February	61°F	39°F	1.60
March	67°F	42°F	0.92
April	73°F	46°F	0.34
May	82°F	53°F	0.09
June	91°F	60°F	0.04
July	97°F	67°F	0.18
August	96°F	67°F	0.19
September	89°F	62°F	0.17
October	78°F	53°F	0.36
November	65°F	43°F	0.45
December	57°F	37°F	1.19

Source: The Weather Channel, 2014.

C.2.1.3 Existing Air Quality

The United States Environmental Protection Agency (USEPA) and California Air Resources Board (CARB) classify an area as attainment, unclassified, or nonattainment depending on whether or not the monitored ambient air quality data shows compliance, insufficient data available, or non-compliance with the federal and State ambient air quality standards, respectively. The National and California Ambient Air Quality Standards (NAAQS and CAAQS) relevant to the Project are provided in Table C.2-2.

Table C.2-2. National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards
Ozone (O_3)	1-hour	0.09 ppm	—
	8-hour	0.070 ppm	0.075 ppm
Respirable particulate matter (PM_{10})	24-hour	50 µg/m^3	150 µg/m^3
	Annual mean	20 µg/m^3	—
Fine particulate matter ($PM_{2.5}$)	24-hour	—	35 µg/m^3
	Annual mean	12 µg/m^3	12.0 µg/m^3
Carbon monoxide (CO)	1-hour	20 ppm	35 ppm
	8-hour	9.0 ppm	9 ppm
Nitrogen dioxide (NO_2)	1-hour	0.18 ppm	0.10 ppm
	Annual mean	0.030 ppm	0.053 ppm
Sulfur dioxide (SO_2)	1-hour	0.25 ppm	0.075 ppm
	24-hour	0.04 ppm	—

Notes: ppm=parts per million; µg/m^3= micrograms per cubic meter; "—" = no standard
Source: CARB, 2013, Ambient Air Quality Standards Table.

The project area is located within the Mojave Desert Air Basin (MDAB), under the jurisdiction of the Antelope Valley Air Quality Management District (AVAQMD). Table C.2-3 summarizes the federal and State attainment status of criteria pollutants for the Project area based on the NAAQS and CAAQS, respectively.

Table C.2-3. Attainment Status for Antelope Valley Portion of the MDAB

Pollutant	Federal	State
Ozone	Severe Nonattainment	Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified/Attainment	Attainment
PM10	Unclassified/Attainment	Nonattainment
PM2.5	Unclassified/Attainment	Unclassified

Source: CARB, 2014a; USEPA, 2014a

Ozone, NO_2, CO, PM10, and PM2.5 concentrations are currently recorded at the Lancaster Division Street monitoring station located approximately 15 miles north northwest of the Littlerock Reservoir. This monitoring station also used to monitor CO concentrations. The current nearest operating monitoring station for SO_2 is in the City of Burbank about 30 miles southwest of Littlerock Reservoir, and the closest within the MDAB is Victorville about 40 miles east of the Project site.

Ozone

In the presence of ultraviolet radiation, both nitrogen oxides (NO_x) and volatile organic compounds (VOCs) go through a number of complex chemical reactions to form ozone. Table C.2-4 summarizes the ambient ozone data for the project area collected since 2002 from the Lancaster Division Street monitoring station. The table includes the maximum hourly and 8-hour average concentration and the number of days above the National and State standards. The Los Angeles County portion of the MDAB is classified as a serious nonattainment area for the 8-hour ozone NAAQS and nonattainment of the ozone CAAQS.

Table C.2-4. Ozone Air Quality Summary, 2002-2013

	1-Hr Ozone Summary			8-Hr Ozone Summary			
Year	Maximum 1-Hr Avg. (ppm)	Days Above CAAQS	Days Above NAAQS	Max. State 8-Hr Avg. (ppm)	Days Above CAAQS	Max.Fed. 8-Hr Avg. (ppm)	Days Above NAAQS
2002	0.157	46	5	0.107	87	0.107	70
2003	0.156	50	4	0.120	92	0.120	67
2004	0.121	37	0	0.101	85	0.101	61
2005	0.127	42	1	0.103	73	0.103	60
2006	0.132	22	2	0.106	66	0.105	39
2007	0.118	16	0	0.101	63	0.101	43
2008	0.116	18	0	0.103	59	0.102	35
2009	0.122	22	0	0.102	70	0.102	45
2010	0.107	11	0	0.096	78	0.096	45
2011	0.115	19	0	0.100	76	0.100	53
2012	0.112	13	0	0.096	72	0.095	39
2013	0.108	9	0	0.094	53	0.093	34

Source: CARB, 2014b; USEPA, 2014b
CAAQS: 1-hr, 0.070 ppm; 8-hr, 0.09 ppm
NAAQS: 8-hr, 0.075 ppm

The long-term trends for ozone concentrations and number of days exceeding the standards each year have shown reduction since the mid-1980s; however, ozone continues to be above the State 1-hour and State and federal 8-hour ozone standards. The western MDAB is primarily impacted by ozone and ozone precursor pollutants transported from the SCAB (i.e. Metropolitan Los Angeles) and the San Joaquin Valley Air Basin (SJVAB). The long-term trends in ozone pollutant levels in the western MDAB are inexorably tied to the reduction in ozone precursor pollutant levels in these two upwind air basins.

Carbon Monoxide (CO)

CO is generally found in high concentrations only near a significant source of emissions (i.e., freeway, busy intersection, etc.). The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since mobile sources (motor vehicles) are the main cause of CO, ambient concentrations of CO are highly dependent on motor vehicle activity. In fact, the peak CO concentrations occur during the rush hour traffic in the morning and afternoon. Carbon monoxide concentrations in the State have declined significantly due to two statewide programs: (1) the 1992 wintertime oxygenated gasoline program, and (2) Phases I and II of the reformulated gasoline program. Additionally, overall vehicle fleet turnover from higher-emitting older engines to lower-emitting new engines is a significant factor in the declining CO levels.

Table C.2-5 summarizes the ambient carbon monoxide data for the Project area collected over the past 10 years from the Lancaster Division Street monitoring station. The table includes the available maximum 8-hour concentrations.

Most of the project site route area, and proposed sediment removal route and storage areas, would be expected to have even lower CO levels than those presented in Table C.2-5, as they are not located near dense population centers and would experience comparatively vehicle traffic, which is the major contributor to CO emissions. As indicated in the table, there have been no exceedances of CAAQS or NAAQS since at least 2002 for the 8-hour CO standard in Lancaster.

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Table C.2-5. Carbon Monoxide Air Quality Summary, 2002-2011

Year	Maximum 8-Hr Avg. (ppm)	Month of Max. 8-Hr Avg.
2002	2.24	Sep
2003	1.88	Dec
2004	1.72	Jan
2005	1.54	Dec
2006	1.60	Dec
2007	1.25	Jan
2008	1.04	Nov
2009	1.2	—
2010	1.23	Jan
2011	1.33	Nov
2012	1.4	—
2013	1.2	—

Source: CARB, 2014b; USEPA, 2014b
Note: "—" indicates data not reported by the source.
CAAQS: 1-hr, 9.0 ppm; 8-hr, 20 ppm
NAAQS: 1-hr, 9 ppm; 8-hr, 35 ppm

Nitrogen Dioxide (NO_2)

The majority of the NO_x emitted from combustion sources is in the form of nitric oxide (NO), while the balance is mainly NO_2. NO is oxidized by O_2 (oxygen) in the atmosphere to NO_2 but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO_2 often occur during the fall and not in the winter. While winter atmospheric conditions favor the trapping of ground level releases of NO there is a lack of significant radiation intensity (less sunlight) to oxidize NO to NO_2. In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions (atmospheric unstable conditions) disperse pollutants, preventing the accumulation of NO_2 to levels approaching the 1-hour ambient air quality standard. NO is also oxidized by O_3 to form NO_2. The formation of NO_2 in the summer with the help of the ozone occurs according to the following reaction:

$$NO + O_3 \rightarrow NO_2 + O_2$$

In urban areas, ozone concentration level is typically high. That level will drop substantially at night as the above reaction takes place between ozone and NO. This reaction explains why, in urban areas, ozone concentrations at ground level drop, while aloft and in downwind rural areas (without sources of fresh NO_x emissions) ozone concentrations can remain relatively high.

Table C.2-6 summarizes the ambient nitrogen dioxide data for the Project area collected over the past 12 years from the Lancaster Division Street monitoring station. The table includes the maximum 1-hour and annual concentrations. This table shows that both the short-term and long-term average NO_2 concentrations have been dropping fairly significantly since 2002. The MDAB is either unclassified or in attainment for nitrogen dioxide.

Table C.2-6. Nitrogen Dioxide Air Quality Summary, 2002-2013

Year	Maximum 1-Hr Avg. (ppm)	Maximum Annual Avg. (ppm)
2002	0.101	0.016
2003	0.067	0.015
2004	0.103	0.015
2005	0.074	0.015
2006	0.066	0.015
2007	0.064	0.014
2008	0.062	0.013
2009	0.065	—
2010	0.056	0.012
2011	0.058	0.012
2012	0.049	0.009
2013	0.048	0.008

Source: CARB 2014b.
Note: "—" is for a year with less than representative monitoring data coverage for the year or data not reported by the source.
CAAQS: 1-hr, 0.18 ppm; annual, 0.030 ppm
NAAQS: 1-hr, 0.10 ppm; annual, 0.053 ppm

Inhalable Particulate Matter (PM10)

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NO_x, sulfur oxides (SO_x), VOC, and ammonia, given the right meteorological conditions, can form particulate matter in the form of nitrates (NO_3), sulfates (SO_4), and organic particles. These pollutants are known as secondary particulates, because they are not directly emitted, but are formed through complex chemical reactions in the atmosphere.

Table C.2-7 summarizes the ambient particulate matter data collected from the Lancaster Division Street monitoring station. The table includes the maximum 24-hour and annual arithmetic average concentrations. As shown in Table C.2-7, the project area experiences exceedances of the State 24-hour PM10 standards and the State annual arithmetic mean PM10 standards. The western MDAB in the Project area is unclassified for the federal PM10 standard and is nonattainment of the State PM10 standard.

Table C.2-7. PM10 Air Quality Summary, 2002-2013

Year	State Maximum Daily Average (μg/m³)	Days Above Daily CAAQS*	Federal Maximum Daily Average (μg/m³)	Days Above Daily NAAQS*	State Annual Average (μg/m³)
2002	73	6	210	1	29.7
2003	54	6	98	—	23.2
2004	33	—	83	—	—
2005	47	—	55	—	—
2006	58	26	65	—	25.1
2007	181	18	86	—	28.2
2008	70	—	143	—	—
2009	56	—	199	1	—
2010	—	—	43	—	—
2011	49	—	81	—	—
2012	43	—	85	—	18.5
2013	173	—	185	6	—

Source: CARB, 2014b; USEPA, 2014b.
CAAQS: 24-hr, 50 μg/m³; annual arithmetic, 20 μg/m³
NAAQS: 24-hr, 150 μg/m³;
*Days above the State and national standard (calculated): Because PM10 is monitored approximately once every six days; the potential number of exceedance days is typically calculated by multiplying the actual number of days of exceedance by six.
Note: "—" is for a year with less than representative monitoring data coverage for the year or data not reported by the source.

Fine Particulate Matter (PM2.5)

PM2.5, similar to PM10, can be emitted directly or it can be in the form of secondary particulate. Most combustion particulate, including diesel particulate matter, is emitted as fine PM2.5 and most secondary particulate formation is also formed as fine PM2.5. Fugitive dust on the other hand is typically emitted in high proportions of larger PM fraction sizes, so that ambient PM10 concentrations have a much higher fraction of contribution from fugitive dust than ambient PM2.5 concentrations.

Table C.2-8 summarizes the ambient fine particulate matter data collected over the past 12 years from the Lancaster Division Street monitoring station. The MDAB is unclassified for both the federal and State PM2.5 standards.

Table C.2-8. PM2.5 Air Quality Summary, 2002-2013*

Year	State Maximum Daily Average (µg/m^3)	Federal 98th Percentile of Maximum Daily Average (µg/m^3)	Days Above 98th Percentile Daily NAAQS	State Annual Average (µg/m^3)	Federal Annual Average (µg/m^3)
2002	24	23	—	—	10.4
2003	25	21	—	9.4	9.3
2004	18	18	—	—	8.5
2005	28	17	—	8.9	8.9
2006	18	13	—	7.4	7.4
2007	25	16	—	8.0	7.7
2008	24	24	—	—	7.2
2009	20	16	—	7.8	7.7
2010	15	14	—	—	5.9
2011	50	50	—	—	7.1
2012	14	14	—	—	5.4
2013	12	11	—	—	5.8

Source: CARB, 2014b; USEPA, 2014b.
CAAQS: Annual Mean Standard, 12 µg/m^3
NAAQS: 24-Hr, 35 µg/m^3., Annual Arithmetic Mean, 12 µg/m^3;
*Days above the State and national standard (calculated): Because PM10 is monitored approximately once every six days; the potential number of exceedance days is typically calculated by multiplying the actual number of days of exceedance by six.
Note: "—" is for a year with less than representative monitoring data coverage for the year or data not reported by the source.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels such as natural gas contain very little sulfur and consequently have very low SO_2 emissions when combusted. By contrast, fuels high in sulfur content such as coal or heavy fuel oils can emit very large amounts of SO_2 when combusted. Sources of SO_2 emissions come from every economic sector and include a wide variety of fuels, gaseous, liquid, and solid.

The MDAB is designated attainment or unclassified for all SO_2 State and federal ambient air quality standards. There are no SO_2 monitoring stations near the Project site or within the MDAB west of Victorville and Trona; therefore, no representative SO_2 ambient air quality data exists.

C.2.1.4 Summary

As discussed above and presented in Table C.2-3, the Project area is in nonattainment of the State and federal ozone standards and the State PM10 standard. The Project area is designated as attainment and/or unclassified for all other criteria pollutant standards. The Project area's attainment status is significantly influenced by pollutant transport from both the south (South Coast Air Basin, i.e. Los Angeles area) and the west (San Joaquin Valley Air Basin). The long-term trends in pollutant levels in the western MDAB are inexorably tied to the reduction in pollutant levels in these two upwind air basins.

C.2.1.5 Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill and the chronically ill, especially those with cardio-respiratory diseases. Impacts from the Project would be localized at the areas of material removal, material hauling, and material storage or disposal. The localized short-term impacts would be greatest to those located adjacent or very close to these areas. Sensitive receptors located more than 0.25 mile from these construction sites would have limited exposure times and concentrations, so only the sensitive receptors located within 0.25 mile of Littlerock Reservoir, the main sediment haul route and sediment storage area are considered those with potentially significant pollutant exposure.

Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods for industrial/commercial areas are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

A land use survey was conducted to identify sensitive receptors (e.g., local residences, schools, hospitals, recreational facilities) in the general vicinity of the Project. There are no residences or other sensitive receptors located within a mile of the main project site at Littlerock Reservoir and recreational activities at the site would be suspended during the Project. There are several dozen residences located within 0.25 mile of the haul routes and there are residences that may be located within 0.25 miles of the primary sediment storage site depending on its exact location within the existing aggregate mines, and residences located within 0.25 miles of the secondary sediment storage site. There are no known public schools, hospitals, or active recreational facilities known to exist within one-half mile of the Project site, the haul routes or sediment storage sites. The air quality analysis will consider the Project impacts to the residential receptors located along the haul route and near the sediment storage site.

C.2.1.6 Climate Change

While climate change has been a concern since at least 1998, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), efforts devoted to greenhouse gas (GHG) emissions reduction, and climate change research and policy have increased dramatically in recent years.

Global climate change (GCC) is expressed as changes in the average weather of the Earth, as measured by change in wind patterns, storms, precipitation, and temperature. Much scientific research has indicated that the human-related emissions of GHGs above natural levels are likely a significant contributor to GCC.

Because the direct environmental effect of GHG emissions is the increase in global temperatures, which in turn has numerous indirect effects on the environment and humans, the area of influence for GHG impacts associated with the Project would be global. However, those cumulative global impacts would be manifested as impacts on resources and ecosystems in California. Additionally, as this analysis concerns cumulative global impacts, there is no separate cumulative impacts analysis for Global Climate Change.

Setting

The Project site is located in Northern Los Angeles County in the MDAB. In California, ARB is designated as the responsible agency for traditional air quality regulations. In addition, Assembly Bill (AB) 32 vested ARB with regulatory authority for GHGs.

Greenhouse Gases

Greenhouse gases are gases that trap heat in the atmosphere and are emitted by natural processes and human activities. Examples of GHGs that are produced both by natural processes and industry include CO_2, Methane (CH_4), and Nitrous Oxide (N_2O). The accumulation of GHGs in the atmosphere regulates the earth's temperature. GHGs have varying amounts of global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. By convention, CO_2 is assigned a GWP of 1. In comparison, CH_4 has a GWP of 25, which means that it has a global warming effect 25 times greater than CO_2 on an equal-mass basis. To account for their GWP, GHG emissions are often reported as CO2e (CO_2 equivalent). The CO2e for a source is calculated by multiplying each GHG emission by its GWP, and then adding the results together to produce a single, combined emission rate representing all GHGs.

C.2.2 Regulatory Framework

The Project includes construction and ongoing operations and maintenance activities but does not include any long-term stationary emission sources, so there are very few direct air quality regulations that specifically regulate the Project's air quality emission sources. The regulations that do apply, such as fugitive dust regulations, tend to be general and allow multiple means of achieving compliance. Similarly, regulations related to climate change and greenhouse gas emissions reductions generally relate to stationary source emissions or development construction standards, so there are very few regulations that directly apply to this project's greenhouse gas emissions sources. A description of the specific and general regulations that apply to the Project is provided below.

Table C.2-9 provides a list of plans and policies that are applicable to air quality and climate change, and includes a discussion of the Project's consistency with each plan or policy.

C.2.2.1 Air Quality

- **United States Environmental Project Agency (USEPA).** USEPA has issued a number of National Ambient Air Quality Standards (NAAQS) (see Section C.2.1.2). The AVAQMD and the California Air Resources Board (CARB) are the responsible agencies for providing attainment plans and meeting attainment with these standards; and the USEPA reviews and approves these plans and regulations that are designed to attain and maintain attainment with the NAAQS. USEPA has a number of other regulations under the authority of the federal Clean Air Act (such as New Source Review (NSR), Prevention of Significant Deterioration (PSD), Title V permitting program, etc.); however, none of these regulations apply to this project because the Project would have no long-term operating stationary emission sources. Therefore, a PSD air quality impact analysis of the Project's impacts to the nearest mandatory Class I areas is not required. The USEPA does have on-road and off-road engine emission reduction programs that indirectly affect the Project's Emissions through the phasing in of cleaner on-road and off-road equipment engines.

- **USDA Forest Service Land Management Plan.** The USDA Forest Service regulates the portion of the Project that is located within the National Forest System lands, and the Angeles National Forest Plan Strategy does not include any air quality strategies that would be significantly impacted by the construction or operation of the Project (USFS, 2005). The Angeles National Forest air quality strategies are limited to the following: (1) AIR 1: Minimize Smoke and Dust; and (2) AIR 2: Forest Air Quality Emissions. The Angeles National Forest strategy AIR 1 is very general and is directed to "Control and reduce fugitive dust to protect human health, improve safety and moderate or eliminate environmental impacts." The only action item of this of this strategy is to "Incorporate visibility requirements into project plans." The Angeles National Forest air quality strategy AIR 2 relates to providing an air quality inventory for prescribed burns and wildfires and therefore does not directly relate to the Project's emissions.

- **California Air Resources Board (CARB).** CARB has issued a number of California Ambient Air Quality Standards (CAAQS) (see Section C.2.1.2). CARB, like USEPA, also has on-road and off-road engine emission reduction programs that indirectly affect the Project's emissions through the phasing in of cleaner on-road and off-road equipment engines. Additionally, CARB has a Portable Equipment Registration Program that allows owners or operators of portable engines and portable equipment driven by portable engines, such as a portable concrete batch plant or screening plant, to register their units under a Statewide portable program to operate their equipment, which must meet specified program emission requirements, throughout California without having to obtain individual permits from local air districts.
- **Antelope Valley Air Quality Management District (AVAQMD).** The Project is located within the local jurisdiction of the AVAQMD. The local jurisdiction is responsible for planning, implementing, and enforcing federal and State ambient standards within its jurisdiction. The regulations of this agency are focused on stationary sources; therefore, most of the local agency regulations are not relevant to this Project. However, portable engines and portable equipment used during construction that are larger than 50 hp and that are not registered under the CARB Portable Equipment Registration Program would need to be obtain permits from the AVAQMD. The Project's construction and later maintenance activities will also have to comply with AVAQMD visible emissions, nuisance, and fugitive dust regulations, as follows:
  - AVAQMD Rule 401 – Visible Emissions
  - AVAQMD Rule 402 – Nuisance
  - AVAQMD Rule 403 – Fugitive Dust
- These rules limit the visible dust emissions from the Project construction sites, prohibit emissions that can cause a public nuisance, and require the prevention and reduction of fugitive dust emissions. One or more measures are required by the Fugitive Dust rules reduce fugitive dust emissions from specific dust-causing activities. These measures may include, adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, using chemical stabilizers and/or ceasing all activities (such as during periods of high winds). Additionally, any state or locally permitted portable stationary equipment that may be associated with the Project and that would also cause fugitive dust emissions would also have to comply with the following AVAQMD fugitive dust and emission limit rules:
  - AVAQMD Rule 401 – Visible Emissions
  - AVAQMD Rule 402 – Nuisance
  - AVAQMD Rule 403 – Fugitive Dust
  - AVAQMD Rule 404 – Particulate Matter – Concentration
  - AVAQMD Rule 405 – Solid Particulate Matter – Weight

- Any locally permitted portable stationary equipment with internal combustion engines associated with the Project would also have to comply with the following AVAQMD rule:
  - AVAQMD Rule 1110.2 – Emissions From Stationary, Non-road & Portable Internal Combustion Engines
- **County of Los Angeles General Plan.** The County's General Plan includes a long list of air quality related goal and policies. These goals and policies generally relate to future development and transportation improvements to reduce air quality impacts from future growth. There are no air quality policies in the General Plan that directly relate to the actions of the Project.
- Antelope Valley Areawide General Plan. This General Plan does not include an air quality element.
- **County of Los Angeles Draft General Plan 2035.** The draft General Plan includes an air quality element that has several goals and policies; however, none of the air quality measures are applicable to the Project.
- **City of Palmdale General Plan.** This General Plan does not include an air quality element.

C.2.2.2 General Conformity

- **Section 176(c), Clean Air Act Amendments (CAAA).** Per Section 176(c) of the CAAA of 1990, the Forest Service must make a determination of whether the Project (i.e., proposed action) and project alternatives "conforms" with the State Implementation Plan (SIP). However, if the total direct and indirect emissions from the Project and project alternatives are below the General Conformity Rule (40 CFR §93.153) de minimis emission levels, the Project would be exempt from performing a comprehensive Air Quality Conformity Analysis and Determination, and would be considered to be in conformity with the SIP. If an Air Quality Conformity Analysis is necessary it must be certified prior to the Project's Record of Decision (ROD).

C.2.2.3 Climate Change

- **United States Environmental Project Agency.** Under the provisions of the Clean Air Act (CAA) to protect public health and welfare, the USEPA has the authority to regulate GHGs, should a finding be made that GHGs have the potential for adverse impacts. In response to the Supreme Court decision on December 7, 2009, the USEPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA:
  - Endangerment Finding: That the current and projected concentrations of the GHGs in the atmosphere threaten the public health and welfare of current and future generations, and
  - Cause or Contribute Finding: That the combined emissions of GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

  USEPA has enacted a number of GHG regulations and other environmental regulations that will impact GHG emissions, including: (1) Mandatory GHG Reporting, (2) GHG Tailoring Rule for PSD Permits, (3) GHG Vehicle Emissions Standards, (4) Corporate Average Fuel Economy Standards, and (5) Renewables Fuel Standard. None of these federal regulations are specifically relevant to the Project. However, the vehicles/fuels used for project activities will have reduced GHG emissions due to the implementation of some of these regulations.
- **California Air Resources Board (CARB).** California is one of several states that have set GHG emission targets. Executive Order S-3-05 and Assembly Bill 32 (AB 32), the California Global Warming Solutions

Act of 2006, promulgated targets to achieve reductions in GHG to 1990 GHG levels by the year 2020. This target-setting approach allows progress to be made in addressing climate change, and is a forerunner to setting emission limits. CARB is the agency in charge of promulgating and enforcing most of the statewide climate change/GHG emissions limit regulations. CARB, and other state agencies, have enacted a number of GHG regulations and other environmental regulations that will impact California GHG emissions, including: (1) Mandatory GHG Reporting, (2) Cap and Trade, (3) Advanced Clean Cars Program, (4) Electricity Renewable Portfolio Standard (RPS), and (5) Power Plant Emissions Performance Standard (EPS). None of these State regulations are specifically relevant to the Project. However, the vehicles/fuels used for project activities will have reduced GHG emissions due to the implementation of some of these regulations.

- **Office of the California Attorney General.** The Office of the California Attorney General maintains a website that addresses mitigation for greenhouse gases (OAG, 2014). This website provides links to documents that list potential CEQA mitigations for global climate change impacts (OPR, 2008; CAPCOA, 2009). These documents tend to focus on the discussion of measures that are recommended to be added to planning documents, rather than the identification of measures that would be applicable to specific types of development projects. From these documents, specific mitigation measures that could be relevant to the Project have been identified and listed below in Table C.2-14.
- **City of Palmdale Energy Action Plan.** The City of Palmdale's Energy Action Plan includes a large number of GHG emission reduction goals and measures meant to achieve a citywide GHG emission reduction of 15 percent from 2005 year levels by the year 2020. However, most of these goals and measures do not apply to the Project. The one specific goal that indirectly applies is the municipal and community goal to reduce GHG emissions related to water consumption.

Table C.2-9. Consistency with Applicable Air Quality and Climate Change Plans and Policies

Plan/Policy	Consistency	Explanation
State of California GHG Reduction Strategies		
Vehicle Climate Change Standards	Consistent	These are ARB enforced standards; vehicles that access the Project that are required to comply with the standards would comply with these strategies.
Limit Idling Time for Commercial Vehicles	Consistent	Project vehicles would be required to comply with ARB idling restriction regulations.
Construction and Demolition Waste Reduction	Consistent	The Project's primary waste stream, sand/aggregate, would be stored in existing aggregate mining pits or on a City of Palmdale owned property for later re-use. Lesser waste streams, including waste asphalt or concrete would be recycled. (See Appendix A)
Increase Water Use Efficiency	Consistent	The Project would allow PWD operations to be more efficient by increasing the use of local surface water and reducing the amount of needed imported water.
County of Los Angeles Draft General Plan 2035		
Climate Change Policy AQ 3.5: Encourage maximum amount of energy conservation in new development and municipal operations.	Consistent	The Project would allow PWD operations to be more efficient by increasing the use of local surface water and reducing the amount of needed imported water.
County of Los Angeles Unincorporated Los Angeles County Community Climate Action Plan 2020		
CCAP Measure LUT-9: Encourage idling limits of 3 minutes for heavy-duty construction equipment, as feasible within manufacturer's specifications.	Consistent	This idling restriction is a stated project commitment (See Appendix A).

Table C.2-9. Consistency with Applicable Air Quality and Climate Change Plans and Policies

Plan/Policy	Consistency	Explanation
CCAP Measure LUT-11: Reduce energy consumption and waste generation associated with pavement maintenance and rehabilitation.	Consistent	Pavement will be replaced/resurfaced only as necessary and asphalt waste will be recycled (See Appendix A)
CCAP Measure LUT-12: Utilize electric equipment wherever feasible for construction projects.	Consistent	Measure requires use of electric equipment were feasible. The use of electric equipment is generally not feasible in the remote project site location due to the lack of electrical infrastructure at the project site and the size/energy requirements of the heavy construction equipment needed to complete the Project.
CCAP Measure WAW-2: Promote the use of wastewater and gray water to be used for agricultural, industrial, and irrigation purposes. Manage stormwater, reduce potential treatment, and protect local groundwater supplies.	Consistent	Imported water use and related energy based GHG emissions would be reduced by the increased use in local surface water resources.
CCAP Measure SW-1: For the County's unincorporated areas, adopt a waste diversion goal to comply with all state mandates to divert at least 75% of waste from landfill disposal by 2020.	Consistent	The Project's primary waste stream, sand/aggregate, would be stored in existing aggregate mining pits or on a City of Palmdale owned property for later re-use. Lesser waste streams, including waste asphalt or concrete would be recycled to the extent feasible. (See Appendix A).
City of Palmdale Energy Action Plan		
Municipal and Community Goal 2: Reduce Water Consumption for Energy Conservation	Consistent	The measures specified under these goals do not specifically apply to the Project; however, imported water use and related energy based GHG emissions would be reduced by the increased use in local water resources. Additionally water used for fugitive dust control would be obtained from the local surface water available at the reservoir.

Source: USFS, 2005: OPR, 2008: CAPCOA, 2009: LAC, 2014a: LAC, 2014b; City of Palmdale, 2011.

C.2.3 Issues Identified During Scoping

There were no air quality or climate change issues identified during the public scoping period. See Appendix E (Summary of Scoping Process) for a summary of issues relevant to the entire Project that were raised during the scoping process.

C.2.4 Environmental Consequences

C.2.4.1 Air Quality

Significance Criteria. The following significance criteria for Air Quality were derived from the AVAQMD CEQA Guidelines (AVAQMD, 2011), the Angeles National Forest Strategy (USFS, 2005) and from Federal air quality regulations (40 CFR Part 93 Subpart B). Impacts of the proposed action/project or alternatives would be considered significant and would require mitigation if:

- Criterion AIR1: The Project would be inconsistent with the current approved Air Quality Management Plan.
- Criterion AIR2: The Project would generate emissions of air pollutants that would exceed any AVAQMD regional air quality standard as defined in Table C.2-10.

Table C.2-10. AVAQMD Significance Thresholds

	Daily Emissions (lbs/day)						Annual Emissions (Tons)					
	VOC	CO	NOx	SOx	PM10	PM2.5	VOC	CO	NOx	SOx	PM10	PM2.5
AVAQMD Significance Thresholds	137	548	137	137	82	82	25	100	25	25	15	15

Source: AVAQMD, 2011.

Per direct guidance from MDAQMD staff, where MDAQMD and AVAQMD share staff and have the same significance thresholds and nearly identical CEQA guidance, emissions from very short-term projects that exceed daily MDAQMD emissions thresholds would not be considered significant under the following circumstances or conditions: (MDAQMD, 2014)

- The Project does not create any localized pollutant hot spots (required).
- The Project does not exceed the annual emissions thresholds (required).
- The Project is applying reasonably feasible control measure for the pollutants exceeding the daily emissions thresholds (required depending on project circumstances).
- The Project's construction schedule is altered, in a manner that increases air quality emissions, in order to reduce other project impacts (consideration for review).
- The Project's emissions are included in attainment plans (if true then only this item is needed to identify impacts as less than significant).
  - Criterion AIR3: The Project would expose sensitive receptors to substantial pollutant concentrations.
  - Criterion AIR4: The Project would result in non-compliance with the Federal General Conformity Rule (40 CFR Parts 6, 51, and 93) requirements.
  - Criterion AIR5: The Project would expose a substantial number of people to objectionable odors.
  - Criterion AIR6: The Project would conflict with air quality provisions of the Angeles National Forest Strategy.

Significance conclusions for individual impacts are not required for compliance with NEPA. Therefore, conclusions presented in the following analysis regarding the significance of identified impacts are provided for the purposes of CEQA only.

Emissions Calculations Methodology. The air quality emissions resulting from Project and project action alternative activities were calculated using the most recent available emission factors from CARB for on-road and off-road vehicles/equipment and the most recent fugitive dust emission calculation methodologies from the United States Environmental Protection Agency (USEPA, 2014c). Detailed Project schedules, equipment use, and material transport quantities were used to develop the activity estimates used in the emission calculations. Due to the scope and complexity of this Project, simplified construction project emission calculation programs (such as the California Emissions Estimator Model software CalEEMod) were not used.

As discussed earlier, the emission estimates utilized within this section assumed a 7-year construction scenario for the proposed Project and a 13-year construction scenario for Alternative 1. While construction activities may last longer, these durations represent worst-case daily and total emissions. The detailed construction schedule, equipment use, and vehicle trip assumptions used within the emission calculations are provided in Appendix B (Air Quality Calculations).

C.2.4.2 Climate Change

Significance Criteria. Appendix G of the CEQA Guidelines allows the lead agency discretion in how to address and evaluate significance based on these criteria. According to these Guidelines the following criteria may be considered to establish the significance of GCC emissions (AEP, 2011).

Would the Project:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The AVAQMD CEQA Guidelines provide an annual GHG emissions threshold of 100,000 tons per year (AVAQMD, 2001). This guideline also provides for a short-term threshold that is proportional to the annual threshold; however, the annual threshold is more appropriate both for this long-term project and for the evaluation of GHG emissions impacts in general. Construction GHG emissions are included, amortized over the Project's life, in the Project's annual GHG emissions totals.

Considering these guidelines, the following criteria are used in this EIR to determine the significance of Project GCC impacts:

- Criterion GHG1: The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold.
- Criterion GHG2: The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Emissions Calculations Methodology. Direct GHG emissions would result from fuel use from proposed construction and operation activities. Indirect emissions could occur from an increase in on-site electricity use during construction or operation or from the increased use of water. However, for this Project there is not assumed to be an incremental increase in on-site electricity consumption from construction and operation activities; and this Project would allow the increased use of local water supplies that would cause a reduction in GHG emissions from water management. Therefore, indirectly the Project would reduce GHG emissions; however, the potential magnitude of this GHG emissions reduction was not estimated.

GHG emissions were calculated based on methodologies provided in The Climate Registry – General Reporting Protocol (TCR, 2013) (TCR Protocol), and emissions factors for the TCR Protocol updated in 2014 (TCR, 2014). The TCR Protocol is the guidance document that TCR members, which includes the State of California, use to prepare annual GHG inventories for the Registry.

The assumptions used to create the air pollutant emissions and vehicle and equipment use were used to create diesel and gasoline fuel use estimates during Project construction and operation. These fuel use estimates along with the TCR GHG emissions factors for diesel and gasoline were used to determine the GHG emissions estimates.

C.2.4.3 Proposed Action/Project

Direct and Indirect Effects Analysis

The Project would include the following separate construction and operation activities:

Construction

- Site preparation, equipment, and material receipt and storage at the lay down area;
- Grade control structure excavation and refilling construction, including temporary screening plant and concrete batch plant;
- Sediment stockpiling and removal (1,165,000 cubic yards total, as much as 172,800 cubic yards/year for seven years, as much as 2,880 cubic yards per day using 16 dump trucks that haul 12 cubic yards/trip);
- Sediment hauling to the storage area in the existing sand and gravel pit area, or the alternative storage site on PWD owned land;
- Sediment storage area sediment pushing;
- Maintenance of unpaved and paved access roads; and
- Cleanup and demobilization.

Operation

- Site preparation, equipment and material receipt and storage at the lay down area;
- Sediment stockpiling and removal (38,000 cubic yards total per year, as much as 1,080 cubic yards per day using 6 dump trucks that haul 12 cubic yards/trip);
- Sediment hauling to the storage area in the existing sand and gravel pit area, or the alternative storage site on PWD owned land;
- Sediment storage area sediment pushing;
- Maintenance of unpaved and paved access roads; and
- Cleanup and demobilization.

The removed sediment would be placed into the storage area and a stabilized surface would be created at the end of each year's construction or operation excavation period. The detailed construction activity assumptions, including the construction equipment use, on-road traffic, and construction schedule are provided in Appendix B (Air Quality Calculations).

Air Quality

The Project would be inconsistent with the current approved Air Quality Management Plan (Criterion AIR1)

Impact AQ-1: Project Construction and Operation would conflict with the approved AVAQMD Air Quality Management Plans

The Project is located in the MDAB under the jurisdiction of the AVAQMD. The Antelope Valley portion of the MDAB is in non-attainment of the federal and State ozone standards and the State PM10 standard. The AVAQMD has developed a 2004 Ozone Attainment Plan (State and federal attainment) and a 2014 update to the Reasonably Available Control Technology State Implementation Plan (RACT SIP) analysis, and has prepared a list of measures to reduce PM emissions to meet State planning requirements.

Ozone

The AVAQMD 2004 Ozone Attainment Plan (AVAQMD, 2004) does not propose any new control measures beyond those in their current rules and regulations. The Project commitments for off-road equipment (See Appendix A) would meet or exceed the requirements of the only potentially project applicable ozone precursor reduction related rule (Rule 1110.2), and the construction contractor would have to ensure that permitted portable equipment also comply with this rule. The 2014 RACT SIP Analysis (AVAQMD, 2014) does not include any actions that are relevant to project emissions sources. Therefore, the Project would be consistent with the Ozone Air Quality Management Plan for Antelope Valley.

PM10

The AVAQMD prepared a list of measures to reduce PM emissions in 2005 (AVAQMD, 2005). Of the new control measures listed, the only applicable measures are fugitive dust control measures that would be integrated into Rule 403 – Fugitive Dust. The construction contractor would be required to comply with all AVAQMD rules and regulations; therefore, the Project would comply with the AVAQMD State PM attainment control measures.

Summary

The Project would have to comply with all rules and regulations applicable at the time of the Project's construction and operation and would implement the air quality project commitments (see Appendix A) that would reduce air pollutant emissions during Project construction and operation. Therefore, the Project would not conflict with the approved AVAQMD Air Quality Management Plans.

CEQA Significance Conclusion

Project construction, operations, and maintenance would be required to comply with AVAQMD rule and regulations. Therefore, the Project would have less than significant impacts in regards to applicable air quality plan conformance (Class III).

The Project would generate emissions of air pollutants that would exceed any AVAQMD regional air pollutant emissions threshold as defined in Table C.2-10. (Criterion AIR2)

Impact AQ-2: The Project's Construction Emissions Would Exceed AVAQMD Significance Criteria

Using vehicle and equipment assumptions developed for the Project, the air pollutant emissions were estimated for the two construction phases of the Project, grade control structure construction and excavation. The grade control structure construction will occur during a 3-month period in the first year of the Project life, and the excavation phase will occur for approximately 2.5 months each year for 7 years of the Project life starting the year after the grade control structure is constructed. As discussed earlier, a 7-year construction scenario for the proposed Project represents worst-case daily and total emissions. Tables C.2-11 and C.2-12 provide the average daily and annual air pollutant emissions estimates for the grade control structure construction.

Table C.2-11. Project Grade Control Structure – Average Daily Construction Emissions (lbs/day)						
	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.64	5.46	3.20	0.01	0.21	0.13
Off-road equipment	9.58	33.64	114.83	0.11	5.42	4.99
Fugitive dust	—	—	—	—	27.71	6.28
Total	10.21	39.10	118.03	0.12	33.34	11.41
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011.

Table C.2-12. Project Grade Control Structure – Average Construction Emissions (tons/yr)						
	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.02	0.20	0.12	0.00	0.01	0.00
Off-road equipment	0.35	1.24	4.25	0.00	0.20	0.18
Fugitive dust	—	—	—	—	1.03	0.23
Total	0.38	1.45	4.37	0.00	1.23	0.42
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Tables C.2-11 and C.2-12 show that the GCS construction emissions are estimated to be below all AVAQMD daily and annual emissions thresholds.

Tables C.2-13 and C.2-14 provide the average daily air pollutant emissions estimates for the excavation phase construction, with Table C.2-13 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-14 assuming that the sediment transport will be to the alternate sediment storage site.

Table C.2-13. Project Excavation Phase – Average Daily Construction Emissions (lbs/day)						
	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	5.82	28.44	40.26	0.13	2.30	1.68
Off-road equipment	12.90	25.26	84.77	7.89	10.76	9.90
Fugitive dust	—	—	—	—	129.26	37.14
Total	18.72	53.70	125.03	8.02	142.32	48.72
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	Yes	No

Source: Appendix B; AVAQMD, 2011

Table C.2-14. Project Excavation Phase Alternate Sediment Storage Site – Average Daily Construction Emissions (lbs/day)						
	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	4.19	22.06	28.13	0.09	1.63	1.17
Off-road equipment	12.90	25.26	84.77	7.89	10.76	9.90
Fugitive dust	—	—	—	—	106.34	22.11
Total	17.09	47.32	112.90	7.98	118.73	33.19
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	Yes	No

Source: Appendix B; AVAQMD, 2011

As these two tables show, the PM10 emissions exceed the AVAQMD daily emissions thresholds. All other air pollutant emissions estimates are below the AVAQMD daily emissions thresholds.

Tables C.2-15 and C.2-16 provide the annual air pollutant emissions estimates for the excavation phase construction, with Table C.2-15 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-16 assuming that the sediment transport will be to the alternate sediment storage site.

Table C.2-15. Project Excavation Phase – Annual Construction Emissions (tons/yr)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.19	0.91	1.29	0.00	0.07	0.05
Off-road equipment	0.41	0.81	2.71	0.25	0.34	0.32
Fugitive dust	—	—	—	—	4.14	1.19
Total	0.60	1.72	4.00	0.26	4.55	1.56
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Table C.2-16. Project Excavation Phase Alternate Sediment Storage Site – Annual Construction Emissions (tons/yr)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.13	0.71	0.90	0.00	0.05	0.04
Off-road equipment	0.41	0.81	2.71	0.25	0.34	0.32
Fugitive dust	—	—	—	—	3.40	0.71
Total	0.55	1.51	3.61	0.26	3.80	1.06
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

As these two tables show, the air pollutant emissions estimates for the excavation phase of construction are well below the AVAQMD annual emissions thresholds.

SPCs Applicable to Impact AQ-2

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

All of the average daily and annual emissions are estimated to be below the AVAQMD emissions thresholds, except for average daily PM10 emissions during the excavation phase of construction.

While the Project's average daily PM10 emissions exceed the AVAQMD threshold during the excavation phase of the Project, per guidance from AQMD staff, emissions from very short-term projects that exceed daily AVAQMD emissions thresholds would not be considered significant under the following circumstances or conditions: (MDAQMD, 2014)

- The Project does not create any localized pollutant hot spots (required).
- The Project does not exceed the annual emissions thresholds (required).
- The Project is applying reasonably feasible control measure for the pollutants exceeding the daily emissions thresholds (required depending on project circumstances).
- The Project's construction schedule is altered, in a manner that increases air quality emissions, in order to reduce other project impacts (consideration for review).
- The Project's emissions are included in attainment plans (if true then only this item is needed to identify impacts as less than significant).

The Project would not create any localized pollutant hotspots that would impact any sensitive receptors (see the discussion below under Impact AQ-4), the Project's excavation phase construction PM10 emissions do not exceed the AVAQMD annual emissions thresholds, and the Project's schedule is altered to reduce impacts on biology (bird breading season) and to recreation that would occur if the reservoir was closed and drained to dead pool level for greater periods of the year. The Project meets the two required considerations noted above, which might be enough for AVAQMD to agree that the Project's emissions are less than significant. However, to ensure that these cumulative emissions impacts are less than significant, feasible mitigation of PM10 emissions will also be implemented during the excavation phase of the Project (please see SPCs AQ-1 through AQ-5 provided in Appendix A).

Therefore, all construction period pollutant emissions impacts are less than significant (Class III).

Impact AQ-3: The Project's Operation Emissions Would Exceed AVAQMD Significance Criteria

Tables C.2-17 and C.2-18 provide the average daily air pollutant emissions estimates for the ongoing annual excavation, with Table C.2-17 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-18 assuming that the sediment transport will be to the alternate sediment storage site.

Table C.2-17. Project Ongoing Annual Sediment Removal – Average Daily Emissions (lbs/day)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	2.34	13.15	15.27	0.05	0.89	0.64
Off-road equipment	8.99	16.18	49.02	5.94	7.65	7.04
Fugitive dust	—	—	—	—	49.05	13.15
Total	11.33	29.34	64.29	5.99	57.60	20.82
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Table C.2-18. Project Ongoing Annual Sediment Removal Alternate Sediment Storage Site – Average Daily Emissions (lbs/day)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	1.75	10.86	10.90	0.04	0.65	0.46
Off-road equipment	8.99	16.18	49.02	5.94	7.65	7.04
Fugitive dust	—	—	—	—	40.32	7.94
Total	10.74	27.04	59.92	5.98	48.62	15.44
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Tables C.2-17 and C.2-18 show that the ongoing annual excavation emissions are estimated to be below all AVAQMD daily emissions thresholds.

Tables C.2-19 and C.2-20 provide the annual air pollutant emissions estimates for the ongoing annual excavation, with Table C.2-19 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-20 assuming that the sediment transport will be to the alternate sediment storage site.

Table C.2-19. Project Ongoing Annual Sediment Removal – Annual Emissions (tons/yr)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.05	0.26	0.31	0.00	0.02	0.01
Off-road equipment	0.18	0.32	0.98	0.12	0.15	0.14
Fugitive dust	—	—	—	—	0.98	0.26
Total	0.23	0.59	1.29	0.12	1.15	0.42
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Table C.2-20. Project Ongoing Annual Sediment Removal Alternate Sediment Storage Site – Annual Emissions (tons/yr)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.03	0.22	0.22	0.00	0.01	0.01
Off-road equipment	0.18	0.32	0.98	0.12	0.15	0.14
Fugitive dust	—	—	—	—	0.81	0.16
Total	0.21	0.54	1.20	0.12	0.97	0.31
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

As these two tables show, the air pollutant emissions estimates for the ongoing annual excavation are well below the AVAQMD annual emissions thresholds.

SPCs Applicable to Impact AQ-3

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

All operation air pollutant emissions impacts are well below AVAQMD emissions thresholds, resulting in a less than significant impact (Class III).

The Project would expose sensitive receptors to substantial pollutant concentrations. (Criterion AIR3)

Impact AQ-4: The Project's Construction or Operations Emissions Would Create Health Risks

The Project's emissions would not include a large amount of toxic air pollutant emissions. The primary toxic air pollutant emitted is diesel particulate matter (DPM) from the Project's trucks and off-road equipment; however, even those emissions would be limited and the on-road DPM emissions would be spread along the primary sediment hauling route. Additionally, the majority of the off-road equipment DPM emissions from the Project and initial construction or maintenance, would occur at Littlerock reservoir, which is located more than a mile from any residences or other sensitive receptors. Due to the lack of schools or other significantly sensitive receptors near active project areas, the distance from residences to the main construction areas, the DPM emissions from on-road vehicles being spread out over several miles, and considering SPCs AQ-1 through AQ-5 (See Appendix A) would reduce diesel particulate matter (DPM) emissions, it is concluded that no adverse impacts to sensitive receptors would occur from toxic air pollutant emissions.

Please also see Section C.6 (Hazards and Public Safety) for a discussion of the potential for the Project to cause Valley Fever related health effects.

SPCs Applicable to Impact AQ-4

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Toxic air pollutant emissions are located far from sensitive receptors or spread out over a large area and so Project emissions of toxic air pollutants would not create substantial concentrations at sensitive receptor locations. Therefore, the impacts to sensitive receptors would be less than significant (Class III).

The Project would result in non-compliance with the Federal General Conformity Rule (40 CFR Parts 6, 51, and 93) requirements. (Criterion AIR4)

Impact AQ-5: The Project's Construction or Operations Emissions within the Angeles National Forest would exceed Applicable General Conformity Thresholds

The Project would potentially result in adverse impacts if the Project were to cause annual emissions that exceed the General Conformity *de minimis* thresholds. The current general conformity thresholds for the Antelope Valley portion of the MDAB, which is in severe nonattainment of the federal ozone standard, are as follows:

- NOx – 25 tons/year
- VOC – 25 tons/year

As the annual emissions estimates for construction (Tables C.2-12, C.2-15, and C.2-16) and operation (Tables C.2-19 and C.2-20) show the Project's estimated annual NOx and VOC emissions are well below the General Conformity applicability thresholds. A General Conformity analysis is not required for this project.

SPCs Applicable to Impact AQ-5

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

General Conformity would not be triggered; therefore, impacts are less than significant (Class III).

The Project would expose a substantial number of people to objectionable odors. (Criterion AIR5)

Impact AQ-6: The Project's Construction or Operations would create odors

Construction equipment and construction activities may create mildly objectionable odors. Additionally, biological decomposition odors may occur as the result of removing potentially wet sediments from the reservoir. These odors would be temporary, would occur far from populations, and would not affect a substantial number of people.

SPCs Applicable to Impact AQ-6

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Odor impacts would be less than significant (Class III).

The Project would conflict with air quality provisions of the Angeles National Forest Strategy. (Criterion AIR6)

Impact AQ-7: The Project would conflict with Angeles National Forest Air Quality Strategies

The Angeles National Forest Strategy does not include any air quality strategies that would be adversely impacted by the construction or operation of the Project. The Angeles National Forest air quality strategies are limited to the following:

- AIR 1: Minimize Smoke and Dust
- AIR 2: Forest Air Quality Emissions

The Angeles National Forest strategy AIR 1 is very general and is directed to "Control and reduce fugitive dust to protect human health, improve safety and moderate or eliminate environmental impacts." The only action item of this of this strategy is to "Incorporate visibility requirements into project plans." The Project construction smoke and dust would be reduced through conformance with AVAQMD fugitive dust rules and additionally mitigated to the extent feasible by SPCs AQ-1 through AQ-5 (see Appendix A). Therefore, this ANF air quality strategy would be complied with and no adverse impacts would occur.

The Angeles National Forest air quality strategy AIR 2 relates to providing an air quality inventory for prescribed burns and wildfires and therefore does not directly relate to the Project's construction and operation emissions. The Project's fire safety requirements are addressed separately.

Table C.2-21. Project – Summary of Project Greenhouse Gas Emission Estimates

Emissions Source	Annual CO2e (tons)
Construction Emissions	
On-Road Emissions	3,086
Off-Road Emissions	2,943
Subtotal Emissions	6,029
Amortized Construction Emissions (50-year life)	121
Operation Emissions	
On-Road Emissions	4,593
Off-Road Emissions	3,968
Subtotal Emissions	8,561
Amortized Operation Emissions (50 year-life)	171
Total Annualized Emissions	292
AVAQMD Significance Threshold	100,000
Exceeds Threshold?	NO

Source: Appendix B; AVAQMD, 2011.

SPCs Applicable to Impact AQ-7

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

There would be no conflict with Angeles National Forest Air Quality Strategies; therefore, impacts are less than significant (Class III).

Greenhouse Gases

The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold. (Criterion GHG1)

Impact GHG-1: The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold.

Using the same vehicle and equipment assumptions used to calculate the Project's air pollutant emissions, the fuel use was estimated for the on-road vehicle traffic and the off-road equipment to determine the direct GHG emissions from the Project. The Project has limited indirect emissions, and as noted previously may cause reductions in indirect emissions, and those secondary emissions were not calculated. Table C.2-21 provides the annualized direct CO2e emissions estimate for the Project.

Table C.2-21 shows the emissions totals for one year of GCS construction, 7 years of excavation (worst-case/maximum construction scenario), and 42 years of operation maintenance excavation. The amortized annual emissions divide these Project-life emissions by the 50-year Project life to obtain the Project's annualized emissions. The amortized Project life annual emissions are orders of magnitude below the AVAQMD significance threshold

Table C.2-22 provides the annualized direct CO2e emissions estimate for the Project assuming exclusive use of the alternate sediment storage site. The Project may use both storage locations, so these two tables represent the range of expected GHG emissions.

The shorter haul distance to the alternate sediment disposal location results is slightly lower GHG emissions than shown for the primary sediment disposal location as shown in Table C.2-21.

Table C.2-22. Project – Alternate Sediment Storage Site – Summary of Project Greenhouse Gas Emission Estimates

Emissions Source	Annual CO2e (tons)
Construction Emissions	
On-Road Emissions	2,236
Off-Road Emissions	2,943
Total Emissions	5,179
Amortized Emissions (50-year life)	104
Operation Emissions	
On-Road Emissions	3,445
Off-Road Emissions	3,968
Subtotal Emissions	7,413
Amortized Operation Emissions (50 year-life)	148
Total Annualized Emissions	252
AVAQMD Significance Threshold	100,000
Exceeds Threshold?	NO

Source: Appendix B; AVAQMD, 2011.

SPCs Applicable to Impact GHG-1

SPC GHG-1 (Recycle Construction Wastes)

CEQA Significance Conclusion

GHG emissions for the Project are estimated to be well below AVAQMD GHG emissions thresholds and are less than significant (Class III).

The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. (Criterion GHG2)

Impact GHG-2: The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

As shown above in Table C.2-9, the Project would not conflict with applicable GHG emission reduction plans, policies, and regulations. The Project would use, re-use, or recycle all project waste streams, including the sediment, to the extent feasible (see Appendix A). Additionally, the Project would create the potential for increased beneficial use of a local potable water source.

SPCs Applicable to Impact GHG-2

SPC GHG-1 (Recycle Construction Wastes)

CEQA Significance Conclusion

The Project would conform to GHG emissions reductions policies, goals, and regulations, so impacts are less than significant (Class III).

C.2.4.4 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Alternative 1, which would differ from the Project only during the construction excavation phase, includes the following construction and operation activities:

Construction

- Sediment stockpiling and removal (1,400,000 cubic yards total, as much as 109,080 cubic yards/year for 13 years, as much as 1,080 cubic yards per day using 6 dump trucks that haul 12 cubic yards/trip)
- All other aspects of the Project construction, such as the grade control structure construction and the mobilization/demobilization/cleanup requirements would be identical or similar in nature to that noted for the Project.

Operation

- Identical to the Project, except that it would start 6 years later due to the longer construction excavation phase.

The detailed construction activity assumptions for Alternative 1, including the construction equipment use, on-road traffic, and construction schedule are provided in Appendix B (Air Quality Calculations).

Air Quality

The Project would be inconsistent with the current approved Air Quality Management Plan (Criterion AIR1)

Impact AQ-1: Project Construction and Operation would conflict with the approved AVAQMD Air Quality Management Plans

Alternative 1 would have the same types of emissions sources and so would be identical to the Project in relation to conformance with air quality management plans as described previously.

Summary

Alternative 1 would have to comply with all rules and regulations applicable at the time of the Project's construction and operation. Therefore, the Alternative 1 would not conflict with the approved AVAQMD Air Quality Management Plans.

CEQA Significance Conclusion

Project construction and operations and maintenance would be required to comply with AVAQMD rule and regulations and would implement the air quality project commitments that would reduce air pollutant emissions during Project construction and operation. Therefore, Alternative 1 would have less than significant impacts in regards to applicable air quality plan conformance (Class III).

The Project would generate emissions of air pollutants that would exceed any AVAQMD regional air pollutant emissions threshold as defined in Table C.2-10. (Criterion AIR2)

Impact AQ-2: The Project's Construction Emissions Would Exceed AVAQMD Significance Criteria

Using vehicle and equipment assumptions developed for the Project and Alternative 1, the air pollutant emissions were estimated for the two construction phases of the Project, grade control structure construction and excavation. The grade control structure construction would be the same for both alternatives and would occur during a 3-month period in the first year of the Project life, and the excavation phase for Alternative 1 would occur, at a much lower daily excavation rate compared to the Project, for approximately 5 months for 13 years of the Project life starting the year after the grade control structure is constructed. As discussed earlier, a 13-year construction scenario for Alternative 1 represents worst-case daily and total emissions. Tables C.2-11 and C.2-12, provided previously, provide the average daily and annual air pollutant emissions estimates for the grade control structure construction.

Tables C.2-11 and C.2-12 show that the GCS construction emissions are estimated to be below all AVAQMD daily and annual emissions thresholds.

Tables C.2-23 and C.2-24 provide the average daily air pollutant emissions estimates for the excavation phase construction for Alternative 1, with Table C.2-23 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-24 assuming that the sediment transport will be to the alternate sediment storage site.

Table C.2-23. Alternative 1 Excavation Phase – Average Daily Construction Emissions (lbs/day)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	2.45	13.76	16.04	0.05	0.94	0.67
Off-road equipment	8.95	15.85	49.78	6.00	7.73	7.11
Fugitive dust	—	—	—	—	50.65	13.55
Total	11.40	29.61	65.81	6.06	59.32	21.33
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Table C.2-24. Alternative 1 Excavation Phase Alternate Sediment Storage Site – Average Daily Construction Emissions (lbs/day)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	1.82	11.30	11.37	0.04	0.68	0.48
Off-road equipment	8.95	15.85	49.78	6.00	7.73	7.11
Fugitive dust	—	—	—	—	42.30	8.31
Total	10.77	27.15	61.14	6.04	50.71	15.90
AVAQMD Significance Thresholds	137	548	137	137	82	82
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

As these two tables show none of the excavation-phase construction emissions for Alternative 1 exceed the AVAQMD daily emissions thresholds.

Tables C.2-25 and C.2-26 provide the annual air pollutant emissions estimates for the excavation phase construction for Alternative 1, with Table C.2-25 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-26 assuming that the sediment transport will be to the alternate sediment storage site.

Table C.2-25. Alternative 1 Excavation Phase – Annual Construction Emissions (tons/yr)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.13	0.72	0.84	0.00	0.05	0.04
Off-road equipment	0.47	0.83	2.61	0.32	0.41	0.37
Fugitive dust	—	—	—	—	2.66	0.71
Total	0.60	1.55	3.46	0.32	3.11	1.12
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

Table C.2-26. Alternative 1 Excavation Phase Alternate Sediment Storage Site – Annual Construction Emissions (tons/yr)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road equipment	0.10	0.59	0.60	0.00	0.04	0.02
Off-road equipment	0.47	0.83	2.61	0.32	0.41	0.37
Fugitive dust	—	—	—	—	2.22	0.44
Total	0.57	1.43	3.21	0.32	2.66	0.83
AVAQMD Significance Thresholds	25	100	25	25	15	15
Significant?	No	No	No	No	No	No

Source: Appendix B; AVAQMD, 2011

As these two tables show, the air pollutant emissions estimates for the excavation phase of construction for Alternative 1 are well below the AVAQMD annual emissions thresholds.

SPCs Applicable to Impact AQ-2

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

All construction air pollutant emissions impacts for Alternative 1 are well below AVAQMD emissions thresholds and are less than significant (Class III).

Impact AQ-3: The Project's Operation Emissions Would Exceed AVAQMD Significance Criteria

The Project goes into its operation and maintenance phase once the excavation phase is over. The operation and maintenance phase for Alternative 1 and the Project are identical, namely the removal of annual sediment accumulations. Therefore, Tables C.2-17 and C.2-18 also provide the average daily air pollutant emissions estimates for the ongoing annual excavation for Alternative 1, with Table C.2-17 assuming the sediment transport will be to in the primary sediment storage site (existing aggregate pits) and Table C.2-18 assuming that the sediment transport will be to the alternate sediment storage site.

As these two tables show, the air pollutant emissions estimates for the ongoing annual excavation are well below the AVAQMD annual emissions thresholds.

SPCs Applicable to Impact AQ-3

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

All operation air pollutant emissions impacts for Alternative 1 are well below AVAQMD emissions thresholds and are less than significant (Class III).

The Project would expose sensitive receptors to substantial pollutant concentrations. (Criterion AIR3)

Impact AQ-4: The Project's Construction or Operations Emissions Would Create Health Risks

Alternative 1 would have the same types of toxic air emissions from the same types of emissions sources as the Project, although Alternative 1 would have lower maximum daily and annual emissions. The same analysis factors as noted for the Project apply to the Alternative 1. Therefore, due to the lack of schools or other significantly sensitive receptors near active Project areas, the distance from residences to the main construction areas, the DPM emissions from on-road vehicles being spread out over several miles, and considering the Project commitments (See Appendix A) that would reduce diesel particulate matter (DPM) emissions, it is concluded that no adverse impacts to sensitive receptors would occur from Alternative 1's toxic air pollutant emissions.

Please also see Section C.6 (Hazards and Public Safety) for a discussion of the potential for the Project to cause Valley Fever–related health effects.

SPCs Applicable to Impact AQ-4

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Toxic air pollutant emissions are located far from sensitive receptors or spread out over a large area and so project emissions of toxic air pollutants would not create substantial concentrations at sensitive receptor locations. Therefore, the impacts to sensitive receptors would be less than significant (Class III).

The Project would result in non-compliance with the Federal General Conformity Rule (40 CFR Parts 6, 51, and 93) requirements. (Criterion AIR4)

Impact AQ-5: The Project's Construction or Operations Emissions within the Angeles National Forest would exceed Applicable General Conformity Thresholds

Alternative 1 would potentially result in adverse impacts if the Project were to cause annual emissions that exceed the General Conformity *de minimis* thresholds. The current general conformity thresholds for the Antelope Valley portion of the MDAB, which is in severe nonattainment of the federal ozone standard, are as follows:

- NOx – 25 tons/year
- VOC – 25 tons/year

As the annual emissions estimates for Alternative 1 construction (Tables C.2-12, C.2-23, and C.2-24) and operation (Tables C.2-19 and C.2-20) show Alternative 1's estimated NOx and VOC emissions are well below the General Conformity applicability thresholds. A General Conformity analysis is not required for this Project.

SPCs Applicable to Impact AQ-5

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

General Conformity would not be triggered; therefore impacts are less than significant (Class III).

The Project would expose a substantial number of people to objectionable odors. (Criterion AIR5)

Impact AQ-6: The Project's Construction or Operations would create odors

Alternative 1 construction equipment and construction activities may create mildly objectionable odors. Additionally, biological decomposition odors may occur as the result of removing potentially wet sediments from the reservoir. These odors would be temporary, would occur far from populations, and would not affect a substantial number of people.

SPCs Applicable to Impact AQ-6

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Odor impacts would be less than significant (Class III).

The Project would conflict with air quality provisions of the Angeles National Forest Strategy. (Criterion AIR6)

Impact AQ-7: The Project would conflict with Angeles National Forest Air Quality Strategies

The Angeles National Forest Strategy does not include any air quality strategies that would be adversely impacted by the construction or operation of Alternative 1. The Angeles National Forest air quality strategies are limited to the following:

- AIR 1: Minimize Smoke and Dust
- AIR 2: Forest Air Quality Emissions

The Angeles National Forest strategy AIR 1 is very general and is directed to "Control and reduce fugitive dust to protect human health, improve safety and moderate or eliminate environmental impacts." The only action item of this of this strategy is to "Incorporate visibility requirements into project plans." The construction smoke and dust from Alternative 1 would be reduced through conformance with AVAQMD fugitive dust rules and additionally mitigated to the extent feasible by the Project commitments (see Appendix A). Therefore, this ANF air quality strategy would be complied with and no adverse impacts would occur.

The Angeles National Forest air quality strategy AIR 2 relates to providing an air quality inventory for prescribed burns and wildfires and therefore does not directly relate to the Alternative 1's construction and operation emissions. Fire safety requirements for Alternative 1 are addressed separately.

SPCs Applicable to Impact AQ-7

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

There would be no conflict with Angeles National Forest Air Quality Strategies; therefore, impacts are less than significant (Class III).

The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold. (Criterion GHG1)

Greenhouse Gases

Impact GHG-1: The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold.

Table C.2-27 provides the annualized direct CO2e emissions estimate for Alternative 1.

Table C.2-27 shows the emissions totals for one year of GCS construction, 13 years of excavation (worst-case/maximum construction scenario), and 36 years of operation maintenance excavation. The amortized annual emissions divide these project life emissions by the 50-year project life to obtain the Alternative 1 annualized emissions. The amortized project life annual emissions are orders of magnitude below the AVAQMD significance threshold, but are somewhat higher than those for the Project.

Table C.2-27. Alternative 1 – Summary of Project Greenhouse Gas Emission Estimates

Emissions Source	Annual CO2e (tons)
Construction Emissions	
On-Road Emissions	3,969
Off-Road Emissions	3,733
Subtotal Emissions	7,702
Amortized Emissions (50 year-life)	154
Operation Emissions	
On-Road Emissions	3,937
Off-Road Emissions	3,401
Subtotal Emissions	7,338
Amortized Operation Emissions (50 year-life)	147
Total Annualized Emissions	301
AVAQMD Significance Threshold	100,000
Exceeds Threshold?	NO

Source: Appendix B; AVAQMD, 2011.

Table C.2-28 provides the annualized direct CO2e emissions estimate for Alternative 1 assuming exclusive use of the alternate sediment storage site. The Project may use both storage locations, so these two tables represent the range of expected GHG emissions.

The shorter haul distance to the alternate sediment disposal location results is slightly lower GHG emissions than shown for the primary sediment disposal location as shown in Table C.2-27. However, the GHG emissions from Alternative 1 have been estimated to be slightly higher than those for the Project. The higher project-life GHG emissions for Alternative 1 are due to the expected higher efficiencies that can occur for the Project's higher daily volume sediment hauling.

Table C.2-28. Alternative 1 – Alternate Sediment Storage Site – Summary of Project Greenhouse Gas Emission Estimates

Emissions Source	Annual CO2e (tons)
Construction Emissions	
On-Road Emissions	2,972
Off-Road Emissions	3,733
Total Emissions	6,705
Amortized Emissions (50 year-life)	134
Operation Emissions	
On-Road Emissions	2,953
Off-Road Emissions	3,401
Subtotal Emissions	6,354
Amortized Operation Emissions (50 year-life)	127
Total Annualized Emissions	261
AVAQMD Significance Threshold	100,000
Exceeds Threshold?	NO

Source: Appendix B; AVAQMD, 2011.

SPCs Applicable to Impact GHG-1

SPC GHG-1 (Recycle Construction Wastes)

CEQA Significance Conclusion

GHG emissions for Alternative 1 are estimated to be well below AVAQMD GHG emissions thresholds and are less than significant (Class III).

The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. (Criterion GHG2)

Impact GHG-2: The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Alternative 1 is essentially identical to the Project in terms of conformance with GHG emissions reduction plans, policies, and regulations. Therefore, Alternative 1 would not conflict with applicable GHG emissions reduction plans, policies, and regulations.

SPCs Applicable to Impact GHG-2

SPC GHG-1 (Recycle Construction Wastes)

CEQA Significance Conclusion

Alternative 1 would conform to GHG emissions reductions policies, goals, and regulations, so impacts are less than significant (Class III).

C.2.4.5 Alternative 2: No Action/No Project Alternative

Air Quality

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at an annual average rate of 38,000 cubic yards per year. Palmdale Water District (PWD) would not undertake any activities to remove sediment. Therefore, no air pollutant emissions would be generated.

At full capacity, sediment accumulated behind the dam would be approximately 7.4 million cubic yards. In the event sediment buildup led to safety issues and required demolition/removal of the Dam, construction activities (and related air pollutant emissions) are expected to be greater than that of the Project or Alternative 1. Demolition of the dam and restoration of the waterway would require the removal of 2.8 million cubic yards of sediment and dam concrete be removed. Such activities would result in a project similar to, but larger than, the Project, with the location(s) that could handle all of the material storage and disposal being uncertain and likely more distant that proposed for the Project or Alternative 1. Additionally, demolition and removal of the concrete dam would require extensive construction. While many activities would occur within the Reservoir and not proximate to sensitive receptors, the hauling and disposal of up to 2.8 million cubic yards of sediment and dam debris would generate air pollutant emissions similar to, but likely greater in quantity, than that of the Project or Alternative 1.

In the event the Reservoir became filled with sediment and the Dam was left, it is likely some sort of downstream flood-control channeling would need to be constructed. Air pollutant emissions from such construction activities would be temporary and are expected to be similar in quantity to that occurring during grade control construction. However, depending on the location of such flood control facilities, the air quality emissions may be emitted proximate to downstream residential receptors.

CEQA Significance Conclusion

Air pollutant emissions generated from the potential eventual dam removal construction activities may exceed AVAQMD emissions thresholds. While such a determination is speculative, the possibility exists. Therefore, air quality impacts related to Impact AQ-2 for the No Action/No Project Alternative are considered significant and unavoidable (Class I). All other air quality impacts would be less than significant (Class III).

Greenhouse Gases

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at an annual average rate of 38,000 cubic yards per year. PWD would not undertake any activities to remove sediment. Therefore, no greenhouse gas emissions would be directly generated.

At full capacity, sediment accumulated behind the dam would be approximately 7.4 million cubic yards. In the event sediment buildup led to safety issues and required demolition/removal of the Dam, demolition of the dam and restoration of the waterway would require the removal of 2.8 million cubic yards of sediment and dam concrete be removed. Therefore, construction activities (and related greenhouse gas emissions) are expected to be greater than that of the Project or Alternative 1. Such activities would result in a project similar to, but larger than, the Project, with the location(s) that could handle all of the material storage and disposal being uncertain and likely more distant that proposed for the Project or Alternative 1. While many activities would occur within the Reservoir and not proximate to sensitive receptors, the hauling and disposal of up to 2.8 million cubic yards of sediment and dam debris would generate greenhouse gas emissions similar to, but likely greater in quantity, than that of the Project or Alternative 1.

In the event the Reservoir became filled with sediment and the Dam was left, it is likely some sort of downstream flood-control channeling would need to be constructed. Greenhouse gas emissions from such construction activities would be temporary and are expected to be similar in quantity to that occurring during grade control construction.

While the greenhouse gas emissions from dam removal activities may not exceed the AVAQMD thresholds, the loss of this water resource would not comply with GHG emissions reductions policies and goals that seek to maximize local water resources and reduce the GHG emissions associated with long distance water importing. It is assumed that construction wastes, including the sediment removed, would be recycled or re-used to the extent feasible.

CEQA Significance Conclusion

The direct greenhouse gas emissions generated from the potential eventual dam removal construction are not expected to exceed AVAQMD emissions thresholds. However, the No Action/No Project Alternative would cause the loss of the local water resource which would not comply with all applicable GHG emissions reduction policies and goals. Therefore, the GHG emissions impacts related to Impacts GHG-1 and GHG-2 for the No Action/No Project Alternative are considered significant and unavoidable (Class I).

C.2.5 Impact Summary

C.2.5.1 Air Quality

The air quality impacts associated with the Project and Alternative 1 would be less than significant. While such a determination is speculative for the No Action/No Project Alternative, the possibility exists that significant and unavoidable air quality impacts may occur from construction from removal of Littlerock Dam if the Reservoir were allowed to fill up with sediment and Dam safety became compromised.

Table C.2-29 summarizes the direct and indirect environmental impacts of the proposed action and the alternatives on air quality. Refer to Appendix A for the air quality project commitments.

Table C.2-29. Summary of Impacts and Mitigation Measures – Air Quality

Impact	Impact Significance: Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1, 2]	Mitigation Measures/SPC
AQ-1: Project Construction and Operation would conflict with the approved AVAQMD Air Quality Management Plans	Class III	Class III	Class III	Yes	None
AQ-2: The Project's Construction Emissions Would Exceed AVAQMD Significance Criteria	Class III	Class III	Class I	Yes	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
AQ-3: The Project's Operation Emissions Would Exceed AVAQMD Significance Criteria	Class III	Class III	Class III	Yes	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
AQ-4: The Project's Construction or Operations Emissions Would Create Health Risks	Class III	Class III	Class III	Yes	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
AQ-5: The Project's Construction or Operations Emissions within the Angeles National Forest would exceed Applicable General Conformity Thresholds	Class III	Class III	Class III	Yes	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
AQ-6: The Project's Construction or Operations would create odors	Class III	Class III	Class III	Yes	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table C.2-29. Summary of Impacts and Mitigation Measures – Air Quality

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1, 2]	
AQ-7: The Project would conflict with Angeles National Forest Air Quality Strategies	Class III	Class III	Class III	Yes	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.
2 – Determination based on non-biological resource sensitive receptors.

C.2.5.2 Greenhouse Gases

The greenhouse gas emissions impacts associated with the Project and Alternative 1 would be less than significant. While such a determination is speculative for the No Action/No Project Alternative, the possibility exists that significant and unavoidable greenhouse gas impacts may occur from the loss of the water resource, from a GHG emission reduction policy perspective, if the Reservoir were allowed to fill up with sediment and the water resource was lost.

Table C.2-30 summarizes the direct and indirect environmental impacts of the proposed action and the alternatives on greenhouse gases. Refer to Appendix A for the greenhouse gas Project commitments.

Table C.2-30. Summary of Impacts and Mitigation Measures – Greenhouse Gases

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1, 2]	
GHG-1: The Project would produce GHG emissions that exceed the AVAQMD CO2e annual emissions threshold	Class III	Class III	Class I	Yes	SPC GHG-1 (Recycle Construction Wastes)
GHG-2: The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.	Class III	Class III	Class I	Yes	SPC GHG-1 (Recycle Construction Wastes)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.
2 – Determination based on non-biological resource sensitive receptors.

C.3 Biological Resources

This section describes effects to biological resources from the implementation of the proposed Littlerock Reservoir Sediment Removal Project (Project). The following discussion addresses existing environmental conditions in the affected area, identifies and analyzes environmental impacts for a range of Project alternatives, and recommends measures to reduce or avoid adverse impacts anticipated from the construction of the proposed grade control structure, the removal of accumulated sediment, and from the ongoing operational effects from annual sediment removal. Existing laws and regulations relevant to biological resources are described and how the Project would comply with these regulations.

A Biological Assessment evaluates impacts to federally listed threatened, endangered, proposed, petitioned, and candidate species, and is written according to guidelines of the U.S. Fish and Wildlife Service (USFWS). A Biological Evaluation evaluates impacts to USDA Forest Service (Forest Service) Sensitive species. Because the Project has the potential to affect listed species, a Biological Opinion for the Project will also be completed by the USFWS and provided in the Final EIS/EIR.

C.3.1 Affected Environment

The Affected Environment for biological resources includes the baseline biological conditions of the Project area. Vegetation types within the Project area are described to characterize botanical resources and wildlife habitat values. Biotic habitats suitable for the occurrence of special-status plant and wildlife species are also described.

For the purposes of describing, assessing, and analyzing Biological Resources the Project area is defined as the Littlerock Reservoir and all day use areas, including roads and recreational areas (Figure C.3-1). This includes Rocky Point (the location of the proposed grade control structure) and a portion of Little Rock Creek extending approximately 1,000 feet upstream from Rocky Point.

C.3.1.1 Baseline Data Collection Methodology

This section provides a description of the methodology used to assess biological resources in the Project area. Biological information was collected through field investigations (i.e., reconnaissance, protocol, and focused surveys); review of existing online and published literature; consultation with local biologists and regional experts; and coordination with regulatory staff including the United States Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW; formerly the California Department of Fish and Game [CDFG]), and the Forest Service. Field surveys were conducted between 2007 and 2014.

Information from a review of the literature, combined with observations from Aspen’s field surveys, were used to generate a list of sensitive vegetation communities and special-status plant and animal taxa that either observed or may have the potential to occur within the Study Area and adjacent habitat. For the purposes of this report, special-status taxa are defined as plants or animals that:

- Have been designated as either rare, threatened, or endangered by CDFW or USFWS and are protected under the Federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA);
- Are candidate species being considered or proposed for listing under these acts;
- Are considered Species of Special Concern by the CDFW;
- Are designated as California Rare Plant Rank (CRPR) 1, 2, 3, or 4 plant species;

- Are listed as Forest Sensitive Species by Angeles National Forest;
- Are fully protected by the California Fish and Game Code, Sections 3511, 4700, 5050, or 5515; or
- Are of expressed concern to resource or regulatory agencies, or local jurisdictions.

Literature Search

Sensitive biological resources known to occur in the region or potentially present were identified through a review of existing literature sources including USGS topographic maps, aerial photography, and the CDFW California Natural Diversity Data Base (CNDDB) (CDFW, 2014). The Project site is located within the U.S. Geological Survey (USGS) Pacifico Mountain, California 7.5-foot topographic quadrangle. The following eight adjacent quadrangles were also included in the database search due to their proximity to the Study Area: Chilao Flat, Condor Peak, Acton, Ritter Ridge, Palmdale, Littlerock, Juniper Hills, and Waterman Mountain.

Additional data regarding the potential occurrence of special-status species and policies relating to these sensitive natural resources were gathered from the following sources:

- Special Animals List (CDFW, 2016a);
- State and federally listed endangered and threatened animals of California (CDFW, 2016b);
- California Wildlife Habitat Relationships (CDFG, 2008);
- Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2015);
- Angeles National Forest Land Management Plan (USFS, 2005);
- Pacific Southwest Region Regional Forester's Sensitive Species List (USFS, 2014);
- Consortium of California Herbaria (CCH, 2011);
- Biological Assessment for the Littlerock Dam and Reservoir Sediment Control Plan (PCR, 2001);
- Antelope Valley Area Plan (LADRP, 2015);
- County of Los Angeles Significant Ecological Areas (LADRP, 2014); and
- Aerial photographs of Littlerock Reservoir and surrounding areas (from October 2012, December 2011, July 2011, June 2009, July 2008, March 2006, February 2006, December 2005, November 2005, July 2003, June 2002, May 2002, June 1994, and May 1994).

Consultation with Agencies and Local Experts

Agency coordination has been ongoing and includes biological resource staff from the ANF, CDFW, and the USFWS. Biological resource data including the use and distribution of sensitive wildlife, including arroyo toads have also been obtained from interviews and site visits with experts on arroyo toad ecology including Ruben Ramirez, Larry Hunt, and William Haas.

Surveys

Aspen conducted biological resource assessments within and adjacent to the Project site between 2007 and 2015. Surveys were conducted by experienced biologists familiar with the resources in the region and under appropriate conditions to detect and identify plant and wildlife species. Surveys of the Project site were conducted year round in order to evaluate seasonal use of the site and to note wintering bird use. Field personnel included Chris Huntley, Jared Varonin, Brady Daniels, Cindy Hitchcock, Justin Wood, Tracy Popiel, Jennifer Lancaster, Lynn Stafford, Larry Hunt, Jason Berkeley, and William Haas.

Surveys were conducted across a broad geographic range to better characterize the biological resources that occur or have the potential to be present in the vicinity of the Project area. This area is defined as the Study Area and includes all portions of the Project area and a buffer that extends 0.25 miles upstream from Rocky Point (including a portion of Santiago Creek), and approximately one mile downstream of Littlerock Dam. Most wildlife surveys included the entire Study Area. Vegetation mapping was limited to a subset of the Study Area extending approximately 500 feet from the Project area. This area is identified as the Vegetation Study Area. Figure C.3-1 shows the limits of the Project area, Study Area, and Vegetation Study Area. Table C.3-1 includes a list of the surveys conducted and a brief summary of their results. Survey methodologies are described in Appendix C-1.

Table C.3-1. Summary of Surveys Conducted at the Littlerock Reservoir and Sediment Disposal Sites

Target Species	Survey Type	Survey Dates	Results
Rare Plants and Vegetation	Focused Pedestrian Survey	16 May 2007 23 May 2010 7 Jul 2011 20 and 30 May 2012 6 Jun 2012	Three special-status plants, Johnston's monkeyflower (*Mimulus johnstoni*), short-joint beavertail (*Opuntia basilaris var. brachyclada*), and Lemmon's syntrichopappus (*Syntrichopappus lemmonii*) were detected within the Vegetation Study Area. These occurrences were outside of the Project area and would not be subject to disturbance. All vegetation types were mapped in the Vegetation Study Area (which included the proposed haul routes and sediment disposal site at 47th Street East).
Gastropods and Fish	Focused Pedestrian Survey of Micro-Habitats, Hand Raking Seining/Dip Netting/Visual Observations	1 - 3 Jun 2011 13 Jan 2012 4-5 Aug 2014	Sensitive gastropods were not detected in the Study Area. Several species of non-native fish were detected. Sensitive fish were not observed in the Study Area.
Amphibians and Reptiles	Acoustic, Focused Pedestrian, Inspections of Microhabitats	16 May 2007 24 Sep 2007 5, 14,18 May 2010 1 - 3 Jun 2011 12 Jul 2012 13,21 May 2014 Ongoing May 2015	One federally listed amphibian, the arroyo toad, was commonly detected within the Study Area above Rocky Point. The species has not been observed below the dam or within the Reservoir below Rocky Point. The species was not observed in the small tributary drainages that feed the Reservoir. Common amphibians were routinely observed at the Reservoir and along the stream terraces. Western toad was observed on access roads and in upland areas. Several sensitive reptiles were observed in the Study Area, including California legless lizard, coastal whiptail, coast horned lizard, and southwestern pond turtle.
Desert Tortoise and Burrowing Owl	Protocol Surveys	26 April 2014	The 47th Street sediment disposal site provides suitable habitat for burrowing owl and there is a moderate potential that this species would be present. Very few suitable burrows (i.e., ground squirrel only) were observed. No desert tortoise or their sign was found on or adjacent to the site.
Terrestrial Mammals	Reconnaissance-Level Surveys; Visual Surveys; Review of Scat, Tracks, Sign, Middens, and Burrows Habitat Assessment for Mohave Ground Squirrel	16 May 2007 5 and 14 May 2010 1–3 Jun 2011 13 Jan 2012 12 Jul 2012 22 Aug 2014 April 2015	Sensitive mammals (with the exception of bats, see below) were not detected in the Study Area. However, the area is expected to support a number of rare or protected species including bighorn sheep, American badgers, and ringtail.

Table C.3-1. Summary of Surveys Conducted at the Littlerock Reservoir and Sediment Disposal Sites

Target Species	Survey Type	Survey Dates	Results
Bats	Visual and Acoustic (SongMeter™ SM2 and Wildlife Acoustics EM3)	17–18 May 2012 17–18 Jul 2012	Several species of bats were detected at the Reservoir including pallid bat and western small-footed myotis.
Least Bell's Vireo	Focused (Non-Protocol) and Protocol Surveys	22–23 Jul 2010 29 Apr 2011 10 and 19 May 2011 1,10, 21 Jun 2011 1 and 12 Jul 2011 16 Feb 2012 18 Apr 2012 18 May 2012	Least Bell's vireo was detected on Little Rock Creek downstream of the dam. The birds fledged young in 2011 but did not appear to do so in 2012.
Birds	Focused Pedestrian and Acoustic	14 May 2010 22–23 Jul 2010 1–3 Jun 2011 12–13 Jul 2012 15 Dec 2011 18 Jan 2012 16 Feb 2012 18 Apr 2012 18 May 2012 12 Jul 2012 18 Jul 2012 30 Aug 2011 13 Jan 2012	Eighty-five species of birds were detected in the Study Area including a variety of special status species. Bald eagle is known as an occasional winter visitor.
State and Federal Waters	Formal Delineation	4–5 Aug 2014	Littlerock Reservoir was determined to support State and federal jurisdictional waters. Wetlands are not present at the Reservoir.

C.3.1.2 Environmental Setting

Regional Setting and Background

The Littlerock Reservoir (Reservoir) is located approximately 3 miles southwest of the community of Littlerock, within the boundaries of the Santa Clara Mojave Rivers Ranger District in the Angeles National Forest (ANF) (Figure C.3-2). Inflow into the Reservoir is seasonal and varies widely depending on annual precipitation and snowmelt. Littlerock Dam, constructed in 1924, was originally built to provide a source of irrigation for downstream agricultural activities. With the construction of the California Aqueduct, which started in 1960, the Reservoir became a back-up water source for the communities it served. Historically, the watershed supported cattle grazing and mining.

The primary sediment disposal site would be exhausted sand and gravel mines located in the community of Littlerock, approximately 6 miles north of the Dam (as shown in Figures B-1 and C.3-2). Currently, six individual quarries operate within this area. The quarries abut Little Rock Creek, residential areas, and isolated rural lands adjacent to Highway 138. Sediment would also be stockpiled on property owned by Palmdale Water District (PWD) located in semi natural lands immediately west of 47th Street East, just north of the California Aqueduct (see Figures B-11 and C.3-2). Though varied floristic influences exist in the Antelope Valley and surrounding foothills, this region has been subject to historic land uses such as farming, grazing, recreation, water diversion (i.e., the Littlerock Reservoir and the California Aqueduct), and infrastructure development (i.e., the construction of residential and commercial properties, military land uses including Edwards Air Force Base, Interstate 14, and Highway 138).

The Reservoir is located in the Antelope Valley at the transition of the southern border of the Mojave Desert and the northeastern foothills of the San Gabriel Mountains. The Reservoir and proposed access roads are surrounded by National Forest System lands with portions bordered by small private in-holdings, rural residences, and privately held natural lands. This Project is located in a broad transition zone between the Mojave Desert and the Transverse Ranges which supports a variety of native and introduced plants and wildlife. The 2005 Forest Service Land Management Plan indicates the ANF is home to approximately nine native species of fish, 18 amphibians, 61 reptiles, 299 birds, 104 mammals, 2,900 vascular plants, and an unknown number of species of invertebrate animals and non-vascular plants. Some of these species are endemic to the ANF, and some have special status as federally listed threatened, endangered, proposed, candidate, or Forest Sensitive Species. Little Rock Creek is home to several sensitive biological resources including the arroyo toad, two-striped garter snake, southwestern pond turtle, and a variety of rare birds including least Bell's vireo and bald eagle.

Local Setting

The Project area includes the Reservoir where sediment would be removed and the grade control structure installed at Rocky Point; staging areas located within or immediately adjacent to the Reservoir; and sediment disposal areas located off NFS lands. Sediment disposal areas are located up to 6 miles north of the Reservoir and include disturbed quarries and semi natural lands (See Figures C.3-3, C.3-4, and C.3-5).

Littlerock Reservoir and Rocky Point

The Reservoir is located in a narrow mountainous valley on NFS lands and is approximately one mile in length. Access to the Reservoir is from Cheseboro Road, named after a popular cowboy actor from the early twentieth century. The road is located on the west side of the reservoir where recreational facilities are located. These include a boat ramp, restrooms, parking areas, a small café, cabins, and picnic facilities.

The shoreline is composed of eroded slopes, sand, small rock, and fines. In a few locations the banks have been reinforced with rock gabions and riprap. In addition to providing drinking water, the Reservoir supports recreational opportunities including boating, fishing, and swimming. When the reservoir is drained at the end of summer, dry portions of the Reservoir have been open to recreational off-highway vehicle (OHV) travel.

The upstream portion of the Project area and the southern extent of the Study Area are located in the northern limit of the Lower Little Rock Creek Critical Biological Zone of the ANF. Little Rock Creek is closed to the public above Rocky Point to protect the federally endangered arroyo toad (*Anaxyrus californicus*) and its designated critical habitat. A barrier of orange snow fencing delineates this area. During the course of surveys Aspen routinely observed vehicle tracks beyond the barrier, indicating that some OHV users are entering designated critical habitat for arroyo toad.

Vegetation at the Reservoir varies and includes species associated with the Mojave Desert and San Gabriel Mountains. California buckwheat scrub, California juniper woodland, and singleleaf pinyon woodland dominate the foothills surrounding the Reservoir. This habitat is relatively intact although small trails from OHVs occur in a few locations. Vegetation along the margins of the Reservoir is affected by seasonal fluctuations in water surface elevations that occur from the operation of the facility. The lack of soil development, steep slopes, and variable water surface elevations limit vegetation to patchy isolated areas in most locations. These factors contribute to the lack of vegetation in most of the reservoir; however, a Fremont cottonwood (*Populus fremontii*) forest with western sycamore (*Platanus* *racemosa*) and willows (*Salix sp.*) is present in the Reservoir near Rocky Point. During surveys conducted in 2012, Aspen observed that many of the mature cottonwoods and willows were dead or dying and many have been removed from the Reservoir. This community is also present north of Rocky Point and to some degrees in other upstream areas.

The proposed grade control structure would be located at Rocky Point, where the creek is confined between a steep natural slope to the east and a reinforced man-made slope on the west. This location supports a picnic area and is often used for fishing or water play. During periods of low water recreationists construct small dams to trap water in this area. Vegetation in the developed area includes scattered cottonwoods, Joshua trees, juniper, and upland shrubs while riparian areas support emerging riparian vegetation. Depending on the time of year, emerging riparian vegetation including juvenile willows colonize portions of the reservoir and stream channel but are removed from scour or lost through inundation during the winter.

Little Rock Creek Downstream of the Dam

North of the Dam, the channel supports relatively undisturbed Southern cottonwood-willow riparian forest and Mojave riparian forest. The riparian vegetation and associated transitional habitat located in this area is more characteristic of unconfined river channels; however, much of the fine sediments are trapped behind the Littlerock Dam. Thick stands of riparian vegetation border the active stream channel in many locations and form broad canopies over the stream. Understory species include mulefat and herbaceous wetland species such as bulrushes (*Scirpus spp*.), cattails (*Typha spp.*) and nutsedges (*Cyperus spp*.). Non-native grasses, stinging nettle (*Urtica dioica ssp. holosericea*), and mugwort (*Artemisia douglasiana*) are also common in mesic areas. In a few locations, dense thickets of poison oak (*Toxicodendron diversilobum*) also occur.

As the creek flows north, the channel becomes more characteristic of an alluvial fan where riparian vegetation becomes patchy and routinely intergrades with more upland species. Vegetation on the mid- to upper-stream terraces is largely characterized by California buckwheat scrub. Big sagebrush scrub is present to limited areas and confined to mature alluvial benches and roadsides. Juniper woodland, non-native pines, and cleared areas supporting bee-keeping are also present.

Sediment Disposal Sites and Access Roads

The PWD–owned property on 47th Street East consists of a 21-acre site dominated by California junipers (*Juniperus californica*). Additional shrubs include desert tea (*Ephedra nevadensis*), narrowleaf goldenbush (*Ericameria linearifolia*), California buckwheat, antelope brush (*Purshia glandulosa* var. *glandulosa*), Chaparral yucca (*Hesperoyucca whipplei*), and Joshua tree. A moderate cover of annual and perennial wildflowers including Xantu's chaenactis (*Chaenactis xantiana*), desert dandelion (*Malacothrix glabrata*), checker fiddleneck (*Amsinckia tessellata*), common phacelia (*Phacelia distans*), chia (*Salvia columbariae*), small-flowered poppy (*Eschscholzia minutiflora*), Kennedy's mariposa lily (*Calochortus kennedyi*), and wild hyacinth (*Dichelostemma capitata*) were detected on the site. The vegetation is best classified as California juniper woodland (Alliance; Sawyer et al., 2009) and also best matches descriptions of Mojavean juniper woodland and scrub in Holland (1986). Approximately 2 acres of the site is barren and a small trail system supporting OHV and equestrian uses crosses the site. Illegal dumping and scattered trash litter is common. A braided ephemeral drainage carries storm flows off the site.

The exhausted mining pits are located adjacent to Highway 136 and are primarily devoid of vegetation. Excluding the active quarries, vegetation in the surrounding area is dominated by Joshua tree woodland, creosote bush scrub, brittle bush-ephedra scrub, and ruderal communities (RCA, 2005; PCR, 2005).

PWD Facilities at Littlerock Dam

For the continued safe operation of the Dam and to support water deliveries, PWD maintains an access road, staging area, and various diversion facilities at the base of the Dam. Crews periodically inspect this area and conduct routine maintenance and monitoring activities. The access road crosses a small channel with a corrugated pipe to convey flows below the Dam. Near the toe of the Dam, riparian areas support a mixture of arroyo willow thickets, open water, and sandy wash habitats (See Figures C.3-3, C.3-4 and C.3-5). The composition of these communities varies to some degree based on scour and seasonal flooding. During large storm events, scouring flows pass over the spillway and remove most of the vegetation immediately below the Dam. During these events, the access road is washed out and must be replaced to maintain access to the Dam.

Small ranches, horse properties, a dog kennel, and a small network of dirt roads are present along portions of Cheseboro Road. Creosote bush scrub, Joshua tree woodland, rabbitbrush scrub, and ruderal vegetation border Cheseboro Road north of Mount Emma Road. South of Mount Emma Road, the vegetation transitions from more intact scrub communities dominated by California buckwheat scrub, Mormon tea scrub, and big sagebrush scrub (See Figure C.3-4).

C.3.1.3 Special Habitat Management Areas Overview

Riparian Conservation Areas

Riparian Conservation Areas (RCAs) are defined as “an area delineated next to water features requiring special management practices to maintain and/or improve watershed and riparian-dependent resource conditions” (USDA, 2005). They are managed for habitat conservation according to Standard S47 in Part 3 of the Forest Service Land Management Plan. This standard requires that RCAs within the Project area must be identified using USDA Five-Step Project Screening Process for Riparian Conservation Areas. RCAs include areas containing aquatic and terrestrial components and serve as the interface between land and water. Specifically, RCAs can include lands adjacent to perennial, intermittent, or ephemeral streams as well as in and around meadows, lakes, reservoirs, ponds, wetlands, vernal pools, seeps, springs, and other water bodies. RCAs are unique areas that support a high diversity of plant and animal species and typically have a high degree of endemism including threatened and endangered species. The variety of wildlife species associated with RCAs on the ANF is high and these species use these areas for breeding, aestivation, foraging, refugia, and as movement corridors (USDA, 2005).

To provide for the management of species that use riparian areas, each RCA has a buffer area of associated upland habitat which corresponds to the unique life history of the species. The size of an RCA is determined primarily by the type of water (perennial or intermittent), but can be adjusted for other characteristics such as topography, species present, and connectivity to other RCAs. Within the Project area several RCAs support threatened and endangered species including the arroyo toad.

Antelope Valley Significant Ecological Area

The Reservoir is located adjacent to the proposed Antelope Valley Significant Ecological Area (SEA) and portions of the haul route are within the SEA. The SEA designation is given to land that supports irreplaceable biological resources, and SEAs are mapped as a zoning overlay in the Los Angeles County General Plan (LADRP, 2014). Development within the SEAs is regulated by Los Angeles County Ordinance (Hillside Management and Significant Ecological Areas Ordinance) intended to preserve the biological resources and sustainability of the SEAs (LADRP, 2014).

United States Fish and Wildlife Service Critical Habitat

The Reservoir is located immediately downstream and adjacent to designated critical habitat for the arroyo toad (USFWS, 2011). The most recent critical habitat was designated on February 9, 2011 and is part of the Little Rock Creek Basin, which is designated as Unit 21 (50 CFR Part 17) (See Figure C.3-6).

C.3.1.4 Vegetation Communities and Landforms

Surveys resulted in the documentation of 266 species of native and non-native vascular plants within the Study Area. Non-vascular plants, including lichens and bryophytes, were not identified during the surveys. A list of all plants observed within the Vegetation Study Area is provided in Appendix C-2.

Eleven types of vegetation were mapped within the Vegetation Study Area (See Table C.3-2, Figures C.3-3, C.3-4, and C.3-5). Vegetation was classified using names and descriptions in Sawyer et al. (2009). Vegetation classification according to Holland (1986) is also included. Non-native woodland and ruderal vegetation were mapped, but do not match any vegetation descriptions in Sawyer et al. (2009). Four additional non-vegetated land cover types were mapped including developed, unvegetated lake bottom, sandy wash, and open water.

At the time of vegetation mapping, the Reservoir was at the dead pool elevation (i.e., was "dry"). It is important to note that the acreages of vegetation types mapped in within the Reservoir are representative of the vegetation present, but acreages vary seasonally and depend on level of inundation at any given time. Further, vegetation within the Reservoir inundation zone is dynamic and the extent and distribution vary with rainfall amounts, inundation times and extent, amount of scour experienced, and other factors.

Table C.3-2. Summary of Vegetation and Cover Types and Acreages

Vegetation Community[1]			Location		
Sawyer et al. (2009) Vegetation Classification	Holland (1986) Vegetation Classification	Type	Reservoir[2]	Haul Roads[3]	Sediment Disposal Site
Arroyo willow thickets	Southern willow scrub	Riparian	5.26	2.02	0.00
Big sagebrush scrub	Big sagebrush scrub	Upland	2.88	17.05	0.00
Black willow scrub	Riparian scrub	Riparian	5.76	0.00	0.00
California buckwheat scrub	Mojave mixed woody scrub	Upland	79.60	21.09	0.00
California juniper woodland	Mojavean juniper woodland and scrub	Upland	32.01	47.44	28.2
Cattail marsh	Freshwater marsh	Riparian	0.00	0.27	0.00
Creosote bush scrub	Mojave creosote bush scrub	Upland	0.00	4.23	0.00
Fremont cottonwood forest	Southern cottonwood willow riparian forest Mojave riparian forest	Riparian	3.59	4.41	0.00
Herbaceous wetland	Freshwater marsh	Riparian	3.56	0.00	0.00
Joshua tree woodland	Joshua tree woodland	Upland	0.00	4.41	0.00
Mormon tea scrub	Mojave mixed woody scrub Great Basin mixed scrub	Upland	4.53	17.47	0.00
Rubber rabbitbrush scrub	Rabbitbrush scrub	Upland	0.00	22.86	0.00
Singleleaf pinyon woodland	Mojavean pinyon woodland	Upland	67.24	0.00	0.00

Table C.3-2. Summary of Vegetation and Cover Types and Acreages

Vegetation Community[1]		Type	Location		
Sawyer et al. (2009) Vegetation Classification	Holland (1986) Vegetation Classification		Reservoir[2]	Haul Roads[3]	Sediment Disposal Site
Other Cover Types and Landforms[4]					
Developed		Upland	21.91	71.17	5.5
Non-native woodland		Upland	0.00	4.68	0.00
Open water		Riparian	9.65	0.00	0.00
Ruderal		Riparian	0.00	21.00	0.00
Sandy wash		Riparian	32.02	2.30	0.00
Unvegetated lake bottom		Riparian	54.69	0.00	0.00
Total			322.68	240.39	33.7

1 – Communities in **bold** type are considered sensitive by the CDFW.
2 – Vegetation was mapped within the Reservoir and surrounding 500-foot buffer; see Figure C.3-3. The Reservoir was dry when vegetation mapping was conducted. When full, the Reservoir comprises approximately 95 acres of open water.
3 – Vegetation was mapped within a 300-foot wide corridor centered on the centerline of the proposed haul roads; see Figure C.3-4.
4 – These cover types and landforms are not vegetation types defined in Sawyer et al. (2009) and Holland (1986).

Riparian Vegetation

Much of the natural riparian vegetation in California has been lost or degraded due to a variety of factors, including land use conversions to agricultural, urban, and recreational uses; channelization for flood control; sand and gravel mining; groundwater pumping; water impoundments; and various other alterations. Faber et al. (1989) estimated that as much as 95 to 97 percent of riparian habitats have been lost in southwestern California. Riparian communities are considered high priority for inventory by CDFW (CDFG, 2010).

Riparian habitats are biologically productive and diverse, and are the exclusive habitat for several threatened or endangered wildlife species and many other special-status species. Many of these species are wholly dependent on riparian habitats throughout the entirety of their life cycles, while others may utilize these habitats during certain seasons or life history phases. For example, numerous amphibian species breed in aquatic habitats, but spend most of their lives in upland areas.

In an otherwise arid landscape, primary productivity in riparian habitats is high due to year-round soil moisture. High plant productivity leads to increased habitat structural diversity and increased food availability for herbivorous animals, and in turn, predatory animals (reviewed by Faber et al., 1989). Insect productivity is also at relatively higher levels in riparian systems. During the warmer months, large numbers of insects provide a prey base for a diverse breeding bird fauna, including several special-status birds. Structural diversity, including standing dead trees and fallen logs is also much more evident in riparian systems than those of most regional uplands. Riparian woodlands tend to have multi-layered herb, shrub, and tree canopies, whereas most upland communities have a simpler structure. More complex habitat structure creates a greater diversity of nesting and foraging sites for birds. Similarly, mammal diversity is greater due to higher biological productivity, denning site availability, thermal cover, and water availability.

Fremont cottonwood forest (*Populus fremontii* Forest Alliance). Fremont cottonwood forest is the most mature riparian vegetation in the Vegetation Study Area. It is found at the margin of the reservoir and along Little Rock Creek above and below the reservoir. In the Project area, it is dominated by

Fremont cottonwood (*Populus fremontii*) with western sycamore (*Platanus racemosa*), black willow (*Salix goodingii*), and arroyo willow (*S. lasiolepis*). In higher elevations, this vegetation best matches southern cottonwood-willow riparian forest as described by Holland (1986). In the lower elevations of below the Reservoir this community best matches the description of Mojave riparian forest (Holland, 1986). Southern cottonwood-willow riparian forest and Mojave riparian forest are both recognized as sensitive communities by the CDFW (CDFG, 2010).

During surveys conducted in 2012, it was noted that many of the mature cottonwoods and willows that occur along the margins of the reservoir, mapped within Fremont cottonwood forest, were dead or dying (See Figure C.3-7). An unknown number of the dead trees have been felled and left in place. While the exact cause of the tree mortality is unknown, it can probably be attributed to extended periods of inundation.

Arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance). Arroyo willow thickets are lower in stature and typically less mature than cottonwood forests. Arroyo willow thickets tend to establish in recently scoured portions of the floodplain that have available ground water and open soil. Given enough time between disturbances, this vegetation may develop into Fremont cottonwood forest. In the Project area, arroyo willow thickets are dominated by arroyo willow, black willow, and red willow (*S. laevigata*), with an understory of riparian shrubs and herbaceous perennials. This vegetation type matches descriptions of southern willow scrub in Holland (1986). Arroyo willow thickets also match the description of Southern Riparian Scrub, which is recognized as a sensitive community by CDFW (CDFG, 2010).

Cattail marshes [*Typha* (*angustofolia, domingensis, latifolia*) Herbaceous Alliance]. Cattail marsh is abundant at the upstream margin of the reservoir above Rocky Point. This community also periodically becomes established at Rocky Point after the Reservoir has been drawn down. Broad leaved cattail (*Typha latifolia*) is present along with many other native and non-native wetland plants, including rabbits foot grass (*Polypogon monspeliensis*), rushes (*Juncus* spp.), monkey flowers (*Mimulus* spp.), young willows, young saltcedar (*Tamarix ramosissima*), and sweet clovers (*Melilotus* spp.). Given enough time between scouring floods and changes in the water level of the reservoir, this vegetation will quickly develop into arroyo willow thickets. This vegetation best matches freshwater marsh as described by Holland (1986). This alliance is not recognized by CDFW as sensitive (CDFG, 2010).

Herbaceous wetland. This area is unvegetated due to seasonal inundation; however, riparian vegetation, weeds, and herbaceous plants quickly become established along some areas of the Reservoir. Herbaceous vegetation observed near Rocky Point includes native and non-native species such as rabbits foot grass, willow herb (*Epilobium ciliatum*), salt heliotrope (*Heliotropium curassavicum*), bracted verbena (*Verbena bracteata*), and pineapple weed.

Upland Vegetation

In contrast to riparian and wetland plant species that are adapted to seasonally flooded or periodically saturated soils, upland plant communities consist of plant species that are adapted to drier conditions and typically require only seasonal precipitation to obtain adequate water resources for growth and reproduction. In the Vegetation Study Area, most of the upland plant communities are located in the foothills to the east and west of the Reservoir and adjacent to the haul road.

Juniper and Joshua tree woodland habitats support unique assemblages of plant and wildlife species and vast acreages of these habitats have been lost over the last several decades due to urbanization and agricultural activities in the Antelope Valley. In general, other desert plant communities lack vertical structure and shade. However, these habitats provide the important structural characteristics for mammals and avian species. Additionally, unlike herbaceous or shrub-dominated habitats, arid woodlands are extremely slow developing, with mature juniper and pinyon woodlands requiring as much as 150 years to reach full maturity. Due to the unique floristic composition and structure of these communities, and due to historic and ongoing losses, several local plans, ordinances, and policies have designated juniper and Joshua tree woodland habitats as sensitive.

Big sagebrush (*Artemisia tridentata* Shrubland Alliance). Big sagebrush is uncommon and confined to mature alluvial benches and roadsides in the Vegetation Study Area. It is dominated by big sagebrush (*Artemisia tridentata*), with other plants such as rubber rabbitbrush (*Ericameria nauseosa*), desert bitterbrush (*Purshia glandulosa*), and hairy yerba santa (*Eriodictyon trichocalyx*) are present. This community best matches big sagebrush scrub as described by Holland (1986). In the Vegetation Study Area, big sagebrush intergrades with other types of vegetation, such as California juniper woodland, Mormon tea scrub, and rubber rabbitbrush scrub. This alliance is not recognized by CDFW as sensitive (CDFG, 2010).

California buckwheat scrub (*Eriogonum fasciculatum* Shrubland Alliance). California buckwheat scrub is common within the Vegetation Study Area, primarily on south-facing slopes adjacent to the reservoir and haul road. It is dominated by Mojave Desert California buckwheat (*Eriogonum fasciculatum* var. *polifolium*) with other species such as Acton's encelia (*Encelia actoni*), narrowleaf goldenbush (*E. linearifolia*), and Mormon tea (*Ephedra viridis*). California buckwheat scrub partially matches the description of Mojave mixed woody scrub as described by Holland (1986). This vegetation community is not recognized by CDFW as sensitive (CDFG, 2010).

California juniper woodland (*Juniperus californica* Woodland Alliance). California juniper woodland is found at several locations within the Vegetation Study Area. It is characterized by California juniper, which typically grows with an understory of species similar to those listed in California buckwheat scrub (described above) and Mormon tea scrub (described below). It best matches descriptions of Mojavean juniper woodland and scrub in Holland (1986). California juniper woodland tends to intergrade with singleleaf pinyon woodland (described below) in the Vegetation Study Area. California juniper woodland is not recognized by CDFW as sensitive (CDFG, 2010).

Creosote bush scrub (*Larrea tridentata* Shrubland Alliance). Creosote bush scrub is the most characteristic vegetation of the California deserts and is dominated by creosote bush (*Larrea tridentata*). Other shrub species present in smaller numbers include desert box thorn (*Lycium* spp.), Acton's encelia, and beavertail cactus. Ground cover among the shrubs is fairly open in most of the Project area, largely dominated by native bunchgrasses and other herbs. This community occurs near the proposed sediment disposal sites. This vegetation matches descriptions of Mojave creosote bush scrub in Holland (1986). Creosote bush scrub is not recognized by CDFW as sensitive (CDFG, 2010).

Joshua tree woodland (*Yucca brevifolia* Woodland Alliance). Joshua trees (*Yucca brevifolia*) are found at scattered locations throughout the Vegetation Study Area, but only the larger, intact patches are mapped separately. With the exception of the Joshua trees, these woodlands match the description of California juniper woodland (described above). This vegetation matches Joshua tree woodland as described by Holland (1986) and is recognized by CDFW as sensitive (CDFG, 2010).

Mormon tea scrub (*Ephedra viridis* Shrubland Alliance). This vegetation is similar in composition to California buckwheat scrub, but the dominant species are Mormon tea and desert bitterbrush. Within the Vegetation Study Area, it is isolated to a few steep north-facing slopes on the west side of the reservoir. It partially matches the description of Mojave mixed woody scrub and Great

Basin mixed scrub by Holland (1986). Mormon tea scrub is not recognized by CDFW as sensitive (CDFG, 2010).

Non-native woodland. This vegetation is composed primarily of non-native trees that have been planted for ornamental value and does not match any named vegetation in Sawyer et al. (2009) or Holland (1986). Non-native woodlands are present at several areas within the Vegetation Study Area, primarily along the haul routes. The largest non-native woodland in the Vegetation Study Area is near the reservoir entrance station where planted trees are persisting and in some cases reproducing. Non-native trees observed in this area include black locust (*Robinia pseudoacacia*), silk tree (*Albizia julibrissin*), cypresses (*Cupressus* spp.), saltcedar, and various pines (*Pinus* spp.). Non-native shrubs such as rosemary (*Rosmarinus officinali*) and oleander (*Nerium oleander*) were also observed. Non-native woodlands are not recognized by CDFW as sensitive (CDFG, 2010).

Rubber rabbitbrush scrub (*Ericameria nauseosa* Shrubland Alliance). This vegetation is characterized by the presence of rubber rabbitbrush. In the Vegetation Study Area, this vegetation was observed in a few isolated canyon bottoms and roadsides near the Reservoir and at several locations along the haul road. It is similar in species composition to big sagebrush (described above) but is dominated by rubber rabbitbrush. This vegetation matches descriptions of rabbitbrush scrub in Holland (1986) and is not recognized by CDFW as a sensitive community (CDFG, 2010).

Singleleaf pinyon woodland (*Pinus monophylla* Woodland Alliance). Singleleaf pinyon woodland is common within the Vegetation Study Area on slopes surrounding the Reservoir. Singleleaf pinyon pine (*Pinus monophylla*) is the dominant species, with California juniper, desert bitterbrush, and Joshua tree also present. Understory species are similar to those described in California buckwheat scrub (described above). This vegetation best matches Mojavean pinyon woodland described in Holland (1986). Singleleaf pinyon woodland is not recognized by CDFW as sensitive (CDFG, 2010).

Ruderal. Ruderal vegetation is characteristic of heavily disturbed sites such as roadsides, graded areas, and former agricultural lands. Ruderal areas typically have little overall vegetation cover, and what vegetation is present is dominated by non-native weeds, "weedy" native species, and escaped ornamental species. Ruderal species identified in the Vegetation Study Area include summer mustard (*Hirshfeldia incana*), cheat grass (*Bromus tectorum*), Mediterranean grass (*Schismus barbatus*), and pineapple weed (*Chamomilla suaveolens*). This vegetation is not recognized by CDFW as sensitive (CDFG, 2010).

Other Land Covers

Developed. There are numerous developed areas in the Project area including roads, parking lots, residential areas, and adjacent cleared lands. These areas are typically devoid of vegetation or support scattered ornamental species or low densities of weeds.

Sandy wash. This cover type is found in dry stream channels that have recently been scoured by floods. This cover type typically supports low densities of plant cover; however, in the absence of scouring flows or inundation these areas may develop more complex vegetation communities.

Open water. The operation of the Reservoir includes seasonal fluctuations in the water surface elevation. Typically, the Reservoir is at capacity after winter precipitation. Water levels are maintained through the summer and gradually lowered to the dead pool elevation after Labor Day. The change in the water surface elevations greatly affects the type and composition of vegetation at the Reservoir. When water recedes, large areas of barren sand and mud are exposed. When full, the Reservoir comprises approximately 95 acres of open water.

Unvegetated lake bottom. This cover type is found when the Reservoir is drained. Similar to sandy wash communities this cover type typically supports low densities of plant cover if any. However, in the absence of scouring flows or extreme heat these areas may support a variety of native and non-native vegetation.

Weeds

Executive Order 13112 defines criteria for certain plant species to be considered invasive. These species can effectively displace native species and modify the fire ecology of the forest. The term “noxious weeds” includes all plants formally designated by the Secretary of Agriculture or other responsible State officials. These are plants that have been determined to be undesirable or injurious in some capacity. (FSM 2900; USFS, 2011). Several noxious weeds already exist within the Vegetation Study Area, including the haul route. Some of these species occur in well-established populations and appear to be associated with historic disturbance.

Noxious weeds pose a threat to the natural processes of plant community succession, fire frequency, biological diversity, and species composition. The survival of some populations of special-status species could be adversely affected by the success of an introduced plant species. In areas subject to wildfires, exotic plants can quickly out-compete natives and change the ecology of the system. Noxious weeds present a severe threat to natural habitats. Monocultures of noxious weeds can create unfavorable conditions for native plants and wildlife. Heavy infestations of some species can also significantly reduce the recreational or aesthetic value of open space.

The Forest Service management direction indicates that noxious and invasive plant species pose a threat to native plant and animal species on NFS lands. FSM 2900 directs the Forest Service to require all equipment be cleaned when working in a site contaminated with noxious weeds.

Surveys within the Study Area identified 51 non-native plant species. Several of these are considered noxious weeds by the California Invasive Plant Council (Cal-IPC, 2013). Table C.3-3 lists the noxious and invasive plant species that were identified during the surveys. Figure C.3-8 depicts the location of each species in relation to the Reservoir and haul route. Appendix C-3 provides additional information on the life history characteristics, threat level, and currently recognized methods for their control or eradication.

Table C.3-3. Noxious and Invasive Plant Species Identified in the Vegetation Study Area

Common Name	Scientific Name	Threat Level*
Brome grasses	*Bromus* spp.	High
Tocalote	*Centaurea melitensis*	Moderate
Short-pod mustard	*Hirschfeldia incana (Brassica geniculata)*	Moderate
Tree tobacco	*Nicotiana glauca*	Moderate
Jerusalem thorn	*Parkinsonia aculeata*	Evaluated But Not Listed
Rabbitsfoot grass	*Polypogon monspeliensis*	Limited
White horsenettle	*Solanum elaeagnifolium*	Evaluated But Not Listed
Smilo grass	*Stipa miliacea*	N/A
Tamarisk	*Tamarix sp.*	High
Wand mullein	*Verbascum virgatum*	N/A

*Cal-IPC threat levels:
Evaluated But Not Listed – there is insufficient information available to assign a rating, or the available information indicates that the species does not have significant impacts at the present time.

High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
Limited – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

C.3.1.5 Common Wildlife

The Project area supports a wide range of vegetation communities associated with disturbed areas, rural residential properties, active quarries, and natural lands. The distribution of wildlife in the Project area varies greatly depending on location, vegetation community, and disturbance level.

The habitat with the greatest intrinsic value to wildlife is the riparian community. Little Rock Creek provides a diverse set of habitats that support a variety of wildlife species. These habitat types contribute to the diversity and abundance of wildlife in the region as they provide for permanent and migratory residency, foraging, and breeding behaviors. In addition, the creek bed and adjacent uplands provide breeding and refugia for a number of wildlife species. However, the Project area is also extensively used by recreationists including families, day users, boaters, and anglers. In the fall, portions of the site are subject to OHV use. The disturbance caused by these recreational activities limits the daytime use of the Project area by some species of wildlife and degrade the value for wildlife that enters the Reservoir area. Nonetheless, common and sensitive wildlife were detected at or near the Study Area. Appendix C-4 provides a list of all the wildlife detected in the Project area.

Invertebrates

Habitat conditions in the Study Area provide a suite of microhabitat conditions for a wide variety of terrestrial and aquatic insects, crustaceans, and other invertebrates. This includes swift running portions of Little Rock Creek with cobble and rocks, thick leaf litter, and pools of slow-moving or still water. As in all ecological systems, invertebrates play a crucial role in a number of biological processes. They serve as the primary or secondary food source for a variety of fish, bird, reptile, and mammal predators; they provide important pollination vectors for numerous plant species; they act as efficient components in controlling pest populations; and they support the naturally occurring maintenance of an area by consuming detritus and contributing to necessary soil nutrients. Surveys detected a wide variety of Anisoptera (dragonflies) Zygoptera (damselflies), Hemiptera (true bugs), Coleoptera (beetles), Diptera (flies), Pleocoptera (stone flies), Lepidoptera (moths and butterflies), Hymenoptera (wasps, bees, and ants), and Trichoptera (caddis flies).

Both non-native Argentine ants (*Linepithema humile*, formerly *Iridomyrmex humile*), and native harvester ants (*Pogonomyrmex californicus*) were detected in the Study Area. Harvester ants were commonly observed in upland habitats to the east and west of the Reservoir. Stream invertebrates were common and included a variety of aquatic larvae such as damselflies, dragonfly larvae, and water bugs (i.e., toe biters [family Belostomatidae]). These aggressive insects prey on other insects, small fish, and amphibians.

Fish

Flows in the lower portion of Little Rock Creek below the Reservoir are primarily ephemeral and do not support year-round habitat for fish. The Reservoir does support perennial water; however, the amount of water available to fish fluctuates depending on annual rainfall and water releases. Habitat conditions in

Little Rock Creek above the Reservoir include overhanging vegetation, deep pools, and sections with short runs and riffles. Substrate conditions vary by location, but Little Rock Creek contains areas supporting silty sands, gravel, cobble, and boulder-dominated zones. Macro algae communities are present during portions of the year within localized areas and include mat-forming algae (*Charra sp*.). The Reservoir, when full, is approximately 100 feet deep and supports inundated vegetation that provides shelter for a variety of fish. Shallows and coves are present around portions of the Reservoir and provide habitat for species tolerant of warmer waters (i.e., Sunfish). Reservoir and creek temperatures vary by season and are a function of depth, location, and snow pack in the upper watershed.

Native fish were not detected during the surveys. Bluegill (*Lepomis macrochirus*) and largemouth bass (*Micropterus salmoides*) were the most common non-native species detected and were found to occur in the Reservoir and portions of Little Rock creek above Rocky Point. In addition, a gold fish (*Carassius auratus auratus*) was captured during surveys of the Reservoir in 2014. Rainbow trout (*Oncorhyncus mykiss*), and brown trout (*Salmo trutta*) have been detected in the Reservoir and the Little Rock Creek Watershed. However, due to potential negative effects on arroyo toad populations, a court order in 2009 required the CDFW to halt stocking activities at the Reservoir. Nonetheless, rainbow trout have been detected by Aspen as recently as 2014 in small pools above the Reservoir. However, due to drought conditions these pools dried up and the fish were lost through thermal stress, loss of oxygen, desiccation, or predation. As with many reservoirs and streams in California, nonnative and invasive fish were routinely detected during the surveys. Although not detected during the surveys, the watershed is known to support exotic species including green sunfish (*Lepomis cyanellus*), pumpkinseed sunfish (*L. gibbosus*), common carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), and bullhead (*Ameiurus* sp.).

Contaminated Fish and Soils in Reservoir. In 2014, the California Office of Environmental Health Hazard Assessment (OEHHA) issued a bulletin noting high levels of mercury and polychlorinated biphenyls (PCBs) in fish tissue sampled from the Reservoir (LRWQCB, 2014). Sediment and fish tissue from Littlerock Reservoir were sampled on August 4, 2014. Fifteen samples, including 11 sediment samples and four fish tissue samples, were collected and analyzed for the presence of mercury, chlorinated pesticides, and PCB congeners. All of the tissue (i.e., four samples) tested positive for chlorinated pesticides (i.e., DDT, DDD, and DDE) with levels that exceed the reporting limit. In addition, a goldfish sampled at the Reservoir also tested positive for Hexachlorobenzene. All four fish tissue samples also tested positive for PCB congeners and for mercury, with the mercury results ranging from 0.3644 to 0.6601 ppm. The EPA and FDA require that fish sold across state lines contain less than 1.0 ppm of mercury (ATSDR, 1999). The OEHHA has provided Advisory Tissue Levels for contaminants in fish intended for human consumption. The bass, which had the highest levels mercury of all the sampled fish tissue, exceeded the "No Consumption" limit for children and women of child-bearing age (OEHHA, 2008). Although the sample size was small for fish (i.e., four fish), the tests support the previous work conducted by the State Water Resources Control Board's (SWRCB) Surface Water Ambient Monitoring Program in 2007-2008, which detected elevated levels of mercury and PCB's in fish collected from the Reservoir (LRWQCB, 2014).

Sediment samples did not detect chlorinated pesticides (including DDT), at or above the method detection limit (MDL). One PCB analyte (PCB138) was detected in 3 of the 11 samples, but the amount is extremely small (i.e., ranging from 1.1 to 1.9 parts per billion [ppb]). The MDL for this analyte is 1.0 ppb, and the reporting limit (RL) is 5.0 ppb. Because the three positive results for PCB138 in sediment all fall below the RL, the values reported are estimates. As mercury was analyzed as total mercury (Hg) (i.e., the element was not speciated in this analysis), it is unknown what percentage is organic mercury versus methylmercury. All 11 sediment samples tested positive for the presence of mercury (i.e., ranging from

0.0032 to 0.0213 parts per million [ppm]). The Agency for Toxic Substances and Disease Registry reports that normal levels of mercury in soil range from 0.02 to 0.625 ppm (ATSDR, 1999). All but one of the sediment sample results fall below the lower value of this range, and the one result that falls within this range lies at the extreme lower end of the range. A recent peer-reviewed synthesis study defined a critical upper limit for mercury in soils below which 95 percent of the 52 species sampled (including plants, animals, and microbes) would be unharmed by chronic exposure. This limit was found to be 0.13 ppm (Tipping et al., 2010). All 11 sediment sampling results are roughly an order of magnitude below this critical upper limit. In contrast to the fish samples, the sediment sampling results show that the Reservoir sediment is mostly free of contaminants and where a contaminant was detected the level of contamination was extremely low.

Amphibians

Amphibians often require a source of standing or flowing water to complete their life cycle. However, some terrestrial species can survive in drier areas by remaining in moist environments found beneath leaf litter and fallen logs, or by burrowing into the soil. Conditions within the Study Area generally provide year-round habitat for a variety of amphibian species. When flowing, Little Rock Creek can provide small pools, shallow rills and runs, and deep, wide slow-moving water supporting several native and nonnative species. The southern extents of the Reservoir provide a year-round water source within coves and shallows that are capable of supporting amphibian species. However, the presence of predatory fish likely decreases the numbers of amphibians that occur along the margins of the lake. Additionally, small pools and/or depressions located on the west side of the main access road were found to support breeding populations of amphibians. Observations of amphibians were also recorded along the western edges of the main entrance road to the recreational area below the dam.

Adjacent upland habitat and existing riparian vegetation provide ample foraging opportunities. Amphibians that were observed during surveys include the California tree frog (*Pseudacris cadaverina*), Baja California chorus frog (*P. hypochondriaca*), and the nonnative bullfrog (*Lithobates catesbeiana*). Western (California) toad (*Anaxyrus boreas* [*halophilus*]) adults and egg masses were also observed. Upland areas adjacent to the Reservoir have the potential to support populations of western spadefoot toad (*Spea hammondii*). Although not detected in the Study Area, both newts and salamanders are well documented in the region. These species are highly cryptic and often difficult to detect. Downed logs, bark, and other woody material in various stages of decay (often referred to as coarse woody debris) provide shelter and feeding sites for a variety of wildlife, including amphibians and reptiles (Maser and Trappe, 1984). Within the Study Area, these features are generally found within the Reservoir itself or the Little Rock Creek channel. Many native amphibians are adversely affected or excluded by exotic fish and amphibian species, which are common within the Study Area.

Reptiles

The number and type of reptile species that may occur at a given site is related to a number of biotic and abiotic features. These include the diversity of plant communities, substrate, soil type, and presence of refugia such as rock piles, boulders, and native debris. Reptiles were commonly observed in the Study Area, in both disturbed and natural areas. Western fence lizard (*Sceloporus occidentalis*), desert spiny lizard (*Sceloporus magister*), sagebrush lizard (*Sceloporus graciosus*), southern alligator lizard (*Elgaria multicarinata*), and side blotch lizard (*Uta stansburiana*) were observed whenever weather conditions were favorable and were broadly distributed within the uplands and along the edge of riparian habitats.

The Study Area also supports a variety of snakes. Southwestern threadsnake (*Rena humilis humilis*), San Diego gopher snake (*Pituophis catenifer annectens*), San Diego nightsnake (*Hypsiglena ochrorhyncha* *klauberi*), patch-nosed snake (*Salvadora hexalepis*), striped racer (*Masticophis lateralis*), red racer (*Coluber flagellum piceus*), California lyersnake (*Trimorphodon lyrophanes*), long-nosed snake (*Rhinocheilus lecontei*), ring-neck snake (*Diadophis punctatus*), California kingsnake (*Lampropeltis getula californiae*), and Southern pacific rattlesnake (*Crotalus helleri*) were observed within the Study Area.

Although not observed, several other common reptiles likely occur in the Study Area. Most reptile species, even if present in an area, are difficult to detect because they are cryptic and their life history characteristics (i.e., foraging and thermoregulatory behavior) limit their ability to be observed during most surveys. Further, many species are active only within relatively narrow thermal limits, avoiding both cold and hot conditions, and most take refuge in microhabitats that are not directly visible to the casual observer, such as rodent burrows, in crevices, under rocks and boards, and in dense vegetation where they are protected from unsuitable environmental conditions and predators. In some cases, they are observed only when flushed from their refugia.

Common reptiles that may occur in desert scrub communities associated with the sediment disposal areas or in habitat present along the haul routes include western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), gopher snake (*P. catenifer*), desert iguana (*Dipsosaurus dorsalis*), desert night lizard (*Xantusia vigilis*), long-nosed leopard lizard (*Gambelia wislizenii*), and Mohave rattlesnake (*Crotalus scutulatus*). Other reptiles that are expected to occur in the Project area include glossy snake (*Arizona elegans*), common kingsnake (*Lampropeltis getula*), California whipsnake (*Masticophis lateralis*), red racer (*M. flagellum*), night snake (*Hypsiglena chlorophaea*), long-nosed snake (*Rhinocheilus lecontei*), spotted leaf-nosed snake (*Phyllorhynchus decurtatus*), western patch-nosed snake (*Salvadora hexalepis*), and lyre snake (*Trimorphodon biscutatus*).

Reptile species that may be present below the Reservoir in areas supporting Mojave riparian forest and desert wash habitats include the Gilbert skink (*Eumeces gilberti*), common garter snake (*Thamnophis sirtalis*), and southern alligator lizard (*Elgaria multicarinata*).

Desert tortoise. The desert tortoise (*Gopherus agassizii*) is a federal and State threatened species that ranges from the Mojave and Sonoran deserts of southeastern California and southern Nevada, south through Arizona into Mexico. It occurs primarily on flats and bajadas with soils ranging from sand to sandy gravel with scattered shrubs. The desert tortoise requires sufficient suitable plants for forage and cover, and suitable substrates for burrows and nest sites. The desert tortoise is threatened by off-road vehicles, livestock grazing, and mining. Disease related to human-caused stress is also taking a heavy toll on the desert tortoise (Christopher et al., 2003). Desert tortoise habitat is present at the proposed 47th Street East sediment disposal site and along the haul routes. Historically, desert tortoises were likely abundant in the Project area and likely utilized the foothills of the ANF. However, urbanization, infrastructure, and agricultural practices have fragmented existing populations in the region.

Habitat on the sediment disposal site has been mapped as suitable for desert tortoise by the DRECP (See Figure C.3-9). The predictive model (based on Nussear et al., 2009) ranks tortoise habitat based on sixteen environmental data layers including soils, landscape, climate, and biotic factors that were merged with desert tortoise presence data region wide. This model provides an output of the statistical probability of habitat potential that can be used to map potential areas of desert tortoise habitat (ibid.). The habitat quality is given a numeric value ranging from zero to 1. Areas within the designated mapping unit of one square kilometer given a rank of zero are not considered suitable habitat for desert tortoise; areas given the value of 1.0 represent high-quality habitat for this species. Model values for the sediment disposal site range from 0.6 to 1. Although the map identifies most of the sediment disposal site as high-quality desert tortoise habitat, portions of the Project site are clearly degraded or developed and do not constitute suitable habitat for desert tortoise. The model reflects hypothesized habitat potential given the range of environmental conditions where tortoise occurrence was documented (Nussear et al., 2009). Therefore, there are likely areas of potential habitat for which habitat potential was not predicted to be high, and likewise, areas of low potential for which the model predicted higher potential (ibid.). Nussear et al. (2009) also states that the map of desert tortoise potential habitat does not account either for anthropogenic effects, such as urban development, habitat destruction, or fragmentation, which has been ongoing in this portion of the Antelope Valley for decades. Based on surveys of the 47th Street sediment disposal site PWD considers the habitat to be isolated from known occupied habitat and provide little value for the recovery of desert tortoise due to the development in the region.

Birds

Eighty-five species of common and sensitive birds were identified in the Study Area during surveys completed between 2010 and 2012. It is possible that many other birds use the site either as wintering habitat, seasonal breeding, or as occasional migrants. Special-status species are further discussed below.

The diversity of birds at this location is a function of the presence of perennial water and the wide variation in plant communities that provide habitat for a number of different groups of birds. For example, shore birds and other more aquatic species were commonly detected within the Reservoir and along Little Rock Creek. In a few locations both upstream of the Reservoir and downstream of the dam, the presence of small rock weirs have resulted in the formation of large pools where shore birds and ducks prey on insects and/or small fish. Mallard duck (*Anas platyrhynchos*), American coot (*Fulica americana*), green heron (*Butoroides virescens*), northern shoveler (*Anas clypeata*), and ruddy duck (*Oxyura jamaicensis*) were commonly observed, often feeding, within the surveyed areas. Great blue heron (*Ardea Herodias*), a CDFG Special Animal, and ring-necked duck (*Aythya collaris*) were also observed within the Study Area.

Various common song birds were detected within the Study Area and were closely associated or dependent on the riparian vegetation that borders portions of the Reservoir and is present along the Little Rock Creek Channel downstream of the dam structure. Riparian systems are frequently considered one of the most productive forms of wildlife habitat in North America. Many bird species are wholly, or at least partially, dependent on riparian plant communities for breeding and foraging (Warner and Hendrix., 1984). Some of the detected species included song sparrow (*Melospiza melodia*), ash-throated flycatcher (*Myiarchus cinerascens*), Bewick's wren (*Thryomanes bewickii*), cliff swallow (*Petrochelidon pyrrhonota*), house finch (*Carpodacus mexicanus*), yellow-rumped warbler (*Setophaga coronata*), warbling vireo (*Vireo gilvus*), lesser goldfinch (*Carduelis psaltria*), and least Bell's vireo (*Vireo bellii pusillus*).

Bird use of the upland areas east and west of the Reservoir and adjacent to Little Rock Creek was common and included a variety of song birds, raptors, vultures, and game birds. Western king bird (*Tyrranus verticalis*), spotted towhee (*Pipilo maculatus*), oak titmouse (*Baeolophus inornatus*), mourning dove (*Zenaida macroura*), and California quail (*Callipepla californica*), were fairly common. Rock wren (*Salpinctes obsoletus*), California towhee (*Melozone crissalis*), and mountain quail (*Oreortyx pictus*) were also observed. Common ravens (*Corvus corax*) were observed nesting in several locations along the nearly vertical rock faces of the northeastern perimeter of the Reservoir. Several lesser nighthawk (*Chordeiles acutipennis*), a ground nesting species, were detected near the Reservoir and in Little Rock Creek above and below the dam.

Several raptors including red-tailed hawk (*Buteo jamicensis*), great horned owl (*Bubo virginianus*), western screech owl (*Otus kennicottii*), and American kestrel (*Falco sparverius*) were observed either soaring over the site (red-tailed hawks) or foraging for small birds in the Study Area (great horned owl and kestrel).

Although not detected during surveys described in this report, a review of available online eBird (eBird, 2016) data report observations of northern shoveler, Say's phoebe (*Sayornis saya*), western bluebird (*Sialia mexicana*), double-crested cormorant (*Phalacrocorax auritus*), red-breasted sapsucker (*Sphyrapicus ruber*), ladder-backed woodpecker (*Picoides scalaris*), ruby-crowned kinglet (*Regulus calendula*), hermit thrush (*Catharus guttatus*), and white-crowned sparrow (*Zonotrichia leucophrys*) at the Reservoir. Bald eagle (*Haliaeetus leucocephalus*), a state-listed endangered and fully protected species, was also reported at the Reservoir from eBird data.

A number of birds are expected to be present at the proposed sediment disposal sites or in desert communities along the proposed haul routes. Some of the species include verdin (*Auriparus flaviceps*), LeConte's thrasher (*Toxostoma lecontei*), black-throated sparrow (*Amphispiza bilineata*), and California quail (*Callipepla californica*). Joshua trees provide suitable nesting substrate for numerous species including red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), ladder-backed woodpecker (*Picoides scalaris*), loggerhead shrike (*Lanius ludovicianus*), Bewick's wren (*Thryomanes bewickii*), cactus wren (*Campylorhynchus brunneicapillus*), northern mockingbird (*Mimus polyglottos*), and Scott's oriole (*Icterus parisorum*).

Lesser nighthawk (*Chordeiles acutipennis*), horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), sage sparrow (*Amphispiza belli canescens*), migrant or wintering Brewer's (*Spizella breweri*), chipping (*Spizella passerina*), and savannah sparrows (*Passerculus sandwichensis*) are all known from local desert scrub communities. Juniper woodland habitat supports western scrub jay (*Aphelocoma californica*), phainopepla (*Phainopepla nitens*), and house finch (*Carpodacus mexicanus*). Although not observed Bendire's thrasher (*Toxostoma bendirei*) and American robin (*Turdus migratorius*) would also be expected to occur in desert scrub communities.

The Reservoir and surrounding region is home to a variety of wintering birds and there is a well-known change in use by "migrant" species between the breeding season in spring and summer and in the winter. Most of the "Neotropical migrants" that are present during the breeding season are absent in the winter, and a different complement of "winter migrant" bird species is encountered (in addition to resident species that are present in all seasons). Studies in the Central Valley (Motroni, 1979) have indicated that the absolute numbers of wintering riparian birds may equal or even exceed the numbers present in the breeding season. At the Reservoir, periodic wintering use by bald eagles has been noted in addition to other common winter visitors. Wintering ferruginous hawk (*B. regalis*), great horned owl (*Bubo virginianus*), and other raptors are common in the Antelope Valley and may periodically visit the Reservoir. Other common birds that forage on invertebrates and/or seeds in agricultural fields in the Antelope Valley include killdeer (*Charadrius vociferous*) and American pipit (*Anthus rubescens*), species known from the Reservoir. Alfalfa fields are especially important as the primary foraging area for the locally nesting Swainson's hawk (*B. swainsoni*), a species listed as threatened by the CDFG. Other wintering species known from the region include mountain plovers (*C. montanus*).These species were not observed in the Survey Area; however, they may overfly the area. Similarly, western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) has not been detected at the Project site. Nesting habitat for this species is marginal at best below the dam and generally lacks the size and structure preferred by this bird. It was determined that suitable habitat for this species is not present at the Reservoir.

Mammals

The distribution of mammals in the Study Area is associated with the presence of such factors as access to perennial water, topographical and structural components (i.e., rock piles, vegetation, and stream terraces) that provide for cover and support prey base; and the presence of suitable soils for fossorial mammals (i.e., sandy areas in the upper portions of the Reservoir when water levels are low).

Small mammals or their sign were commonly observed during most of the surveys. These included California ground squirrel (*Spermophilus beecheyi*), desert shrew (*Notiosorex crawfordi*), California vole (*Microtus californicus*), deer mouse (*Peromyscus maniculatus*), Botta's pocket gopher (*Thomomys bottae*), black-tailed jackrabbit (*Lepus californicus*), and desert cottontail (*Sylvilagus audubonii*). Mojave riparian forest located below the Reservoir provides foraging and breeding habitat for ornate shrew (*Sorex ornatus*), brush mouse (*Peromyscus boylii*), and southern grasshopper mouse (*Onychomys torridus*). Predators such as the long-tailed weasel (*Mustela frenata*) are likely to be attracted to the wooded riparian habitats that occur on Little Rock Creek.

Mid-size mammals including raccoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*), bobcat (*Felis rufus*), mountain lion (*Puma concolor*), mule deer (*Odocoileus hemionus*), gray fox (*Urocyon cinereoargenteus*), and coyote (*Canis latrans*) were detected. While not detected during surveys, striped skunk (*Mephitis mephitis*) and American badger (*Taxidea taxus*) have the potential to occur within the Study Area. Because Littlerock and Santiago Creeks provide a large continuous corridor through the Angeles National Forest, far-ranging species like black bear (*Ursus americanus*) appear to frequent the Study Area.

Juniper woodland habitat located at the Reservoir and to some degree at the proposed 47th Street East disposal site provides breeding and foraging habitat for many mammals, such as California ground squirrel (*Spermophilus beecheyi*), desert kangaroo rat (*Dipodomys deserti*),long-tail pocket mouse, pinyon mouse (*Peromyscus truei*), and mule deer. Gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), and kit fox (*Vulpes macrotis*) also may occur.

Creosote bush scrub and other desert scrub communities located along the haul roads provide foraging and breeding habitat for many species including pocket mouse (*Perognathus* spp.), white-tailed antelope squirrel (*Ammospermophilus leucurus*), California ground squirrel, desert kangaroo rat (*Dipodomys deserti*), Merriam's kangaroo rat (*D. merriami*), desert cottontail (*Sylvilagus audubonii*), desert woodrat (*Neotoma lepida*), kit fox, and coyote.

Joshua trees provide foraging and breeding habitat for cactus mouse (*Peromyscus eremicus*), canyon mouse (*P. crinitus*). Several bat species may forage over desert scrub and Joshua tree woodland, such as pallid bats (*Antrozous pallidus*), western pipistrelles (*Pipistrellus hesperus*), big free-tailed bat (*Nyctinomops macrotis*), western mastiff bat (*Eumops perotis*), Mexican free-tailed bat (*Tadarida brasiliensis*), and spotted bat (*Euderma maculatum*).

Bats were commonly detected and forage over most of the Study Area where they prey on small insects, moths, and other invertebrates. Many bats concentrate foraging activities in riparian and wetland habitats where insect abundance is high (CDFG, 2000). Common bats detected in the Study Area, using visual searches (utilizing a Echo Meter EM3) and a Sonobat system, included canyon bat (*Parastrellus hesperus*), greater bonneted bat (*E. perotis*), Mexican free-tailed bat, and big brown bat (*Eptesicus fuscus*). Special-status bats (discussed further in Section 4.4 below) detected in the Study Area included pallid bat (*Antrozous pallidus*), Yuma myotis (*Myotis yumanensis*), and western small-footed myotis (*Myotis ciliolabrum*). Although not detected, it is likely that fringed myotis (*M. thysanodes*) and long-legged myotis (*M. volans*) occur within or adjacent to the Study Area. Migrant bats such as the western red bat (*Lasiurus blossevilli*) and the hoary bat (*L. cinereus*) may occur in riparian areas in the spring and early fall.

Mohave ground squirrel. Historically, the Mohave ground squirrel (*Spermophilus mohavensis*), a State listed species, was widely distributed in the region possibly including the proposed sediment disposal site. Since the early 1950s, urbanization, infrastructure, and agricultural practices have fragmented existing populations in the region and the population has declined in the Palmdale region. Habitat on the sediment disposal site has been mapped as suitable for this species by the DRECP (See Figure C.3-9). Model values for the sediment disposal site range from poor quality habitat ranked at 0.0 to 0.2 to moderate habitat ranked from 0.4 to 0.6. However, a 2015 survey determined that the sediment disposal site does not contain suitable habitat for this species (Phoenix, 2015).

C.3.1.6 Management Indicator Species

The Angeles National Forest Land Management Plan offsets a goal of sustaining viable populations of native and desired non-native species. The LMP selected Management Indicator Species (MIS), defined as species whose population or habitat trends are believed to indicate the effects of management activities on National Forest System lands (36 CFR 219.19(a) (1) [1982]; 36 CFR 219.14 [2005]), and as a focus for monitoring (36 CFR 219.19(a) (6) [1982]). On the ANF, the following habitat types and management issues have been assigned an indicator species as a measure of management success:

- Healthy Diverse Habitats (Mule deer)
- Fragmentation (Mountain lion)
- Montane Conifer Forest (California spotted owl, California Black oak, and White fir)
- Riparian Habitat (Song sparrow)
- Aquatic Habitat (Arroyo toad)
- Oak Regeneration (Blue oak, Engleman oak, and Valley oak)
- Bigcone Douglas-fir Forest (Bigcone Douglas-fir)
- Coulter Pine Forest (Coulter pine)

MIS that occur in the Project area include mule deer, mountain lion, arroyo toad, and song sparrow. A description of each MIS in the Project area is provided below.

Healthy Diverse Habitats (Mule Deer). Mule deer are common on the ANF and have been routinely observed at the Reservoir. These animals occupy a wide range of habitats but prefer to forage and shelter near riparian areas, seeps, and oak woodlands. While these species occupy most habitats, late successional chaparral typically is not preferred for foraging. Mule deer on NFS lands use dense vegetation for cover and forage mainly in open sagebrush and edge habitats. These species are able to move along an elevational gradient to maximize use of climatic conditions and forage availability during different seasons. Movement usually occurs in the fall and spring and roughly the same routes are used by the same herds year after year. On the ANF, the current deer herd is believed to include approximately 2,180 mule deer (USFS, 2005). Mule deer have been chosen as an indicator of the effectiveness of forest management strategies on landscape patterns in chaparral age class diversity (USFS, 2005).

Fragmentation (Mountain lion). The mountain lion is selected as an MIS to monitor the effects of forest activities and uses on a landscape-level scale to determine effects of habitat fragmentation and habitat linkages (USFS, 2005). The general health of this species largely depends on current deer populations and this solitary animal prefers large areas of undisturbed habitat that supports a stable prey base. Populations of this species on NFS lands are low primarily because this species requires large home ranges and has limited social interaction (USFS, 2005). The greatest concern to this species is loss of habitat and connectivity between home ranges. Suitable range for this species occurs in the Project area and this species is expected to be present at the Reservoir.

Riparian Habitat (Song sparrow). The song sparrow is selected as an MIS because its relative abundance is expected to be responsive to disturbance or management activities. The primary threat to the song sparrow and other riparian birds is the destruction of habitat, loss of water in riparian areas, and human disturbance (USFS, 2005). Long-term monitoring of song sparrow populations would provide a measure of forest management success in increasing the quality of riparian areas. Song sparrow was detected in the Project area at the Reservoir and below Littlerock Dam.

Aquatic Habitat (Arroyo toad). The arroyo toad occurs in semi-arid regions including valley-foothill, desert riparian, and desert wash habitat. This species breeds in shallow, gravelly streams, and rivers with sandy banks that typically contain willows, cottonwoods, and sycamores, and it has been known to utilize upland habitat within 2,000 meters (6,562 feet) of breeding habitat for foraging and wintering (USFWS, 2011).

This species is present in the Project area above Rocky Point upstream from the proposed grade control structure. The Forest Service has designated the Lower Little Rock Creek Critical Biological Land-Use Zone (CBLUZ) for the protection of arroyo toad, and defined allowable recreational activities in this CBLUZ. The distribution of arroyo toad in the Project area below Rocky Point is restricted to some degree from operation of the reservoir, exotic fish (i.e., bass), and from human use of the Reservoir (i.e., trampling, creek diversion, illegal OHV) during periods when the creek bed is not inundated.

C.3.1.7 Sensitive Vegetation Communities

Sensitive vegetation communities are defined by CDFG (2010) as, "...communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects." Sensitive vegetation communities in the Project area include southern cottonwood-willow riparian forest, Mojave riparian forest, riparian scrub, and Joshua tree woodland. Subsequent field surveys determined that areas mapped as Fremont cottonwood forest generally meet the classification requirements of southern cottonwood-willow riparian forest and Mojave riparian forest (See Table C.3-2 above and Figures C.3-3, C.3-4, and C.3-5).

C.3.1.8 Special-Status Plants

Approximately 24 special-status plant taxa have the potential to occur in the Project area. Figures C.3-10a and C.3-10b illustrate the known locations of special-status plants occurring in or near the Study Area (CDFW, 2015). Three special-status plants, Johnston's monkeyflower (*Mimulus johnstoni*), short-joint beavertail (*Opuntia basilaris var. brachyclada*), and Lemmon's syntrichopappus (*Syntrichopappus lemmonii*), were detected within the Vegetation Study Area during botanical surveys conducted from 2010–2014. None of these plants were detected in the Project area. Table C.3-4 lists the sensitive plant species that have the potential to occur in the Vegetation Study Area. Species descriptions having a low, moderate, or high potential to occur are described in Appendix C-5.

Each of these taxa were assessed for their potential to occur within the study area based on the following criteria:

- Present: Taxa were observed within the Study Area during recent botanical surveys or population has been acknowledged by CDFW, USFWS, or local experts.

- High: Both a documented recent record (within 10 years) exists of the taxa within the Study Area or immediate vicinity (approximately 5 miles) and the environmental conditions (including soil type) associated with taxa present within the Study Area.
- Moderate: Both a documented recent record (within 10 years) exists of the taxa within the Study Area or the immediate vicinity (approximately 5 miles) and the environmental conditions associated with taxa presence are marginal and/or limited within the Study Area or the Study Area is located within the known current distribution of the taxa and the environmental conditions (including soil type) associated with taxa presence occur within the Study Area.
- Low: A historical record (over 10 years) exists of the taxa within the Study Area or general vicinity (approximately 10 miles) and the environmental conditions (including soil type) associated with taxa presence are marginal and/or limited within the Study Area.
- Not Likely to Occur: Species or sign not observed on the site, outside of the known range, and conditions unsuitable for occurrence.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Federal or State Endangered or Threatened Species			
Astragalus brauntonii Braunton's milkvetch	CRPR 1B.1, FE	Coastal scrub and chaparral. Recent burns or disturbed areas. <2,300'. Los Angeles, Orange, and Ventura Counties.	Unlikely: The project area is outside of the historic range of the species. Suitable habitat is not present.
Berberis nevinii Nevin's barberry	CRPR 1B.1, FE	Sandy to gravelly soils. Washes, chaparral, cismontane woodland, and coastal scrub. Generally found in lowlands or drainages. <2,200'.	Unlikely: The project area is outside of the historic range of the species. Suitable habitat is not present.
Brodiaea filifolia Thread-leaved brodiaea	CRPR 1B.1, FT	Grasslands and vernal pools, grassy openings in chaparral or coastal sage scrub, playas. 100-2,900'. Often found in clay. Southern base of San Gabriel Mtns. at Glendora and San Dimas & San Bernardino at Arrowhead Springs.	Unlikely: The project area is outside of the historic range of the species. Suitable habitat is not present.
Chorizanthe parryi var. *fernandina* San Fernando Valley spineflower	CRPR 1B.1, SE, FC, FSS	Sandy places in coastal or desert shrublands; historically from San Fernando Valley, adjacent foothills, and coastal Orange Co.; now known only in E Ventura & W LA Cos; Elev. 490-4,000 ft.; May-June.	Low: The project area is outside of the historic range of the species. Suitable habitat is, however, present.
Dodechema leptoceras Slender horned spineflower	CRPR 1B.1, FE	Sandy alluvial fans, benches, and terraces in coastal scrub, chaparral and cismontane woodland areas. 700-3,000'.	Low: The project area is outside of the historic range of the species. Suitable habitat is, however, present.
Forest Service Sensitive and CRPR Species			
Acanthoscyphus parishii var. *abramsii* Abram's flowery puncturebract	CRPR 4.2, FSS	In chaparral on soils derived from sandy or shale substrates at elevations of 3,750–6,750 feet.	Low. No suitable habitat in Project disturbance area, but could occur in chaparral on slopes surrounding the Project area.
Androsace elongata ssp. *acuta* California androsace	CRPR 4.2, FSW	Coastal scrub, chaparral, cismontane woodland, meadows and seeps, and valley and foothill grassland habitats. Elev. 492 to 3,936 ft. March to June.	Moderate: There are several populations on the foothill desert slopes of the San Gabriel and Liebre Mountains. Suitable habitat is present.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Anomobryum julaceum Slender silver moss	CRPR 4.2	Non-vascular moss that grows on mesic soils and rocks along creeks in broadleaf and coniferous forests. Elev. 300 to 3,000 ft. Year-round.	Low: This species is represented in southern California from a single collection made from the high elevations of the San Gabriel Mtns. Suitable habitat is present in the project area.
Arctostaphylos *glandulosa* ssp. *gabrielensis* San Gabriel manzanita	CRPR 1B.2, FSS	Large shrub that grows on rocky chaparral habitats; endemic to San Gabriel Mtns near Mill Creek Summit, Elev. 5,000 ft.; March.	Low: This species is known from the upper watershed but the project area is below the elevation range for this species. It has a low potential to disperse into the project area from the upper watershed.
Arctostaphylos parryana ssp. *tumescens* Interior manzanita	CRPR 4.3, FSS	Primarily found in montane chaparral, but may also be seen in riparian corridors, willow scrub and adjacent upland forest, ridgetops, ecotones between chaparral and woodland, Yellow Pine Forest, and Pinyon, Juniper, and Joshua Tree Woodland. 5500-7580’.	Low: This species is known from the upper watershed but the Project area is below the elevation range for this species. It has a low potential to disperse into the Project area from the upper watershed.
Astragalus bicristatus Crested Milk-vetch	CRPR 4.3, FSS	Open, rocky areas in coniferous forests. 5,500-9000’. Los Angeles, Riverside and San Bernardino Counties.	Unlikely: No suitable habitat present, the project area is well below the elevation range of the species.
Astragalus lentiginosus var. *antonius* San Antonio Milk-vetch	CRPR 1B.3, FSS	Open slopes in pine forest, 5,000-8,500’, San Gabriel Mtns.	Unlikely: No suitable habitat present, the project area is well below the elevation range of the species.
Botrychium crenulatum Scalloped Moonwort	CRPR 2B.2, FSS	Bogs and fens, lower montane coniferous forest, meadows and seeps, and marshes & swamps (freshwater). 4,900-10,800’.	Unlikely: No suitable habitat present, the project area is well below the elevation range of the species.
Calochortus clavatus var. *clavatus* Club-haired mariposa lily	CRPR 4.3, FSS	Chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland at 75-1300 meter elevations	Low. No suitable habitat in Project disturbance area, but could occur in chaparral on slopes surrounding the Project area.
Calochortus clavatus var. *gracilis* Slender Mariposa Lily	CRPR 1B.2, FSS	Chaparral on slopes or in canyons below 1200 m, south base of San Gabriel and Sierra Pelona mountains.	Low. No suitable habitat in Project disturbance area, but could occur in chaparral on slopes surrounding the Project area.
Calochortus fimbriatus Late-Flowered Mariposa Lily	CRPR 1B.2, FSS	Dry, open coastal woodland; chaparral, 400-1500 m, locally up to 2500 m. Often in serpentine soil. Coast ranges, Ventura county west.	Unlikely: Not known to occur on the ANF and soil type not found in project area. Suitable habitat for this species not present in project area.
Calochortus palmeri var. palmeri Palmer's mariposa lily	CRPR 1B.2, FSS	Wet meadows and seeps in lower montane coniferous forest and chaparral habitats. Elev. 3,281-7,841 ft. May-July.	Moderate: This species was not observed during recent surveys but is known from the general area.
Calochortus plummerae Plummer's mariposa lily	CRPR 4.2	Granitic rock outcrops or rocky soils of granitic origin, in lower montane coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland, and chaparral habitats. Elev. 328-5,577 ft. May-July	Low: The Project is just outside of the known geographic range for this species but suitable habitat is present within the project area.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Calochortus striatus Alkali mariposa lily	CRPR 1B.2, FSS	Alkaline soils, in floodplains and springs in chaparral, chenopod scrub, and Mojavean desert scrub. Elev. 230-5,232 ft. April-June.	Low*: The species is known from alkaline soils in the Mojave Desert. Poor quality habitat was observed at the northern end of the haul roads but it is not expected in the project area.
Calystegia piersonii Pierson's morning-glory	CRPR 4.2	Shrublands and lower elev. forests; below about 5000 ft. elev.; northern San Gabriel Mts., Liebre Mts., and adjacent Mojave Desert. May-June.	Moderate: This species was not observed during recent surveys, but is known from the general area.
Canbya candida Pygmy-poppy	CRPR 4.2, FSS	Joshua tree woodland, Mojavean desert scrub, or pinyon and juniper woodland habitats with gravelly, granitic, or sandy soils. Elev. 1,968-4,790 ft. March-June.	High: Suitable habitat is preset within the Vegetation Study Area and numerous historic records are known from the area. May be present at the proposed sediment disposal site at 47th Street.
Castilleja gleasonii Mt. Gleason paintbrush	CRPR 1B.2, SR, FSS	Rocky places within lower montane coniferous forest and pinyon and juniper woodland communities. Elev. 2,700-7,120. May-June.	Moderate: This species is known from higher elevation of the San Gabriel Mtns but several collections from lower elevations have been made. Suitable habitat is present.
Castilleja plagiotoma Mojave paintbrush	CRPR 4.3, FSS	Great Basin scrub, Joshua tree woodland, lower montane coniferous forest, and pinyon and juniper woodland habitats. Elev. 984-8,200 ft. April-June.	High: This species was not detected during recent surveys but suitable habitat is present within the Vegetation Study Area and it is known from the general vicinity of the Project.
Chorizanthe parryi var. *parryi* Parry's Spineflower	CRPR 1B.1, FSS	Valley-floor and foothill habitats. Dry, sandy or gravelly soils in washes, alluvial benches, and in foothill microhabitats with unconsolidated soils and low vegetation cover. Coastal sage scrub, chaparral, alluvial fan scrub, and the ecotone between chaparral and oak woodland. 30-1,130 m. (100-3700ft)	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Cladium californicum California saw-grass	CRPR 2B.2, FSS	Alkaline marshes, swamps, springs (including hot springs), perennial streams, and ponds. In sunny or partly shaded areas by riparian trees. Soil is usually moist to wet, often alkaline, and may be clay or gravel. Immediately adjacent vegetation is usually riparian, such as palms or willows, and may be dense. 100-7,000'.	Low: Suitable habitat is present within the Vegetation Study Area, but it was not detected during recent surveys and is not known from the area.
Claytonia lanceolata var. *peirsonii* Peirson's Spring Beauty	CRPR 3.1, FSS	Gravelly conifer woodlands, scree slopes. 5,000-8,500'.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Deinandra mohavensis Mojave tarplant	CRPR 1B.3, SE, FSS	Washes, seasonal creeks/seeps, openings in chaparral, disturbed areas. Not known from ANF, most occurrences in San Bernardino, San Jacinto mts. 900-1600 m.	Unlikely: Project area is well outside of the known range of the species.
Drymocallis glanduloas ssp. *ewanii* Ewan's Cinquefoil	CRPR 1B.3, FSS	Seeps, springs, wet areas in central San Gabriel Mountains, 1900-2400 m	Low: Suitable habitat is present within the Vegetation Study Area, but it was not detected during recent surveys and is not known from the area.
Dudleya cymosa ssp. *crebrifolia* San Gabriel River Dudleya	CRPR 1B.2, FSS	On exposed granite outcroppings in CSS or chaparral areas. Fish Canyon, Lytle Creek area. 300-1100 m.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Dudleya densiflora San Gabriel Mountain Dudleya	CRPR 1B.1, FSS	Steep granitic canyon walls adjacent to chaparral, coastal scrub, and coniferous forest. Southeast San Gabriel Mountains. 900-1,700'	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Dudleya multicaulis Many-stemmed Dudleya	CRPR 1B.2, FSS	Heavy soils, often clayey, coastal plain. Chaparral, coastal scrub, and valley & foothill grassland. <2,000'.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Eremegone macradenia var. *arcuifolia* Forest Camp Sandwort	FSS	Ridgetops in chaparral (openings, granitic, usually oak dominated). 4,000-5,600'.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Eriogonum kennedyi var. *alpigonum* Southern Alpine Buckwheat	CRPR 1B.3, FSS	Alpine boulder and rock fields, subalpine, granitic gravel, found on high peaks and ridgetops. 8,500-11,550'.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Eriogonum microthecum var. *johnstonii* Johnston's Buckwheat	CRPR 1B.3, FSS	Rocky, subalpine coniferous forest and upper montane coniferous forest. 8,500-9,500'.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Galium grande San Gabriel Bedstraw	CRPR 1B.2, FSS	Open, broad-leafed forest, open chaparral, cismontane woodland, and lower coniferous forest. Rocky slopes. 1,450-5,000'. San Gabriel Mtns.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Heuchera abramsii Abram's Alumroot	CRPR 4.3, FSS	Rocky crevices in upper montane forest, 2800-3500 m.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Heuchera caespitosa Urn-Flowered Alumroot	CRPR 4.3, FSS	Rocky crevices in montane conifer forest in San Gabriel Mountains, 1500-2500 m	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Horkelia cuneata ssp. *Puberula* Mesa horkelia	CRPR 1B.1, FSS	Sandy or gravely areas in coastal sage scrub, chaparral, or oak woodland. 50-850 m.	Unlikely: Project area is well outside of the known range of the species.
Hulsea vestita ssp. *gabrtielensis* San Gabriel Mountains sunflower	CRPR 4.3, FSS	Rocky, subalpine coniferous forest, upper montane coniferous forest, talus slopes or rock outcroppings. 1500-2,900 m.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Hulsea vestita ssp. *pygmaea* Pygmy Alpinegold	CRPR 1B.3, FSS	Gravelly sites of granitic substrate alpine areas or subalpine forest ; 2800-3900 m	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Imperata brevifolia California satintail	CRPR 2B.1, FSS	Meadows and seeps within chaparral, coastal scrub, and Mojavean desert scrub communities. Elev. below 4,000 ft. September-May.	Low: Suitable habitat is present within the Vegetation Study Area, but it was not detected during recent surveys and is not known from the area.
Lepechinia fragrans Fragrant Pitcher Sage	CRPR 4.2, FSS	Chaparral areas, including those recovering from recent fire. Mt. Lukens, western Santa Monica Mountains. 20-1350 m.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Lepechinia rossii Ross's Pitcher Sage	CRPR 1B.2, FSS	Rocky outcrops of reddish sedimentary rock, on north to northeast facing slopes; between 305-790 m in elevation. Generally associated with open areas and appears to be in greatest abundance following fire.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Lewisia brachycalyx Short-sepaled Lewisia	CRPR 2B.2, FSS	Seasonally wet habitats within open coniferous forest; specifically in montane meadows or seeps and often in sandy soils	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Lilium humboldtii ssp. ocellatum Ocellated Humboldt lily	CRPR 4.2, FSW	Riparian woodland openings within chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest communities; generally on gravelly soils within gullies. Elev. below 6,000 ft. March-July.	Low: This species is known from deep shaded canyons throughout the San Gabriel Mtns, but it was not detected during recent surveys and is not known from the area.
Lilium parryi Lemon lily	CRPR 1B.2, FSS	Meadows and seeps within lower and upper montane coniferous forests communities. Elev. 4,000-9,000 ft. July-August.	Low: Known from the upper reaches of the drainage but the project area is below the elevation range for this species and the project area lacks suitable habitats.
Linanthus concinnus San Gabriel linanthus	CRPR 1B.2, FSS	Dry rocky slopes within chaparral and montane coniferous forest communities. Elev. 5,000-9,200 ft. May-July.	Unlikely: Known from higher elevation areas of the San Gabriel Mtns, the project area is well below the elevation range of the species.
Linanthus orcuttii Orcutt's Linanthus	CRPR 1B.3	Openings in chaparral, lower montane coniferous forest, and pinyon-juniper woodland at elevations of 3,000–7,050 feet. Usually in vernally moist openings.	Low. No suitable habitat in Project disturbance area, but could occur in chaparral on slopes surrounding the Project area.
Loeflingia squarrosa var. *artemisiarum* Sagebrush loeflingia	CRPR 2B.2	Sandy soils (dunes) in Great Basin scrub and Sonoran desert scrub. Elev. 2,200-5,300 ft. April-May	Low*: The species is known from very few locations in the vicinity of alkali flats to the north of the project area. Poor quality habitat was observed at the northern end of the haul roads but it is not expected in the project area.
Lupinus peirsonii Peirson's lupine	CRPR 1B.3, FSS	Gravelly or rocky slopes within Joshua tree woodland, lower and upper montane coniferous forest, and pinyon and juniper woodland communities. Elev. 3,200-8,200 ft. April-May.	Low: This species is not known from the project vicinity, but occurs in the upper reaches of the watershed. It could be present within the vegetation study area as a wash-down waif species but is not expected to persist in the Reservoir.
Malacothamnus davidsonii Davidson's bush-mallow	CRPR 1B.2	Chaparral, cismontane woodland, coastal scrub, and riparian woodland. Elev. 300-2,500 ft. June-January.	Low: Very few records of this species within the general vicinity of the project area.
Mimulus johnstoni Johnston's monkeyflower	CRPR 4.3	Gravelly or rocky slopes within Joshua tree woodland, lower and upper montane coniferous forest, and pinyon and juniper woodland communities. Elev. 3,200 0-6,000 ft. April-May.	Present*: Observed within the Vegetation Study Area, just downstream of Littlerock Dam on a steep sandy slope, not observed within the project area.
Monardella australis ssp. Jokerstii Jokerst's Monardella	CRPR 1B.1, FSS	Found at elevations from 4430-5740 ft, with possible waifs as low as 525 ft. On steep scree or talus slopes between breccia, ravines, canyon bottoms, and secondary alluvial benches along drainages and washes. In loamy soil derived from granite or mixed alluvium. In chaparral, montane coniferous forest or woodland, or sometimes riparian.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Monardella macrantha ssp. *hallii* Hall's Monardella	CRPR 1B.3, FSS	Chaparral, broadleaved upland woodland, cismontane woodland, coniferous forest (usually Bigcone Spruce), and valley & foothill grassland. 2,000-6,600'. San Gabriel and San Bernardino Mtns.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Monardella viridis ssp. *saxicola* Rock Monardella	CRPR 4.3, FSS	Broadleaved upland forest, montane chaparral, coniferous forest, and cismontane woodland. Usually in dry, rocky areas. 1,650-6,000'. San Gabriel Mtns.	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Navarretia peninsularis Baja Navarretia	CRPR 1B.2, FSS	Wet areas in open forest or chaparral. 4,950-7,600'.	Unlikely: No suitable habitat present, the project area is well outside of the known range and elevation of the species.
Nemacladus secundiflorus var. robbinsonii Robbins' nemacladus	CRPR 1B.2, FSS	Openings in chaparral and foothill grasslands; Elev. 875-4250 ft.; April-June.	Unlikely: The subspecies is known from a single location in the San Gabriel Mtns, east of the Project area. No suitable habitat is present.
Opuntia basilaris var. brachyclada Short-joint beavertail	CRPR 1B.2, FSS	Open chaparral, juniper woodland, or similar woodland communities. Elev. 1,394-5,900 ft. April-June.	Present: This variety was observed at two locations within the Vegetation Study Area just outside of the Project area.
Oreonana vestita Woolly mountain-parsley	CRPR 1B.3, FSS	Ridge tops and on rocky soils such as dry gravel or talus in lower and upper montane coniferous forest and subalpine coniferous forest at elevations of 6,500–11,500 feet.	Unlikely. This species is not known from the project vicinity and the project area is well below the elevation range of this species.
Orobanche valida ssp. valida Rock Creek broomrape	CRPR 1B.2, FSS	Granitic soils within chaparral and pinyon and juniper Woodland communities. Elev. 4,000-7,000 ft. May-July.	Unlikely: This species is not known from the project vicinity and the project area is below the elevation range of this species.
Oxytropis oreophila var. *oreophila* Rock-loving Oxytrope	CRPR 2B.3, FSS	Open sunny areas; on gravelly or rocky flats, slopes, ridges, or summits; or in alpine boulder fields or fell-fields. Surrounding vegetation is usually composed of alpine cushion plants when above treeline, or subalpine coniferous forest at lower elevations. Soils are usually dry, sandy to rocky. 8860-12500 ft	Unlikely: No suitable habitat present, the project area is well outside of the known range and elevation of the species.
Parnassia cirrata var. *cirrata* Fringed Grass-Of-Parnassus	CRPR 1B.3, FSS	Mesic areas in open, broad-leafed forest, open chaparral, cismontane woodland, and lower forest. Rocky slopes. 455-1,525 m. San Gabriel Mtns.	Low. No suitable habitat in Project disturbance area, but could occur in chaparral on slopes surrounding the Project area.
Scutellaria bolanderi ssp. austromontana Southern Skullcap	CRPR 1B.2, FSS	Gravelly streambanks and mesic sites, chaparral, cismontane woodland, lower montane conifer forest. 425-2000 m. Mainly in Riverside, San Diego counties.	Unlikely: Project area is well outside of the known range of the species.
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	CRPR 1B.2, FSS	Chaparral, cismontane woodland, and montane conifer habitat at elevations of 3,300–8,200 feet (1,000–2,500 meters).	Unlikely: No suitable habitat present, the project area is well outside of the known range of the species.
Sidalcea neomexicana Salt Spring Checkerbloom	CRPR 2B.2, FSS	Flat or gently sloped, moist alkaline areas such as springs, marshes, bogs, swamps, or playas. Also hillsides, roadcuts and roadsides, in pastures and fields, and in meadows. 100-5020 ft	Low: Potential habitat is present within the Vegetation Study Area, but it was not detected during recent surveys and is not known from the area.

Table C.3-4. Known and Potential Occurrence of Special-Status Plant Taxa within the Study Area

Name	Status	Habitat	Potential for Occurrence
Sidotheca caryophylloides Chickweed Starry Puncturebract	CRPR 4.3, FSS	Sandy or gravelly flats, washes, and slopes, chaparral, montane conifer woodlands; 1300-2600 m	Low: Potential habitat is present within the Vegetation Study Area, but it was not detected during recent surveys and is not known from the area. Nearest record over 10 miles south.
Streptanthus campestris Southern Jewelflower	CRPR 1B.3, FSS	Rocky openings in chaparral, conifer forest, oak woodland, 600-2790 m. High variation in habitat and elevation of species. San Diego, Riverside, San Bernardino counties.	Unlikely: Project area is well outside of the known range of the species.
Stylocline masonii Mason's neststraw	CRPR 1B.1, FSS	Ephemeral annual; sandy washes, saltbush shrubland, pinyon-juniper woodland, etc., western Central Valley (Monterey Co. south to Kern Co.) and Soledad Cyn. wash in LA Co., below about 4,000 ft. elev.; March-April.	Low: This species is not known from the project vicinity but suitable habitat is present.
Symphyotrichum defoliatum San Bernardino aster	CRPR 1B.2, FSS	Occurs near ditches, springs and seeps in cismontane woodland, valley foothill grasslands, coastal scrub, lower montane coniferous forest, meadows, swamps and marshes from 2 to 2040 meters. (7-6700 ft)	Unlikely: Project area is well outside of the known range of the species.
Symphytotrichum greatae Greata's aster	CRPR 1B.3	Woodlands, chaparral, lower montane forests; around springs or mesic sites, Elev.1,000–6,600 ft.; San Gabriel Mts. and Liebre Mts. August-October.	Low: This species is known from the upper watershed and although the habitat in the project area is not ideal, it has some potential to occur.
Syntrichopappus lemmonii Lemmon's syntrichopappus	CRPR 4.3, FSW	Chaparral, Joshua tree woodland, and pinyon and juniper woodlands within sandy or gravelly soils. Elev. 1,640-6,004 ft. April-May.	Present*: This species was detected within the vegetation study area, just downstream of the dam. It was growing on a steep talus slope adjacent to the haul road. It was not detected within the Project area.
Thelypteris puberula var. *sonorensis* Sonoran Maiden Fern	CRPR 2B.2, FSS	Streams, meadows, and seeps below 550 m.	Unlikely: Project area is well outside of the known range of the species.
Thysanocarpus rigidus Rigid Fringepod	CRPR 1B.2, FSS	Often dry rocky slopes or ridges, or generally open areas. It grows between 1970-7200 ft in elevation, usually in pine and oak woodlands.	Low. No suitable habitat in Project disturbance area, but could occur in open areas in chaparral on the slopes surrounding the Project area.

Source: CDFW, 2014

SE – California-listed Endangered
ST – California-listed Threatened
SR – California-listed Rare
FSS – USDA Forest Service Sensitive Species
FSW – USDA Forest Service Watch List

CRPR 1B – Rare or endangered in California and elsewhere
CRPR 2 – Rare or endangered in California, more common elsewhere
CRPR 3 – More information needed (Review List)
CRPR 4 – Limited Distribution (Watch List)
0.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2 = Fairly threatened in California (20-80% occurrences threatened)
0.3 = Not very threatened in California (<20% of occurrences threatened or no current threats known

* = likelihood with an asterisk is based only on habitat adjacent to the haul roads and not within the project area.

C.3.1.9 Special-Status Wildlife

Special-status taxa include those listed as threatened or endangered under the federal or California Endangered Species Acts, taxa proposed for listing, Species of Special Concern, and other taxa which have been identified by the USFWS and CDFW, and Forest Service Sensitive species. Figures C.3-11a and C.3-11b illustrates the known locations of special-status wildlife occurring within or near the Study Area (CDFW, 2015). The specific habitat requirements and the locations of known occurrences of each special-status wildlife taxa were the principal criteria used for inclusion in the list of taxa potentially occurring within the Study Area. There are currently 87 special-status wildlife taxa documented within the general region of the Study Area.

Each of the 87 taxa were assessed for their potential to occur within the Study Area based on the following criteria:

- Present: Taxa (or sign) were observed in the Study Area or in the same watershed (aquatic taxa only) during the most recent surveys, or a population has been acknowledged by Forest Service, CDFW, USFWS, or local experts.
- High: Habitat (including soils) for the taxa occurs on site and a known occurrence occurs within the Study Area or adjacent areas (within 5 miles of the site) within the past 20 years; however, these taxa were not detected during the most recent surveys.
- Moderate: Habitat (including soils) for the taxa occurs on site and a known regional record occurs within the database search, but not within 5 miles of the site or within the past 20 years; or, a known occurrence occurs within 5 miles of the site and within the past 20 years and marginal or limited amounts of habitat occurs on site; or, the taxa's range includes the geographic area and suitable habitat exists.
- Low: Limited habitat for the taxa occurs on site and no known occurrences were found within the database search and the taxa's range includes the geographic area.
- Not Likely to Occur: Species or sign not observed on the site, outside of the known range, and conditions unsuitable for occurrence.

Twenty taxa were observed or considered in or adjacent to the Study Area. The remaining 67 taxa have a low, moderate, or high potential to occur based on existing recorded occurrences, known geographic range, and the presence of suitable habitat (See Table C.3-5). Special-status wildlife species having a low, moderate, or high potential to occur are described in Appendix C-5.

Special-status invertebrates or fish were not detected in the Study Area. Arroyo toad, federally listed as endangered and a CDFW Species of Special Concern, was the only sensitive amphibian detected within Little Rock Creek. This species was detected upstream of Rocky Point and was routinely observed during surveys. The USFWS proposed to downlist the status of this species from Endangered to Threatened in March 2014. The USFWS withdrew the proposed rule on December 23, 2015 and this species remains federally listed as Endangered.

A number of special-status reptiles were observed in the Project Study Area. A single coast horned lizard (*Phrynosoma blainvillii*), a CDFW Species of Special Concern, was observed in a sandy drainage adjacent to the main access road to the Reservoir. Coastal whiptail (*Aspidoscelis tigris*), a CDFW Special Animal, was observed along the fringes of the riparian areas just below the dam. Southwestern pond turtle (*Actinemys marmorata*) and two-striped garter snake (*T. hammondi*), both CDFW Species of Special Concern and Forest Service Sensitive Species, were observed within aquatic habitat above and below the dam.

Desert tortoise has not been observed in the Project area but habitat for this species is present at the proposed 47th Street East sediment disposal site and along the haul routes. Historically, desert tortoises were likely abundant in the Project area and likely utilized the foothills of the ANF. Although habitat on the sediment disposal site has been mapped as suitable for desert tortoise by the DRECP and USGS (see Figure C.3-9), it is unlikely this species is present in this location. No tortoises or sign of tortoises were observed during surveys.

Seven special-status songbirds were detected within riparian areas of the Study Area and included least Bell's vireo (*Vireo bellii pusillus*), willow flycatcher (*Empidonax traillii*), Lawrence's goldfinch (*Spinus lawrencei*), Vaux's swift (*Chaetura vauxi*), Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), summer tanager (*Piranga rubra cooperi*), and yellow warbler (*Setophaga petechia*).

Sharp-shinned hawk (*Accipiter striatus*), a CDFW Watch List species, and bald eagle (*Haliaeetus leucocephalus*) were observed at the Reservoir. Bald eagle is a state-listed endangered species and a Forest Service Sensitive Species that appears to be a routine winter visitor to the Reservoir. Although not observed, Swainson's hawk could forage at the 47th Street East sediment disposal site. This species is not expected to nest at the Reservoir.

Sensitive mammals detected at the site included the pallid bat, a CDFW Species of Special Concern and Forest Service Sensitive Species, and Yuma myotis, a CDFW Special Animal. Although not detected during surveys, Nelson's (San Gabriel Mountains) bighorn sheep (*Ovis canadensis nelsoni*) have been observed upstream of the Reservoir by CDFW biologists (L. Welch, personal communication, 10 September 2012).

Mohave ground squirrel has not been observed in the Project area. Historically, this species was widely distributed in the region possibly including the proposed sediment disposal site. However, a 2015 survey determined that the sediment disposal site does not contain suitable habitat for this species (Phoenix, 2015).

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
INVERTEBRATES					
Callophrys mossii hidakupa	San Gabriel Mountains elfin	SA, FSS	Endemic to the San Gabriel and San Bernardino Mountains at elevations of 3,000-5,500 feet, typically on steep, rocky, north-facing cliffs. The larval host plant is a stonecrop (*Sedum spathulifolium*).	There are no known recent records for this species in the Study Area. The Study Area lacks suitable habitat, including host plant.	Not likely to occur
Helminthoglypta traskii	Trask shoulderband snail	SA	Terrestrial; southern California endemic known from Ventura, Los Angeles, Orange, and San Diego Counties; prefers coastal sage scrub and chaparral.	There are no known recent records for this species within a 20 mile radius of the Study Area. However the Study Area is located within the known geographic distribution for this species (Magney, 2011); suitable habitat is limited within the Study Area.	Moderate
Plebejus saepiolus aureolus	San Gabriel Mountains blue butterfly	SA, FSS	Type locality is wet meadow seep in yellow pine forest. The foodplant is *Trifolium wormskioldii.*	There are no known recent records for this species in the Study Area. The Study Area lacks suitable habitat, including foodplant.	Not likely to occur
Plebulina emigdionis	San Emigdio blue butterfly	SA, FSS	Often near streambeds, washes, or alkaline areas. Associated with four-wing saltbush (*Atriplex canescens*) and quail brush (*Atriplex lentiformis*).	There are no known recent records for this species in the Study Area. The Study Area is located within the known geographic distribution for this species· Suitable habitat occurs within limited portions of the Study Area.	Low
FISH					
Catostomus santaanae	Santa Ana sucker	FT, CSC	Typically inhabits small, shallow streams and rivers less than 23 feet (7 meters) wide where water temperature is generally below 72 º F (22 º C), and where currents range from swift to sluggish	This species has not been documented within the Study Area. The Study Area is located outside of the known geographic distribution for this species. The closest known record of this species is from the Santa Clara River approximately 11–12 miles to the west of the Study Area.	Not likely to occur
Gasterosteus aculeatus williamsoni	Unarmored threespine stickleback	FE, SE, CFP	Slow-moving and backwater areas of coastal and inland streams.	This species has not been documented within the Study Area. The Study Area is located outside of the known geographic distribution for this species. The closest known record of this species is from the Santa Clara River approximately 12–13 miles to the west of the Study Area.	Not likely to occur
Gila orcuttii	Arroyo chub	CSC, FSS	Los Angeles Basin southern coastal streams; slow water stream sections with mud or sand bottoms; feeds heavily on aquatic vegetation and associated invertebrates.	There are no known recent records for this species in the Study Area. The Study Area is not located within the known geographic distribution for this species. The nearest known recorded occurrence of this species is over 15 miles to the southeast in the San Gabriel River.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
Rhinicthys osculus ssp. 8	Santa Ana speckled dace	CSC, FSS	Inhabit various stream and channel types, small springs, brooks, and pools in intermittent streams and perennial rivers.	There are no known recent records for this species in the Study Area. The Study Area is not located within the known geographic distribution for this species. The closest known record of this species is from the Big Tujunga Creek approximately 13–15 miles to the west of the Study Area.	Not likely to occur
AMPHIBIANS					
Anaxyrus californicus	Arroyo toad	FE, CSC	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash; rivers with sandy banks, willows, cottonwoods, and/or sycamores.	This species has been documented within the Study Area. More specifically, arroyo toads have been recorded from Rocky Point (at the Reservoir) and upstream within Little Rock Creek past the confluence with Santiago Creek. Arroyo toads have also been detected within Santiago Creek.	Present
Batrachoseps gabrieli	San Gabriel Mtns. slender salamander	FSS, SA	Known only from 13 sites within forest communities of the San Gabriel Mountains. Primarily inhabits talus and large rocks, logs, and bark during periods of surface activity.	Not known to occur in Study Area but could potentially utilize Little Rock Creek and adjacent riparian areas. The Study Area is outside of the known range of this species but it is known from the portions of the San Gabriel Mountains to the south of the Study Area.	Low
Ensatina eschscholtzii croceater	Yellow-blotched salamander	CSC, FSS	Litter and debris of oak woodland, pine dominated open woodland, and fir dominated open forest.	Suitable habitat does not occur in the Study Area, and it is well outside the known range of this subspecies.	Not likely to occur
Rana boylii	Foothill yellow-legged frog	CSC, FSS	Inhabits shallow, small to medium-sized, rocky streams, from sea level to about 6,365 feet.	Although suitable habitat occurs within portions of the Study Area, it is outside the known range of this subspecies. This species is believed to be extirpated from the San Gabriel Mountains.	Not likely to occur
Rana draytonii	California red-legged frog	FT, CSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation; requires 11-20 weeks of permanent water for larval develop-ment; must have access to aestivation habitat.	Although suitable habitat occurs within portions of the Study Area, it is outside the known range of this subspecies.	Not likely to occur
Rana muscosa	Sierra Madre (= southern mountain) yellow-legged frog	FE, SE, CSC	Prefers partly shaded, shallow streams with a rocky substrate; requires a minimum of 15 weeks of permanent water for metamorphosis.	The largest known population of this species occurs within the upper portions of the Little Rock Creek watershed. Pockets of suitable habitat may occur when flows and/or pools are present within Little Rock Creek; this species has not been detected within the Study Area.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
Spea hammondii	Western spadefoot	CSC	Occurs in numerous habitat types, primarily in grasslands but can be found in valley-foothill hardwood woodlands, sage scrubs, chaparral where pooled/ponded water, supporting typically clay-rich soils, remains through early spring (April/May); in some areas, vernal pools, stock ponds, and road pools are essential for breeding, egg-laying, and larval development.	There are no known records for this species in the Study Area within a 15 mile radius. The Study Area is located just outside the known geographic distribution for this species. Pockets of suitable habitat occur within the Study Area.	Low
Taricha torosa	Coast Range newt	CSC	Historically distributed in coastal drainages from central Mendocino County in the North Coast Ranges, south to Boulder Creek, San Diego County. Breeds in ponds, reservoirs, streams; terrestrial individuals occupy various adjacent upland habitats, including grasslands, woodlands, and forests.	Suitable habitat is present onsite above Rocky Point. Known from locations throughout the San Gabriel Mountains.	Moderate
REPTILES					
Actinemys marmorata	South western pond turtle	CSC, FSS	Inhabits permanent or nearly permanent bodies of water in various habitat types; requires basking sites such as partially submerged logs, vegetation mats, or open mud banks.	This species was observed within the Study Area (above and below the Reservoir) during surveys conducted in 2012. The Study Area is located within the known geographic distribution for this species.	Present
Anniella pulchra pulchra	Silvery (=California) legless lizard	CSC, FSS	Sandy or loose loamy soils under sparse vegetation; soil moisture is essential; prefer soils with high moisture content.	This species was detected within the Study Area under a small woodpile, adjacent to the Reservoir, during surveys conducted in 2012.	Present
Aspidoscelis tigris stejnegeri	Coastal whiptail	SA	Found in deserts and semi-arid areas with sparse vegetation and open areas; also found in woodland and riparian habitats; substrates may be firm soil, sandy, or rocky.	This species was documented within the Study Area during surveys conducted in 2012. The Study Area is located within the known geographic distribution for this species; suitable habitat occurs throughout the Study Area.	Present
Charina bottae umbratica	Southern rubber boa	ST	Occurs in conifer forests near streams and meadows. Known to occur in the Transverse Range, San Bernardino Mountains, and thought to be extirpated from the San Gabriel Mountains.	Thought to be extirpated from the San Gabriel Mountains, but focused surveys have not been conducted. Suitable habitat does not occur in the Study Area.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
Charina trivirgata roseofusca (Lichanura orcutti)	Coastal rosy boa	SA, FSS	Fairly dense vegetation and rocky habitat within desert and chaparral from the coast to Mojave and Colorado deserts.	Suitable habitat is present within the Study Area outside the perimeter of the Reservoir. This species was reported approximately 6 miles west of the Study Area in June 2009 along a transmission line corridor.	Moderate
Diadophis punctatus modestus	San Bernardino ringneck snake	SA, FSS	Canyons with rocky outcrops or rocky talus slopes in conifer forest or chaparral habitats.	Suitable habit occurs within the Study Area and this species was observed during surveys.	Present
Gopherus agassizii	Desert tortoise	FT, ST	Inhabits semi-arid grasslands, gravelly desert washes, canyon bottoms and rocky hillsides. Associated plant species includes creosote bush, Joshua tree, cheese bush, saltbush, grasses, and cacti.	The Study Area lies outside of the known range of this species; portions of the identified haul routes, however, do occur within the range and have suitable habitat. Habitat on the sediment disposal site has been mapped as suitable for desert tortoise by the DRECP.	Not likely to occur
Lampropeltis zonata parvirubra	San Bernardino mountain kingsnake (California mountain kingsnake, San Bernardino population)	CSC, FSS	Inhabits canyons with low to moderate tree canopy, with rock outcrops or talus, frequently in association with big cone spruce and chaparral vegetation at lower elevations.	Suitable habitat occurs within the Study Area.	Moderate
Phrynosoma blainvillii	Coast (San Diego) horned lizard	CSC,	A variety of habitats, including coastal sage scrub, chaparral, oak woodland, riparian woodland, and coniferous forest. Friable, sandy soils in areas with an abundant prey base of native ants are key habitat components.	This species was documented within a sandy drainage, adjacent to the main access road through the Reservoir, during surveys conducted in 2012. The Study Area is located within the known geographic distribution for this species; suitable habitat occurs in portions of the Study Area.	Present
Thamnophis hammondii	Two-striped garter snake	CSC, FSS	Highly aquatic; found in or near perma-nent fresh water; often along streams with rocky beds and riparian growth.	This species was documented within the Study Area downstream of the dam and upstream of Rocky Point during surveys conducted in 2012. The Study Area is located within the known geographic distribution for this species; suitable habitat occurs throughout the Study Area.	Present
BIRDS					
Accipiter cooperii	Cooper's hawk	WL	Woodland, chiefly of open, interrupted, or marginal type; nest sites mainly in riparian growths of deciduous trees.	The eBird online database documents sightings of this species at the Reservoir and the CNDDB reports a historic occurrence approximately 8 miles northwest of the Study Area. These sightings do not indicate if the individuals were foraging, passing through, or nesting. Suitable habitat is present within the riparian areas of the Reservoir perimeter and Little Rock Creek.	Present (non-nesting)
Accipiter gentilis	Northern goshawk	CSC, FSS	Nests in old-growth stands of conifer and conifer/hardwood forests.	Suitable nesting habitat for this species does not occur within the Study Area and is highly fragmented within the Angeles National Forest.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
Accipiter striatus	Sharp-shinned hawk	WL	Prefers, but not restricted to riparian habitats; breeds in ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats; requires north-facing slopes with perches.	This species was observed within the Study area during surveys conducted in 2010 as was presumed to be overwintering. No nesting activity was observed.	Present
Agelaius tricolor	Tricolored blackbird	SE, CSC, BCC	Highly colonial species; requires open water, protected nesting substrate, and foraging areas with insect prey within a few kilometers of colony.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; suitable breeding and foraging habitat occurs, depending on water levels, within the upper extents of the Reservoir (changes year to year). Nearest recorded occurrence is approximately seven miles northwest of the Study Area in Lake Palmdale.	Moderate
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	WL	Resident in southern California coastal sage scrub and sparse mixed chaparral; frequents relatively steep, often rocky hillsides with grass and forb patches.	This species was observed within the Study Area during surveys conducted in 2012; breeding was confirmed within the Study Area.	Present
Artemisiospiza belli belli	Bell's sage sparrow	WL, BCC	Found in shrubby habitats including coastal sage scrub and chaparral, primarily of the chamise type.	There are no known records for this species in the Study Area; suitable habitat is present within the Study Area outside of the Reservoir footprint. Nearest recorded occurrence, from 2005, is approximately 13 miles northwest of the Study Area.	Moderate
Aquila chrysaetos	Golden eagle	BGEPA, BCC, CFP, WL	Forages in open grasslands, desert scrub and agricultural fields. Nests on ledges on cliff faces, rock outcrops and occasionally in large trees.	There are no known records for this species within the Study Area; limited suitable nesting habitat for this species occurs within the Study Area but does occur on portions of the ANF. Suitable foraging habitat is present within Study Area.	Moderate (nesting)/High (foraging)
Ardea herodias	Great blue heron	SA	Rookery sites typically occur in groves of large trees within proximity to aquatic foraging areas of streams, wetlands, and grasslands.	This species was documented in the Study Area during surveys conducted in 2012. The Study Area is located within the known geographic distribution for this species; limited suitable rookery habitat occurs within the eastern portions of the Study Area within and adjacent to the Reservoir, suitable foraging habitat occurs throughout the Study Area.	Present (No rookery observed)
Asio flammeus	Short-eared owl	CSC	Usually occurs in open areas with few trees, such as grasslands, prairies, dunes, meadows, agricultural fields, emergent wetlands; requires dense vegetation for cover.	There are no known recent records for this species in the Study Area; suitable habitat is not present within the Study Area. Limited suitable habitat may be present along the proposed haul routes.	Low**
Asio otus	Long-eared owl	CSC	Breeds in thickly vegetated desert washes and oases, montane coniferous forests and in riparian and pinyon-juniper woodlands. Requires adjacent open habitats for foraging.	Suitable habit occurs within the Study Area; however, there are no known reports of this species within or adjacent to the Study Area. This species is known to occur on portions of the ANF to the southwest of the Study Area.	Moderate

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
Athene cunicularia	Burrowing owl	BCC, CSC	Open, dry perennial or annual grasslands, deserts, and scrublands characterized by low-growing vegetation; subterranean nester, dependent upon burrowing mammals, particularly California ground squirrels.	There are no known records for this species in the Study Area; nearest CNDDB record for this species occurs approximately 10 miles to the northwest. While suitable habitat for this species does not occur within the Study Area it does occur along portions of the proposed haul routes.	Moderate**
Buteo regalis	Ferruginous hawk	BCC, WL	Forages in grasslands and agricultural fields.	There are no known records for this species in the Study Area; nearest CNDDB record for this species occurs approximately 10 miles to the northwest. This species is a known winter resident in the Antelope Valley. Limited foraging habitat is present within the Study Area.	Moderate
Buteo swainsoni	Swainson's hawk	ST, BCC	Breeds in stands with few trees in juniper-sage flats, riparian areas, and oak savannahs.	Limited suitable nesting habitat is present within the Study Area; there are no known records for this species within the Study Area. This species may move through the Study Area during migration and while foraging.	Moderate
Calypte costae	Costa's hummingbird	SA	Primarily occurs in desert wash, edges of desert riparian and valley-foothill riparian, coastal scrub, desert scrub, low-elevation chaparral.	This species was documented during surveys within the Study Area in 2012. Suitable habitat is present within the Study Area.	Present
Chaetura vauxi vauxi	Vaux's swift	CSC	Breeds in coniferous and mixed coniferous forests; requires large-diameter, hollow trees for breeding and roosting; forages in areas of open water where insect prey congregates.	This species was documented during surveys within the Study Area in May 2012 although the breeding status of the individuals was not confirmed.	Present
Charadrius montanus	Mountain plover	BCC, CSC	Winters in short grasslands and agricultural fields. Breeds in short-grass prairies outside of California.	Suitable habitat is not present within the Study Area; there are no known records for this species in the Study Area.	Not likely to occur
Circus cyaneus	Northern harrier	CSC	Prefer open country, grasslands, steppes, wetlands, meadows, agriculture fields; roost and nest on ground in shrubby vegetation often at edge of marshes.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; suitable breeding and foraging habitat occurs within the Study Area.	Moderate
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	FT, SE, BCC, FSS	Nests along the broad, lower flood-bottoms of larger river systems; also nests in riparian forests and riparian jungles of willow often mixed with cottonwoods, with an understory of blackberry, nettles, or wild grape.	There are no known records for this species in the Study Area; there are no CNDDB records for this species within a 15 mile radius of the Study Area; the Study Area is located within the known geographic distribution for this species; suitable breeding and foraging habitat does not occur in the Study Area.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
Dendroica petechia brewsteri	Yellow warbler	BCC, CSC	Riparian plant associations; prefers willows, cottonwoods, aspens, sycamores, and alders for nesting and foraging.	This species was documented within the Study Area during surveys conducted in 2012 and was noted as a potential breeding resident; the Study Area is located within the known geographic distribution for this species; suitable breeding and foraging habitat occurs in the Study Area.	Present
Elanus leucurus	White-tailed kite	CFP	Typically nests at lower elevations in riparian trees, including oaks, willows, and cottonwoods; forages over open country.	There are no known records for this species in the Study Area or surrounding areas. The Study Area is located within the known geographic distribution for this species; limited breeding and foraging habitat occurs in the Study Area.	Low
Empidonax traillii	Willow flycatcher	SE	Moist, shrubby areas, often with standing or running water for breeding, and winters in shrubby clearings and early successional growth	There are no known breeding records for this species in the Study Area or surrounding areas. The Study Area is located within the known geographic distribution for this species; and 5 willow flycatchers of undetermined subspecies were observed below the Dam and in Littlerock Creek during Project surveys in May 2012. Suitable breeding habitat is not present within the Study Area as this species prefers riparian areas of greater density than are present. Suitable foraging habitat occurs throughout the Study Area.	Present (Non-nesting migrants)
Empidonax traillii extimus	Southwestern willow flycatcher	FE, SE	Riparian woodlands in southern California.	There are no known breeding records for this species in the Study Area or surrounding areas. The Study Area is located within the known geographic distribution for this species. Willow flycatchers of undetermined subspecies were observed below the Dam and in Littlerock Creek during Project surveys in May 2012. Suitable breeding habitat is not present within the Study Area as this species prefers riparian areas of greater density than are present. Suitable foraging habitat occurs throughout the Study Area.	Potentially Present (Non-nesting migrants)
Eremophila alpestris actia	California horned lark	WL	Occurs in open habitats, forages in bare dirt in short and/or sparse grassland and areas of scattered shrubs.	There are no known records for this species in the Study Area; there are no CNDDB records for this species within a 15 mile radius of the Study Area. Limited breeding and foraging habitat occurs in the Study Area.	Low
Falco columbarius	Merlin	WL	Wide-variety of habitats including marshes, deserts, seacoasts, open woodlands, fields.	There are no known records for this species in the Study Area or surrounding areas; This species is a winter resident that does not breed in California; the Study Area is located within the known geographic winter distribution for this species; suitable foraging habitat occurs throughout the Study Area.	Moderate
Falco mexicanus	Prairie falcon	BCC, WL	Rare in southern California; nests along cliff faces or rocky outcrops; forages over open spaces, agricultural fields.	There are no known records for this species in the Study Area. The CNDDB reports one historic occurrence approximately 10 miles to the west of the Study Area. Marginal (at best) nesting habitat occurs within the Study Area; suitable foraging habitat occurs throughout the Study Area.	Low

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
Falco peregrinus anatum	American peregrine falcon	BCC, CFP	Occurs in various open habitats, especially where suitable nesting cliffs present.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; suitable breeding habitat does not occur within but may be present in areas adjacent to the Study Area; foraging habitat occurs throughout the Study Area.	Low
Gymnogyps californianus	California condor	FE, SE, CFP	Nests in caves, crevices, behind rock slabs, or on large ledges on high sandstone cliffs; requires vast expanses of open savannah, grasslands, and foothill chaparral with cliffs, large trees and snags for roosting and nesting.	There are no known records for this species in the Study Area. The ANF is within the range of the condor and this wide ranging species has been documented as using the Forest for foraging, loitering, and roosting. Suitable nesting habitat is not present within the Study Area.	Low
Haliaeetus leucocephalus	Bald eagle	SE, CFP, BGEPA, FSS	Nests on large trees in the vicinity of large lakes, reservoirs and rivers. Wintering birds are most often found near large concentrations of waterfowl or fish.	Although not documented nesting within the Study Area, this species was observed foraging at the Reservoir during surveys conducted in 2015. A bald eagle has been observed overwintering at the Reservoir.	Present (non-nesting)
Icteria virens	Yellow-breasted chat	CSC	Inhabits riparian thickets of willow and other brushy tangles near water courses; nests in low, dense riparian vegetation; nests and forages within 10 feet of ground.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; limited breeding and foraging habitat occurs in the Study Area.	Moderate
Lanius ludovicianus	Loggerhead shrike	BCC, CSC	Broken woodland, savannah, pinyon-juniper woodland, Joshua tree woodland, riparian woodland, desert oases, scrub, and washes; prefers open country for hunting with perches for scanning and fairly dense shrubs and brush for nesting.	Although not documented within the Study Area an occurrence of this species is reported from the CNDDB approximately 2.5 miles east of the Study Area. Suitable foraging and breeding habitat occurs within the Study Area.	High
Numenius americanus	Long-billed curlew	BCC, WL	Generally nest in short grasses including grass prairies or agricultural fields and move to denser grasslands after young have fledged. Winter at the coast and in Mexico.	There are no known recent records for this species in the Study Area; There are a variety of eBird records for this species approximately 20 miles to the north within the Lancaster Area. Suitable habitat occurs within portions of the Study Area.	Low
Pandion haliaetus	Osprey	WL	Forages and nests along rivers, lakes, and reservoirs.	There are no known recent records for this species in the Study Area; however, this generally coastal species is known from the San Gabriel Mountains. Suitable foraging habitat occurs within and adjacent to the Reservoir.	Low
Piranga rubra	Summer tanager	CSC	Breeds in mature, desert riparian habitats dominated by cottonwood and willow.	This species was documented during surveys within the Study Area in May and July 2012 although the breeding status of the individuals was not confirmed.	Present

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
Polioptila californica californica	Coastal California gnatcatcher	FT, CSC	Various sage scrub communities, often dominated by California sage and buckwheat; generally avoids nesting in areas with a slope of greater than 40%, and typically less than 820 feet in elevation.	There are no known records for this species in the Study Area or surrounding areas; the Study Area is located within the known geographic distribution for this species. Suitable habitat for this species does not occur within the Study Area.	Not likely to occur
Pyrocephalus rubinus	Vermilion flycatcher	CSC	Nests in desert riparian and landscaped cottonwoods and other trees in developed areas including golf courses; often near agricultural or grassland areas.	There are no known recent records for this species in the Study Area; There is a 2010 eBird record for this species approximately 7 miles to the northwest at Lake Palmdale. Suitable habitat occurs within portions of the Study Area.	Moderate
Riparia riparia	Bank swallow	ST	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert; requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, or the ocean to dig a nesting hole.	There are no known recent records for this species in the Study Area; There are numerous eBird records for this species approximately 20 miles to the northwest near the City of Lancaster. Suitable habitat occurs within portions of the Study Area.	Low
Selasphorus sasin	Allen's hummingbird	BCC, SA	Most commonly breeds in coastal scrub, valley-foothill hardwood, and valley-foothill riparian habitats; occurs in a variety of woodland and scrub habitat as a migrant.	There are no known recent records for this species in the Study Area. There are several eBird records for this species approximately 5 miles to the northwest and 10 miles to the east. Suitable habitat occurs throughout the Study Area.	Moderate
Spinus lawrencei	Lawrence's goldfinch	BCC, SA	Breeds in a variety of habitats throughout its range in southern California, including mixed conifer-oak forest, blue oak savannah, pinyon-juniper woodland, chaparral, riparian woodland, and desert oases.	This species was observed within the Reservoir and within the southern extent of the Study Area in 2012. Suitable habitat occurs within portions of the Study Area.	Present
Strix occidentalis occidentalis	California spotted owl	CSC, BCC, FSS	In Southern California occupies montane hardwood and montane hardwood/conifer forests with dense, multi-layered canopies.	There are no known records for this species in the Study Area or surrounding areas. Suitable habitat does not occur within the Study Area.	Not likely to occur
Toxostoma bendirei	Bendire's thrasher	CSC, BCC	Prefers desert habitats with tall vegetation comprised of cholla cactus, creosote bush and yucca. Also found in juniper woodland.	There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species. Limited suitable habitat is present within the Study Area.	Not likely to occur.
Toxostoma lecontei	Le Conte's thrasher	CSC, BCC	Sparse desert scrub such as creosote bush, Joshua tree, and saltbush scrubs, or sandy-soiled cholla-dominated vegetation. Nests in dense, spiny shrubs or densely branched cactus in desert wash habitat.	There are no known records for this species in the Study Area. The CNDDB reports occurrences of this species approximately 5 miles northeast of the Study Area. Suitable habitat occurs within portions of the Study Area.	Moderate

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
Vireo bellii pusillus	Least Bell's vireo	FE, SE	Summer resident of southern California in low riparian habitats in vicinity of water or dry river bottoms; found below 2000 ft; nests placed along margins of bushes or on twigs projecting into pathways, usually willow, mesquite, mulefat.	This species was detected during surveys conducted below the dam in 2010, 2011, and 2012. Suitable habitat occurs within the northern extent of the Study Area.	Present
Vireo vicinior	Gray Vireo	FSS	Summer resident of southern California in desert and riparian areas. Known to nest in chaparral, scrub oak, and big sagebrush.	Known from Liebre Mountain and Mint Canyon (near Vasquez Rocks), Los Angeles County.	Moderate
MAMMALS					
Antrozous pallidus	Pallid bat	CSC, FSS	Desert, grassland, shrubland, wood-land, forest; most common in open, dry habitats with rocky areas for roosting; very sensitive to disturbance of roosting sites.	This species was detected during surveys in the Study Area. Suitable habitat occurs throughout the Study Area.	Present
Bassariscus astutus	Ring-tailed cat	CFP	Occurs in chaparral, coastal sage scrub, riparian scrub, oak woodlands, and riparian woodlands in proximity to permanent water.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species and it is known to occur within sections of the San Gabriel Mountains. Suitable habitat is present within portions of the Study Area.	Moderate
Chaetodipus fallax pallidus	Pallid San Diego pocket mouse	CSC	Prefers to inhabit desert wash, desert scrub, desert succulent scrub and/or pinyon-juniper woodland.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species. Nearest CNDDB for this record is approximately 7 miles to the southeast of the Study Area. Suitable habitat occurs within portions of the Study Area.	Low
Corynorhinus townsendii	Townsend's big-eared bat	SC, CSC, FSS	Coastal conifer and broadleaved forests, oak and conifer woodlands, arid grasslands and deserts, and high-elevation forests and meadows. Primarily roosts in caves and abandoned mines, but may roost in buildings, bridges, rock crevices, and hollow trees in many habitat types.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species. Roosting and foraging habitat occur within portions of the Study Area.	Moderate
Dipodomys merriami parvus	San Bernardino kangaroo rat	FE, CSC	Generally found in alluvial scrub vegetation on sandy loam substrates found in alluvial fans and/or floodplains. Needs early to intermediate seral stage vegetation.	There are no known recent records for this species in the Study Area. The nearest CNDDB record is approximately 10 miles northeast of the Study Area and this is likely a misidentification. Suitable habitat is not present within the Study Area.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
Euderma maculatum	Spotted bat	CSC	Occupies a wide variety of habitats from arid deserts and grasslands, to mixed conifer forests; feeds over water and along washes; needs rock crevices in cliffs or caves for roosting.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	Moderate
Eumops perotis californicus	Western mastiff bat	CSC	Many open, semi-arid to arid habitats, including coniferous and deciduous woodland, coastal scrub, grassland, chaparral; roosts in crevices in cliff faces, high buildings, trees, tunnels.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	Moderate
Lasiurus blossevillii	Western red bat	CSC	Primarily roosts in mature riparian forest but also found in upland forests, woodlands, and orchards	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	Moderate
Lasiurus cinereus	Hoary bat	SA	Prefers deciduous and coniferous woodlands; primarily roosts in tree foliage.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	High
Macrotus californicus	California leaf-nosed bat	CSC	Prefers caves, mines and rock shelters in Sonoran desert scrub.	There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	Low
Myotis ciliolabrum	Western small-footed myotis	SA	Occurs in a wide variety of arid upland habitats at elevations ranging from sea level to 2,700 meters (8,860 feet); day roosts include rock crevices, caves, tunnels and mines, and, sometimes, buildings and abandoned swallow nests.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	High
Myotis thysanodes	Fringed myotis	SA, FSS	Occurs in a wide variety of habitats. Optimal habitats include pinyon–juniper, valley foothill hardwood and hardwood-conifer woodlands. Forms maternity colonies and roosts in caves, mines, buildings and crevices.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	High
Myotis volans	Long-legged myotis	SA	Generally found along forest edges with good sun exposure. Breeds in tree cavities, under loose bark, rock crevices, cliffs and buildings. Forage over ponds, streams and forest clearings.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.	High

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
Myotis yumanensis	Yuma myotis	SA	Inhabits open forests and woodlands with sources of water. Species is closely tied to bodies of water, over which it feeds. Forms maternity colonies in caves, mines, buildings, or crevices.	This species was detected within the Study Area during surveys conducted in 2012. Suitable foraging and breeding habitat occurs within portions of the Study Area.	Present
Neotamias speciosus speciosus	Lodgepole chipmunk	SA	Occurs in isolated populations in the Southern California mountains in open-canopy forests and mixed-conifer from 6000–10,350 feet in elevation	There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species and is well below the preferred elevation of this species. The CNDDB reports a historic occurrence of this species approximately 10 miles southeast of the Study Area.	Not likely to occur
Onychomys torridus ramona	Southern grasshopper mouse	CSC	Occurs primarily in grassland and sparse coastal sage scrub habitats.	There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; Suitable habitat occurs within limited portions of the Study Area.	Moderate
Ovis canadensis nelsoni	Nelson's (San Gabriel Mountains) bighorn sheep	SA, FSS	Inhabits open, rocky, steep areas with access to water and herbaceous vegetation. Populations currently managed in the Sheep management area of the San Gabriel Mountains.	This species has been observed upstream of the Reservoir near Santiago Creek in 2005. The Study Area is located within the known geographic distribution for this species; suitable habitat occurs within portions of the Study Area.	Present
Perognathus alticolus alticolus	White-eared pocket mouse	CSC, FSS	Known only from a series of allopatric populations in arid yellow pine communities in the vicinity of Little Bear Valley and Strawberry Peak, San Bernardino Mountains, San Bernardino County. This species is likely to be found among Sagebrush and other shrubs in open, Ponderosa Pine forests and Pinyon-Juniper woodlands and in Sagebrush covered areas on the northern slopes and Big Bear Basin of the San Bernardino Mountains.	There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species.	Low
Perognathus alticolus inexpectatus	Tehachapi pocket mouse	CSC, FSS	Occurs in a diversity of habitats including, Joshua tree woodland, pinyon-juniper woodland, oak savanna, and native and non-native grasslands. Burrows in friable, sandy soil.	There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species. This species is, however, known to occur on the east slopes of the San Gabriel Mountains. Suitable habitat is present within the Study Area.	Not likely to occur

Table C.3-5. Known and Potential Occurrence of Special-Status Wildlife within the Study Area

Taxa					
Scientific Name	Common Name	Status	Habitat Type	Comments	Occurrence Potential
Perognathus longimembris brevinasus	Los Angeles pocket mouse	CSC	Found in open ground of fine sandy composition; prefers fine, sandy soils and may utilize these soil types for burrowing; may be restricted to lower elevation grassland and coastal sage scrub.	There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species.	Not likely to occur
Taxidea taxus	American badger	CSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils; require sufficient food source, friable soils, and open, uncultivated ground; prey on burrowing rodents.	There are no known records for this species in the Study Area; the Study Area is located within the known geographic distribution for this species; suitable habitat occurs within portions of the Study Area.	Moderate
Xerospermophilus mohavensis	Mohave ground squirrel	ST	Occurs in the Mojave Desert in desert scrub and Joshua tree woodlands with winterfat (*Krascheninnikovia lanata*) and spiny hopsage (*Grayia spinosa*).	This species is not expected to occur at the Reservoir. A 2015 survey determined that the sediment disposal sites do not contain suitable habitat for this species (Phoenix, 2015).	Not likely to occur

Federal Rankings:
FE = Federally Endangered
FT = Federally Threatened
FP = Federal Proposed for Listing
FC = Federal Candidate for Listing
BCC = USFWS Bird of Conservation Concern
FSS = Forest Sensitive Species (ANF; USFS, 2014)
BGEPA = Bald and Golden Eagle Protection Act

State Rankings:
SE= State Endangered
ST = State Threatened
SC = State Candidate for Listing
CFP = California Fully Protected
CPF = California Protected Fur-bearer
SA = CDFW Special Animal
WL = CDFW Watch List
CSC = California Species of Special Concern

* Although these species have the some potential to occur or are present within the Study Area, they are likely to be limited to occasional or sporadic use of the Project area.

** The occurrence potential for these species is limited to the proposed haul routes only and the 47th Street East sediment disposal site. Suitable habitat for the indicated species is not present within Reservoir.

C.3.1.10 Designated Critical Habitat

Designated Critical Habitat for the arroyo toad, Unit 21 (50 CFR Part 17), is present immediately south of the proposed grade control structure at Rocky Point (USFWS, 2011). Refer to Figure C.3-6 for a graphical depiction of critical habitat within the Study Area.

C.3.1.11 Jurisdictional Waters and Wetlands

The Antelope Valley Watershed, which contains the majority of the Project, is a large (3,387-square-mile) closed basin in the western Mojave Desert. All water that enters the watershed either infiltrates into the underlying groundwater basin, or flows toward three playa lakes located near the center of the watershed. These playa lakes are located on Edwards Air Force Base and include Rosamond Lake, Rogers Dry Lake, and Buckhorn Dry Lake. Rosamond and Rogers Dry Lakes are used by Edwards Air Force Base for flight test activities, research operations, and emergency landings.

Little Rock Creek is a major intermittent drainage that transports water from the San Gabriel Mountains to the playas described above. During periods of normal rainfall, the creek readily overtops the dam and flows for several miles into the Antelope Valley. Riparian vegetation is present at the Reservoir and along Little Rock Creek below the dam. The proposed 47th Street East sediment disposal site is located in the lower foothills of the San Gabriel Mountains immediately below the California Aqueduct. This site is bisected by a series of ephemeral drainages that carry surface water off the site. As a result of the dry climate in the Project area, the existing ephemeral streams typically flow only during periods of heavy rainfall.

A preliminary jurisdictional delineation of State and or federal waters/wetlands was conducted at the Reservoir, at Little Rock Creek below the dam, and at 47th Street East sediment disposal site (see Figures C.3-12a, C.3-12b). Based on this survey the preliminary jurisdictional determination and delineation of waters report identified 92.306 Federal non-wetland waters and 97.428 acres of State jurisdictional waters (see Table C.3-6). Federal wetland waters do not occur in the Reservoir or in Little Rock Creek. Littlerock Reservoir, Little Rock Creek, and the ephemeral drainages on the 47th Street East sediment disposal site would be considered “waters of the United States” and would be subject to the jurisdiction of the USACE, the CDFW, and the RWQCB.

Table C.3-6. Jurisdictional Waters in the Project area

	Corps/LRWQCB Waters and Wetlands (Acres)		
Location	Non-wetland Waters of U.S.	Wetlands	CDFW Jurisdictional Waters (acres)
Reservoir	91.9	0.0	96.4
District Access Road	0.006	0.0	0.028
47th Street East Sediment Disposal Area	0.4	0.0	1.0
Total	92.306	0.0	97.428

C.3.1.12 Wildlife Corridors and Linkages

The ability for wildlife to move freely among populations is important to long-term genetic variation and demography. Fragmentation and isolation of natural habitat may cause loss of native species diversity in fragmented habitats. In the short term, wildlife movement may also be important to individual animals’ ability to occupy home ranges, if a species range extends across a potential movement barrier. These considerations are especially important for rare, threatened, or endangered species, and wide-ranging species such as large mammals, which exist in low population densities.

The Reservoir is located within the boundaries of the ANF, traversing an area dominated by steep, mountainous ridgelines and deep valleys. From a wildlife movement perspective, the ANF can be considered a large block of continuous open space surrounded by transitional ecotones, including the arid desert regions to the north and the highly developed San Gabriel Valley and Los Angeles Basin to the south. As a result, the ANF provides expansive habitat for wildlife movement and represents a broad, regional linkage between the San Bernardino Mountains to the east and the Santa Susana and Sierra Madre Mountains to the west. The proposed sediment disposal areas are located in the urban interface but may still provide passage or resting areas for some species.

The California Essential Habitat Connectivity Project was commissioned by the California Department of Transportation (Caltrans) and CDFW to create a statewide assessment of essential habitat connectivity to be used for conservation and infrastructure planning (Spencer et al., 2010). One of its goals was to create the Essential Connectivity Map, which depicts large, relatively natural habitat blocks that support native biodiversity (natural landscape blocks) and areas essential for ecological connectivity between them (essential connectivity areas).

The Essential Connectivity Map (*ibid*) identifies the San Gabriel Mountains as a natural landscape block with essential connectivity areas in some of the more developed areas. This map does not provide a fine enough scale to identify the Project site, but it is either within or adjacent to a natural landscape block.

The Project area is adjacent to Los Angeles County's proposed Antelope Valley Significant Ecological Area (SEA) and portions of the haul route are within the SEA. The SEA designation is given to land that supports irreplaceable biological resources, and SEAs are mapped as a zoning overlay in the Los Angeles County General Plan (LADRP, 2014). Development within the SEAs is regulated by Los Angeles County Ordinance (Hillside Management and Significant Ecological Areas Ordinance) intended to preserve the biological resources and sustainability of the SEAs (LADRP, 2014).

The Antelope Valley SEA extends from the ANF to the playa lakes within Edwards Air Force Base, encompassing most of the two largest drainages (Little Rock Creek and Big Rock Creek) exiting the northern slope of the San Gabriel Mountain range. The Little Rock Creek segment of the SEA extends from the Littlerock Dam north along the Little Rock Creek Wash and floodplain (LADRP, 2014).The SEA serves as a major habitat linkage and movement corridor for plant and wildlife species. The Little Rock Creek (and Santiago Creek) riparian corridor, and its associated uplands, is recognized as a vital pathway for wildlife moving from the higher elevations of the surrounding ANF to desired lower elevation habitats. Several migratory songbirds utilize the riparian vegetation within the corridor for breeding, nesting, and foraging, or at a minimum, as transient rest sites during migration. Additionally, large, wide-ranging animals, such as black bear, mountain lion, and coyote have been documented at the Reservoir in search of prey opportunities, water, and cover. In the Project area the Dam acts as a seasonal barrier for some species.

C.3.2 Regulatory Framework

The following are federal, state, and local laws, ordinances, regulations, and standards that apply to biological resources and jurisdictional waters and wetlands. See Section C.9 (Recreation and Land Use) for an evaluation of policies within the Forest Service Land Management Plan that are applicable to biological resources.

C.3.2.1 Federal

- **Endangered Species Act of 1973.** The Endangered Species Act (ESA) (16 USC 1531 et seq.) and subsequent amendments establish legal requirements for the conservation of endangered and threatened species and the ecosystems upon which they depend. The ESA also requires the USFWS to designate critical habitat for listed threatened and endangered species. The effects analyses for designated critical habitat must consider the role of the critical habitat in both the continued survival and the eventual recovery (i.e., the conservation) of the species for which it was designated. ESA provisions protect federally listed threatened and endangered species and their habitats from unlawful take and ensure that federal actions do not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.
- **Clean Water Act.** The Clean Water Act (33 USC 1251 et seq.) establishes legal requirements for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters.
  - **Section 404.** Section 404 establishes a permit program administered by the U.S. Army Corps of Engineers (USACE) regulating the discharge of dredged or fill material into waters of the United States, including wetlands. Implementing regulations by the USACE are found at 33 CFR Parts 320-330. Guidelines for implementation are referred to as the Section 404(b)(1) Guidelines and were developed by the EPA in conjunction with the USACE (40 CFR Parts 230). The Guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts. A 404(b)(1) Evaluation Summary is included in Appendix F of this EIS/EIR.
  - **Section 401.** Section 401 requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the United States must obtain a State certification that the discharge complies with other provisions of the Clean Water Act. The Regional Water Quality Control Boards administer the certification program in California.
- **Migratory Bird Treaty Act.** The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711) makes it unlawful to possess, buy, sell, purchase, barter or "take" any migratory bird listed in Title 50 of the Code of Federal Regulations Part 10. "Take" is defined as possession or destruction of migratory birds, their nests, or eggs. Disturbances that cause nest abandonment and/or loss of reproductive effort or the loss of habitats upon which these birds depend may be a violation of the Migratory Bird Treaty Act. The Federal Migratory Bird Treaty Act (MBTA) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary. This act encompasses whole birds, parts of birds, and bird nests and eggs. Executive Order 13186 (January 10, 2001) identifies the responsibilities of federal agencies to protect migratory birds, and directs executive departments and agencies to take certain actions to further implement the MBTA. The Order requires each agency that undertakes actions that could affect migratory birds to enter into a Memorandum of Understanding (MOU) with the USFWS to promote the conservation of migratory bird populations. The Forest Service entered into the required MOU with the USFWS on December 8, 2008 (FS Agreement #08-MU-1113-2400-264). The MOU identifies specific activities to be undertaken by the Forest Service and USFWS to promote bird conservation.
- **Bald and Golden Eagle Protection Act.** The Bald Eagle Protection Act of 1940 (16 U.S.C. 668, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this Act. Take of bald and golden eagles is defined as follows: "disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering

behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior'' (72 FR 31132; 50 CFR 22.3).

- The USFWS is the primary federal authority charged with the management of bald and golden eagles in the United States. USFWS guidance on the applicability of current Eagle Act statutes and mitigation is currently under review. On November 10, 2009 the USFWS implemented new rules (74 FR 46835) governing the "take" of golden and bald eagles. The new rules were released under the existing Bald and Golden Eagle Act which has been the primary regulation protection unlisted eagle populations since 1940. All activities that may disturb or incidentally take an eagle or its nest as a result of an otherwise legal activity must be permitted by the USFWS under this act.
- **Noxious Weed Act of 1974, as amended.** This act provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health. Under this act, the Secretary of Agriculture was given the authority to designate plants as noxious weeds, and inspect, seize, and destroy products, and to quarantine areas, if necessary to prevent the spread of such weeds.

C.3.2.2 State

- **California Endangered Species Act.** Provisions of California Endangered Species Act protect State-listed Threatened and Endangered species. The CDFW regulates activities that may result in "take" of individuals ("take" means "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill"). Habitat degradation or modification is not expressly included in the definition of "take" under the California Fish and Game Code. Additionally, the California Fish and Game Code contains lists of vertebrate species designated as "fully protected" (California Fish & Game Code §§ 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians], 5515 [fish]). Such species may not be taken or possessed.
- In addition to federal and State-listed species, the CDFW also has produced a list of Species of Special Concern to serve as a "watch list." Species on this list are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Species of Special Concern may receive special attention during environmental review, but they do not have statutory protection.
- Birds of prey are protected in California under the State Fish and Game Code. Section 3503.5 states it is "unlawful to take, possess, or destroy any birds of prey (in the order Falconiformes or Strigiformes) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this Code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "take" by the CDFG. Under Sections 3503 and 3503.5 of the State Fish and Game Code, activities that would result in the taking, possessing, or destroying of any birds-of-prey, taking or possessing of any migratory nongame bird as designated in the Migratory Bird Treaty Act, or the taking, possessing, or needlessly destroying of the nest or eggs of any raptors or non-game birds protected by the Migratory Bird Treaty Act, or the taking of any non-game bird pursuant to Fish and Game Code Section 3800 are prohibited.
- **California Code of Regulations (Title 14, sections 670.2 and 670.5).** Identifies the plants and animals of California that are declared rare, threatened, or endangered.
- **Protected furbearing mammals (California Code of Regulations, Title 14, section 460).** Fisher, marten, river otter, desert kit fox, and red fox may not be taken at any time.

- **Native Plant Protection Act (Fish & Game Code 1900-1913).** California's Native Plant Protection Act (NPPA) requires all State agencies to utilize their authority to carry out programs to conserve endangered and rare native plants. Provisions of NPPA prohibit the taking of listed plants from the wild and require notification of the CDFG at least 10 days in advance of any change in land use. This allows CDFG to salvage listed plant species that would otherwise be destroyed. The Applicant is required to conduct botanical inventories and consult with CDFG during project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.
- **Section 3503 & 3503.5 of the Fish and Game Code.** Under these sections of the Fish and Game Code, the Applicant is not allowed to conduct activities that would result in the taking, possessing, or destroying of any birds-of-prey, taking or possessing of any migratory non-game bird as designated in the Migratory Bird Treaty Act, or the taking, possessing, or needlessly destroying of the nest or eggs of any raptors or non-game birds protected by the Migratory Bird Treaty Act, or the taking of any non-game bird pursuant to Fish and Game Code Section 3800.
- **Porter-Cologne Water Quality Control Act.** Regional water quality control boards regulate the "discharge of waste" to "waters of the State." All projects proposing to discharge waste that could affect waters of the State must file a waste discharge report with the appropriate regional board. The board responds to the report by issuing waste discharge requirements (WDR) or by waiving WDRs for that project discharge. Both of the terms "discharge of waste" and "waters of the State" are broadly defined such that discharges of waste include fill, any material resulting from human activity, or any other "discharge." Isolated wetlands within California, which are no longer considered "waters of the United States" as defined by Section 404 of the CWA, are addressed under the Porter-Cologne Act.
- **State-Regulated Habitats.** The State Water Resources Control Board is the State agency (together with the Regional Water Quality Control Boards [RWQCB]) charged with implementing water quality certification in California. The Project falls under the jurisdiction of the Los Angeles (Region 4) RWQCB.
- The CDFW extends the definition of stream to include "intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams (USGS defined), and watercourses with subsurface flows. Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife" (CDFG, 1994).
- Activities that result in the diversion or obstruction of the natural flow of a stream; or which substantially change its bed, channel, or bank; or which utilize any materials (including vegetation) from the streambed may require that the Project applicant enter into a Streambed Alteration Agreement with the CDFW.
- **Fully Protected Designations – California Fish and Game Code Sections 3511, 4700, 5515, and 5050.** Prior to enactment of CESA and the federal ESA, California enacted laws to "fully protect" designated wildlife species from take, including hunting, harvesting, and other activities. Unlike the subsequent CESA and ESA, there was no provision for authorized take of designated fully protected species. Currently, 36 fish and wildlife species are designated as fully protected in California, including golden eagle.
- California Senate Bill 618 (signed by Governor Brown in October 2011) authorizes take of fully protected species, where pursuant to an NCCP, approved by CDFW. The legislation gives fully protected species the same level of protection as is provided under the Natural Community Conservation Planning Act for endangered and threatened species (see below).
- **Native Birds – California Fish and Game Code Sections 3503 and 3513.** California Fish and Game Code Section 3503 prohibits take, possession, or needless destruction of bird nests or eggs except as otherwise provided by the Code; Section 3503.5 prohibits take or possession of birds of prey or their eggs except as otherwise provided by the Code; and Section 3513 provides for the adoption of the

MBTA's provisions (above). With the exception of a few non-native birds such as European starling, the take of any birds or loss of active bird nests or young is regulated by these statutes. Most of these species have no other special conservation status as defined above. The administering agency for these sections is the CDFW. As with the MBTA, these statutes offer no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game migratory birds.

- **Streambed Alteration Agreements – California Fish and Game Code Sections 1600-1616.** Under these sections of the Fish and Game Code, an applicant is required to notify CDFW prior to constructing a project that would divert, obstruct, or change the natural flow, bed, channel, or bank of a river, stream, or lake. Preliminary notification and project review generally occur during the environmental review process. When a fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the Project. CDFW jurisdiction is determined to occur within the water body of any natural river, stream, or lake. The term "stream," which includes creeks and rivers, is defined in Title 14, CCR, Section 1.72.

C.3.2.3 Local

- **Los Angeles County Ordinances**
  - **Hillside Management and Significant Ecological Areas Ordinance.** This ordinance regulates development within Significant Ecological Areas (SEAs) to preserve biological resources and sustainability. The SEA designation is given to land that supports irreplaceable biological resources, and SEAs are mapped as a zoning overlay in the Los Angeles County General Plan.
  - **Los Angeles County Oak Ordinance.** This ordinance requires permitting and mitigation for the removal of oak trees.
- **City of Palmdale General Plan (January 1993).** The General Plan sets forth goals to preserve and protect biological resources, including: (1) preserve significant natural and man-made open space areas; (2) protect significant ecological resources and ecosystems, including, but not limited to, sensitive flora and fauna habitat areas; (3) preserve designated natural hillsides and ridgelines in the Planning Area, to maintain the aesthetic character of the Antelope Valley; (4) protect the quality and quantity of local water resources; and (5) promote the attainment of state and federal air quality standards.
- Biological resources are addressed in the City's General Plan Goal ER2, which calls for protecting "…significant ecological resources and ecosystems, including, but not limited to, sensitive flora and fauna habitat areas." Significant Ecological Areas are identified at Big Rock Wash, Little Rock Wash, Ritter Ridge, Portal Ridge, and Alpine Butte. Biological surveys are required for any new development in these areas, and significant environmental resources are required to be considered and preserved to the extent feasible. The plan also calls for the preservation of natural drainage courses and riparian areas containing significant concentrations of ecological resources, as well as significant Joshua tree woodlands.
- The City would require biological assessments and reports for projects in known or suspected natural habitat areas prior to Project approval. These reports would be used to establish significant natural habitat areas and ecologically sensitive zones to prevent disturbance and degradation of these areas. Recommended mitigation measures as identified in the reports would be required to be implemented as development occurs.
- **City of Palmdale Native Desert Vegetation Ordinance.** The City has adopted Ordinance No. 952, referred to as the Native Desert Vegetation Ordinance. This ordinance is designed to preserve a number

of specimen-quality juniper and Joshua trees that add to community identity, and to encourage the use of native vegetation in new development landscaping. All landscaping for new developments must conform to the requirements set forth in the Native Desert Vegetation Ordinance.

- **Antelope Valley Area Plan.** This plan requires minimizing disruption and degradation of the environment, integrating land uses with natural environmental systems, instituting measures to mitigate the impacts of environmental hazards, and prohibiting expansion of urban uses into areas of rare and endangered species. It promotes the designation of significant plant and wildlife habitats as Significant Ecological Areas (SEAs) and preservation of biotic diversity in the valley by designating rare and unique plant and animal SEAs and the measures for their protection. This plan promotes the establishment of an open space network.

C.3.3 Issues Identified During Scoping

Table C.3-7 below provides a list of biological resource issues raised during the public scoping period for the EIS/EIR (see Appendix E, Summary of Scoping Process). Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.3-7. Scoping Issues Relevant to Biological Resources

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
The Draft EIS/EIR should identify an alternative and define mitigation measures to ensure that the concentrations of Hg and PCBs in fish tissue are not increased by the Project and are decreased to the extent feasible.	The EIS/EIR includes a reasonable range of alternatives including allowing the Reservoir to fill with sediment. The presence of Hg and PCBs in fish tissue is considered part of the baseline condition. Standard Project Commitments have been incorporated into the Project that require sediment testing for these and other constituents. Fish tissue and sediment samples were collected to analyze Hg and PCB content. The source of these contaminants is currently unknown. The potential effect of each alternative on levels of Hg and PCBs in surface waters, sediments, and fish tissue is analyzed in Section C.12.5.
The Draft EIS/EIR should evaluate changes to management of fish species as a tool in addressing mercury impairments. Which species are present and how they are managed is an important factor in determining the severity of the problem in a given reservoir. Stocking reservoirs with less predatory fish might limit methylmercury bioaccumulation.	Reservoir management alternatives (such as pH adjustment, nutrient addition, oxygenation, and stocking practices) to reduce methylmercury production are not part of the proposed action. Measures are included as part of the proposed action to ensure that contaminated sediments would not be mobilized or otherwise allowed to enter the aquatic ecosystem. Due to the presence of arroyo toads in Little Rock Creek the CDFW no longer stocks recreational fish in the Reservoir. Native fish were not detected during the surveys. Bluegill and largemouth bass were the most common non-native species detected in the Reservoir and portions of Little Rock Creek above Rocky Point. Green sunfish, pumpkinseed sunfish, common carp, channel catfish, and bullhead are also expected to occur. Rainbow trout and brown trout have been recorded above the Reservoir and in some areas have been removed by the CDFW. Non-native fish would be removed from the Reservoir as part of the proposed action.

Table C.3-7. Scoping Issues Relevant to Biological Resources

Comment	Consideration in the EIS/EIR
Recommend researching existing thresholds for mercury in prey fish and evaluating the potential risk to wildlife that may exist. Utilize the recent data on collected tissue of sport fish to assess potential impacts on wildlife that consume small fish from the reservoir. Include the results of this analysis in the EIS/EIR.	Non-native fish would be removed as part of the proposed action (see Sections B.2.3.2 and C.3.1.5), which would avoid exposure of bird species to elevated levels of contaminants.
Department of Fish and Wildlife	
The Draft EIS/EIR should: (1) Focus on adverse Project impacts to Least Bell's Vireo and identify avoidance measures; and (2) Identify sediment disposal locations and evaluate their impacts to biological resource. Any sediment disposal sites should be carefully evaluated for the presence of wetland habitat (e.g., existing depressions or mining pits).	The EIS/EIR provides an evaluation of impacts to least Bell's vireo and other threatened, endangered, proposed, candidate, sensitive species habitats and wetlands. Standard Project Commitments have been incorporated into the Project to reduce impacts to these species or their habitats. The EIS/EIR provides a thorough analysis of the proposed sediment disposal sites and includes an evaluation of jurisdictional waters at those locations.
Per CEQA Guidelines, §15125(c), information on the regional setting that is critical to an assessment of environmental impacts should place special emphasis on resources that are rare or unique to the region.	The EIS/EIR provides a thorough description of the baseline setting.
The analysis should include a thorough, recent floristic-based assessment of special status plants and natural communities, following the Department of Fish and Wildlife's (DFW) Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (http://www.dfg.ca.gov/habcon/plant/). Conduct floristic, alliance- and/or association-based mapping and vegetation impact assessments within the Project area with use of the Manual of California Vegetation (2nd ed., 2008). Include adjoining habitat areas in this assessment where site activities could lead to direct or indirect impacts off site.	In conformance with CDFG (2009), surveys were (a) floristic in nature, (b) consistent with conservation ethics, (c) systematically covered all habitat types on the sites, and (d) are well documented, by this report and by voucher specimens to be deposited at Rancho Santa Ana Botanic Garden. Vegetation descriptions included the Project area and a 500-foot buffer. Vegetation names are based on Sawyer et al. (2009) and have been defined at least to the alliance level and in some cases to the association level.
Inventory rare, threatened and endangered, and other sensitive species on site and within the area of potential effect, as defined by CEQA Guidelines § 15380. Address seasonal variations in use of the Project area. Develop species-specific survey procedures in consultation with U.S. Fish and Wildlife Service.	Field surveys were conducted between 2007 and 2014 and included a wide range of focused and protocol surveys. Please see Section C.3.1.1 for a description of survey methods.
Analysis should include a 9-quad search around the Project vicinity to identify potential sensitive species. Include a current inventory of the biological resources associated with each habitat type on site and within the area of potential effect. Contact the California Natural Diversity Data Base (www.wildlife.ca.gov/biogeodata/) to obtain current information on any previously reported sensitive species and habitat, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code.	The literature review included a nine quad search in addition to extensive review of existing regulatory plans, technical studies and consultation with local experts.
The DFW strongly discourages disturbance to wetlands or conversion of wetlands to uplands. All wetlands and watercourses, whether intermittent episodic or perennial, should be retained and provided with substantial setbacks that preserve the riparian and aquatic values and maintain their value to on-site and off-site wildlife populations.	A preliminary jurisdictional delineation of State and or federal waters/wetlands was conducted at the Reservoir, at Little Rock Creek below the dam, and at 47th Street East sediment disposal site Based on this survey the preliminary jurisdictional determination and delineation of waters report identified 92.306 Federal non-wetland waters and 97.428 acres of State jurisdictional waters. Federal wetland waters do not occur in the Reservoir or in Little Rock Creek.

Table C.3-7. Scoping Issues Relevant to Biological Resources

Comment	Consideration in the EIS/EIR
The DFW has regulatory authority over activities in streams and/or lakes that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) of a river or stream, or use material from a streambed. Project applicants must provide written notification to the DFW pursuant to the Fish and Game Code (§1600 et seq.) and may need to obtain a Lake and Streambed Alteration Agreement (LSA). In order to issue a LSA, the DFW would require the EIS/EIR to include a full discussion of the Project's potential impacts to the stream or riparian resources and the incorporation of adequate avoidance, mitigation, monitoring and reporting commitments.	Littlerock Reservoir, Little Rock Creek, and the ephemeral drainages on the 47th Street East sediment disposal site would be considered "waters of the United States" and would be subject to the jurisdiction of the USACE, the CDFW, and the RWQCB. As required by law PWD would comply with all regulatory requirements.
The DFW considers adverse impacts to a CESA-listed species to be significant without mitigation. The DFW recommends that the Applicant seek appropriate take authorization under CESA prior to Project implementation (e.g., Incidental Take Permit, Consistency Determination). Early consultation is encouraged, as significant modification to a project and its mitigation measures may be required in order to obtain a CESA Permit. The DFW may need to prepare a separate CEQA document for the issuance of an Incidental Take Permit unless the Project addresses all impacts to CESA-listed species and specifies a mitigation monitoring and reporting program in sufficient detail.	The EIS/EIR provides an analysis of impacts to State and federally listed species. Standard Project Commitments have been incorporated into the Project to avoid or reduce impacts to listed species. In addition, PWD would be seeking take coverage through Section 2081 for potential impacts to State listed species.
Include a discussion of potential adverse impacts to biological resources from sediment-removal activities, staging areas, lighting, noise, human activity, exotic species, and drainage, as well as proposed mitigation measures.	The EIS/EIR provides an analysis of impacts from sediment-removal activities, staging areas, lighting, noise, human activity, exotic species, and to drainages. Standard Project Commitments have been incorporated into the Project to avoid or reduce impacts from the Project.
Evaluate indirect Project impacts on biological resources, including resources in nearby public lands, open space, adjacent natural habitats, riparian ecosystems, and any designated and/or proposed or existing reserve lands. Evaluate impacts on, and maintenance of, wildlife corridor/ movement areas, including access to undisturbed habitats in adjacent areas.	The EIS/EIR provides an analysis of impacts on impacts on biological resources, including wildlife corridor/movement areas, resources in nearby public lands, open space, adjacent natural habitats, riparian ecosystems, and any designated and/or proposed or existing reserve lands. Standard Project Commitments have been incorporated into the Project to avoid or reduce impacts from the Project.
Develop a cumulative effects analysis for biological resources as described under CEQA Guidelines, §15130.	The EIS/EIR provides an analysis of cumulative effects impacts on biological resources.
The EIS/EIR should include measures to fully avoid and otherwise protect Rare Natural Communities from Project-related impacts. The DFW considers these communities as threatened habitats having regional and local significance.	Standard Project Commitments have been incorporated into the Project to avoid or reduce impacts from the Project.
The EIS/EIR should include mitigation measures for adverse impacts to sensitive plants, animals, and habitats. Mitigation measures should emphasize avoidance and reduction of Project impacts. For unavoidable impacts, on-site habitat restoration or enhancement should be discussed in detail. If on-site mitigation is not feasible or would not be biologically viable and therefore not adequately mitigate the loss of biological functions and values, off-site mitigation through habitat creation and/or acquisition and preservation in perpetuity should be addressed.	Standard Project Commitments have been incorporated into the Project to avoid or reduce impacts from the Project. Where required, PWD would acquire off-site compensation lands that would be preserved in perpetuity.

Table C.3-7. Scoping Issues Relevant to Biological Resources

Comment	Consideration in the EIS/EIR
The EIS/EIR should include measures to perpetually protect the targeted habitat values from direct and indirect negative impacts. Issues that should be addressed include, but are not limited to, restrictions on access, proposed land dedications, monitoring and management programs, control of illegal dumping, water pollution, and increased human intrusion.	The EIS/EIR proposed Standard Project Commitments that reduce or avoid impacts from the Project.
The DFW recommends that measures be taken to avoid impacts to nesting birds during the implementation of the Project. Proposed activities (e.g., staging and disturbances to native and nonnative vegetation, structures, and substrates) should occur outside of the avian breeding season which generally runs from February 1 to September 1 (as early as January 1 for some raptors) to avoid take of birds or their eggs. If avoidance of the avian breeding season is not feasible, the DFW recommends surveys by a qualified biologist (i.e., experience in conducting breeding bird surveys) to detect protected native birds occurring in suitable nesting habitat that is to be disturbed and (as access to adjacent areas allows) any other such habitat within 300 feet of the disturbance area (within 500 feet for raptors). Project personnel, including all contractors working on site, should be instructed on the sensitivity of the area. Reductions in the nest buffer distance may be appropriate depending on the avian species involved, ambient levels of human activity, screening vegetation, or possibly other factors.	To reduce impacts to nesting birds, PWD would implement Standard Project Commitments that require the protection of nesting birds through worker education, pre-construction surveys for nesting birds, avoidance of active nest sites, construction monitoring, and the control of fugitive dust.
Habitat Restoration Plans should be prepared by persons with expertise in southern California ecosystems and native plan revegetation techniques and should include: (a) location of mitigation sites; (b) plant species to be used, container sizes, and seeding rates; (c) schematic depicting the mitigation area; (d) planting schedule; (e) description of the irrigation methodology; (f) measures to control exotic vegetation on site; (g) specific success criteria; (h) detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria and providing for conservation of the mitigation site in perpetuity.	Habitat restoration plans would be prepared by a qualified botanist with experience restoring arid ecosystems.

C.3.4 Environmental Consequences

Significance Criteria. The following significance criteria are based on the CEQA environmental checklist presented in Appendix G of the CEQA Statutes and Guidelines and are used to describe the potential impacts of the Project and alternatives on the sensitive biological resources that may occur in the Project area. All direct, indirect, short-term, and long-term impacts associated with the Project and project alternatives are assessed within this section. The Project would have a significant adverse environmental impact on biological resources if it would:

- Criterion BIO1: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW, Forest Service, or USFWS.
- Criterion BIO2: Have an adverse effect, either directly or through habitat modifications, on any species listed as fully protected, endangered, threatened, or proposed or critical habitat for these species.

- Criterion BIO3: Have a substantial adverse effect, either directly or through habitat modifications on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, Forest Service, or USFWS
- Criterion BIO4: Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Criterion BIO5: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Criterion BIO6: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances.
- Criterion BIO7: Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP.

Impact Assessment Methodology. Impacts to biological resources were assessed through consideration of Project effects on the landscape, habitat, community, and species level for the Project and alternatives. Impacts refer to initial excavation and sediment removal activities, construction of the grade control structure; annual and semi-annual sediment removal activities that would be conducted as part of operation; periodic road repairs below the Reservoir to maintain access to Project facilities; and the effects of water delivery on biological resources at the Reservoir and in downstream locations.

C.3.4.1 Description of Direct, Indirect, and Operational Impacts

Direct impacts are defined under CEQA as those that result from a project and occur at the same time and place. For biological resources in the Project area, direct impacts include the removal of vegetation or habitat; disturbance to wildlife from construction of the grade control structure, sediment removal activities, and road repairs below Littlerock Dam; crushing of burrows or animals in soft sediment; and mortality from road kill. Indirect impacts are caused by a project, but can occur later in time or are farther removed in distance but are reasonably foreseeable and related to the Project. Indirect impacts can include the disruption of native seed banks, spread of invasive plant species, changes to soil or hydrology that adversely affects native species over time, disruption of prey base, or increased predation through alterations of the physical landscape from project features. Indirect impacts may also include increased traffic and human disturbance from annual sediment removal activities and alterations to water surface elevations that result from water deliveries.

C.3.4.2 Permanent and Temporary Impacts

Permanent impacts include the conversion of land to a new use, such as the construction of the grade control structure or the placement of fill on natural lands. Temporary impacts are considered activities that are of short duration (i.e., 6 to 12 months) and that do not result in a permanent land use conversion.

C.3.4.3 Impacts to Biological Resources from Construction, Sediment Removal, and Road Repair Activities

The following discussion provides a summary of the types of impacts to biological resources that could occur due to construction of the grade control structure, sediment removal, and road repair activities within the Reservoir.

Direct impacts to vegetation from general excavation and sediment removal would involve clearing vegetation and disrupting native seed banks. Indirect effects include fugitive dust and the spread of non-native and invasive weeds (especially to adjacent habitats off site or in upstream riparian areas). Excessive dust can reduce photosynthetic capacity in plants over time and inhibit reproduction by physically coating reproductive structures or excluding insect pollinators.

Direct impacts to wildlife could occur from excavation activities as a result of mechanical crushing, road kill, loss of breeding sites, disturbance from human activity and vehicles, and trampling. Disturbances to wildlife would be associated with the removal of vegetation, excavation of the grade control structure, and changes to existing topographical and hydrological conditions. Indirect impacts to wildlife could include noise and vibration from earthmoving, fugitive dust, the degradation of water quality, changes in water runoff due to alterations in topography, increased erosion and sediment transport, and the spread of noxious weeds. Increased lighting during low-light periods (i.e., when pouring soil cement for the grade control structure) and noise can cause some species to leave the area and may disrupt foraging, breeding, or other activities. Many insects are drawn to light, and species that prey on insects, such as bats, may be attracted to lighted areas which would increase the potential for disturbance or mortality. General direct impacts to wildlife are summarized in Table C.3-8.

Table C.3-8. Direct Impacts to Wildlife from Construction, Sediment Removal, and Road Repair Activities

Activity	Impacts
MAMMALS	
Earth moving, grading, habitat/vegetation removal	▪ Direct mortality to small or less mobile species ▪ Crushing of burrows or fossorial animals, disruption of soil surfaces, compaction of soils, and displacement of native species ▪ Reduced use of area as a foraging or movement corridor ▪ Fugitive dust and habitat loss ▪ Creation of barriers disrupting movement
Noise and vibration	▪ Interference with breeding or foraging activities and movement patterns ▪ Avoidance of areas adjacent to the excavation zone ▪ Interference with hearing resulting in increased predation ▪ Abandonment of burrows or habitat
Man-made sources of light	▪ Disturbance or mortality to species that prey on insects attracted to light sources ▪ Collisions with vehicles at night
Placement and use of temporary access roads	▪ Crushing of burrows, disruption of soil surfaces, compaction of soils, and displacement of native species ▪ Establishment of ruts or depressions that can alter soil conditions and hydrology ▪ Alteration of physical characteristics of soil underneath roads (placement of roads increases compaction up to 200 times relative to undisturbed sites) ▪ Effect on animal behavior by altering home range use, affect movement patterns, reduce reproductive success, alter escape response, and increase physiological stress
Traffic	▪ Accidental mortality of small diurnal animals from vehicle collision ▪ Secondary vehicular mortality of opportunistic predators feeding on road kill
Waste	▪ Ingestion of trash or leaked/spilled fluids such as ethylene glycol antifreeze
BIRDS	
Earth moving, grading, habitat/vegetation removal	▪ Displacement of breeding birds and the abandonment of active nests (during breeding season) ▪ Loss of eggs and nestlings including ground nesting birds ▪ Loss of foraging habitat in the Reservoir

Table C.3-8. Direct Impacts to Wildlife from Construction, Sediment Removal, and Road Repair Activities	
Activity	Impacts
Noise and vibration	▪ Interference with breeding or foraging activities and movement patterns ▪ Avoidance of areas adjacent to the disturbance zone ▪ Interference with hearing resulting in increased predation ▪ Abandonment of nests
Man-made sources of light	▪ Disturbance or mortality to species that prey on insects attracted to light sources
Placement and use of temporary access roads	▪ Crushing of ground nests
Traffic	▪ Accidental mortality of opportunistic predators and scavengers (such as carrion birds) feeding on road kill ▪ Disruption of breeding, foraging, and movement of bird species resulting in nest, roost, or territory abandonment and subsequent reproductive failure (during breeding season)
Waste	▪ Ingestion of trash or leaked/spilled fluids such as ethylene glycol antifreeze
AMPHIBIANS, REPTILES, AND FISH	
Earth moving, grading, habitat/vegetation removal	▪ Direct mortality to small or less mobile species ▪ Crushing of burrows, disruption of soil surfaces, compaction of soils, and displacement of native species ▪ Fugitive dust and habitat loss ▪ Degradation of water quality in breeding areas from erosion and sedimentation
Noise and vibration	▪ Interference with breeding or foraging activities and movement patterns ▪ Avoidance of areas adjacent to the excavation zone ▪ Interference with hearing resulting in increased predation ▪ Abandonment of burrows
Placement and use of temporary access roads	▪ Unintentional entombment within burrows or aestivation sites ▪ Establishment of ruts or depressions that can alter soil conditions and hydrology ▪ Effect on animal behavior by altering home range use, affect movement patterns, reduce reproductive success, alter escape response, and increase physiological stress
Traffic	▪ Accidental mortality of small diurnal animals from vehicle collision ▪ Secondary vehicular mortality of opportunistic predators and scavengers feeding on road kill

C.3.4.4 Proposed Action/Project

Direct and Indirect Effects Analysis

Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or FWS (Criterion BIO1)

Impact BIO-1: The Project would result in temporary and permanent losses of native vegetation.

The Project would result in 11.6 acres of permanent and 65.3 acres of temporary disturbance to vegetation and unvegetated landforms including riparian woodlands, herbaceous wetland, unvegetated lake bottom, and sandy wash. Approximately 5.8 acres of juniper woodland and 5.5 acres of disturbed habitat would be lost at the 47th Street disposal site (See Table C.3-9 and Figures C.3-13, C.3-14, and C.3-15). Sediment disposed at the exhausted quarries would be limited to disturbed areas that do not support native vegetation. The acreages of these communities are based on mapping conducted in 2012 and 2014 and vary in response to scour from winter storms and seasonal flooding.

Table C.3-9. Total Project Disturbance by Location

Vegetation Community[1]		Type	Total Disturbance in Acres by Location Temporary/Permanent		
Sawyer et al. (2009) Vegetation Classification	Holland (1986) Vegetation Classification		Reservoir[2]	Haul Roads	Sediment Disposal Site
Arroyo willow thickets	**Southern willow scrub**	Riparian	0/0	0/0	0/0
Big sagebrush scrub	Big sagebrush scrub	Upland	0/0	0/0	0/0
Black willow scrub	**Riparian scrub**	Riparian	2.59/0.14	0/0	0/0
California buckwheat scrub	Mojave mixed woody scrub	Upland	0.02/0	0/0	0/0
California juniper woodland	Mojavean juniper woodland and scrub	Upland	0/0	0/0	5.8/5.8
Cattail marsh	Freshwater marsh	Riparian	0/0	0/0	0/0
Creosote bush scrub	Mojave creosote bush scrub	Upland	0/0	0/0	0/0
Fremont cottonwood forest	**Southern cottonwood willow riparian forest**	Riparian	0.06/0	0/0	0/0
	Mojave riparian forest				
Herbaceous wetland	Freshwater marsh	Riparian	3.46/0.04	0/0	0/0
Joshua tree woodland	**Joshua tree woodland**	Upland	0/0	0/0	0/0
Mormon tea scrub	Mojave mixed woody scrub	Upland	0/0	0/0	0/0
	Great Basin mixed scrub				
Rubber rabbitbrush scrub	Rabbitbrush scrub	Upland	0/0	0/0	0/0
Singleleaf pinyon woodland	Mojavean pinyon woodland	Upland	0/0	0/0	0/0
Other Cover Types and Landforms					
Developed		Upland	0/0	0/0	5.5/5.5
Non-native woodland		Upland	0/0	0/0	0/0
Open water		Riparian	0/0	0/0	0/0
Ruderal		Riparian	0/0	0/0	0/0
Sandy wash		Riparian	11.78/0.15	0/0	0/0
Unvegetated lake bottom		Riparian	47.42/0	0/0	0/0
Total			65.33/0.33	0/0	11.3/11.3

1 – Communities in **bold** type are considered sensitive by the CDFW.
2 – Impacts to vegetation in the Reservoir would only occur when the Reservoir is dry. When full, the Reservoir comprises approximately 95 acres of open water.

Prior to construction of the grade control structure or sediment removal activities the Reservoir would be drained to the dead pool elevation (i.e., the lowest water surface elevation that can be achieved). At this time, much of the Reservoir would be limited to recently colonizing vegetation. Construction of the grade control structure would require temporary removal of sediment from the stream channel in order to reach a sufficient depth to ensure the stability of the structure and to provide a safe work area for construction crews. In addition, a small berm and dewatering wells would be placed upstream of the work area to divert stream flows around the work area should they occur. Sediment from the grade control structure would be stockpiled in a downstream area. Once completed, only a narrow portion of the grade control structure would remain at grade. Sediment removal activities would occur throughout the Reservoir in areas previously subject to inundation.

Implementation of the Project would remove vegetation, alter soil conditions, result in the loss of native seed banks, and result in temporary changes in the topography of the drainage. Sediment removal, processing of materials, and associated vehicle travel on Cheseboro Road and other paved streets could result in increased fugitive dust to native vegetation in adjacent areas. Wind-blown dust can degrade soils and vegetation over a wide area (Okin et al., 2001). Dust can have deleterious physiological effects on plants and may affect their productivity and nutritional qualities (Sharifi et al., 1997). Fugitive dust can kill plants by burial and abrasion, interrupt natural processes of nutrient accumulation, and allow the loss of soil resources. The destruction of plants and soil crusts by windblown dust exacerbates the erodibility of soil and accelerates the loss of nutrients (Okin et al., 2001). Additional information on potential direct and indirect impacts to native vegetation is described above under Impacts to Biological Resources from Construction, Sediment Removal, and Road Repair Activities (See also Table C.3-8).

The vast majority of sediment removal activities would occur in unvegetated sandy wash. Most of the vegetation at the Reservoir is limited to scattered elements along the margin of the Reservoir and within a few well defined communities. These areas abut recreation facilities and are routinely subject to disturbance from anglers, recreationists, and OHV use. Riparian habitat would be removed; however, the functional value of the community in the Reservoir has been adversely affected or lost through mortality or previous disturbance and/or removal. While many of the large trees previously mapped as Fremont Cottonwood have been lost through inundation or disturbance, riparian vegetation is found along the stream corridor in the upper end of the Reservoir.

Mortality of submerged riparian vegetation is related to a number of factors including the duration of inundation, water clarity, time of year, and most importantly, the age class of the tree. Plants flooded during early stages of development may not have the energy reserves required to persist for extended periods of time (Gladwin and Roelle, 1998). This factor greatly influences the distribution of riparian trees in the reservoir. Many of the trees in the Reservoir remained submerged for extended periods between 2006 and 2009 as a result of winter storms, the accumulation of sediment, and water delivery requirements. During this period, large areas of riparian forest became decadent and died. Recruitment of new tress was also limited. Sprenger et al. (2001) noted that total submergence of cottonwood seedlings resulted in complete mortality of first-year saplings. While many of the trees are lost, the area still supports important components that are utilized by some wildlife. Similarly, during periods when the Reservoir is drained, a mosaic of native and non-native vegetation can become temporarily established in newly exposed soils; however, these are lost through seasonal inundation.

Ongoing operations and maintenance impacts, including annual sediment removal and repairs to PWD access road below the dam, would be limited to previously disturbed areas of the Reservoir and existing access roads. Impacts to vegetation would be primarily limited to herbaceous plants and saplings; however it is expected that due to the timing of these activities (i.e., immediately after Reservoir draw down) vegetation would have limited time for recruitment in the disturbance area.

Implementation of the Project is not expected to result in the degradation or loss of riparian habitat in downstream areas. The impacts of controlled flows on seedling establishment and survival have been documented in many riparian systems. In some circumstances, the regulation of flow regimes can result in a loss of riparian vegetation along rivers and streams. Implementation of the Project would increase the current storage capacity of Littlerock Reservoir by 463 acre-feet, resulting in diversions by PWD to Palmdale Lake for municipal use within the limits of their annual allotment. Without the Project, PWD would be required to increase water extraction from groundwater wells and further depend on water from the State Water Project.

As described in Section C.7.1.2, about one year in six (16 percent of all years) does not produce enough runoff to fill the reservoir. Based on USGS records, approximately 43 percent of the years (21 out of 49) do not produce sufficient inflow to Littlerock Reservoir to satisfy PWDs allotment. For these years, there would be no difference between without Project and with Project conditions below the dam. The remaining 57 percent of the years with sufficient runoff to satisfy the allotment could be held in the reservoir for diversion to Palmdale Lake. During these periods, water would still overtop the dam and be available for downstream beneficial uses.

On average, for the entire 49 years of record, the overflow volume available below the dam could be reduced by approximately 265 acre-feet annually as a result of the Project. The average annual recharge to the Antelope Valley Groundwater Basin below the dam is estimated at approximately 48,000 acre-feet per year (DWR, 2004). A reduction of 265 acre-feet amounts to 0.55 percent of the total overall recharge to this basin; that is, water that is available to riparian communities below the dam. The reduction of this level of water is not considered an adverse impact. Additionally, leakage through the Dam was maintained during the Dam restoration activities that occurred in 1994.

Although much of the riparian vegetation in the Reservoir and the juniper woodland present at the 47th Street disposal site has been degraded, the removal of these communities would be considered an adverse impact. To reduce impacts to these communities, PWD would implement a series of Standard Project Commitments (SPCs) that include restoration, habitat acquisition, and worker training. Implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), and SPC WQ-1 (Prepare Spill Response Plan) would reduce impacts from the Project.

PWD would replace lost vegetation along the margin of the Reservoir and establish riparian communities in backwater areas at a ratio of 3:1. Impacts to juniper woodland would be replaced through habitat acquisition at a ratio of 1.5:1. As described Section C.2 (Air Quality), all existing activities are subject to dust control requirements and prohibitions on visible emissions (APCD Rule 401) and are prohibited from causing dust at a level that constitutes a nuisance (APCD Rule 403). Compliance with these regulations, which typically requires the application of dust control measures, would ensure that the generation of fugitive dust is minimized.

SPCs Applicable to Impact BIO-1

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

CEQA Significance Conclusion

In arid regions such as Southern California, riparian habitats play a particularly crucial role in maintaining biodiversity because up to 80 percent of vertebrate species rely on them for at least part of their lifecycle (Knopf et al., 1988) and because of the central role riparian habitats play in a variety of ecological functions (Rottenborn, 1999; Fischer and Fischenich, 2000). In the Antelope Valley, large areas of riparian habitat and juniper woodlands have been lost to development. However, implementation of Standard Project Commitment (SPC) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), and SPC WQ-1 (Prepare Spill Response Plan) would ensure impacts to native vegetation remain less than significant (Class III).

Impact BIO-2: The Project would result in the establishment and spread of noxious weeds.

Construction of the grade control structure, sediment removal activities, and road repairs below Littlerock Dam would result in soil disturbance that could introduce new noxious weeds to the Project area, haul roads, or sediment disposal sites. New introductions occur when seeds are inadvertently introduced, most often with mulch, hay bales, or wattles used for erosion control, or when they are transported on construction equipment or tires from off-site areas. Many invasive non-native species are adapted to and promoted by soil disturbance (Lathrop & Archbold, 1980). Once introduced, they can out-compete native species because of minimal water requirements, high germination potential, and high seed production; and can outcompete native annuals where nitrogen deposition (major roadways such as Highway 138) and precipitation rates are higher, leading to higher risk of wildfire (Allen et al., 2010). Weeds can become locally dominant, representing a serious threat to native desert ecosystems (Abella et al., 2008).

The spread of invasive plants is a major threat to biological resources because nonnative plants can displace native plants, increase the threat of wildfire, and supplant wildlife foods that are important to desert tortoise and other herbivorous species. Noxious and invasive weeds pose a threat to the natural processes of plant community succession, fire frequency, biological diversity and species composition. The introduction of noxious and invasive weed species is a special concern for native plant communities and is recognized by the Forest Service as a threat to native vegetation communities and wildlife.

Direct impacts occur when noxious weeds become established in an area by increasing vegetative cover, creating a dense layer that prevents native vegetation from germinating, or altering the edaphic and hydrological conditions. Noxious weeds can create such an unfavorable environment for wildlife that associate, mutualistic species necessary for native plant life cycles, such as seed dispersers, fossorial mammals, or pollinators, are lost from the area.

Indirect impacts attributed to the colonization of noxious weeds could include a gradual decrease in natural biodiversity as noxious weed infestations may extirpate native plant populations. To reduce the potential for the spread of invasive plants, the applicant has proposed measures such as cleaning vehicles and equipment prior to working off-road and restoring temporarily disturbed habitat at the conclusion of construction. Additional information on direct and indirect impacts from weeds is described above under Impacts to Biological Resources from Construction, Sediment Removal, and Road Repair Activities (See also Table C.3-8).

The term “noxious weeds” includes all plants formally designated by the U.S. Secretary of Agriculture or other responsible State official, and these species usually possess one or more of the following characteristics: “aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof” (USFS Manual 2080). The Project site does not currently support a large amount of exotic vegetation, as frequent disturbance by inundation limits the establishment of most plants in the reservoir. However, noxious and invasive weeds are widespread in the region and several species occur along Cheseboro Road, along the access road to the Dam, and the proposed disposal sites. Although the region currently supports wide populations of noxious weeds, the introduction of new species not currently present in the Project area or the spread of noxious plant species would be considered an adverse impact.

To reduce impacts from the spread or establishment of weeds, PWD would implement SPC-BIO-2 (Prepare and Implement a Weed Control Plan) which includes guidelines for the use of weed control treatments (i.e., herbicide, manual, and mechanical methods) during construction of the grade control structure, sediment removal, and road repair activities. The implementation of SPC-BIO-1a (Restoration/Compensation for Impacts to Native Vegetation Communities) and SPC-BIO-1b (Worker Environmental Awareness Program) would further reduce the spread of invasive plants through restoration and detection. Each of the proposed SPCs described above combine to provide a suite of Best Management Practices (BMPs) intended to reduce the spread of noxious or invasive weeds on the Project site. These include common measures such as stabilizing soils, limiting erosion, reducing ground disturbance, targeting local weed infestations, cleaning vehicles and equipment, and comprehensive actions such as restoration, weed management, and the acquisition of mitigation lands.

The Weed Control Plan, including the control methods to be used, would be prepared consistent with the FS's *Plan for Invasive Plants, Angeles National Forest and San Gabriel Mountains National Monument Environmental Assessment (EA)* (September 2015). Control of weeds would be important to ensure successful establishment of native vegetation along the Reservoir and to prevent new infestations along the access roads. However, manual treatments and herbicide use can result in indirect impacts to vegetation and wildlife in the Reservoir and in off-site riparian and aquatic habitat unless appropriate precautions are implemented, as outlined in the *Plan for Invasive Plants EA*. Any herbicide use would conform to the FS's *Plan for Invasive Plants EA*, including formulations to be used and the methods of application. Adhering to this existing FS guidance on weed control would ensure that any mechanical or chemical weed control implemented as part of the proposed Project would not result in secondary impacts to vegetation or wildlife.

The management of weed infestations is best accomplished by species-specific methodologies, which may include herbicide application, mechanical removal, and bio-control methods such as sheep grazing. Due to typically large seed banks and the ability of some weed species to re-sprout following removal methods, most species require more than one round of treatment, or require a different follow-up treatment method after the initial removal occurs. However, effective weed management is expected to be successful with the proposed monitoring and reporting standards. Implementation of the SPCs described above, in accordance with the existing FS weed management guidelines, would provide a reasonable and feasible suite of mechanisms that would be effective in reducing impacts from the spread of invasive of noxious weeds from the proposed project. Table C.3-10 contains a list of herbicides, including their potential risks to native vegetation and wildlife, which are proposed for use within the Project area on National Forest System lands. It is important to note that there is an extensive variability related to different types of exposure scenarios and dosages for each herbicide. Furthermore, the effects of certain herbicides can vary exclusively at the species level. Therefore, the information presented in Table 3.3-10 is intended as a general overview of the possible effects of herbicide use. Of the four herbicides listed in Table C.3-10, glyphosate would most likely be used within the Project area. However, the application of any herbicide would be conducted by a licensed herbicide applicator. Full analyses on the effects of these four listed herbicides on human and ecological health can be found in the Forest Service Risk Assessment Final Reports (http://www.fs.fed.us/foresthealth/pesticide/risk.shtml) and the *Plan for Invasive Plants, Angeles National Forest and San Gabriel Mountains National Monument Environmental Assessment* (September 2015) and is incorporated by reference.

Table C.3-10. General Effects of Herbicides on Plant and Wildlife Species

Herbicide	Effects on Vegetation	Effects on Wildlife
Chlorsulfuron	Rate and extent of uptake following foliar application varies by species Inhibits an enzyme that is essential for plant growth	Causes weight loss and decreased body weight gain in experimental mammals Appears to have low toxicity in mammals, birds, fish, and invertebrates
Glyphosate	Inhibits shikimic acid pathway, effectively blocking synthesis of certain phenolic compounds and aromatic amino acids Inhibits photosynthesis, respiration, and nucleic acid synthesis	May reduce food conversion efficiency leading to loss of body weight in mammals and birds Certain surfactants used with glyphosate are much more toxic to fish that others May cause histological changes in gills, kidneys, and liver of some fish
Imazapyr	Inhibits an enzyme that is essential for plant growth Practically non-toxic to conifers	Appears to be relatively non-toxic to terrestrial and aquatic animals
Triclopyr	Mimics indole auxin plant growth hormones causing uncontrollable growth At sufficiently high levels of exposure, abnormal growth is so severe that vital functions cannot be maintained and plants die	May cause developmental effects at levels that cause maternal toxicity in mammals May have adverse effect on mammalian kidney functions Higher concentrations may cause mortality or immobility in frog tadpoles Larger doses may cause a decrease in body length and smaller doses may lead to lethargic behavior in some fish Relatively non-toxic to birds

Source: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml

While the overall benefits of herbicide use are generally straightforward, herbicide use may have detrimental effects on ecosystem values and functions. As noted in the CNPS Policy on the use of herbicides in situations where native vegetation may be affected, the tradeoff between the benefits and costs of using herbicide – either proven or alleged – has made it difficult for the public at large, CNPS members, other organizations, and public agencies to evaluate whether or not to use herbicides (CNPS, 2008). It is generally desirable to select an herbicide that has low toxicity, would not move from its target or leach into groundwater (low water solubility), and would not remain in the environment for a long period of time (low persistence). Furthermore, the application method selected depends on the type of control needed, the type of vegetation, and the site situation (site conditions and locations). Not all herbicides or application methods are equally appropriate, effective, or safe, given different site conditions and weed species.

There are several exposure scenarios possible for herbicides and wildlife. These include direct spray; indirect contact through grooming or contact with affected vegetation; and ingestion of contaminated media, including vegetation, prey species, and water. Because of the relationship of body weight to surface area and to the consumption of food and water, small animals would generally receive a higher dose, in terms of body weight, than large animals would receive for a given type of exposure (Durkin, 2007). However with the Project SPCs and compliance with existing FS guidelines on herbicide application, the potential for impacts to aquatic fauna would be minimized. For non-target terrestrial plants, the primary hazard is unintended direct spray or spray drift. Off-site drift typically depends on the droplet size and meteorological conditions. Other off-site exposure scenarios for vegetation include percolation, runoff, sediment transport, and wind erosion. Although overspray may adversely affect some non-target species, the removal of noxious or invasive weeds and the control of existing populations would be considered a beneficial effect. To reduce the effects of herbicides on listed species including arroyo toads (located upstream of the proposed grade control structure), if used, PWD would implement SPC BIO-2 (Prepare and Implement a Weed Control Plan), which would include guidelines for the use of weed control treatments (i.e., herbicide, manual, and mechanical methods) to reduce the risk of overspray or non-target application.

SPCs Applicable to Impact BIO-2

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

CEQA Significance Conclusion

Due to the intense effects of noxious weed establishment and the difficulty in controlling existing infestations or restoring arid habitats, Project-related activities that result in the spread of noxious weed populations would have long-lasting consequences for desert and riparian communities in the Project area. To reduce the potential spread of weeds, PWD would implement SPC B-2 (Prepare and Implement a Weed Control Plan). The implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) and SPC BIO-1b (Worker Environmental Awareness Program) would further reduce the spread of invasive plants through restoration and detection. Incorporation of these SPCs would ensure impacts from weeds remain less than significant (Class III).

Habitat-Related Impacts to Wildlife

Impact BIO-3: The Project would cause the loss of foraging habitat for wildlife or result in disturbance to wildlife in adjacent habitat.

The Reservoir and surrounding NFS lands support a broad assemblage of wildlife. Natural lands on the sediment disposal site at 47th street, while disturbed, provide foraging habitat for a number of species. Some of these species potentially affected by the Project are permanent residents such as black bear, mountain lion, desert kit fox, and American badger. Other species including bald eagles and ferruginous hawks are winter residents that forage in the region.

Direct impacts from the Project would include temporary disturbance of vegetation communities and land forms (i.e., the unvegetated Reservoir bottom) utilized as foraging habitat for common and rare wildlife, fugitive dust, and increased noise levels due to heavy equipment and vehicle traffic. Other direct impacts include mortality from trampling or crushing; increased noise levels due to heavy equipment use; light impacts from construction during low-light periods; increased vehicular and human presence along existing access roads. Noise from clearing, grading, and construction activities could affect wildlife in adjacent habitats by interfering with breeding or foraging activities and movement patterns, causing animals to temporarily avoid areas adjacent to the construction zone. Construction could affect nocturnal wildlife that roost in the Project area by displacing these species and increasing their risk of injury or mortality. More mobile species such as birds and larger mammals would likely disperse into adjacent habitat areas during sediment removal activities. However, smaller animals along the margins of the reservoir or at sediment disposal sites would be less able to disperse.

Sediment removal activities would require extensive road use along Cheseboro Road and other designated haul routes. Roads and vehicle use can affect animal behavior by altering home range use, affect movement patterns, reduce reproductive success, alter escape response, and increase physiological stress (Trombulak and Frissell, 2000). Edge effects from roads can last well past the time of construction. Vehicles using Cheseboro Road would result in an increase in accidental wildlife mortality from road kill. Diurnal reptiles such as western fence lizard and small mammals including California ground squirrels are most likely to be present on access roads and would be more vulnerable to vehicle accidents. Animals killed along access roads as a result of the Project could attract opportunistic predators such as ravens which could act as a subsidy to this species.

Indirect impacts to foraging habitat could include alterations to existing topographical and hydrological conditions, increased erosion and sediment transport, and the establishment of noxious weeds. Operational impacts from annual sediment removal include increased human presence, the spread of noxious weeds, and vehicle traffic.

Construction activities associated with the Project would result in disturbance to a variety of wildlife. With the exception of some good quality riparian vegetation the majority of the Reservoir consists of sparsely to unvegetated wash. Construction activities would limit the ability for some species to forage at the Reservoir for several months at a time. However, access to surface water is generally present above and below the dam and work would not be conducted at night when many species are foraging. Similarly, construction activities would stop at the commencement of the rainy season. Nonetheless, the loss of juniper woodland, although subject to disturbance from ongoing anthropogenic disturbance, and the reduction in access to the Reservoir to wildlife over the life of the Project would be considered adverse and remove nesting and foraging habitat for wildlife. Similarly, even disturbed areas may provide access to edge habitats or early successional plant communities which are preferred foraging areas for some wildlife species.

To reduce impacts to wildlife from the loss of important foraging habitat or project disturbance, the PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), and SPC BIO-2 (Prepare and Implement a Weed Control Plan). These measures include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education and the control of invasive weeds. Implementation of these SPCs would provide for the protection of common wildlife by educating workers on the avoidance mechanisms in place to avoid impacts to common and sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. The measures would include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species.

SPCs Applicable to Impact BIO-3

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

CEQA Significance Conclusion

Project-related impacts on common wildlife are typically not considered significant under CEQA. However, the large scale of the Project and the required annual sediment removal activities would result in long-term operational impacts to a wide variety of snakes, amphibians, small mammals, and birds. Implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), and SPC BIO-2 (Prepare and Implement a Weed Control Plan) would ensure impacts to common wildlife would remain less than significant (Class III).

Impact BIO-4: The Project would result in disturbance to nesting birds or raptors.

The Project site provides foraging, cover, and/or breeding habitat for a variety of resident and migratory birds. Nesting birds have been commonly observed nesting in the few remaining trees along the margins of the Reservoir, in native vegetation adjacent to parking areas, and on open ground within the stream channel. Nesting birds have been observed in riparian vegetation below the dam and in upstream areas. Juniper trees present at the 47th Street sediment disposal site provide rare substrate in the desert and support nesting habitat for a variety of birds. Scattered Joshua trees, which were also documented at the 47th Street disposal site, are another important nest substrate in the desert. Although not detected in the Project area, Joshua trees often support nesting for large birds including raptors. During surveys of the Project site, nesting birds were detected in crevices on the steep walls of the Reservoir.

Direct impacts to nesting birds include ground-disturbing activities associated with construction of the grade control structure, sediment removal activities, and road repairs below Littlerock Dam, as well as increased noise levels from heavy equipment, increased human presence, and exposure to fugitive dust. Construction and operations during the breeding season could result in the displacement of breeding birds and the abandonment of active nests, as well as a disruption in foraging activity.

Indirect impacts to nesting birds could include the loss of habitat due to the colonization of weeds, dust, or human disturbance due to repairs to the access road or routine inspection of the Reservoir. Weed management could also affect nesting.

Ground-disturbing activities associated with the Project have the potential to disturb nesting birds. The removal of habitat during the breeding season could result in the displacement of breeding birds and the abandonment of active nests. Breeding birds and other wildlife may temporarily or permanently leave their territories to avoid construction activities, which could lead to reduced reproductive success and increased mortality. Increased vehicle travel on Cheseboro Road and other access routes could displace nesting birds or result in lower nest success.

Construction of the grade control structure would be initiated in July toward the end of the breeding season which would reduce the potential for nesting birds to be present in the work areas. Sediment removal activities commence after Labor Day and continue until mid- to late November. This would greatly reduce the potential for nesting birds to be present in the work area. However, some birds remain on the nest well into July and nesting periods are affected by a number of factors including weather and access to forage. Similarly, some birds even in desert regions would be expected to have active nests or young well into the summer. Depending on the species, birds may actively nest on the ground close to equipment, on spoil piles, or idle construction equipment. In other arid ecosystems in Southern California, birds have been documented nesting on vehicles, foundations, construction trailers, and equipment left overnight or during a long weekend. With the exception of a few non-native birds such as European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*), the loss of active bird nests or young is regulated by the Federal Migratory Bird Treaty Act (MBTA) and Fish and Game Code Section 3503 and would be considered an adverse impact.

To minimize impacts to nesting birds PWD would Implement SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) and SPC BIO-1b (Worker Environmental Awareness Program). Implementation of these SPCs would protect nesting birds through worker education, pre-construction surveys for nesting birds, avoidance of active nest sites, construction monitoring, and the control of fugitive dust. A discussion of potential impacts to special-status birds is presented below.

SPCs Applicable to Impact BIO-4

SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds)

SPC BIO-1b (Worker Environmental Awareness Program)

CEQA Significance Conclusion

The loss or abandonment of nests, eggs, or their young would be a violation of State and federal law. To avoid potential impacts to nesting birds, PWD would implement SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) and SPC BIO-1b (Worker Environmental Awareness Program). Implementation of SPC BIO-4 would establish a 300-foot buffer around active nest sites to provide for the protection of nesting birds, while SPC BIO-1b would educate workers on mitigation requirements and the sensitivities of plant and wildlife species. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Have an adverse effect, either directly or through habitat modifications, on any species listed as fully protected, endangered, threatened, or proposed or critical habitat for these species (Criterion BIO2)

Threatened and Endangered Plant Species

Impact BIO-5: The Project could disturb endangered, threatened, or proposed plant species or their habitat.

State or federally listed plant species were not detected in the Project area. Although native plant communities are present there is no indication that rare plants occur or have the potential to occur in the Reservoir or at the proposed grade control location. Nearby habitat could potentially support sensitive plants and three Forest Service sensitive species were detected. Listed plants were not found at the proposed 47th Street East sediment disposal site. However, seasonal rainfall across Southern California has been extremely limited which could reduce the potential to detect sensitive plants at the proposed sediment disposal sites or along the margins of the Reservoir.

Focused botanical surveys of the Reservoir and access roads were conducted on 16 May 2007, 23 May 2010, 7 Jul 2011, 20 May 2012, and 30 May 2012. Surveys of the 47th Street sediment disposal site were conducted on 16 April 2014. The recent drought has limited the detectability of some annual plants in the Project area. However, plant expression was considered good to excellent in many portions of the alignment during the 2007 to 2008 rain years. Surveys conducted during this period resulted in good plant detection including ephemeral annuals that cannot be detected in some years. Subsequent surveys including a summer survey conducted in 2011 provided access to plants responding to summer monsoons. With the exception of the 47th Street East sediment disposal site all of the Project areas received multiple botanical surveys.

Listed plant populations are not expected to occur in the Project area and would not be adversely affected by the Project. However, because plant expression can vary and rainfall has been patchy in the Project area, the PWD would conduct pre-construction surveys of the 47th Street East sediment disposal site. If listed plant species are detected PWD would not place sediment or disrupt natural hydrology within 200 feet of the population. The following SPCs would also be implemented to avoid impacts to listed plant species: SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native

Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), and SPC BIO-2 (Prepare and Implement a Weed Control Plan). SPC BIO-1a and SPC BIO-1b would limit construction work to previously surveyed and historically disturbed areas (i.e., the Reservoir) while using best management practices. SPC BIO-2 (Prepare and Implement a Weed Control Plan) would prevent or reduce the potential spread of noxious weeds, control existing weed populations, and restore native habitats as required by Forest Service Manual 2080.

SPCs Applicable to Impact BIO-5

SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

CEQA Significance Conclusion

Listed plant species were not identified during focused surveys of the Project. Implementation of SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), and SPC BIO-2 (Prepare and Implement a Weed Control Plan) would ensure impacts to listed plants remain less than significant (Class III).

Threatened and Endangered Wildlife

Habitat in the Project area has the potential to support a variety of State and federally listed wildlife species. Two federally listed species are occur in the Project area: arroyo toad and least Bell' vireo. Arroyo toad is present in Little Rock Creek above Rocky Point and least Bell's vireos were documented below the dam downstream of the existing PWD access road. Mountain yellow-legged frogs occur in the upper watershed but are not expected at the Reservoir. Three other State or federally listed species or species proposed for listing have the potential to occur at the Reservoir or sediment disposal sites. These include:

- California condor
- Southwestern willow flycatcher
- Swainson's hawk

Threatened or Endangered Invertebrates

There are no known threatened or endangered invertebrates in Littlerock Reservoir, Little Rock Creek, or the proposed sediment disposal areas.

Threatened and Endangered Amphibians

The presence of and potential for amphibians to occur in the Project area is linked to the physical characteristics of the landscape, existing anthropogenic activities (i.e., human trampling, OHV, and road traffic) and the presence of non-native predatory fish in the Reservoir. The operation of the Reservoir, which includes wide fluctuations in water surface elevations, also affects the distribution of amphibians in the Project area. Amphibians often require a source of standing or flowing water to complete their life cycle. However, some more terrestrial species including arroyo toads known from the Project area are linked to aquatic resources for a very limited time during the breeding season and spend significant times away from the creek channel. Other species can survive in drier areas by remaining in moist environments found beneath leaf litter and fallen logs, or by burrowing into the soil. These xeric-adapted species conserve moisture by emerging only under conditions of high humidity or when the weather is cool and/or wet. Depending on the location portions of the Project area provide suitable habitat for amphibians.

In southern California, mountain yellow-legged frogs inhabit rocky and shaded streams from 1,200 to 7,500 feet elevation. Typical habitat consists of perennial creeks fed by snowmelt and springs. Non-aquatic habitats commonly include willow, alder, and big-cone spruce at lower elevations and various pines, white fir, and incense cedar at higher elevations. (USFWS, 2012). Mountain yellow-legged frogs have not been detected during focused surveys of the Project area, have not been recorded in the vicinity, and are not expected to occur at the Reservoir.

Contaminated Fish Removal. The Littlerock Reservoir does not support any species of native fish. As discussed in Section B.2.3.2, all non-native fish will be removed from the Reservoir during sediment removal activities in order to improve habitat conditions for arroyo toad and other native species. The fish tissue that was sampled from the Reservoir show a large number of contaminants at high levels, relative to the sediment samples (see Section C.3.1.5). Based on the surveys conducted by the SWRCB and the Lahontan Regional Water Quality Control Board, animals ingesting fish from the Reservoir would be exposed to elevated levels of mercury and PCBs (LRWQCB, 2014). Removal of invasive fish during the Project's first year of sediment excavation would create a beneficial effect on wildlife that would otherwise be at risk from ingesting fish with elevated levels of contaminants.

Impact BIO-6: The Project would result in loss or disturbance to arroyo toads.

The arroyo toad (*Anaxyrus californicus*) is federally listed as endangered and a CDFW Species of Special Concern. The current distribution of arroyo toad in the Project area is well studied and appears limited to Little Rock Creek above Rocky Point and Santiago Creek, a tributary drainage (See Figure C.3-16). Ramirez (Cadre, 2002) conducted a radio telemetry study of this species above Rocky Point in 2002. Similarly, the Forest Service conducts routine surveys of this population. In addition, Aspen has conducted numerous diurnal and nocturnal inspections of the Project area for over seven years in coordination with Forest Service and CDFW biologists. This species was not found during surveys of the small side canyons that flow into the Reservoir below Rocky Point or in Little Rock Creek below the dam.

Factors influencing survival between breeding seasons may include desiccation, starvation, predation by native and introduced species, and activities that disturb non-breeding habitats (Sweet, 1992). Drought, especially when combined with water diversions from streams, can lead to a scarcity or early drying of breeding pools and restrict foraging during the period essential for rapid growth. Drought and water diversions also cause the loss of damp subsurface soil, which may result in high adult mortality (Sweet, 1992). The extended 5-year drought in Southern California during the late 1980s has been closely tied to extremely low reproductive success and subsequent population declines of arroyo toads during this period (Sweet, 1992). During the 2006-2007 rain year, one of the driest years on record in Southern California, reproduction of this species was also reduced. Protocol surveys conducted by Aspen at Little Rock Creek and Castaic Creek on the ANF detected little evidence of large-scale breeding and few metamorph toads were identified later in the season. Conversely Aspen noted numerous metamorph toads during surveys at Littlerock in 2010.

Direct impacts to arroyo toad could occur as a result of crushing from pedestrian traffic, mechanized equipment, temporary disruption of foraging or thermoregulation sites in adjacent upland areas, fugitive dust, or the disruption of egg masses from impacts to water quality. Arroyo toads spend the majority of their life cycles well away from aquatic habitat, that is, post breeding this species occupies streamside terraces and adjacent uplands and impacts to adjacent vegetation can have deleterious effects on this species (Cadre, 2002). Breeding behavior could also be disrupted due to construction noise.

Disturbance would be associated with the temporary removal of vegetation for the grade control structure and sediment removal activities. The Project would result in a permanent loss of 0.33 acre of suitable habitat. Construction activity may result in the incidental take of individual toads, egg masses, and larvae depending on the construction season. Because this species is largely nocturnal, impacts from pedestrian traffic and vehicle use at dawn, dusk, and during the evening would be of concern because this species is known to traverse roads between riparian and upland habitats, especially during rain events. Large numbers of toads, both adults and juveniles, can be active at night during the spring and early summer under otherwise dry conditions. During these activities, toads may move onto and across roads, where they are subject to road kill by passing vehicles.

Direct effects to juvenile toads may also occur. In many cases, recruitment of metamorphic arroyo toads may occur in only a small section of the stream, even if breeding activity has been more widely distributed. Observations on the Los Padres National Forest (Sweet, 1992) and on other sites in Orange and San Diego Counties indicate that even brief human activities are likely to result in substantial mortality of metamorphic toads. This is usually not a deliberate act; the cryptic nature, very small size (less than 20 mm or 0.8 in) and immobility (when on the surface) of metamorphic toads foster accidental trampling.

Indirect effects to this species may be caused by the diversion or modification of water flows at the grade control structure, increased downstream sediment transport, or the establishment of noxious weeds. Human activities can indirectly affect arroyo toads by increased noise or by attracting predators such as the common raven, kit fox, and coyote from trash and litter (Boarman, 2004). Other indirect effects could result from fuel, lubricant, or concrete spills (used in the soil cement for the grade control structure) near water, which could be mobilized into the water by a subsequent storm event and cause lethal or sublethal poisoning effects.

Operational impacts to arroyo toad are similar to sediment removal activities and include crushing by vehicles, trampling, increased sedimentation, dust, and the spread of exotic weeds. The timing and delivery of water releases from the Reservoir can also adversely affect egg masses, larvae, and metamorph toads if they become stranded by receding water surface elevations. USGS (2003) found that toads were at the greatest risk of loss from water deliveries during the months of April, May and June at the Sweetwater Reservoir. While seasonal variations in breeding occur, toads at Little Rock Creek would be at risk during this same period.

Arroyo toad has the potential to move into the Reservoir as the water level recedes; however, this species has not been detected below Rocky Point as of 2014. Animals that move into this area are susceptible to predation by non-native fish, mechanical crushing from OHVs, or trampling. Predatory non-native species have been identified as a significant threat to this species (Stephenson and Calcarone, 1999), and game fish in the reservoir would prey on any toads or larvae present. Animals that aestivate in the seasonally dry portions of the Reservoir would likely drown as water levels return to winter levels and aestivation sites become submerged.

Implementation of the Project has the potential to adversely affect arroyo toads and may result in loss or mortality. In order to avoid or minimize impacts to arroyo toad, PWD would implement a series of actions that include general construction best management practices described in SPC BIO-1b (Worker Environmental Awareness Program), and specific measures focused on the arroyo toad. SPC-BIO-6a (Conduct Surveys and Implement Avoidance Measures), SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring), and SPC BIO-6c (Seasonal Surveys During Water Deliveries) describe the proposed methods that would be implemented during construction of the grade control structure sediment removal activities, and during scheduled water releases.

Under SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures), PWD would limit sediment removal activity to seasonally inundated portions of the Reservoir after the water has been lowered in the late summer months. Arroyo toads are not expected to occur in this area or be limited to the upstream margin of the Reservoir. The greatest potential risk to arroyo toads would be the construction of the grade control structure. This area supports suitable habitat as the water levels recedes and is adjacent to occupied habitat. Animals in upstream areas could forage in this area or burrow into soft, moist sands during the day. In accordance with SPC BIO-6a, PWD would conduct pre-construction surveys of the Project area and install toad fencing along the upstream margin of the Reservoir to reduce the potential for toads to enter the proposed work area. PWD would install fencing around the entire work area and would include mesh screens on diversion structures to prevent animals from entering the Reservoir from a culvert.

Per SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring), PWD would conduct clearance surveys of the fenced work area prior to excavation, monitor construction, and implement other best management practices such as good housekeeping, inspecting equipment for leaks, and following the fieldwork code of practice developed by the Declining Amphibian Population Taskforce. Clearance surveys would be conducted at night and during daylight periods to increase the potential to locate any toads that may occur within the exclusion area.

Per SPC BIO-6c (Seasonal Surveys During Water Deliveries), PWD would conduct annual monitoring and reporting at the Reservoir to reduce the potential stranding of arroyo toads egg strings, larvae, or metamorphs during water deliveries. At the maximum water surface elevation, the edge of the Reservoir merges with sandy terraces above Rocky Point. This interface provides approximately 3,015 feet of shoreline that would be directly affected by water deliveries from the Reservoir. Although the water is deep enough in many areas to support non-native fish, it is possible that arroyo toads may produce egg strings in the shallow margins of the Reservoir. In a study conducted by USGS (2003) at the Sweetwater Reservoir, it was postulated that eggs, larvae and metamorphs would have varying ranges of mortality risk due to their placement (i.e., egg strings in shallow water) or their mobility. Eggs were assumed to be at greatest risk with 80 to 100 percent estimated to be lost as a result of a dam release from being stranded on the shore or in quickly drying pools (ibid). Due to their mobility, larvae are assumed to have a greater chance of surviving a release event with 50 to 100 percent estimated to be lost as a result of a dam release and can possibly swim to safety or track the falling water levels to avoid getting displaced or stranded. Due to their mobility and ability to leave the streambed, metamorphs were assumed to have the greatest chance of surviving a release event with 0 to 50 percent estimated to be lost as a result of a dam release (Ibid).

To reduce potential impacts to this species PWD would implement SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures), SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring), and SPC BIO-6c (Seasonal Surveys During Water Deliveries). In addition, SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), SPC WQ-1 (Prepare Spill Response Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts from the spread of weeds, contaminated water, and fugitive dust.

SPCs Applicable to Impact BIO-6

SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures)

SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring)

SPC BIO-6c (Seasonal Surveys During Water Deliveries)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

SPC WQ-1 (Prepare Spill Response Plan)

CEQA Significance Conclusion

To reduce potential impacts to arroyo toad eggs, larvae, metamorphs, and adult toads, PWD would implement SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures), SPC Bio 6b (Conduct Surveys and Implement Avoidance Measures), and SPC BIO-6c (Seasonal Surveys During Water Deliveries). In addition SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), SPC WQ-1 (Prepare Spill Response Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Threatened and Endangered Reptiles

There are no known threatened or endangered reptiles in Littlerock Reservoir, Little Rock Creek, or the proposed sediment disposal areas. Protocol surveys for desert tortoise were conducted on the sediment disposal site and evidence of this species was not observed. Although the sediment disposal site supports habitat for this species the site is subject to routine disturbance, is functionally isolated from known occupied habitat, and is nearly surrounded by urban development. No records for desert tortoise exist within the Project area and no sign of their presence was detected during protocol surveys.

Threatened or Endangered Fish

There are no known threatened or endangered fish in the Littlerock Reservoir, Little Rock Creek, or the proposed sediment disposal areas. Threatened or endangered fish are not expected to be affected by the Project.

Threatened, Endangered, or Fully Protected Birds

Several State and federally listed bird species have the potential to occur at Littlerock Reservoir, Little Rock Creek, or the proposed sediment disposal area. Least Bell's vireo has been documented below the dam and fledged chicks in 2011. California condor, while not observed, is a far ranging species, which could water at the Reservoir. Swainson's hawks were not detected, but could forage near the sediment disposal site. Bald eagle is a periodic winter visitor to the Reservoir and it is possible that golden eagles forage in the area. Similarly, many species of migratory birds may be short-term seasonal visitors to the Project area.

Impact BIO-7: The Project could result in the loss of California condors.

The California condor is considered present on the ANF and may soar over portions of the Project site. Although condors have not been observed at the Reservoir, they occur broadly over the region during foraging trips. They have been documented roosting or loitering at Whittaker Peak, Bear Divide, and Mt. Lukens on the ANF.

California condors are a wide ranging species with potential to occur at any time within the Project area. USFWS management of condors includes use of feeding stations strategically located to direct condor activity away from areas where human activity is high. The supplemental feeding program has been successful in directing condors to areas within USFWS managed refuge lands. However, over the life of this Project, it is possible that individual condors could fly over or stop in the Project area.

Within the Project area, the greatest risk for condors is associated with the potential for ingestion of objects such as microtrash (i.e. broken glass, hardware, plastic waste, bottle caps, small pieces of metal) or substances such as ethylene glycol antifreeze. These are existing conditions present within the Littlerock site and not associated with the project activities. Adults can bring microtrash back to nest sites where young birds can be injured or killed when they ingest the material. California condors are known to forage on a variety of carrion including small mammals such as jack rabbits (Collins, 2000) and may be attracted to small animals killed during construction activities on the proposed haul routes. Other hazards include power line collisions or vehicle strikes. The proposed action includes SPCs to avoid injury or mortality to California condors.

While California condors are not currently present in the Project area, they could become periodic visitors as their population increases. Proper implementation of Project SPCs will ensure avoidance of potential impacts to condors. PWD would implement SPC BIO-7 (Monitor Construction and Remove Trash and Microtrash), which includes periodic monitoring, cessation of Project activities within 500 feet of a California condor, and the removal of microtrash, waste, and road kill from the Project site. In addition, the implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts from the spread of weeds, limit fugitive dust, and further reduce potential for Project impacts to any condors that might visit the Project area.

SPCs Applicable to Impact BIO-7

SPC BIO-7 (Monitor Construction and Remove Trash and Microtrash)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

California condors are not present in the Project area but could become periodic visitors as their populations increase. To avoid potential for impacts to California condor, PWD would implement SPC BIO-7 (Monitor Construction and Remove Trash and Microtrash) which includes periodic monitoring, the cessation of Project activities within 500 feet of a California condor, and the removal of Project-generated debris, trash, waste, and road kill from the Project site. In addition, SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts from the spread of weeds, limit fugitive dust, and avoid the potential for Project-related impacts to this species if present. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-8: The Project could disturb nesting willow flycatchers, southwestern willow flycatchers, least Bell's vireos, or their habitat.

Willow flycatchers, including the federally listed southwestern willow flycatcher, have not been documented breeding within the Project area. Five willow flycatchers of undetermined subspecies were observed in riparian habitat below the dam and in Littlerock Creek on May 18, 2012. No breeding activity was detected, and no willow flycatchers were observed during follow-up surveys in July 2012. It is unknown whether these individuals were the federally listed southwestern willow flycatcher or a different subspecies (all subspecies are state listed). It was determined that the individuals were migrants, and no breeding is expected at these locations because the habitat quality is not typical of the habitat used by breeding southwestern willow flycatchers, and the Project area is well south of the breeding range for the other willow flycatcher subspecies.

Potential threats that have been identified on NFS lands are directed towards nesting habitat and include wildfires and resultant flooding, water diversion or extraction, unauthorized vehicle use, high levels of dispersed recreation, road and trail construction and use, invasive non-native vegetation, cowbird parasitism, and predation. However, suitable breeding habitat for willow flycatchers is not present at the Reservoir.

Least Bell's vireo nest below the dam but have not been observed at the Reservoir. Suitable habitat for this species may become established above Rocky Point given limited scouring and seasonal access to water. Critical Habitat for this species is not present in the Project area. Project activities have potential to impact least Bell's vireos through ground-disturbing activities associated with construction of the grade control structure, sediment removal, road repair activities, increased noise levels from heavy equipment, increased human presence, and exposure to fugitive dust. However, SPCs have been incorporated into the Project to minimize or avoid impacts to nesting least Bell's vireos, as described below.

Least Bell's vireos are not expected to nest at the Reservoir and would not be affected by the construction of the grade control structure, sediment removal, or road repair activities. The most likely disturbance to this species would be from haul trucks driving on Cheseboro Road and repairs to the access road below the dam. The nests are located in Little Rock Creek east and adjacent to Cheseboro Road. The creek in this area is located in a deep channel (approximately 40 to 80 feet) below the elevation of the road. Sound measurements taken below the dam — see Section C.8 (Noise) — identify that the area has low ambient noise when water is not flowing. During periods of heavy flow (i.e., winter and early spring), the noise from the creek can easily exceed 60 dB(A) at the nest sites. Road noise or dust may adversely affect nesting birds. Many riparian birds including least Bell's vireo and other neo-tropical migrants are adversely affected by noise and human disturbance. Reijnen et al., 1995 demonstrated that for two species of European warbler (*Phylloscopus* spp.), sound levels between 26 dB(A) and 40 dB(A) reduced breeding density by up to 60 percent compared to areas without disturbance. In addition, while current sound thresholds for most birds in California are considered to be approximately 60 dB(A), this level may still adversely affect breeding success for least Bell's vireo. W. Haas (personal communication, 2007) reported that in 1999, sound levels were recorded at 87 locations containing similar habitat conditions in the vicinity of the San Luis Rey River, the most robust and stable population of flycatchers in California. Data indicated that noise levels were the most important factor for occupancy. These data suggest disturbance from adjacent road noise and urban development may be a contributing factor in the use of habitat adjacent to developed areas. Conversely Aspen has noted least Bell's vireo successfully fledging chicks in a number of locations with high levels of ambient noise. This includes urban areas of Murrieta Creek, at the Santa Clara River Highway 101 overpass in Ventura, and at Prado Dam in Riverside County.

Construction of the grade control structure would be initiated in July toward the end of the breeding season, which would reduce the potential for least Bell's vireo and other breeding neo-tropical migrants to be present in the work areas. Sediment removal activities commence after Labor Day and continue until mid- to late November. However, many birds remain on the nest well into July and nesting periods are affected by a number of factors including weather and access to forage.

Project activities will have no direct effects on nesting least Bell's vireos below the dam, but foraging birds may avoid areas closest to the road during haul periods. Fugitive dust is not expected since the access road has an asphalt surface. Use, maintenance, and repair of the access road will occur on an as-needed basis. Therefore, these activities could occur during the reproductive season. Habitat in immediate proximity of the road is not suitable for nesting least Bell's vireos, but could be used by foraging birds. Access road use, maintenance, and repair could lead to some short-term displacement of foraging birds. No permanent displacement or impacts to reproductive success are expected.

Any Project activities that result in the loss or degradation to habitat for least Bell's vireo and other neo-tropical migrants would be considered adverse. To reduce impacts to least Bell's vireo and other neo-tropical migrants, PWD would implement SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) which includes protocol surveys of suitable habitat, avoidance of any active nests, and monitoring of nest buffers. In addition, general SPC's including SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would further reduce impacts to this species, if present.

SPCs Applicable to Impact BIO-8

SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

To reduce or avoid impacts to least Bell's vireo and other neo-tropical migrants, PWD would implement SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat), which includes protocol surveys of suitable habitat, avoidance of any active nests, and monitoring of nest buffers. In addition, general SPCs including SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would further reduce impacts to this species if present. Implementation of these measures would ensure impacts remain less than significant (Class III).

Impact BIO-9: The Project would disturb Swainson's hawks.

Swainson's hawks nest in areas such as riparian woodlands, roadside trees, trees along field borders, and the edges of remnant oak woodlands. In the Antelope Valley, they are found in Joshua trees and in large non-native trees that border agricultural fields. There are no known records of this species within the vicinity of the Reservoir; however, migratory and foraging birds may pass through the canyons. Aspen biologists noted one adult Swainson's hawk foraging in a field north of the Los Angeles World Airports' Palmdale Regional Airport and another bird perched in a tree at 90th Street East in September 2009, over 5 miles north of the sediment disposal site. The closest known nesting sites are over 10 miles away north of Alpine butte (CDFW, 2014).

Swainson's hawk has not been detected at the Reservoir or sediment disposal sites. This species is not expected to forage at the Reservoir, although it has a moderate potential to forage at the sediment disposal sites. Nesting is also not expected at the Reservoir and is unlikely to occur at the sediment disposal sites. Direct impacts to Swainson's hawk, if present, would include disruption of foraging activity due to increased dust, noise, and human presence associated with the placement of fill or loss of habitat at the sediment disposal site. Indirect impacts include a reduction in habitat suitability due to the establishment of noxious weeds. Operational impacts are not expected but could occur if the species nests in adjacent habitat.

Because annual sediment removal activities would occur for many years and this species is known from the Antelope Valley, it is not possible to predict what use may occur at the debris disposal site in the future. Project activities that cause Swainson's hawks to abandon their nests or otherwise fail to reproduce would be considered an adverse impact. To reduce or avoid impacts to this species PWD would implement SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks), which includes a pre-construction survey at the sediment disposal site on 47th Street East prior to land disturbance and the establishment of buffers to avoid nesting birds if detected. The loss of foraging habitat would be off-set through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). The implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts from the spread of weeds and fugitive dust.

SPCs Applicable to Impact BIO-9

SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's Hawks)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Swainson's hawk has not been detected at the Reservoir or sediment disposal site. This species is not expected to forage at the Reservoir and has a moderate potential to forage at the sediment disposal site. Because annual sediment removal activities would occur for many years and this species is known from the Antelope Valley, it is possible that this species may be present in the future. SPCs have been incorporated into the Project to ensure activities will not have significant impacts associated with abandonment of Swainson's hawk nests or failed reproductive success. To reduce or avoid impacts to this species, PWD would implement SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks), which includes a pre-construction survey at the sediment disposal site on 47th Street East prior to land disturbance and the establishment of buffers to avoid nesting birds if detected. The loss of foraging habitat would be offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). The implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts from the spread of weeds and fugitive dust. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-10: The Project would result in disturbance to Bald or Golden Eagles.

Bald eagle is State-listed as endangered and is a Forest Service Sensitive Species that appears to be a routine winter visitor to the Reservoir. Golden eagles are fully State protected and may forage over the Project area. Bald and golden eagles are also protected under the federal Bald and Golden Eagle Protection Act (BGEPA). Golden eagles have not been observed but could forage in undisturbed habitat adjacent to the Reservoir or at the sediment disposal site at 47th Street East. Eagles could also nest on large trees near the reservoir but may be precluded from this activity due to ongoing human disturbance and use of the Reservoir. Human intrusions near golden eagle nest sites have resulted in nest abandonment; high nestling mortality when young go unattended due to altered behavior by the parent birds; premature fledging; and ejection of eggs or young from the nest (Pagel et al., 2010). Other protected raptors including peregrine falcons may also periodically forage in the Reservoir.

The Project must be in compliance with the BGEPA and will include measures designed to avoid impacts to reproductive success. Direct impacts if present would include temporary disturbance due to noise and human presence associated with sediment removal activities or the placement of fill at the sediment disposal site. Golden and bald eagles are not expected to nest at the Reservoir at this time. Indirect impacts include the loss of habitat due to the establishment of noxious weeds and from the placement of fill at the sediment disposal site at 47th Street East. Under the BGEPA, nest abandonment or decreased golden eagle reproductive success caused by substantial interference with normal breeding, feeding, or sheltering behavior, would constitute "take." Impacts that result in the disruption of breeding or foraging would be considered an adverse impact.

Sediment removal activities are not expected to substantially alter the use of the Reservoir by bald or golden eagles. Golden eagles may forage in the Project area at any time of year but have not been recorded at the Reservoir, while bald eagles appear to be only a periodic winter visitor. To reduce impacts to sensitive wildlife and maximize use of the water reserves in the Reservoir, the majority of sediment removal activities would occur between late summer and early winter when stream flows would fill the Reservoir and preclude sediment removal activities. Bald eagles are not typically found at the Reservoir during this period. Bald eagles would retain access to the site during the winter and would be able to forage on fish and other prey. In addition, the removal of invasive fish from Littlerock Reservoir would create a beneficial effect on golden and bald eagles by preventing the exposure of bird species to elevated levels of contaminants.

The placement of fill at the 47th Street East sediment disposal location would remove up to approximately 5 acres of potential foraging habitat that could be used by golden eagles. To reduce this impact, and to avoid other impacts to bald and golden eagles from the Project, PWD would implement SPC BIO-4, SPC BIO-8, SPC BIO-9, SPC BIO-1a, and SPC BIO-2. SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) includes pre-construction surveys for nesting birds and the establishment of buffers if nesting birds are detected. Implementation of SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) and SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) would increase the potential to detect any nesting raptors in the Project area. The loss of foraging habitat would be offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). The implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts from the spread of weeds and fugitive dust.

SPCs Applicable to Impact BIO-10

SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds)

SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat)

SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

To reduce or avoid impacts to bald and golden eagles, PWD would implement SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) which includes pre-construction surveys for nesting birds and the establishment of buffers to avoid nesting birds if detected. Implementation of SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) and SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) would increase the potential to detect any nesting raptors in the Project area. The loss of foraging habitat would be offset through SPC BIO-1a (Restoration/Compensation for Impacts to Native Vegetation Communities). The implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts from the spread of weeds and fugitive dust. Implementation of these SPCs would ensure impacts to golden and bald eagles would remain less than significant (Class III).

Threatened, Endangered, or Fully Protected Mammals

Protocol surveys for Mohave ground squirrel were conducted at the sediment disposal site and evidence of this species was not observed (see Section C.3.1.5). Based on the known distribution of this species in the region, the habitat conditions at the Project site, and the level of ongoing human use, it was determined that the sediment disposal site does not provide suitable habitat for Mohave ground squirrel.

Impact BIO-11: The Project would result in disturbance or loss of habitat for the ringtail.

Ringtail, a fully protected species in California, has the potential to occur in chaparral and riparian habitat associated with Little Rock Creek. Although not observed during several years of surveys this species is known from the San Gabriel Mountains. Ringtails are similar to raccoons in that they are often found within 0.6 mile (1 kilometer) of a permanent water source (Zeiner et al., 1990b).

Direct impacts from the construction of the grade control structure, sediment removal, and road repair activities would include mortality of individual ringtail or disturbance of ringtail maternity dens during the pup-rearing season (May 1 to September 1). Construction in riparian areas could also disturb denning ringtails if present. Dens may be in a hollow tree, a rock pile, a crevice in a cliff, or in abandoned burrows or woodrat nests (Zeiner et al., 1990b). Ringtails change dens frequently and an individual rarely spends more than three days in the same shelter. However, females with young remain in the same den for 10 to 20 days after giving birth. After that time dens may be changed daily (Poglayen-Neuwall and Toweill, 1988). Construction noise, dust, human presence, or ground disturbance could result in the abandonment of these den sites or result in mortality of juvenile animals. Indirect impacts to ringtail could include the spread of noxious weeds that degrade habitat quality, degradation of water quality due to siltation, and alteration of soils. Operational impacts would include disturbance to ringtail dens, the spread of noxious weeds, and disturbance from annual sediment removal activities or repairs to PWD access road below the dam.

The degradation of riparian areas has been identified by the Forest Service as a potential threat to the species on NFS lands (Stephenson and Calcarone, 1999). However, the total area of riparian habitat affected by the Project is low and it is not likely to make this species highly vulnerable to adverse effects from sediment removal activities. Ringtails that den in some of the large riparian trees that remain in the Reservoir would be affected; however, sediment removal activities of the grade control structure would primarily occur outside of the denning season for this species. With the exception of the denning period, this species is highly mobile and may leave the work area undetected. However, as this species is primarily nocturnal (although this species has been observed during the day in remote canyons) there is some potential to disturb denning or resting animals. If present impacts to this species would be considered adverse.

To reduce impacts to this species PWD would implement SPC BIO-11 (Conduct Focused Surveys for Ringtail and Avoid denning Areas) that includes preconstruction surveys to evaluate the potential presence of this species in or adjacent to the proposed work area. If present, work would be redirected to adjacent areas. In addition, SPC BIO-1a (Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts to this species from the loss to riparian habitat, educate workers regarding sensitive wildlife, reduce impacts from the spread of weeds, and limit fugitive dust in riparian habitats.

SPCs Applicable to Impact BIO-11

SPC BIO-11 (Conduct Focused Surveys for Ringtail and Avoid denning Areas)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

This is a California fully protected species and direct loss of this species is prohibited. To reduce or avoid impacts to this species, PWD would implement SPC BIO-11 (Conduct Focused Surveys for Ringtail and Avoid denning Areas) which includes preconstruction surveys to evaluate the potential presence of this species in or adjacent to the proposed work area. If present, work would be redirected to adjacent areas. In addition, SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce impacts to this species from the loss to riparian habitat, educate workers regarding sensitive wildlife, reduce impacts from the spread of weeds, and limit fugitive dust in riparian habitats. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Have a substantial adverse effect, either directly or through habitat modifications on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, Forest Service, or USFWS (Criterion BIO3)

Special-status Plants

Approximately 24 special-status plant taxa have the potential to occur in the Project area. Figure C.3-10 illustrates the known locations of special-status plants occurring in or near the Study Area (CDFW, 2015). Three special-status plants, Johnston's monkeyflower (CRPC 4.3), short-joint beavertail (CRPR 1.B/FSS), and Lemmon's syntrichopappus (CRPR 4.S/FSW), were detected within the Vegetation Study Area during botanical surveys conducted from 2010 to 2014. None of these plants were detected in the Project area. Table C.3-4 lists the sensitive plant species that have the potential to occur in the Vegetation Study Area.

Impact BIO-12: The Project would result in the loss of candidate, Forest Service Sensitive, or special-status plant species.

Direct, indirect, and operational impacts to special-status plant species would be the same as described for listed plant species (Impact BIO-5) and may occur in a variety of ways, including the direct removal of plants during the construction of the grade control structure, sediment removal or road repair activities, or the placement of fill at the disposal site. Indirect impacts may include the invasion of weedy invasive and dust from grading or from trucks along Cheseboro Road and the other designated haul routes. Rare plants may also be disturbed from annual sediment removal activities, from repairs to PWD access road below the dam, or from weed management activities that include manual treatments and the use of herbicides. If present, the loss of sensitive plants would be considered an adverse impact.

Rare plants have not been found and are not expected to be present in the Reservoir. Based on surveys the most likely area to support rare plants would be in the juniper woodland habitat on the sediment disposal site at 47th Street East. Although not observed, sensitive plant species including pygmy poppy (*Canbya candida*) and Mojave paintbrush (*Castilleja plagiotoma*) CRPR 4.3 and Forest Service Sensitive species could be present. Although rare plants were detected in only a few locations, there is a potential for some species to occur in areas that have not been subject to intense focused surveys (i.e., the 47th Street sediment disposal area) or may have failed to germinate even though plant expression on the sediment removal site was adequate in 2014 despite the poor rain year. If any of these species are encountered during pre-construction focused surveys, all individuals or populations within Project disturbance areas would be marked and avoided to the maximum extent possible. However, it is possible that some sensitive plants would be subject to Project disturbance.

Typically, impacts to a small number of non-State- or federally listed special-status plants (i.e., impacts to a few individuals) or impacts to a population where loss of the population would not negatively affect the range of the special-status plant species are not typically considered adverse. However, if Project activities result in the loss of more than ten percent of the known individuals within the Forest Service Sensitive, and/or special-status plant species (list 1.B or list 2 only) occurrence to be impacted, PWD shall preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 ratio (habitat preserved: habitat impacted).

To reduce impacts to sensitive plant species, PWD would implement SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants). The implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) and SPC BIO-1b (Worker Environmental Awareness Program) would further reduce impacts to sensitive plants by limiting work to previously surveyed and historically disturbed areas (i.e., the Reservoir) and using best management practices. Indirect effects on listed plants from the spread of invasive weeds would be minimized by implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan). This measure would prevent or reduce the potential spread of noxious weeds, control existing weed populations, and restore native habitats as required by Forest Service Manual 2080. SPC AQ-2 (Fugitive Dust Controls) and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would limit fugitive dust impacts to plant species.

SPCs Applicable to Impact BIO-12

SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

PWD has incorporated SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants) into the Project to reduce impacts to sensitive plant species. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) and SPC BIO-1b (Worker Environmental Awareness Program) would further reduce impacts to sensitive plants by limiting work to previously surveyed and historically disturbed areas (i.e., the Reservoir) and using best management practices. Indirect effects on special-status plants from the spread of invasive weeds would be minimized by implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan). This measure would prevent or reduce the potential spread of noxious weeds, control existing weed populations, and restore native habitats as required by Forest Service Manual 2080. SPC AQ-2 (Fugitive Dust Controls) and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would limit fugitive dust impacts. The implementation of these SPCs would ensure impacts to sensitive plants remain less than significant (Class III).

Special Status Invertebrates

Special-status invertebrates were not detected; however, portions of the Study Area have the potential to support shoulderband snails. Shoulderband snails are a group of pulmonate (air-breathing) snails that can occur in areas with suitable micro-habitat such as rock or debris piles, dead vegetation, or small drainages where soil moisture persists. Although there are no known records for Trask shoulderband snail (*Helminthoglypta traskii*), a California Special Animal, this species is known from the region. San Emigdio blue butterfly, a Forest Sensitive Species, is not expected to occur in the Project area but may be associated with salt bush along the margins of Little Rock Creek in downstream areas. This species is known from the Mojave River in Victorville.

Impact BIO-13: The Project could result in the loss of Shoulderband Snails or San Emigdio Blue Butterfly.

Sensitive invertebrates are not expected to occur in the Reservoir, but may be associated with adjacent riparian and upland communities that provide suitable microhabitat conditions. If present, direct impacts would include loss or mortality from construction, sediment removal, or road repair activities that crush individuals or alter microhabitat conditions to the degree the species can no longer survive (i.e., removal of leaf litter). Impacts to butterflies would most likely result from vehicle strikes. Indirect and operational impacts could include the spread or colonization of weeds, weed management, fugitive dust, and the alteration of hydrology or the disruption of flows to off-site areas at the sediment disposal sites. Impacts to these species would be considered adverse.

To reduce or avoid impacts to these species, PWD would implement SPC BIO-1a (Provide Restoration/ Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these SPCs provide for protection by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. The SPCs include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species.

SPCs Applicable to Impact: BIO-13

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Trask shoulderband snail and San Emigdio blue butterfly have not been detected in the Project area. While it is possible these species occur in adjacent habitat, impacts would be reduced or avoided through implementation of the following SPCs: SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these SPCs provide for protection by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. The SPCs include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Special-Status Reptiles and Amphibians

Coast horned lizard, a CDFW Species of Special Concern and coastal whiptail, a CDFW Special Animal, and silvery legless lizard, a CDFW Species of Special Concern and Forest Service Sensitive Species, were observed near the dam. Southwestern pond turtle and two-striped garter snake, CDFW Species of Special Concern and Forest Service Sensitive Species, were observed within aquatic habitat above and below the dam. In addition, the Project area provides habitat for a variety of special-status reptiles and amphibians.

Impact BIO-14: The Project could result in mortality or injury to southwestern pond turtles or a disruption of nesting habitat.

Southwestern pond turtles have been observed at the Reservoir near Rocky Point and below the dam. The pond turtle is normally found in and along riparian areas, although gravid females have been reported to nest more than 1,300 feet away from the nearest aquatic habitat (Holland, 1994). Pond turtles may also make overland movements up to one mile between areas of aquatic habitat (Bury, 1972 in Ernst et al., 1994). The preferred habitat for these turtles includes ponds or slow-moving water with numerous basking sites (logs, rocks, etc.), food sources (plants, aquatic invertebrates, and carrion), and few predators (raccoons, introduced fishes, and bullfrogs). Juvenile and adult turtles are commonly seen basking in the sun at appropriate sites, although they are extremely wary animals and often dive into the water at any perception of danger.

Direct effects to southwestern pond turtle may occur as a result of mechanical crushing; loss of nesting, breeding or basking sites; and human trampling. Disturbance would be associated with the removal of vegetation and construction of the grade control structure. Disruption of basking activity and potential impacts to southwestern pond turtles may result from construction activities, if pond turtles are present near the proposed construction site. To date, pond turtles have rarely been seen and when observed were noted at the upper margin of the Reservoir. It is possible they breed in the Reservoir; however, young turtles would fall prey to bass and other fish.

Direct impacts to southwestern pond turtles could also result from temporary impacts to water quality, fugitive dust, temporary loss of upland nesting sites and foraging habitat, disruption of breeding activity, or disturbance of basking sites. Juvenile southwestern pond turtles typically move from nesting sites in adjacent upland or riparian areas to the stream in the spring (Buskirk, 1992). Hatchlings are very small, often less than one inch, and may be inadvertently trampled during Project construction. In addition, access to zooplankton, an important hatchling food source, may be disrupted if water quality were to be severely degraded by the Project.

Indirect impacts to southwestern pond turtle would include alteration of habitat that precludes pond turtle use, degradation of water quality over time due to siltation and sedimentation, and the spread of noxious weeds. Operational impacts include risk of mortality by vehicles and disturbance during annual sediment removal activities or repairs to PWD access road below the dam.

The greatest potential for injury or mortality to southwestern pond turtles as a result of Project activities is the damage or destruction of nesting areas. Since southwestern pond turtles often nest communally, damage or destruction of a nesting area could result in injury or mortality to a large number of incubating eggs or hatchling turtles and could disrupt egg-laying activities of adult female turtles. Sediment removal activities would be limited to dry portions of the Reservoir that were previously inundated. In addition, sediment removal activities and the construction of the grade control structure would commence in late summer after water surface elevations have been reduced in the Reservoir. Construction of the grade control structure and sediment removal activities would not be conducted in ponded or flowing water. Pond turtles or their eggs may be present in vegetated areas subject to clearing; however these areas are seasonally inundated and pond turtles that place eggs in these areas would be lost. Nonetheless any impacts to pond turtles would be considered adverse.

To reduce impacts to pond turtles, PWD would implement SPC BIO-14 (Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures) which includes clearance surveys for southwestern pond turtles prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education on how to identify pond turtles, and the control of invasive weeds. Implementation of these SPCs would provide for protection of pond turtles by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-14

SPC BIO-14 (Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

To reduce impacts to pond turtles, PWD would implement SPC BIO-14 (Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures) which includes clearance surveys for southwestern pond turtles prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide

Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts through acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these measures provide for protection by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-15: The Project could result in injury or mortality for two-striped garter snakes.

The two-striped garter snake is highly aquatic but may move considerable distances into upland habitats, even where permanent water is lacking. Two-striped garter snakes have been observed in riparian, freshwater marsh, coastal sage scrub, chaparral, oak woodland, and grassland habitats. Rathburn et al. (1993) found that these snakes tend to occupy streamside sites during the summer and switch to nearby upland habitats during the winter. Two-striped garter snakes were observed in Little Rock Creek above and below the dam. This species is not expected to occur on the sediment disposal sites.

Direct impacts due to construction activities include mortality or injury of individual two-striped garter snakes as a result of mechanical crushing; loss of nesting, breeding, or basking sites; fugitive dust; and human trampling. Other direct effects to these species include degradation of water quality through siltation caused by vehicles using wet ford stream crossings and removal of vegetation. Indirect effects include compaction of soils and introduction of exotic plant species. Operational impacts include risk of mortality by vehicles and disturbance on PWD access road below the dam or during annual sediment removal activities.

Project effects to this species would be similar to southwestern pond turtle and would be considered adverse. By design, the Project would limit work to dry areas of the Reservoir and stream channel. This would reduce the potential for direct effects to this species. To reduce effects of the Project on two-striped garter snakes PWD would implement SPC BIO-15 (Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures), which includes clearance surveys for two-striped garter snakes prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these SPCs would provide for protection by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-15

SPC BIO-15 (Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

To reduce impacts to two-striped garter snakes, PWD would implement SPC BIO-15 (Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures) which includes clearance surveys for southwestern pond turtles prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these measures provide for protection by educating workers to avoid sensitive species and their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these measures ensures that potential impacts would remain less than significant (Class III).

Impact BIO-16: The Project could result in injury or mortality for Coast Range newts.

The Coast Range newt requires water for breeding, but uses adjacent upland habitat extensively. It is often found where water sources dry up for the summer, and during moist conditions, can be found beneath logs, boards, rocks, and in rodent burrows. This species can also be found in drier habitats such as oak forests, chaparral, and rolling grasslands. A permanent water source is not necessary as this species needs water only during breeding. In areas where newts utilize streams, they can be found in slow-moving areas and pools. The range of the Coast Range newt within southern California is highly fragmented; however, Coast range newts have been identified on the ANF.

This species has not been detected in the Project area but may occur in Little Rock Creek and in many of the perennial or nearly perennial aquatic habitats on the south slopes of the San Gabriel Mountains. The primary threats to this species on NFS lands include predatory non-native species, maintenance of aquatic stream flows, water quality, and illegal collecting. Coast Range newts are expected to have a low potential to occur in the Reservoir due to the presence of predatory fish. Coast Range newts are not expected to occur at the proposed 47th Street sediment disposal site.

Direct impacts to Coast Range newts include mortality or injury of individual animals as a result of mechanical crushing; loss of breeding sites; fugitive dust; and human trampling. Other direct effects to these species include degradation of water quality through siltation caused by vehicles using wet ford stream crossings; and removal of vegetation. Indirect effects include compaction of soils and introduction of exotic plant species. Operational impacts include risk of mortality by vehicles and disturbance on PWD access road below the dam or during annual sediment removal activities. Seasonal fluctuations in the water surface elevations could also strand egg masses of juvenile newts.

Project effects to this species would be similar to reptiles and amphibians that rely on aquatic areas to support their life history and would be considered adverse if they occur. By design, the Project would limit work to dry areas of the Reservoir and stream channel. This would reduce the potential for direct effects to this species. To reduce effects of the Project, PWD would implement SPC BIO-16 (Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures), which includes clearance surveys for Coast Range newts prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts through the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), SPC WQ-1 (Prepare Spill Response Plan), and SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP]) would limit construction in wetted areas and reduce the potential for hazardous spills into waterways. Implementation of these SPCs would protect Coast Range newts by educating workers to avoid sensitive species and their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Seasonal surveys conducted for arroyo toads (SPC BIO-6c [Seasonal Surveys During Water Deliveries]) along the margins of the Reservoir prior to water deliveries would reduce the potential for standing of egg masses.

SPCs Applicable to Impact BIO-16

SPC BIO-16 (Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

SPC WQ-1 (Prepare Spill Response Plan)

SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP])

CEQA Significance Conclusion

Project activities that result in the loss of coast range newts would be considered a significant impact. To reduce effects of the Project, PWD would implement SPC BIO-16 (Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures). This SPC includes clearance surveys for Coast Range newts prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) and SPC WQ-1 (Prepare Spill Response Plan) would limit construction in wetted areas and reduce the potential for hazardous spills into waterways. Implementation of these SPCs would protect Coast Range newts by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Seasonal surveys conducted for arroyo toads (SPC BIO-6c [Seasonal Surveys During Water Deliveries]) along the margins of the Reservoir prior to water deliveries would reduce the potential for standing of egg masses. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-17: The Project could result in injury or mortality of terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.

Several non-listed special-status reptiles and amphibians (terrestrial herpetofauna) could be affected by the Project. These include the following terrestrial California Species of Special Concern and Forest Service Sensitive species:

- San Diego horned lizard
- Silvery legless lizard
- Orange-throated whiptail
- Coastal rosy boa
- San Bernardino ringneck snake
- San Bernardino mountain kingsnake
- Coast patch-nosed snake

Several of these species, including San Diego horned lizard, silvery legless lizard, San Bernardino ringneck snake, and orange-throated whiptail were detected near the reservoir. Given the ecology of these species and cryptic nature, it is likely that some or all of the species identified above may occur in or near the Project area. Special-status terrestrial herpetofauna potentially present in the Project area would be subject to similar types of impacts. Direct impacts include being hit by vehicles on access roads, mechanical crushing during construction of the grade control structure, or the placement of fill at the 47th Street East sediment disposal site. Other impacts include fugitive dust; and general disturbance due to increased human activity. Project implementation may also result in permanent loss of habitat at the sediment disposal site. Special-status terrestrial herpetofauna could be injured or killed during ground-disturbing Project activities in undeveloped upland habitats and in some developed areas throughout the Project including staging areas near the Reservoir. Indirect impacts to these species include compaction of soils and the introduction of exotic plant species. Operational impacts include risk of mortality by vehicles and disturbance on access roads during annual sediment removal activities or during repairs to PWD access road below the dam.

Direct loss of these species would be considered an adverse impact. To reduce effects of the Project, PWD would implement SPC BIO-17 (Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures). This SPC includes clearance surveys for terrestrial herpetofauna prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts through the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), SPC WQ-1 (Prepare Spill Response Plan), and SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP]) would limit construction in wetted areas and reduce the potential for hazardous spills into waterways. Implementation of these SPCs would protect terrestrial herpetofauna by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-17

SPC BIO-17 (Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

SPC WQ-1 (Prepare Spill Response Plan)

SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP])

CEQA Significance Conclusion

Direct loss of these species would be considered a significant impact. To reduce effects of the Project PWD would implement SPC BIO-17 (Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures). This SPC includes clearance surveys for terrestrial herpetofauna prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) and SPC WQ-1 (Prepare Spill Response Plan) would limit construction in wetted areas and reduce the potential for hazardous spills into waterways. Implementation of these SPCs would protect terrestrial herpetofauna by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Special-Status Birds

The Project area supports a variety of special-status birds. Impacts to special-status birds would be similar to those described for common wildlife (see Impact B-3). Impacts to nesting birds are described in Impact BIO-4. Non-listed, special-status birds are discussed in greater detail below.

Impact BIO-18: The Project would result in the loss of suitable burrowing owl habitat.

Burrowing owls, a CDFW Species of Special Concern, are known from the Antelope Valley and may occur at the 47th Street East sediment disposal site. Protocol surveys for this species did not detect signs of this species; however, owls may occupy a suitable site at any time. Burrowing owls are not expected to occur at the Reservoir. This species is not known to nest on NFS lands, although burrowing owls may occur along the lower margins of the forests where they come in contact with desert slopes and valleys that abut NFS lands. Management of NFS lands does not significantly influence the conservation status of this species given its range and habitat requirements (Stephenson and Calcarone, 1999).

Direct impacts to burrowing owls as a result of construction activities for the Project could include the crushing of burrows, removal or disturbance of vegetation, increased noise levels from heavy equipment, increased human presence, and exposure to fugitive dust. Indirect impacts could include the loss of habitat due to the colonization of noxious weeds. Operational impacts include disturbance on access roads during annual sediment removal activities.

Burrowing owls are not expected to be adversely affected at the Reservoir or during annual sediment removal activities. If burrowing owls are present at the sediment disposal site, the placement of fill could destroy occupied burrows or cause the owls to abandon burrows. However, SPCs have been incorporated into the proposed action to ensure construction during the breeding season does not result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. The loss of occupied burrowing owl habitat (habitat known to have been occupied by owls during the nesting season within the past 3 years) or reductions in the number of this rare species, directly or indirectly through nest abandonment or reproductive suppression, would constitute an adverse impact. Furthermore, raptors, including owls and their nests, are protected under both federal and State laws and regulations, including the Migratory Bird Treaty Act and California Fish and Game Code Section 3503.5.

To reduce or avoid these adverse effects, PWD would implement SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls). This SPC includes pre-construction surveys for burrowing owls at the sediment disposal site or any area supporting suitable habitat and the establishment of buffers if detected. Should the Project result in habitat loss for this species, PWD would acquire suitable habitat to replace lost territories. Implementation of SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) and SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) would increase the potential to detect burrowing owls in the Project area. The loss of foraging habitat would be further offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including worker education and the control of invasive weeds. Implementation of these measures would protect burrowing owls by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-18

SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds)

SPC BIO (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat)

SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

The loss of occupied burrowing owls or their habitat would be considered a significant impact. Furthermore, raptors, including owls and their nests, are protected under both federal and State laws and regulations, including the Migratory Bird Treaty Act and California Fish and Game Code Section 3503.5. To reduce or avoid the effects of the Project, PWD would implement SPC BIO-18 (Conduct Surveys for Burrowing Owls and Implement Monitoring, Avoidance, and Minimization Measures). This

SPC includes pre-construction surveys for burrowing owls at the sediment disposal site or any area supporting suitable habitat and the establishment of buffers if detected. Should the Project result in habitat loss for this species, PWD would acquire suitable habitat to replace lost territories. Implementation of SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) and SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) would increase the potential to detect burrowing owls in the Project area. The loss of foraging habitat would be further offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including worker education and the control of invasive weeds. Implementation of these SPCs would protect burrowing owls by educating workers to avoid sensitive species or their habitat, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-19: The Project could disturb Forest Service Sensitive or California Species of Special Concern birds.

A variety of birds considered sensitive by the Forest Service or CDFW were documented in the Project area (see Table C.3-5). These include Lawrence's goldfinch, Vaux's swift, Southern California rufous-crowned sparrow, summer tanager, and yellow warbler. Yellow warblers would be expected to breed in the area while Vaux's swift are typically associated with coniferous forests. While not observed, species including yellow-breasted chat (*Icteria virens*) may occur in riparian areas of Little Rock Creek, and gray vireo (*Vireo vicinior*) could occur in riparian areas or surrounding upland scrub habitats. Loggerhead shrike (*Lanius ludovicianus*) and Le Conte's thrasher (*Toxostoma lecontei*) could occur in or near juniper woodlands present at the 47th Street East sediment disposal site.

Direct, indirect, and operational impacts to nesting birds would be the same as described for common birds and raptors (see Impact BIO-4), southwestern willow flycatchers and least Bell's vireos (see Impact BIO-8), and burrowing owls (see Impact BIO-18). Direct impacts to nesting birds include ground-disturbing activities associated with construction of the grade control structure, sediment removal, road repair activities, increased noise levels from heavy equipment, increased human presence, and exposure to fugitive dust. Construction of the grade control structure during the breeding season has potential to impact breeding birds and reproductive success. Because sediment removal activities are scheduled to start after September 1, the potential for impacts to reproductive success is greatly reduced.

Indirect impacts to nesting birds include human disturbance, the spread of noxious weeds and disruption of breeding or foraging activity due to repairs to the access road or routine inspection of the Reservoir. Weed management could also affect nesting.

Project activities have potential to affect foraging and roosting birds if present during grade control construction, sediment removal, or access road repair. Birds and other wildlife may temporarily or permanently leave their territories to avoid construction activity, which could lead to reduced reproductive success and increased mortality. The loss of nesting birds would be considered adverse. Because of the potential for displacement of breeding birds and the abandonment of active nests, removal of vegetation during the breeding season will only be implemented if surveys have first been conducted to locate nesting birds.

Nesting birds are protected under federal and State laws and regulations, including the Migratory Bird Treaty Act and California Fish and Game Code Section 3503.5. To reduce effects of the Project on nesting birds, PWD would implement SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds). This SPC includes pre-construction surveys for nesting birds and the establishment of buffers if detected. Implementation of SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat), SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's Hawks), and SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls) would increase the potential nesting birds in the Project area. The loss of foraging habitat would off-set through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including worker education, and the control of invasive weeds and dust. Implementation of these SPCs would protect nesting birds by educating workers, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-19

SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds)

SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat)

SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks)

SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

The loss of nesting birds would be considered a significant impact and could violate State and federal laws that protect migratory and resident birds. To reduce or avoid effects of the Project on nesting birds, PWD would implement SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds). This SPC includes pre-construction surveys for nesting birds and the establishment of buffers if detected. Implementation of SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat), SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's Hawks), and SPC BIO-18 (Conduct Surveys for Burrowing Owls and Implement Monitoring, Avoidance, and Minimization Measures) would increase the potential nesting birds in the Project area. The loss of foraging habitat would offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts through worker education and the control of invasive weeds and dust. Implementation of these measures would protect nesting birds by educating workers, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Special-Status Mammals

The Project area supports a variety of special-status mammal species including several species of bats, small rodents, mid-size carnivores such as American badger, and Nelsons bighorn sheep. Some of the species have widespread distributions such as the black-tailed jackrabbit; whereas other species including bats and pocket mice occur in very limited areas and are often reliant on specific habitat types, such as rocky canyons, large trees with cavities, caves, bridges, and tunnels for many species of bats. Nelsons bighorn sheep is a periodic visitor to the hills above the Reservoir.

Impacts to sensitive mammals would be similar to those described for common wildlife (see Impact B-4). Wide-ranging species such as black-tailed jackrabbit are not likely to be affected by the Project. These species are able to quickly egress an area and the short duration of construction at any single point would not result in adverse impacts to the species; however, other species may be affected by the Project. These are discussed in greater detail below.

Impact BIO-20: The Project could result in mortality of, and loss of habitat for, special-status bat species.

Sensitive bats detected at the Reservoir included the pallid bat, a CDFW Species of Special Concern and Forest Service Sensitive Species, and Yuma myotis, a CDFW Special Animal. Townsend's big-eared bat, western red bat, hoary bat, spotted bat, western mastiff bat, big free-tailed bat, long-legged myotis, and pocketed free-tailed bat are all California Species of Special Concern that have the potential to occur within the Project area. Pallid bat and Townsend's big-eared bat are also Forest Service Sensitive species. The Project area includes numerous locations that constitute suitable bat foraging and roosting habitat, including Little Rock Creek, the Reservoir, juniper woodland on the sediment disposal site, and in adjacent scrub communities. The presence of large trees with exfoliating bark (i.e., large willow and cottonwood trees, Joshua trees, and junipers), water delivery tunnels below the dam, rock outcroppings, mine shafts, and hollow trees, provide suitable habitat for day roosts and hibernaculum.

Bat life histories vary widely. Some species hibernate during winter, or migrate to warmer areas. During the breeding season, bats generally roost during the day, either alone or in communal roost sites, depending on species. Some species feed mainly over open water where insect production is especially high, but others forage over open shrublands. The decline of bat populations is often due to roost site disturbance, loss of foraging habitat, and loss of roost sites. Activities that have been documented to impact bats include livestock grazing, vegetation treatments, and water reclamation that could lead to loss of a water source or riparian habitat. Due to their sensitivity to human disturbance, roost protection is important for bats. Roost protection measures may include seasonal use restrictions or physical closures as necessary.

Direct impacts to bats include mortality or displacement of bats during ground-disturbing activities associated with construction of the grade control structure, sediment removal, road repair activities, increased noise levels from heavy equipment, human presence, and exposure to fugitive dust. Noise, vibration, and human activity could disrupt maternity roosts during the breeding season. Indirect effects could include increased traffic, dust, and human presence in the Project area that could result in bats abandoning their roosts or maternal colonies. For example, Townsend's big-eared bat is known to abandon young when disturbed. Bats that forage near the ground, such as the pallid bat, would also be subject to crushing or disturbance by vehicles driving at dusk, dawn, or during the night. The use of access roads during dusk and dawn could also disturb bats or result in vehicle strikes.

Implementation of the Project would not prevent bats from foraging in the Reservoir or result in the loss of known maternity sites or roosting trees. However, bats are known from the Reservoir and could be disturbed from Project activities. The loss or disturbance to special-status bats would be considered adverse. To reduce impacts to bats, PWD would implement SPC BIO-20 (Survey for Maternity Colonies or Hibernaculum for Roosting Bats). This SPC includes pre-construction surveys for roosting bats and the avoidance of maternity colonies or hibernaculum. If maternity colonies are found, a construction buffer would be established and work diverted to another area. The loss of foraging habitat would offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including worker education and the control of invasive weeds. Implementation of these SPCs would protect bats by educating workers, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-20

SPC BIO-20 (Survey for Maternity Colonies or Hibernaculum for Roosting Bats)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Although bat roosts have not been confirmed at the reservoir or below the reservoir, there is potential for bats to use the dam tunnel and area trees and rock faces for roosting. Implementation of the Project would not prevent bats from foraging in the Reservoir or result in the loss of known maternity sites or roosting trees. However, bats are known from the Reservoir and could be disturbed from Project activities. To reduce impacts to bats, PWD would implement SPC BIO-20 (Survey for Maternity Colonies or Hibernaculum for Roosting Bats). This SPC includes pre-construction surveys for roosting bats and the avoidance of maternity colonies or hibernaculum. If maternity colonies are found, a construction buffer would be established and work diverted to another area. The loss of foraging habitat would be offset through SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities). SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would minimize impacts by including worker education and the control of invasive weeds. Implementation of these SPCs would protect bats by educating workers, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-21: The Project could result in mortality of, and loss of habitat for, special-status mammals.

Although not detected during surveys, the Project area may support a variety of small rodents including the Los Angeles pocket mouse, San Joaquin pocket mouse, pallid San Diego pocket mouse, and Southern grasshopper mouse. San Diego black-tailed jackrabbit may also occur in the region. These species are not expected to occur in the Reservoir but may be present in adjacent habitat, at the sediment disposal site, or along the proposed haul routes. The pallid San Diego pocket mouse has been found in pinyon-juniper woodland, desert scrub, rocky slopes, and agave-ocotillo habitat (Lackey, 1996). On desert slopes of the eastern San Gabriel Mountains, the species' distribution was closely correlated with the presence of yucca, particularly on dry, rocky southern slopes (Vaughan, 1954).

Direct impacts to these species would include mechanical crushing by vehicles and construction equipment, trampling, dust, and loss of habitat at the 47th Street East sediment disposal site. Construction disturbance can also result in the flushing of small animals from refugia which increases the predation risk for small rodents. Indirect impacts include alteration of soils, such as compaction that could preclude burrowing and the spread of exotic weeds.

These species are not expected to be subject to impacts from sediment removal activities and are likely distributed across the sediment disposal site in low densities. Nonetheless, the Project would remove or disturb vegetation and these animals would be subject to mortality from the placement of fill at this location. Impacts to these species would be considered adverse. To reduce impacts to small mammals PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these SPCs would provide for the protection of wildlife by educating workers on avoidance mechanisms, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. The SPCs include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species.

SPCs Applicable to Impact BIO-21

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

The distribution of small mammals in the Project area is greatly influenced by the fluctuating water surface elevations on the Reservoir and sensitive mammals are not expected to subject to impacts from sediment removal activities. Sensitive mammals are likely distributed across the sediment disposal site in low densities partly due to anthropogenic disturbance including OHV use. Nonetheless, the Project would remove or disturb vegetation and these animals would be subject to mortality from the placement of fill at this location. Impacts to these species would be considered significant. To reduce impacts to small mammals, PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these SPCs would provide for the protection of wildlife by educating workers on avoidance mechanisms, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. The SPCs include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-22: The Project could result in mortality of American badgers or desert kit fox.

American badgers and desert kit fox (a fully protected species under California Code of Regulations, Title 14, Section 460) were not detected in the Project area but may occur in drier, open habitats with friable soil anywhere within the Project area. Nonetheless, the Project would remove or disturb foraging habitat and these animals could be subject to adverse effects from the placement of fill at the 47th Street East sediment disposal site. Impacts to these species would be considered adverse.

Direct impacts to American badger and desert kit fox include mechanical crushing of individuals or burrows by vehicles and construction equipment, noise, dust, and loss of habitat. Indirect impacts include alteration of soils such as compaction that could preclude burrowing and the spread of exotic weeds. Operational impacts include risk of road kill on Cheseboro Road and other haul routes and the spread of noxious weeds.

To reduce impacts to American badger and desert kit fox PWD would implement SPC BIO-22 (Conduct Surveys for American Badger and Desert Kit Fox and Avoid During the Breeding Season). This SPC includes pre-construction surveys and avoidance of maternity dens and construction monitoring. If required for the placement of fill, PWD would passively relocate badgers out of the work area to reduce the potential for mortality. This includes monitoring and collapsing the dens once the animal leaves the site. However, badgers often retreat to burrows when alarmed and without active monitoring of a den it is difficult to determine the status of individual burrows. PWD would be required to avoid impacts to desert kit fox natal dens.

To reduce impacts, PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these measures provide for protection of American badgers and desert kit fox by educating workers on avoidance mechanisms, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat.

SPCs Applicable to Impact BIO-22

SPC BIO-22 (Conduct Surveys for American Badger and Desert Kit Fox and Avoid During the Breeding Season)

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

CEQA Significance Conclusion

Badgers and kit foxes are categorized as "fur-bearing mammals" (CDFG Code Section 4000). California Code of Regulations, Title 14, section 460, designates kit fox as "protected," and they are protected by CDFG Game Code (section 86) prohibition against take, defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." American badger is also considered a Species of Special Concern. Direct and indirect impacts to American badgers and desert kit fox would be significant if present. To reduce impacts to small mammals, PWD would implement SPC BIO-22 (Conduct Surveys for American Badger and Desert Kit Fox and Avoid During the Breeding Season). This SPC includes pre-construction surveys and avoidance of maternity dens and construction monitoring. If required for the placement of fill, PWD would passively relocate badgers out of the work area to reduce the potential for mortality. PWD would avoid impacts to desert kit fox natal dens. To reduce impacts, PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs include the acquisition of mitigation lands for habitat loss, the establishment of riparian vegetation, worker education, and the control of invasive weeds. Implementation of these SPCs provide for protection of American badgers and desert kit fox by educating workers on avoidance mechanisms, restoring temporarily disturbed areas after sediment removal activities, and acquiring off-site habitat. Implementation of these SPCs would ensure impacts remain less than significant (Class III).

Impact BIO-23: The Project would disturb Nelson's bighorn sheep.

Bighorn sheep are known from the local mountain ranges and are periodic visitors to Littlerock Canyon. Direct effects to bighorn sheep could include disturbance from construction activities, noise, and lighting. However, because of the distance to known herds, the Project is not expected to result in direct impacts from noise, dust, or human activity unless sheep move close to the Reservoir. During most summer months access to surface water remains in upstream portions of Little Rock Creek. The most likely risk to bighorn sheep would be increased road traffic. If present, the disruption of foraging or limiting sheep's access to water would be considered adverse impact.

The Project would not result in the loss of foraging habitat or disrupt inter-mountain movement for Nelson's bighorn sheep. While sheep may range far from mountainous areas, especially during intermountain movement, the Project is not expected to result in the loss of annual spring forage for this species or act as a barrier to movement. Sediment removal activities would take place in late summer after most spring plants have completed their bloom.

Indirect impacts to bighorn sheep could include the degradation of habitat from invasive weeds and risk of wildfires. Preventing access to watering sources is another potential effect. Operational impacts include the risk of road kill on Cheseboro Road.

To reduce impacts to Nelson's bighorn sheep, PWD would implement a series of measures including SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). These SPCs provide for protection of Nelson's bighorn sheep by educating workers on avoidance mechanisms and restoring temporarily disturbed areas after sediment removal activities. The SPCs include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species. In addition, SPC FIRE-1 (Curtailment of Activities), SPC FIRE-2 (Preparation of a Fire Plan), and SPC FIRE-3 (Spark Arrester Requirements) would be implemented to minimize risk of wildfire from Project activities.

SPCs Applicable to Impact BIO-23

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

SPC FIRE-1 (Curtailment of Activities)

SPC FIRE-2 (Preparation of a Fire Plan)

SPC FIRE-3 (Spark Arrester Requirements)

CEQA Significance Conclusion

Nelson's bighorn sheep are designated sensitive by the Forest Service and are protected by CDFW regulations. To reduce or avoid impacts to Nelsons bighorn sheep, PWD would implement a series of measures including SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds). Implementation of these SPCs provide for protection of Nelson's bighorn sheep by educating workers on avoidance mechanisms and restoring temporarily disturbed areas after sediment removal activities. In addition, SPC FIRE-1 (Curtailment of Activities), SPC FIRE-2 (Preparation of a Fire Plan), and SPC FIRE-3 (Spark Arrester Requirements) would be implemented to minimize risk of wildfire from Project activities.

The SPCs include directives that educate workers regarding reduced vehicle speeds and housekeeping activities that reduce conflicts with native species. Implementation of these SPCs would ensure that impacts remain less than significant (Class III).

Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. (Criterion BIO4)

Impact BIO-24: The Project could result in the loss of wetland habitats.

The preliminary jurisdictional determination and delineation of waters report identified approximately 92.306 acres of federal non-wetland waters and 97.428 acres of State waters in the Project area (see Figure C.3-12). Federal wetland waters do not occur in the Reservoir or in Little Rock Creek.

Construction of the grade control structure and sediment removal activities would result in approximately 73.2 acres of temporary disturbance to State and federal non-wetland waters. Annual repairs to PWD access road below the dam would disturb approximately 0.006 acres of federal non-wetland waters and 0.028 acres of State waters. The placement of fill on the 47th Street East sediment disposal site would avoid direct impacts to all jurisdiction waters. As currently proposed, sediment would be stored on no more than 8 acres of the site (See Figure C.3-15). Construction of the grade control structure would result in permanent impacts to approximately 0.33 acres above grade. Soil cement bank protection would extend laterally from the primary structure, as well as along the west upstream bank, to protect adjacent side slopes. This soil cement structure plus adjacent bank protection would span approximately 250 to 476 feet of channel (bank to bank) with a maximum depth of approximately 56 feet underground. The subterranean portion of the structure would extend downstream approximately 112 feet at an approximately 2-to-1 slope (see Figures B-3 and B-4). Because the grade control structure and most of the adjacent bank protection would be constructed below grade, only the upper lip of the structure would be visible when the reservoir water level is lowered (approximately 8 feet by 200 feet). Soil cement bank protection adjacent to the structure and on the west bank upstream of the structure would extend approximately 9 feet above the reservoir bed.

The importance of intermittent and ephemeral streams to wildlife in arid environments is well known (Levick et al., 2008). Ephemeral washes similar to those on the proposed sediment disposal site provide unique habitat that is distinct from the surrounding uplands providing more continuous vegetation cover and microtopographic diversity than the surrounding uplands. Ephemeral and intermittent streams in the arid west provide important habitat for wildlife and are responsible for much of the biotic diversity (Levick et al., 2008). They have higher moisture content and provide shade and cooler temperatures within the channel. In cases where the habitat is distinct in species composition, structure, or density, wash communities provide habitat values not available in the adjacent uplands. Riparian and wash dependent vegetation along desert washes drive food webs, provide seeds for regeneration, habitat for wildlife, access to water, and create cooler, more hospitable microclimatic conditions essential for a number of plant and animal species. Baxter (1988) noted that washes, because of their higher diversity plant communities, are probably important foraging locations for desert tortoise; in smaller washes, there is greater cover and diversity of spring annuals, providing important food sources.

Sediment removal activities would be considered temporary and would not substantially alter the functions of the Reservoir. At the completion of sediment removal activities, the Reservoir would fill with water for the season and continue to provide habitat for non-native fish and other aquatic resources. Habitat functions in much of the wash have been compromised by OHV use and riparian vegetation is limited to a few areas of the Reservoir. Nonetheless, impacts to these resources from the Project would be considered adverse. Permanent impacts from the placement of the grade control structure would be limited in scale and largely buried at the completion of construction which would allow for the annual recruitment of herbaceous vegetation above the structure in this area.

The small ephemeral washes present on the 47th Street East sediment disposal site appear to flow from at least one culvert under the California Aqueduct to off-site areas. PWD would avoid direct impacts to these features to maintain hydrology across the site.

Direct impacts to State and federal waters would include the removal of native riparian vegetation, the discharge of fill, degradation of water quality, and increased erosion and sediment transport. Indirect impacts could include alterations to the existing topographical and hydrological conditions and the introduction of non-native, invasive plant species. Operational impacts to wetland habitats would be similar to direct and indirect impacts and would primarily occur as a result of annual sediment removal activities or repairs to PWD access road below the dam. As required by law, PWD would comply with the regulations regarding conducting Project activities in water bodies under the jurisdiction of the State and federal government. Therefore, PWD would obtain required permits pursuant to Section 401 and 404 of the CWA and the State Porter-Cologne Act (see Appendix F for a 404(b)(1) Evaluation Summary) and CDFG Code 1605. On NFS lands, PWD would comply with the Forest Service requirements regarding Riparian Conservation Areas. There would be no net loss of wetlands from the implementation of the Project.

To reduce impacts to State and federal waters PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), SPC AQ-5 (Reduce Off-Road Vehicle Speeds), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), and SPC WQ-1 (Prepare Spill Response Plan). These measures include restoration, habitat acquisition, the avoidance of jurisdictional features on the sediment disposal site, worker training, and dust control. PWD would not conduct work in areas supporting ponded or flowing water and would replace lost vegetation along the margin of the Reservoir at a ratio of 3 to 1. Impacts to juniper woodland habitat would be replaced through habitat acquisition at a ratio of 1.5 to 1. Compliance with State and federal regulations and the SPCs proposed by PWD would minimize impacts to State and federal waters.

SPCs Applicable to Impact BIO-24

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

SPC WQ-1 (Prepare Spill Response Plan)

CEQA Significance Conclusion

Due to the importance of riparian and wash communities and its suitability to support special-status species, any loss of these habitats associated with the Project is significant. As required by law, PWD would comply with the regulations regarding conducting Project activities in water bodies under the jurisdiction of the State and federal government. Therefore, PWD would obtain required permits pursuant to Section 401 and 404 of the CWA and the State Porter-Cologne Act (see Appendix F for a 404(b)(1) Evaluation Summary) and CDFG Code 1605. On NFS lands, PWD would comply with the Forest Service requirements regarding Riparian Conservation Areas. To reduce impacts to State and federal waters, PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), SPC AQ-5 (Reduce Off-Road Vehicle Speeds), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), and SPC WQ-1 (Prepare Spill Response Plan). These measures include restoration, habitat acquisition, the avoidance of jurisdictional features on the sediment disposal site, worker training, and dust control. PWD would not conduct work in areas supporting ponded or flowing water and would replace lost vegetation along the margin of the Reservoir at a ratio of 3 to 1. Impacts to juniper woodland habitat would be replaced through habitat acquisition at a ratio of 1.5 to 1. Compliance with State and federal regulations and the SPCs proposed by PWD would ensure impacts to State and federal remain less than significant (Class III).

Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (Criterion BIO5)

Studies suggest that habitat fragmentation and isolation of natural areas ultimately results in the loss of native species within those communities (Soulé et al., 1988). The ability for wildlife to move freely among populations is important to long-term genetic variation and demography. Fragmentation and isolation of natural habitat may cause loss of native species diversity in fragmented habitats. In the short term, wildlife movement may also be important to an animal's ability to occupy home ranges, if a species range extends across a potential movement barrier. These considerations are especially important for rare, threatened, or endangered species, and wide-ranging species such as large mammals, which exist in low population densities. The Project area is located in the San Gabriel

Mountains which has been designated an essential connectivity area (Spencer et al., 2010). Littlerock dam is the only major physical obstacle in the area and precludes passage for aquatic species or wildlife with limited dispersal ability. Otherwise the Reservoir is surrounded by open natural lands with little to any physical barriers. The 47th Street east sediment disposal site is located in an area that has been subject to extensive development and does not appear to contribute to wildlife connectivity or movement for most species.

Direct impacts include the placement of physical structures such as the grade control structure at Rocky Point or the placement of fill at the 47th Street East sediment disposal area. Ground-disturbing activity including construction of the grade control structure or sediment removal activities and use of existing access roads would be expected to interfere with terrestrial wildlife movement during construction or sediment removal activities. The Project could also affect wildlife in adjacent habitats by interfering with movement patterns or causing animals to temporarily avoid areas adjacent to the construction zone. More mobile species such as birds and larger mammals would likely disperse into adjacent habitat areas during the clearing and sediment removal. Wildlife use of the area would be affected during these activities and from annual sediment removal activities.

Indirect impacts include human disturbance, colonization or expansion of invasive weeds, and vehicle traffic. Operational impacts would be the same as described for direct and indirect impacts.

Construction activities may temporarily limit terrestrial wildlife movement at the Reservoir; however, the broad geographic range and habitat that occurs in the region would remain available to wildlife. Wildlife would maintain access to the Reservoir during the morning and early evening as well as during nighttime hours. The Project would not substantially interfere with the movement of any native resident or migratory fish, reptile, or amphibian species. There are no listed reptiles or amphibians below the dam and sensitive amphibians that enter the Reservoir are considered lost through predation or from existing land uses. Existing barriers to movement currently limit movement in the Project area. Native and migratory fish are not present in this watershed and would not be affected by the Project.

There are no known bird or bat migratory corridors that would be directly impeded by the Project. Large concentrations of migrants are not known to utilize any specific portion of the Project site and Project activities are not expected to preclude use of the area. Migrating birds would have access to riparian communities above and below the dam during sediment removal activities.

Impact BIO-25: The Project would interfere with established wildlife migratory corridors.

Direct impacts include the placement of physical structures such as the grade control structure at Rocky Point or the placement of fill on approximately eight acres of the 47th Street East sediment disposal area. Ground-disturbing activity including construction of the grade control structure or sediment removal activities and use of existing access roads would be expected to interfere with terrestrial wildlife movement during construction or sediment removal activities. The Project could also affect wildlife in adjacent habitats by interfering with movement patterns or causing animals to temporarily avoid areas adjacent to the construction zone. More mobile species such as birds and larger mammals would likely disperse into adjacent habitat areas during the clearing and sediment removal. Wildlife use of the area would be affected during these activities and from annual sediment removal activities.

Indirect impacts include human disturbance, colonization or expansion of invasive weeds, and vehicle traffic. Operational impacts would be the same as described for direct and indirect impacts.

Construction activities may temporarily limit terrestrial wildlife movement at the Reservoir; however, the broad geographic range and habitat that occurs in the region would remain available to wildlife. Wildlife would maintain access to the Reservoir during the morning and early evening as well as during nighttime hours. The Project would not substantially interfere with the movement of any native resident or migratory fish, reptile, or amphibian species. There are no listed reptiles or amphibians below the dam and sensitive amphibians that enter the Reservoir are considered lost through predation or from existing land uses. Existing barriers to movement currently limit movement in the Project area. Native and migratory fish are not present in this watershed and would not be affected by the Project.

There are no known bird or bat migratory corridors that would be directly impeded by the Project. Large concentrations of migrants are not known to utilize any specific portion of the Project site and Project activities are not expected to preclude use of the area. Migrating birds would have access to riparian communities above and below the dam during sediment removal activities.

CEQA Significance Conclusion

Construction activities may temporarily limit terrestrial wildlife movement at the Reservoir; however, the broad geographic range and habitat that occurs in the region would remain available to wildlife. Wildlife would maintain access to the Reservoir during the morning and early evening as well as during nighttime hours. The Project would not substantially interfere with the movement of any native resident or migratory fish, reptile, or amphibian species. There are no listed reptiles or amphibians below the dam. Existing barriers to movement currently limit movement in the Project area. Native and migratory fish are not present in this watershed and would not be affected by the Project.

There are no known bird or bat migratory corridors that would be directly impeded by the Project. Large concentrations of migrants are not known to utilize any specific portion of the Project site and Project activities are not expected to preclude use of the area. Migrating birds would have access to riparian communities above and below the dam during sediment removal activities. Although species would be disrupted during certain activities, impacts to migratory corridors from the Project would be less-than-significant (Class III).

Impact BIO-26: The Project would result in effects to Management Indicator Species.

The 2005 Forest Service's Land Management Plan (USFS, 2005) requires forest scale monitoring of habitat status and trend for select MIS on the ANF. Detailed information addressing effects to MIS are incorporated by reference and will be included in Final EIS/EIR. Table C.3-11 identifies permanent impacts to MIS habitat that would occur during implementation of the Project.

Table C.3-11. Impacts to Management Indicators and Management Indicator Species on the ANF

Management Indicator (MI)	Management Indicator Species (MIS)	Acres Directly Impacted by Proposed Project
Fragmentation	Mountain lion	65
Healthy Diverse Habitats	Mule deer	65
Aquatic Habitat	Arroyo toad	0.33
Riparian Habitat	Song Sparrow	0.33

Healthy Diverse Habitats (Mule Deer)

Mule deer are used by the Forest Service as an indicator of healthy diverse habitats. Availability of suitable vegetation for fawning, forage, and cover in close proximity to water is the most limiting factor for mule deer. The ANF LRMP (USFS, 2005) considers all habitat types as potentially suitable for mule deer. Therefore, the entire Project area on the ANF is considered suitable habitat for mule deer. Implementation of the Project would impact approximately 65 acres of mule deer habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends. Mule deer are known to inhabit the entire forest, consisting of a total of 701,122 acres. Forest-wide deer population distribution is stable. The Project would result in a temporary decrease in forest-wide habitat (0.01 percent of forest-wide habitat) for deer during sediment removal activities. This decrease is negligible and equivalent to less than one deer home range. The Project-level habitat impacts would not modify the existing forest-wide population distribution trend.

Fragmentation (Mountain lion)

Availability of adequate prey base and habitat connectivity between subpopulations has been identified as the limiting factors for mountain lion populations. The Forest LRMP (USFS, 2005) considers all habitat types as potentially suitable for the mountain lion. Therefore, the entire Project area on the ANF is considered suitable habitat. Implementation of the Project would impact approximately 65 acres of mountain lion habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends. Mountain lions are known to inhabit the entire forest, consisting of a total of 701,122 acres. Forest-wide mountain lion population distribution is stable. The Project would result in a slight temporary decrease in forest-wide habitat (0.01 percent of forest-wide habitat) for mountain lion. Based on the small size of the affected habitat, Project activities are not expected to lead to a decrease in population numbers or modify the existing forest-wide population distribution trend.

Riparian Habitat (Song Sparrow)

The primary threat to song sparrows and other riparian birds is the destruction of riparian habitat and loss of water (USFS, 2005). Acres of suitable habitat are used to assess the effects of the Project and alternatives on song sparrow habitat. Implementation of the Project would permanently impact approximately 0.33 acres of song sparrow habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends. The Project would result in a slight temporary decrease in song sparrow habitat, which is equivalent to one song sparrow home range (Zeiner et al., 1990a).The slight decrease in habitat is not expected to lead to a decrease in population numbers or modify the existing declining forest-wide population distribution trend.

Aquatic Habitat (Arroyo toad)

Acres of suitable aquatic and riparian habitat are used to assess the effects of the Project and alternatives on arroyo toad habitat. Implementation of the Project would permanently impact 0.33 acre of suitable arroyo toad habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends. The effects of the Project would result in a small decrease in forest-wide suitable habitat for arroyo toad. The Project would not alter or contribute to the existing forest-wide habitat or population trend.

To reduce effects of the Project on MIS, PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC

BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures), SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring), and SPC BIO-6c (Seasonal Surveys During Water Deliveries). These measures target restoration of riparian vegetation; limit disturbance to riparian songbirds and arroyo toads, and provide best management practices to reduce or avoid impacts to MIS.

SPCs Applicable to Impact BIO-26

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-1b (Worker Environmental Awareness Program)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds)

SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures)

SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring)

SPC BIO-6c (Seasonal Surveys During Water Deliveries)

CEQA Significance Conclusion

Impacts to MIS would occur during implementation of the Project and are evaluated in the context of habitat loss. For all MIS in the Project area, loss of habitat would be minimal, largely temporary, and replaced at the conclusion of sediment removal activities. To further reduce effects of the Project on MIS, PWD would implement SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures), SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring), and SPC BIO-6c (Seasonal Surveys During Water Deliveries). These measures target restoration of riparian vegetation, limit disturbance to riparian songbirds and arroyo toads, and provide best management practices to reduce or avoid impacts to MIS. Implementation of these SPCs ensures impacts would remain less than significant (Class III).

Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances. (Criterion BIO6)

The Project may result in the loss of Joshua trees and juniper trees at the 47th Street East sediment disposal area. These species receive protection from the Palmdale Native Desert Vegetation Ordinance. Chapter 14.04 of the City of Palmdale Municipal Code requires a desert vegetation preservation plan with minimum preservation standards for removal of vegetation at sites with Joshua trees and other species included in the California Desert Native Plants Act, California Food and Agriculture Code, Division 23. In compliance with these regulations, PWD shall obtain permits from both Los Angeles County for the removal of Joshua trees and other native vegetation that do not occur on NFS lands. If onsite preservation is not feasible PWD would acquire additional lands preserving protected trees. PWD may also pay in lieu fees in compliance with this regulation.

Because of the development of SPC's described above in Criteria BIO1 through BIO5, the Project is consistent with local and regional policies and ordinances protecting biological resources including the Los Angeles County Tree Removal requirements, the Palmdale Municipal Code, and the California Desert Native Plants Act. Therefore, no additional impact not already discussed elsewhere in the document would occur.

CEQA Significance Conclusion

Through Project design and implementation of SPC's described in Criteria BIO1 through BIO5, the Project is consistent with local and regional policies and ordinances protecting biological resources including the Los Angeles County Tree Removal requirements, the Palmdale Municipal Code, and the California Desert Native Plants Act. Therefore, no impact would occur.

Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP. (Criterion BIO7)

The sediment disposal sites including the exhausted quarries are located on private lands included in the West Mojave Plan Habitat Conservation Plan (WMPHCP). The WMPHCP was completed in March 2006 but has not been formally adopted on private lands. The Reservoir is located on lands included in the 2005 Forest Service's Land Management Plan. The 2005 Land Management Plan includes objectives and direction for managing resources on the ANF, including plant and wildlife species that are federally listed and/or Forest Service sensitive. The Plan includes Management Strategy WL-1 (Threatened, Endangered, Proposed, Candidate, and Sensitive Species Management) which requires the Forest Service to manage habitat to move listed species toward recovery and de-listing and to prevent listing of proposed and sensitive species. Management Strategy WL-2 (Management of Species of Concern) directs the Forest Service to maintain and improve habitat for fish, wildlife, and plants, including those designated as game species, harvest species, management indicator species, and watch list species. The Plan directs Forest Service management activities to prevent the introduction of new invaders, to conduct early treatment on new infestations, and contain and control established infestation of invasive species through Management Strategy IS-1.

As part of the Project, PWD would implement SPC's, described in Criteria BIO1 through BIO5. Implementation of these SPC's would ensure the Project is compliant with the 2005 Land Management Plan and no impact would occur.

C.3.4.5 Alternative 1: Reduced Sediment Removal Intensity

Under Alternative 1, construction of the grade control structure would be identical to the Project. This alternative would differ in the timing and duration of sediment removal activities. Under this Alternative sediment removal would commence on July 1st compared to the day after Labor Day; work would be conducted 5 days a week instead of 6; and the duration of sediment removal activities would increase to 13 years, instead of 6.

Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or FWS (Criterion BIO1)

Implementation of Alternative 1 would result in the same impacts to native vegetation (Impact BIO-1), from habitat loss and from the spread of invasive plant species (Impact BIO-2) as described for the Project. Under certain circumstances, weeds could become established earlier and fewer areas supporting herbaceous vegetation may be present as water levels are generally lowered at the end of summer in response to reduced inflow and ongoing water deliveries.

Implementation of Alternative 1 would result in the same impacts to wildlife (Impact BIO-3) and nesting birds (Impact BIO-4) as described for the Project. The reduction in truck trips (180 per day vs. 480 per day) would reduce adverse effects from road kill to some extent but the extended construction period would still result in similar impacts to these species. Similarly, the commencement of work on July 1 would increase the likelihood of disturbing nesting birds. Implementation of the same SPCs for the Project would reduce impacts to biological resources identified under Criterion BIO 1 from Alternative 1.

CEQA Significance Conclusion

Implementation of Alternative 1 would result in the same impacts to biological resources identified under Criterion BIO 1 as described for the Project and would be considered significant. Implementation the same SPCs for the Project would reduce impacts to biological resources identified under Criterion BIO 1 to a less-than-significant level (Class III).

Have an adverse effect, either directly or through habitat modifications, on any species listed as fully protected, endangered, threatened, or proposed or critical habitat for these species (Criterion BIO2)

Implementation of Alternative 1 would result in the same impacts or greater to species listed as fully protected, endangered, threatened, or proposed or critical habitat as the Project. Listed plant species (Impact BIO-5) are not present and would be avoided if detected. Impacts to arroyo toads (Impact BIO-6) would be greater because commencing work in July would require draining the reservoir earlier in the season. If arroyo toads are present in the upstream margin of the reservoir they could be subject to stranding. However, arroyo toad egg masses are typically not found in July and metamorph toads and larvae may be capable to moving closer to the active stream channel.

Alternative 1 would result in the same impacts to California condors (Impact BIO-7) as described for the Project if present. The reduction in truck trips (180/day vs. 480/day) would reduce adverse effects from road kill which may attract condors. Impacts to listed songbirds (Impact BIO-8), Swainson's hawk (Impact BIO-9), and bald or golden eagles (Impact BIO-10) would also be the same; however, the commencement of work on July 1 would increase the likelihood of disturbing nesting birds in the Reservoir, sediment disposal sites, or along Cheseboro Road. Commencing work earlier in the season may also slightly increase the risk to ringtail (Impact BIO-11) when compared to the Project by disturbing pupping season. Implementation of the same SPCs for the Project would reduce impacts to biological resources identified under Criterion BIO2 from Alternative 1.

CEQA Significance Conclusion

Implementation of Alternative 1 would result in the same impacts to biological resources identified under Criterion BIO 2 as described for the Project and would be considered significant. Implementation of the same SPCs for the Project would reduce impacts to biological resources identified under Criterion BIO 2 to a less-than-significant level (Class III).

Have a substantial adverse effect, either directly or through habitat modifications on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, Forest Service, or USFWS (Criterion BIO3)

Implementation of Alternative 1 would result in the same impacts to candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, Forest Service, or USFWS species as described for the Project. Sensitive plants (Impact BIO-12) or invertebrates (Impact BIO-13) were not found in the disturbance area and would be subject to the same direct and indirect impacts as the Project. Implementation of Alternative 1 may result in a minor reduction in road kill to butterflies should they occur from fewer truck trips.

Implementation of Alternative 1 would result in the same impacts to southwestern pond turtles (Impact BIO-14), two-striped garter snakes (Impact BIO-15), coast range newts (Impact BIO-16), and sensitive amphibian and reptile species (Impact BIO-17) as described for the Project. Reduced water levels required to construct in July could reduce habitat for these species in the Reservoir; however, fluctuating water levels at the reservoir occur during below-normal rain years.

Implementation of Alternative 1 would result in the same impacts to burrowing owls (Impact BIO-18), special status nesting birds (Impact BIO-19), special status bats (Impact BIO-20), and other special-status mammals (Impact BIO-21, Impact BIO-22, and Impact BIO-23) or greater as described for the Project. The commencement of work on July 1 would increase the likelihood of disturbing active breeding birds or disrupt mammal denning or pupping should they occur. Implementation of the same SPCs for the Project would reduce impacts to biological resources identified under Criterion BIO 3 from Alternative 1.

CEQA Significance Conclusion

Implementation of Alternative 1 would result in the same impacts to biological resources identified under Criterion BIO 3 as described for the Project and would be considered significant. Implementation the same SPCs for the Project would reduce impacts to biological resources identified under Criterion BIO 3 to a less than significant level (Class III).

Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. (Criterion BIO4)

Implementation of Alternative 1 would result in the same impacts to jurisdictional waters (Impact BIO-24) as described for the Project. Implementation of the same SPCs for the Project would reduce impacts to jurisdictional waters identified under Criterion BIO 4 from Alternative 1. Please refer to Appendix F for a 404(b)(1) Evaluation Summary of the proposed Project and alternatives.

CEQA Significance Conclusion

Implementation of Alternative1 would result in the same impacts to jurisdictional waters as described for the Project and would be significant. Implementation of the same SPCs for the Project would reduce impacts to jurisdictional waters identified under Criterion BIO 4 to a less-than-significant level (Class III).

Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (Criterion BIO5)

Implementation of Alternative 1 would result in the same impacts to established wildlife corridors (Impact BIO-25) and MIS (Impact BIO-26) as described for the Project. Implementation of the same SPCs for the Project would reduce impacts to established wildlife corridors and MIS identified under Criterion BIO 5 from Alternative 1.

CEQA Significance Conclusion

Implementation of Alternative 1 would result in the same impacts to established wildlife corridors and MIS as described for the Project and would be less than significant (Class III).

Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances. (Criterion BIO6)

Implementation of Alternative 1 would result in the same determination of compliance with existing policies or ordinances protecting biological resources as described for the Project. Because of the development of SPC's described above in Criteria BIO1 through BIO5, the Alternative 1 is consistent with the local and regional policies and ordinances protecting biological resources including the Los Angeles County Tree Removal requirements, the Palmdale Municipal Code, and the California Desert Native Plants Act. Therefore, no additional impact, not already discussed elsewhere in the document, would occur.

CEQA Significance Conclusion

Implementation of Alternative 1 would result in the same determination of compliance with existing policies or ordinances protecting biological resources as described for the Project. Therefore, no impact would occur.

Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP. (Criterion BIO7)

Implementation of Alternative 1 would result in the same determination of compliance with existing HCPs, NCCP's, or State HCP's as described for the Project. Because of SPC's described in Criteria BIO1 through BIO5, the Project is compliant with the 2005 Forest Service Land Management Plan and no impact would occur.

C.3.4.6 No Action/No Project Alternative

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year. Under the No Action/No Project Alternative continued sediment deposition could compromise the long-term integrity of the Dam. In this event, the California Department of Water Resources (DWR) Division of Safety of Dams could require the Dam to be breached. In addition, as the Dam would no longer function as a viable water storage facility, it would not be in compliance with the Forest Service Special Use Permit under which it currently operates. Subsequently, the Dam may need to be demolished per the conditions identified in the Forest Service's Special Use Permit. Demolition of the Dam would result in the elimination of the potential for water impoundment at the existing Reservoir, and permanent loss of this potable water source. All sediment accumulated behind the Dam would have to be removed in a project similar to, but larger than, the Project. At full capacity, sediment accumulated behind the Dam would be approximately 7.4 million cubic yards.

If the Dam remained stable and sediment continued to accumulate within the Reservoir, water storage would diminish and the reservoir would fill with sediment from upstream areas. Similar to upstream conditions, riparian vegetation would be expected to recruit along the margins of the active channel and may eventually develop into a mature riparian community. Other areas of the reservoir likely would be similar to alluvial fan communities and consist of a mosaic of upland and riparian vegetation depending on the scour regime associated with the creek. Should this occur, the Project area may develop characteristics that would support habitat for arroyo toad and other species associated with riparian vegetation and floodplains.

If the dam becomes unstable and must be removed, impacts to native vegetation would be greater and encompass a wider area compared to the Project. Demolition of the dam and restoration of Little Rock Creek would require the removal of 2.8 million cubic yards of sediment and dam concrete. Removal of sediment and demolition of the dam would result in a project similar to, but larger than, the Project, with greater impacts to native vegetation above and below the dam.

Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or FWS (Criterion BIO1)

Under the No Action/No Project Alternative impacts to native vegetation (Impact BIO-1), habitat loss from the spread of invasive plant species (Impact BIO-2), disturbance to common wildlife (Impact BIO-3) or nesting birds (Impact BIO-4) would not occur. Native vegetation would likely expand as the Reservoir fills with sediment increasing the amount of vegetation in the Project area. Overtime the Reservoir would support extensive nesting habitat for a variety birds. It is uncertain if the acquisition of water to replace the lost Reservoir capacity would result in impacts to these resources at other locations.

If the dam becomes unstable and must be removed, impacts to biological resources identified under Criterion BIO 1 would be greater because of expanded construction activities and encompass a total similar area compared to the Project. Under this scenario, the removal of the dam would also result in habitat degradation to downstream areas. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect biological resources. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

Under the No Action/No Project Alternative if the dam becomes unstable and must be removed impacts to biological resources identified under Criterion BIO 1 would be greater and encompass a wider area compared to the Project. These impacts would be considered significant (Class II).

Have an adverse effect, either directly or through habitat modifications, on any species listed as fully protected, endangered, threatened, or proposed or critical habitat for these species (Criterion BIO2).

Under the No Action/No Project Alternative impacts to listed plant populations (Impact BIO-5), arroyo toads (Impact BIO-6), California condors (Impact BIO-7), listed songbirds (Impact BIO-7), Swainson's hawk (Impact BIO-8), bald and golden eagles (Impact BIO-9), or ringtail (Impact BIO-11) would not occur. Over time, it is possible that sensitive plants and other listed species could become established at or near the Reservoir as new habitat develops. The loss of the Reservoir would likely reduce the presence of non-native predatory fish and provide additional habitat for native wildlife in Little Rock Creek. Impacts to habitat in off-site locations would remain available for sensitive wildlife. It is uncertain if the acquisition of water to replace the lost Reservoir capacity would result in impacts to listed plants at other locations.

If the dam becomes unstable and must be removed, impacts to biological resources identified under Criterion BIO 2 would be greater compared to the Project. The removal of sediment and the dam would alter stream and channel morphology in Little Rock Creek upstream of Rocky Point and below the dam. This habitat loss would substantially alter conditions in the creek and result in the acquisition of additional sediment disposal sites in other areas. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect biological resources. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

If the dam becomes unstable and must be removed, impacts to biological resources identified under Criterion BIO 2 would be greater compared to the Project. These impacts would be considered significant (Class II).

Have a substantial adverse effect, either directly or through habitat modifications on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, Forest Service, or USFWS (Criterion BIO3)

Under the No Action/No Project Alternative impacts to sensitive plant populations (Impact BIO-12), special-status invertebrates (Impact BIO-13), special-status reptiles and amphibians (Impact BIO-14, Impact BIO-15, Impact BIO-16, and Impact BIO-17), burrowing owls (Impact BIO-18), sensitive birds (Impact BIO-19), special-status bats (Impact BIO-20), and other special-status mammals (Impact BIO-21, Impact BIO-22, and Impact BIO-23) would not occur. Over time it is possible that sensitive plants and other species could become established at or near the Reservoir as new habitat develops. Many of these species may benefit from the loss of deep water lake habitat that currently supports a broad assemblage of predatory fish. Over time, it is possible that more natural stream conditions favored by native species would become established.

If the dam becomes unstable and must be removed, impacts to biological resources identified under Criterion BIO 3 would be greater compared to the Project due to the expanded construction activities. Removal of sediment and demolition of the dam would result in a project similar to, but larger than, the Project, with greater impacts to sensitive species above and below the dam. Increased truck traffic to remove accumulated sediment would indirectly affect sensitive species in adjacent areas. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect biological resources. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

If the dam becomes unstable and must be removed impacts to biological resources identified under Criterion BIO 3 would be greater compared to the Project. These impacts would be considered significant (Class II).

Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. (Criterion BIO4)

Under the No Action/No Project Alternative impacts to jurisdictional waters (Impact BIO-24) would not occur. Over time, riparian features would increase and the Reservoir would likely shift from an open water community to a more natural stream channel. It is uncertain if the acquisition of water to replace the lost Reservoir capacity would result in impacts to jurisdictional features at other locations. If the dam becomes unstable and must be removed, impacts to jurisdictional waters would be greater compared to the Project. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect jurisdictional resources. Therefore, this alternative would result in a direct and adverse impact. Please refer to Appendix F for a 404(b)(1) Evaluation Summary of the proposed Project and alternatives.

CEQA Significance Conclusion

If the dam becomes unstable and must be removed, impacts to jurisdictional resources identified under Criterion BIO 4 would be greater compared to the Project. These impacts would be considered significant (Class II).

Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (Criterion BIO5)

Under the No Action/No Project Alternative, impacts to established wildlife corridors or MIS would not occur. There are no known bird or bat migratory corridors that would be directly impeded by the Project. Over time, the establishment of riparian vegetation in the reservoir may support additional use by resident and migratory species or MIS.

If the dam becomes unstable and must be removed, this alternative would increase disturbance to wildlife in the region including MIS compared to the Project. However, over time, this alternative would re-establish connectivity within the watershed. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect established wildlife corridors or MIS. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

If the dam becomes unstable and must be removed, impacts to jurisdictional resources identified under Criterion BIO 5 would be greater compared to the Project. These impacts would be considered significant (Class II).

Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances. (Criterion BIO6)

Under the No Action/No Project Alternative, the Project would not be implemented and there would no conflict with existing policies or ordinances protecting biological resources. If the dam becomes unstable and must be removed implementation of No Action/No Project Alternative could conflict with existing policies or ordinances protecting biological resources as described for the Project. It is unknown what project commitments would be included in this alternative, or if they would be adequate to comply with policies or ordinances protecting biological resources. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

If the dam becomes unstable and must be removed the No Action/No Project Alternative could conflict with existing policies or ordinances protecting biological resources identified under Criterion BIO 6. These impacts would be considered significant (Class II).

Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP. (Criterion BIO7)

Under the No Action/No Project Alternative, the Project would not be implemented and there would no conflict with existing HCPs, NCCP's, or State HCP's. If the dam becomes unstable and must be removed implementation of No Action/No Project Alternative could conflict with existing HCPs, NCCP's, or State

HCP's as described for the Project. It is unknown what project commitments would be included in this alternative, or if they would be adequate to comply with HCPs, NCCP's, or State HCP's protecting biological resources. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

If the dam becomes unstable and must be removed the No Action/No Project Alternative could conflict with existing HCPs, NCCP's, or State HCP's protecting biological resources identified under Criterion BIO 7. These impacts would be considered significant (Class II).

C.3.5 Impact Summary

Table C.3-12 summarizes direct and indirect environmental impacts of the Project and alternatives. See Section C.3.4 for the environmental analysis and full text of recommended SPCs.

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-1: The Project would result in temporary and permanent losses of native vegetation.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program)
BIO-2: The Project would result in the establishment and spread of noxious weeds.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program)
BIO-3: The Project would cause the loss of foraging habitat for wildlife or result in disturbance to wildlife in adjacent habitat.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan)
BIO-4: The Project would result in disturbance to nesting birds or raptors.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-1b (Worker Environmental Awareness Program)

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance: Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	Mitigation Measures/SPC
BIO-5: The Project could disturb endangered, threatened, or proposed plant species or their habitat.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan)
BIO-6: The Project would result in loss or disturbance to arroyo toads.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures) SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring) SPC BIO-6c (Seasonal Surveys During Water Deliveries) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) SPC WQ-1 (Prepare Spill Response Plan)
BIO-7: The Project could result in the loss of California condors.	Class III	Class III	No impact* Class II**	No	SPC BIO-7 (Monitor Construction and Remove Trash and Microtrash) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance: Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	Mitigation Measures/SPC
BIO-8: The Project could disturb nesting willow flycatchers, southwestern willow flycatchers, least Bell's vireos, or their habitat.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-9: The Project would disturb Swainson's hawks.	Class III	Class III	No impact* Class II**	No	SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-10: The Project would result in disturbance to Bald or Golden Eagles.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-11: The Project would result in disturbance or loss of habitat for the ringtail.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-11 (Conduct Focused Surveys for Ringtail and Avoid denning Areas) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-12: The Project would result in the loss of candidate, Forest Service Sensitive, or special-status plant species.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-5 (Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-13: The Project could result in the loss of Shoulderband Snails or San Emigdio Blue Butterfly.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance: Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	Mitigation Measures/SPC
BIO-14: The Project could result in mortality or injury to southwestern pond turtles or a disruption of nesting habitat.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-14 (Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-15: The Project could result in injury or mortality for two-striped garter snakes.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-15 (Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-16: The Project could result in injury or mortality for Coast Range newts.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-16 (Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) SPC WQ-1 (Prepare Spill Response Plan) SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP])

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-17: The Project could result in injury or mortality of terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-17 (Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) SPC WQ-1 (Prepare Spill Response Plan) SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP])
BIO-18: The Project would result in the loss of suitable burrowing owl habitat.	Class III	Class III	No impact* Class II**	No	SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-19: The Project could disturb Forest Service Sensitive or California Species of Special Concern birds.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks) SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-20: The Project could result in mortality of, and loss of habitat for, special-status bat species.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-20 (Survey for Maternity Colonies or Hibernaculum for Roosting Bats) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-21: The Project could result in mortality of, and loss of habitat for, special-status mammals.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

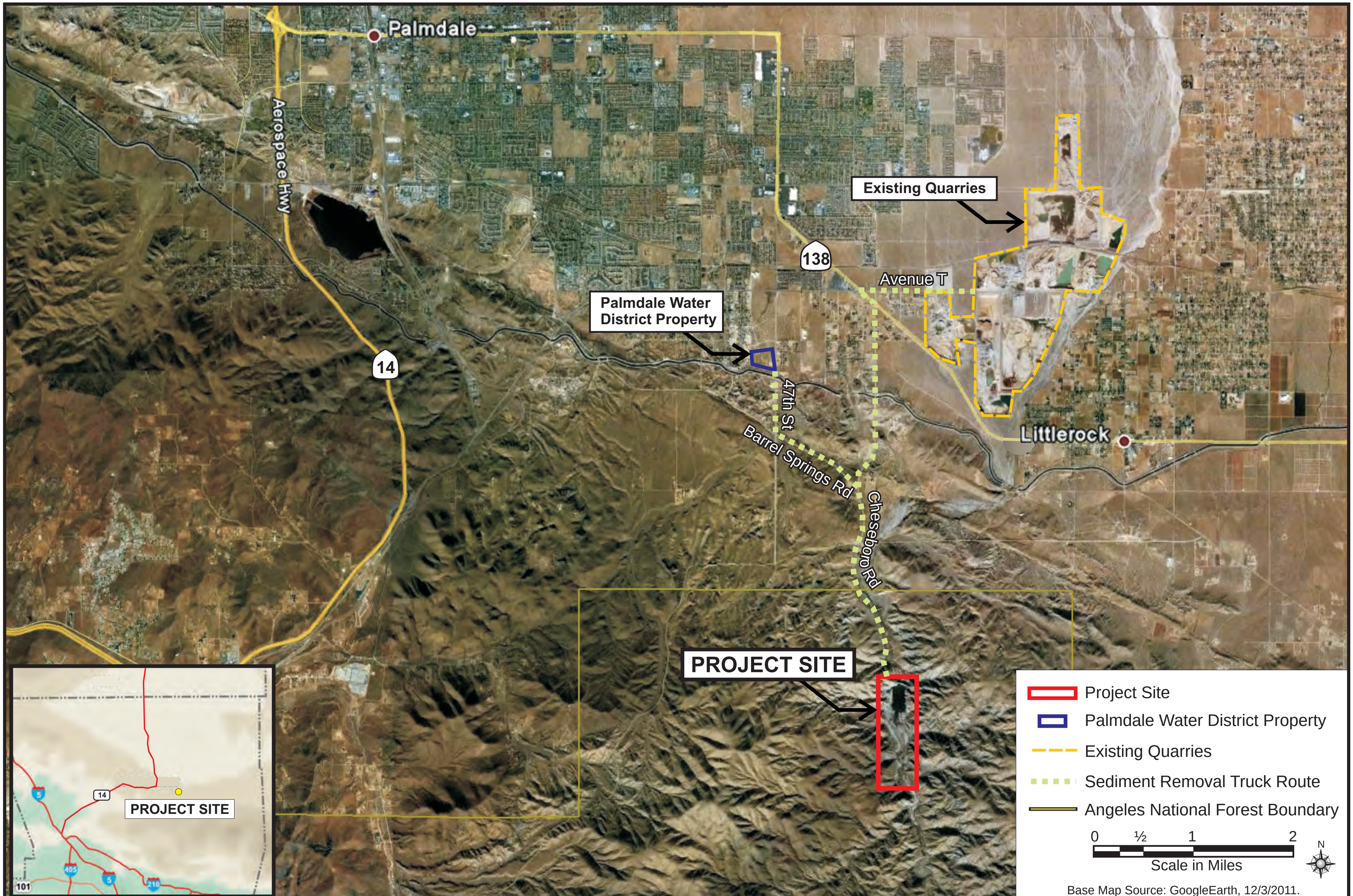
Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-22: The Project could result in mortality of American badgers or desert kit fox.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-22 (Conduct Surveys for American Badger and Desert Kit Fox and Avoid During the Breeding Season) SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds)
BIO-23: The Project would disturb Nelson's bighorn sheep.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC FIRE-1 (Curtailment of Activities) SPC FIRE-2 (Preparation of a Fire Plan) SPC FIRE-3 (Spark Arrester Requirements)
BIO-24: The Project could result in the loss of wetland habitats.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels) SPC WQ-1 (Prepare Spill Response Plan)

Table C.3-12. Summary of Impacts and Standard Project Conservation Measures – Biological Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
BIO-25: The Project would interfere with established wildlife migratory corridors.	Class III	Class III	No impact* Class II**	Yes	Not Applicable
BIO-26: The Project would result in effects to Management Indicator Species.	Class III	Class III	No impact* Class II**	Yes	SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) SPC BIO-1b (Worker Environmental Awareness Program) SPC BIO-2 (Prepare and Implement a Weed Control Plan) SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds) SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures) SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring) SPC BIO-6c (Seasonal Surveys During Water Deliveries)

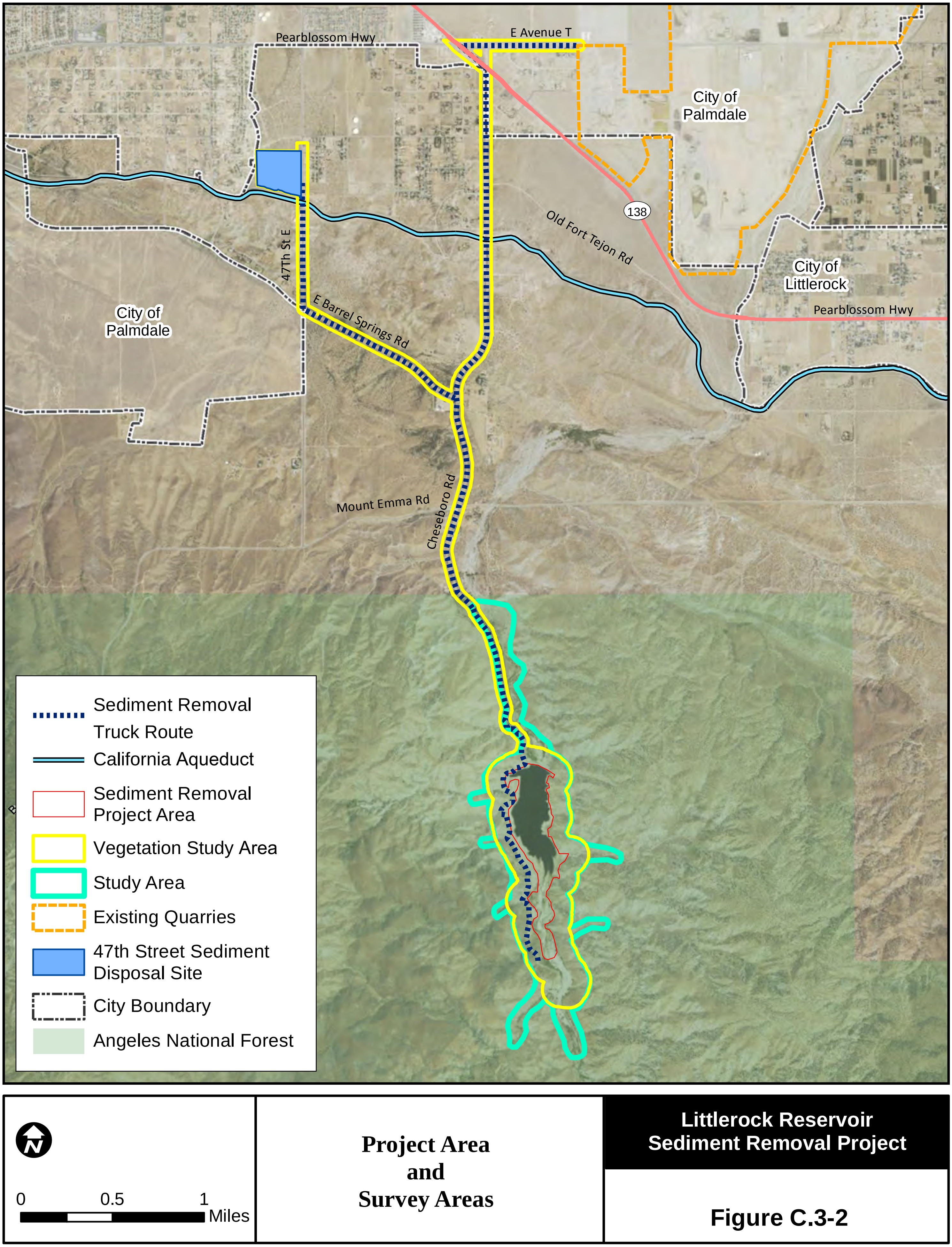
Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.
* Assumes the dam remains stable
**Assumes the dam becomes unstable and requires demolition



Regional Project Location and Sediment Removal Truck Routes

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.3-1

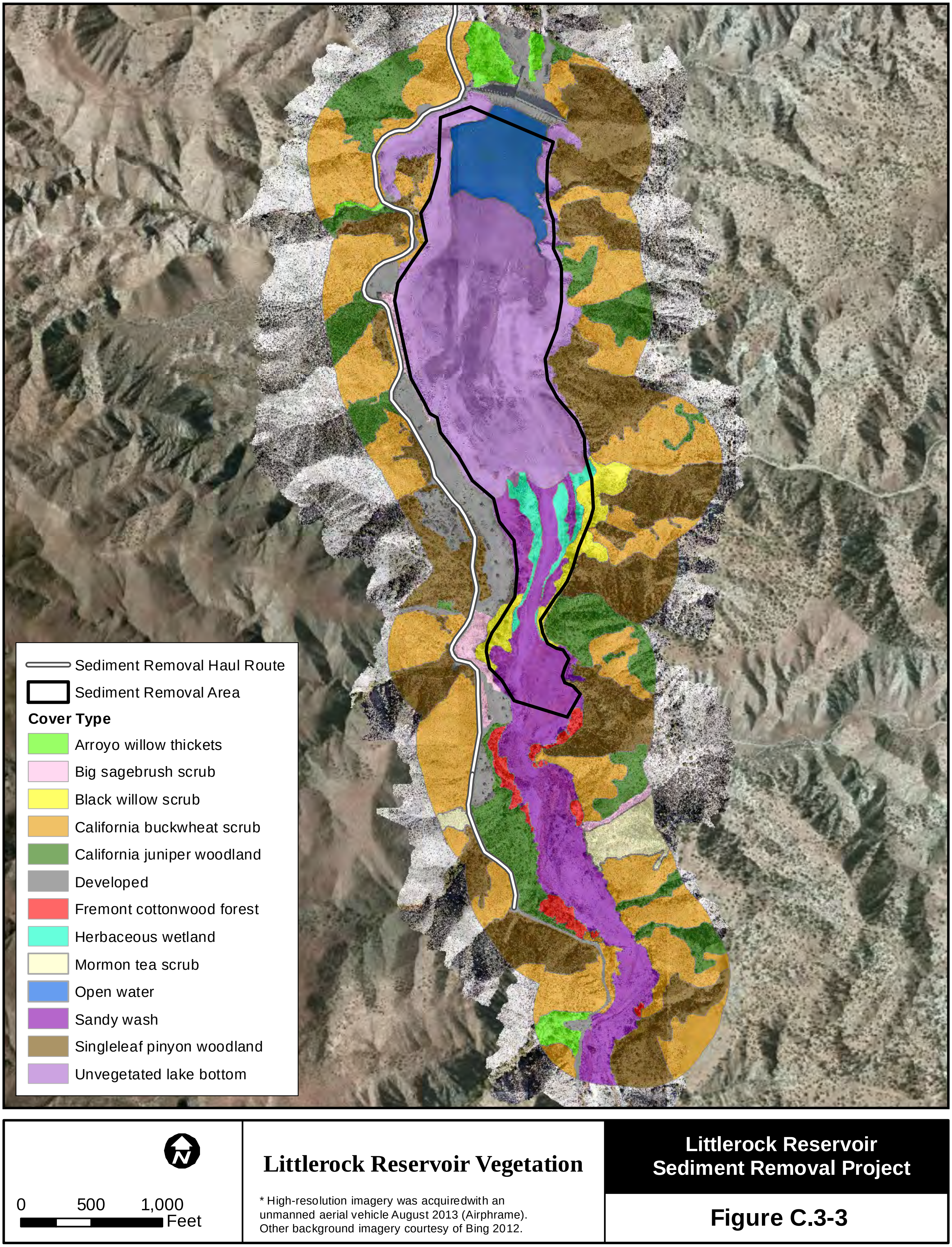


Project Area and Survey Areas

Littlerock Reservoir Sediment Removal Project

Figure C.3-2

May 2016



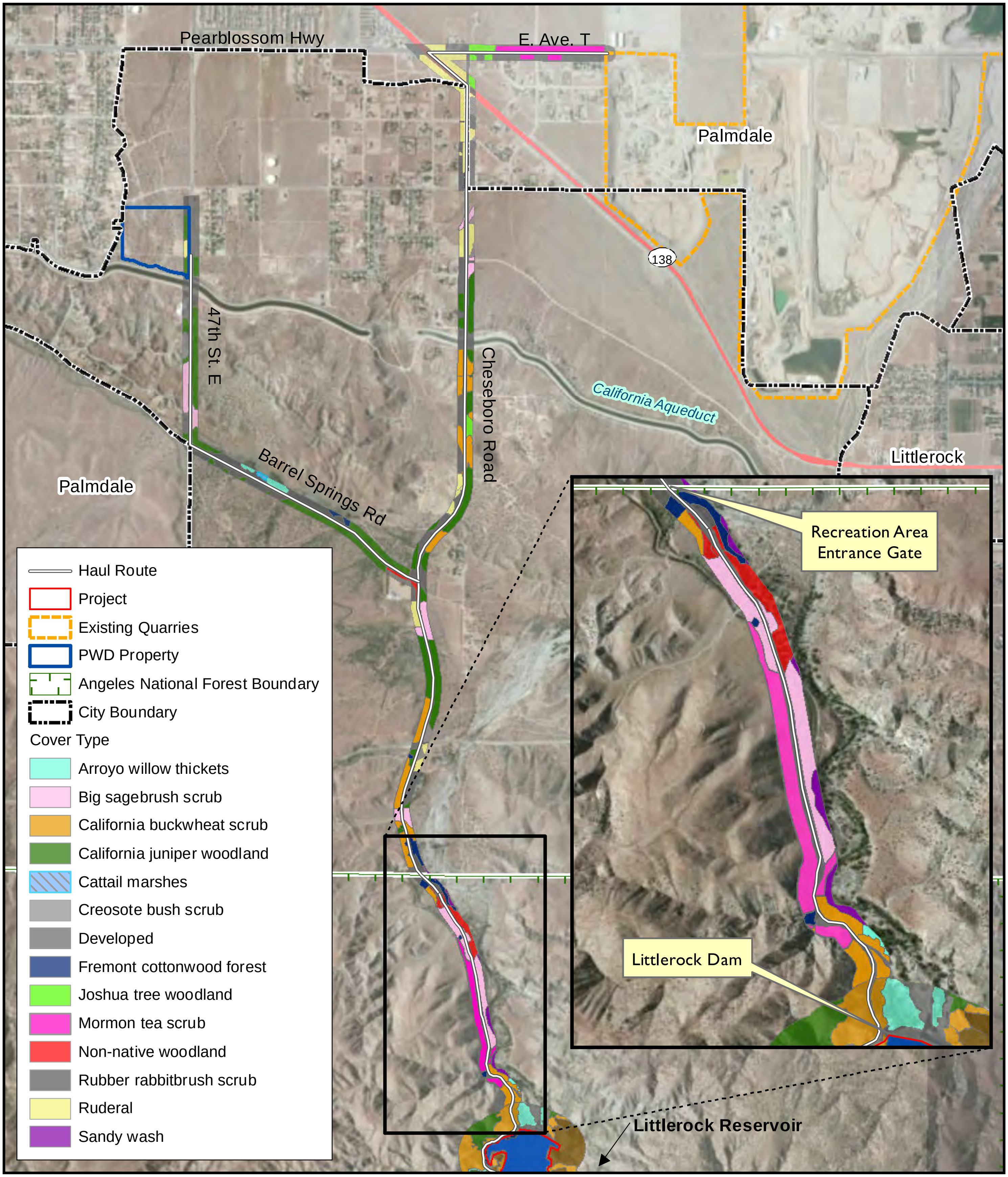
Littlerock Reservoir Vegetation

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame). Other background imagery courtesy of Bing 2012.

Littlerock Reservoir Sediment Removal Project

Figure C.3-3

May 2016



N

0 0.25 0.5 Miles

Proposed Haul Route Vegetation

Littlerock Reservoir Sediment Removal Project

Figure C.3-4

May 2016

47th Street Sediment Storage Site
Vegetation

Littlerock Reservoir Sediment Removal Project

Figure C.3-5

May 2016

0 0.25 0.5 Miles

Arroyo Toad Critical Habitat

Littlerock Reservoir Sediment Removal Project

Figure C.3-6

May 2016

0 500 1,000 Feet

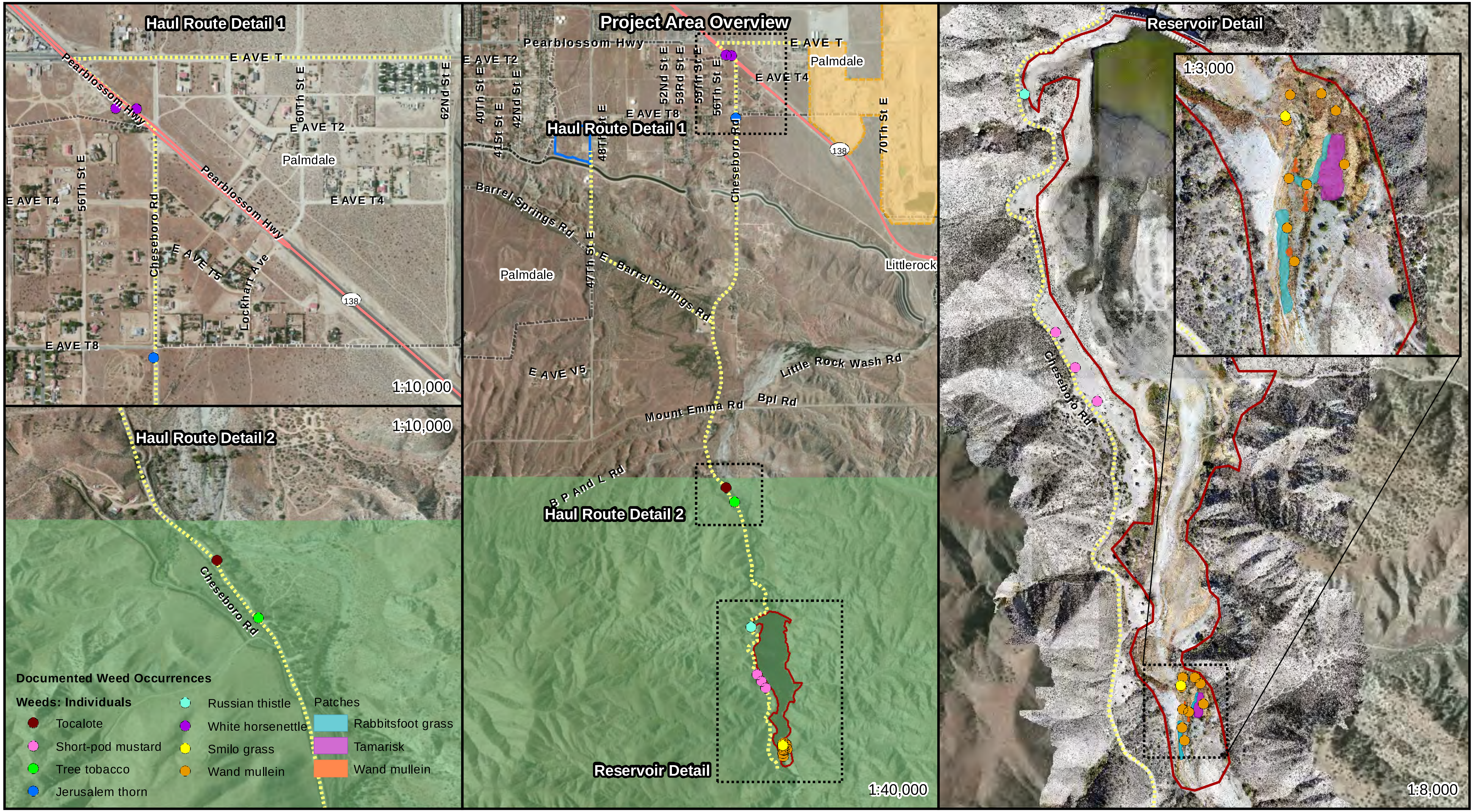
Dead or Removed Cottonwood Tree Locations

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame). Other background imagery courtesy of Bing 2012.

Littlerock Reservoir Sediment Removal Project

Figure C.3-7

May 2016



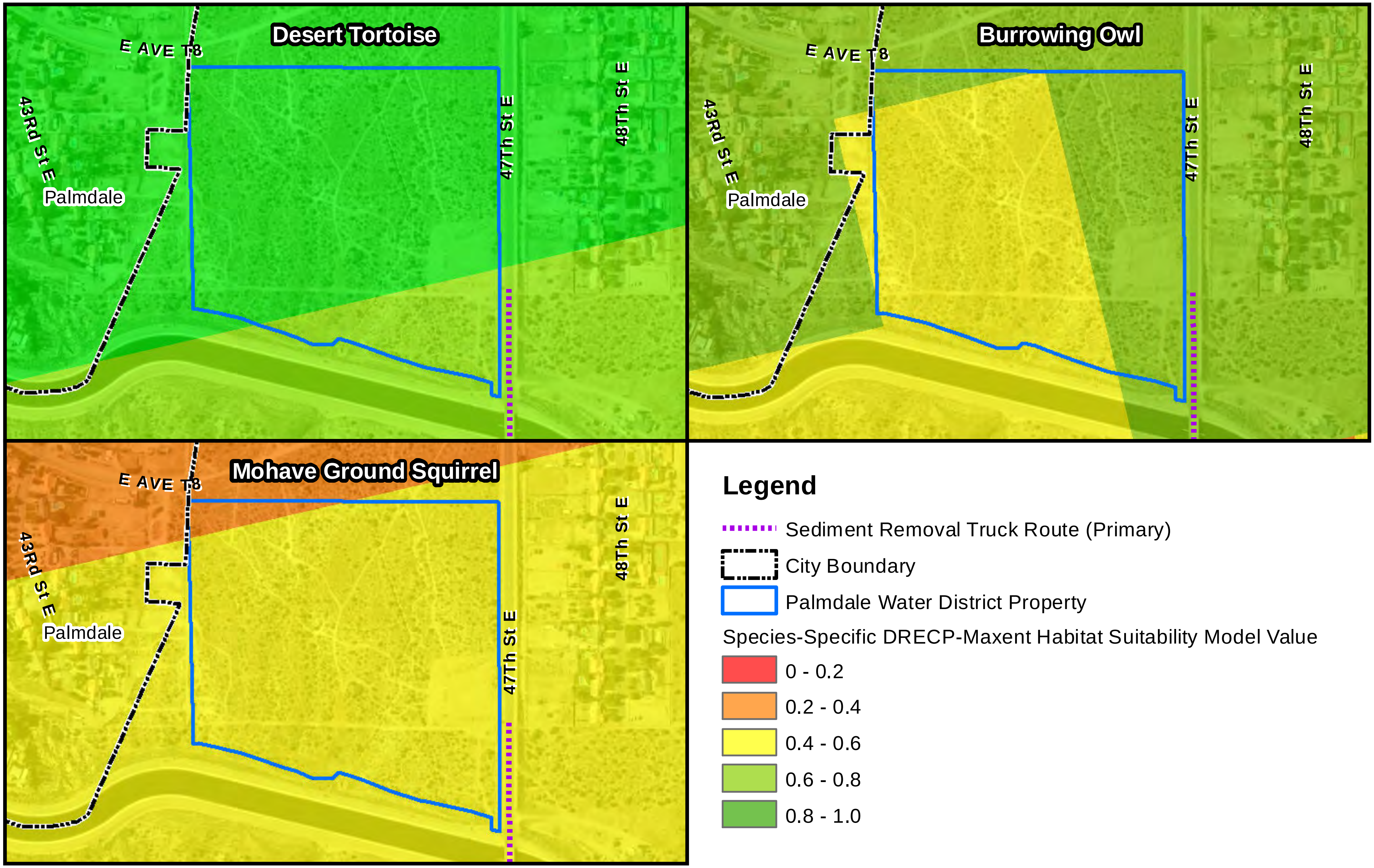
Sediment Removal Truck Route (Primary)
Existing Quarries
Littlerock Reservoir
Palmdale Water District Property
City Boundary
Angeles National Forest Boundary

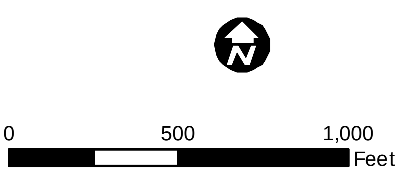
Project Area and Haul Route Weeds

Littlerock Reservoir Sediment Removal Project

Figure C.3-8

May 2016



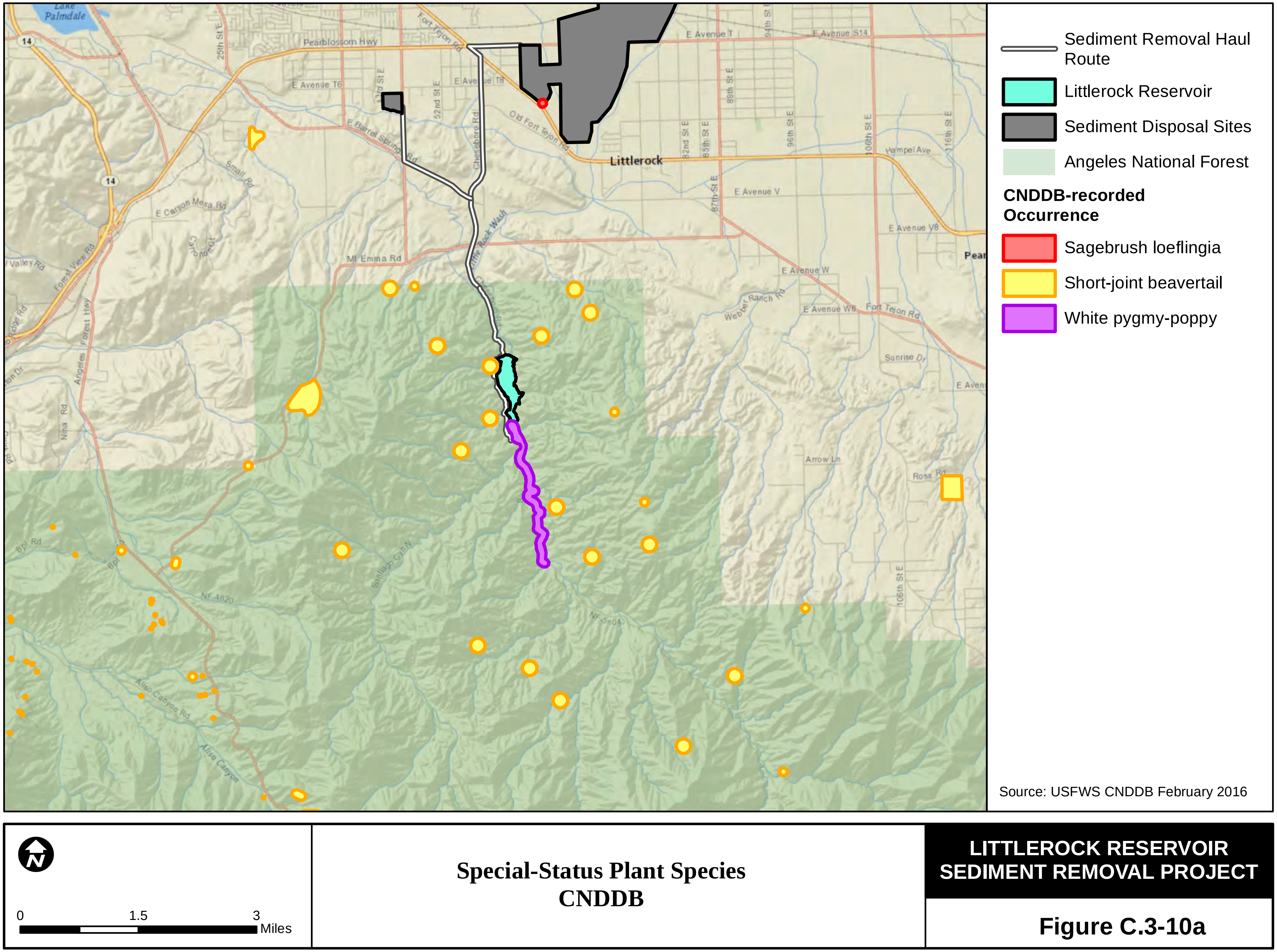


47th Street Sediment Storage Site
DRECP Modelled Habitat

Littlerock Reservoir
Sediment Removal Project

Figure C.3-9

May 2016

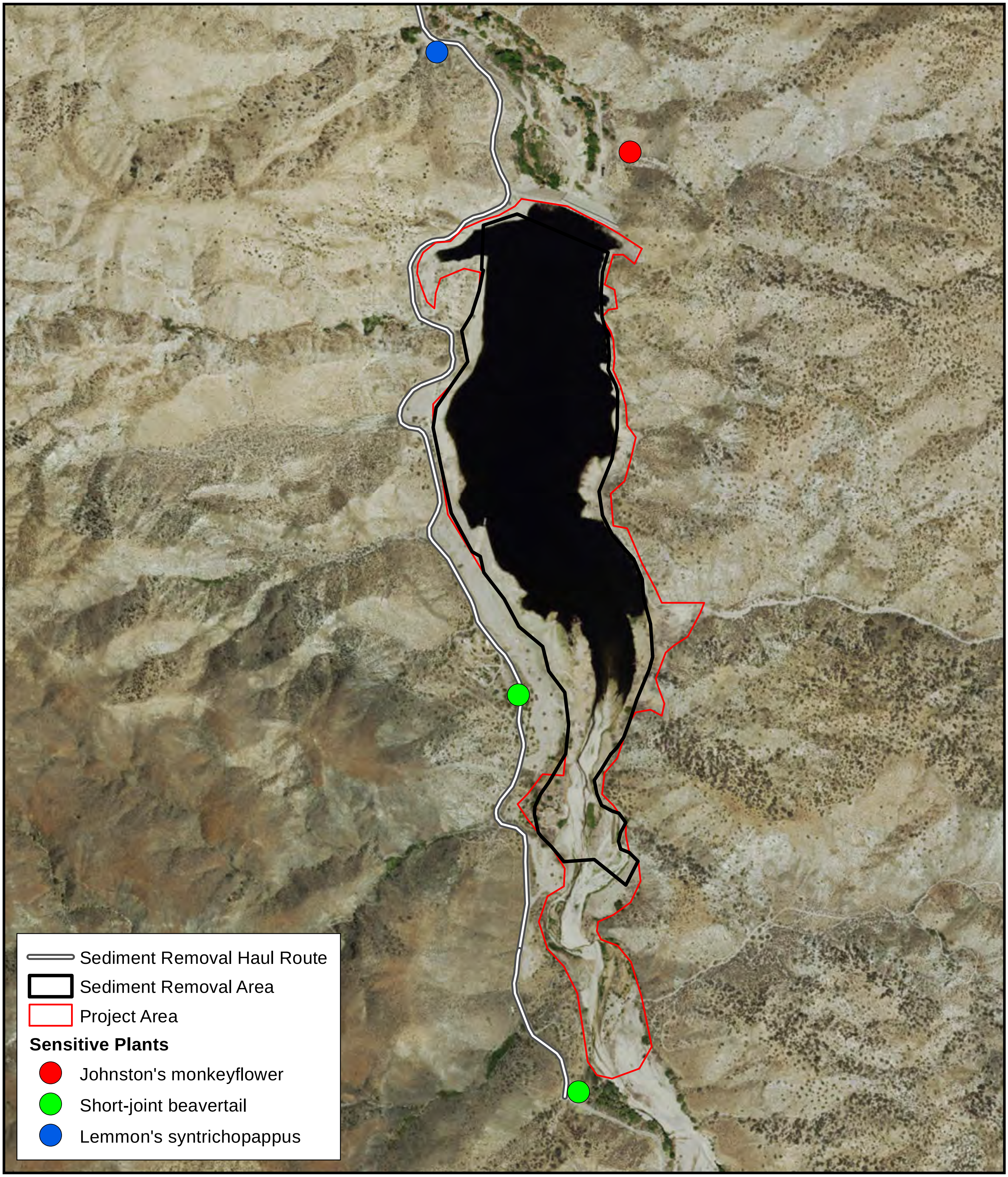


Special-Status Plant Species
CNDDB

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.3-10a

May 2016



0 500 1,000 Feet

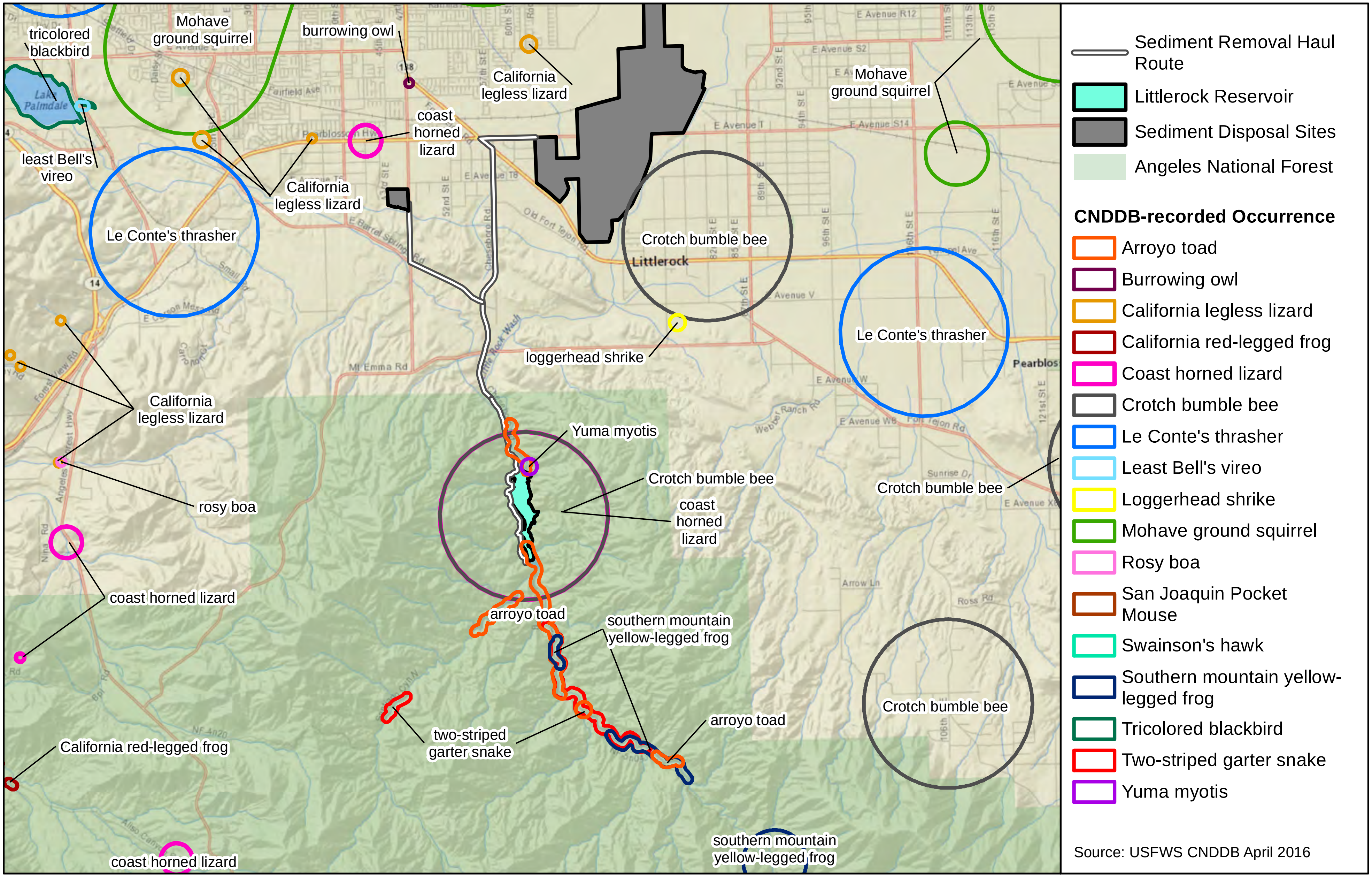
Special-Status Plants Survey Results

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame). Other background imagery courtesy of Bing 2012.

Littlerock Reservoir Sediment Removal Project

Figure C.3-10b

May 2016

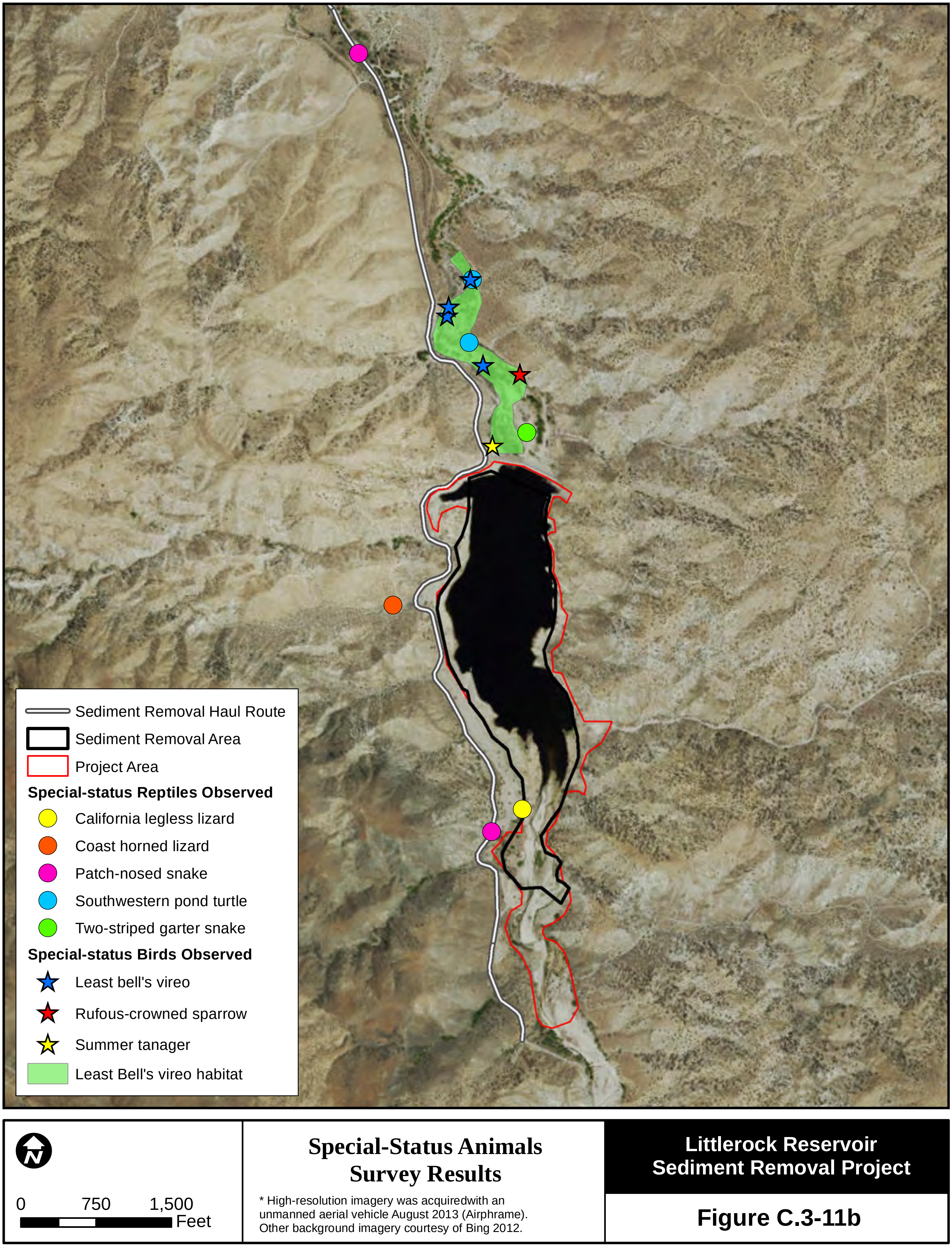


Special-Status Animal Species CNDDB

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.3-11a

May 2016



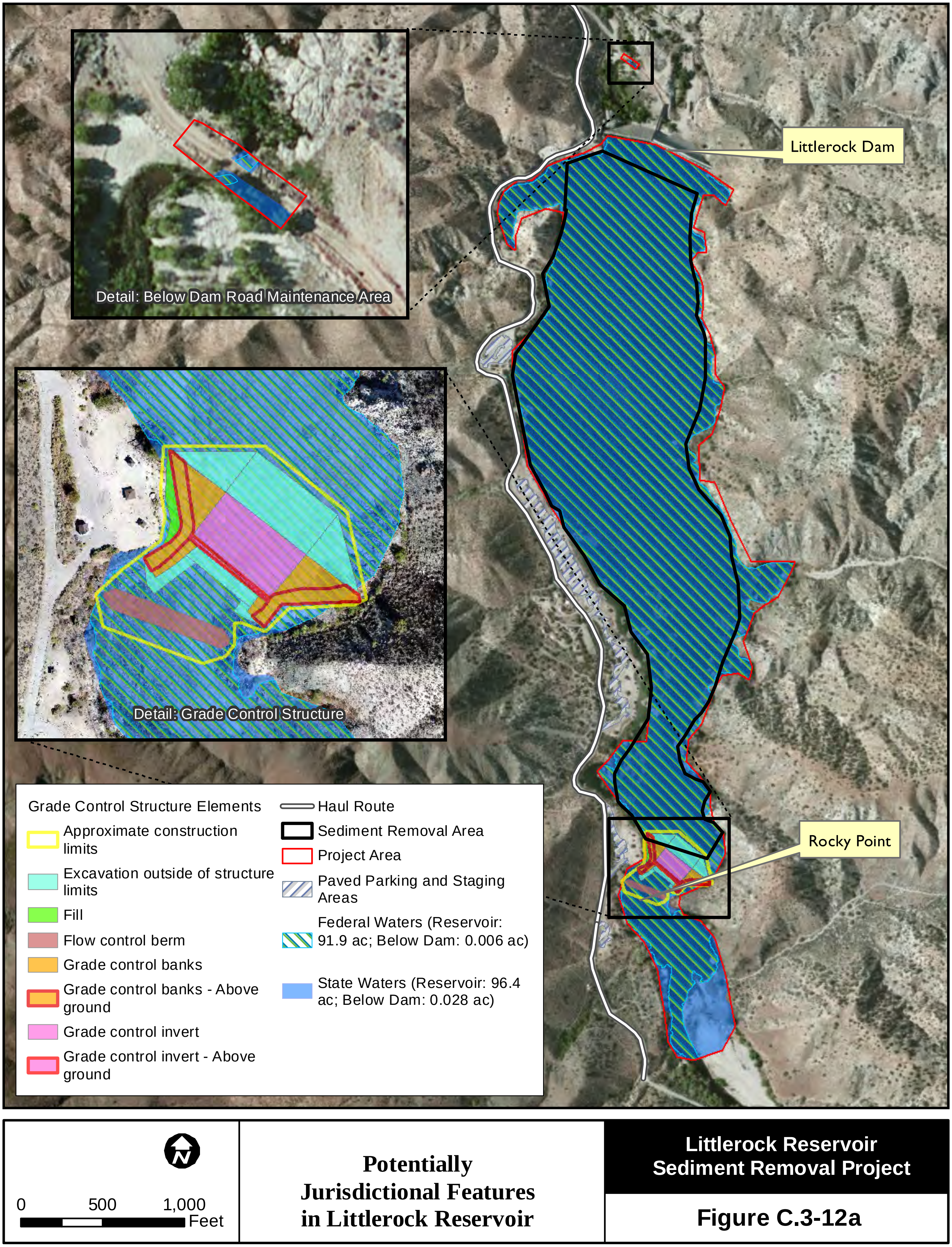
Special-Status Animals Survey Results

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame). Other background imagery courtesy of Bing 2012.

Littlerock Reservoir Sediment Removal Project

Figure C.3-11b

May 2016



Potentially Jurisdictional Features in Littlerock Reservoir

Littlerock Reservoir Sediment Removal Project

Figure C.3-12a

May 2016

47th Street Sediment Storage Site
Potentially Jurisdictional Drainages

Littlerock Reservoir Sediment Removal Project

Figure C.3-12b

May 2016

0 500 1,000
Feet

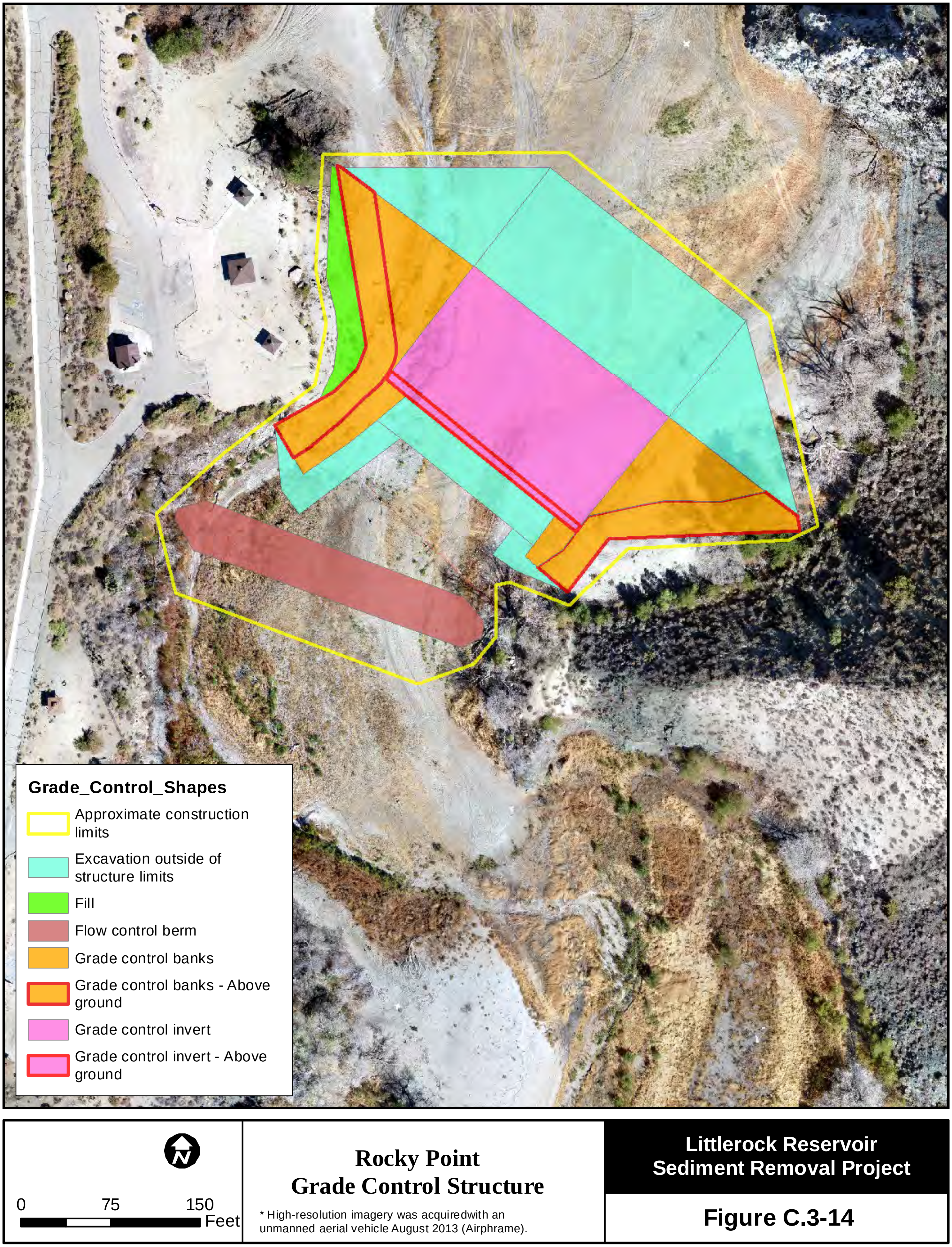
Littlerock Reservoir
Sediment Removal Area

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame). Other background imagery courtesy of Bing 2012.

Littlerock Reservoir
Sediment Removal Project

Figure C.3-13

May 2016



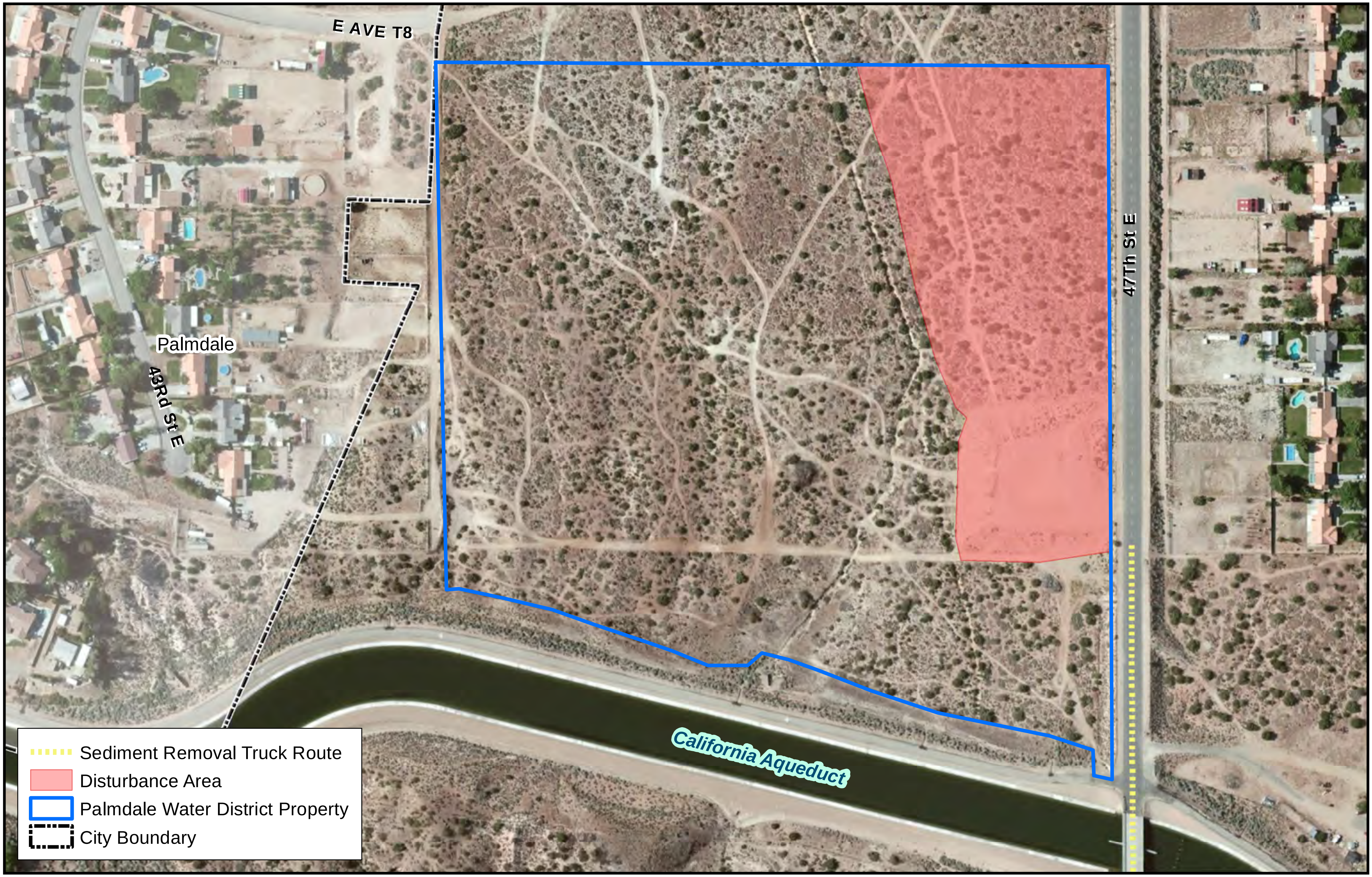
Rocky Point
Grade Control Structure

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame).

Littlerock Reservoir
Sediment Removal Project

Figure C.3-14

May 2016



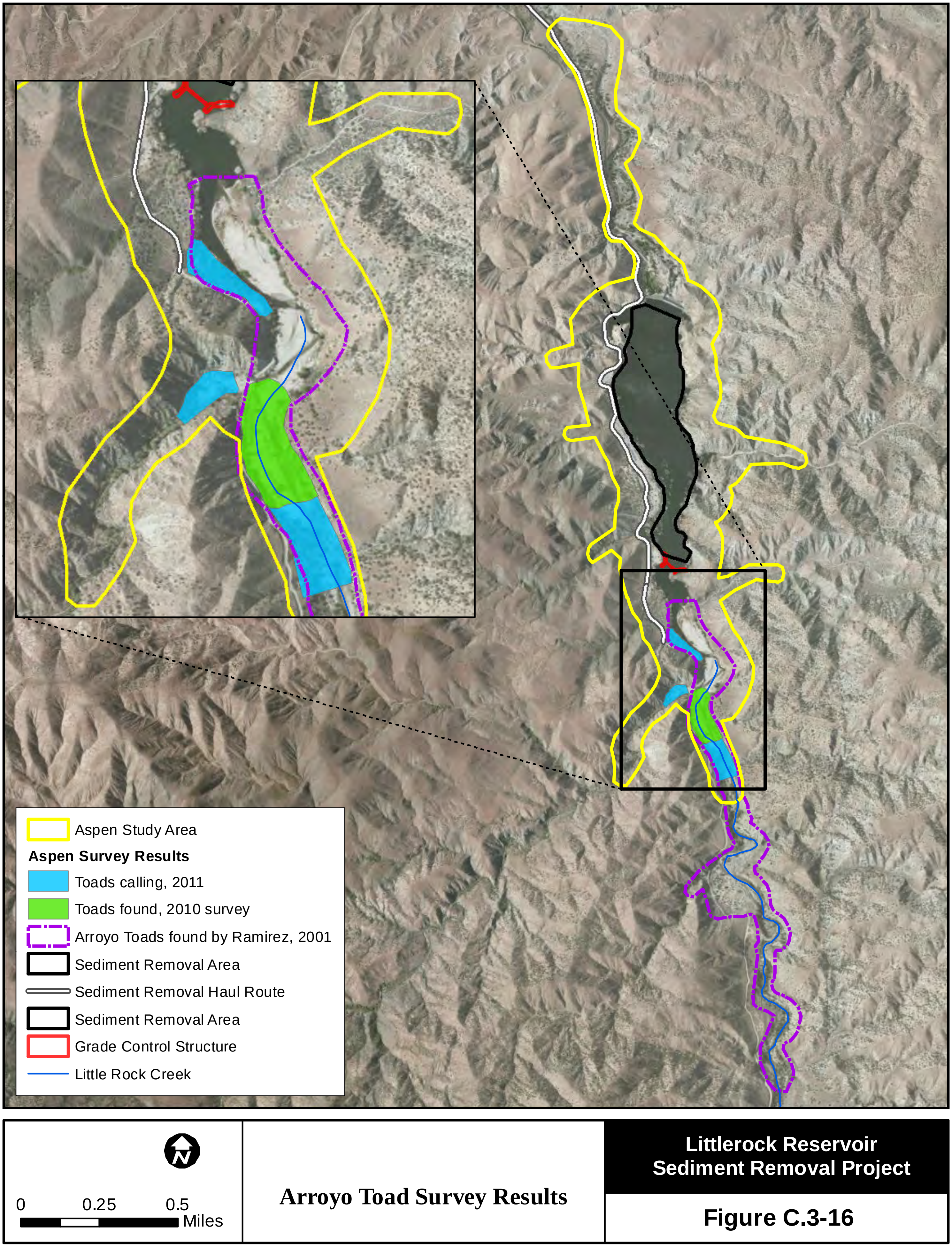
N
0 225 450 Feet

47th Street Sediment Storage Site
Disturbance Area

Littlerock Reservoir
Sediment Removal Project

Figure C.3-15

May 2016



Arroyo Toad Survey Results

Littlerock Reservoir Sediment Removal Project

Figure C.3-16

May 2016

C.4 Cultural Resources

A cultural resource is defined as any object or specific location of past human activity, occupation, or use, identifiable through historical documentation, inventory, or oral evidence. Cultural resources can be separated into three categories: archaeological, built environment, and traditional cultural resources.

Archaeological resources include both prehistoric and historical remains of human activity. Historical archaeological resources can consist of structural remains (such as cement foundations), historical objects (such as bottles and cans), and sites (such as trash deposits or scatters). Prehistoric archaeological resources can include lithic scatters, ceramic scatters, quarries, habitation sites, temporary camps/rock rings, ceremonial sites, and trails.

Built environment resources can include buildings, structures (e.g., canals, roads, bridges, and dams), and objects (e.g., boundary markers and monuments).

A traditional cultural resource or traditional cultural property (TCP) can include Native American sacred sites (such as rock art sites) and traditional resources or ethnic communities important for maintaining the cultural traditions of any group.

C.4.1 Affected Environment

C.4.1.1 Regional Setting and Approach to Data Collection

For the purposes of cultural resources, the Project Study Area includes the Littlerock Reservoir (Reservoir) and two off-site dumping locations (47th Street East property and the Hi-Grade Materials Company property). The Area of Potential Effect (APE) defined for the Project includes all disturbance areas within the Reservoir and the off-site dumping locations (totaling approximately 206 acres).

For the Project, records searches were conducted at the South Central Coastal Information Center (SCCIC) housed at the California State University, Fullerton. Records searches consisted of a review of relevant historic maps, and excavation and survey reports. Site forms for recorded sites within a 0.5-mile radius of the Project APE were copied.

Field surveys were conducted in order to verify the location of any previously identified cultural resources and to inspect lands within the Project APE. Field surveys are useful for identifying above-ground or surface cultural resources and for identifying high-probability areas. However, negative pedestrian survey results do not preclude the possibility that buried archaeological deposits could be discovered. Conejo Archaeological Consultants conducted a pedestrian field survey of the Reservoir in December 2006 (Maki, 2006). Applied EarthWorks, Inc. (Æ) conducted pedestrian field surveys of the two off-site dumping areas in September 2014 (Smallwood, 2014).

C.4.1.2 Prehistoric Background

Prehistoric archaeological sites in California are places where Native Americans lived or carried out activities during the prehistoric period before Europeans arrived in 1769 A.D. These sites contain artifacts and subsistence remains, and they may contain human burials. Artifacts are objects made by people and include tools (such as projectile points, scrapers, and grinding implements), waste products from making stone tools (flakes and debitage), and nonutilitarian or decorative artifacts (beads, ornaments, ceremonial items, and rock art). Subsistence remains include the inedible portions of foods, such as animal bone and shell, and edible parts that were lost and not consumed, such as charred seeds.

Over the past century, archaeologists have generally divided the prehistory of the Western Mojave Desert into five distinct periods or sequences distinguished by specific material (i.e., technological) or cultural traits. Early cultural chronologies were proposed by Amsden (1937), Campbell et al. (1937), and Rogers (1939), that were later adapted by Warren and Crabtree in 1972 (later published in 1986 and further detailed by Warren in 1984), in what many consider to be the most influential cultural sequence proposed for the region. Alternative sequences have since emerged (e.g., Bettinger and Taylor, 1974; Hall, 1993; Yohe, 1992) proposing new nomenclature (e.g., Newberry Period vs. Rose Spring Period vs. Saratoga Springs), slightly adjusted cultural chronologies, or attempting to link the Great Basin chronological framework to the Mojave Desert.

Recently, Sutton et al. (2007:233) proposed a cultural-ecological chronological framework based on climatic periods (e.g., Early Holocene) "to specify spans of calendric time and cultural complexes (e.g., Lake Mojave Complex) to denote specific archaeological manifestations that existed during (and across) those periods." The new sequence draws heavily from Warren and Crabtree (1986) and Warren (1984), as well as from the vast body of recent archaeological research conducted in the region.

Pleistocene (ca. 10000 to 8000 cal B.P.)

The earliest cultural complex recognized in the Mojave Desert is Clovis, aptly named for the fluted projectiles often associated with Pleistocene megafaunal remains. Arguments for pre-Clovis Paleoindian human occupation in the Mojave Desert rely on relatively sparse evidence and unpublished data, although in light of the growing body of evidence suggesting a pre-Clovis occupation of the Americas, the argument cannot simply be ruled out. Paleoindian culture is poorly understood in the region due to a relative dearth of evidence stemming from a handful of isolated fluted point discoveries and one presumed occupation site on the shore of China Lake. Archaeologists tend to interpret the available data as evidence of a highly mobile, sparsely populated hunting society that occupied temporary camps near permanent Pleistocene water sources.

Early Holocene (ca. 8000 to 6000 cal B.P.)

Two archaeological patterns are recognized during the Early Holocene: the Lake Mojave Complex (sometimes referred to as the Western Pluvial Lakes Tradition) and the Pinto Complex. The Lake Mojave Complex is characterized by stemmed projectile points of the Great Basin Series, abundant bifaces, steep-edged unifaces and crescents. Archaeologists have also identified, in less frequency, cobble-core tools and ground stone implements. The Pinto Complex, on the other hand, is distinguished primarily by the presence of Pinto-style projectile points. Although evidence suggests some temporal overlap, the inception of the Pinto Complex is assigned to the latter part of the Early Holocene and is generally considered a Middle Holocene cultural complex.

During this period, the Lake Mojave cultural complex utilized more extensive foraging ranges, as indicated by an increased frequency of faraway materials. Spheres of influence also expanded, as potential long-distance trade networks were established between desert and coastal peoples. Groups were still highly mobile, but they practiced a more forager-like settlement-subsistence strategy. Residential sites indicate more extensive periods of occupation and recurrent use. In addition, residential and temporary sites also indicated a diverse social economy, characterized by discrete workshops and special-use camps (e.g., hunting camps). Diet also appears to have diversified, with a shift away from dependence upon lacustral (lake) environments such as lakeside marshes, to the exploitation of multiple environments containing rich resource patches.

Middle Holocene (ca. 7000 to 3000 cal B.P.)

The Pinto Complex is the primary cultural complex in the Mojave Desert during the Middle Holocene. Once thought to have neatly succeeded the Lake Mojave Complex, a growing corpus of radiocarbon dates associated with Pinto Complex artifacts suggest that its inception could date as far back into the latter part of the Early Holocene. Extensive use of toolstone other than obsidian and high levels of tool blade reworking were characteristic of this complex and the earlier Lake Mojave Complex. A reduction in toolstone source material variability, however, suggests a contraction of foraging ranges that had expanded during the Early Holocene. Conversely, long-distance trade with coastal peoples continued uninterrupted, as indicated by the presence of *Olivella* shell beads.

The most distinguishing characteristic of the Pinto Complex is the prevalence of ground stone tools, which are abundant in nearly all identified Pinto Complex sites. The emphasis on milling tools indicates greater diversification of the subsistence economy during the Middle Holocene. Groups increased reliance on plant processing while continuing to supplement their diet with protein from small and large game animals.

Late Holocene (ca. 2000 cal B.P. to Contact)

The Late Holocene in the greater Southern California region is characterized by increases in population, higher degrees of sedentism, expanding spheres of influence, and greater degrees of cultural complexity. In the Mojave Desert, the Late Holocene is divided into several cultural complexes; namely the Gypsum Complex (2000 cal B.C. to cal A.D. 200), the Rose Spring Complex (cal A.D. 200 to 1100), and the Late Prehistoric Complexes (cal A.D. 1100 to contact).

The Gypsum Complex is defined by the presence of side-notched (Elko series), concave-based (Humboldt series), and well-shouldered contracting stem (Gypsum series) projectile points. Other indicative artifacts include quartz crystals, paint, rock art, and twig figures, which are generally associated with ritual activities.

The Rose Spring Complex can also be defined by the presence of distinct projectile points (i.e., Rose Spring and Eastgate series) and artifacts, including stone knives, drills, pipes, bone awls, milling implements, marine shell ornaments, and large quantities of obsidian. Of greater significance, however, are the characteristic advancements in technology, settlement strategies, and evidence for expanding and diverging trade networks. The Rose Spring Complex marks the introduction of the bow and arrow weapon system to the Mojave Desert, likely from neighboring groups to the north and east. As populations increased, groups began to consolidate into larger, more sedentary residential settlements as indicated by the presence of well-developed middens (food refuse heaps) and architecture. West and north of the Mojave River, increased trade activity along existing exchange networks ushered in a period of relative material wealth, exhibited by increased frequencies of marine shell ornaments and toolstone, procured almost exclusively from the Coso obsidian source. East and south of the Mojave River, archaeological evidence suggests there was a greater influence from Southwest and Colorado River cultures (i.e., Hakataya and Patayan).

Between approximately A.D. 1100 and contact, a number of cultural complexes emerged that archaeologists believe may represent prehistoric correlates of known ethnographic groups. During the Late Prehistoric Cultural Complex, material distinctions between groups were more apparent, as displayed by the distribution of projectile point styles (e.g., Cottonwood vs. Desert Side-notched), ceramics, and lithic materials. Long-distance trade continued, benefiting those occupying “middleman” village sites along the Mojave River where abundant shell beads and ornaments, and lithic tools were recovered from archaeological contexts (Rector et al., 1983). Later on, however, trade in Coso obsidian was significantly reduced as groups shifted focus to the procurement of local silicate stone.

C.4.1.3 Ethnographic Background

Tataviam

The Tataviam, which translates to "people who face the sun," are a Native American group that resided in and around the area encompassing the Project region. They belong to the family of Serrano people who migrated down into the Antelope, Santa Clarita, and San Fernando valleys sometime before 450 A.D. They settled into the upper Santa Clara River Drainage. Some Tataviam settlements in the Santa Clarita and upper valleys were Nuhubit (Newhall); Piru-U-Bit (Piru); Tochonanga, which is believed to have been located at the confluence of Wiley and Towsley Canyons; and the very large village of Chaguibit, the center of which is buried under the Rye Canyon exit of Interstate-5. The Tataviam also lived where Saugus, Agua Dulce, and Lake Elizabeth are located today. This places the Serrano among the larger "Shoshonean" migration into Southern California that occurred 2,000 to 3,000 years ago (Higgins, 1996).

Although primarily living on the upper reaches of the Santa Clara River drainage system, east of Piru Creek, the Tataviam also marginally inhabited the upper San Fernando Valley, including present day San Fernando and Sylmar (which they shared with their inland Tongva/Gabrieleño neighbors). The Tataviam were hunters and gatherers who prepared their foodstuffs in much the same way as their neighbors did. Their primary foods included yucca, acorns, juniper berries, sage seeds, deer, the occasional antelope, and smaller game such as rabbits and ground squirrels. There is no information regarding Tataviam social organization, though information from neighboring groups shows similarities among Tataviam, Chumash, and Gabrieleño ritual practices. Like their Chumash neighbors, the Tataviam practiced an annual mourning ceremony in late summer or early fall which would have been conducted in a circular structure made of reeds or branches. At first contact with the Spanish in the late eighteenth century, the population of this group was estimated at fewer than 1,000 persons. However, this ethnographic estimate of the entire population is unlikely to be accurate, since it is based only on one small village complex and cannot necessarily be indicative of the entire population of Tataviam. Given the archaeological evidence at various Tataviam sites, as well as the numbers incorporated into the Spanish Missions, pre-contact population and early contact population easily exceeded 1,000 persons (Blackburn, 1962; Johnston, 1962).

Kitanemuk

The Kitanemuk belonged to the northern section of the people known as the "Serrano." The name, "Serrano," however, is merely a generic term meaning "mountaineers" or "those of the Sierras." Ethnographers group the Kitanemuk with the Serrano based on linguistic similarities though the Kitanemuk did not identify themselves as Serrano. They lived on the upper Tejon and Paso creeks and also held the streams on the northern extent of the Tehachapi Mountains, the small creeks draining the northern slope of the Liebre and Sawmill Range, with Antelope Valley and the westernmost part of the Mojave Desert. The extent of their territorial claims in the desert region is not certain.

The Kitanemuk lived in permanent winter villages of 50 to 80 people or more. During the late spring, summer, and fall months they dispersed into smaller, highly mobile gathering groups. They followed a seasonal round, visiting different environmental regions as the important food producing plants became ready for harvest. Some staple foods important to the Kitanemuk include acorns and piñon pine nuts, yucca, elderberries, and mesquite beans were available as well (Duff, 2004).

While traveling in the Antelope Valley in 1776, Spanish explorer and Franciscan priest, Francisco Garcés, encountered the Kitanemuk living in communal tule houses. His written account describes the dwellings as consisting of a series of individual rooms surrounding a central courtyard. Each room housed a family and its own door and hearth. Garcés also relates that the Kitanemuk had extensive trade relations with sometimes distant groups. For example, he writes that the Kitanemuk traded with the "Canal" (Chumash of the Santa Barbara Channel region) and describes wooden vessels with inlays of *Haliotis* that bore stylistic similarities to decorations found on the handles of Chumash knives and other objects (Kroeber, 1925).

C.4.1.4 Historical Background

Antelope Valley

The Antelope Valley is a 3,000-square-mile-high desert closed basin that straddles northern Los Angeles County and southern Kern County. The Antelope Valley was a trade route for Native Americans traveling from Arizona and New Mexico to California's coast. Exploration began in the early 1770s, but it was not until the 1840s that the Valley was first settled permanently. The 1854 establishment of the Fort Tejon military post near Castaic Lake and Grapevine Canyon created a gateway for Antelope Valley traffic (Antelope Valley Community History, 2010).

During the nineteenth century, gold mining at the town of Acton and cattle ranching contributed to the growth of Antelope Valley. When news broke that gold was discovered in the Soledad Canyon (located in between Palmdale and Santa Clarita), a number of miners arrived and set up various mining camps near the canyon's rich mineral and silver discoveries. The area grew to the point that a post office was needed. The U.S. Postal Service rejected the area's informal name of "Soledad City" to avoid confusion with Soledad in Monterey County. The city was named "Ravenna" in honor of a local merchant and saloon keeper, Manuel Ravenna. Ravenna became a shipping point from which the canyon's gold, silver and copper ores were hauled off to port in San Pedro. Metal and ore products were first transported out of the area using freight wagons drawn by oxen or mules; this mode of transportation was replaced in 1876 with the completion of the Southern Pacific Railroad through the Antelope Valley. Ravenna became a ghost town shortly thereafter, as the miners moved up the canyon to new rail sidings where Acton now stands (City of Acton, 2010).

The Butterfield mail station, the Los Angeles to San Francisco telegraph line, and the Southern Pacific Railroad brought people and communication through the Valley during the 1860s and 1870s. Antelope Valley produced alfalfa and grain for some time until several dry years ensued. Mining near Acton helped residents sustain during the drought between 1874 and the Great Depression of the 1930s. By 1897 nearly everyone had left the Valley. Mining continues in and around the Antelope Valley today (County of Los Angeles, 1986).

City of Palmdale

The Antelope Valley, where the Project APE is located, was settled once the Southern Pacific Railroad line between San Francisco and Los Angeles was completed in 1876. The region was dependent on stock raising, dry farming, and fruit orchards. The origins of the city of Palmdale are in two early communities: Harold and Palmenthal. Harold (also known as Alpine Station) was at the intersection of the Southern Pacific Railroad tracks and Fort Tejon Road (now Barrel Springs Road). Palmenthal was settled in 1886 by approximately 55 Swiss and German families, mostly from Nebraska and Illinois. The name is supposedly from the settlers' misidentification of the Joshua trees (City of Palmdale, 2009). A drought in the 1890s stifled growth. In 1899, residents from Harold and Palmenthal relocated to a new site, which became Palmdale, near the railroad station and the stagecoach line between San Francisco and New Orleans.

In 1895, the Harold Reservoir, now known as Palmdale Lake, was formed after the South Antelope Valley Irrigation Company constructed an earthen dam. A wooden ditch, flume, and wooden trestle were constructed at the same time to connect Little Rock Creek to the reservoir. The primary purpose of the reservoir was to supply water for agriculture in the area. Beginning in the 1950s, the reservoir's water was also used to supply residences. The Palmdale Irrigation District agreed to purchase water from the then-new East Branch of the California Aqueduct in 1963. Subsequently, the lake was expanded to contain the increased water supply, and a new treatment facility adjacent to the lake was built (Palmdale Water District, 2009).

In 1917, electricity was introduced in the area, and deep wells were constructed to provide a steady water supply. In 1912 and 1913, the construction of the Los Angeles Aqueduct attracted workers to the area. In 1919, a bond issue passed to construct the Littlerock Dam, which is approximately 11 miles southeast of Palmdale within the Angeles National Forest (Los Angeles County Department of Regional Planning, 2009:6).

Beginning in the 1930s, the aerospace industry contributed toward the development of Palmdale. The establishment of Muroc Air Base (now Edwards Air Force Base) in 1933 caused the population of the Antelope Valley to double. In addition, the Palmdale Airport was built in 1940. In 1950, the Federal Government took over the airport for a jet testing facility and renamed it U.S. Air Force Plant 42 (Los Angeles County Department of Regional Planning, 2009:6). The Skunk Works, an alias for Lockheed Martin's group that develops extremely confidential and advanced products, primarily for the U.S. military, is located at Air Force Plant 42. The Skunk Works was formed in 1943 and led by Clarence L. "Kelly" Johnson to create the airframe for the XP-80, a powerful jet designed to answer the German jet threat during World War II. Over the years, the Skunk Works has designed many more famous aircraft designs for the U.S. military (Lockheed Martin, 2009).

C.4.1.5 Littlerock Reservoir

The Littlerock Reservoir contains no previously recorded cultural resources. In addition, no cultural resources were identified within this portion of the Project APE during the pedestrian survey.

C.4.1.6 47th Street East Property

The 47th Street East Property contains one previously recorded cultural resource (P-19-002475/CA-LAN-2475H). Documented in 1996, P-19-002475 consists of a historic-era metal can scatter dating to the late 1930s and early 1940s. In addition to rusted metal cans, it also contained fragments of bottle glass, chinaware sherds, iron pipe, metal scrap, barrel hoops, nails, and spent ammunition cartridges. During the pedestrian survey of the Project APE, no evidence of this site was observed. The area where the site was located appears to have been graded in recent years. This resource is no longer extant. No other cultural resources were identified within this portion of the Project APE during the pedestrian survey.

C.4.1.7 Hi-Grade Materials Company Property

The Hi-Grade Materials Company Property contains no previously recorded cultural resources. In addition, no cultural resources were identified within this portion of the Project APE during the pedestrian survey.

C.4.2 Regulatory Framework

This section provides an overview of the regulatory framework for cultural resources. Section C.9 (Recreation and Land Use) contains an evaluation of policies within the Forest Service Land Management Plan that are applicable to cultural resources.

C.4.2.1 Federal

- **National Historic Preservation Act (NHPA).** Under the NHPA of 1966, the Project is considered a federally licensed "undertaking" per 36 CFR § 800.2 (o) and subject to compliance with Section 106 of the NHPA of 1966, as amended. Under these guidelines, federal agencies are required to identify cultural resources that may be affected by project actions, assess the significance of these resources and their eligibility for inclusion on the National Register of Historic Places (NRHP) as per 16 USC 470w (5), and consult with the Advisory Council on Historic Preservation (ACHP) regarding project effects on significant resources. Eligibility is based on criteria defined by the Department of the Interior. Generally, districts, archaeological sites, buildings, structures, and objects that possess integrity are potentially eligible for inclusion on the NRHP under the following criteria:

  A) that are associated with events that have made a significant contribution to the broad patterns of our history; or

  B) that are associated with the lives of persons significant in our past; or

  C) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

  D) that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR § 60.4).

  If a cultural resource is determined to be an eligible historic property under 36 CFR § 60.4, then Section 106 requires that the effects of the proposed undertaking be assessed and considered in planning the undertaking. According to 36 CFR § 800.3 (Regulations of the Advisory Council on Historic Preservation Governing the Section 106 Review Process), the lead agency, State Historic Preservation Office (SHPO), and Council must consider the special concerns of Indian tribes in historic preservation issues, and must allow tribes to participate as "interested persons" regarding properties of historic value to an Indian tribe on non-Indian lands.

- **Native American Graves Protection and Repatriation Act (NAGPRA).** The NAGPRA was enacted on November 16, 1990, to address the rights of lineal descendants, Indian tribes, and Native Hawaiian organizations to Native American cultural items, including human remains, funerary objects, sacred objects, and objects of cultural patrimony. NAGPRA assigned implementation responsibilities to the Secretary of the Interior. If human remains are encountered on Federal lands, NAGPRA states that the responsible Federal official must be notified immediately and that no further disturbance shall occur in the area until clearance is given by the responsible Federal official (43 C.F.R. § 10.4). If the remains are determined to be Native American Indian, the Federal agency would then notify the appropriate federally recognized Native American tribe and initiate consultation.

- **Archeological Resources Protection Act (ARPA).** If federal or Indian lands are involved, the ARPA may impose additional requirements on an agency. ARPA: (1) Prohibits unauthorized excavation on federal and Indian lands; (2) Establishes standards for permissible excavation; (3) Prescribes civil and criminal penalties; (4) Requires agencies to identify archeological sites; and (5) Encourages cooperation between federal agencies and private individuals.

- **Antiquities Act of 1906.** The Antiquities Act of 1906 states, in part: That any person who shall appropriate, excavate, injure or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States, without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated, shall upon conviction, be fined in a sum of not more than five hundred dollars or be imprisoned for a period of not more than 90 days, or shall suffer both fine and imprisonment, in the discretion of the court.

C.4.2.2 State

- **California Environmental Quality Act.** Cultural resource management work conducted as part of the Project is to comply with CEQA Statute and Guidelines, which direct lead agencies to first determine whether cultural resources are "historically significant" resources. CEQA requires that impacts that a project may have on cultural resources be assessed and requires mitigation if significant (or "unique") cultural resources are to be impacted (Section 21083.2 [a-1] and Appendix K). Generally, a cultural resource is considered "historically significant" if the resource is 45 years old or older, possesses integrity of location, design, setting, materials, workmanship, feeling, and association, and meets the requirements for listing on the California Register of Historical Resources (CRHR) under any one of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or,
4. Has yielded, or may be likely to yield, information important in prehistory or history (Title 14 CCR, § 15064.5).

The statutes and guidelines specify how cultural resources are to be managed in the context of projects, such as the Project. Briefly, archival and field surveys must be conducted, and identified cultural resources must be inventoried and evaluated in prescribed ways. Prehistoric and historical archaeological resources, as well as built environment resources such as standing buildings, structures, and objects, deemed "historically significant" must be considered in project planning and development. Additionally, any Project that may affect "historically significant" cultural resources must be submitted to the SHPO for review and comment prior to project approval by the responsible agency and prior to construction.

If a Lead Agency determines that an archaeological site is a historical resource, the provisions of California Public Resources Code (CPRC) §21084.1 and CEQA Guidelines §15064.5 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site is to be treated in accordance with the provisions of PRC §21083 regarding unique archaeological resources. The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of a project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines §15064[c][4]).

If human remains of any kind are found during construction activities, CEQA Guidelines Section 15064.5(e) and Assembly Bill 2641 are to be followed. These require that all construction activities cease immediately and the County Coroner and a qualified archaeologist must be notified. The coroner would examine the remains and determine the next appropriate action based on his or her findings. If the coroner determines the remains to be of Native American origin, the Native American Heritage Commission (NAHC) must be notified. The NAHC would then identify a most-likely descendant to be consulted regarding treatment and/or reburial of the remains.

- **Native American Heritage Commission (Public Resources Code Sections 15064.5(e) and 15064.5(d), et seq.).** This code requires that excavation activities be stopped whenever human remains are uncovered and that the County coroner be called in to assess the remains. If the County coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours. At that time, the lead agency must consult with the appropriate Native Americans as identified by the Native American Heritage Commission and the lead agency, under certain circumstances, should develop an agreement with the Native Americans for the treatment and disposition of the remains.

C.4.2.3 Local

- **County of Los Angeles General Plan.** The County of Los Angeles General Plan has the following policies regarding cultural resources:
  - Policy C/NR 14.1: Mitigate all impacts from new development on or adjacent to historic, cultural, and paleontological resources to the greatest extent feasible.
  - Policy C/NR 14.2: Support an inter-jurisdictional collaborative system that protects and enhances historic, cultural, and paleontological resources.
  - Policy C/NR 14.3: Support the preservation and rehabilitation of historic buildings.
  - Policy C/NR 14.4: Ensure proper notification procedures to Native American tribes in accordance with Senate Bill 18 (2004).
  - Policy C/NR 14.5: Promote public awareness of historic, cultural, and paleontological resources.
  - Policy C/NR 14.6: Ensure proper notification and recovery processes are carried out for development on or near historic, cultural, and paleontological resources.
- **City of Palmdale General Plan.** The City of Palmdale General Plan has an objective to promote the identification and preservation of historical structures, historical sites, archaeological sites, and paleontological resources in the City. The following policies would protect historical and culturally significant resources that contribute to the community's sense of history:
  - Policy ER7.1.1: Identify and recognize historic landmarks from Palmdale's past.
  - Policy ER7.1.2: Promote maintenance, rehabilitation, and appropriate reuse of identified landmarks where feasible.
  - Policy ER7.1.3: Require that new development protect significant historic, paleontological, or archaeological resources, or provide for other appropriate mitigation.
  - Policy ER7.1.4: Develop and maintain a cultural sensitivity map. Require special studies/surveys to be prepared for any development proposals in areas reasonably suspected of containing cultural resources, or as indicated on the sensitivity map.
  - Policy ER7.1.5: When human remains, suspected to be of Native American origin are discovered, cooperate with the Native American Heritage Commission and any local Native American groups to determine the most appropriate disposition of the human remains and any associated grave goods.
  - Policy ER7.1.6: Cooperate with private and public entities whose goals are to protect and preserve historic landmarks and important cultural resources.

C.4.3 Issues Identified During Scoping

Table C.4-1 below provides a list of cultural resource issues raised during the public scoping period for the EIS/EIR [see Appendix E (Summary of Scoping Process)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion of the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.4-1. Scoping Issues Relevant to Cultural Resources

Comment	Consideration in the EIS/EIR
Fernandeno Tataviam Band of Mission Indians	
The Project would break ground in traditional Tataviam tribal lands and may disturb culturally sensitive deposits.	As noted in Section C.4.4, Impact Assessment Methodology, no archaeologically sensitive areas were identified within the Project area. In addition, should culturally sensitive deposits be encountered during Project construction, SPC CUL-2 provides for treatment of previously unidentified cultural resources and SPC CUL-3 provides for treatment of human remains if encountered during construction.
Native American Heritage Commission	
The Project must adequately comply with CEQA guidelines §15064.5(b) and mitigate Project-related impacts on archaeological resources.	As noted in Section C.4.2, Regulatory Framework, the Project would comply with all state and federal guidelines regarding cultural resources.
Include in the mitigation plans provisions for the identification and evaluation of accidentally discovered archaeological resources, pursuant to CEQA §15064.5(f).	Mitigation Measure C-1b, as noted in Section C.4.4, Environmental Consequences, provides for treatment of previously unidentified cultural resources.
In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.	As noted in Section C.4.4, Impact Assessment Methodology, no archaeologically sensitive areas were identified within the Project area.
California Public Resources Code §21083.2 requires documentation and analysis of archaeological items that meet the standard in §15064.5 (a)(b)(f).	As noted in Section C.4.2, Regulatory Framework, the Project would comply with all state and federal guidelines regarding cultural resources.
If there is federal jurisdiction of this project due to funding or regulatory provisions, then consultation may be required with culturally affiliated Native American tribes to determine if the Project may have an adverse impact on cultural resources per NEPA 42 USC 4321-43351, §106 of the National Historic Preservation Act (16 USC 470 et seq.), and 36 CFR Part 800.14(b).	As noted in Section C.4.2, Regulatory Framework, the Project would comply with all state and federal guidelines regarding cultural resources.
Coordinate, as feasible, additional archaeological activity with the Native American Heritage Commission (NAHC), and submit the final report (including site forms, site significance and mitigation measures) to the NAHC planning department. Any information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure pursuant to California Government Code §6254.10.	PWD would coordinate and communicate with the NAHC regarding archaeological activity as appropriate. In addition, all confidential information would be placed in an appendix and not made available for public disclosure.
A list of appropriate Native American Contacts for consultation concerning the project site has been provided and is attached to this letter to determine if the proposed active might impinge on any cultural resources.	Consultation with Native American tribes in the area was conducted during the public scoping period.

Table C.4-1. Scoping Issues Relevant to Cultural Resources

Comment	Consideration in the EIS/EIR
Consider first, avoidance for sacred and/or historical sites, pursuant to CEQA Guidelines §15370(a). If the Project goes forward, mitigation and monitoring plans should include provisions for the analysis and disposition of recovered artifacts, pursuant to California Public Resources Code §21083.2 in consultation with culturally affiliated Native Americans.	SPC CUL-2, as noted in Section C.4.4, Environmental Consequences, provides for treatment of previously unidentified cultural resources.
Include provisions for discovery of Native American human remains in mitigation plans. Health and Safety Code §7050.5, CEQA §15064.5(e), and Public Resources Code §5097.98 mandate the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.	SPC CUL-3, as noted in Section C.4.4, Environmental Consequences, provides for treatment of human remains if encountered during construction.

C.4.4 Environmental Consequences

Impact Assessment Methodology. The cultural resource literature and records searches for the Littlerock Reservoir indicated that 22 archaeological surveys have been conducted within a 0.5-mile radius of the Littlerock Reservoir. None of these previous studies involved the Project. This search also noted 14 cultural resources within a one-mile radius of the Littlerock Reservoir. None of these previously documented resources are within the Project APE. Finally, no cultural resources were identified during the intensive archaeological survey of the Littlerock Reservoir.

The cultural resources literature and records search for the off-site dumping locations (47th Street East property and the Hi-Grade Materials Company property) indicated that 37 cultural resource studies have been conducted previously within a one-mile radius of the off-site dumping locations. Of these, three studies included various portions of the Project APE. The records search also noted 20 previously documented cultural resources within a one-mile radius of the off-site dumping locations. One of these resources, a historic-era can dump (P-19-002475/CA-LAN-2475H), was identified within the 47th Street East property. The intensive archaeological survey of the off-site dumping locations found no evidence of this site. In addition, the area where the site was documented appeared to have been graded in recent years. Finally, no newly identified cultural resources were observed during the pedestrian survey of the off-site dumping locations.

Information gathered from the cultural resource literature, records searches, and field surveys was also used to assess the potential for encountering previously unrecorded cultural resources in the Project APE.

Significance Criteria. The following significance criteria for cultural resources were derived from the CEQA Guidelines Appendix G. Impacts of the proposed action/project or alternatives would be considered significant and would require mitigation if:

- Criterion CR1: The Project would cause a substantial adverse change in the significance of a cultural resource.
- Criterion CR2: The Project could disturb human remains, including those interred outside of formal cemeteries.

Direct Impacts under CEQA and NEPA. Direct impacts to cultural resources are those associated with project development, construction, and co-existence. Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources may result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or demolition of overlying structures. Construction can have direct impacts on historical built-environment resources when those buildings or structures must be removed to make way for new buildings or structures or when the vibrations of construction impair the stability of historical buildings or structures nearby. New buildings or structures can have direct impacts on historical built environment resources when the new buildings or structures are stylistically incompatible with their neighbors and the setting, or when the new buildings or structures produce a harmful effect to the materials or structural integrity of the historical built environment resources, such as emissions or vibrations.

Indirect Impacts under CEQA and NEPA. Generally speaking, indirect impacts to archaeological resources are those that may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historical built environment resources can suffer indirect impacts when project construction creates potentially damaging noise and vibration, improved accessibility and vandalism, or greater weather exposure. It should also be noted that NEPA requires the consideration of effects to both NRHP-eligible cultural resources (identified through the Section 106 process), as well as effects to resources that may not be eligible. This includes consideration of cultural resources identified through the consultation process.

Adverse Effects under Section 106. Rather than creating separate categories of direct and indirect impacts, the Section 106 regulations are focused on effects more broadly to historic properties. The regulatory definition of "effect," pursuant to 36 CFR § 800.16(i), is that the term "means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the NRHP." The NHPA is specifically concerned about adverse effects to those properties. The regulations identify adverse effects as occurring when an undertaking is found to "alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association (36 C.F.R. § 800.5(a)(1))." "Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative (36 C.F.R. § 800.5(a)(1))."

C.4.4.1 Proposed Action/Project

Direct and Indirect Effects Analysis

This analysis of direct and indirect impacts for the Project is organized according to the following Project phases: construction and operation and maintenance.

Construction

Project construction would require both temporary and permanent disturbance areas and could result in the direct impact to unanticipated cultural resources including damage and/or displacement of resources, resulting in the loss of information about history and prehistory.

While no known resources are within the Project APE, five cultural resources are documented within a quarter mile of the Littlerock Reservoir and the area is sensitive for prehistoric and historical cultural resources. Therefore, the only potential for direct impacts to cultural resources during the construction phase of the Project is from unanticipated or inadvertent cultural resource discoveries. Due to various surface conditions or changes over time, not all cultural resources are expressed on the surface. Any project with ground disturbing components has the potential to directly impact unanticipated cultural resources.

Sediment removal from the Reservoir would have no impact on cultural resources, as excavation would be limited to removing sediments deposited after construction of the Littlerock Dam (post-dam sediments) and would not reach the original ground surface that existed prior to construction of the Dam (pre-dam ground surface). Disposal of excavated sediments at the two off-site dumping areas would also have no impact on cultural resources, as sediments would either be stockpiled or dumped into low-lying gullies or exhausted mining pits. No native sediments would be disturbed in this process.

However, construction of the grade control structure would require excavation, with excavation occurring within the Littlerock Reservoir bed and banks adjacent to Rocky Point. Buried or otherwise obscured cultural resources may be present within the portions of the Project APE associated with the grade control structure that are located outside of the Littlerock Reservoir bed. If such resources are encountered, impacts would be reduced through the implementation of SPCs CUL-1 and CUL-2.

No human remains are known to be located within the Project APE. However, there is always the possibility that unmarked burials may be unearthed during construction. In the unlikely event of an accidental discovery of any human remains, the procedures and provisions in SPC CUL-3 would be implemented.

Indirect impacts to cultural resources are not anticipated for the Project.

Operation and Maintenance

Operation and maintenance of the Reservoir and grade control structure would not result in any disturbance of cultural resources. Although maintenance would require the excavation and removal of 38,000 cubic yards of sediment from the Reservoir annually, this excavation would be limited to removing post-dam deposited sediments and would not reach the original pre-dam ground surface. As with the initial excavation of sediment in the Reservoir, this sediment removal would have no impact on cultural resources.

The Project would cause a substantial adverse change in the significance of a cultural resource (Criterion CR1).

Impact C-1: Implementation of the Project would demolish, destroy, relocate, or disturb the cultural resource in a manner that would diminish its integrity or materially impair the significance of the resource.

Unknown buried resources (prehistoric and historical archaeological sites) could be inadvertently unearthed during ground-disturbing activities associated with Project construction. The procedures and provisions in SPCs CUL-1 and CUL-2 address inadvertent discoveries and provide detail on how these activities would be implemented.

SPCs Applicable to Impact C-1

SPC CUL-1 (Archaeological Monitoring Outside the Little Rock Creek and Reservoir Bed)

SPC CUL-2 (Unidentified Cultural Resource Discovery Procedures)

CEQA Significance Conclusion

Unknown buried resources (prehistoric and historical archaeological sites) could be inadvertently unearthed during ground-disturbing activities associated with Project construction of the grade control structure. In accordance with the Forest Service Land Management Plan, any unknown cultural resources within the Project APE would be considered eligible for listing on the NRHP until proven otherwise. Implementation of SPCs CUL-1 and CUL-2 would ensure that construction is temporarily halted in the event that a previously unknown archaeological resource is discovered, and that impacts to unanticipated archaeological discoveries are reduced to a less-than-significant level (Class III).

The Project could disturb human remains, including those interred outside of formal cemeteries (Criterion CR2)

Impact C-2: Implementation of the Project could uncover, expose, and/or damage human remains.

No formal cemeteries or human remains are known to be located within the Project area. However, there is always the possibility that unmarked burials may be unearthed during construction. The procedures and provisions in SPC CUL-3 provide detail on how this activity would be implemented, in the unlikely event of an accidental discovery of any human remains.

SPCs Applicable to Impact C-2

SPC CUL-3 (Unidentified Human Remains Discovery Procedures)

CEQA Significance Conclusion

No human remains are known to be located within the Project area. However, there is always the possibility that unmarked burials could be inadvertently unearthed during excavation activities, which could result in damage to these human remains. In the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery, SPC CUL-3 would be implemented to reduce impacts. Nonetheless, the effect would be considered adverse under the regulations in the NHPA, and therefore, treatment of the remains, other than protection in place, would be a significant and unavoidable impact (Class I).

C.4.4.2 Alternative 1: Reduced Sediment Removal Intensity

Under Alternative 1, construction of the grade control structure would be identical to that of the Project. Once restored, ongoing sediment removal to maintain Reservoir capacity would be identical to that of the Project. Therefore, this alternative only differs from the Project during the initial (restorative) sediment removal. Alternative 1 seeks to reduce certain environmental impacts (primarily air quality, traffic, and noise) by:

- Starting the initial sediment removal period on July 1 (annually), instead of after Labor Day.
- Sediment removal activities would occur 5 days per week, instead of 6 (with the Project).
- Restoring the Reservoir to 1992 design water storage and flood control capacity within a minimum of 13 years, instead of 6 (with the Project).

Excavated sediment may first be stockpiled within the excavation area if drying is needed. PWD would first seek to recycle excavated material as feasible, likely for use PWD and other municipal projects within Palmdale and the surrounding area. All excavated material that cannot be recycled/reused would be trucked off-site for disposal at one of two locations:

- **The 47th Street East property.** This property is owned by PWD and encompasses approximately 36 acres. The property is located along the west side of 47th Street East, immediately north of the East

Branch of the California Aqueduct. The property comprises vacant, undeveloped land characterized by several ridges, gullies, and knolls, and is located approximately four miles driving distance north of the Reservoir. The Project proposes to stockpile removed sediment from the Reservoir within the low-lying gullies in a manner that it would not mound above adjacent grades.

- **The Hi-Grade Materials Company property.** This property encompasses approximately 170 acres near Pearblossom Highway. The property is located approximately five miles driving distance north of the Reservoir and is an active quarry containing large open pits that have been exhausted of quarry materials. The Project proposes to dispose of removed sediment within the quarry's exhausted pits.

Direct and Indirect Effects Analysis

This analysis of direct and indirect impacts for Alternative 1 is organized according to the following project phases: construction and operation and maintenance.

Construction

Construction of Alternative 1 would require both temporary and permanent disturbance areas and could result in the direct impact to unanticipated cultural resources including damage and/or displacement of resources, resulting in the loss of information about history and prehistory.

While no known resources are within the APE of Alternative 1, five cultural resources are documented within a quarter mile of the Littlerock Reservoir and the area is sensitive for prehistoric and historical resources. Therefore, the only potential for direct impacts to cultural resources during the construction phase of Alternative 1 is from unanticipated or inadvertent cultural resource discoveries. Due to various surface conditions or changes over time, not all cultural resources are expressed on the surface. Any project with ground disturbing components has the potential to directly impact unanticipated cultural resources.

Under Alternative 1, sediment removal would have no impact on cultural resources, as excavation would be limited to removing sediments deposited after construction of the Littlerock Dam (post-dam sediments) and would not reach the original ground surface that existed prior to construction of the Dam (pre-dam ground surface). Disposal of excavated sediments at the two off-site dumping areas would also have no impact on cultural resources as sediments would either be stockpiled or dumped into low-lying gullies or exhausted mining pits. No native sediments would be disturbed in this process.

However, construction of the grade control structure would require excavation to and below pre-dam ground surface levels with the vast majority of this excavation occurring within the Littlerock Reservoir bed and banks adjacent to Rocky Point. Buried or otherwise obscured cultural resources may be present within the portions of the Project APE associated with the grade control structure that are located outside of the Little Rock Creek bed. If such resources are encountered, impacts would be reduced through the implementation of SPCs CUL-1 and CUL-2.

No human remains are known to be located within the APE of Alternative 1. However, there is always the possibility that unmarked burials may be unearthed during construction. In the unlikely event of an accidental discovery of any human remains, the procedures and provisions in SPC CUL-3 would be implemented.

Indirect impacts to cultural resources are not anticipated for Alternative 1.

Operation and Maintenance

Operation and maintenance of the Reservoir and grade control structure would not result in any disturbance of cultural resources. Although maintenance would require the excavation and removal of 38,000 cubic yards of sediment from the Reservoir annually, this excavation would be limited to removing post-dam deposited sediments and would not reach the original pre-dam ground surface. As with the initial excavation of sediment in the Reservoir, this sediment removal would have no impact on cultural resources.

The Project would cause a substantial adverse change in the significance of a cultural resource (Criterion CR1)

Impact C-1: Implementation of the Project would demolish, destroy, relocate, or disturb the cultural resource in a manner that would diminish its integrity or materially impair the significance of the resource.

Unknown buried resources (prehistoric and historical archaeological sites) could be inadvertently unearthed during ground-disturbing activities associated with Project construction. The procedures and provisions in SPCs CUL-1 and CUL-2 address inadvertent discoveries and provide detail on how these activities would be implemented.

SPCs Applicable to Impact C-1

SPC CUL-1 (Archaeological Monitoring Outside the Little Rock Creek and Reservoir Bed)

SPC CUL-2 (Unidentified Cultural Resource Discovery Procedures)

CEQA Significance Conclusion

Unknown buried resources (prehistoric and historical archaeological sites) could be inadvertently unearthed during ground-disturbing activities associated with Project construction of the grade control structure. In accordance with the Forest Service Land Management Plan, any unknown cultural resources within the Project APE would be considered eligible for listing on the NRHP until proven otherwise. Implementation of SPC CUL-2 would ensure that construction is temporarily halted in the event that a previously unknown archaeological resource is discovered, and that impacts to unanticipated archaeological discoveries are reduced to a less-than-significant level (Class III).

The Project could disturb human remains, including those interred outside of formal cemeteries (Criterion CR2)

Impact C-2: Implementation of the Project could uncover, expose, and/or damage human remains.

No formal cemeteries or human remains are known to be located within the Project area. However, there is always the possibility that unmarked burials may be unearthed during construction. The procedures and provisions in SPC CUL-3 provide detail on how this activity would be implemented, in the unlikely event of an accidental discovery of any human remains.

SPCs Applicable to Impact C-2

SPC CUL-3 (Unidentified Human Remains Discovery Procedures)

CEQA Significance Conclusion

No human remains are known to be located within the Project area. However, there is always the possibility that unmarked burials could be inadvertently unearthed during excavation activities, which could result in damage to these human remains. In the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery, SPC CUL-3 would be implemented to reduce impacts. Nonetheless, the effect would be considered adverse under the regulations in the NHPA, and therefore, treatment of the remains, other than protection in place, would be a significant and unavoidable impact (Class I).

C.4.4.3 Alternative 2: No Action/No Project Alternative

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam. Under this alternative, sediment would continue to enter the Reservoir at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually.

Direct and Indirect Effects Analysis

In the event sediment buildup led to safety issues and required demolition/removal of the Dam, construction activities (and related noise) are expected to be greater than that of the Project or Alternative 1. Demolition of the dam and restoration of the waterway would require extensive construction. Activities would be similar or greater in intensity to the Project, and would likely require additional construction years. Unknown buried resources (prehistoric and historical archaeological sites) could be inadvertently unearthed during ground-disturbing activities associated with such construction. While unknown, it is likely similar procedures and provisions as SPCs CUL-1 and CUL-2 would be necessary to address inadvertent discoveries and provide detail on how these activities would be implemented.

In the event the Reservoir became filled with sediment and the Dam was left in place, it is likely that some type of downstream flood-control channeling would need to be constructed. While unknown, should these activities include any significant ground disturbance, it is likely similar procedures and provisions as SPCs CUL-1 and CUL-2 would be necessary to address inadvertent discoveries and provide detail on how these activities would be implemented.

CEQA Significance Conclusion

The No Action/No Project Alternative would not result in impacts to cultural resources.

C.4.5 Impact Summary

Table C.4-2 summarizes the direct and indirect environmental impacts of the proposed action and the alternatives on cultural resources. Refer to Section C.4.4 for the entire environmental analysis and recommended SPCs.

Table C.4-2. Summary of Impacts and Mitigation Measures – Cultural Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
C-1: Implementation of the Project would demolish, destroy, relocate, or disturb the cultural resource in a manner that would diminish its integrity or materially impair the significance of the resource.	Class III	Class III	No impact	Yes	SPC CUL-1 (Archaeological Monitoring Outside the Little Rock Creek and Reservoir Bed) SPC CUL-2 (Unidentified Cultural Resource Discovery Procedures)
C-2: Implementation of the Project could uncover, expose, and/or damage human remains.	Class I	Class I	No impact	Yes	SPC CUL-3 (Unidentified Human Remains Discovery Procedures)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.

C.5 Geology and Soils

This section describes the existing conditions and geologic hazards related to geology and soils within the proposed action (Project) area. This analysis focuses on the potential exposure of people or structures to geologic hazards as well as the potential for the proposed action to cause or be affected by unstable soil conditions.

C.5.1 Affected Environment

Baseline data were collected from several sources, including: U.S. Geological Survey (USGS), USDA Natural Resources Conservation Service (NRCS), Department of Conservation California Geological Survey (CGS), and Palmdale Water District (PWD).

C.5.1.1 Regional Setting

The Project study area includes Littlerock Reservoir and dam, the potential sand and gravel pits and PWD disposal areas, and the haul route between the reservoir and the disposal areas, as shown in Figure B-1. The Project area is located on the north-central edge of the Transverse Range's physiographic province, an east-west-trending group of mountain ranges and valleys in Southern California. The reservoir and disposal sites are located along the boundary between the north-facing foothills of the San Gabriel Mountains and the Antelope Valley. The reservoir and upstream contributing area are located in the Angeles National Forest, and are bounded by Mount Emma Ridge and Pacifico Mountain to the west; Kratka Ridge, Mount Hillyer, and Waterman Mountain to the south; and Mount Williamson, Pallett Mountain, and Pleasant View Ridge to the east. The disposal sites are located on the valley floor north of the reservoir. The mining pits are located within the alluvial fan formed by Little Rock Wash, and the PWD property lies to the west of the drainage.

The San Gabriel Mountains were formed by north-south compression of the Earth's crust combined with uplift along east-west trending faults, including the Sierra Madre fault system. The active San Andreas Fault, which runs roughly perpendicular to Little Rock Wash between the reservoir and the disposal sites, represents the northerly boundary of the Transverse Ranges province and the San Gabriel Mountains.

C.5.1.2 Geology

The mountains near the reservoir are formed by an igneous rock complex of Precambrian to Mesozoic age (URS, 2008; USGS, 2005). The valley north of the reservoir near the disposal sites contains Mesozoic-age granitics, Pliocene-age sedimentary rocks, and Holocene fan deposits. The Littlerock Reservoir is underlain by Late Triassic quartz monzonite and monzodiorite. Bedrock beneath the dam and reservoir is mapped as Mesozoic-age Lowe granodiorite. An outcropping of Middle Proterozoic anorthosite and gabbro borders the reservoir to the southwest. As the haul route leaves the quartz formation associated with the reservoir, it traverses Pliocene to Holocene alluvium, Miocene to Pleistocene sandstone and conglomerate, and Mesozoic granodiorite and quartz monzonite. The PWD disposal site is underlain by Mesozoic granodiorite and quartz monzonite, and Pliocene to Holocene alluvium. The mining pits are underlain entirely by Pliocene to Holocene alluvium.

C.5.1.3 Seismicity

The seismicity of Southern California is dominated by the intersection of the north-northwest trending San Andreas Fault system and the east-west trending Transverse Ranges fault system. The closest known active fault to the Project area is the Mojave segment of the San Andreas Fault, located approximately two miles north of the reservoir. The San Andreas is a right-lateral strike-slip fault that runs over 700 miles from the Gulf of California to Cape Mendocino. Ground rupture associated with the 1857 earthquake on the San Andreas occurred along the segment of the fault that is adjacent to the Project site, and the modern trace has been the site of recurring Holocene ground rupture (URS, 2008).

Neither the Littlerock Reservoir nor the potential disposal sites fall within an Earthquake Fault Zone as defined by CGS. However, the haul route crosses the Earthquake Fault Zone associated with the San Andreas Fault. Although neither the reservoir nor the disposal sites would be subject to surface fault rupture, the entire project area could experience strong ground shaking from both the San Andreas and Transverse Range fault systems (CGS, 2014).

C.5.1.4 Soils

The area surrounding the reservoir and disposal sites is dominated by Entisols, with small areas of Alfisols and Inceptisols interspersed (NRCS, 2014). The reservoir and downstream wash are underlain by riverwash that is composed primarily of sand, gravel, cobbles, and some boulders. Both sides of the reservoir are surrounded by the Trigo family of dry-Lithic Xerorthents. The PWD property disposal site is underlain by Hanford, Ramona, and Vista coarse sandy loam. The mining pits disposal site is surrounded by Arizo gravelly loamy sand and loamy fine sand, and Hesperia fine sandy loam.

The soils surrounding the reservoir are highly susceptible to erosion and have an average slope gradient of 65 percent. Therefore, the potential for landslide in the area surrounding the reservoir is high. The soils surrounding the disposal sites are less susceptible to erosion and lie on the generally flat valley floor. There is no risk of landslide in the areas surrounding the disposal sites.

Liquefaction is the phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake induced, strong groundshaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude and frequency of earthquakes in the surrounding region. Saturated, unconsolidated silts, sands, and silty sands within 50 feet of the ground surface are most susceptible to liquefaction. The potential for liquefaction in the upper loose layers of sands within Littlerock Reservoir is high (URS, 2008). The depth of potential liquefiable sands is approximately 20 feet.

C.5.2 Regulatory Framework

This section provides an overview of the regulatory framework for geology and soils, specifically as they relate to geologic hazards and unstable soil conditions. Table C.5-1 provides a list of plans and policies that are applicable to geology and soils, and includes a discussion of the Project's consistency with each plan or policy.

C.5.2.1 California Department of Conservation

- **Alquist-Priolo Earthquake Fault Zoning Act of 1972.** This Act (formerly the Special Studies Zoning Act) regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. This Act helps define areas where fault rupture is most likely to occur and groups faults into categories of active, potentially active, and inactive in order to assess the potential for damage to structures or injury to people from fault rupture.
- **Seismic Hazards Mapping Act of 1990.** This Act (Public Resources Code, Chapter 7.8, Division 2) directs the California Department of Conservation, California Geological Survey (CGS) to delineate Seismic Hazard Zones. The purpose of the Act is to reduce the threat to public health and safety and

to minimize the loss of life and property by identifying and mitigating seismic hazards. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by CGS in their land-use planning and permitting processes.

C.5.2.2 County of Los Angeles

- **County** of **Los Angeles General Plan.** The County of Los Angeles General Plan Safety Element contains goals and policies to minimize injury, loss of life, and property damage due to seismic and geologic hazards, including earthquakes and landslides.
- **Antelope Valley Areawide General Plan.** The Antelope Valley Areawide General Plan includes policies to protect people and structures from the risk of seismic hazards. Special development standards are required for projects within the Seismic Safety Management Areas, which are based on the Alquist-Priolo Earthquake Fault Zones.

C.5.2.3 City of Palmdale

City of Palmdale General Plan. The City of Palmdale General Plan Safety Element contains a goal to minimize danger and damage to public health, safety, and welfare resulting from natural hazards, including seismic hazards. This goal is implemented through review (and modification when necessary) of development within or adjacent to geologic hazards.

Table C.5-1. Consistency with Applicable Geology and Soil-Related Plans and Policies

Plan/Policy	Consistency	Explanation
Alquist-Priolo Earthquake Fault Zoning Act and Seismic Hazards Mapping Act	Yes	Earthquake Fault Zones, Liquefaction zones, and Landslide zones have been reviewed and identified in Section C.5.1. No structures would be placed within a geologic hazard zone.
County of Los Angeles General Plan, Antelope Valley Areawide General Plan, and City of Palmdale General Plan Seismic and Geologic Hazard Policies.	Yes	Seismic and geologic hazards have been identified in Section C.5.1. The Project will be designed and operated so as to minimize risks associated with seismic and geologic hazards.

C.5.3 Issues Identified During Scoping

Table C.5-2 below provides a list of geology and soil-related issues raised during the public scoping period for the EIS/EIR [see Appendix E (Summary of Scoping Process)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.5-2. Scoping Issues Relevant to Geology and Soils

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
The Draft EIS/EIR should evaluate and consider reducing concentrations of inorganic mercury in reservoir sediment through stabilization of soils.	Soils will be stabilized by the grade control structure to prevent upstream incision and erosion of the stream channel. Soils downstream of the grade control structure will be excavated and disposed of at an appropriate site. Clean sediment will be deposited at one of two disposal sites identified in Figure B-1. Any sediment that is found to be contaminated will be disposed of in an appropriate hazardous waste facility, thereby reducing concentrations of inorganic mercury in reservoir sediment. Soils within the reservoir downstream of the grade control structure will not be stabilized for the purposes of isolating inorganic mercury.

Table C.5-2. Scoping Issues Relevant to Geology and Soils

Comment	Consideration in the EIS/EIR
The Draft EIS/EIR should identify an alternative and define mitigation measures to ensure that the concentrations of Hg and PCBs in sediments are not increased by the Project and are decreased to the extent feasible.	Reservoir management alternatives (such as pH adjustment, nutrient addition, oxygenation, and stocking practices) to reduce methylmercury production are not part of the proposed action. Concentrations of Hg and PCBs in sediments would not be increased by the Project. Because contaminated sediment that is encountered during excavation would be removed and be disposed of in an appropriate hazardous waste facility, the concentrations of Hg and PCBs in sediments within the reservoir may be decreased under the proposed action.

C.5.4 Environmental Consequences

Significance Criteria. Appropriate criteria have been identified and utilized in order to base the significance conclusions on the CEQA Appendix G Environmental Checklist and to make them relevant to this analysis based on local conditions and the project description. Geologic conditions were evaluated with respect to Project impacts on local geology, as well as the impacts local geologic conditions may have on the Project. For purposes of the CEQA analysis in this report, impacts related to geology and soils are considered significant if the Project would:

- Criterion GEO1: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known Alquist-Priolo earthquake fault, landslides, strong seismic ground shaking, or seismic-related ground failure, including liquefaction.
- Criterion GEO2: Cause or be affected by substantial soil erosion, slope instability, or slope failure.

Impact Assessment Methodology. This impact analysis is based on an assessment of baseline conditions relevant to the site, including geologic formations, soil types and properties, and known or potential geologic hazards, which are presented in Section C.5.1. These baseline conditions were evaluated based on their potential to be affected by, or to affect, construction activities as well as operation and maintenance activities related to the Project and alternatives. Potential impacts were then identified based on the predicted interaction between construction, operation, and maintenance activities with the affected environment, using appropriate technical analysis and the impact significance criteria. Standard project commitments, described in Appendix A, were considered as project features in the impact analysis.

Impacts are described in terms of location, context, and intensity, and identified as being either short- or long-term, and direct or indirect in nature. Beneficial as well as adverse impacts are identified, with a discussion of the effect and risk to public health and safety, and potential violation of environmental laws. Mitigation measures are developed to avoid, minimize or rectify impacts, and described in terms of need and mitigating effect on the impact.

C.5.4.1 Proposed Action/Project

This section describes the direct and indirect effects of the proposed action (Project) on geology and soils and the exposure of people or structures to seismic and geologic hazards.

Direct and Indirect Effects Analysis

Exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving, rupture of a known Alquist-Priolo earthquake fault, landslides, strong seismic ground shaking, or seismic-related ground failure, including liquefaction (Criterion GEO1)

Impact G-1: The Project would expose people or structures to potential substantial adverse effects due to seismic or geologic hazards.

Neither the Littlerock Reservoir nor the proposed disposal sites are located within an Alquist-Priolo Earthquake Fault Zone. Additionally, no structures would be constructed under the proposed action. However, the San Andreas Fault runs east-west between the reservoir and the disposal sites, approximately 1.7 miles north of Littlerock Dam. In the event of a large earthquake along this fault, the entire Project area would experience strong seismic ground shaking. This ground shaking would not expose structures to adverse effects because no structures would be constructed under the proposed action. Although construction workers could be exposed to strong seismic ground shaking, they would not experience any direct adverse effects because Project work (excavation, hauling, and disposal of sediment) would occur in an open overhead environment with no risk of injury due to falling objects or collapsing structures.

The greatest risks under the proposed action associated with Criterion GEO1 are landslide and liquefaction. Structures would not be exposed to adverse effects, as no structures would be constructed under the proposed action. Construction workers could be exposed to risk of injury due to landslide or liquefaction. Although the area surrounding Littlerock Reservoir has not been evaluated by the California Geological Survey, the reservoir is surrounded by steep slopes that could be subject to earthquake-induced landslides. A landslide on the surrounding hillsides could affect the Project area and cause injury or death to construction workers. The loose, often saturated sands and silt within the reservoir could be subject to liquefaction during a seismic event. In the event of liquefaction, the ground would become unstable and construction workers could be injured by falling or coming into contact with falling equipment.

Implementation of SPC GEO-1, provided in Appendix A, would reduce the risk of injury or death due to seismic and geologic hazards to a negligible level.

SPCs Applicable to Impact G-1

SPC GEO-1 (Geotechnical Investigation)

CEQA Significance Conclusion

Any potential risk of injury or death due to seismic or geologic hazards would be minor. Landslides or liquefaction would likely only occur during an earthquake, and therefore would be limited to short periods. This risk would be further reduced through implementation of SPC GEO-1. Impacts would be less than significant (Class III).

Production of or exposure to substantial soil erosion, slope instability, or slope failure (Criterion GEO2)

Impact G-2: The Project would cause or be affected by substantial soil erosion, slope instability, or slope failure.

The Project includes construction of a subterranean grade control structure within the reservoir, excavation of accumulated sediment to restore 1992 design water storage and flood control capacity, ongoing annual sediment removal to maintain reservoir design capacity, and maintenance or improvement of the roadbed along the sediment disposal haul route to prevent or repair damage to affected roadways. The excavation of accumulated sediment is by definition a soil-disturbing activity. Soil disturbance can lead to increased erosion and sedimentation, and can mobilize pollutants that may have attached to the sediment. All excavation work would occur during the dry season and within the reservoir. Any loose or stockpiled soil that is not immediately removed to a disposal site would be naturally redistributed along the bed of the reservoir. This sediment would be confined by Littlerock Dam. Disposal of clean sediment would occur at the PWD property or in abandoned mining pits shown on Figure B-1. Although one small, ephemeral stream crosses the PWD property, SPC HYDRO-1 (refer to Appendix A) would ensure that sediment be placed and graded so that it not enter the stream channel through subsequent erosion and sedimentation. Sediment disposed in the abandoned gravel mining pits would be substantially below the surrounding grade, and no sediment would leave the site or enter any waterbody.

SPC HYDRO-1 would ensure that excavated material to be stockpiled on the PWD alternate disposal site would not obstruct or divert flow in the ephemeral watercourse that crosses that property. Implementation of a Stormwater Pollution Prevention Plan as required by the Clean Water Act would further reduce the potential for sediment eroded by stormwater runoff to leave the disposal site. No Project-related erosion in this watercourse is expected. Sedimentation from the stockpile will be minor due to compliance with existing regulations.

Construction of the grade control structure would also result in soil disturbance. However, this disturbance would also occur only within the reservoir, and any loose or stockpiled soil would similarly be confined by Littlerock Dam. Road maintenance and improvement along the sediment disposal haul route could also lead to soil disturbance. However, the haul routes follow paved roads, and any soil disturbance related to maintenance or improvement of the roadways would be minimal and short-term. No new roads would be created, and no paved surfaces would be converted to bare soil conditions.

Destabilization of natural or constructed slopes could occur as a result of construction activities due to excavation and grading operations. Slope failures are more likely to occur in areas with a history of previous failure, in weak geologic units exposed on unfavorable slopes and in areas of fault-sheared rock. Instances of triggered slope failure from excavation activities could cause damage to construction equipment and could potentially result in injury to workers. However, as discussed above under Impact G-1, a design level geotechnical investigation would be performed prior to construction and would include evaluation of slope stability issues in areas of planned grading and excavation, and provide recommendations for development of grading and excavation plans. Based on the results of the geotechnical investigations, appropriate support and protection measures would be designed and implemented to maintain the stability of slopes adjacent to work areas during and after construction.

SPCs Applicable to Impact G-2

SPC GEO-1 (Geotechnical Investigation)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

CEQA Significance Conclusion

Any potential impacts to geology and soils related to erosion or slope failure would be minor. Implementation of SPCs GEO-1 and HYDRO-1 would ensure that slopes within the Project area are properly stabilized prior to and during construction. Impacts would be less than significant (Class III).

C.5.4.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving, rupture of a known Alquist-Priolo earthquake fault, landslides, strong seismic ground shaking, or seismic-related ground failure, including liquefaction (Criterion GEO1)

Impact G-1: The Project would expose people or structures to potential substantial adverse effects due to seismic or geologic hazards.

Project activities under this alternative related to Impact G-1 would be very similar to those described under the proposed action. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. Fewer workers would be exposed to risks associated with landslide and liquefaction, but over a longer period of time. These risks would remain the same as under the Project, and would be minor.

CEQA Significance Conclusion

SPC GEO-1 would be implemented to avoid any potential risk to people or structures. Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Production of or exposure to substantial soil erosion, slope instability, or slope failure (Criterion GEO2)

Impact G-2: The Project would cause or be affected by substantial soil erosion, slope instability, or slope failure.

Project activities under this alternative related to Impact G-2 would be very similar to those described under the proposed action. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. Fewer workers would be exposed to risks associated with unstable slopes, but over a longer period. These risks would remain the same as under the proposed action, and would be minor. Soil disturbance under this alternative would be potentially less than under the proposed action, but would occur over a longer period.

CEQA Significance Conclusion

Implementation of SPCs GEO-1 and HYDRO-1 would ensure that slopes within the area of proposed activity are properly stabilized prior to and during construction. Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

C.5.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually. This lost capacity could be addressed either by breaching the dam and allowing the natural flow of Little Rock Creek to overtop the dam, or by demolishing the dam and removing approximately 2.8 million cubic yards of sediment and dam concrete. Demolition of Littlerock Dam and removal of the accumulated sediment could expose construction workers to risks associated with liquefaction and landslide. This alternative would involve much more earth movement and could involve working on or near steeper slopes. The geotechnical safeguards for this potential demolition and excavation work are unknown, and therefore the No Action/No Project Alternative could result in a direct, adverse impact.

Under the No Action Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually. This lost capacity could be addressed either by breaching the dam and allowing the natural flow of Little Rock Creek to overtop the dam, or by demolishing the dam and removing approximately 2.8 million cubic yards of sediment and dam concrete. Whether the dam was breached or demolished, it is likely that substantial downstream erosion and sedimentation would result. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect downstream resources from erosion and sedimentation. Therefore, this alternative would result in a direct and adverse impact.

CEQA Significance Conclusion

Impacts to seismic or geologic hazards and substantial soil erosion, slope instability, or slope failure would be significant and unavoidable (Class I).

C.5.5 Impact Summary

Impact G-1 for the Project and Alternative 1 is adverse, but not significant (Class III). Impact G-1 is significant and unavoidable under the No Action Alternative. Impact G-2 for the Project and Alternative 1 is adverse, but not significant (Class III). Impact G-2 is significant and unavoidable under the No Action Alternative. Table C.5-3 summarizes impact significance.

Table C.5-3. Summary of Impacts and Mitigation Measures – Geology and Soils

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
G-1: The Project would expose people or structures to potential substantial adverse effects due to seismic or geologic hazards.	Class III	Class III	Class I	Yes	SPC GEO-1 (Geotechnical Investigation)
G-2: The Project would cause or be affected by substantial soil erosion, slope instability, or slope failure.	Class III	Class III	Class I	Yes	SPC GEO-1 (Geotechnical Investigation) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.

C.6 Hazards and Public Safety

This section provides an analysis of hazards and public safety impacts associated with the construction and operation of the proposed action (Project) and alternatives. Specifically, this section addresses the handling and use of hazardous materials and the potential for environmental contamination to the public. For a discussion of wildland fire hazards, refer to Section C.13. Additionally, the analysis of air quality is provided in Section C.2.

C.6.1 Affected Environment

With respect to hazardous materials and public safety, the study area is defined as 0.5-mile buffer area surrounding the Reservoir, sediment disposal sites, and sediment disposal haul routes. Because the Project would not transport significant quantities of hazardous materials (as discussed further in Section C.6.4), this study area boundary defines the disturbance area limits and geographic extent of Project-related activities with respect to risk of upset.

C.6.1.1 Hazardous Materials

Definition

Hazardous materials are generally substances that by their nature and reactivity have the capacity to cause harm or health hazards during normal exposure, accidental release, or other mishap. Hazardous materials are characterized as being toxic, corrosive, flammable, reactive, an irritant, or strong sensitizers. The term "hazardous substances" encompasses chemicals regulated by both the United States Department of Transportation's (DOT) "hazardous materials" regulations and the U.S. Environmental Protection Agency's (USEPA) "hazardous waste" regulations, including emergency response. Hazardous wastes require special handling and disposal because of their potential to impact public health and the environment. A designation of "acutely" or "extremely" hazardous refers to specific listed chemicals and quantities.

Hazardous substances are defined by State and federal regulations to protect public health and the environment. Hazardous materials have certain chemical, physical, or infectious properties that cause them to be considered hazardous. Hazardous substances are defined in CERCLA Section 101(14), and also in the California Code of Regulations (CCR), Title 22, Chapter 11, Article 2, Section 66261, which provides the following definition:

> A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed.

Hazardous Material Sites

The Littlerock Dam and Reservoir are located on Little Rock Creek below the confluence of Santiago Canyon in the ANF. With the exception of the Littlerock Resort concession area, the area surrounding the dam and reservoir consists of natural land and is void of industrial, commercial, and residential development. Currently, motorized boats are not allowed within the Reservoir. When the Reservoir water level is lowered for beneficial drinking water use, off-highway vehicle (OHV) use of the Reservoir bottom occurs. However, fuel or vehicle oils are not regularly stored or utilized within the Reservoir.

Existing and past land use activities at and near the sediment disposal sites and along the sediment disposal haul routes are potential indicators of hazardous material storage and use. For example, many industrial sites, historic and current, have soil or groundwater contamination by hazardous substances. Other hazardous materials sources include leaking underground tanks in commercial and rural areas, contaminated surface runoff from polluted sites, orchards, and contaminated groundwater plumes. A review of the following environmental databases was completed for the study area:

- Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) databases (USEPA, 2014)
- Statewide Cortese list, which contains the following (CalEPA, 2014):
  - List of Hazardous Waste and Substances sites from Department of Toxic Substances Control (DTSC) EnviroStor database.
  - List of Leaking Underground Storage Tank Sites by County and Fiscal Year from State Water Resources Control Board (SWRCB) GeoTracker database.
  - List of solid waste disposal sites identified by SWRCB with waste constituents above hazardous waste levels outside the waste management unit.
  - List of "active" Cease and Desist Orders and Cleanup and Abatement Orders from SWRCB. NOTE: This list contains many sites that do not concern the discharge of wastes that are hazardous materials. Therefore, any site within Palmdale was reviewed for applicability.
  - List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code, identified by DTSC.

The review of these databases indicates there are no known active hazardous waste sites within 0.5 miles of the Reservoir, sediment disposal sites, or sediment disposal haul routes.

Construction Related-Hazardous Materials

Excavation and disposal of accumulated sediments, construction of the grade control structure, and maintenance and improvement of haul route roadways would involve the operation of heavy machinery and construction vehicles. The operation of these vehicles and machinery could result in a spill or accidental release of hazardous materials, including fuel, engine oil, engine coolant, and lubricants.

Reservoir Sediment

For this analysis, soil that is excavated from a site containing hazardous materials would be considered to be a hazardous waste if it exceeded specific CCR Title 22 criteria, or, on National Forest System lands, if it exceeded criteria defined in CERCLA or other relevant federal regulations. Remediation (cleanup and safe removal/disposal) of hazardous wastes found at a site is required if excavation of these materials is performed; it may also be required if certain other activities are proposed. Contaminated soil exceeding regulatory limits for construction backfill would require onsite treatment or transport to offsite processing facilities. Contaminated soil removed from the construction area must be transported according to State and federal regulations and be replaced by imported soil approved for backfill.

Both sediments and fish tissue from Littlerock Reservoir were sampled on August 4, 2014. The detailed results of these tests are provided in Appendix D. Fifteen samples, including 11 sediment samples and 4 fish tissue samples, were collected and analyzed for the presence of mercury, chlorinated pesticides, and PCB congeners. For chlorinated pesticides (including DDT), no analyte was detected at or above the method detection limit (MDL). For PCB congeners, one analyte (PCB138) was detected in three of the 11 samples. However, the amount of PCB138 that was detected is extremely small. The three sample results range from 1.1 to 1.9 parts per billion (ppb). The MDL for this analyte is 1.0 ppb, and the reporting limit (RL) is 5.0 ppb. All 11 sediment samples tested positive for the presence of mercury. Mercury was analyzed as total mercury (Hg), and the element was not speciated in this analysis. Therefore, it is unknown what percentage of this mercury is organic mercury versus methylmercury. The sample results range from 0.0032 to 0.0213 parts per million (ppm). The Agency for Toxic Substances and Disease Registry reports that normal levels of mercury in soil range from 0.02 to 0.625 ppm (ATSDR, 1999). All but one of the sediment sample results fall below the lower value of this range, and the one result that falls within this range lies at the extreme lower end of the range. The sampling results show that the sediment in Littlerock Reservoir is mostly free of contaminants, and that in cases where a contaminant was detected, the level of contamination is extremely low.

C.6.1.2 Littlerock Dam

Littlerock Dam is a concrete gravity dam, approximately 170 feet high from foundation to crest, and spans 576 feet across the canyon, forming the Reservoir. In 1994, the last major renovation of the dam was completed, which involved strengthening the downstream face with roller-compacted concrete.

C.6.1.3 Valley Fever

Coccidioidomycosis, often referred to as San Joaquin Valley Fever or Valley Fever, is one of the most studied and oldest known fungal infections. Valley Fever most commonly affects people who live in hot dry areas with alkaline soil and varies with the season. This disease, which affects both humans and animals, is caused by inhalation of arthroconidia (spores) of the fungus Coccidioides immitis (CI). CI spores are found in the top few inches of soil and the existence of the fungus in most soil areas is temporary. The cocci fungus lives as a saprophyte (an organism, especially a fungus or bacterium, which grows on and derives its nourishment from dead or decaying organic matter) in dry, alkaline soil. When weather and moisture conditions are favorable, the fungus "blooms" and forms many tiny spores that lie dormant in the soil until they are stirred up by wind, vehicles, excavation, or other ground-moving activities and become airborne. The City of Palmdale and the entire Project area is located entirely within areas designated as “suspected endemic” for Valley Fever (CDC, 2014).

Persons exposed to airborne *C. immitis* arthrospores may become infected with Valley Fever. Construction workers, agricultural workers, and other people who are outdoors and are exposed to wind, dust, and disturbed topsoil are at an elevated risk of contracting Valley Fever. The resulting infection is most likely to have no symptoms or present with mild cold like symptoms, but it can cause flu like symptoms, or in rare cases (one percent) cause a disseminated form of the disease that can cause severe disabling illness or death.

C.6.2 Regulatory Framework

This section provides an overview of the regulatory framework for hazards and public safety. Table C.6-1 provides a list of plans and policies that are applicable to hazards and public safety, and includes a discussion of the Project’s consistency with each plan or policy.

C.6.2.1 U.S. Environmental Protection Agency (EPA)

- **Federal Toxic Substances Control Act, Resource Conservation and Recovery Act (RCRA), Hazardous and Solid Waste Act (HSWA).** The Federal Toxic Substances Control Act (1976) and RCRA (1976) established a program administered by the U.S. EPA for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the HSWA, which affirmed and extended the "cradle to grave" system of regulating hazardous wastes. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by HSWA.
- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).** Congress enacted CERCLA, commonly known as Superfund, on December 11, 1980. This law provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established requirements concerning closed and abandoned hazardous waste sites; provided for liability of persons responsible for releases of hazardous waste at these sites; and established a trust fund to provide for cleanup when no responsible party could be identified. CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, and/or contaminants. The NCP also established the National Priorities List (NPL). The Superfund Amendments and Reauthorization Act (SARA) amended CERCLA on October 17, 1986.

C.6.2.2 State of California

- **California Hazardous Waste Control Law (HWCL).** The HWCL is administered by CalEPA to regulate hazardous wastes. While the HWCL is generally more stringent than RCRA, until the EPA approves the California program, both the State and federal laws apply in California. The HWCL lists 791 chemicals and about 300 common materials that may be hazardous; establishes criteria for identifying, packaging and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal and transportation; and identifies some wastes that cannot be disposed of in landfills.
- **Hazardous Material Worker Safety.** The California Occupational Safety and Health Administration (CA OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. CA OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

C.6.3.3 Local

- **Los Angeles County Fire Department.** The County of Los Angeles Fire Department, Health Hazardous Materials Division is the agency responsible for regulating and monitoring hazardous material use and storage in unincorporated and most incorporated areas of Los Angeles County. Its mission is to protect the public health and the environment throughout Los Angeles County from accidental releases and improper handling, storage, transportation, and disposal of hazardous materials and wastes through coordinated efforts of inspections, emergency response, enforcement, and site mitigation oversight (LACFD, 2014). Emergency response to a hazardous materials spill within the City of Palmdale would be handled by the Los Angeles County Fire Department.

- **Los Angeles County General Plan.** Both the approved General Plan (1974) and public review draft of the 2035 General Plan (2014) were reviewed for hazards and safety goals and policies applicable to the Project (County of Los Angeles 1974 and 2014a). Neither version of the General Plan contains applicable goals or policies pertaining to hazardous materials or public safety related to the Project.
- **City of Palmdale General Plan.** A review of the Palmdale General Plan Safety and Environmental Resources Elements identified the following applicant General Plan policies related to Project hazards and public safety (City of Palmdale, 1994):
  - Policy S2.1.1: Evaluate potential hazards associated with rupture of the California Aqueduct, to ensure that development in areas threatened with inundation are designed to minimize the threat to life and property.
  - Policy S2.1.2: Evaluate the potential for inundation from failure of the Lake Palmdale or Littlerock dams when reviewing development proposals within potential inundation areas.
  - Policy S2.3.3: Require that soils containing toxic or hazardous substances be cleaned up to the satisfaction of the agency having jurisdiction, prior to the granting of any permits for new development.
  - Policy S2.3.4: Restrict or prohibit land uses and activities that generate excessive amounts of hazardous materials or wastes that cannot be properly maintained or disposed.
  - Policy ER6.2.2: In the Little Rock Wash area, address environmental concerns related to: (6) Public safety.

Table C.6-1. Consistency with Applicable Hazard-Related Plans and Policies

Plan/Policy	Consistency	Explanation
City of Palmdale General Plan – Safety Element		
Policy S2.1.1: Evaluate potential hazards associated with rupture of the California Aqueduct, to ensure that development in areas threatened with inundation are designed to minimize the threat to life and property.	Yes	The Project will not place any structures within an area that would be subject to inundation following rupture of the California Aqueduct. There would be no threat to life or property.
Policy S2.1.2: Evaluate the potential for inundation from failure of the Lake Palmdale or Littlerock dams when reviewing development proposals within potential inundation areas.	Yes	The Project will not place any structures within an area that would be subject to inundation following failure of the Lake Palmdale or Littlerock dams. There would be no threat to life or property.
Policy S2.3.3: Require that soils containing toxic or hazardous substances be cleaned up to the satisfaction of the agency having jurisdiction, prior to the granting of any permits for new development.	Yes	No soils containing toxic or hazardous substances were discovered during pre-construction sampling. Any contaminated soil that is discovered during construction of the Project would be removed and transported to an appropriate hazardous waste disposal facility.
Policy S2.3.4: Restrict or prohibit land uses and activities that generate excessive amounts of hazardous materials or wastes that cannot be properly maintained or disposed.	Yes	The Project would not generate excessive amounts of hazardous materials or wastes.
City of Palmdale General Plan – Environmental Resources Element		
Policy ER6.2.2: In the Little Rock Wash area, address environmental concerns related to: 6. Public safety	Yes	Environmental concerns related to public safety within the Little Rock Wash area are addressed in Section C.6.4.1.

Source: USFS, 2005; City of Palmdale 1994

C.6.3 Issues Identified During Scoping

Table C.6-2 below provides a list of hazard and public safety issues raised during the public scoping period for the EIS/EIR [see Appendix E (Summary of Scoping Process)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.6-2. Scoping Issues Relevant to Hazards and Public Safety

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
Prior to any dredging or sediment disturbing activities in Little Rock Creek and Littlerock Reservoir, soils must be sampled and characterized so that proper handling and disposal methods can be adequately evaluated. Recommend that soils be analyzed for heavy metals (Title 22, CCR), PCBs, volatile organic compounds, and total petroleum hydrocarbons (gas and diesel ranges).	Both sediments and fish tissue from Littlerock Reservoir were sampled on August 4, 2014. Fifteen samples, including 11 sediment samples and 4 fish tissue samples, were collected and analyzed for the presence of mercury, chlorinated pesticides, and PCB congeners. VOCs and total petroleum hydrocarbons were not analyzed. The sampling results show that the sediment in Littlerock Reservoir is mostly free of contaminants, and that in cases where a contaminant was detected, the level of contamination is extremely low.
Public Comments	
Concern that communities surrounding the proposed sediment deposit sites will be exposed to Coccidioidomycosis (San Joaquin Valley Fever) following major dust events, and that residents will be subject to unhealthy levels of dust inhalation.	The potential Project impacts related to San Joaquin Valley Fever are discussed in Section C.6.4.1. It is not anticipated that the Project would result in adverse effects related to San Joaquin Valley Fever.

C.6.4 Environmental Consequences

Significance Criteria. The following significance criteria for hazards and public safety were derived from applicable local, State, and federal regulations to protect public health and the environment and review of Project activities within a rural area possibly prone to wildfires. Impacts of the Project or alternatives would be considered significant and would require mitigation if:

- Criterion HAZ1: Create an adverse hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Criterion HAZ2: Cause detrimental effects on the public health or well-being of the majority of the surrounding population.

Impact Assessment Methodology. In order to assess the potential for released hazardous materials to affect the public, this analysis identifies the types and required use of hazardous materials during all Project activities. This analysis was conducted by examining the choice and amount of chemicals to be used, the manner in which the Project requires use of the chemicals, the manner by which they would be transported to the site, and the way in which they will be used and stored on site.

Engineering and administrative controls concerning the use of hazardous materials are included as part of the Project. Engineering controls are physical or mechanical systems, such as storage tanks or automatic shut-off valves, that can prevent the spill of hazardous material from occurring, or that can either limit the spill to a small amount or confine it to a small area. Administrative controls are the rules and procedures that workers at the facility must follow that would help to prevent accidents or to keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to contain any spill and prevent a spill from moving off-site and causing harm to the public. Because the Reservoir serves as both a public drinking supply and recreation area, this analysis considers any hazardous material used during Project activities as having potential to impact public health if not transported, stored, used, or contained during a spill properly. As described in Section C.6.2, the Superfund Amendments and Reauthorization Act (SARA), which amends the Comprehensive Environmental Response and Liability Act, governs hazardous substances. SARA provides regulations primarily for planning, reporting, and notification concerning hazardous substances.

C.6.4.1 Proposed Action/Project

The hazards and public safety impacts of the Project are discussed below under subheadings corresponding to each significance criterion. For each criterion, the analysis determines whether implementation of the Project would result in adverse impacts.

Direct and Indirect Effects Analysis

Create an adverse hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (Criterion HAZ1)

Impact HAZ-1: Hazardous material use and transport may result in spills that contaminate Reservoir water or groundwater, or endanger public health.

Toxic substances may cause short-term or long-lasting health effects, ranging from temporary effects to permanent disability, or death. For example, toxic substances can cause eye or skin irritation, disorientation, headache, nausea, allergic reactions, acute poisoning, chronic illness, or other adverse health effects if human exposure exceeds certain levels (the level depends on the substance involved). Carcinogens (substances known to cause cancer) are a special class of toxic substances. Examples of toxic substances include most heavy metals, pesticides, and benzene (a carcinogenic component of gasoline). Ignitable substances are hazardous because of their flammable properties. Gasoline, hexane, and natural gas are examples of ignitable substances. Corrosive substances are chemically active and can damage other materials or cause severe burns upon contact. Examples include strong acids and bases such as sulfuric (battery) acid or lye. Reactive substances may cause explosions or generate gases or fumes. Explosives, pressurized canisters, and pure sodium metal (which react violently with water) are examples of reactive materials.

The principal environmental impact involving hazardous waste associated with the Project would be related to the potential mobilization of contaminants resulting in exposure of workers and the general public (i.e., excavation and handling of contaminated soil). Hazardous materials in the construction area may require special handling as toxic substances and hazardous waste can create an exposure risk to workers and the general public due to spills or upset or from excavation and transport.

Active hazardous waste sites greater than 0.25 miles from the project site would have a low potential to cause contamination at the site. Subsurface migration of contaminants within the unsaturated soil zone is predominantly vertically downward and is not likely to migrate horizontally. Although no known contaminated sites with potential to impact the Project were identified in this review, it is possible that other contaminated sites could be discovered during construction of the Project. Soil contamination may be encountered where no sites are currently designated or identified. Existing contamination of soils may exist in the project area due to unauthorized dumping or historic unreported hazardous materials spills. However, pre-construction analysis of sediment within Littlerock Reservoir has shown that the level of existing contamination is very low.

Activities and operations that use or manage hazardous or potentially hazardous substances could create a hazardous situation if release of these substances occurs. Individual circumstances, including the type of substance, quantity used or managed, and the nature of the activities and operations, affect the probable frequency and severity of consequences from a hazardous situation. During construction, hazardous materials such as vehicle fuels, oils, and other vehicle maintenance fluids would be used and stored on-site. There is potential for accidental incidents involving release of gasoline, diesel fuel, oil, hydraulic fluid, and lubricants from vehicles or other equipment or the release of solvents, adhesives, or cleaning chemicals from construction activities. Improperly maintained equipment could leak fluids during operation and while parked. Spills and leaks of hazardous materials during construction activities could potentially result in soil, groundwater, or surface water contamination. PWD and ANF plan to minimize, avoid, and/or clean up any unforeseen spill of hazardous materials by ensuring construction would be performed in accordance with PWD's Construction Storm Water Pollution Prevention Plan (SWPPP). Additionally, the preparation of a Spill Response Plan under SPC WQ-1 (refer to Appendix A) would further reduce the potential for any adverse impact to water quality.

SPCs Applicable to Impact HAZ-1

SPC WQ-1 (Prepare Spill Response Plan)

CEQA Significance Conclusion

The potential for hazardous materials to enter any waterbody would be reduced through implementation of SPC WQ-1. Impact would be less than significant (Class III).

Cause detrimental effects on the public health or well-being of the majority of the surrounding population (Criterion HAZ2)

Impact HAZ-2: Project activities would result in Littlerock Dam safety or degradation issues.

The Project would involve excavation and grading activities to remove accumulated sediment from Littlerock Reservoir. If improperly designed or executed, these activities could result in unstable soil and slopes, and could adversely impact the strength or stability of Littlerock Dam. However, implementation of Standard Project Commitments would ensure that excavation and grading activities would not adversely impact the strength or stability of Littlerock Dam. A design level geotechnical investigation would be performed prior to construction and would include evaluation of slope stability issues in areas of planned grading and excavation, and provide recommendations for development of grading and excavation plans. Based on the results of the geotechnical investigations, appropriate support and protection measures would be designed and implemented to maintain the stability of slopes adjacent to work areas during and after construction. No bedrock would be excavated and the structural integrity of Littlerock Dam would not be adversely affected. The topography of the reservoir bottom would be returned to 1992 conditions, and the overall weight of material held behind Littlerock Dam would be reduced through Project activities. This reduction in sediment stored behind the dam would reduce the pressure placed on the dam in the event of seismically induced liquefaction. With implementation of Standard Project Commitments, this impact would be negligible.

CEQA Significance Conclusion

Any potential impacts to hazards related to dam failure or instability would be minor and are considered less than significant (Class III).

Impact HAZ-3: Project activities would increase exposure of the public to Valley Fever.

Soil disturbance can result in fugitive dust that could mobilize the spores that cause Valley Fever. The Project would require a large amount of earthmoving; however, much of this would be the movement of sediments that are often submerged below the surface of the Littlerock Reservoir or saturated with water along the active Littlerock Stream, which due to being submerged or saturated for long periods of time would not be subject to C. immitis fungal growth. So, while there may be some limited potential for the C. immitis fungus to exist in the Project excavation area and the sediment storage areas, the risk of the Project activities causing Valley Fever infection is considered low due to the characteristics of the sediment being excavated at the project site, the distance of receptors from the Project excavation site and sediment storage areas, and the implementation of required Antelope Valley Air Quality Management District (AVAQMD) Rule 403 fugitive dust control requirements and additional project commitments (see Appendix A) that would substantially reduce fugitive dust emissions.

SPCs Applicable to Impact HAZ-3

SPC AQ-2 (Fugitive Dust Controls)

CEQA Significance Conclusion

Conformance with existing air quality regulations and implementation of SPC AQ-2 ensures less than significant impacts (Class III).

Impact HAZ-4: Project activities would expose the public to unsafe levels of mercury in fish caught for human consumption.

As discussed in Section B.2.3.2, during the first year of sediment removal, all water will be diverted from the Reservoir in order to strand non-native fish. A qualified biologist will supervise this activity and be available to inspect for any native reptiles or amphibians. If present, these species will be collected and relocated to upstream areas. Fish carcasses will be immediately collected and disposed in an approved landfill accepting such waste to ensure no adverse odor is created and to prevent other species of wildlife from consuming the fish. Prior to each subsequent annual sediment removal period, after water has been diverted from the Reservoir, a biologist will determine if any invasive fish species are present and will assess the need for additional fish removals.

Excavation and grading activities could mobilize mercury that is bound to buried sediment. This exposed and disturbed mercury could enter the water column and eventually bioaccumulate up the food chain. Under current conditions, fish within Littlerock Reservoir have been found with elevated levels of mercury. In some cases, these levels exceed safe consumption thresholds, resulting in a fish consumption advisory issued for Littlerock Reservoir (LRWQCB, 2014). Although it is possible that Project activities could exacerbate the existing level of mercury contamination in fish, pre-construction sediment test results show very low levels of mercury in the soil. Additionally, excavation and grading activities would occur during the dry season when the reservoir is closed to the public. No disturbed sediment would enter Little Rock Creek or Little Rock Wash. The Project would not change operation protocol for Littlerock Reservoir (including drawdown and release schedules), nor would the Project change any fish stocking practices or alter any upstream or downstream habitat. Any Project impacts related to exposure of the public to unsafe levels of mercury in fish caught for human consumption would be negligible.

CEQA Significance Conclusion

Sediment disturbing activities would not expose the public to mercury levels in fish or increase mercury levels within the Reservoir, resulting in less than significant impacts (Class III).

Impact HAZ-5: Project activities would result in unsafe highway conditions or increase the frequency of traffic accidents.

Excavation and removal of accumulated sediment from Littlerock Reservoir would involve the operation of 16 large dump trucks between the hours of 7:00 a.m. and 7:00 p.m. This increase in large vehicle traffic could lead to unsafe highway conditions or an increase in the frequency of traffic accidents. However, the roadways between Littlerock Reservoir and the potential sediment disposal sites are lightly traveled and large vehicles are common in the area due to existing mining operations. Implementation of Standard Project Commitments, including a traffic control plan and flagmen at key intersections, would further reduce the magnitude of this impact. Hazard impacts related to unsafe traffic conditions would be minor.

SPCs Applicable to Impact HAZ-5

SPC TRA-1 (Prepare Traffic Control Plan)

CEQA Significance Conclusion

Any potential impacts to hazards related to unsafe traffic conditions would be reduced through the implementation of SCP TRA-1, resulting in less than significant impacts (Class III).

C.6.4.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Create an adverse hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (Criterion HAZ1)

Impact HAZ-1: Hazardous material use and transport may result in spills that contaminate Reservoir water or groundwater, or endanger public health.

Project activities under this alternative related to Impact HAZ-1 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. Fewer workers would be exposed to risks associated with hazardous materials, but over a longer period of time. These risks would remain the same as under the Project, and would be minor.

SPCs Applicable to Impact HAZ-1

SPC WQ-1 (Prepare Spill Response Plan)

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Cause detrimental effects on the public health or well-being of the majority of the surrounding population (Criterion HAZ2)

Impact HAZ-2: Project activities would result in Littlerock Dam safety or degradation issues.

Project activities under this alternative related to Impact HAZ-2 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. As described above in Section C.6.4.1, a design level geotechnical investigation would be performed prior to construction. Implementation of recommendations from the geotechnical investigation would ensure that soils and slopes in the Project area remain stable and that the structural integrity of Littlerock Dam is not compromised. The risks associated with dam instability or failure would remain the same as under the Project, and would be minor. Impact HAZ-2 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.6.4.1.

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Impact HAZ-3: Project activities would increase exposure of the public to Valley Fever.

Project activities under this alternative related to Impact HAZ-3 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. As described above in Section C.6.4.1, the sediment contained in Littlerock Reservoir is not conducive to fungal growth associated with Valley Fever, and sensitive receptors are not located near the excavation and disposal sites. The risks associated with exposure of the public to Valley Fever would remain the same as under the Project, and would be minor. Impact HAZ-3 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.6.4.1.

SPCs Applicable to Impact HAZ-3

SPC AQ-2 (Fugitive Dust Controls)

CEQA Significance Conclusion

Conformance with existing air quality regulations and implementation of SPC AQ-2 would ensure that impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Impact HAZ-4: Project activities would expose the public to unsafe levels of mercury in fish caught for human consumption.

Project activities under this alternative related to Impact HAZ-4 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. As described above in Section C.6.4.1, the sediment in Littlerock Reservoir contains very low levels of mercury, and no sediment would enter Little Rock Wash or any other downstream receiving water. The risks associated with increased exposure of the public to fish with high levels of mercury would remain the same as under the Project, and would be minor. Impact HAZ-4 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.6.4.1.

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Impact HAZ-5: Project activities would result in unsafe highway conditions or increase the frequency of traffic accidents.

Project activities under this alternative related to Impact HAZ-5 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. This reduced number of dump trucks could lead to a slight reduction in overall traffic impacts, including unsafe highway conditions. The risks associated with unsafe highway conditions would remain the same as under the Project, and would be minor. Impact HAZ-5 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.6.4.1.

SPCs Applicable to Impact HAZ-5

SPC TRA-1 (Prepare Traffic Control Plan)

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

C.6.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually. This lost capacity could be addressed either by breaching the dam and allowing the natural flow of Little Rock Creek to overtop the dam, or by demolishing the dam and removing approximately 2.8 million cubic yards of sediment and dam concrete.

During demolition and excavation, hazardous materials such as vehicle fuels, oils, and other vehicle maintenance fluids would be used and stored on-site. There is potential for accidental incidents involving release of gasoline, diesel fuel, oil, hydraulic fluid, and lubricants from vehicles or other equipment or the release of solvents, adhesives, or cleaning chemicals from construction activities. Improperly maintained equipment could leak fluids during operation and while parked. Spills and leaks of hazardous materials during construction activities could potentially result in soil, groundwater, or surface water contamination. Standard project commitments regarding the handling, disposal, and spill response for hazardous materials under this project are unknown. Therefore, this alternative could result in a direct and adverse impact.

Project activities under this alternative related to Impact HAZ-3 would be similar to those described under the Project. If Littlerock Dam were demolished under this alternative, a large amount of sediment would need to be excavated. However, as described above in Section C.6.4.1, the sediment contained in Littlerock Reservoir is not conducive to fungal growth associated with Valley Fever, and sensitive receptors are not located near the excavation site. Additionally, under either No Action Alternative scenario, Littlerock Reservoir would likely cease to support a fish population, and the public would not be exposed to unsafe levels of mercury in fish caught for human consumption.

Project activities under this alternative related to Impact HAZ-5 would be similar to those described under the Project. Demolition of Littlerock Dam and excavation of the accumulated sediment would require a much larger number of truck trips. However, those truck trips are not expected to substantially change the overall highway safety conditions, especially considering the existing conditions, including active mining operations in the area. The risks associated with unsafe highway conditions would remain the same as under the Project, and would be minor.

CEQA Significance Conclusion

The impact under HAZ-1 and HAZ-2 would be significant and unavoidable (Class I). Impacts for HAZ-3 are the same as those described for the Project, less than significant (Class III). No impact would occur under HAZ-4. Impacts associated with HAZ-5 are considered less than significant with the implementation of traffic control measures similar to SPC TRA-1 (under a No Project scenario which required removal of the dam).

C.6.5 Impact Significance Summary

Impacts HAZ-1 through HAZ-5 for the Project and Alternative 1 are adverse, but not significant (Class III). Under the No Action Alternative, Impacts HAZ-1 and HAZ-2 would be significant and unavoidable (Class I). Table C.6-3 summarizes impact significance.

Table C.6-3. Summary of Impacts and Mitigation Measures – Hazards and Public Safety

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
HAZ-1: Hazardous material use and transport may result in spills that contaminate Reservoir water or groundwater, or endanger public health	Class III	Class III	Class I	Yes	SPC WQ-1 (Prepare Spill Response Plan)
HAZ-2: Project activities would result in Littlerock Dam safety or degradation issues	Class III	Class III	Class I	Yes	None
HAZ-3: Project activities would increase exposure of the public to Valley Fever	Class III	Class III	Class III	No	SPC AQ-2 (Fugitive Dust Controls)
HAZ-4: Project activities would expose the public to unsafe levels of mercury in fish caught for human consumption	Class III	Class III	No Impact	Yes	None
HAZ-5: Project activities would result in unsafe highway conditions or increase the frequency of traffic accidents	Class III	Class III	Class III	No	SPC TRA-1 (Prepare Traffic Control Plan)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.

C.7 Hydrology

This section describes the existing conditions related to surface water hydrology and groundwater in the area of the proposed action (Project) and alternatives. Surface water and groundwater quality are described in Section C.12 (Water Quality and Resources).

C.7.1 Affected Environment

The Project area for surface water hydrology and groundwater includes the Littlerock Reservoir and Dam, Little Rock Creek downstream of the Dam to Rosamond Dry Lake, and the potential gravel pit and Palmdale Water District (PWD) disposal areas shown in Figures B-1 and B-2.

C.7.1.1 Climate

The climate of the Project area is characterized by long, hot, dry summers, and short, mild, relatively wet winters. Storms that have the potential to produce significant amounts of precipitation and flooding are extra-tropical cyclones of North Pacific origin, which normally occur from December through March. These storms often last for several days, and are capable of producing widespread precipitation. In addition to the extra-tropical cyclones, the area of the Project may receive thunderstorms, which can occur at any time of the year. Thunderstorms cover comparatively small areas, but result in high-intensity precipitation, usually lasting for less than three hours. On a smaller watershed, thunderstorms can produce flash flooding.

The average annual precipitation in the Palmdale area is 7.75 inches, with more than 12 inches possible in the local mountains, which include Littlerock Reservoir and the contributing watershed. More than 80 percent of all annual precipitation occurs between the months of November and March (SDLAC, 2005). Little precipitation occurs during summer.

C.7.1.2 Surface Hydrology

Little Rock Creek drains into the Antelope Valley Watershed, which is a 3,387-square-mile closed basin in the western Mojave Desert. Approximately 80 percent of the watershed has a low to moderate ground slope (0 to 7 percent). The remaining 20 percent consists of foothills and rugged mountains, some of which reach to over 9,000 feet in elevation. The floor of the Antelope Valley Watershed generally lacks defined natural channels outside of the foothills and is subsequently subject to unpredictable sheet flow patterns (SDLAC, 2005). The Antelope Valley Watershed has no outlet to the ocean. All water that enters the watershed either infiltrates into the underlying groundwater basin, or flows toward three playa lakes located near the center of the watershed. These playa lakes, Rosamond, Rogers, and Buckhorn, are usually dry, only containing water following large winter storms. Surface runoff that collects in the dry lakes quickly evaporates from the surface. Only a small quantity of water infiltrates to the groundwater due to the nearly impermeable nature of the playa soils (SDLAC, 2005).

Littlerock Reservoir provides water supply for the PWD and the Littlerock Irrigation District (SDLAC, 2005). The Littlerock Reservoir is approximately 95 acres in size (when full) and is located on Little Rock Creek near Palmdale, California. The reservoir is contained by Littlerock Dam, originally constructed in 1924. The watershed of Little Rock Creek at the reservoir is 63.7 square miles in area. Downstream of the reservoir Little Rock Creek flows north to northeast, intersecting an undergrounded segment of the California Aqueduct and the elevated State Route 138 (SR-138). Beyond SR-138, Little Rock Creek forms a large alluvial fan known as Little Rock Wash, eventually discharging into the Rosamond Dry Lake approximately 22 miles north of Littlerock Reservoir. The 100-year peak discharge of Little Rock Creek at the reservoir is 20,000 cubic feet per second (cfs) (Woodward Clyde, 1992).

Figure C.7-1 shows the Project site and the Littlerock watershed and drainages. Figure C.7-2 shows the Little Rock Creek 100-year floodplain (FEMA, 2008), delineated by approximate methods. Figure C.7-3 shows the maximum reservoir extent at spillway crest on 2013 topography.

Inflow to Littlerock reservoir occurs primarily in the winter months, typically beginning about midway through November and ending in June. Some residual flow, on the order of 1 cfs or less, may occur all summer. Median annual inflow to the reservoir, based on United States Geological Survey data for 1930 to 2005 (USGS, 2014) is 6,979 acre-feet, with average inflow 12,494 acre-feet. The observed annual inflow range from 1930 to 2005 is 432 acre-feet (1951) to 61,464 acre-feet (2005). About one year in six, on average, does not produce enough runoff to fill the reservoir.

Under current conditions, PWD has the right to annually divert 5,500 acre-feet of water per year from Littlerock Reservoir. Beginning when the reservoir has sufficient volume in late fall or early winter, PWD conducts water from Littlerock Reservoir to Lake Palmdale, located approximately 7.1 miles northwest of Littlerock Reservoir, by Palmdale Ditch (above ground culvert). Lake Palmdale acts as a forebay for PWD's water treatment plant, and stores approximately 4,250 acre-feet of State Water Project water and Little Rock Creek water (Aspen, 2005). The rate of water supply removal from Littlerock Reservoir is variable up to a maximum of approximately 50 cfs (design maximum), and averaging 9 to 10 cfs over an entire season (roughly December to September). Not all years produce enough water in the reservoir for PWD to take the entire allotment.

When Littlerock Reservoir is full, and inflow exceeds the outflow to Lake Palmdale, the excess water overtops the dam spillway into Little Rock Creek downstream of the dam. During wet years most reservoir inflow overtops the dam spillway and flows in Little Rock Creek toward Rosamond Dry Lake. During the summer, the reservoir is drained for water supply until a minimal recreation pool is reached. The recreation pool is maintained until Labor Day, after which the lake is further drawn down until it is effectively empty at the end of September.

Littlerock Reservoir currently (year 2013) has capacity for 3,037 acre-feet of water storage. This capacity has been diminishing over the years due to sediment inflow. Since 1992, 463 acre-feet of sediment have accumulated in the reservoir, giving an average accumulation rate of 22 acre-feet (36,000 cubic yards) per year. Since construction in 1924, approximately 1,564 acre-feet of storage have been lost to sediment accumulation.

The existing quarries into which Littlerock Reservoir sediment would be deposited are located in areas of the historic alluvial fan of Little Rock Creek, but these quarries are currently outside the 100-year floodplain (Figure C.7-2). The PWD property that would be used as a temporary sediment storage site is crossed by one small, unnamed ephemeral stream and has no mapped 100-year floodplain.

C.7.1.3 Groundwater

The Project site consists of a sandy streambed, which may hold water when saturated but is not considered to be an aquifer or source of groundwater. Geotechnical borings made in 2008 at the Rocky Point area of the lake, approximately 4,500 feet upstream of the dam, found groundwater 14.5 to 16 feet below the reservoir bed (URS, 2008). The Littlerock Dam foundation is on bedrock (Woodward Clyde, 1992), so it is likely any local groundwater located beneath the streambed upstream of the dam would be contained within the limits of Littlerock Reservoir by the dam.

Little Rock Creek flows into the Antelope Valley Groundwater Basin (Figure C.7-2), which is the principal groundwater basin for southeastern Kern County, City of Palmdale, and the portion of Los Angeles County surrounding the City of Palmdale. The basin is bounded on the northwest by the Garlock Fault zone at the base of the Tehachapi Mountains and on the southwest by the San Gabriel Mountains. To the east, the basin is bounded by ridges, buttes, and low hills, and to the north it is bounded by the Fremont Valley Groundwater Basin (DWR, 2004). The surface area of the Antelope Valley Groundwater Basin is approximately 1,580 square miles, extending across Kern, Los Angeles, and San Bernardino Counties (DWR, 2004). Most recharge of the Antelope Valley Groundwater Basin occurs at the foot of the mountains and hills by percolation through the head of alluvial fan systems. Eighty percent of natural recharge comes from mountain runoff attributed to Big Rock and Little Rock Creeks.

Portions of the Antelope Valley Groundwater Basin have experienced groundwater extractions and lowering of the groundwater table leading to subsidence in the past due primarily due to agriculture (USGS, 1998). Agricultural use has diminished substantially since the 1960s, although extraction for municipal use has increased (PWD, 1999). Little Rock Creek recharges the Pearland subunit of the Antelope Valley Groundwater Basin which, due to Little Rock Creek and Big Rock Creek flows, during wet years recovers completely from the past effects of pumping (PWD, 1999). PWD obtains approximately 40 percent of their approximately 26,700 acre-foot annual water supply from underground aquifers via 27 active wells in the Antelope Valley Groundwater Basin (Aspen, 2005).

C.7.2 Regulatory Framework

This section provides an overview of the regulatory framework for surface water and groundwater not related to water quality. Water quality is addressed in Section C.12 (Water Quality and Resources).

Table C.7-1 provides a list of plans and policies that are applicable to surface water and groundwater hydrology, and includes a discussion of the Project's consistency with each plan or policy. Section C.9 (Recreation and Land Use) contains an evaluation of policies within the Forest Service Land Management Plan that are applicable to hydrology.

U.S. Environmental Protection Agency

- **Clean Water Act.** The Clean Water Act, described in more detail in Section C.12.2.1, requires the development of a Storm Water Pollution Prevention Plan (SWPPP) requiring best management practices to prevent water quality degradation due to construction activities. Best management practices would apply to sediment control.
- **Watershed Protection and Flood Prevention Act of 1954.** This Act establishes policy that the Federal Government should cooperate with states and their political subdivisions, soil or water conservation districts, flood prevention or control districts, and other local public agencies for the purposes of preventing erosion, floodwater, and sediment damages in the watersheds of the rivers and streams of the United States; furthering the conservation, development, utilization, and disposal of water, and the conservation and utilization of land; and thereby preserving, protecting, and improving the Nation's land and water resources and the quality of the environment.
- **National Flood Insurance Act/Flood Disaster Protection Act.** The National Flood Insurance Act of 1968 made flood insurance available for the first time. The Flood Disaster Protection Act of 1973 made the purchase of flood insurance mandatory for the protection of property located in Special Flood Hazard Areas. These laws led to mapping of regulatory floodplains and to local management of floodplain areas according to guidelines, which include prohibiting or restricting development in flood hazard zones.
- **Executive Order 11988: Floodplain Management.** Executive Order 11988 requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide

leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains.

California Department of Fish and Wildlife (CDFW)

- Lake and Streambed Alteration Program. Section 1602 of the California Fish and Game Code protects the natural flow, bed, channel, and bank of any river, stream, or lake designated by the CDFW in which there is, at any time, any existing fish or wildlife resources, or benefit for the resources. Section 1602 requires an agreement between the CDFW and a public agency proposing a project that would:
  - Substantially divert or obstruct the natural flow of any river, stream or lake;
  - Substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or,
  - Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.
- The Streambed Alteration Agreement includes conditions necessary to protect stream or lake resources.

County of Los Angeles

- **County of Los Angeles General Plan.** The County of Los Angeles General Plan Safety Element includes provisions to discourage high-risk development in floodplains, minimize flood hazards, and ensure adequate flood control system capacity.
- **Antelope Valley Areawide General Plan.** The Antelope Valley Areawide General Plan encourages the use of floodplain areas for groundwater recharge, and limits other uses in these areas to extractive (sand and gravel), agricultural, or open space/recreational uses unless flood protective measures are included.

City of Palmdale

- **City of Palmdale General Plan.** The City of Palmdale General Plan contains a variety of provisions related to surface waters and groundwater. These primarily relate to preserving floodplain development safety and groundwater preservation. The City has developed a master drainage plan that all new development must be consistent with, and requires that new development be designed or modified so as to minimize the potential adverse impacts affecting floodplains, restore and preserve the natural and beneficial values served by floodplains, and to use measures that mitigate or reduce the risk of flood loss.

Table C.7-1. Consistency with Applicable Hydrology Plans and Policies

Plan/Policy	Consistency	Explanation
County of Los Angeles General Plan, Antelope Valley Areawide General Plan, and City of Palmdale General Plan General Flood Protection and Groundwater Protection Policies		
Various goals and policies to preserve floodplain development safety, ensure adequate flood control system capacity, minimize flood hazards, and preserve groundwater.	Yes	The Project would not alter the integrity of Littlerock Dam, nor would it involve the construction of any structure that would be subject to flood damage or induce flood damage on other property. Flow patterns would not be altered. The flood control capacity of Littlerock Dam would be increased. The ability of floodplain areas to serve as groundwater recharge conduits would not be altered.

C.7.3 Issues Identified During Scoping

Table C.7-2 below provides a list of hydrology issues raised during the public scoping period for the EIS/EIR [see Appendix E (Scoping Summary Report)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.7-2. Scoping Issues Relevant to Hydrology

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
The Draft EIS/EIR should clearly define the 1992 baseline conditions identified in the scoping letter utilizing 1992 bathymetry of the lake, 1992 map of the topographic contours of the lake, or the 1992 contour and surface area of the lake's shoreline, as necessary.	Baseline condition year is 2013. The 2013 shoreline is shown in Figure C.7-3. Topographic mapping of the reservoir bed shows a capacity of 3,500 acre-feet water storage in 1995, and 3037 acre-feet in 2013. See Section C.7.1.2.
The Project is located within the Rock Creek Hydrologic Area of the Antelope Hydrologic Unit 626.00 and overlies the Antelope Valley Groundwater Basin No. 6-44. The Draft EIS/EIR should identify the beneficial uses of the water resources (per Chapter 2 of the Basin Plan) within the Project area, and include an analysis of the potential impacts to hydrology with respect to these resources.	Addressed in Sections C.7.1.2, C.7.4, and C.12.
Requests a Jurisdictional Delineation Report that describes the water resources on the Project sites and outlines the methodology used to define the extent of surface water features. A copy of this report must be submitted to the U.S. ACOE for verification.	Addressed in Section C.5.1.
In determining mitigation for impacts to waters of the State, consider Basin Plan requirements (minimum 1.5:1 mitigation ratio for impacts to wetlands) and utilize 12501-SPD Regulatory Program Standard Operating Procedure for Determination of Mitigation Ratios (ACOE South Pacific Division, Dec. 2012).	Addressed in Section C.5.1.
The EIR/EIS should evaluate a suite of alternatives to stabilize Little Rock Creek upstream of the dam. Stream channel stabilization practices, including various types of revetments, grade control structures, and flow restrictors, have been effective in controlling sediment production caused by hydromodification activities. Bioengineering techniques reduce flow velocities and scour by increasing sediment deposition. Bioengineering includes planting vegetation that forms dense mats of flexible stems such as willow to protect or rehabilitate eroded streambanks. Structural practices, both direct and indirect, protect or rehabilitate eroded streambanks and are usually implemented in combination to provide stability to the stream system. Indirect methods include grade control structures or hydraulic barriers installed across streams to stabilize the channel and control upstream degradation. Vegetative methods should be used in conjunction with or over structural methods because vegetation is relatively easy to establish and maintain, is visually attractive, and is the only streambank stabilization method that can repair itself when damaged. Other advantages to using vegetative erosion control over structural control include increased pollutant attenuation and nutrient uptake capacity, habitat for fish and wildlife, and added cultural resources. Additionally, hardening the banks of streams and rivers with shoreline stabilization protection such as stone riprap revetments can accelerate the movement of surface water and pollutants from upstream, thus degrading water quality in depositional areas downstream.	This is a design issue outside the scope of this impact analysis. The Project includes a grade control to stabilize the streambed upstream of the excavation. Aside from proposed bank protection at the grade control, no other bank protection is necessary. Within the reservoir erosion control measures downstream of the grade control are not needed due to low flow velocities (static or nearly static water) and the need to periodically return and excavate sediment to maintain capacity. The grade control structure is designed to withstand a discharge of 20,000 cfs at flow velocities of 15 feet per second. Vegetative measures may not be appropriate for long-term grade control under this circumstance.

C.7.4 Environmental Consequences

Significance Criteria. Appropriate criteria have been identified and utilized to make these significance conclusions based on the CEQA Appendix G Environmental Checklist, Initial Study and significance threshold guidance from the County of Los Angeles (County of Los Angeles, 1987) and relevance to this analysis based on local conditions and the project description. Not all of the standard Appendix G and Los Angeles County criteria are applicable. For instance, the Project does not involve the construction of housing. Standard criteria related to housing are not used. For purposes of the CEQA analysis in this analysis, hydrology impacts are considered significant if the Project would:

- Criterion H1: Substantially deplete groundwater supplies or interfere with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- Criterion H2: Place within a watercourse or flood hazard area structures which would impede or redirect flood flows, or otherwise alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in erosion or siltation on or off site.
- Criterion H3: Increase the rate or amount of surface runoff or impede or redirect flood flows in a manner which would result in flooding on or off site, or otherwise create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems.
- Criterion H4: Result in or be subject to damage from seiche or inundation by mudflow.

Impact Assessment Methodology. The impact analysis is based on an assessment of baseline conditions relevant to the site hydrology, presented in Section C.7.1, and an assessment of project-related and alternative-related effects on baseline conditions during project construction, long-term operation, and long-term maintenance using appropriate technical analysis and the impact significance criteria.

C.7.4.1 Proposed Action/Project

This section describes the direct and indirect effects related to surface water and groundwater hydrology in the area of the Project and alternatives. Direct and indirect effects to surface water and groundwater quality are described in Section C.12 (Water Quality and Resources).

Direct and Indirect Effects Analysis

Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted) (Criterion H1)

Impact H-1: The Project would deplete groundwater supplies downstream of the dam.

The Project would increase the storage capacity of Littlerock Reservoir by 463 acre-feet. Water diverted to Palmdale Lake would not be available for Antelope Valley Groundwater Basin recharge in Little Rock Creek downstream of the dam. The loss of this recharge could have an adverse effect on local groundwater levels and supplies downstream of the dam. Without implementation of the Project, PWD would need to rely more heavily on additional local groundwater pumping and water from the State Water Project.

PWD water removals can begin near the beginning of the annual runoff season, with ongoing replenishment from runoff during the winter, meaning total PWD removals can exceed the total capacity of the reservoir. As described in Section C.7.1.2, about one year in six (16 percent of all years) do not produce enough runoff to fill the reservoir. Based on USGS records, approximately 43 percent of the years (21 out of 49) do not produce sufficient inflow to Littlerock Reservoir to satisfy the PWD allotment. For these years there would be no difference between without Project and with Project conditions for downstream groundwater recharge. For the remaining 57 percent of the years with sufficient runoff to satisfy the Palmdale Water District allotment, approximately 463 acre-feet that under current conditions would annually overflow the dam spillway could be held in the reservoir for diversion to Palmdale Lake.

On average, for the entire 49 years of record, overflow volume available for infiltration to the Antelope Valley Groundwater Basin could be reduced by about 265 acre-feet annually as a result of the Project. Average annual recharge to the Antelope Valley Groundwater Basin is estimated at about 48,000 acre-feet per year (DWR, 2004). An average annual reduction of 265 acre-feet amounts to about 0.55 percent of the total overall recharge to this basin. This would be an indirect effect of the Project that would take place immediately after project completion.

The overall Project effect of about 0.55 percent reduction in water available for recharge to the Antelope Valley Groundwater Basin is expected to have minor effect on overall aquifer volume and groundwater levels, with no mitigation necessary. The Pearland subunit of the Antelope Valley Groundwater Basin, which is recharged by Little Rock Creek and Big Rock Creek, currently recovers completely from the past effects of pumping during wet years, so little or no effect is expected on groundwater levels. During dry years, there would be no change in dam overflow due to the Project, and no effect on groundwater recharge. Overall groundwater pumping by PWD would be offset by additional surface flow available from Littlerock Reservoir due to the Project, further reducing the effect of the impact.

CEQA Significance Conclusion

The Project-related reduction in Little Rock Creek water available to groundwater recharge would be minor, with little or no overall effect on aquifer volume or groundwater levels due to good recovery of the local groundwater subbasin in wet years, resulting in less than significant impacts (Class III).

Place within a watercourse or flood hazard area structures which would impede or redirect flood flows, or otherwise alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in erosion or siltation on or off site (Criterion H2)

Impact H-2: The Project would alter existing flow patterns, resulting in erosion and siltation.

The Project would alter Little Rock Creek flows within the boundary of Littlerock Reservoir by excavating up to 1,165,000 cubic yards of sediment from the reservoir bed, including an additional estimated 38,000 cubic yards annually, and install an in-stream, grade-control structure with associated bank protection. Sediments within the reservoir would be disturbed by the excavation, and local hydraulic conditions altered, potentially causing the remaining sediments to be subject to erosion and downstream deposition.

The effect of Impact H-2 on erosion and siltation would be negligible. No mitigation is necessary. All activities would be conducted within the limits of the reservoir, which, when full, has very low-flow velocity even during large floods (100-year flow velocity within the Project area would average less than one foot per second). The grade control structure and associated bank protection would be at-grade and not impede or redirect in-stream flow. The Project could induce local erosion when inflow occurs when the reservoir is empty or filling, due to steepening of the bed slope downstream of the grade control structure, but this erosion would be confined to the reservoir bottom and sides below the water surface with no anticipated damage to adjacent property. Eroded sediments would be confined to the reservoir bed by Littlerock Dam. Average flow velocities approaching zero at the dam would not be sufficient to raise transported bed sediments approximately 80 feet vertically to the spillway level to be transported downstream. Wash load (very fine) sediments disturbed in the bed could be transported over the spillway if the reservoir fills very rapidly from a dry condition, but stream gage records show that this would be a very uncommon condition. Overall, sediment transported downstream would be unaffected by the Project.

SPC HYDRO-1, provided in Appendix A, would ensure that excavated material to be stockpiled on the PWD alternate disposal site not obstruct or divert flow in the ephemeral watercourse that crosses that property. Compliance with the Federal Clean Water Act would ensure no sedimentation from the stockpile during construction. No Project-related erosion in this watercourse is expected. Sedimentation from the stockpile would be minor due to compliance with existing regulations.

SPCs Applicable to Impact H-2

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

CEQA Significance Conclusion

The Project-related effect on erosion and siltation would be negligible. There would be no alteration of flood flows leading to erosion or siltation except for minor alterations within the reservoir itself. With the implementation of SPC HYDRO-1, impacts would be less than significant (Class III).

Increase the rate or amount of surface runoff or impede or redirect flood flows in a manner which would result in flooding on or off site, or otherwise create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems (Criterion H3)

Impact H-3: The Project would alter Little Rock Creek flow volumes downstream of the dam, and otherwise alter stream flow characteristics, increasing the potential for flooding.

All new construction would be within the reservoir limits where induced flooding by diversion could not occur. The flow path within the reservoir would not be altered. The Project would not increase the maximum level of the reservoir. Although not specifically operated for flood control, the reservoir is emptied each year and, with a current capacity sufficient to contain the entire annual flow for approximately 16 percent of the years, the reservoir reduces the potential for downstream flooding by containing surface flows. The Project would increase the Littlerock Reservoir volume available to detain floods by 463 acre-feet (15 percent increase in volume), which would increase the flood-control capacity of the reservoir. The increase in flood control capacity would be a direct effect of the Project that would take place immediately after Project completion and be a beneficial effect on flooding downstream of the dam.

CEQA Significance Conclusion

The Project would have a reducing effect on downstream flooding, resulting in a beneficial impact (Class IV).

Result in or be subject to damage from seiche or inundation by mudflow (Criterion H4)

There is no impact under Significance Criterion H4. The Project would not alter the lake in a manner to increase the potential for seiche, nor would the Project include any structures or other above-ground structures or uses that would be subject to seiche damage. Mudflow inundation may be possible in the surrounding hills, but the Project would make no alteration of terrain that would cause mudflow or produce any structures that would be subject to mudflow. Some local earth displacement may be possible below the reservoir level, but these would be within the reservoir floor where no damage is expected.

C.7.4.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted) (Criterion H1)

Impact H-1: The Project would deplete groundwater supplies downstream of the dam.

Impact H-1 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.7.4.1.

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Place within a watercourse or flood hazard area structures which would impede or redirect flood flows, or otherwise alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in erosion or siltation on or off site (Criterion H2).

Impact H-2: The Project would alter existing flow patterns, resulting in erosion and siltation.

Impact H-2 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.7.4.1.

SPCs Applicable to Impact H-2

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, less than significant (Class III).

Increase the rate or amount of surface runoff or impede or redirect flood flows in a manner which would result in flooding on or off site, or otherwise create or contribute to runoff

water which would exceed the capacity of existing or planned stormwater drainage systems (Criterion H3)

Impact H-3: The Project would alter Little Rock Creek flow volumes downstream of the dam, and otherwise alter stream flow characteristics, increasing the potential for flooding.

Impact H-3 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.7.4.1.

CEQA Significance Conclusion

Impacts for Alternative 1 are the same as those described for the Project, resulting in a beneficial impact (Class IV).

Result in or be subject to damage from seiche or inundation by mudflow (Criterion H4)

Alternative 1 has no impact under Significance Criterion H4 for the same reasons described for the Project in Section C.7.4.1.

C.7.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, sediment would continue to accumulate in Littlerock Reservoir to the point where eventually the reservoir would fill with sediment and become inoperative as a water-supply reservoir. Assuming current and past accumulation rates of sediment, complete filling should occur between 90 and 128 years from the present, although it is likely the reservoir would become impractical for water supply sooner. Reservoir capacity would diminish each year, resulting in increased PWD reliance on groundwater. Sudden inflows of large amounts of sediment, as could occur after a large fire on the watershed, could dramatically and rapidly reduce the expected future lifespan of the reservoir.

At some point in the future, probably much less than the 90 to 128 years expected time to fill, PWD may need to make alterations to their outlet and conveyance system to continue to collect and convey water after the existing outlet is covered with sediment. At the time the reservoir becomes completely inoperable with the No Action Alternative, the 5,500 acre-feet maximum that PWD can divert from Littlerock Reservoir each year would likely be compensated by increased groundwater pumping and use of State Project Water unless another water source is found. State Water Project water, the third source of PWD water, faces an uncertain future due to increased population, environmental demands, and uncertain climate conditions.

CEQA Significance Conclusion

The No Action/No Project Alternative would eventually result in an increased reliance on groundwater extraction and State Project water to supply the greater Palmdale area, resulting in potential impacts associated with declines in groundwater levels from necessary additional extraction. Impact H-1 is significant and unavoidable (Class I) with the No Action/No Project Alternative. Impact H-2 would not occur with the No Action/No Project Alternative. Under the No Action/No Project Alternative, sediment accumulation and the eventual filling of Littlerock Reservoir with sediment would eventually eliminate the flood-control capacity of Littlerock Reservoir. With all water storage capacity lost, Littlerock Flows would pass over the reservoir undiminished, with a corresponding increase in the flood hazard downstream of Littlerock Dam. Impact H-3 is significant and adverse (Class I) with the No Action/No Project Alternative. The No Action/No Project Alternative has no impact under Significance Criterion H4.

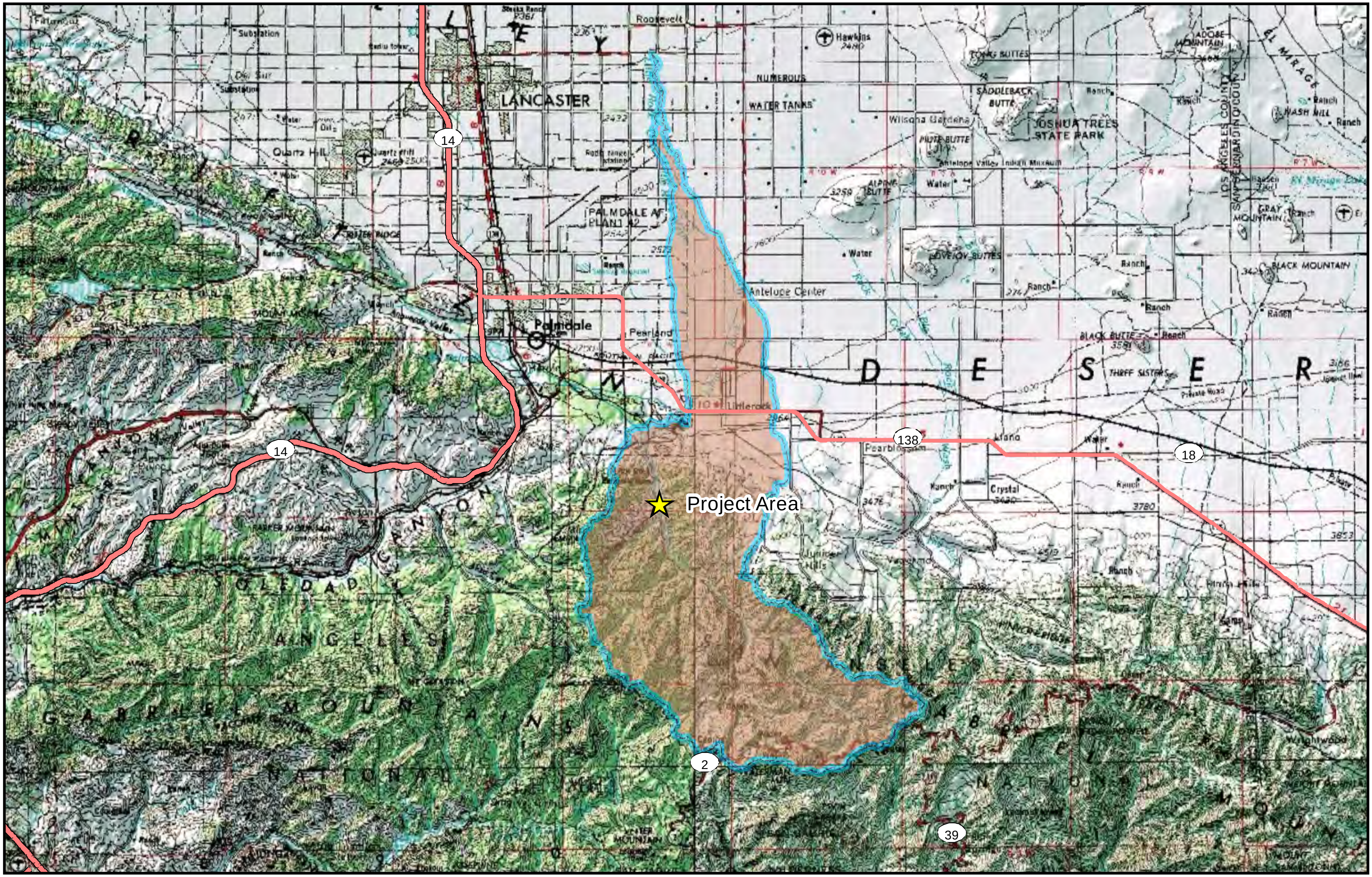
C.7.5 Impact Summary

Impacts H-1 and H-2 for the Project and Alternative 1 are adverse, but not significant (Class III), and the No Action Alternative would have no effect associated with Impact H-2. Impacts H-1 and H-3 are significant and unavoidable (Class I) with the No Action/No Project Alternative. Impact H-3 is beneficial for the Project and Alternative 1. Table C.7-3 summarizes impact significance.

Table C.7-3. Summary of Impacts and Mitigation Measures – Hydrology

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
H-1: The Project would deplete groundwater supplies downstream of the dam	Class III	Class III	Class I	No	None
H-2: The Project would alter existing flow patterns, resulting in erosion and siltation	Class III	Class III	No Impact	Yes	SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)
H-3: The Project would alter Little Rock Creek flow volumes downstream of the dam, and otherwise alter stream flow characteristics, increasing the potential for flooding.	Class IV	Class IV	Class I	Yes	None

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.



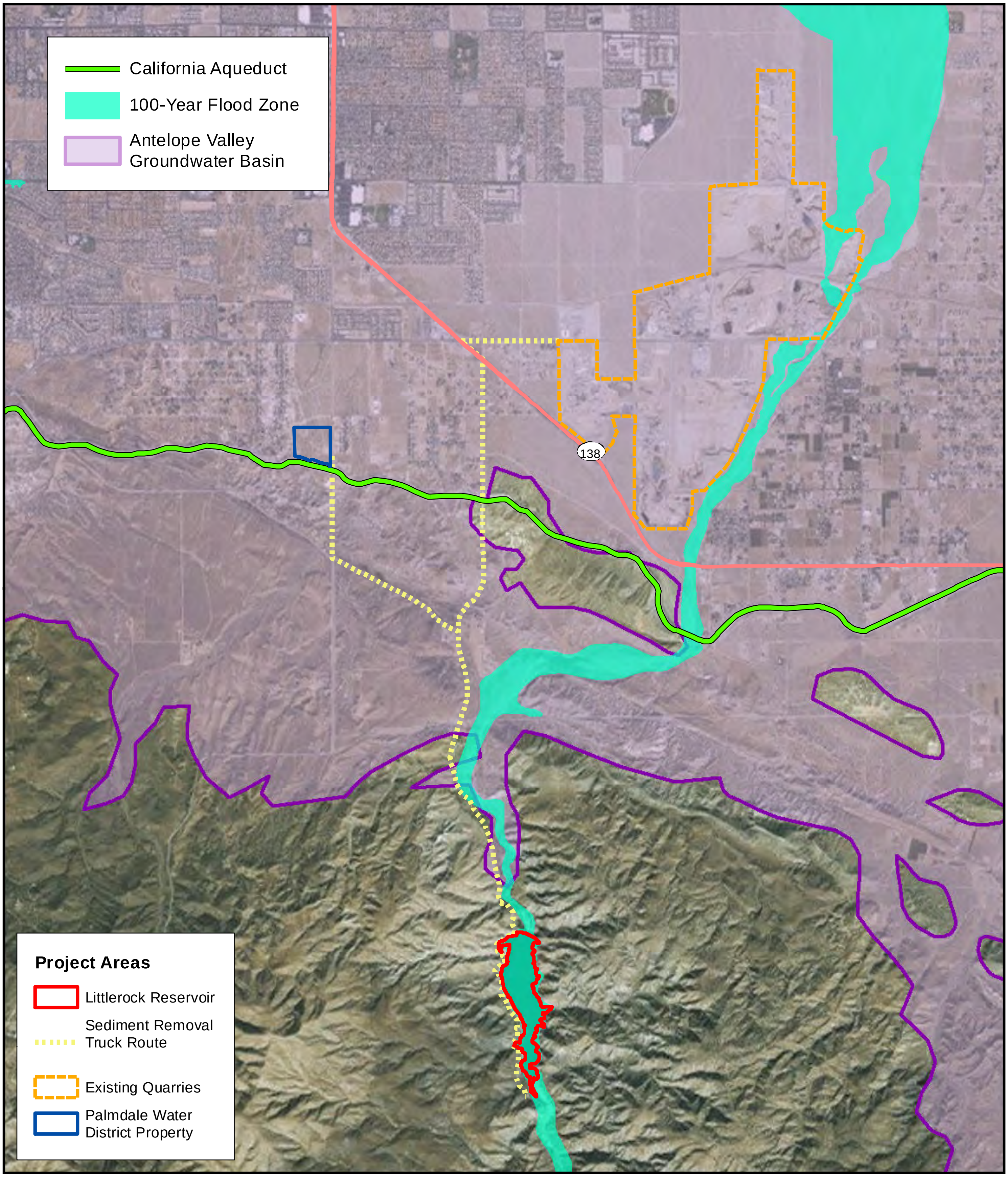
0 3.5 7 Miles

Little Rock Wash Watershed

Littlerock Reservoir Sediment Removal Project

Figure C.7-1

May 2016



100-Year Flood Hazard Zones

Littlerock Reservoir Sediment Removal Project

Figure C.7-2

May 2016

0 500 1,000 Feet

Maximum Water Level in Reservoir

* High-resolution imagery was acquiredwith an unmanned aerial vehicle August 2013 (Airphrame).

Littlerock Reservoir Sediment Removal Project

Figure C.7-3

May 2016

C.8 Noise

Presented within this section is information on ambient noise conditions in the vicinity of the Littlerock Reservoir, truck haul routes, and sediment disposal locations associated with the proposed action (Project) and alternatives. Potential noise impacts associated with construction and operation of the Project is based on the evaluation of exposure of persons to or the generation of noise levels in excess of established standards. Section C.8.1 provides the existing setting, including background information on noise, the noise environment of the Project area, and sensitive receptors. Section C.8.2 describes the existing noise standards and regulations applicable to the Project.

C.8.1 Affected Environment

The potential effects of Project-related noise on wildlife are analyzed in Section C.3, Biological Resources. As discussed below in Section C.8.1.4, no sensitive receptors are located within the Reservoir or proximate to the quarry sediment disposal sites. Therefore, the area of study analyzed within this section, with respect to temporary noise or vibration generated by the Project or alternatives, is haul truck roadways and the proposed Palmdale Water District (PWD) sediment disposal/holding site. That is because these are the only Project areas containing sensitive receptors.

C.8.1.1 Fundamentals of Environmental Acoustics

The assessment of noise impacts uses specific terminology and descriptors not commonly used in everyday conversation. Therefore, to assist in a thorough understanding of the subsequent analysis, Table C.8-1 provides definitions for technical terminology utilized.

Table C.8-1. Summary of Acoustical Terms

Term	Definition
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
A-Weighted Sound Level (dBA)	The sound level in decibels as measured on a sound level meter using the A weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Ambient Noise Level	The composite noise from all sources resulting in the normal, existing level of environmental noise at a given location. The Leq, as defined below, typically defines the ambient level.
Equivalent Noise Level (Leq)	The average A-weighted dB level, on an equal energy basis, during the measurement period.
Maximum Noise Level (Lmax)	The maximum noise level during a sound measurement period.
Minimum Noise Level (Lmin)	The maximum noise level during a sound measurement period.
Percentile Noise Level (Ln)	The noise level exceeded during *n* percent of the measurement period, where *n* is a number between 0 and 100 (e.g., L90)
Community Noise Equivalent Level (CNEL)	The average sound level over a 24 hour period, with a penalty of 5 dB added between 7 pm and 10 pm. and a penalty of 10 dB added for the nighttime hours of 10 pm to 7 am.

The effects of noise on people can be grouped into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction
- Interference with activities such as speech, sleep, learning
- Physiological effects such as startling and hearing loss

In most cases, typical noise produces effects in the first two categories, being subjective effects and interference with activities only. An example of physiological effects of noise may include workers in industrial plants that might experience physiological effects of noise. No satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is due primarily to the wide variation in individual thresholds of annoyance and habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is by comparison with the existing or "ambient" environment to which that person has adapted.

Community noise levels are usually closely related to the intensity of nearby human activity. Noise levels are generally considered low when ambient levels are below 50 dBA, moderate in the 50-65 dBA range, and high above 65 dBA (FTA, 2006).

Typical Leq daytime noise levels are:

- 35 dBA or below in a rural or wilderness area,
- 50 to 60 dBA in small towns or wooded or lightly used residential areas,
- 75 dBA in busy urban areas, and
- 85 dBA near major freeways and airports.

Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, high noise levels are nevertheless considered to be adverse to public health. In general, the more the level or the tonal (frequency) variations of a noise exceed the existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual. When comparing sound levels from similar sources (for example, changes in traffic noise levels), a 3-dBA increase is considered to be a just-perceivable difference, 5 dBA is clearly perceivable, and 10 dBA is considered a doubling in perceived loudness.

C.8.1.2 Fundamentals of Environmental Vibration

Vibration is a phenomenon related to noise, where common sources include trains, large vehicles on rough roads, and construction activities such as blasting, pile-driving, and operating heavy earth-moving equipment (FTA 2006). Vibration is defined as the mechanical motion of earth or ground, building, or other type of structure, induced by the operation of any mechanical device or equipment located upon or affixed thereto. Vibration generally results in an oscillatory motion in terms of the displacement, velocity, or acceleration of the ground or structure(s) that causes a normal person to be aware of the vibration by means such as, but not limited to, sensation by touch or visual observation of moving objects.

The groundborne energy of vibration has the potential to cause structural damage and annoyance; it can be felt outdoors, but the perceived intensity of vibration effects are much greater indoors due to the shaking of structures. Several land uses are sensitive to vibrations, and include hospitals, libraries, residential areas, schools, and churches.

C.8.1.3 Ambient Noise Conditions in the Project Area

Ambient noise at Littlerock Reservoir is primarily created by birds chirping, wind noise, and periodic noise from recreationists and concessionaire activities. At residential receptor locations, the dominant noise source along the haul truck transportation routes and PWD disposal property is roadway traffic. In general, the proposed truck route areas are predominantly open space or rural residential lands where existing noise levels are generally low.

Six short-term (15 minute) noise measurements were conducted to document and provide a reference of the ambient noise conditions of the Reservoir and at residential receptor locations near haul truck routes. The locations of these noise measurements are shown in Figure C.8-1. Four of these noise measurements were taken at the nearest residential receptors to the haul truck routes and PWD disposal property. No sensitive receptors are located proximate to quarry sites proposed for sediment disposal. The results of these measurements are shown in Table C.8-2.

Table C.8-2. Ambient Noise Measurement Results

No.	Description	Measurement					
		Time	Leq	Lmin	Lmax	L90	Notes
1	Reservoir bed at Rocky Point.	8:00 a.m. – 8:15 a.m.	22.1	11.2	29.4	22.0	Primary noise source was birds chirping.
2	Access road terminus below the dam at Palmdale Ditch/Little Rock Creek.	8:30 a.m. – 8:45 a.m.	24.0	12.6	38.3	23.7	Primary noise source was birds chirping. Secondary noise sources were distant dog barks and one helicopter pass-by.
3	East side of Cheseboro Road south of Mt. Emma Road at residential receptor 75-100' from center of nearest travel lane.	9:00 a.m. – 9:15 a.m.	41.2	22.4	55.6	36.7	Primary noise source was distant passenger vehicle traffic on Mt. Emma Road and birds chirping.
4	West side of 47th Street north of Barrel Springs Road at residential receptor 75-100' from center of nearest travel lane.	9:30 a.m. – 9:45 a.m.	43.3	26.6	60.7	41.1	Primary noise source was infrequent passenger vehicle traffic on 47th Street and Barrel Springs Road.
5	West end of PWD property on 47th Street near residential receptors.	10:10 a.m. – 10:25 a.m.	42.4	25.1	45.8	38.9	Primary noise sources were infrequent and distant traffic on 47th Street and dog barking. Secondary noise source was distant general aviation pass-by.
6	West side of Cheseboro Road north of aqueduct at residential receptor 75-100' from center of nearest travel lane.	10:35 a.m. – 10:50 a.m.	44.7	26.5	61.8	41.8	Primary noise source was infrequent passenger vehicle traffic on Cheseboro Road and dog barking.

Notes: All measurements are in dBA and were taken on Wednesday, September 17, 2014 using a Quest Technologies Model 2800 Impulse Integrating Sound Level Meter. During each measurement, the sound meter microphone was covered with a windscreen to eliminate wind noise as part of the ambient condition measurements. Due to regular strong gusts, wind noise generally exceeded the measured Leq and L90 presented. Additionally, no water inflow/outflow was occurring at locations 1 and 2 during measurements.

C.8.1.4 Sensitive Receptors

A land use survey was conducted to identify any potentially sensitive receptors (e.g., schools, residences, and recreational facilities) in the general vicinity of the Reservoir, Project truck routes, and sediment disposal locations. The surrounding area immediately adjacent to Littlerock Reservoir is recreational use area, and does not contain any residential structures. A detailed land use inventory is provided in Section C.9 (Recreation and Land Use). Scattered single-family homes, mobile homes, and residential ranches are located along Cheseboro Road, Pearblossom Highway, and 47th Street segments of the proposed haul truck routes. In addition, residential homes are located immediately west of the PWD disposal property. No sensitive receptors are located within 0.5 mile of the quarry disposal areas. The nearest sensitive receptors sites to Project activities are reflected in Figure C.8-1, noise measurement locations 3 through 6.

The haul truck routes would traverse lands within the City of Palmdale and unincorporated Los Angeles County. Portions of the routes that are within the City of Palmdale include the following:

- Cheseboro Road (east side) approximately 1,000 feet of south of Pearblossom Highway.
- Pearblossom Highway between Cheseboro Road and Avenue T.
- Avenue T between Pearblossom Highway and Quarries.

C.8.2 Regulatory Framework

Table C.8-3 provides a list of plans and policies that are applicable to noise and includes a discussion of the Project's consistency with each plan or policy.

Table C.8-3. Consistency with Applicable Noise-Related Plans and Policies

Plan/Policy	Consistency	Explanation
Los Angeles County Noise Control Ordinance (Ordinance Title 12, Chapter 12.08)	Yes	Noise levels from Project activities would attenuate to below dBA performance standards at adjacent residential receptors and all activities would occur within allowable construction hours.
City of Palmdale General Plan NoiseElement – Policy N1.1.3	Yes	The Project does not include any temporary or permanent stationary noise sources within the City of Palmdale
City of Palmdale General Plan Noise Element – Policy N1.2.2	Yes	Annual sediment removal and restoration/maintenance activities would occur only between 7:00 a.m. to 7:00 p.m., up to 6 days a week (no activities occurring on Sundays or federal holidays)
City of Palmdale General Plan Noise Element – Policy N1.2.4	Yes	SPCs NOI-1 and NOI-2 ensure any potential conflicts of intermittent noise sources to residential locations along the Project truck route and PWD sediment storage site would be less than significant
City of Palmdale Municipal Code, Chapter 8.28, Section 8.28.030	Yes	Annual sediment removal and restoration/maintenance activities would occur only between 7:00 a.m. to 7:00 p.m., up to 6 days a week (no activities occurring on Sundays or federal holidays)

Source: Los Angeles County, 2014b; City of Palmdale, 1993; City of Palmdale, 2014

Federal

There are no federal noise standards that directly regulate environmental noise. Table C.8-4 provides a summary of recommended noise levels for protecting public health and welfare with an adequate margin of safety. With regard to noise exposure and workers, the federal Occupational Safety and Health Administration (OSHA) establishes regulations to safeguard the hearing of workers exposed to occupational noise (29 CFR Section 1910.95, Code of Federal Regulations).

Table C.8-4. Examples of Protective Noise Levels Recommended by U.S. EPA

Effect	Maximum Level 24-hour Leq	Exterior or Interior Area
Hearing loss	70 dBA	All areas.
Outdoor activity interference and annoyance	55 dBA	Outdoors in residential areas and farms and other outside areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	55 dBA	Outdoor areas where people spend limited amounts of time, such as schoolyards, playgrounds, etc.
Indoor activity interference and annoyance	45 dBA	Indoor residential areas.
	45 dBA	Other indoor areas with human activities such as schools, etc.

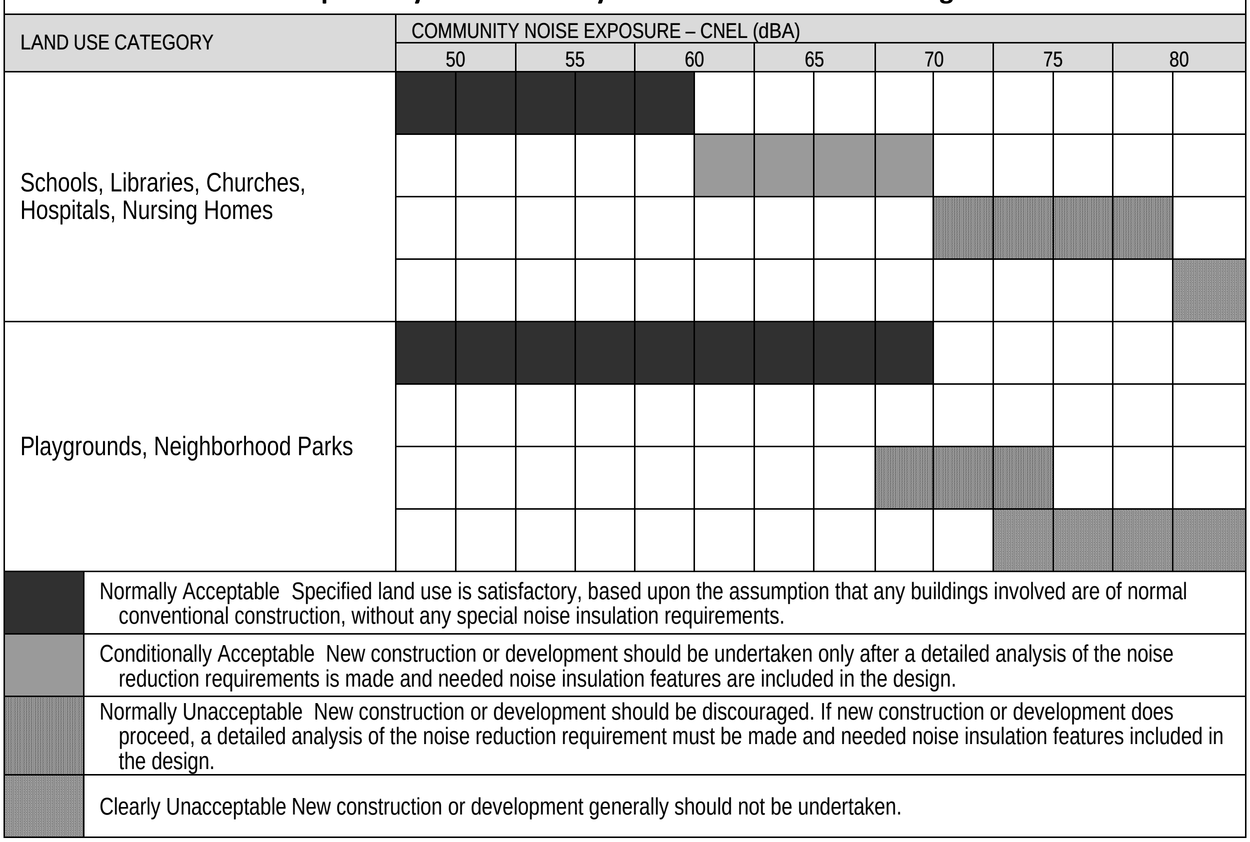
Source: USEPA, 1974.

State

California Office of Safety and Health Administration (Cal/OSHA) also regulates employee noise exposure, as mandated by Title 8 of the California Code of Regulations, Group 15, Article 105 §§ 5095-5100. Additionally, a Hearing Conservation Program must be instituted when employees are exposed to noise levels of an 8-hour, time-weighted average at or greater than 85 dBA.

The California Office of Planning and Research has developed guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. These CNEL noise recommendations are listed in Table C.8-5, but are not regulation. Instead, they are provided as a reference for local jurisdictions when creating General Plan and local noise policy (OPR, 2003).

Table C.8-5. Land Use Compatibility for Community Noise Environment Local Regulations and Standards



Source: OPR, 2003.

Local

- **County of Los Angeles General Plan.** The Los Angeles County General Plan is the foundational document for all community-based plans that serve the unincorporated areas. Both the approved General Plan (1974) and public review draft of the 2035 General Plan (2014) were reviewed for noise goals and policies applicable to the Project (County of Los Angeles 1974 and 2014a). Neither version of the General Plan contains applicable goals or policies pertaining to noise from the Project.
- **County of Los Angeles Noise Control Ordinance (Ordinance Title 12, Chapter 12.08).** The County's Noise Ordinance also includes construction noise restrictions that apply to residential and commercial properties, as presented in Table C.8-6. Furthermore, it is required that all mobile and stationary internal-combustion-engine powered equipment or machinery to be equipped with suitable exhaust and air-intake silencers in proper working order (Los Angeles County, 2014b).

Table C.8-6. County Construction Noise Limits, dBA

Time	Single-Family Residential	Multi-Family Residential	Semi-Residential/Commercial
Mobile Equipment (non-scheduled, intermittent, short-term operation – less than 10 days)			
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	75	80	85
Daily, 8:00 p.m. to 7:00 a.m., and all day Sunday and legal holidays	60	64	70
Stationary Equipment. Maximum noise level for repetitively scheduled and relatively long-term operation (periods of 10 days or more) of stationary equipment			
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60	65	70
Daily, 8:00 p.m. to 7:00 a.m., and all day Sunday and legal holidays	50	55	60

Source: Los Angeles County, 2014

- As shown in Table C.8-4, the maximum noise level limits from mobile construction equipment between the hours of 7:00 a.m. and 8:00 p.m. are 75 dBA at the property line of single-family residential areas, 80 dBA at multi-family residential areas, and 85 dBA at semi-residential and commercial areas. In addition, Section 12.08.44 of the County Noise Ordinance prohibits non-emergency construction activity between the weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays.
- **City of Palmdale General Plan.** The Palmdale General Plan Noise Element is intended to comply with the State mandate and to set guidelines to prevent noise and land use conflicts. A review of the Noise Element identified the following applicant General Plan policies related to Project noise (City of Palmdale, 1994):
  - **Policy N1.1.3:** When proposed stationary noise sources could exceed an exterior noise level of 65 dBA CNEL at present, or could impact future noise sensitive land uses, require preparation of an acoustical analysis and mitigation measures to reduce noise levels to no more than 65 dBA CNEL exterior and 45 dBA CNEL interior; if the noise level cannot be reduced to these thresholds through mitigation, the new noise source should not be permitted.
  - **Policy N1.2.2:** Restrict construction hours during the evening, early morning and Sundays.

– **Policy N1.2.4:** Where deemed appropriate based upon available information, acoustical analysis and appropriate mitigation for noise-sensitive land uses should be required in areas which may be adversely impacted by significant intermittent noise sources.

- **City of Palmdale Noise Ordinance.** The acceptable levels are presented in Table C.8-6. The City of Palmdale Municipal Code, Chapter 8.28, Section 8.28.030, specifies that construction noise shall not occur between the hours of 8:00 p.m. and 6:30 a.m. in any residential zone or within 500 feet of any residence (City of Palmdale, 2014).

C.8.3 Issues Identified During Scoping

There were no noise-related issues raised by the public or agencies during the public scoping period, refer to Appendix E.

C.8.4 Environmental Consequences

Significance Criteria. The following significance criteria for noise were derived from the applicable construction-related local noise regulations, presented above in Tables C.8-4 and C.8-5. Impacts of the Project or alternatives would be considered significant and would require mitigation if:

- Criterion NOI1: Predicted sound levels from temporary use of mobile equipment during construction and operational activities would exceed 75 dBA at single-family residences or 85 dBA at semi-residential/commercial receptors.
- Criterion NOI2: Predicted sound levels from temporary use of stationary equipment during construction and operational activities would exceed 60 dBA at single-family residences or 70 dBA at semi-residential/commercial receptors.
- Criterion NOI3: Noise from temporary use of stationary and mobile equipment during construction and operational activities would occur outside of 7:00 a.m. to 7:00 p.m., or at any time on Sundays or holidays in Los Angeles County or between and 6:30 a.m. and 8:00 p.m. within the City of Palmdale.
- Criterion NOI4: Vibration from temporary use of stationary and mobile equipment during construction and operational activities would damage or cause significant nuisance to sensitive receptors.

Impact Assessment Methodology. Noise impacts are typically determined by compliance with all applicable noise performance standards and regulations. Because both construction and operational activities of the Project would be short-term and temporary during a calendar year (approximately 3 months), they would not result in a permanent change in ambient noise conditions. Therefore, compliance with temporary construction-related noise standards and regulations is applicable.

Noise impacts on the surrounding community are enforced through local noise ordinances, supported by nuisance complaints and subsequent investigation. It is assumed that all existing regulations to the construction and operation of the Project would be enforced. Although the PWD has pre-emptive jurisdiction over local standards and regulations as a State Water agency, local standards are used in this section to help determine the significance of noise impacts. The Occupational Safety and Health Association (Cal-OSHA in California) regulates noise standards related to on-site worker health and safety (OSHA, 2014). Therefore, an analysis of noise to workers is not required.

To determine potential impacts, the significance criteria identified above were compared against predicted noise levels of Project-related mobile and stationary equipment use in relation to the locations of sensitive receptors described in Section C.8.1.3 (Sensitive Receptors). Impacts are identified should the applicable noise standards presented in Criteria NOI1 and NOI2 be exceeded by Project-related activities. Additionally, impacts are identified if construction noise would occur outside the allowable hours defined by Los Angeles County and the City of Palmdale in Criterion NOI3.

C.8.4.1 Proposed Action/Project

The following section describes the Project's noise impacts as determined by the thresholds of significance and, where necessary, provides mitigation measures that would serve to reduce adverse impacts.

Direct and Indirect Effects Analysis

Predicted sound levels from temporary use of mobile equipment during construction and operational activities would exceed 75 dBA at single-family residences or 85 dBA at semi-residential/commercial receptors (Criterion NOI1)

Activities within the Reservoir and Angeles National Forest (ANF) include construction of the grade control structure, annual sediment removal, and annual restoration/maintenance. Because the Reservoir would be closed to the public during these activity periods, noise within the ANF would not be proximate to any residential or recreation receptors. Additionally, as described above in Section C.8.1.4, no residential receptors are located within 0.5 mile of the quarry sediment disposal locations. Sediment disposal activities within the quarries would not expose receptors to noise. Therefore, the analysis below for Impact N-1 is focused on mobile construction noise along the haul truck routes and periodic activities occurring at the PWD sediment staging location that may impact residential receptors within unincorporated Los Angeles County and the City of Palmdale.

Impact N-1: Noise from mobile sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances

Noise impacts during annual sediment removal/disposal activities would be a function of the construction equipment, the equipment location, and the timing and duration of the noise-generating activities. Typical noise levels generated by individual pieces of mobile construction equipment utilized during Project implementation are displayed in Table C.8-7.

Table C.8-7. Noise Levels from Mobile Construction Equipment

Construction Equipment	Noise Level (Lmax dBA at 50 feet)
Grader/Spreader	85
Compacter	83
Sweeper	82
Excavator	81
Front End Loader	79
Bulldozer/Backhoe	78
Dump Truck	76
Water Truck	76

Source: FHWA, 2006

The construction noise levels presented in Table C.8-7 represent conservative worst-case Lmax conditions, in which the maximum noise level of the piece of construction equipment is generated (FHWA, 2006). These maximum noise levels would not be continuous throughout the workday at any single receptor location, but instead periodic and short-term. These maximum construction-related noise levels would attenuate at an average rate of 6 dBA every doubling of distance depending on adjacent surfaces and noise spreading (FTA, 2006). Table C.8-8 provides estimated Lmax noise levels at different distances from the source.

Table C.8-8. Attenuation of Construction Noise Levels Away from Source

Distance (feet)	Noise Level (dBA, Lmax)
50	76 – 85
100	70 – 79
200	64 – 73
400	58 – 67
800	52 – 61

Source: FTA, 2006

- **Haul Truck Routes**. Haul (dump) trucks would travel along the Project truck routes as sediment is brought to the disposal sites. As noted in Section C.8.1.4, some residential receptors on Cheseboro Road and Pearblossom Highway are located within the City of Palmdale. However, since the City does not have any applicable exterior noise standards for temporary mobile construction noise, the County's 75 dBA threshold is utilized.

  At the closest residential uses along Cheseboro Road, Pearblossom Highway, and 47th Street, temporary haul truck noise would occur periodically 100 feet from residential structures (attenuating to 70 dBA Lmax). While residential setbacks vary along the route, field reconnaissance indicates this is the average structure setback. Therefore, intermittent construction-related Lmax noise levels at residences along the haul truck routes would not exceed the 75 dBA exterior noise threshold for mobile construction equipment noise, as designated by the County of Los Angeles. Additionally, the proposed haul routes are public roadways where daily vehicle use, including large truck trips, regularly subjects these adjacent receptors to exterior Lmax vehicle noise levels similar to that of Project related haul trips. While periodic bursts of noise from haul trucks is estimated to fall below this Lmax threshold, SPC NOI-1 is included to monitor and address any construction noise complaints (refer to Appendix A).

- **PWD Sediment Storage Site**. Residential receptors are located immediately west of the PWD sediment staging property with observed setbacks of 100 feet from the PWD property edge. It should be noted that these residential receptors are located within the City of Palmdale. However, since the City does not have any applicable exterior noise standards for temporary mobile construction noise, the 75 dBA threshold is utilized. All equipment utilized on the site for temporary sediment storage would be mobile.

  As shown in Table C.8-8, these receptors could experience periodic exterior noise levels of 70-79 dBA Lmax at the structure exterior, should mobile construction equipment be utilized at the extreme west portion of the PWD property. As discussed in Section B.2.3.2, small amounts of sediment would be stored at this location only for the short term and would always first occur in the northeast portion of the site, ensuring the greatest distance from adjacent residences. The entrance to this property and area where sediment would be stored is located immediately adjacent to 47th Street, conservatively 900 feet from the nearest residential receptor. Activities from this distance are expected to generate exterior noise levels less than 52-61 dBA Lmax at the structure exterior. Therefore, intermittent construction-related Lmax noise levels at the PWD site are not expected to exceed the 75 dBA exterior noise threshold for mobile construction equipment noise at adjacent residential receptors. To ensure this threshold is not exceeded and compliance with the City of Palmdale Municipal Code (Chapter 8.28, Section 8.28.030) is achieved, SPC NOI-2 is included (refer to Appendix A). Additionally, SPC NOI-1 would include monitoring and addressing noise complaints from activities occurring at the PWD site.

SPCs Applicable to Impact N-1

SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan)

SPC NOI-2 (PWD Site Buffer Requirements)

CEQA Significance Conclusion

With the implementation of SPCs NOI-1 and NOI-2, any potential conflicts of mobile noise sources to residential locations along the Project truck routes and PWD sediment storage site would be less than significant (Class III).

Predicted sound levels from temporary use of stationary equipment during construction and operational activities would exceed 60 dBA at single-family residences or 70 dBA at semi-residential/commercial receptors (Criterion NOI2)

Impact N-2: Noise from stationary sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances

The only stationary construction equipment utilized during the duration of the Project would be temporary use of a soil cement batch plant, rock screener, dewatering pumps, and generators during construction of the grade control structure. These activities would occur entirely within the Reservoir, which would be closed to the public during these activity periods. The grade control structure and restored/ongoing water storage capacity of the Reservoir would not generate any new permanent stationary noise.

CEQA Significance Conclusion

Temporary noise generated by stationary construction equipment would not impact any sensitive receptors. As the Reservoir would be closed during grade control structure construction and annual sediment removal, stationary construction noise would not impact park users and would be less than significant (Class III).

Noise from temporary use of stationary and mobile equipment during construction and operational activities would occur outside of 7:00 a.m. to 7:00 p.m., or at any time on Sundays or holidays in Los Angeles County or between and 6:30 a.m. and 8:00 p.m. within the City of Palmdale (Criterion NOI3)

Impact N-3: Temporary construction activities may occur outside allowable hours and substantially disturb sensitive receptors

Construction of the grade control structure would occur entirely within the ANF and is not subject to allowable construction hours specified by Los Angeles County or City of Palmdale. As described in Section B.2.2, the grade control structure is currently estimated to take approximately 20 weeks to complete with most activities typically occurring between 7:00 a.m. to 7:00 p.m., 6 days per week (no work on Sundays or federal holidays). Temporary night construction may be necessary during large soil cement pours. However, the likelihood of this occurrence is considered low. No work would be permitted outside of these normal times/days without prior written approval from the Forest Service.

As discussed in Section B.2.3, annual sediment removal and restoration/maintenance activities would occur only between 7:00 a.m. to 7:00 p.m., up to 6 days a week (no activities occurring on Sundays or federal holidays). Therefore, these activities would be in full compliance with the allowable construction hours specified by the Los Angeles County Noise Ordinance, City of Palmdale General Plan, and City of Palmdale Municipal Code.

CEQA Significance Conclusion

All construction activities would be in full compliance with the allowable construction hours specified by the Los Angeles County Noise Ordinance, City of Palmdale General Plan, and City of Palmdale Municipal Code. Any activities occurring within the ANF outside normal times/days would occur only with prior written approval from the Forest Service. Therefore, less than significant impacts would occur (Class III).

Vibration from temporary use of stationary and mobile equipment during construction and operational activities would damage or cause significant nuisance to sensitive receptors (Criterion NOI4)

Activities within the Reservoir during construction of the grade control structure, annual sediment removal, and annual restoration/maintenance would occur entirely within the ANF and would not be proximate to any residential receptors. The Reservoir would be closed to the public during these activity periods. Additionally, as described above in Section C.8.1.4, no residential receptors are located within 0.5 mile of the quarry sediment disposal locations. Therefore, the analysis below for Impact N-4 is focused on vibration from haul truck trips and periodic activities within the PWD sediment staging location that may impact residential receptors within unincorporated Los Angeles County and the City of Palmdale.

Impact N-4: Vibration from temporary construction equipment use could substantially disturb sensitive receptors

Typically, groundborne vibrations generated by man-made activities attenuate rapidly with distance from the source of the vibration. Construction-related vibration is usually confined to short distances (i.e., 500 feet or less) from the source (FTA, 2006).

Heavy truck trips could produce short-term groundborne vibration occurrences at residential receptors located along Cheseboro Road, Pearblossom Highway, and 47th Street. Due to the amount of heavy truck traffic currently occurring on Pearblossom Highway, the primary locations of concern would be residences along Cheseboro Road and 47th Street. The main cause of vibration during transport would be uneven road surfaces. The level of vibration depends upon the vehicle speed and weight. Loaded and unloaded haul truck weight would remain fairly static throughout annual sediment removal. Reducing speeds on the haul truck routes may slightly reduce the potential for vibration, but could in turn create traffic flow and safety hazards from speeds below the posted speed limit. Based on a review of the local roadway network between the Reservoir and quarries, no alternative routes offer haul trucks less sensitive roadways. Therefore, while few options are available to reduce the potential for adverse temporary vibration from haul trucks on these public roadways, SPC NOI-1 is proposed to monitor and address any vibration complaints from haul trucks and heavy equipment use.

Localized vibration may also occur within the PWD sediment storage site from haul truck ingress/egress and sediment stockpiling/removal activities. The implementation of SPC NOI-2 would ensure on-site construction equipment use within the PWD sediment storage site would not occur within 500 feet of any residential structures. Furthermore, SPC NOI-1 is proposed to monitor complaints of any construction-related vibration within the PWD site.

SPCs Applicable to Impact N-4

SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan)

SPC NOI-2 (PWD Site Buffer Requirements)

CEQA Significance Conclusion

With the implementation of SPCs NOI-1 and NOI-2, vibration impacts from Project haul trucks to residential locations along the Project truck routes and activities within the PWD sediment storage site would be less than significant (Class III).

C.8.4.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Predicted sound levels from temporary use of mobile equipment during construction and operational activities would exceed 75 dBA at single-family residences or 85 dBA at semi-residential/commercial receptors (Criterion NOI1)

Alternative 1 would result in identical activities within the Reservoir and the ANF as the Project. These activities would not be proximate to any residential receptors and the Reservoir would be closed to the public during these activity periods. Additionally, as described above in Section C.8.1.4, no residential receptors are located within 0.5 mile of the quarry sediment disposal locations. Therefore, the analysis below is focused on noise from haul truck trips and periodic activities occurring at the PWD sediment staging location under Alternative 1.

Impact N-1: Noise from mobile sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances

Peak noise levels during annual sediment removal along the haul truck routes and at the PWD site would be identical to that described for the Project. However, by starting the initial sediment removal period on July 1 (annually), instead of after Labor Day, the overall daily frequency of noise would be reduced through an overall reduction in the number of daily haul trips. It should be noted that while there may be a reduction in the number of daily haul trips, the overall number of days that activities would occur is increased into the months of July and August. Therefore, Alternative 1 would reduce the amount of mobile noise occurring per day, but would increase the overall number of days noise would be generated annually.

While estimated Lmax noise levels from haul truck trips would be below 75 dBA Lmax at receptors, SPC NOI-1 would also be required for Alternative 1 to monitor and address any construction noise complaints. Furthermore, SPC NOI-2 would be required to ensure intermittent construction-related Lmax noise levels at the PWD site would not exceed 75 dBA at adjacent receptors. Additionally, SPC NOI-1 would include monitoring noise complaints from activities occurring at the PWD site.

SPCs Applicable to Impact N-1

SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan)

SPC NOI-2 (PWD Site Buffer Requirements)

CEQA Significance Conclusion

With the implementation of SPCs NOI-1 and NOI-2 as part of Alternative 1, any potential conflicts of mobile noise sources to residential locations along the truck route and adjacent to the PWD sediment storage site would be less than significant (Class III).

Predicted sound levels from temporary use of stationary equipment during construction and operational activities would exceed 60 dBA at single-family residences or 70 dBA at semi-residential/commercial receptors (Criterion NOI2)

Impact N-2: Noise from stationary sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances

The only stationary construction equipment utilized with Alternative 1 would be identical to that of the Project and occur entirely within the Reservoir only during construction of the grade control structure. The Reservoir would be closed to the public during these activity periods and stationary noise would not occur proximate to any residential receptors. The grade control structure and restored water storage capacity of the Reservoir under Alternative 1 would not generate any new permanent stationary noise.

CEQA Significance Conclusion

Noise generated by stationary construction equipment would not impact any sensitive receptors. As the Reservoir would be closed during Alternative 1 construction and excavation, stationary construction noise would not impact park users and would be less than significant (Class III).

Noise from temporary use of stationary and mobile equipment during construction and operational activities would occur outside of 7:00 a.m. to 7:00 p.m., or at any time on Sundays or holidays in Los Angeles County or between and 6:30 a.m. and 8:00 p.m. within the City of Palmdale (Criterion NOI3)

Impact N-3: Temporary construction activities may occur outside allowable hours and substantially disturb sensitive receptors

Alternative 1 alters the initial sediment removal period to start on July 1 (annually), instead of after Labor Day, and reduces the weekly construction schedule by one day per week. Under Alternative 1, all activities within Los Angeles County and City of Palmdale would occur between 7:00 a.m. to 7:00 p.m., 5 days per week (no work on Sundays or federal holidays). Any work occurring outside these times/days within the ANF would occur only with prior written approval from the Forest Service.

CEQA Significance Conclusion

All construction activities would be in full compliance with the allowable construction hours specified by the Los Angeles County Noise Ordinance, City of Palmdale General Plan, and City of Palmdale Municipal Code. Any activities occurring within the ANF outside normal times/days would occur only with prior written approval from the Forest Service. Therefore, less than significant impacts would occur (Class III).

Vibration from temporary use of stationary and mobile equipment during construction and operational activities would damage or cause significant nuisance to sensitive receptors (Criterion NOI4)

The analysis below for Impact N-4 is focused on mobile vibration from haul truck trips and periodic activities occurring at the PWD sediment staging location. All other activities that may generate temporary vibration would not occur proximate to any residential receptors.

Impact N-4: Vibration from temporary construction equipment use could substantially disturb sensitive receptors

Peak vibration levels under Alternative 1 during annual sediment removal along the haul truck routes and at the PWD site would be identical to that described for the Project. However, by starting the initial sediment removal period on July 1 (annually), instead of after Labor Day, the overall daily frequency of potential vibration from haul trips would be reduced. It should be noted that Alternative 1 does increase the overall number of days where temporary vibration may be generated by increasing the sediment removal period into the months of July and August.

SPC NOI-1 is proposed to monitor complaints of haul truck vibration from Alternative 1. Localized vibration may also occur within the PWD sediment storage site from haul truck ingress/egress and sediment stockpiling/removal activities. The implementation of SPC NOI-2 would ensure on-site construction equipment use within the PWD sediment storage site would not occur within 500 feet of any existing sensitive receptor structures. Furthermore, SPC NOI-1 is proposed to monitor complaints of any construction-related vibration within the PWD site.

SPCs Applicable to Impact N-4

SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan)

SPC NOI-2 (PWD Site Buffer Requirements)

CEQA Significance Conclusion

With the implementation of SPCs NOI-1 and NOI-2, vibration impacts from Alternative 1 would be less than significant (Class III).

C.8.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at an annual average rate of 38,000 cubic yards per year. PWD would not undertake any activities to remove sediment. Therefore, no noise would be generated.

In the event sediment buildup led to safety issues and required demolition/removal of the Dam, construction activities (and related noise) are expected to be greater than that of the Project or Alternative 1. Demolition of the dam and restoration of the waterway would require extensive construction. Noise from such activities would be similar or greater in intensity and would likely require additional construction years. While many activities would occur within the Reservoir and not proximate to sensitive receptors, the hauling and disposal of up to 2.8 million cubic yards of sediment and dam debris would generate noise similar to, but likely greater in occurrence, than that of the Project or Alternative 1.

In the event the Reservoir became filled with sediment and the Dam was left, it is likely some sort of downstream flood-control channeling would need to be constructed. Noise from such construction activities would be temporary and similar in levels to that occurring during grade control construction.

However, depending on the location of such flood control facilities, construction may occur proximate to downstream residential receptors.

CEQA Significance Conclusion

Noise generated from eventual construction activities may not comply with all applicable Los Angeles County and City of Palmdale regulations pertaining to noise and vibration performance standards and allowable construction hours. While such a determination is speculative, the possibility exists. Therefore, noise impacts of the No Action/No Project Alternative are considered significant and unavoidable (Class I).

C.8.5 Impact Summary

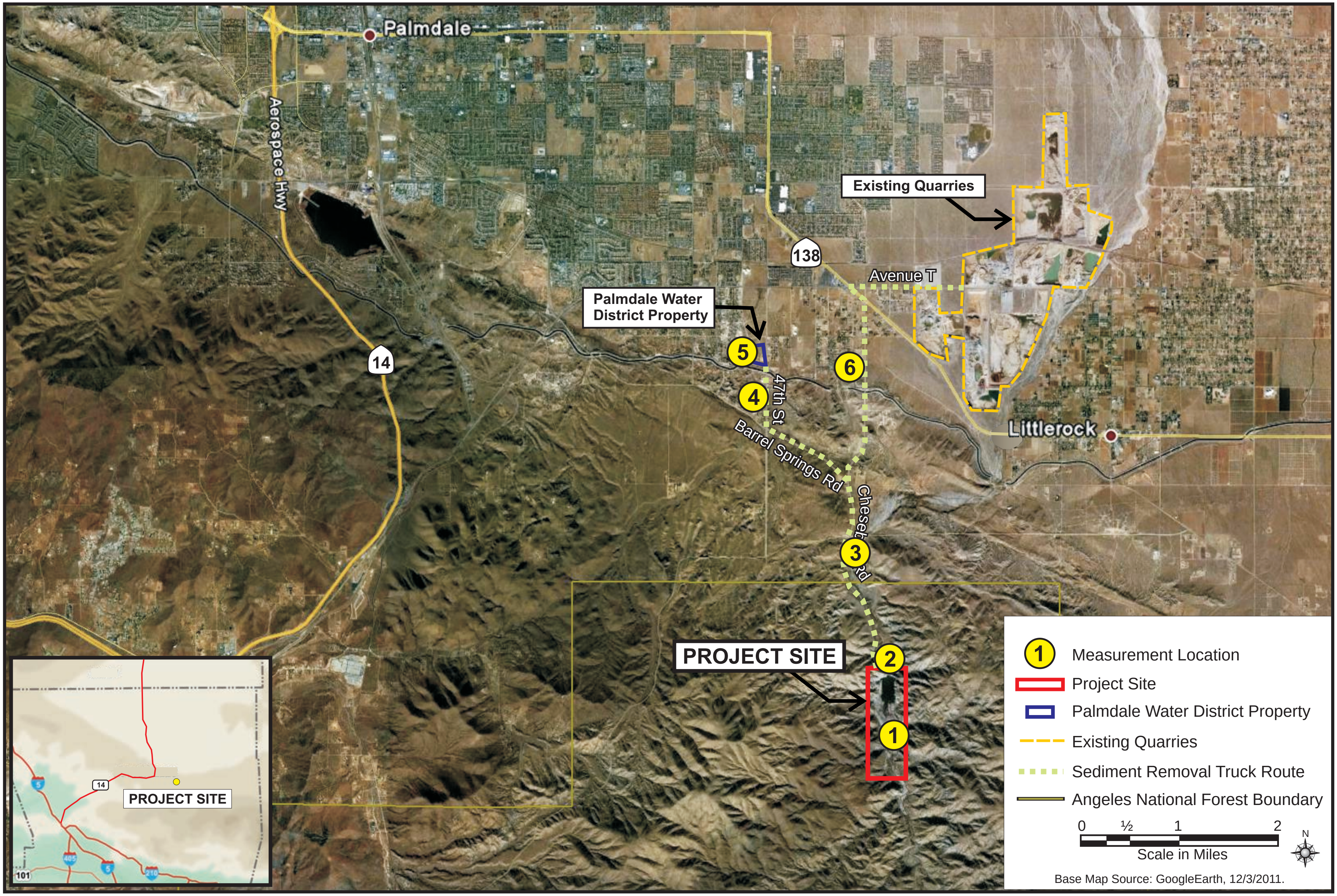
With the implementation of SPCs NOI-1 and NOI-2, potential noise and vibration impacts associated with the Project and Alternative 1 would be less than significant. While such a determination is speculative for the No Action/No Project Alternative, the possibility exists that significant and unavoidable noise impacts may occur from either necessary downstream flood control improvement construction proximate to residential receptors or significant construction from removal of Littlerock Dam if the Reservoir were allowed to fill up with sediment and Dam safety became compromised.

Table C.8-9 summarizes the direct and indirect environmental impacts of the Project and the alternatives on noise and vibration. Refer to Section C.8.4 for the entire environmental analysis and the full text of recommended mitigation measures.

Table C.8-9. Summary of Impacts and Mitigation Measures – Noise

	Impact Significance				
Impact	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1, 2]	Mitigation Measures/SPC
N-1: Noise from mobile sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances	Class III	Class III	Class I	No	SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) SPC NOI-2 (PWD Site Buffer Requirements)
N-2: Noise from stationary sources could substantially disturb sensitive receptors or violate local rules, standards, and/or ordinances	Class III	Class III	Class I	No	None
N-3: Temporary construction activities may occur outside allowable hours and substantially disturb sensitive receptors	Class III	Class III	Class I	Yes	None
N-4: Vibration from temporary construction equipment use could substantially disturb sensitive receptors	Class III	Class III	Class I	No	SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) SPC NOI-2 (PWD Site Buffer Requirements)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.
2 – Determination based on non-biological resource sensitive receptors.



Ambient Noise Measurement Locations

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.8-1

May 2016

C.9 Recreation and Land Use

This section describes the impacts to land use and public recreation associated with the construction and operation of the proposed action and alternatives. The EIS/EIR considers existing and proposed land uses in addition to sensitive land uses that have the potential to be affected by the Project. Sensitive land uses include the following land use types: residences, schools, hospitals, daycare centers, retirement homes, and cemeteries. Recreational resources are also defined as sensitive land uses, as they are susceptible to disturbances (e.g., noise, traffic, dust, etc.) that could decrease or eliminate the value of the recreational experience. In general, recreational facilities (parks, open space, playgrounds, play fields, etc.), recreational activities (bicycling, hiking, boating, etc.), and recreationists are considered to be sensitive receptors for purposes of this impact assessment.

C.9.1 Affected Environment

The proposed sediment removal at Littlerock Reservoir would be located within the Santa Clara/Mojave Rivers Ranger District of the Angeles National Forest (ANF). Truck routes for construction equipment and sediment removal would traverse federal and local jurisdictions that include National Forest System (NFS) lands, unincorporated Los Angeles County, and City of Palmdale (see Figure C.9-1: Jurisdictional Boundaries). The extent of the area to be analyzed for land use impacts is considered the Land Use Study Area. While other issue areas in this EIS/EIR may identify a Study Area with a different radius, the Land Use Study Area has been defined by the following:

- Land and recreation uses immediately adjacent to construction activities at Littlerock Reservoir;
- Land and recreation uses located along the sediment removal truck routes; and
- Land and recreation uses adjacent to the proposed sediment disposal sites.

To facilitate the analysis of land use and public recreation for the proposed action and alternatives, the discussion of the affected environment within the Study Area has been organized by NFS lands, truck routes, and proposed sediment disposal sites.

C.9.1.1 National Forest System Lands

The Land Management Plan (Forest Plan) for the ANF divides NFS lands into Land Use Zones, which identify appropriate management types of uses that are consistent with the desired conditions of each Place within the Forest. The Project occurs within the Backcountry[1] and Developed Area Interface[2] zones. These zones allow a variety of uses and are the two least restrictive zones described in the Forest Plan.

Figure C.9-2 (Angeles National Forest Land Use Zones) illustrates the location of the Forest Service Land Use Zones relative to the Project components. The majority of the Reservoir and the existing paved areas are located within the Developed Area Interface Land Use Zone. However, the proposed grade control structure at Rocky Point is located within the Back Country Land Use Zone.

The Littlerock Dam and Reservoir are authorized on NFS lands by a special use authorization, considered a non-recreation special-use. Although the dam and the water behind it are owned and managed by PWD,

[1] Generally undeveloped; includes network of Back Country roads that provide access for camping, hiking, biking, and OHV use.

[2] Adjacent to communities and developed sites; includes developed recreation facilities and infrastructure.

its operations are subject to a special-use authorization that is administered by the Forest Service (USFS, 2005b).

San Gabriel Mountains National Monument. On October 10, 2014, the San Gabriel Mountains National Monument was established under the President's Antiquities Act authority. The portion of the Study Area that is located on NFS lands is entirely within this National Monument.

Littlerock Reservoir Recreation Facilities. While the primary purpose of Littlerock Dam is to provide a water source to PWD, recreation facilities have been developed at the Reservoir and the surrounding area. Many of these facilities were built pursuant to PWD's agreements with DWR and the Forest Service (USFS, 2014a). These facilities include:

- Little Rock Lake Resort: Includes a general store, cafe, and boat and cabin rentals (USFS, 2014a).
- Picnic Sites: The Juniper Picnic Site, Rocky Point Picnic Site, Fisherman's Point, and Sage Picnic Site are located adjacent to the Reservoir, while the Santiago Staging Area Picnic Site is located 0.25 mile south of the Reservoir.
- Joshua Tree and Basin Campgrounds located approximately one mile south of the dam.
- OHV roads and trails located east and south of the Reservoir (currently closed at the Reservoir due to the presence of endangered species), and OHV use of the Reservoir (when water levels are lowered by PWD) between the dam and Rocky Point.

Historically, Littlerock Reservoir and the surrounding area have provided a diversity of recreational uses and opportunities. The 1997 Recreation Area Guidelines adopted by the Forest Service estimated a design capacity of 489 vehicles, or 1,252 people at one time in the developed recreation area.

There is currently little to no recreational use or potential at Littlerock Reservoir, and a number of factors have contributed to the area's current state. Impacts to Arroyo Toads required closure of Forest Road 5N04 and the campgrounds south of the Reservoir. The ongoing drought has caused PWD to virtually empty the Reservoir as early as April, leaving no "minimum pool" for water-based recreation. In non-drought years the minimum pool is maintained until Labor Day. Declining budgets and fee revenue to the Forest Service have substantially reduced available enforcement personnel and facility maintenance funds. The threat of Quagga mussels has caused the Forest Service to limit boating activities in 2011. The Forest Service has the option to permit a concessionaire to operate the resort facilities, but due to limited economic potential, no permit has been offered since the last one expired in 2013. The State of California Department of Fish and Wildlife (CDFW) no longer stocks trout due to a lawsuit over endangered species impacts, and the California Office of Environmental Health Hazard Assessment has issued a fish consumption advisory due to presence of mercury in fish tissues (LRWQCB, 2014), both limiting a once popular angling destination. One of the recreational opportunities historically available is OHV use within the Reservoir, which was last authorized in 2013. The Forest Service annually assesses OHV use at the Reservoir based on weather and water levels, and therefore it is not consistently available as an OHV area. In some years, OHV use is permitted within the Reservoir for one to two months beginning in September. In other years, the Reservoir has not been lowered to a sufficient degree to allow for OHV use. The Reservoir is currently closed to public access to protect public health and safety, but no official Forest Service Closure Order has been issued. This means the entry gate is closed and locked, but it is not illegal to enter the area.

Current management of recreation at the Reservoir faces challenges such as drought and ongoing closure to OHV use. In determining potential future recreational use, the Forest Plan specifies that existing facilities and recreational opportunities would either be maintained or would be the subject of site-specific analysis to determine future management. It is reasonably foreseeable that the Forest Service would undertake a project to restore the recreational use and opportunities at Littlerock Reservoir over the life of the Project.

Alternative Recreation Facilities. The following recreational resources are located within 35 miles of the Reservoir, and include facilities for boating, fishing, swimming, camping, hiking, and OHV use.

- **Chilao Campground-** Approximately 11 miles south of Littlerock Reservoir, this campground is located within the ANF and includes 84 campsites (USFS, 2016).
- **Soledad Canyon RV and Camping Resort-** Approximately 11 miles southwest of Littlerock Reservoir, this facility offers camping, swimming, sports courts, bike trails, and a miniature golf course (Thousand Trails, 2016).
- **Acton/ Los Angeles North KOA-** Approximately 14 miles southwest of Littlerock Reservoir, this facility offers camping, swimming, and sports courts (KOA, 2016).
- **Rowher Flat OHV Recreation Area-** Approximately 20 miles west of Littlerock Reservoir, this 10,000-acre recreation area is managed by the Forest Service and is open year-round. It includes 60-miles of trails and areas for camping (USFS, 2011; RiderPlanet, 2015).
- **El Mirage Dry Lake Off-Highway Vehicle Recreation Area-** Approximately 28 miles northeast of Littlerock Reservoir, this recreation area is managed by the Bureau of Land Management and is open year-round. It includes 40 miles of OHV trails as well as areas for camping. Other recreational activities include hiking, rock scrambling, rock hounding and the use of ultra-light aircraft (BLM, 2016).
- **Castaic Lake Recreation Area-** Approximately 33 miles west of Littlerock Reservoir, this recreation area is operated by the County of Los Angeles Department of Parks and Recreation. Facilities include camping, fishing, boating, swimming, and hiking (Castaic Lake, 2016).

C.9.1.2 Truck Routes

The truck routes for transporting excavated sediment would utilize existing roadways along areas characterized by undeveloped land with scattered low-density residential uses. The exact truck route would depend upon the selected sediment storage or disposal site, which would include one of the following:

- **PWD-owned property route:** To access this site, trucks would travel along Cheseboro Road, Barrel Springs Road, and 47th Street. The first approximately 1.6 miles of the route along Cheseboro Road would traverse NFS lands, while the remainder 2.7 miles would be entirely within unincorporated Los Angeles County (see Figure C.9-1: Jurisdictional Boundaries). The area along this route is predominately undeveloped with a scattering of ranch-style homes. The route would cross the California Aqueduct, which is located along the southern border of this site. Water storage tanks are located along 47th Street immediately south of the aqueduct.
- **Existing quarries route:** To access the quarries, trucks would travel along Cheseboro Road and Avenue T. The first approximately 1.6 miles of the route along Cheseboro Road would traverse NFS lands, with approximately three miles across unincorporated Los Angeles County and approximately 0.6 mile across the City of Palmdale (see Figure C.9-3: Land Use Designations). The land uses along this route include scattered residences separated by large areas of undeveloped land. Residential development along Cheseboro Road is primarily located north of the California Aqueduct and south of Avenue T.

C.9.1.3 Proposed Sediment Disposal Sites

The Project would temporarily store or dispose of excavated sediment at one of two possible locations. The location of these sites and their adjacent land uses are discussed below:

- **PWD property:** This 21-acre undeveloped site is located in unincorporated Los Angeles County in an area zoned for single-family residential development (see Figure C.9-3). The property is bordered to the east and west by residential development, to the south by the California Aqueduct, and to the north by undeveloped land.
- **Existing quarries:** There are six sand and gravel pits that are located north and east of Pearblossom Highway and south and east of E Avenue S. The quarries are located in an area of the City of Palmdale that is zoned for Quarry and Reclamation Use (see Figure C.9-3: Land Use Designations).

C.9.2 Regulatory Framework

The Project and alternatives would traverse federal and local jurisdictions. The following discussion summarizes the associated laws, regulations, and standards for these jurisdictions. Table C.9-1 provides a list of standards from the Forest Service Land Management Plan, as well as local policies that are applicable to Recreation and Land Use, and includes a discussion of the Project's consistency with each policy.

C.9.2.1 USDA Forest Service

- **National Forest Management Act (NFMA).** This law requires that any site-specific project that is proposed within a national forest must be consistent with Forest Plan Standards in Part 3 of the Forest Plan. While not required by NFMA, the Project is also consistent with Forest Plan program strategies for Special Use Administration, Watershed Function, and Air Quality, and will help accomplish the Desired Conditions for Natural Areas in an Urban Context by using and restoring an existing facility instead of constructing a new one. The Project also occurs within Land Use Zones suitable for these projects and activities as discussed in Section C.9.1.1.

C.9.2.2 County of Los Angeles

- **County of Los Angeles General Plan Land Use Element (Adopted November 1980).** The County of Los Angeles is currently updating its General Plan. Although the 1980 General Plan (as amended) continues to be the official planning document for the County, the proposed 2035 General Plan was also reviewed in this Recreation and Land Use analysis to identify any policies that may be specific to the Project. At this time, there were no policies proposed in the 2035 General Plan for which the Project would be inconsistent.

  The Project would traverse the following County land use classifications: Non-Urban, Open Space, and Low Density Residential (County of Los Angeles, 1980). As described in Section C.9.1 (Affected Environment), the proposed sediment storage site on 47th Street East is zoned for single-family residential development. Per Title 22 of the County of Los Angeles' Planning and Zoning Code (Section 22.20.100), a Single-Family Residence Zone may accommodate solid fill projects (i.e., more than 1,000 cubic yards) as long as a conditional use permit (CUP) has been obtained by the County (County of Los Angeles, 2014b).
- **Antelope Valley Areawide General Plan (Adopted December 1986).** This areawide plan is a component of the County of Los Angeles General Plan and guides the County's planning efforts for the unincorporated portions of Antelope Valley. The nearest unincorporated rural community to the

Project is the community of Littlerock, which is less than one mile east of the existing quarries. The proposed truck routes for sediment disposal would not travel within the Littlerock community. Per the Antelope Valley Areawide General Plan, the Project would traverse lands classified as "Non Urban," which includes low-density residential, airports, waste disposal facilities, mining operations, and quarries (County of Los Angeles, 1986).

C.9.2.3 City of Palmdale

- **City of Palmdale General Plan (January 1993).** The Land Use Element of the City of Palmdale General Plan provides an overview of existing land uses within the City, which includes six sand and gravel mining operations located along the Little Rock Wash on the southeastern border, as well as one mining operation located on the west side of the City at 70th Street West, south of the California Aqueduct (City of Palmdale, 1993). The Project would consider disposing the excavated sediment at the exhausted mining quarries located within the City along its southeastern border. The quarries are located in an area that is currently zoned for Quarry and Reclamation Use. Any quarry operator who participates with the PWD to receive sediment from the Reservoir must apply to the City for a new CUP or for a major modification to its existing CUP, per the discretion of the City.

Table C.9-1. Consistency with Applicable Recreation and Land Use Plans and Policies

Plan/Policy	Consistency	Explanation
USDA Forest Service Land Management Plan Part 3: Design Criteria for the Southern California National Forests (September 2005)		
The following Land Management Plan Standards are applicable to the Project: • *S9/S10 - Design management activities to meet the Scenic Integrity Objectives shown on the Scenic Integrity Objectives Map* • *S11/S12 – Develop specific conservation measures for TEPCS species using Forest Plan species documents and Appendices* • *S14/S15 – Retention of snags and downed logs in and outside of RCAs* • *S18 - Protect known active and inactive raptor nest areas. When appropriate, a no-disturbance buffer around active nest sites will be required from nest-site selection to fledging.* • *S24 – Mitigate ongoing uses on ESA listed species* • *S31 – Design new facilities to direct public use away from ESA listed, proposed or candidate species* • *S32 - When surveys for species presence/absence are done for threatened, endangered, and proposed species, use established survey protocols, where such protocols exist* • *S47 – Riparian Conservation Area 5-Step Screening Process* • *S60 – Cultural and Historic – applies same protection and consideration to sites not yet evaluate for National Register as to those found eligible*	*Yes*	• *S9/S10 - The Project would not alter the definition of High SIO for the Reservoir, and would be consistent with the SIO of the Forest Plan, as discussed in Section C.11.2 (Visual Resources).* • *S11/S12 – Species guidance documents were used in preparing Biological Evaluations/Assessments. Mitigation is captured in SPC's for a variety of species, as discussed in Section C.3 (Biological Resources).* • *S14/S15 – Any snags that are not a safety threat would be retained. Downed logs would be retained to the extent feasible.* • *S18 - An evaluation of impacts to nesting birds and raptors was conducted in Section C.3 (Biological Resources). To ensure that the Project is consistent with the Forest's management activities, SPCs have been incorporated to avoid impacts to nesting birds.* • *S24 – Project purpose and need is to provide long term habitat protection for arroyo toad by installing a grade control structure.* • *S31 – Grade control structure will avoid impacts by serving as a boundary and barrier to areas occupied by arroyo toad.* • *S32 - The Project would comply with all applicable standards and protocols when conducting surveys for listed plants and wildlife.* • *S47 – RCA Screening Process has been applied. See Biology Section C.3.5.4 for analysis of habitat impacts including riparian areas.* • *S60 – Protection of any non-evaluated sites as eligible for the National Register is provided as applicable. See Section C.4.4 (Cultural Resources).*

Table C.9-1. Consistency with Applicable Recreation and Land Use Plans and Policies

Plan/Policy	Consistency	Explanation
• *S61 – Cultural and Historic - human remains that are not under the jurisdiction of the County Coroner shall remain undisturbed unless there is an urgent reason for their disinterment.*		• *S61 - Procedures noted in Mitigation Measure C-2 provide for the appropriate treatment in the event of an accidental discovery of human remains during Project construction. See Section C.4.4 (Cultural Resources).*
County of Los Angeles General Plan Land Use Element (November 1980)		
Policy 5: Where appropriate, promote more intensive use of industrial sites, especially in areas requiring revitalization.	Yes	Excavated sediment would be disposed at exhausted quarries located within the City of Palmdale. Prior to sediment storage at PWD-owned property on 47th Street, PWD would seek a CUP from the County to be consistent with local zoning. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A).
Policy 6: Encourage the recycling of abandoned mineral extraction sites to recreational, industrial or other productive use.	Yes	PWD will seek to recycle excavated sediment as feasible for use on District and other municipal projects. Sediment that cannot be recycled would be disposed at exhausted quarries located within the City of Palmdale.
Policy 8: Protect the character of residential neighborhoods by preventing the intrusion of incompatible uses that would cause environmental degradation such as excessive noise, noxious fumes, glare, shadowing, and traffic.	Yes	SPCs and mitigation measures have been incorporated to minimize trucking and sediment disposal impacts to nearby residences. See Section C.2 (Air Quality and Climate Change), Section C.8 (Noise), Section C.10 (Transportation and Traffic), and Section C.11 (Visual Resources).
Policy 11: Promote planned industrial development in order to avoid land use conflicts with neighboring activities.	Yes	Excavated sediment would be disposed at exhausted quarries located within the City of Palmdale. Prior to sediment storage at PWD-owned property on 47th Street, PWD would seek a CUP from the County to be consistent with local zoning. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A).
County of Los Angeles Antelope Valley Areawide General Plan (December 1986)		
Policy 32: Encourage recycling and revitalization of deteriorating urban areas by pursuing appropriate demolition, rebuilding, and/or rehabilitation.	Yes	PWD will seek to recycle excavated sediment as feasible for use on District and other municipal projects. Sediment that cannot be recycled would be disposed at exhausted quarries located within the City of Palmdale.
Policy 33: Encourage maintenance, conservation, and rehabilitation to prevent community deterioration.	Yes	Excavated sediment would be disposed at exhausted quarries located within the City of Palmdale. Prior to sediment storage at PWD-owned property on 47th Street, PWD would seek a CUP from the County to be consistent with local zoning. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A).
Policy 62: Mitigate where possible undesirable impacts of adjacent land uses (i.e., noise interruption, visual intrusion, and airborne emissions) through utilization of appropriate buffers, building codes and standards.	Yes	SPCs and mitigation measures have been incorporated to minimize trucking and sediment disposal impacts to nearby residences. See Section C.2 (Air Quality and Climate Change), Section C.8 (Noise), Section C.10 (Transportation and Traffic), and Section C.11 (Visual Resources).
Policy 155: Encourage continued cooperation among federal, state and local agencies in multiple use management of public lands — specifically recognizing recreation as a desirable use.	Yes	PWD is working jointly with the Forest Service to restore the flood control and water storage capacity of the existing Reservoir. There would be no impact to recreation areas outside of the Reservoir.

Table C.9-1. Consistency with Applicable Recreation and Land Use Plans and Policies

Plan/Policy	Consistency	Explanation
City of Palmdale General Plan Land Use Element (January 1993)		
Policy L5.2.1: Discourage encroachment of incompatible uses into or adjacent to designated industrial land, when it can be shown that such uses may ultimately impede development of industrial uses, and that such uses may be established elsewhere in the Planning Area.	Yes	Excavated sediment would be disposed at exhausted quarries within the City of Palmdale that are zoned for quarry and reclamation use. Quarry operators would obtain a new or modified CUP from the City to be consistent with local zoning. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A).
Policy L5.2.2: Assure compatibility of industrial development with adjacent uses: ▪ Adopt development standards to ensure industrial uses are compatible with adjacent uses and with aesthetic views from adjacent rights-or-way, including but not limited to standards for screening of outdoor storage, locations of loading and refuse disposal areas, height, bulk, impervious surface area, architectural enhancement, landscaping, and other appropriate measures.	Yes	Prior to sediment disposal, PWD and/or quarry operator would seek any required CUPs to be consistent with local zoning. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A). SPCs and mitigation measures have also been incorporated to minimize trucking and sediment disposal impacts to nearby residences. See Section C.2 (Air Quality and Climate Change), Section C.8 (Noise), Section C.10 (Transportation and Traffic), and Section C.11 (Visual Resources).
Policy L5.2.7: Adopt performance standards for noise, odors, emissions, vibrations glare, radiation, and other potential impacts of industrial development.	Yes	SPCs and mitigation measures have been incorporated to minimize trucking and sediment disposal impacts to nearby residences. See Section C.2 (Air Quality and Climate Change), Section C.8 (Noise), Section C.10 (Transportation and Traffic), and Section C.11 (Visual Resources).
Policy L7.1.6: Within the Mineral Resource Extraction Zone, ensure that future mining activities over which the City has discretionary authority are compatible with neighboring residential uses: ▪ Ancillary uses allowed on the site should be normally associated with extraction and/or processing of decomposed granite. Uses that are not directly associated (e.g., storage of vehicles/equipment not related to on-site materials extraction) are not appropriate. ▪ Ensure that measures to control noise, dust, and erosion/sedimentation are applied to on-going mining activities. ▪ Require screening from public view all equipment, stockpiles, or wastepiles. ▪ Evaluate truck access to and from the site in order to reduce impacts generated by truck traffic to nearby residents.	Yes	Prior to sediment disposal, PWD and/or quarry operator would seek any required CUPs to be consistent with local zoning. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A). SPCs and mitigation measures have also been incorporated to minimize trucking and sediment disposal impacts to nearby residences. See Section C.2 (Air Quality and Climate Change), Section and Section C.11 (Visual Resources).

Sources: City of Palmdale, 1993; County of Los Angeles, 1986, 1980; USDA Forest Service 2005a, 2005b, 2005c.

C.9.3 Issues Identified During Scoping

Table C.9-2 below provides a list of recreation and land use issues raised during the public scoping period for the EIS/EIR [see Appendix E (Summary of Scoping Process)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion of the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.9-2. Scoping Issues Relevant to Recreation and Land Use

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
The Draft EIS/EIR should evaluate and consider changes in reservoir management as a control measure for methylmercury production.	The Project addresses the increased sedimentation of the Reservoir, and would restore the Reservoir to its 1992 water storage and flood control capacity. Future changes in Reservoir management that are for other purposes are outside of the scope of this EIS/EIR. For a discussion of Project impacts related to water quality, please see Section C.12.
The Draft EIS/EIR should evaluate and consider reducing concentrations of inorganic mercury in reservoir sediment through remediation of historic gold and mercury mines upstream of reservoirs.	The Forest Service is not aware of any abandoned mines that have been identified as sources of mercury. Remediation of historic mines is not within the scope of this EIS/EIR. For a discussion of Project impacts related to water quality, please see Section C.12.
City of Palmdale	
The project description indicated that the sediment will be transported off-site to properties owned by the Palmdale Water District or locations accepting sediment for placement and spreading. A Temporary Use Permit for Stockpiling will be required for this activity. No undisturbed land can be used to store/stockpile of sediment, additionally any stockpiling cannot exceed three (3) feet in height of material.	Section C.9.2 discusses the need for obtaining a conditional use permit prior to the use of proposed sediment storage or disposal sites in the City of Palmdale or unincorporated Los Angeles County. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A).
An alternative consisting of long-term year-round closure of the Reservoir, as included within the NOP, does not specify where the sediment will be transported in order to maintain Reservoir storage capacity. The method of disposal of sediment must be discussed as part of any such alternative.	The preliminary alternatives that were considered during the scoping process have been revised; see Section B.4.6 (Description of Alternatives Eliminated from Further Consideration). The revised Alternative 1 would not require year-round closure of the Reservoir. Section B.4.5.1 (Reduced Sediment Removal Intensity Alternative [Alternative 1]) provides a full description of proposed sediment removal and disposal activities. Truck transport routes and proposed sediment storage and disposal sites under Alternative 1 are identical to the proposed action.
Regarding the disposal of sediment within existing quarries, the City wishes to note that the existing mining operations are operating under a Conditional Use Permit. Any disposal or infill of any material within the open pits will require that the selected mining operation, or operations, submit for a major modification to their CUP or that a new Conditional Use Permit application be submitted. Additionally, the Office of Mine and Reclamation will be notified of the major modification to the approved Reclamation Plan(s). The NOP also identifies the potential for an alternative utilizing \ slurry pipelines to transport the sediment to the selected quarry pit or pits. The City would like to comment that an encroachment permit will also be required for any work to be done in the public right-of-way.	The preliminary alternatives that were considered during the scoping process have been revised, with some initial alternatives (e.g., Slurry Excavation Alternative) eliminated due to issues of feasibility or fundamental disadvantages. See Section B.4.6 (Description of Alternatives Eliminated from Further Consideration) for a discussion of these alternatives. Regarding use of sediment disposal sites in the City of Palmdale, PWD would obtain a conditional use permit from the City prior to the start of Project activities to ensure compliance with local zoning requirements. SPC LAND-1 (Obtain Necessary Conditional Use Permits) has been incorporated into the Project to ensure compliance with local zoning requirements (see Appendix A).

C.9.4 Environmental Consequences

Significance Criteria. The following significance criteria for Recreation and Land Use were derived from previous environmental impact assessments for similar projects, agency thresholds, and from the CEQA Guidelines (Appendix G, Environmental Checklist Form, Section IX). Impacts of the Project or alternatives would be considered significant and would require mitigation if they:

- Criterion LU1: Conflict with applicable adopted local, State, or federal land use or recreation plans, goals, policies, or regulations.

- Criterion LU2: Preclude a permitted use on nearby property or create a disturbance that would diminish the function of a particular land use.
- Criterion LU3: Contribute to the long-term loss or degradation of the recreational value of an established, designated, or planned recreational use area.

Impact Assessment Methodology. The impact analysis for Recreation and Land Use begins with a survey of existing land uses and recreational resources within the Project area through the use of site visits, aerial maps, discussions with jurisdictional agencies (i.e., Palmdale Water District, Forest Service, City of Palmdale, and County of Los Angeles), and review of applicable planning and policy documents. These baseline conditions for the Project area are described in Sections C.9.1 (Affected Environment) and C.9.2 (Regulatory Framework).

C.9.4.1 Proposed Action/Project

Direct and Indirect Effects Analysis

Conflict with applicable adopted local, State or federal land use or recreation plans, goals, policies, or regulations (Criterion LU1)

The implementation of the Project is consistent with the Land Use Zones, Strategies, and Desired Conditions in the 2005 Forest Service's Land Management Plan. The Project complies with all applicable Forest Plan Standards listed in Table C.9-1. As described in Section C.9.2, the Project is consistent with Forest Plan program strategies for Special Use Administration, Watershed Function, and Air Quality, and will help accomplish the Desired Conditions for Natural Areas in an Urban Context by using and restoring an existing facility instead of constructing a new one.

As a State water agency, PWD has pre-emptive jurisdiction over local plans, policies, and regulations. However, the Project is anticipated to comply with the plans and policies of the City of Palmdale and the County of Los Angeles. Appendix A describes the SPCs that would limit noise and emissions from construction equipment and dump trucks, and Sections C.2 (Air Quality and Climate Change) and C.8 (Noise) include additional mitigation measures to ensure that Project-related noise and emissions are within acceptable levels to local jurisdictions.

The Project would also comply with local zoning requirements regarding sediment disposal. Prior to any movement of excavated sediment, PWD would either: (1) work with the County of Los Angeles to obtain a CUP for sediment storage at the property on 47th Street East; and/or (2) coordinate with participating quarry operators in the City of Palmdale to ensure that sediment disposal occurs only at sites that have been granted a new CUP or a modification to an existing CUP. This commitment to comply with local zoning requirements at the sediment storage and disposal sites has been incorporated into the Project as SPC LAND-1 (Obtain Necessary Conditional Use Permits). See Appendix A for the full text of the Project's SPCs.

Given that the Project is subject to the discretionary review and approval of the Forest Service, and that PWD is coordinating with the County of Los Angeles and the City of Palmdale to meet their permitting and zoning requirements, the Project would be consistent with applicable plans, policies, and regulations.

Preclude a permitted use on nearby property or create a disturbance that would diminish the function of a particular land use (Criterion LU2)

PWD is working jointly with the Forest Service to restore the flood control and water storage capacity of the Reservoir. These proposed restoration activities would neither expand existing facilities nor convert

NFS lands outside of the Study Area. The existing designation and use of NFS lands would not be affected by the Project.

Outside of NFS lands, no existing recreation facilities, parks, or trails were identified along the proposed truck routes that would be disrupted by sediment hauling activities. The truck routes would utilize existing roadways that would not affect adjacent trail facilities or trail use in Los Angeles County or City of Palmdale.

As discussed in Section C.9.1.1, the Reservoir and surrounding area is currently closed to physical entry. However, this closure is not permanent and the Forest Service may decide to allow recreational use of the Reservoir at any time during the life of the Project. The Forest Plan specifies that the primary recreational facilities and uses be retained or studied on a site-specific basis for retention. Recreational opportunities are currently very limited, but may be adversely affected if the Project were to reduce future recreational opportunities and/or conflict with the ability of the Forest Service to implement the Forest Plan.

If the Reservoir were to be re-opened to public use, Project activities (i.e., construction and excavation) would continue to temporarily preclude the recreational use of the Reservoir and surrounding area (Impact L-1). Sediment storage and disposal may also preclude future land use at the proposed disposal sites (Impact L-2). The following discussion describes these potential impacts and the mitigation measures that are proposed to minimize these impacts to the degree feasible.

Impact L-1: Project construction and excavation would preclude or disturb existing recreational resources.

Grade Control Structure

Construction of the grade control structure and the initial excavation and removal of sediment from the Reservoir bottom at the Project site would begin in July 2017 and extend until seasonal water refill of the Reservoir (between mid-November to January). Historically the Reservoir has provided recreational opportunities, primarily in the form of water-based recreation (i.e., boating and fishing). However, this recreational resource has been affected by the current drought, which has caused PWD to virtually empty the Reservoir as early as April, leaving no “minimum pool” for water-based recreation. Other forms of recreation such as OHV use have been intermittently allowed by the Forest Service within the Reservoir.

As discussed in Section C.9.1, the Reservoir is currently closed to public access to protect public health and safety. Construction of the grade control structure would require PWD to lower the Reservoir water level in July to allow for construction at Rocky Point, and the Reservoir would be closed to the public during this time to ensure safety. However, construction of the grade control structure is not expected to result in a substantial effect on recreation use, because it would occur during 2017 when the potential for recreational use is expected to continue to be very low. In addition, the Reservoir may continue to be closed to the public during that time. Although the Reservoir and surrounding area are currently closed to public use, this closure may be lifted by the Forest Service at any time during the life of the Project. Mitigation Measure L-1a (Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer) is recommended to ensure that all Project-related activities are coordinated with the Forest Service.

Initial Annual Sediment Removal- Restore to 1992 Design Capacity

Once the grade control structure is complete, initial sediment removal (lasting 7 to 12 years) would only occur annually during a timeframe when PWD is permitted to remove water from the Reservoir for beneficial use (all sediment removal activities would be scheduled from Labor Day to mid-November to

January). The Reservoir would be closed to the public during this time to ensure safety. Under current operating conditions, during this timeframe, PWD is permitted to obtain water from the Reservoir as necessary for a potable water source. Therefore, water-based recreational activities are not considered available during this period and would not be affected. However, the temporary closure of the Reservoir during sediment removal would preclude OHV use of the Reservoir floor when it may otherwise be available. Mitigation Measure L-1a (Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer) is recommended to ensure that all Project-related activities are coordinated with the Forest Service. Future recreational use and opportunities at the developed recreation sites would also be impacted by temporary closure of the Reservoir for initial sediment removal. Mitigation Measure L-1b (Provide Compensation to Forest Service for Lost Recreational Opportunity) is recommended to ensure this impact is reduced.

Ongoing Annual Sediment Removal – Operation and Maintenance

After initial sediment removal has occurred and the Reservoir is restored to 1992 design storage capacity, the potential for future water-based recreational opportunities would be limited by maintaining the increased storage capacity of the Reservoir, thereby maintaining the increase in the amount of water necessary to fill the Reservoir to minimum pool. Filling the Reservoir to minimum pool would require approximately ten days to two weeks longer than under current conditions (due to increased capacity); however, this would typically occur between January and March when seasonal rain and snowmelt occurs and refills the Reservoir to minimum pool depths. There would be no effect on the typical water-based recreation season of 95 days (June until Labor Day); however, there may one or two years over the life of the Project where the Reservoir would not reach minimum pool. Mitigation Measure L-1b (Provide Compensation to Forest Service for Lost Recreational Opportunity) would minimize this impact by compensating for any lost recreational opportunity. As the Reservoir is not currently listed for recreational fish stocking by CDFW, the removal of non-native fish would eliminate what remains of a historic recreational fishery. However, no historical recreational use data specific to fishing at the Reservoir is available that would allow quantification of this impact.

During the ongoing sediment removal phase of the Project (operation and maintenance), sediment removal would occur for the life of the Reservoir to maintain its storage capacity. These operation and maintenance activities would occur in a manner identical to that described above for initial sediment removal (between Labor Day to mid-November to January).

In order to ensure that sediment removal and grading of the Reservoir bottom would occur in a manner that could allow the Reservoir to continue as a feasible OHV area, SPC LAND-2 (Design Grading to Accommodate OHV Access) would be included as part of the Project. As described in Appendix A, SPC LAND-2 would require the Project grading plan to consider future safety and access for OHVs. To further reduce recreational impacts to the extent feasible, Mitigation Measure L-1a (Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer) is recommended to ensure that all Project-related activities are coordinated with the Forest Service. Future long-term recreational use and opportunities at the developed recreation sites would be impacted by temporary closure of the Reservoir for ongoing sediment removal. Mitigation Measure L-1b (Provide Compensation to Forest Service for Lost Recreational Opportunity) is recommended to ensure this impact is reduced.

Mitigation for Impact L-1

L-1a **Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer**. PWD shall develop the Project construction schedule and coordinate construction with the Forest Service's Authorized Officer. Coordination efforts shall ensure the following occurs unless otherwise approved by the Forest Service's Authorized Officer:

- Construction and maintenance activities are scheduled to avoid heavy recreational use periods (including major holidays) as determined by the Forest Service's Authorized Officer;
- Staging areas for Project activities are located so as to minimize the need to temporarily close developed recreation facilities;
- Timetables for the required period of use will attempt to limit the need for and duration of temporary closures to the greatest extent feasible; and
- The Forest Service and PWD will meet annually prior to Labor Day to discuss these measures and reach consensus. The Forest Service retains final discretion over any temporary closures.

L-1b **Provide Compensation to Forest Service for Lost Recreational Opportunity.** The recreational impacts of the Project during construction could vary widely in any given year. PWD and the Forest Service agree as part of an annual meeting to assess the likely duration of closures and jointly determine the number of days of lost recreation opportunities directly attributable to the Project during the construction time period. Any areas that remain closed to recreation for other factors not associated with the construction of the Project will not be considered. PWD shall compensate the Forest Service based on long term historical records of revenue generated per day kept prior to start of construction of the Project, and also an agreed upon value of public recreation, as determined by literature or studies. Compensation may be any form allowable under current agreement authorities, including cash, equipment, supplies, or in-kind labor. Contributions may be made to a third party, or applied off-site if agreed to by the parties. The goal is for PWD and the Forest Service to build a partnership that provides and enhances recreation fairly and commensurate with Project impacts.

SPC Applicable to Impact L-1

SPC LAND-2 **(Design Grading to Accommodate OHV Access)**

CEQA Significance Conclusion

After the initial construction and excavation activities proposed throughout the summer and fall of the Project's first year (2017), the proposed action would not preclude recreational use of the Reservoir during the peak summer months until after Labor Day, assuming that the Reservoir is opened for public use during the life of the Project. The implementation of Mitigation Measure L-1a would ensure that ongoing annual excavation and sediment removal is scheduled to avoid closure of the Reservoir during the peak recreational period. The implementation of Mitigation Measure L-1b ensures the Forest Service is compensated for lost recreational opportunity at the Reservoir. The incorporation of SPC LAND-2 would also ensure that grading activities would not permanently preclude OHV use within the Reservoir. With the implementation of these measures, potentially significant recreation impacts would be reduced to a less than significant level (Class II).

Impact L-2: Sediment transport and disposal would preclude or disturb existing uses along the truck route and disposal sites.

As proposed, the Project would transport excavated sediment along existing roadways and temporarily store and/or dispose of sediment at one of two sites. The PWD-owned site on 47th Street East is undeveloped, although existing and possibly future residential development borders the property to the east and west. Existing residences are also adjacent to the sand and gravel quarries in the City of Palmdale along Avenue T. The numerous dump truck trips (maximum of 480 per day) that would be required during the first seven to 12 years of sediment removal, followed by the truck trips during operation and maintenance of the Reservoir, would create nuisance impacts to nearby residences. Residents along the truck routes or disposal sites would be disturbed by the increased truck traffic along roadways, as well as by the noise and emissions from the trucks.

SPCs Applicable to Impact L-2

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ- (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan)

SPC NOI-2 (PWD Site Buffer Requirements)

CEQA Significance Conclusion

Transport of sediment during the initial excavation period, as well as during subsequent operation and maintenance phases, would create nuisance impacts that would be significant and unavoidable. SPCs AQ-1 through AQ-5, NOI-1, and NOI-2 would minimize the disturbance to nearby residences to the degree feasible. However, given the length of time that the disturbance would occur (i.e., initial activities over seven to 12 years plus continued annual excavation), and the proximity of existing residences to the truck routes and sediment storage/disposal sites, the impacts to residential land uses cannot be mitigated to a level that is less than significant (Class I).

Contribute to the long-term loss or degradation of the recreational value of an established, designated, or planned recreational use area (Criterion LU3)

As described in Section C.9.1 (Affected Environment), the Project would restore the existing Reservoir to its 1992 design, which would increase the capacity of the Reservoir. By extending the life of the Reservoir as a functional waterbody, the Project would enhance water-based recreational opportunities offered at the Reservoir. The Project would not contribute to the long-term loss or degradation of recreational resources within the Study Area.

C.9.4.2 Alternative 1: Reduced Sediment Removal Intensity

Direct and Indirect Effects Analysis

Conflict with applicable adopted local, State or federal land use or recreation plans, goals, policies, or regulations (Criterion LU1)

Alternative 1 differs from the Project primarily in regards to the schedule for construction and excavation activities. The components of the alternative, including the location of proposed grade control construction, sediment excavation, and staging areas; dump truck routes; and the proposed sediment storage and disposal sites would be identical to the Project. Alternative 1 would also incorporate SPC LAND-1 (Obtain Necessary Conditional Use Permits), which would ensure that this alternative would comply with local zoning requirements (see Appendix A). Therefore, Alternative 1 would be the same as the Project in that it would comply with and support the goals of the 2005 Forest Service's Land Management Plan, and would meet the permitting and zoning requirements of the City of Palmdale and the County of Los Angeles. Alternative 1 would be consistent with applicable plans, policies, and regulations.

Preclude a permitted use on nearby property or create a disturbance that would diminish the function of a particular land use (Criterion LU2)

Impact L-1: Project construction and excavation would preclude or disturb existing recreational resources.

Alternative 1 would be identical to the Project in that it would not alter the designation or use of NFS lands. However, this alternative would reduce the weekly construction schedule to five days per week (instead of six days per week under the Project), and would begin the annual excavation activities for initial sediment removal on July 1st instead of after Labor Day. The extended schedule for proposed construction and excavation activities would preclude water-based recreational use of the Reservoir, assuming that the Reservoir is opened to the public during the life of the Project and PWD does not lower the Reservoir water level during the summer months (as it is permitted to do during drought years). Impacts to recreational resources at the Reservoir would be increased (i.e., impacting water-based recreational use) and would be more prolonged than under the proposed Project, given that the closure of recreational facilities under Alternative 1 would occur during the heaviest use periods. Implementation of the following measures and commitments would reduce impacts to the extent feasible: Mitigation Measure L-1a would ensure that all Project-related activities are coordinated with the Forest Service. Mitigation Measure L-1b would ensure the Forest Service is compensated for lost recreational opportunity at the Reservoir. The incorporation of SPC LAND-2 would ensure that grading activities would not permanently preclude OHV use within the Reservoir.

Mitigation for Impact L-1

L-1a (Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer)

L-1b (Provide Compensation to Forest Service for Lost Recreational Opportunity)

SPC Applicable to Impact L-1

SPC LAND-2 (Design Grading to Accommodate OHV Access)

CEQA Significance Conclusion

Compared with the Project, Alternative 1 would double the number of years that the Reservoir would be closed to the public as a result of construction and excavation activities. Assuming that the Forest Service re-opens the Reservoir to future public access, recreational use of the Reservoir during the peak summer period would continue to be precluded for a minimum of 13 years. The Forest Service and PWD would continue to annually review the construction schedule and assess future recreation opportunities (see Mitigation Measure L-1a), and the Forest Service would be compensated for lost recreational opportunity (see Mitigation Measure L-1b). However, due to the extended closure, impacts to this popular recreational resource would be significant and unavoidable (Class I).

Impact L-2: Sediment transport and disposal would preclude or disturb existing uses along the truck route and disposal sites.

The dump truck routes and the proposed sediment storage and disposal sites for Alternative 1 would be identical to the Project. However, this alternative includes a reduced weekly construction schedule, which would reduce air quality emissions and the number of daily truck trips. Nuisance impacts to residences adjacent to these sites and truck routes would be reduced in intensity (e.g., less daily truck traffic, reduced daily air quality emissions) in comparison to the Project. The total number of years over which disturbance would occur to residential uses in the Project area would double under Alternative 1. SPCs AQ-1 through AQ-5, NOI-1, and NOI-2 would be incorporated into Alternative 1 and would minimize adverse effects on nearby residents to the degree feasible.

SPCs Applicable to Impact L-2

SPC AQ-1 (Limit Engine Idling)

SPC AQ-2 (Fugitive Dust Controls)

SPC AQ-3 (Off-Road Engine Specifications)

SPC AQ-4 (On-Road Engine Specifications)

SPC AQ-5 (Reduce Off-Road Vehicle Speeds)

SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan)

SPC NOI-2 (PWD Site Buffer Requirements)

CEQA Significance Conclusion

Similar to the Project, transport of sediment during the initial excavation period, as well as during subsequent operation and maintenance phases, would create nuisance impacts that would be significant and unavoidable under Alternative 1. A reduced construction schedule as well as proposed SPCs AQ-1 through AQ-5, NOI-1, and NOI-2 would lessen the daily disturbance to nearby residences in comparison to the Project. However, given the length of time that disturbance would occur (i.e., initial activities over 13 years plus continued annual excavation), and the proximity of existing residences to the truck routes and sediment storage/disposal sites, the impacts to residential land uses cannot be mitigated to a level that is less than significant (Class I).

Contribute to the long-term loss or degradation of the recreational value of an established, designated, or planned recreational use area (Criterion LU3)

Alternative 1 would be identical to the Project in that it would restore the existing Reservoir to its 1992 design capacity. By extending the life of the Reservoir as a functional waterbody, this alternative would enhance water-based recreational opportunities offered at the Reservoir. Alternative 1 would not contribute to the long-term loss or degradation of recreational resources within the Study Area.

C.9.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under Alternative 2, the Reservoir would continue to accumulate sediment until it no longer functioned as a viable water storage facility. Littlerock Dam currently operates under an ANF Special Use Permit as a designated potable water source, and the inability of the Reservoir to operate as a storage facility would require the demolition of the Dam per the conditions identified in the Special Use Permit. As the future management and possible removal of the Dam and the Reservoir would be determined by the review authority of the Forest Service and DWR, Alternative 2 would not conflict with applicable State or federal plans, policies, or regulations. Removal of the Dam would also require the removal of approximately 2.8 million cubic yards of sediment and dam concrete, which would be transported and disposed of in a manner that was consistent with local planning requirements. Alternative 2 would be consistent with applicable plans, policies, and regulations.

Under Alternative 2, there would be no construction of a grade control structure at the Reservoir and management of the Reservoir would not include excavation of sediment. Alternative 2 would not create short-term impacts to a recreational resource, and Impact L-1 (Project construction and excavation would preclude or disturb existing recreational resources) would not occur under this alternative. The potential for Alternative 2 to permanently preclude recreational use of the Reservoir is discussed below under Impact L-3.

In the event that continued sedimentation of the Reservoir under Alternative 2 would compromise the long-term integrity of the Dam, future No Action/No Project activities may include demolishing the Dam and removing approximately 2.8 million cubic yards of sediment and dam concrete. Given that the amount of sediment to be removed under Alternative 2 is more than twice the volume as the Project, the number of dump truck trips and the length of the excavation schedule would be of a greater intensity. Alternative 2 would create a severe disturbance to residences along the truck routes and near the disposal sites (Impact L-2).

Impact L-3: Increased sedimentation of the Reservoir would contribute to the long-term degradation of a recreational resource.

Neither the proposed Project nor Alternative 1 would contribute to the long-term loss or degradation of the recreational value of Littlerock Reservoir (Criterion LU3). However, continued sediment accumulation under Alternative 2 would result in the annual reduction of Reservoir capacity, which would limit the future water-based recreational opportunities within the Study Area. In the event that DWR determined that the Reservoir no longer functioned as a viable water storage facility, the Dam could be demolished and the Reservoir would be permanently closed. The loss of this recreational resource would be irreversible.

CEQA Significance Conclusion

Future removal of the Dam, which may be required under Alternative 2, would involve the excavation and transport of more than twice the volume of sediment as the Project. Such activities would create disturbances to residences along the dump truck routes and disposal sites that would be significant and unavoidable (Class I). Eventual demolition of the Dam, which may occur per the authority of the DWR, would create a significant and irreversible impact (Class I) from the loss of this recreational resource.

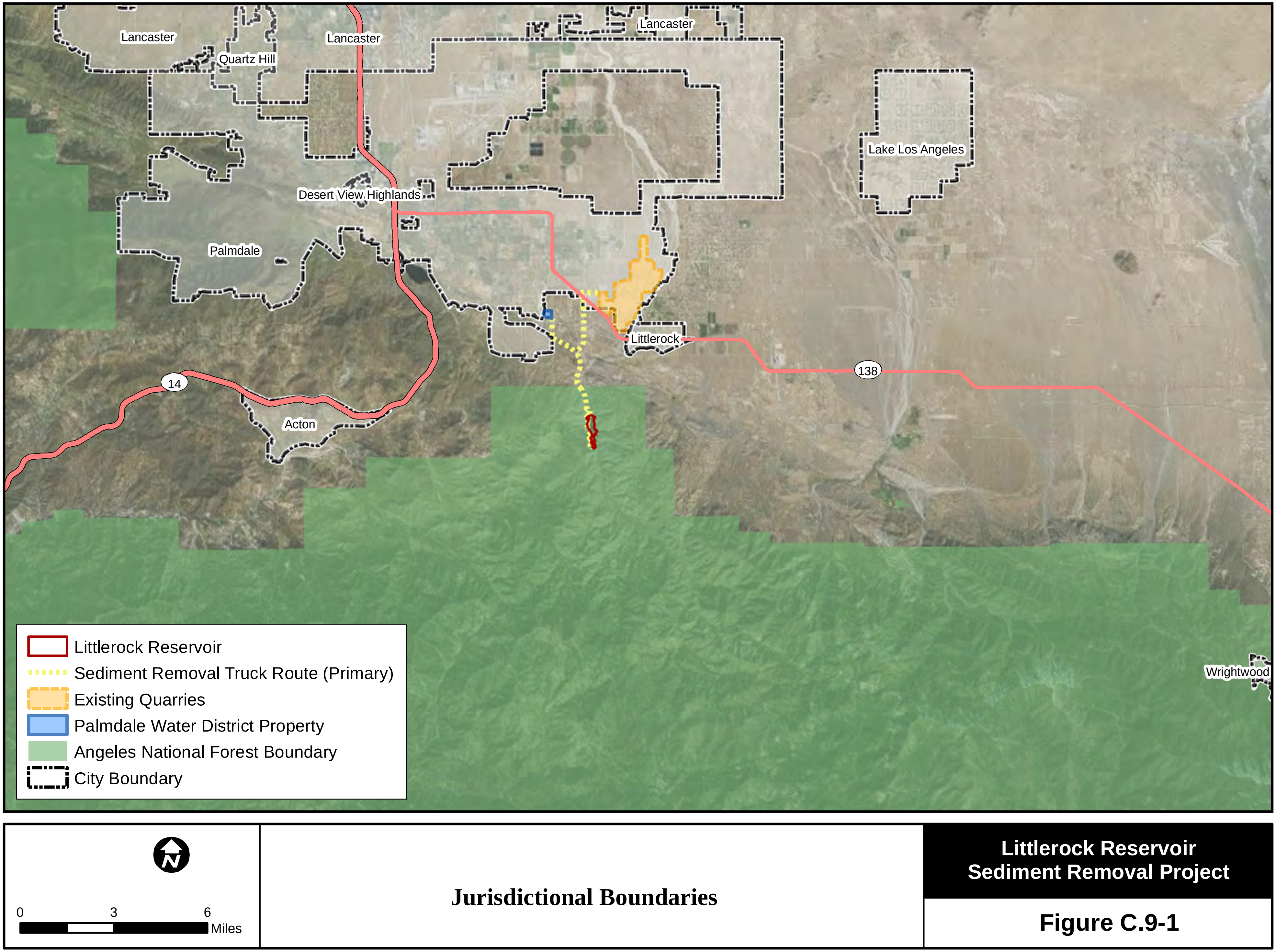
C.9.5 Impact Summary

Table C.9-3 summarizes the direct and indirect environmental impacts of the Project and the alternatives on recreation and land use. Refer to Section C.9.4 for the entire environmental analysis and the full text of recommended mitigation.

Table C.9-3. Summary of Impacts and Mitigation Measures – Recreation and Land Use

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
L-1: Project construction and excavation would preclude or disturb existing recreational resources.	Class II	Class I	NA	Yes	Mitigation Measure L-1a: Coordinate Project scheduling and maintenance activities with Forest Service Authorized Officer Mitigation Measure L-1b: Provide Compensation to Forest Service for Lost Recreational Opportunity SPC LAND-2 (Design Grading to Accommodate OHV Access)
L-2: Sediment transport and disposal would preclude or disturb existing uses along the truck route and disposal sites.	Class I	Class I	Class I	No	SPC AQ-1 (Limit Engine Idling) SPC AQ-2 (Fugitive Dust Controls) SPC AQ-3 (Off-Road Engine Specifications) SPC AQ-4 (On-Road Engine Specifications) SPC AQ-5 (Reduce Off-Road Vehicle Speeds) SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) SPC NOI-2 (PWD Site Buffer Requirements)
L-3: Increased sedimentation of the Reservoir would contribute to the long-term degradation of a recreational resource.	NA	NA	Class I	Yes	None

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.
NA = Not Applicable

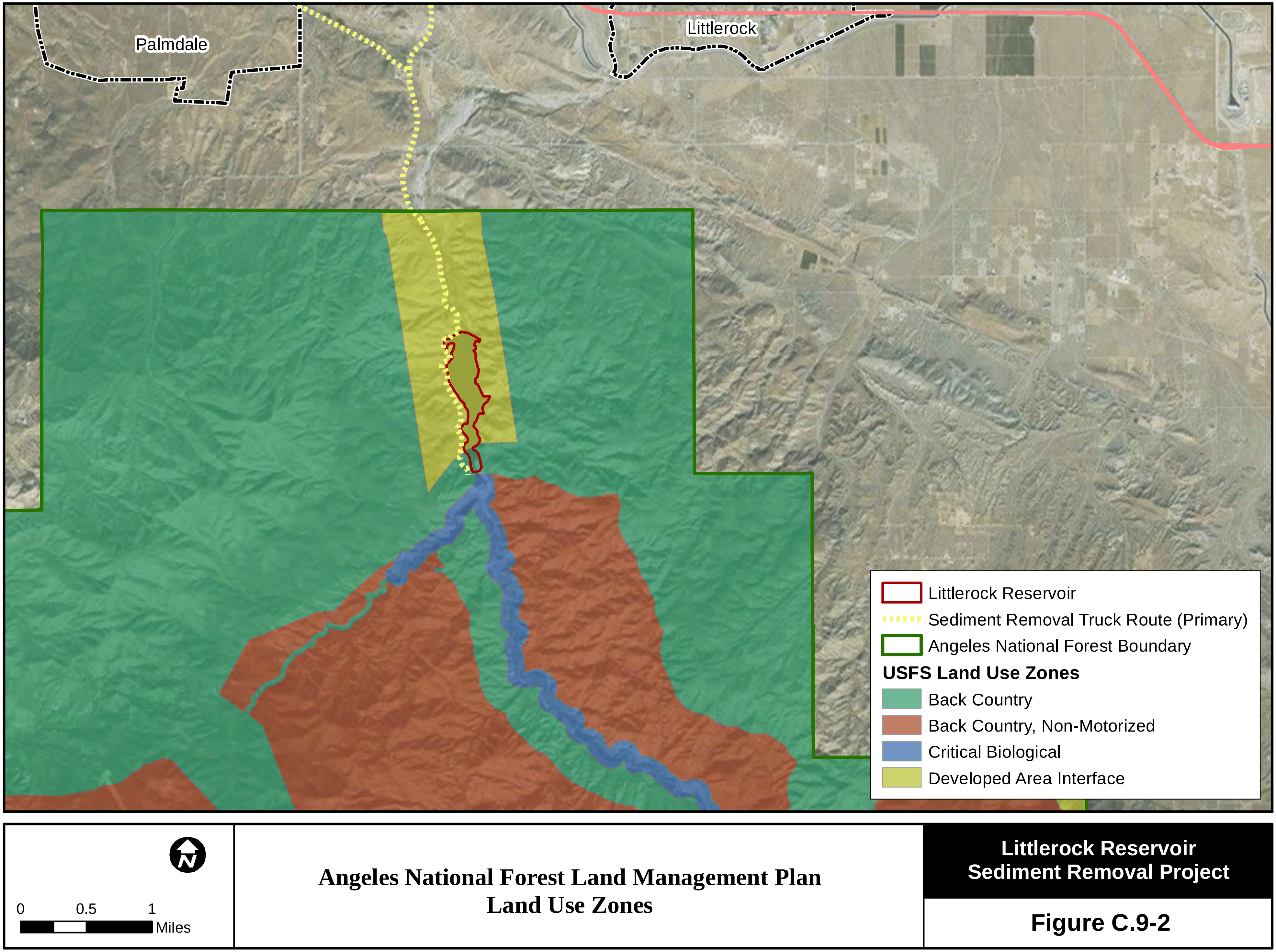


Jurisdictional Boundaries

Littlerock Reservoir Sediment Removal Project

Figure C.9-1

May 2016

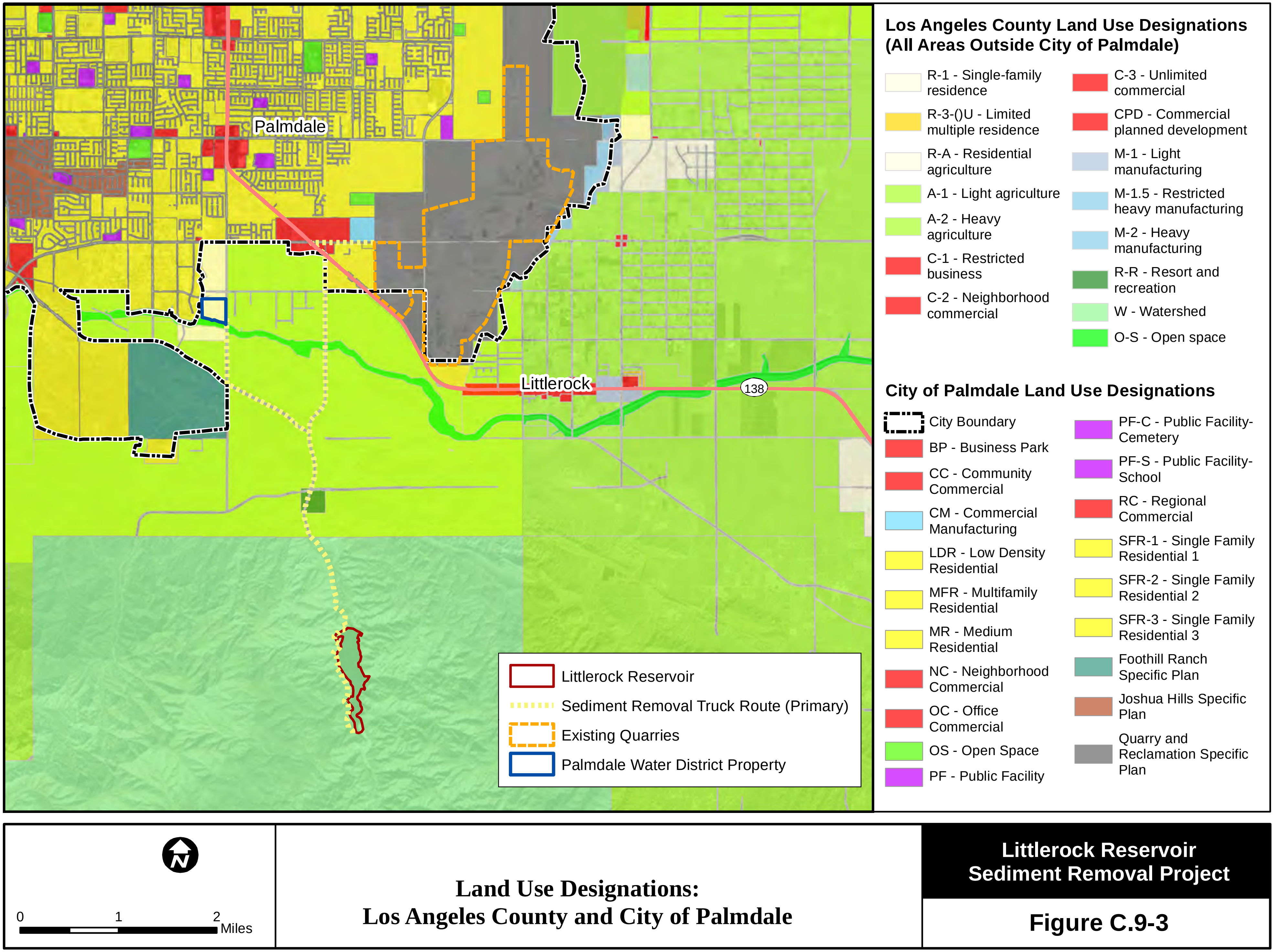


Angeles National Forest Land Management Plan
Land Use Zones

Littlerock Reservoir
Sediment Removal Project

Figure C.9-2

May 2016



Land Use Designations: Los Angeles County and City of Palmdale

Littlerock Reservoir Sediment Removal Project

Figure C.9-3

May 2016

C.10 Transportation and Traffic

This section focuses only on the proposed action (Project) potential to adversely impact capacity of the existing street system, impede the flow of emergency service vehicles, and damage roadways during construction of the Project. Potential impacts related to changes in air traffic patterns, and adopted policies, plans, or programs supporting alternative transportation were found to not require analysis in this EIS/EIR.

C.10.1 Affected Environment

The affected environment for the Project includes roadways and parking areas within the Angeles National Forest (ANF) accessing the Reservoir, as well as public roadways utilized by construction workers and the hauling of sediment materials to the disposal site(s). Haul truck travel routes and roadways that provide access to the Project site are shown in Figure B-1. A description of these roadways follows:

- **Cheseboro Road from ANF boundary to Pearblossom Highway**. Cheseboro Road is a two lane north-south roadway that extends south from Pearblossom Highway to the Angeles National Forest entrance. It continues south into the Angeles National Forest to provide access to Littlerock Reservoir. The posted speed limit along Cheseboro Road is 55 miles per hour and no passing is allowed along most of the roadway. This stretch of Cheseboro Road contains a bridge crossing of the California Aqueduct.
- **Pearblossom Highway between Cheseboro Road and Avenue T**. Pearblossom Highway is a four lane east-west roadway located approximately four miles north of Littlerock Reservoir. At its intersection with Fort Tejon Road, Pearblossom Highway turns to the southeast and becomes a part of State Route 138. The intersection of Pearblossom Highway and Cheseboro Road is unsignalized.
- **Avenue T between Pearblossom Highway and Quarries**. Avenue T is a two lane east-west roadway. The intersection of Avenue T and Pearblossom Highway is signalized with a dedicated right turn lane from westbound Pearblossom Highway onto Avenue T. The posted speed limit on Avenue T is 55 miles per hour.
- **Barrel Springs Road between Cheseboro Road and 47th Street**. Barrel Springs Road is a two lane roadway that intersects with Cheseboro Road approximately two miles north of Littlerock Reservoir and runs in a northwesterly direction to Pearblossom Highway. The posted speed limit on Barrel Springs Road is 55 miles per hour and passing is allowed.
- **47th Street between Barrel Springs Road and PWD sediment disposal property**. 47th Street East is a two lane north-south roadway that runs generally parallel to Cheseboro Road approximately one mile to the west of Cheseboro Road. The posted speed limit on 47th Street Road is 45 miles per hour and passing is allowed. This stretch of 47th Street contains a bridge crossing of the California Aqueduct.

The existing roadway characteristics and traffic conditions for each of the study area roadways are summarized in Table C.10-1. The data in this table were obtained from field reconnaissance, the traffic volume websites of Caltrans and the Los Angeles County Department of Public Works, and the City of Palmdale's "Traffic Volume Map." This data represents the most currently available traffic volume data and is considered representative of current traffic conditions on study area roadways.

Table C.10-1. Roadway Characteristics and 2006 Traffic Volumes

Roadway	Jurisdiction	Lanes	Average Daily Traffic Volume
Cheseboro Road	Los Angeles County City of Palmdale (north of Ave T-8) U.S. Forest Service (inside Angeles National Forest)	2	1,400 – north of Mt. Emma Rd 380 – south of Mt. Emma Rd
Pearblossom Highway	Caltrans	4	19,600 – south of Ave T
Avenue T	City of Palmdale	2	14,400
Barrel Springs Road	Los Angeles County	2	1,140
47th Street East	Los Angeles County	2	430

Source: Los Angeles County Department of Public Works, Caltrans Traffic Census, City of Palmdale's "Traffic Volume Map"

There are four key intersections in the study area that could potentially be affected by the Project. These intersections and the type of traffic control currently in place at each intersection are listed below:

- Cheseboro Road at Barrel Springs Road (stop sign on Barrel Springs Road)
- Cheseboro Road at Pearblossom Highway (stop sign on Cheseboro Road)
- Pearblossom Highway at Avenue T (4-way signal with a dedicated right turn lane from westbound Pearblossom Highway to eastbound Avenue T)
- Barrel Springs Road at 47th Street East (stop signs on 47th Street East)

The levels of service (LOS) at these intersections for the morning and afternoon peak hours were determined using the intersection capacity utilization (ICU) methodology. LOS is a qualitative indicator of an intersection's operating conditions that is used to represent various degrees of congestion and delay. It is measured from LOS A (excellent conditions) to LOS F (extreme congestion), with LOS A through D considered to be acceptable. The level of service is based on the ICU value, which is a comparison of the traffic volumes passing through the intersection to the overall capacity of the intersection. The relationship between the ICU value and the level of service at an intersection is shown in Table C.10-2.

Table C.10-2. Relationship Between ICU Values and Levels of Service

ICU Value	LOS
0.00 to 0.60	A
> 0.60 to 0.70	B
> 0.70 to 0.80	C
> 0.80 to 0.90	D
> 0.90 to 1.00	E
> 1.00	F

Source: FHWA, 2014

These four study area intersections were analyzed to determine their existing operation conditions during the morning and afternoon peak hours. Based on the existing peak hour traffic volumes, the turning movement counts, and the existing number of lanes at each intersection, the LOS has been determined at each intersection, as summarized in Table C.10-3. As shown, all study area intersections currently operate at LOS A during the peak periods.

Table C.10-3. Existing Intersection LOS

Intersection	ICU Value & LOS	
	A.M. Peak Hour[1]	P.M. Peak Hour[2]
Cheseboro Road/Barrel Springs Road	0.182 – A	0.176 – A
Cheseboro Road/Pearblossom Highway	0.302 – A	0.481 – A
Pearblossom Highway/Avenue T	0.640 – B	0.738 – A
Barrel Springs Road/47th Street East	0.209 – A	0.175 – A

Source: Garland Associates, 2014
Notes:
1 - 7:00 a.m. to 9:00 a.m.
2 - 4:00 p.m. to 6:00 p.m.

C.10.2 Regulatory Framework

The roadway network within the study area that would serve as an access system for the Project is within the jurisdiction of four public agencies: the U.S. Forest Service, Caltrans, Los Angeles County, and the City of Palmdale. These agencies are responsible for the operation and maintenance of the study area roadways. Table C.10-4 provides a list of plans and policies that are applicable to surface transportation, and includes a discussion of the Project's consistency with each plan or policy. The Project's consistency with the Forest Plan is discussed in Section C.9.2 (Recreation and Land Use).

Table C.10-4. Consistency with Applicable Transportation Plans and Policies

Plan/Policy	Consistency	Explanation
California Vehicle Code		
California Vehicle Code (CVC), division 2, chapter 2.5; div. 6, chap. 7; div. 13, chap. 5; div. 14.1, chap. 1 & 2; div. 14.8; div. 15 (DMV 2014) includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways.	Yes	SPC TRA-1 requires preparation of a Traffic Control Plan, which shall identify the need for any oversize vehicle, weight restriction, or encroachment permits.
Los Angeles County 2035 Draft General Plan Mobility Element		
Policy M 4.7: Maintain a minimum LOS D, where feasible; however, allow LOS below D on a case by case basis in order to further other General Plan goals and policies, such as those related to environmental protection, infill development, and active transportation.	Yes	As discussed in Section C.10.4, LOS D would be maintained during Project activities at all study area intersections utilizing the utilizing the ICU Methodology.
City of Palmdale General Plan Circulation Element		
Policy C1.4.1: Strive to maintain a Level of Service (LOS) C or better to the extent practical; in some circumstances, a LOS D may be acceptable for a short duration during peak periods.	Yes	As discussed in Section C.10.4, LOS D would be maintained during Project activities at all study area intersections utilizing the utilizing the ICU Methodology. The LOS at the intersection of Cheseboro Road and Pearblossom Highway is LOS with and without the Project. Furthermore, adverse impacts to without project LOS conditions would occur only temporarily (during annual sediment removal period only) and during the afternoon peak period.

Source: DMV, 2014; County of Los Angeles, 2014; City of Palmdale, 1994

C.10.2.1 Federal

- **Title 49, Code of Federal Regulations (CFR).** Title 49, CFR, Subtitle B governs the transportation of oversize vehicles, those transporting the types of materials defined as hazardous, and the marking of the transportation vehicles. Any operations oversize vehicles and those transporting hazardous materials would be required to comply with the regulations, including guidelines set forth by the Federal Motor Carrier Safety Administration.

C.10.2.2 State

- **California Vehicle Code (CVC).** CVC, division 2, chapter 2.5; div. 6, chap. 7; div. 13, chap. 5; div. 14.1, chap. 1 & 2; div. 14.8; div. 15 (DMV, 2014) includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.

- **Caltrans Guide for the Preparation of Traffic Impact Studies (TIS).** The following criteria are a starting point in determining when a TIS is needed (Caltrans, 2002):
  - Generates over 100 peak hour trips assigned to a State highway facility.
  - Generates 50 to 100 peak hour trips assigned to a State highway facility – and, affected State highway facilities are experiencing noticeable delay; approaching unstable traffic flow conditions (LOS "C" or "D").
  - Generates 1 to 49 peak hour trips assigned to a State highway facility – and, affected State highway facilities are experiencing significant delay; unstable or forced traffic flow conditions (LOS "E" or "F").

C.10.2.3 Local

- **County of Los Angeles General Plan.** Both the approved General Plan (1974) and public review draft of the 2035 General Plan (2014) were reviewed for transportation goals and policies applicable to the Project (County of Los Angeles 1974 and 2014a). The 2035 Draft General Plan contains the following applicable policy pertaining to LOS performance standards (County of Los Angeles, 2014):
  - **Policy M 4.7:** Maintain a minimum LOS D, where feasible; however, allow LOS below D on a case by case basis in order to further other General Plan goals and policies, such as those related to environmental protection, infill development, and active transportation.
- **City of Palmdale General Plan.** A review of the Palmdale General Plan Circulation and Environmental Resources Elements identified the following applicant General Plan policies pertaining to LOS performance standards (City of Palmdale, 1994):
  - **Policy C1.4.1:** Strive to maintain a Level of Service (LOS) C or better to the extent practical; in some circumstances, a LOS D may be acceptable for a short duration during peak periods.

C.10.3 Issues Identified During Scoping

Table C.10-5 below provides a list of transportation and traffic-related issues raised during the public scoping period for the EIS/EIR [see Appendix E (Scoping Summary Report)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.10-5. Scoping Issues Relevant to Transportation and Traffic

Comment	Consideration in the EIS/EIR
County of Los Angeles Department of Public Works	
Requests submittal of a traffic impact analysis to Public Works for review and approval, which should include Traffic Index calculations for all proposed haul routes.	Section C.10.4 provides a quantitative traffic analysis for review utilizing the ICU Methodology, Highway Capacity Manual Unsignalized Intersection Methodology, and against the applicable Congestion Management Plan
City of Palmdale	
A traffic impact study is required to: • Address the impacts of additional trips from this project on the City street network, which has the potential for severe wear and tear of City streets; • Address the level of service of those intersections along each proposed delivery route and mitigate impacts as necessary; and • Address and mitigate any impacts on the structural sections of the existing roads along the proposed delivery routes.	Section C.10.4 provides a quantitative traffic analysis for review utilizing the ICU Methodology, Highway Capacity Manual Unsignalized Intersection Methodology, and against the applicable Congestion Management Plan. Impact Criterion TRA3 (and Impact T-3) analyzes the potential for significant damage to public roadways. Mitigation Measures are proposed, as applicable, within Section C.10.4 and Standard Project Commitments related to traffic and road damage are provided in Appendix A.

C.10.4 Environmental Consequences

Significance Criteria. The following significance criteria for transportation and traffic were derived from applicable regulations and performance standards identified in Section C.10.2 (Regulatory Framework) and knowledge of the proposed haul truck routes utilized during sediment removal. Impacts of the Project or alternatives would be considered significant and would require mitigation if:

- Criterion TRA1: Exceed, either individually or cumulatively, a level of service objective or other roadway performance standard established by Caltrans, Los Angeles County, or City of Palmdale for study area roadway segments and intersections.
- Criterion TRA2: Impede emergency vehicle access.
- Criterion TRA3: Result in significant damage to public roadways.

Impact Assessment Methodology. The general objective of the traffic impact analysis is to evaluate the impacts of the Project on the roadways necessary to access the Reservoir and those proposed as routes for sediment disposal. The traffic analysis addresses the temporary increase in vehicle trips on Cheseboro Road, Pearblossom Highway, Barrel Springs Road, 47th Street East, and Avenue T generated by annual temporary Project activities.

During construction of the grade control structure, vehicle trips will primarily be from initial delivery of equipment and daily trips from construction workers. During the initial and ongoing excavation of sediment, a number of vehicles would be traveling to and from the Project site, including trucks delivering equipment to the site, trucks transporting sediment away from the Reservoir, and construction worker commute trips to and from the site. The traffic volumes associated with initial sediment activities were estimated and then added to the existing traffic volumes of the utilized roadway network. With and without project scenarios are compared to applicable Caltrans, Los Angeles County, and City of Palmdale performance standards for utilized roadway segments and critical intersections. This phase of the Project is utilized for analysis because it represents worst-case traffic volumes of the Project.

C.10.4.1 Proposed Action/Project

Direct and Indirect Effects Analysis

Exceed, either individually or cumulatively, a level of service objective or other roadway performance standard established by Caltrans, Los Angeles County, or City of Palmdale for study area roadway segments and intersection (Criterion TRA1)

During construction of the grade control structure, vehicle trips will primarily be from initial delivery of equipment and daily trips from construction workers. During the initial and ongoing excavation of sediment, a number of vehicles would be traveling to and from the Project site, including trucks delivering equipment to the site, trucks transporting sediment away from the site, and construction workers' vehicles commuting to and from the site. The traffic volumes associated with these activities were estimated for each phase of Project activities. These estimated volumes were then added to the baseline traffic volumes and the impacts on the utilized roadway network were evaluated. Similarly, the traffic volumes associated with the annual sediment removal program were estimated for peak activity levels and the traffic impacts were evaluated.

The trip generation characteristics are based on work force estimates and quantities of material that would be transported to and from the site on a typical day of construction during times of peak construction activity. Project generated traffic was added to the existing and projected future baseline traffic volumes on the affected roadways and a comparative analysis was conducted of traffic volumes and levels of service with and without the Project. The analysis addresses existing traffic conditions and two future baseline scenarios: 2022 and 2027. The year 2022 represents the mid-point of the initial sediment removal phase (which is expected to occur from 2017 to 2027), while the year 2027 represents the initial year of the ongoing operation and maintenance sediment removal activities. The before-and-after traffic conditions are evaluated for each of these analysis scenarios.

Trip Generation. The following represents the maximum daily trip generation of the Project for each activity:

- During construction of the grade control structure, it is estimated that the construction activities would generate a total of 30 employee trips per day and six (6) truck trips per day (also shown in Table B-1).
- During the initial sediment excavation phase, activities would generate approximately 70 employee trips per day and 480 truck trips per day (also shown in Table B-2). As the sediment excavation activities would generate substantially more traffic than the construction of the grade control structure, the traffic impact analysis is based on the levels of traffic that would be generated by the excavation activities.
- During ongoing operation and maintenance (O&M), sediment excavation and other O&M activities would generate approximately 180 truck trips per day (also shown in Table B-3).

The levels of Project-generated traffic during the initial excavation phase are summarized in Table C.10-6. For the employee commuter trips, it has been assumed that each of the 30 employees would generate one inbound trip and that five outbound trips would also occur during the morning peak hour. The outbound trips account for drop-offs and other miscellaneous trips during the peak hour. For the afternoon peak hour it was assumed that there would be five inbound trips and 30 outbound trips. It was also assumed that there would be 10 additional auto/light-duty vehicle trips throughout the day.

Table C.10-6 indicates that the Project would generate a total of 560 vehicle trips per day, 75 trips during the morning peak hour (50 inbound and 25 outbound), and 75 trips during the afternoon peak hour (25 inbound and 50 outbound). It was assumed for the analysis that total truck trips per day would be spread out evenly over a 12-hour working day.

Table C.10-6. Project-Generated Traffic During Initial Sediment Removal Phase

	Project Generated Traffic		
Time Period	**Trucks**	**Autos/Light-Duty Vehicles**	**Total**
Daily Traffic			
Round Trips	240	40	280
One-way Trips	480	80	560
AM Peak Hour			
Inbound	20	30	50
Outbound	20	5	25
Total	40	35	75
PM Peak Hour			
Inbound	20	5	25
Outbound	20	30	50
Total	40	35	75

To quantify the increases in traffic that would occur on each affected roadway segment and at each study area intersection as a result of the Project, the site-generated traffic was geographically distributed onto the roadway network using the following assumptions.

- The distribution for the automobile/light-duty vehicle traffic would be 20 percent on Barrel Springs Road, 35 percent on Pearblossom Highway, 35 percent on State Route 138, and 10 percent on 47th Street East. All automobile/light-duty vehicles accessing the Reservoir would utilize Cheseboro Road.
- The truck route to and from the sediment disposal site would run along Cheseboro Road, Pearblossom Highway, and Avenue T. During annual sediment removal, 94 percent of haul truck trips would utilize this route (450 total daily trips, or 225 round trips).
- Based on a maximum limit of 10,000 cubic yards of sediment transported to the PWD site per year, only 6 percent of annual haul truck traffic would travel along Barrel Springs Road and 47th Street East (30 total daily trips, or 15 round trips) to access this site.

Using the generated traffic volumes shown in Table C.10-6 and the geographical distribution assumptions outlined above, the volumes of Project traffic on each access street and at each study area intersection were determined for the traffic impact analysis.

The levels of Project-generated traffic during the ongoing operation and maintenance (O&M) sediment removal phase are summarized in Table C.10-7.

Table C.10-7. Project-Generated Traffic During Ongoing O&M Sediment Removal Phase

Time Period	Project Generated Traffic		
	Trucks	Autos/Light-Duty Vehicles	Total
Daily Traffic			
Round Trips	90	15	105
One-way Trips	180	30	210
AM Peak Hour			
Inbound	8	10	18
Outbound	8	2	10
Total	16	12	28
PM Peak Hour			
Inbound	8	2	10
Outbound	8	10	18
Total	16	12	28

Baseline Traffic Volumes. The existing traffic volumes represent peak hour traffic counts that were taken at the study area intersections in September, 2014. The year 2022 traffic volumes were projected by applying an expansion factor of 17.4 percent to the existing traffic volumes and the year 2027 traffic volumes were projected by applying an expansion factor of 24.8 percent to the existing traffic volumes. These expansion factors were derived from Exhibit D-1, "General Traffic Volume Growth Factors," of the Los Angeles County Congestion Management Program (Los Angeles County Metropolitan Transportation Authority, 2010).

Impact T-1: Exceed, either individually or cumulatively, an established level of service standard for roadways, highways, and intersections utilized by the Project

Los Angeles County Intersection Capacity Utilization (ICU) Methodology. Based on the Los Angeles County "Traffic Impact Analysis Report Guidelines" (Los Angeles County Department of Public Works, January 7, 1997), an impact is considered adverse if the Project related increase in the volume/capacity ratio or ICU value equals or exceeds the thresholds shown below in Table C.10-8. If the Project's contribution would exceed these values, then the Project would result in an increase in traffic which would be substantial in relation to the existing traffic load and capacity of the street system.

Table C.10-8. Significance Criteria for Intersections

Pre-Project		Project Increase In ICU Value
LOS	ICU Value	
C	0.71 to 0.80	0.04 or more
D	0.81 to 0.90	0.02 or more
E/F	0.91 or more	0.01 or more

Source: Los Angeles County, 1997

Initial Sediment Excavation Phase. The before-and-after ICU values and levels of service at the four study area intersections are shown in Table C.10-9 for the morning and afternoon peak hours for the existing conditions scenario for the initial sediment excavation phase.

Table C.10-9. Project Impact on Intersection Levels of Service – Existing Conditions as Baseline

Intersection	Existing Conditions (2014)	Existing Plus Project	Increase in ICU
Cheseboro Road/Barrel Springs Road			
AM Peak Hour	0.182 – A	0.227 – A	0.045
PM Peak Hour	0.176 – A	0.210 – A	0.034
Cheseboro Road/Pearblossom Highway			
AM Peak Hour	0.302 – A	0.346 – A	0.044
PM Peak Hour	0.481 – A	0.531 – A	0.050
Pearblossom Highway/Avenue T			
AM Peak Hour	0.640 – B	0.644 – B	0.004
PM Peak Hour	0.725 – C	0.756 – C	0.031
47th Street E/Barrel Springs Rd			
AM Peak Hour	0.209 – A	0.214 – A	0.005
PM Peak Hour	0.175 – A	0.176 – A	0.001

It should be noted that the traffic volumes and level of service calculations summarized in Table C.10-9 would be temporary (after Labor Day to approximately December 15) and incorporate the assumption that the sediment hauling trucks would have a passenger car equivalency (PCE) factor of 2.0. This adjustment factor accounts for the assumption that a haul truck would utilize the same amount of intersection capacity as two automobiles (passenger cars). The PCE factors are applied to trucks in the ICU calculations because trucks are physically larger than automobiles and have slower acceleration rates.

As shown in Table C.10-9, none of the intersections would be adversely impacted by temporary annual Project traffic during the initial sediment excavation phase for the existing conditions scenario.

The ICU values and levels of service at the four study area intersections are shown in Table C.10-10 for the morning and afternoon peak hours for the year 2022 scenario with and without the Project for the initial sediment excavation phase.

Table C.10-10. Project Impact on Intersection Levels of Service – Year 2022 as Baseline

Intersection	2022 Without Project	2022 With Project	Increase in ICU
Cheseboro Road/Barrel Springs Road AM Peak Hour PM Peak Hour	 0.195 – A 0.188 – A	 0.240 – A 0.223 – A	 0.045 0.035
Cheseboro Road/Pearblossom Highway AM Peak Hour PM Peak Hour	 0.335 – A 0.548 – A	 0.381 – A 0.597 – A	 0.046 0.049
Pearblossom Highway/Avenue T AM Peak Hour PM Peak Hour	 0.732 – C 0.835 – D	 0.737 – C **0.864 – D**	 0.005 **0.029**
47th Street E/Barrel Springs Rd AM Peak Hour PM Peak Hour	 0.229 – A 0.189 – A	 0.234 – A 0.191 – A	 0.005 0.002

Note: **Bold** represents an adverse impact

As shown in Table C.10-10, one intersection would be adversely impacted by temporary annual Project traffic during the initial sediment excavation phase for the year 2022 scenario. The intersection of Pearblossom Highway at Avenue T would operate at an ICU value of 0.835 and LOS D during the afternoon peak hour without the Project and at an ICU value of 0.864 and LOS D during the afternoon peak hour with the Project. As the Project-related increase in the ICU value would be 0.29, the Project's impacts would be adverse according to the Los Angeles County guidelines. Mitigation Measure T-1 (Restrict Haul Truck Movements during PM Peak Period) would be utilized, as feasible, to reduce this impact.

Ongoing Operations and Maintenance Sediment Removal. The Project's impacts during the annual maintenance activities would be less when compared to the impacts described above for the initial sediment excavation phase. The volume of traffic would be less (180 daily truck trips versus 480 during the initial excavation phase) and the duration of impacts would be shorter.

The ICU values and levels of service at the four study area intersections are shown in Table C.10-11 for the morning and afternoon peak hours for the year 2027 scenario with and without the Project. The impact analysis for this scenario is based on the traffic volumes generated during the ongoing operation and maintenance phase of the Project.

Table C.10-11. Project Impact on Intersection Levels of Service – Year 2027 as Baseline

Intersection	2027 Without Project	2027 With Project	Increase in ICU
Cheseboro Road/Barrel Springs Road AM Peak Hour PM Peak Hour	 0.201 – A 0.192 – A	 0.218 – A 0.207 – A	 0.017 0.015
Cheseboro Road/Pearblossom Highway AM Peak Hour PM Peak Hour	 0.352 – A 0.576 – A	 0.373 – A 0.594 – A	 0.021 0.018
Pearblossom Highway/Avenue T AM Peak Hour PM Peak Hour	 0.772 – C 0.881 – D	 0.774 – C 0.891 – D	 0.002 0.010
47th Street E/Barrel Springs Rd AM Peak Hour PM Peak Hour	 0.236 – A 0.193 – A	 0.239 – A 0.194 – A	 0.003 0.001

As shown in Table C.10-11, none of the intersections would be adversely impacted by temporary annual Project-generated traffic during the ongoing operation and maintenance sediment removal phase.

The Los Angeles County "Traffic Impact Analysis Report Guidelines" (LACDPW, 1997) have significance criteria for the analysis of two-lane roadways. The criteria show the acceptable percentage increase thresholds for peak hour traffic volumes on the affected roadways. The criteria are applicable only to two-lane roadways that operate at LOS C, D, E, and F. If the roadways operate at LOS A or B, then the significance thresholds are not applicable. The two-lane roadway segments in the study area are Cheseboro Road, Barrel Springs Road, 47th Street E, and Avenue T, all of which operate at LOS A based on the two-lane roadway capacity values (as opposed to the intersection LOS values). The Project would not, therefore, have an adverse impact based on the two-lane roadway criteria.

Highway Capacity Manual Unsignalized Intersection Methodology. While the LOS analysis summarized in Tables C.10-9, C.10-10, and C.10-11 indicates that the Project would not result in an adverse impact at the intersection of Cheseboro Road and Pearblossom Highway, this conclusion is based on ICU and LOS values that represent the physical capacity of the intersection as a whole. While this methodology is consistent with the Los Angeles County guidelines for traffic impact studies, it does not account for the types of traffic control that are in place at each intersection; i.e., traffic signals or stop signs. Additional analysis has been conducted, therefore, to determine if the intersections that are controlled by stop signs could adequately accommodate the projected truck movements without excessive delays.

The analysis indicated that the delays at the stop sign on Cheseboro Road at Pearblossom Highway would be excessive because the vehicles waiting at the stop sign to turn left from northbound Cheseboro Road onto Pearblossom Highway would operate at LOS F during the afternoon peak period. During the afternoon peak hour, vehicles at the stop sign (including the Project-generated traffic) would have an average delay of 350 seconds for the year 2022 scenario, which is greater than five minutes per vehicle, and 190 seconds for the year 2027 scenario, which is greater than three minutes per vehicle. This calculation is based on the unsignalized intersection methodology from the *Highway Capacity Manual* (TRB, 2010). As the Project would result in LOS F conditions at this intersection, the impact would be adverse. The other unsignalized intersections along the haul routes would operate at acceptable levels of service and the Cheseboro Road/Pearblossom Highway intersect would operate at acceptable levels of service during the morning peak hour.

As traffic conditions at the Pearblossom Highway/Cheseboro Road intersection would be unacceptable, the Project would result in an adverse impact at this location unless mitigation were incorporated. Although the installation of a traffic signal would alleviate the traffic delays, signalization would not be warranted or feasible in conjunction with the Project. Mitigation Measure T-1 (Restrict Haul Truck Movements during PM Peak Period**)** would be utilized, as feasible, to reduce this impact.

Congestion Management Program: The "Guidelines for CMP Transportation Impact Analysis," which is Appendix D of the Congestion Management Program for Los Angeles County (Los Angeles County Metropolitan Transportation Authority, 2010), indicate that a traffic analysis shall address all CMP arterial monitoring intersections where the Project would add 50 or more trips during the weekday peak hour and any mainline freeway monitoring locations where the Project would add 150 or more trips in either direction during the peak hour. The CMP arterial roadway nearest to the Project site is State Route 138, which runs along Fort Tejon Road and Pearblossom Highway, and the intersection of Pearblossom Highway at Avenue T is a designated CMP arterial monitoring intersection. As summarized above, the Project would not result in a change in the LOS values during the morning or afternoon peak hours as the intersection would remain at LOS B, C, or D for the various analysis scenarios. The CMP guidelines indicate that an intersection would be significantly impacted if a project would result in an increase in the ICU value of 0.02 or greater at an intersection that is projected to operate at LOS F. The Project would not, therefore, result in a significant impact at this intersection according to the CMP guidelines because the LOS values would remain at LOS B, C, or D.

With regard to freeways, the nearest freeway is the Antelope Valley Freeway (State Route 14). As the Project would generate a maximum of 75 vehicle trips during the peak hours, the Project would not add 150 or more trips to a freeway segment. As the Project's impacts are well below the thresholds cited above, the Project would not exceed a level of service standard established by the county congestion management agency.

Mitigation for Impact T-1

MM T-1 **Restrict Haul Truck Movements during PM Peak Period.** Implement a haul truck schedule that requires trucks to avoid traveling along the Cheseboro Road–Pearblossom Highway–Avenue T haul route during the afternoon peak period, i.e., from 4:00 to 6:00 p.m., to the extent feasible. The alternative route to be utilized is Cheseboro Road, Barrel Springs Road, 47th Street E, Pearblossom Highway, and Avenue T.

SPCs Applicable to Impact T-1

SPC TRA-1 (Prepare Traffic Control Plan)

CEQA Significance Conclusion

The primary conclusions of the transportation and traffic analysis is that initial sediment removal (to restore the Reservoir design capacity) would result in a significant impact at the intersection of Cheseboro Road and Pearblossom Highway during the afternoon peak hours using both the ICU Methodology and unsignalized intersection methodology from the *Highway Capacity Manual*. This impact could be mitigated by prohibiting/limiting truck hauling activities during the afternoon peak periods. The impact would be reduced to the maximum extent feasible with the incorporation of Mitigation Measure T-1 and SPC TRA-1. While a significant impact would occur if trucks utilize this section of the proposed haul route during the afternoon peak period, the implementation of this mitigation and SPCs would result in less than significant impacts at this study area intersection (Class II).

Impede emergency vehicle access (Criterion TRA2)

Impact T-2: Result in inadequate emergency response

The Project could potentially result in impacts relative to emergency access because the presence of large trucks along the haul routes. The impacts would be adverse if trucking activities would restrict access to adjacent land uses or along travel routes with no suitable alternative access. These impacts would be less than significant because of the implementation of SPC TRA-1, which is described in Appendix A. Furthermore, while the Project would generate traffic resulting in unacceptable levels of service and delays at the intersection of Cheseboro Road and Pearblossom Highway during the afternoon peak period (slowing down emergency access flow during this peak period only), this impact would be mitigated to the extent feasible by Mitigation Measure T-1.

Mitigation for Impact T-2

MM T-1 (Restrict Haul Truck Movements during PM Peak Period)

SPCs Applicable to Impact T-2

SPC TRA-1 (Prepare Traffic Control Plan)

CEQA Significance Conclusion

Potential impacts to emergency access would be less than significant with the implementation of SPC TRA-1 and Mitigation Measure T-1 as part of the Project (Class II).

Result in significant damage to public roadways (Criterion TRA3)

Impact T-3: Project truck trips result in significant damage to public roadways

The repetitive movement of dump trucks along the roadways that would be used as haul routes between the reservoir and the sediment disposal sites could potentially result in pavement damage on the affected roadways. As discussed in Section B.2.5.1, at the completion of grade control structure construction and annual sediment removal activities, PWD would restore all internal Reservoir access roads, parking areas, and travel paths to equal or better conditions as they existed prior to activity commencement. SPC TRA-2 ensures any roadway damage within the ANF is corrected immediately following all activities.

Public roadways that would be used as haul routes are as follows:

- Cheseboro Road between the Angeles National Forest boundary and Pearblossom Highway
- Pearblossom Highway between Cheseboro Road and Avenue T
- Avenue T between Pearblossom Highway and the mining pits/quarries to the east
- Barrel Springs Road between Cheseboro Road and 47th Street E
- 47th Street E between Barrel Springs Road and PWD property north of the California Aqueduct
- Additional route segment of 47th Street E between PWD property and Pearblossom Highway and Pearblossom Highway to Avenue T during the afternoon peak period (under implementation of Mitigation Measure T-1)

The trucking activities could result in pavement damage such as ruts, cracks, potholes, etc., which would require pavement maintenance and rehabilitation to restore the roadways to their pre-Project condition. SPC TRA-2 ensures any roadway damage within public roads is corrected immediately following all activities.

SPCs Applicable to Impact T-3

SPC TRA-2 (Pavement Rehabilitation – Public or National Forest Roadways)

CEQA Significance Conclusion

Roadway damage, both within the ANF and along the haul routes on public roadways, would occur with implementation of the Project. With the implementation of SPC TRA-2, these impacts would be less than significant (Class III).

C.10.4.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Exceed, either individually or cumulatively, a level of service objective or other roadway performance standard established by Caltrans, Los Angeles County, or City of Palmdale for study area roadway segments and intersection (Criterion TRA1)

Impact T-1: Exceed, either individually or cumulatively, an established level of service standard for roadways, highways, and intersections utilized by the Project.

With regard to the traffic/transportation impacts of Alternative 1 as compared to the Project, Alternative 1 would generate fewer truck trips on a daily basis and during the peak periods for the initial sediment removal activities; however, the duration of this phase would be extended to an estimated 13 years (as compared to 7 to 12 years for the Project). The number of dump trucks hauling the sediment would be reduced to six trucks, as compared to 16 trucks for the Proposed action, and the maximum number of truck trips per day would be reduced to 180 trips (90 round trips), as compared to 480 trips (240 round trips) for the Proposed action.

The comparative levels of traffic that would be generated during the initial excavation phase for the Project and Alternative 1 are summarized in Table C.10-12.

Table C.10-12. Comparison of Generated Traffic During Initial Sediment Removal Phase

Time Period	Generated Traffic – Alternative 1 vs. Project		
	Trucks	**Autos/Light-Duty Vehicles**	**Total**
Daily Traffic			
Round Trips	90 (240)	15 (40)	105 (280)
One-way Trips	180 (480)	30 (80)	210 (560)
AM Peak Hour			
Inbound	11 (20)	**10 (30)**	21 (50)
Outbound	11 (20)	**2 (5)**	13 (25)
Total	22 (40)	12 (35)	34 (75)
PM Peak Hour			
Inbound	11 (20)	**2 (5)**	13 (25)
Outbound	11 (20)	**10 (30)**	21 (50)
Total	22 (40)	12 (35)	34 (75)

The impacts of Alternative 1 on the levels of service at the study area intersections would be less than what was shown for the Project in Table C.10-10 during the initial sediment removal phase because of the reduced volumes of site-generated traffic. The traffic analysis for the Project indicates no significant adverse impact at any of the intersections during the morning peak hour and an adverse impact at one intersection during the afternoon peak hour based on the ICU analysis methodology. The adverse impact at the intersection of Pearblossom Highway and Avenue T for the Project would not occur for Alternative 1 because the increase in the ICU value would be below the significance threshold. Although the Project's impacts on traffic delay at the stop sign on northbound Cheseboro Road at Pearblossom Highway would be reduced for Alternative 1 as compared to the Project, this alternative would still result in an adverse delay compared to baseline conditions during the afternoon peak period.

The traffic impacts for the ongoing annual O&M sediment removal activities would be the same for Alternative 1 as that of the Project, as shown in Table C.10-11.

Mitigation for Impact T-1

MM T-1 (Restrict Haul Truck Movements during PM Peak Period)

SPCs Applicable to Impact T-1

SPC TRA-1 (Prepare Traffic Control Plan)

CEQA Significance Conclusion

Alternative 1 impacts at the intersection of Pearblossom Highway and Avenue T would be less than significant. While a significant impact would occur on northbound Cheseboro Road at Pearblossom Highway during the afternoon peak period, the implementation of this mitigation and SPCs would result in less than significant impacts at this study area intersection (Class II).

Impede emergency vehicle access (Criterion TRA2)

Impact T-2: Result in inadequate emergency response

The reduction in daily traffic volumes of large trucks along the haul routes would reduce impacts relative to emergency access. However, Alternative 1 increases the duration of sediment removal every year by starting in July. The impacts would remain adverse if trucking activities would restrict access to adjacent land uses or along travel routes with no suitable alternative access. These impacts would be less than significant because of the implementation of SPC TRA-1, which is described in Appendix A. Furthermore, while the Project would continue to generate traffic volumes resulting in unacceptable delays at the intersection of Cheseboro Road and Pearblossom Highway during the afternoon peak period (slowing down emergency access flow during this peak period only), this impact would be mitigated to the extent feasible by Mitigation Measure T-1 and SPC TRA-1.

Mitigation for Impact T-2

MM T-1 (Restrict Haul Truck Movements during PM Peak Period)

SPCs Applicable to Impact T-2

SPC TRA-1 (Prepare Traffic Control Plan)

CEQA Significance Conclusion

Potential impacts to emergency access would be less than significant with the implementation of SPC TRA-1 and Mitigation Measure T-1 as part of Alternative 1 (Class II).

Result in significant damage to public roadways (Criterion TRA3)

Impact T-3: Project truck trips result in significant damage to public roadways

While the number of trucks would be reduced on an annual basis, the total number of truck trips needed to restore the Reservoir to design capacity would be the same. Therefore, Alternative 1 merely slows the potential for roadway damage during this phase by extending the initial sediment removal phase over more years. The trucking activities of Alternative 1 could result in identical pavement damage such as ruts, cracks, potholes, etc., when compared to the Project, which would require pavement maintenance and rehabilitation to restore the roadways to their pre-Project condition. SPC TRA-2 ensures any roadway damage within public roads is corrected immediately following all activities.

SPCs Applicable to Impact T-3

SPC TRA-2 (Pavement Rehabilitation – Public or National Forest Roadways)

CEQA Significance Conclusion

Roadway damage, both within the ANF and along the haul routes on public roadways, would occur with implementation of Alternative 1. With the implementation of SPC TRA-2, these impacts would less than significant (Class III).

C.10.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at an annual average rate of 38,000 cubic yards per year. PWD would not undertake any activities to remove sediment. Therefore, no traffic would be generated by any activities proposed under either the Project or Alternative 1.

In the event sediment buildup led to safety issues and required demolition/removal of the Dam, construction activities (and related truck trips) are expected to be greater than that of the Project or Alternative 1. Truck trips involved with the removal of 2.8 million cubic yards of sediment and dam debris would be greater in intensity and would likely require many additional years when compared to the Project or Alternative 1.

In the event the Reservoir became filled with sediment and the Dam/Reservoir were left untouched, it is likely some downstream flood-control channeling would need to be constructed. If necessary, minor traffic volumes would be generated during temporary construction activities that likely would be similar in levels to that occurring during grade control construction.

CEQA Significance Conclusion

Under a scenario where 2.8 million cubic yards of sediment and the Dam debris would need to be removed, traffic generated during construction activities would likely result in significant unavoidable impacts. While such a determination is speculative, the possibility exists. Therefore, traffic impacts of the No Action/No Project Alternative are considered significant and unavoidable for this scenario (Class I). During such a scenario, measures similar to SPC TRA-1 would be required to ensure emergency vehicle access and flow to result in less than significant impacts (Class III). Furthermore, the movement of 2.8 million cubic yards of sediment and debris would likely damage public roadways requiring extensive repaving mitigation similar to SPC TRA-2 to result in less than significant impacts (Class III).

C.10.5 Impact Significance Summary

Table C.10-13 summarizes the direct and indirect environmental impacts of the proposed Action and the alternatives on transportation and traffic. Refer to Section C.10.4 for the entire environmental analysis and the full text of recommended mitigation measures.

Table C.10-13. Summary of Impacts and Mitigation Measures – Transportation and Traffic

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
T-1: Exceed, either individually or cumulatively, an established level of service standard for roadways, highways, and inter-sections utilized by the Project	Class II	Class II	Class I (sediment removal scenario) Class III (no sediment removal scenario)	No	Mitigation Measure T-1 (Restrict Haul Truck Movements during PM Peak Period) SPC TRA-1 (Prepare Traffic Control Plan)
T-2: Result in inadequate emergency response	Class II	Class II	Class III	Yes	Mitigation Measure T-1 (Restrict Haul Truck Movements during PM Peak Period) SPC TRA-1 (Prepare Traffic Control Plan)
T-3: Project truck trips result in significant damage to public roadways	Class III	Class III	Class III	Yes	SPC TRA-2 (Pavement Rehabilitation – Public or National Forest Roadways)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.

C.11 Visual Resources

The Visual Resources section describes the scenic and aesthetic impacts to the landscape that are associated with the construction and operation of the Project or alternatives. Situated in northeastern Los Angeles County, the Project would construct a grade control structure and remove sediment from the Littlerock Reservoir annually. The study area for the visual resource analysis was defined by view-points located within the Reservoir's public recreational areas and from public view of the Palmdale Water District (PWD) sediment disposal/holding site on 47th Street.

C.11.1 Visual Resource Descriptors

The consideration of visual resources and general aesthetics utilizes resource-specific quantitative and qualitative terminology. The following terms are utilized within this section to describe visual resources:

- **Viewshed:** The landscape that can be directly seen under favorable atmospheric conditions, from a particular point/area or along a transportation corridor.
  - Foreground View: 0 to 1 mile.
  - Middleground View: 1 to 3 miles.
  - Background View: 3 to 5 miles.
- **Visual Quality:** The relative value of a landscape from a visual perception point of view.
- **Visual sensitivity:** The concern by viewers with changes to visual quality. Visual sensitivity is generally higher in natural or unmodified landscapes.
- **Visual Contrast:** Opposition or unlikeness of different forms, lines, colors, or textures in a landscape. Generally, increased visual contrast within foreground distances would be more noticeable to viewers than increased visual contrast within background distances.

C.11.2 Affected Environment

The Reservoir would be closed to the public during construction of the grade control structure and annual sediment excavation/removal. Therefore, no public viewpoints would be affected on National Forest System (NFS) lands during these periods. However, the grade control structure may be partially visible to the public when the Reservoir is not temporarily closed for sediment removal (if the Reservoir water level does not cover). Therefore, the Rocky Point recreation area of the Reservoir is part of the visual study area. The viewsheds from this location were coordinated with the land use and recreation analyses.

While the Project includes haul truck travel routes within public rights-of-way (ROWs) under the jurisdic-tion of Los Angeles County and the City of Palmdale, due to the temporary and mobile nature of activ-ities along these routes, visual impacts are not considered along public road ROWs for mobile construc-tion vehicles. Sediment deposition inside existing quarries would not be visible to the public. These loca-tions are exhausted mining pits that are below surface grade, setback from public ROWs, and surrounded by security fencing. Therefore, these locations are not included within the visual study area. However, the PWD property proposed for sediment storage/deposition would be visible from public ROWs and residences. Therefore, this site is part of the visual study area.

The visual resource analysis included a combination of information review, Forest Service consultation and methodology, field reconnaissance, seen area analysis, on-site photography, and data evaluation. Viewsheds were analyzed for their potential to display typical or worst-case visual effects of the Project to the scenic and existing aesthetic landscape. From public observer positions, four locations were selected as viewsheds from within the Reservoir and one location was selected at the PWD disposal property for analysis within the visual study area.

C.11.2.1 Reservoir Site

The Littlerock Reservoir is a man-made feature formed by the impoundment of water by the Littlerock Dam. The Reservoir is located on Little Rock Creek in the northeastern foothills of the San Gabriel Mountains on the western edge of the Mojave Desert. Little Rock Creek, which supplies water to the reservoir, is an intermittent stream supported by annual rainfall and snowmelt, and flows north from its headwaters located on the slope of nearby Mount Williamson. Therefore, the size of the Reservoir water basin fluctuates based on yearly precipitation conditions. Photographs of the Reservoir were taken to document the visual character of the site during times the water level was below Rocky Point. Figure C.11-1 identifies the locations of the photographs, while Figure C.11-2 shows the photographs.

As shown in Figure C.11-2, Picture 1 shows views from inside the recreation area across the Reservoir (under minimum pool conditions) consist primarily of the Reservoir water surrounded by rolling hills covered in desert scrub in the middleground and background. Picture 2 shows the boat ramp, parking areas, and recreation use structures located at the edge of the basin along higher elevation peaks at the Reservoir edge. Park facilities include deciduous shade trees, picnic tables with grills, restrooms, drinking fountains, a concession stand, boat launch, and multiple paved parking lots. As shown in Photo 3, surrounding hills and the skyline are prominent foreground views across the Reservoir from park user viewsheds. Photo 4 shows the view from Rocky Point picnic area where fencing is installed within the Reservoir to restrict upstream access.

On NFS lands, the visual analysis compares visual conditions with the Scenic Integrity Objectives (SIOs) in the 2005 Angeles National Forest Land Management Plan (Forest Plan) and Scenery Management System (SMS). These methodologies are further described below in Section C.11.5. Scenic integrity is defined as the state of naturalness or, conversely, the state of disturbance created by human activities or alteration. Integrity is stated in degrees of deviation from the existing landscape character. Existing visual conditions within the Reservoir are identified below consistent with the SMS:

Visual Quality: moderate-to-high. The predominant visual elements across the Reservoir are existing small trees and scrub creating coarse visual textures, set in a horizontal plane of dirt surface, in front of hillsides mottled with low, green shrubs and tan grasses. The skyline beyond the foreground hills is a focal point, drawing the viewer’s eye to the curving lines of the horizon. This park landscape exhibits a moderately high degree of intactness and coherence of form and character with substantial visual variety. However, this harmony of form and character is punctuated by the difference in dry season views and wet season (full Reservoir or minimum pool conditions) views. While the park facilities contain built features with inherent industrial character that diminish the scenic integrity of the existing landscape, these facilities and the drying of the Reservoir lead to a reduction of visual quality. Furthermore, recent tree removal along the Reservoir banks has led to an overall decline in natural landscape.

Viewer Concern: moderate. Visitors can enjoy open space, water elements, and rolling hillside views. The character of the Reservoir contrasts from a reduction in Reservoir water level, reducing the natural feel and panoramic open-space landscape. Viewers may perceive any increase in industrial character visible from the park or blockage of views as an adverse visible change.

Viewer Exposure: low. Due to recent tree removal along the Reservoir bank, there is minimal vegetative screening limiting views of the Reservoir from park visitors. The Reservoir bottom is uniform and visible when the water level is lowered for beneficial water supply. The duration of Reservoir bottom views would be limited, based on annual water inflow and for users who would be expected to visit the park in late winter months. The number of potential viewers would be low, however, leading to a limited viewer exposure.

Overall Visual Sensitivity: low to moderate. For visitors to the area, the moderate visual quality, moderate viewer concern, and low viewer exposure lead to a low to moderate overall visual sensitivity of the visual setting and viewing characteristics.

C.11.2.2 Palmdale Water District Site

As discussed in Section B.2.3.2, a 21-acre site owned by PWD and located within unincorporated Los Angeles County would be used for sediment storage, allowing for future use (recycling) of removed sediment material. Photos of this site were taken from a public viewpoint at the California Aqueduct. The locations of these photographs are shown on Figure C.11-3, with the photos documenting existing visual conditions shown on Figure C.11-4.

As shown in Photos 1 through 4, the predominant visual elements across the PWD site are horizontal plane views of a desert floor showing existing Joshua Trees and desert scrub intermixed within the dirt surface in the foreground, rooftops and cityscape features with a steady tree greenbelt in the middleground, and distant mountains in the background. Views of an elevated dirt pad, vehicle access, and winding natural dirt paths create a focal point in the foreground throughout the site from 47th Street, accentuating that the site is not totally undisturbed. Adjacent to the site are the aqueduct, water storage facilities, residences, and 47th Street, which all contribute to a somewhat urbanized character that diminish the scenic integrity of the existing landscape. Furthermore, unauthorized trash dumping within the site has led to an overall decline in visual quality. While non-passive recreationists were observed from this location at the aqueduct, the viewshed primarily provides low sensitivity with the focal point on the overall background views of Palmdale and the desert floor.

C.11.3 Regulatory Framework

The following discussion summarizes the associated laws, regulations, and standards for the jurisdictions traversed by the Project. Table C.11-1 provides a list of plans and policies that are applicable to visual resources, and includes a discussion of the Project's consistency with each plan or policy.

C.11.3.1 Federal

The Reservoir is located on NFS lands. Section C.9 (Recreation and Land Use) contains an evaluation of policies within the Forest Service Land Management Plan that are applicable to visual resources.

C.11.3.2 State

There are no applicable statewide plans or policies pertaining to the regulation or analysis of visual resource impacts. Each jurisdiction's General Plan regulates designated State Scenic Highways, as discussed under local plans and policies below.

C.11.3.3 Local

- **County of Los Angeles General Plan.** The Los Angeles County General Plan is the foundational document for all community-based plans that serve the unincorporated areas. Both the approved General Plan (1974) and public review draft of the 2035 General Plan (2014) were reviewed for noise goals and policies applicable to the Project (County of Los Angeles 1974a and 2014). The General

Plans do not identify any haul truck travel routes as being a designated scenic road or highway (County of Los Angeles 1974b and 2014). The following applicant General Plan policies related to visual resources were identified:

- **Approved General Plan, Conservation and Open Space Element, Policy 16:** Protect the visual quality of scenic areas including ridgelines and scenic views from public roads, trails, and key vantage points.
- **2035 Draft General Plan, VII Scenic Resources, Policy C/NR 13.4:** Encourage developments to be designed to create a consistent visual relationship with the natural terrain and vegetation.
- **2035 Draft General Plan, VII Scenic Resources, Policy C/NR 13.5:** Encourage required grading to be compatible with the existing terrain.

City of Palmdale General Plan. Review of the City of Palmdale General Plan Environmental Resources Element identifies both Barrel Springs Road and Pearblossom Highway as designated scenic highways (City of Palmdale, 1994). However, because the Project does not include any development (beyond temporary haul truck trips) along these scenic highways, no policies related to scenic highways were found applicable.

Table C.11-1. Consistency with Applicable Visual Resource Plans and Policies

Plan/Policy	Consistency	Explanation
Approved Los Angeles County General Plan		
Conservation and Open Space Element, Policy 16: Protect the visual quality of scenic areas including ridgelines and scenic views from public roads, trails, and key vantage points.	Yes	The visual contrast of temporary sediment storage would be limited to the appearance of expanding the existing at-grade cleared surface on 47th Street northward. Sediment would be only temporarily stored within depressions on the northeastern portion of the site in a manner to not extend above existing grade of 47th Street. Therefore, the temporary storage of sediment within the PWD site located in unincorporated Los Angeles County would not significantly alter existing form, line, color, or texture of the site landscape or character.
Draft Los Angeles County 2035 General Plan		
VII Scenic Resources, Policy C/NR 13.4: Encourage developments to be designed to create a consistent visual relationship with the natural terrain and vegetation.	Yes	The visual contrast of temporary sediment storage would be limited to the appearance of expanding the existing at-grade cleared surface on 47th Street northward. The color of stored sediment would be similar or identical to the existing site surface. While some vegetation would be removed and not replanted within the actual sediment storage area, this activity would not significantly alter existing form, line, color, or texture of the site landscape or character.
VII Scenic Resources, Policy C/NR 13.5: Encourage required grading to be compatible with the existing terrain.	Yes	Sediment would be only temporarily stored on the PWD site within depressions on the northeastern portion of the site in a manner to not extend above existing grade of 47th Street.

Source: Los Angeles County, 1974; Los Angeles County, 2014

C.11.4 Issues Identified During Scoping

There were no visual resource issues identified during the public scoping period. See Appendix E (Scoping Summary Report) for a summary of issues relevant to the entire Project that were raised during the scoping process.

C.11.5 Environmental Consequences

Significance Criteria. The following significance criteria for visual resources were derived from the Forest Service Scenic Management System and by considering potential aesthetic impacts occurring at the proposed sediment disposal locations (not on NFS lands). Impacts of the Project or alternatives would be considered significant and would require mitigation if:

- Criterion VIS1: Have a substantial adverse effect on a scenic vista, or substantially degrade the existing visual character or quality of the affected area.
- Criterion VIS2: Conflict with adopted city, county, State, or federal plans, policies, regulations, or standards applicable to the protection of visual resources.

Impact Assessment Methodology. The Forest Service Scenery Management System (SMS) is intended to attain the highest possible quality of landscape aesthetics and scenery commensurate with other appropriate public uses, costs, and benefits (USFS, 2014). In 2005, the Forest Service implemented the SMS by adopting Scenic Integrity Objectives (SIOs) for its lands in the Forest Plan. The purpose of the SMS is to methodically inventory, manage and monitor aesthetic and scenic resources on NFS lands. In the Angeles National Forest (ANF), the visual resource analysis uses this Forest Service methodology to evaluate Project activities within NSF lands and its effects on landscape aesthetics. The Project was analyzed using the SMS to ascertain compliance with the Land Management Plan. These guidelines are identified in Table C.11-2.

Table C.11-2. General Guidance for Review of Visual Impact Significance Under Forest Service SMS

Visual Sensitivity	Visual Change				
	Low	Low to Moderate	Moderate	Moderate to High	High
Low	Not Significant[1]	Not Significant	Adverse but Not Significant[2]	Adverse but Not Significant	Adverse but Not Significant
Low to Moderate	Not Significant	Adverse but Not Significant	Adverse but Not Significant	Adverse but Not Significant	Adverse and Potentially Significant[3]
Moderate	Adverse but Not Significant[2]	Adverse but Not Significant	Adverse but Not Significant	Adverse and Potentially Significant	Adverse and Potentially Significant
Moderate to High	Adverse but Not Significant	Adverse but Not Significant	Adverse and Potentially Significant	Adverse and Potentially Significant	Significant[4]
High	Adverse but Not Significant	Adverse and Potentially Significant[3]	Adverse and Potentially Significant	Significant[4]	Significant

1 - Not Significant – Impacts may or may not be perceptible but are considered minor in the context of existing landscape characteristics and view opportunity.
2 - Adverse but Not Significant – Impacts are perceived as negative but do not exceed environmental thresholds.
3 - Adverse and Potentially Significant – Impacts are perceived as negative and may exceed environmental thresholds depending on project and site-specific circumstances.
4 - Significant – Impacts with feasible mitigation may be reduced to levels that are not significant or avoided all together. Without mitigation, significant impacts would exceed environmental thresholds.

An adverse visual impact occurs when: (1) a proposed action perceptibly changes existing or desired features of the physical environment so that they no longer appear to be fitting in the characteristic landscape; or (2) a proposed action introduces new features in the physical environment that are perceptibly uncharacteristic of, and discordant with, the subject landscape. Changes that seem uncharacteristic are those that appear out of place, discordant, or distracting, and do not repeat form, line, color, texture, pattern, or scale common to the valued landscape character being viewed. The degree of the visual impact depends upon how noticeable the adverse change may be, that is, the magnitude and extent of deviations from the existing visual conditions, or deviations from the Forest Service SIOs at the Reservoir. The noticeability of a visual impact is a function of the visual characteristics of Project features, as compared to existing visual conditions, degree of visual contrast, and viewing conditions (distance, duration of view, angle of view, public access to viewshed, etc.).

C.11.5.1 Proposed Action/Project

Direct and Indirect Effects Analysis

Have a substantial adverse effect on a scenic vista, or substantially degrade the existing visual character or quality of the site and its surroundings (Criterion VIS1)

Activities at the Reservoir within the ANF include construction of the grade control structure, annual sediment removal, and annual restoration/maintenance activities. Because the Reservoir would be closed to the public during these activity periods, visual impacts within the ANF would be limited to times when these activities are completed. Additionally, sediment disposal within quarry disposal locations would not be visible to the public. This is because the quarry properties are large disturbed areas, setback from public viewsheds. Furthermore, sediment would be disposed within exhausted pits, which are large depressions below existing grade. Therefore, the analysis below for Impact V-1 is focused on Project-related visual changes at the Reservoir when open to the public and from activities occurring at the PWD sediment staging location visible from public vantage points within unincorporated Los Angeles County and the City of Palmdale.

Impact V-1: Project implementation would have a substantial adverse effect on a scenic vista, or substantially degrade the existing visual character or quality of a location and its surroundings

Littlerock Reservoir. Because the Reservoir would be closed to the public during annual Project activity periods, visitors would view changes to the Reservoir landscape only before or after these activity periods. Furthermore, as the Reservoir would typically be submerged by water during times open to the public, Project-related visual changes would be greatest during dry season conditions.

Views of the grade control structure would be most prominent from the Rocky Point picnic area. Because this location is also the upper extent of the Reservoir, it would be last submerged by seasonal water inflow and impoundment. Figure C.11-5 shows existing visual conditions of this location and a visual simulation with the grade control structure in place, under dry conditions. As shown, the grade control structure would be flush with or slightly above the Reservoir bottom, and would not result in a structure with a height that could obstruct views across the Reservoir or block background views of surrounding hillsides.

While the grade control structure would cause a slight increase in the prominence of non-natural features and industrial character, the visual contrast compared to existing conditions would be minimal and would not substantially alter the existing landscape. Because the grade control structure is a soil cement structure utilizing excavated sediment, the color would be similar to existing Reservoir sediment. As shown in Figure C.11-5, under existing conditions, temporary orange fencing is in place at Rocky Point to prohibit upstream activity into Arroyo Toad habitat. While not shown in the visual simulation, similar restriction fencing would likely continue to be in place after construction of the grade control structure. This would reduce visual contrast of the structure.

The greatest visual contrast of the grade control structure would come from soil cement bank protection, which would occur only up to 9 feet above the Reservoir bed extending downstream 40 feet from Rocky Point (refer to Figure C.11-5). While this bank stabilization would introduce industrial contrast, it would mimic the color and shape of the existing Reservoir bank. Therefore, the visual change of the grade control structure and bank protection is considered low and would not significantly alter existing form, line, color, or texture of the Reservoir landscape or character.

Under dry conditions, grading and sediment excavation/removal would also result in visual changes to the Reservoir floor topography. Visible changes would be limited to periods when the Reservoir water level is low. The removal of sediment would simply lower the Reservoir bottom when compared to existing conditions and would not change surface appearance, color, or substantially alter the visual character of the Reservoir. When water storage design capacity of the Reservoir is restored, the Reservoir bottom would be approximately 20 feet lower nearest the Dam and taper to existing grade near Rocky Point. The deepest excavation, nearest the Dam, would be first covered by water impoundment. Therefore, sediment removal would not significantly alter existing form, line, color, or texture of the Reservoir landscape or character.

When compared to the General Guidance for Review of Visual Impact Significance Under Forest Service SMS presented in Table C.11-2, visual impacts of Project activities within the Reservoir and ANF are considered adverse but not significant. Therefore, the Project would not adversely affect this scenic area or substantially degrade the existing visual character of the Reservoir.

PWD Sediment Storage Site. Temporary visual impacts would result from the presence of equipment and sediment stored within this site. Permanent visual changes would also result from the minor alteration of landform and removal of vegetation within the northeast portion of this site (where sediment would be temporarily stored for later reuse). As discussed in Section B.2.3.2, sediment would be stored at this location only for the short term. As shown in Figure C.11-4, the PWD site contains an existing area of disturbance providing an at-grade vehicle access pad on 47th Street (refer to Figure C.11-3 and C.11-4, photo 4). The amount of excavated sediment stored north of this disturbance area would likely vary from year to year, but would be stored in a manner to not extend above the existing grade of 47th Street.

Vehicles, equipment, workers, and stockpiled sediment would be temporarily visible, primarily limited to motorists travelling on 47th Street and residences west of the site (approximately 1,100 feet west of the storage location). Once the sediment storage location is cleared, all staging, vehicle parking, and material storage activities would occur in previously disturbed areas. View contrast from temporary use of equipment would not result in a permanent change to existing views of the site. Ground-disturbing activity, primarily clearing the sediment storage area, has the potential to partially disturb natural vegetative patterns of the site's visual landscape. However, although emergent riparian vegetation is present in isolated areas of the site (refer to Figure C.11-4), the visual focus of the site remains desert sand tone with scattered vegetation. The color of sediment would be similar to that of the site surface under existing conditions. Therefore, the visual contrast of temporary sediment storage would create the appearance of expanding the existing at-grade cleared surface on 47th Street northward (refer to Figure C.11-4, photo 4). This visual change of the site is not considered to significantly alter existing form, line, color, or texture of the site landscape or character.

CEQA Significance Conclusion

The grade control structure bank protection would introduce a new industrial character to views from Rocky Point. Furthermore, temporary sediment storage and activities within the PWD site would expand the existing disturbed and un-vegetated portion of the site north along 47th Street. However, these changes would not significantly alter the existing visual landscape of the sites, as the overall composition of viewsheds at these locations would be largely unaltered. While Project activities would result in some visual contrast over existing conditions, the magnitude of visual change is considered less than significant (Class III).

Conflict with adopted city, county, State, or federal plans, policies, regulations, or standards applicable to the protection of visual resources (Criterion VIS2)

Impact V-2: Project implementation would conflict with applicable plans, policies, regulations, or standards for the protection of visual resources

Scenic Integrity Objectives on NFS Lands. As the Reservoir is located within NFS lands, the key factors considered in determining the degree of visual impact are compliance and consistency with the SIOs. The Forest Service SMS uses Desired Landscape Character (DLC) and SIOs to evaluate, manage, and monitor landscape aesthetics and scenery. DLC expresses the highest quality goal for a given landscape. The DLC represents the sustainable image pursued by the Forest Service for each landscape place. SIO represents the minimum acceptable visual quality that is achieved by the maximum level of acceptable change.

In order to define the degrees of deviation from the natural landscape character that may occur at any given time, the Forest Service uses SIOs to represent the minimum levels of scenic integrity to which landscapes are to be managed. All land management activities, including the Project, must ensure that these minimum levels are achieved. This level of scenic integrity is to be used for inventory purposes only, and is never used as a management objective. This level of scenic integrity is useful for inventorying existing visual conditions or for predicting future scenic conditions of proposed projects.

Littlerock Reservoir is located in the Mojave Front Country Place, which has a designated High SIO. Under the Forest Service SMS, High SIOs are defined as landscapes where the valued landscape character “appears” intact. Visual deviations (human-made structures) may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such a scale that they are not evident. Human-caused deviations may be present but must repeat the form, line, color, texture, and pattern common to the natural landscape character so completely and at such a scale that they are not evident.

Changes to the Reservoir bottom as a result of sediment removal would be visible only for brief periods until the Reservoir is refilled with water. Because the Project would change only the low form topography of the Reservoir bottom and of the same color/form, sediment removal is not considered to result in an adverse change to existing views and sensitivity at the Reservoir.

As discussed in detail under Impact V-1, the visual change of the grade control structure and bank protection is considered low and would not significantly alter existing form, line, color, or texture of the Reservoir landscape or character. The grade control structure would be flush with the topography and only visible during dry conditions. Bank protection at Rocky Point would result in minimal industrial character as the color and shape would mimic existing bank conditions. When compared to the General Guidance for Review of Visual Impact Significance Under Forest Service SMS presented in Table C.11-2, the impact is considered adverse but not significant. Therefore, the Project would not alter the definition of High SIO for the Reservoir, and would be consistent with the SIO of the NFS as outlined in the 2005 Forest Service Land Management Plan.

Los Angeles County General Plan. Policies within the General Plan seek to protect visual quality of scenic areas, including ridgelines and scenic views from public roads, trails, and key vantage points. They also encourage developments to be designed to create a consistent visual relationship with the natural terrain and vegetation. As discussed in detail within Impact V-1, the visual contrast of temporary sediment storage would be limited to expanding the appearance of an existing at-grade disturbed area on 47th Street northward. As discussed in Section B.2.3.2, sediment would be stored within depressions on the northeastern portion of the site in a manner to not extend above existing grade of 47th Street. Therefore, the temporary storage of sediment within this site would not significantly alter existing form, line, color, or texture of the site landscape or character. The Project would be consistent with applicable policies of the Los Angeles County General Plan pertaining to visual quality of the PWD site.

City of Palmdale General Plan. Review of the City of Palmdale General Plan Environmental Resources Element identifies both Barrel Springs Road and Pearblossom Highway as designated scenic highways (City of Palmdale, 1994). However, because the Project does not include any development (beyond temporary haul truck trips) along these scenic highways, no policies related to the management or quality of scenic highways were found applicable.

CEQA Significance Conclusion

The Project is found consistent with visual management policies of the 2005 Forest Service Land Management Plan, Los Angeles County General Plan, and the City of Palmdale General Plan. Less-than-significant impacts would occur with respect to compliance with applicable visual related plans and policies (Class III).

C.11.5.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Have a substantial adverse effect on a scenic vista, or substantially degrade the existing visual character or quality of the site and its surroundings (Criterion VIS1)

Alternative 1 results in identical activities as the Project, but would instead start the sediment removal period on July 1 (annually), instead of after Labor Day, until water storage design capacity of the Reservoir is restored. Visual impacts from the grade control structure, bank protection at Rocky Point, and annual sediment removal would be identical for Alternative 1 as those described for the Project. Therefore, the grade control structure and bank protection, as well as temporary storage of sediment within the PWD site, would not significantly alter existing form, line, color, or texture of the Reservoir and PWD site landscape or character. The Project would not adversely affect any scenic area or substantially degrade the existing visual character of these locations.

CEQA Significance Conclusion

While Alternative 1 activities would result in some visual contrast over existing conditions, the magnitude of visual change is considered less than significant (Class III).

Conflict with adopted city, county, State, or federal plans, policies, regulations, or standards applicable to the protection of visual resources (Criterion VIS2)

As discussed above for Criterion VIS1, visual impacts from Alternative 1 would be the same as those described for the Project. Alternative 1 would not substantially alter existing form, line, color, or texture of the characteristic landscape of the Reservoir. When compared to the General Guidance for Review of Visual Impact Significance Under Forest Service SMS presented in Table C.11-2, the impact is considered adverse but not significant. Therefore, Alternative 1 would not alter the definition of High SIO for the Reservoir, and would be consistent with the SIO of the NFS as outlined in the 2005 Forest Service Land Management Plan. Furthermore, the temporary storage of sediment within the PWD site would be consistent with applicable policies of the Los Angeles County General Plan pertaining to visual quality of the PWD site.

CEQA Significance Conclusion

Alternative 1 is found consistent with visual management policies of the 2005 Forest Service Land Management Plan, Los Angeles County General Plan, and the City of Palmdale General Plan. Less-than-significant impacts would occur with respect to compliance with applicable visual related plans and policies (Class III).

C.11.5.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate behind Littlerock Dam and within the Reservoir at an annual average rate of 38,000 cubic yards per year. PWD would not undertake any activities to remove sediment. At full capacity, sediment accumulated behind the dam would be approximately 7.4 million cubic yards.

While 7.4 million cubic yards of sediment would accumulate within the Reservoir, demolition of the Dam is estimated to only require a one-acre staging area downstream of the Dam and require the removal of approximately 2.8 million cubic yards of sediment and dam concrete. Such activities would result in a project similar to, but larger than, the Project. Upon completion of the extensive construction period necessary under this scenario, it is assumed the Reservoir would be restored to natural conditions. Thus, no water impoundment would occur and Little Rock Creek would free flow through the ANF. This scenario could also include the removal of some or all existing recreational facilities and access roads. It is assumed that absent the Reservoir, current recreation facilities would be removed or altered. A determination of visual compliance with the SIO of the NFS as outlined in the 2005 Forest Service Land Management Plan would be speculative for such a scenario under the No Action/No Project Alternative. This is primarily because a different Land Management Plan would be in place at that time. It is unknown what the SIO of the Reservoir location would be at the time. Because this scenario is assumed to include full restoration of the Reservoir to natural conditions allowing flow of the Little Rock Creek waterway, unknown but not adverse visual impacts would be expected.

In the event the Reservoir became filled with sediment and the Dam was left in place, visual quality of the Reservoir would be similar to existing conditions with the exception of no water impoundment. However, the visible build-up of sediment behind the dam may appear extrinsic and eliminate existing views of the Reservoir banks. Without water impoundment, Little Rock Creek would free flow through the ANF and cascade over the existing dam. A stream channel would likely develop within the central portion of the Reservoir. This scenario would likely require some sort of downstream flood-control channel or protection to be constructed. Depending on the location of such flood control facilities, these could result in visual contrast and adverse visual impacts.

A determination of visual compliance with the SIO of the NFS as outlined in the 2005 Forest Service Land Management Plan would be speculative for either scenario under the No Action/No Project Alternative. This is primarily because a different Land Management Plan would be in place at that time. It is unknown what the SIO of the Reservoir location would be at the time. Furthermore, unknown necessary infrastructure, like new flood control facilities, may be required and not in compliance with the Forest Service Land Management Plan or Los Angeles County plans/policies applicable at the time

CEQA Significance Conclusion

A determination of visual impacts under the No Action/No Project Alternative is somewhat speculative and several scenarios are possible. Regardless of the scenario, it is assumed water would eventually not impound and Little Rock Creek would free flow through the ANF. Under this Alternative, natural conditions at the Reservoir and Little Rock Creek are assumed to eventually be restored. Such an event would result in visual change, but not significant visual contrast as the Reservoir already contains a natural character. Therefore, visual quality impacts of the No Action/No Project Alternative are considered less than significant (Class III).

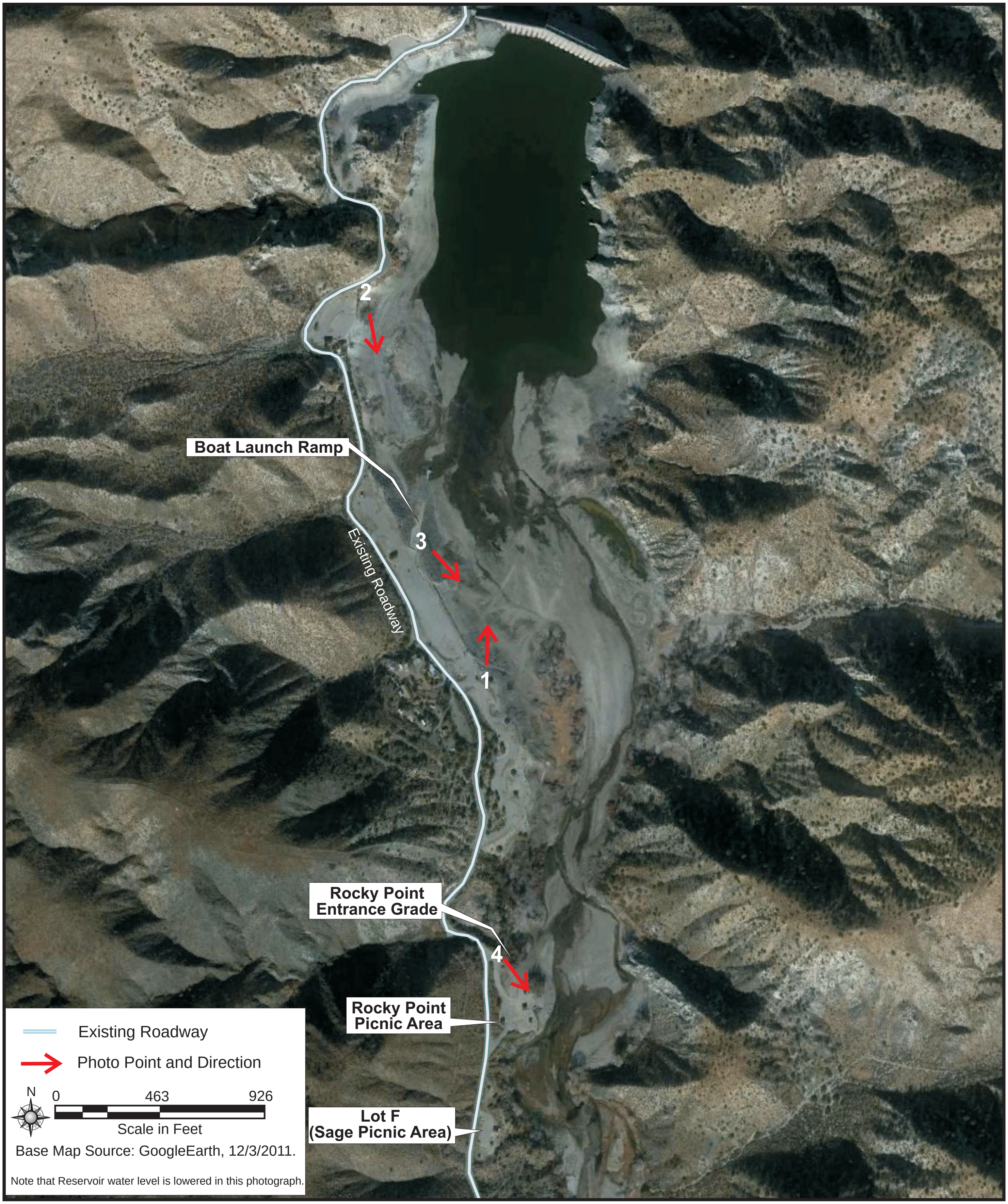
C.11.6 Impact Summary

Table C.11-3 summarizes the direct and indirect environmental impacts of the proposed action and the alternatives on visual resources. Refer to Section C.11.5 for a complete discussion of the environmental analysis.

Table C.11-3. Summary of Impacts and Mitigation Measures – Visual Resources

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
V-1: Project implementation would have a substantial adverse effect on a scenic vista, or substantially degrade the existing visual character or quality of a location and its surroundings	Class III	Class III	Class III	Yes	None
V-2: Project implementation would conflict with applicable plans, policies, regulations, or standards for the protection of visual resources	Class III	Class III	Class III	Yes	None

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.



**Littlerock Reservoir
Photo Key**

**LITTLEROCK RESERVOIR
SEDIMENT REMOVAL PROJECT**

Figure C.11-1

May 2016

Littlerock Reservoir
Photographs

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.11- 2

Palmdale Water District Site Photo Key

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.11-3

May 2016

Palmdale Water District Site Photographs

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.11- 4

May 2016

Existing View

Simulated View

Existing and Simulated Views
From Rocky Point Picnic Area

LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

Figure C.11-5

May 2016

C.12 Water Quality and Resources

This section describes the existing conditions and objectives related to surface water quality and groundwater quality within the proposed action (Project) area. Surface water and groundwater hydrology are described in Section C.7.

C.12.1 Affected Environment

Baseline data were collected from several sources, including: U.S. Geological Survey (USGS), USDA Forest Service (Forest Service), Lahontan Regional Water Quality Control Board (Regional Board), California Department of Water Resources (DWR), and Palmdale Water District (PWD).

C.12.1.1 Topography and Climate

The Project study area includes Littlerock Reservoir and dam, and the potential gravel pit and PWD disposal areas shown in Figure B-1. Additionally, because of the possibility for downstream or down-gradient transport of pollutants, receiving waters downstream of the study area are included in this analysis. The Project area is located at the border of the Antelope Valley and the foothills of the San Gabriel Mountains, southeast of the City of Palmdale. Littlerock Reservoir is located within the Angeles National Forest, and Little Rock Wash (downstream of the reservoir) flows beyond the forest boundary onto the valley floor. The study area is located entirely within the Little Rock Wash Watershed, as defined by the USGS Watershed Boundary Dataset (WBD). The watershed is bounded by Mount Emma Ridge and Pacifico Mountain to the west; Kratka Ridge, Mount Hillyer, and Waterman Mountain to the south; and Mount Williamson, Pallett Mountain, and Pleasant View Ridge to the east. The watershed drains to the north along Little Rock Wash, and typically all runoff infiltrates or evaporates before reaching Rosamond Lake, north of the City of Lancaster. (USGS, 2014)

The Project area lies within the South Lahontan Hydrologic Region, one of ten hydrologic regions in California established by the DWR for management purposes. This HR is also called the South Lahontan Hydrologic Basin Planning Area by the Regional Board. The Project is subject to the water quality standards of the Water Quality Control Plan for the Lahontan Region (Basin Plan) as well as Forest Service water quality management objectives and strategies. The South Lahontan Hydrologic Basin Planning Area is further divided into Hydrologic Units (HU) and Hydrologic Areas (HA). The Project area lies within the Antelope HU. Littlerock Reservoir and all of the upstream contributing area, as well as both potential disposal sites, fall within the Rock Creek HA, while Little Rock Wash (downstream of the reservoir and dam) traverses both the Rock Creek HA and the Lancaster HA. (LRWQCB, 1995)

Climate in the Project area is generally hot and dry in the summer and mild in the winter. Annual average precipitation in the Antelope Valley ranges from 4 to 8 inches, and can exceed 12 inches in the foothills of the San Gabriel Mountains. (PRISM, 2013)

C.12.1.2 Surface Water Quality

Littlerock Reservoir is fed by Little Rock Creek, which is joined by South Fork Little Rock Creek and several unnamed tributaries upstream of the reservoir. The largest unnamed tributary flows through Santiago Canyon and joins Little Rock Creek just upstream of the reservoir. None of these upstream water resources would be affected by the Project or alternatives. However, they are included in this analysis because they contribute to the existing water quality conditions in the Littlerock Reservoir. Downstream of Littlerock Reservoir and dam, Little Rock Creek becomes Little Rock Wash, which starts out with a fairly well-defined channel and quickly becomes a broad alluvial fan that runs south to north along the Antelope Valley floor, towards Rosamond Lake. Just south of State Route 138, Little Rock Wash crosses an undergrounded segment of the California Aqueduct, but these two waterbodies do not interact.

The Basin Plan for the Lahontan Region "sets forth water quality standards for the surface and ground waters of the Region, which include both designated beneficial uses of water and the narrative and numerical objectives which must be maintained or attained to protect those uses." The designated beneficial uses for surfaces waters within the Project area are listed below in Table C.12-1. Each beneficial use is accompanied by a water quality objective as defined in the Basin Plan. In order to achieve these water quality objectives, the Basin Plan defines effluent limitations for point and non-point sources of pollution. (LRWQCB, 1995)

Table C.12-1. Designated Beneficial Uses for Surface Waters within the Project Area

Hydrologic Unit/Subunit Surface Water Feature	Beneficial Uses													
	MUN	AGR	IND	GWR	FRSH	REC-1	REC-2	COMM	WARM	COLD	SAL	WILD	WQE	FLD
Antelope Hydrologic Unit														
Little Rock Creek	X			X		X	X	X		X		X		
Littlerock Reservoir	X	X	X	X		X	X	X		X		X		
Minor Surface Waters[1]	X	X		X		X	X	X	X	X		X		
Minor Wetlands[1]	X	X		X	X	X	X		X			X	X	X
Lancaster Hydrologic Area														
Rosamond Dry Lake[2]				X			X		X		X	X		

1 - The beneficial uses listed for minor surface waters and minor wetlands within the Antelope Hydrologic Unit are the same for minor surface waters and minor wetlands within the Lancaster and Rock Creek Hydrologic Areas, and therefore those surface water features are not repeated in this table.

2 - During rare periods of heavy rainfall, Rosamond Dry Lake can receive runoff from Little Rock Wash, and therefore is included in this analysis as downstream receiving water. The SAL use does not apply to tributaries of Rosamond Dry Lake.

X Existing or Potential Beneficial Use

MUN Municipal and Domestic Supply – Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

AGR Agricultural Supply – Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing.

IND Industrial Service Supply – Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.

GWR Ground Water Recharge – Uses of waters used for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

FRSH Freshwater Replenishment – Uses of water used for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).

REC-1 Water Contact Recreation – Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

REC-2 Non-contact Water Recreation – Uses of water for recreational activities involving proximity to water but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

COMM Commercial and Sportfishing – Uses of waters used for commercial or recreational collection of fish or other organisms including, but not limited to, uses involving organisms intended for human consumption.

WARM Warm Freshwater Habitat – Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

COLD Cold Freshwater Habitat – Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

SAL Inland Saline Water Habitat – Uses of waters that support inland saline water ecosystems including, but not limited to, preservation and enhancement of aquatic saline habitats, vegetation, fish, or wildlife, including invertebrates.

WILD Wildlife Habitat – Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

WQE Water Quality Enhancement – Uses of water that support natural enhancement or improvement of water quality in or downstream of a water body including, but not limited to, erosion control, filtration and purification of naturally occurring water pollutants, streambank stabilization, maintenance of channel integrity, and siltation control.

FLD Flood Peak Attenuation/Flood Water Storage – Uses of riparian wetlands in floodplain areas and other wetlands that receive natural surface drainage and buffer its passage to receiving waters.

Narrative and numerical water quality objectives for numerous constituents apply to all surface waters in the Lahontan Region and are defined in the Basin Plan. Compliance with these water quality objectives serves to protect the beneficial uses listed above, and to prevent degradation of existing water quality conditions. Section 303(d) of the Clean Water Act requires the identification of waterbodies that do not meet, or are not expected to meet, water quality standards. These impaired waterbodies are prioritized in the 303(d) list and the development of a Total Maximum Daily Load (TMDL) is required. No TMDLs have been developed within the study area. However, Littlerock Reservoir does not meet water quality standards for the MUN beneficial use and a TMDL is required but not yet complete. The reservoir is currently listed as impaired by metals (manganese). The source of this impairment is unknown. In addition, the Regional Board is considering listing Littlerock Reservoir as impaired by mercury and PCBs. (LRWQCB, 2014)

C.12.1.3 Groundwater Quality

The Project area lies along the southern boundary of the very large Antelope Valley Groundwater Basin. Littlerock Reservoir itself is not underlain by any groundwater basins, but nearly the entire length of Little Rock Wash (beginning just downstream of Littlerock Reservoir dam) is underlain by the Antelope Valley Groundwater Basin. Please see Section C.7 (Hydrology) for a description of the hydrology and hydrogeology of the Basin. Beneficial uses for the basin, as defined above, include: MUN, AGR, IND, and FRSH. Narrative and numerical water quality objectives, as defined in the Basin Plan, apply to all ground waters in the Lahontan Region for the following constituents: bacteria, chemical constituents, radioactivity, taste, and odor.

Groundwater in this basin is typically calcium bicarbonate in character near the surrounding mountains and is sodium bicarbonate or sodium sulfate in character in the central part of the basin. Total dissolved solids in the basin averages 300 mg/L, and ranges from 200 to 800 mg/L. High levels of boron and nitrates have been observed in the basin. (DWR, 2004)

C.12.2 Regulatory Framework

This section provides an overview of the regulatory framework for surface water and groundwater quality. Surface water and groundwater hydrology is addressed in Section C.7.

Table C.12-2 provides a list of plans and policies that are applicable to surface water and groundwater quality, and includes a discussion of the Project's consistency with each plan or policy. Section C.9 (Recreation and Land Use) contains an evaluation of policies within the Forest Service Land Management Plan that are applicable to surface water and groundwater quality.

C.12.2.1 Federal

U.S. Environmental Protection Agency

- **Clean Water Act (CWA).** The CWA was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. The Project would be applicable to Sections 401, 402, 404, and 303(d) of the CWA. Discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (Sections 401 and 402 of the CWA). Section 404 of the CWA authorizes the U.S. Army Corps of Engineers (USACE) to regulate the discharge of dredge or fill material to the waters of the U.S. and adjacent wetlands. Section 303(d) of the CWA requires states to identify "impaired" water bodies as those that do not meet water quality standards.
- **Safe Drinking Water Act (SDWA).** The SDWA is the main federal law that ensures the quality of Americans' drinking water. Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. The SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. SDWA authorizes the United States Environmental Protection Agency (USEPA) to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants that may be found in drinking water. The USEPA, states, and water systems then work together to make sure that these standards are met.

C.12.2.2 State

State Water Resources Control Board

In California, NPDES permitting authority is delegated to, and administered by, the nine RWQCBs. For the Project, NPDES permits would be delegated to the Lahontan Regional Board. Projects that disturb one or more acres are required to obtain NPDES coverage under the California General Permit for Discharges of Storm Water Associated with Construction Activity. The Construction General Permits require the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP describes Best Management Practices (BMPs) the discharger will use to prevent stormwater runoff from leaving the site.

- **Porter Cologne Water Quality Control Act.** The Porter Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq., requires the State Water Resources Control Board and the nine Regional Boards to adopt water quality criteria to protect State waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures.
- **California Water Code §13260.** California Water Code §13260 requires that any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the State, other than into a community sewer system, must submit a report of waste discharge to the applicable Regional Board. Any actions related to the Project that would be applicable to California Water Code §13260 would be reported to the Lahontan Regional Board.

C.12.2.3 Local

County of Los Angeles

- **County of Los Angeles General Plan.** The County of Los Angeles General Plan General Goals and Policies, Conservation and Open Space Element, and Water and Waste Management Element contain goals and policies to conserve water resources, protect surface and ground water quality, and to ensure proper disposal of waste so that water quality is not degraded.
- **Antelope Valley Areawide General Plan.** The Antelope Valley Areawide General Plan includes policies to conserve natural resources through control of groundwater recharge and to protect the viability of surface water as a habitat for fish and other water-related organisms as well as an important environmental component for land-based plants and animals.

City of Palmdale

- **City of Palmdale General Plan.** The City of Palmdale General Plan contains objectives and policies to protect surface and ground water quality, including water conservation measures, the preservation of natural drainage courses, the protection of groundwater recharge, and the requirement for new development to connect to a sanitary sewer system.

Table C.12-2. Consistency with Applicable Water Quality Plans and Policies

Plan/Policy	Consistency	Explanation
Clean Water Act Sections 401, 402, and 404		
Section 401 - State Certification of Water Quality **Section 402** - National Pollutant Discharge Elimination System **Section 404** - Establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands.	Yes	All required certifications and permits would be obtained prior to construction of the Project.
Safe Drinking Water Act		
The Safe Drinking Water Act (SDWA) is the main federal law that ensures the quality of Americans' drinking water. Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards.	Yes	Drinking water quality would not be impacted by this Project. No wells would be installed, and no contaminants would be introduced into the groundwater aquifer.
California Water Code §13260		
Requires an agency to file with the appropriate regional board a report of the discharge, containing the information that may be required by the regional board	Yes	A report of waste discharge would be filed with the Lahontan Regional Board prior to the discharge of any waste to waters of the State.
County of Los Angeles General Plan, Antelope Valley Areawide General Plan, and City of Palmdale General Plan Water Quality Policies.		
Various goals and policies to conserve water resources, protect surface and ground water quality, and to ensure proper disposal of waste so that water quality is not degraded.	Yes	The Project improves the potential for water conservation through increased reservoir storage capacity. Additionally, existing water quality for surface and ground waters would be maintained.

C.12.3 Issues Identified During Scoping

Table C.12-3 below provides a list of water quality issues raised during the public scoping period for the EIS/EIR [see Appendix E (Scoping Summary Report)]. Issues are listed by agency or members of the public providing comment. The table also includes a brief discussion the applicability of each issue to the environmental analysis and where that issue is addressed in the EIS/EIR.

Table C.12-3. Scoping Issues Relevant to Water Quality and Resources

Comment	Consideration in the EIS/EIR
Lahontan Regional Water Quality Control Board	
The Draft EIS/EIR should evaluate the known Hg and PCB concentrations found at Littlerock Reservoir, determine (to the extent possible) the source(s) of Hg and PCBs, and consider and disclose how each of the alternatives may either exacerbate or ameliorate the levels of Hg and PCBs in surface waters, sediments, and fish tissue.	Fish tissue and sediment samples were collected to analyze Hg and PCB content. The source of these contaminants is currently unknown. The potential effect of each alternative on levels of Hg and PCBs in surface waters, sediments, and fish tissue is analyzed in Section C.12.4.
Consider using the State Water Board's website for its "Statewide Mercury Program" as an information source: http://www.swrcb.ca.gov/water_issues/programs/mercury/	Reviewed State Water Board's website and Fact Sheet for Statewide Mercury Control Program for Reservoirs. Information about the likely sources of methylmercury and potential control options was incorporated into this analysis in Section C.12.4.
The Draft EIS/EIR should identify the water quality standards that could potentially be violated by the alternatives and use these standards when evaluating thresholds of significance for impacts (per Chapter 3 of the Basin Plan).	Beneficial uses for all waterbodies in the Project area are listed in in Table C.12-1. Impaired and assessed waterbodies in the Project area are analyzed in Section C.12.4. Water quality objectives are discussed where applicable.
The Project is located within the Rock Creek Hydrologic Area of the Antelope Hydrologic Unit 626.00 and overlies the Antelope Valley Groundwater Basin No. 6-44. The Draft EIS/EIR should identify the beneficial uses of the water resources (per Chapter 2 of the Basin Plan) within the Project area, and include an analysis of the potential impacts to water quality with respect to these resources.	Beneficial uses for waters within the Project area have been identified, and an analysis of the potential impacts to water quality was conducted in Section C.12.4.
Analysis should include a discussion that the Lahontan Regional Water Board recommended the inclusion of Littlerock Reservoir onto the Clean Water Act Section 303(d) list of impaired water bodies (June 19, 2014) due to elevated levels of mercury and PCBs in fish tissue. The State Water Board intends to adopt the 303(d) list within the next few months.	The Lahontan Regional Water Board's recommendation for 303(d)-listing of Littlerock Reservoir for mercury and PCBs is discussed in Section C.12.1.
The Draft EIS/EIR should identify an alternative and define mitigation measures to ensure that concentrations of Hg and PCBs in surface waters, sediments, and fish tissue are not increased by the Project and are decreased to the extent feasible.	Reservoir management alternatives (such as pH adjustment, nutrient addition, oxygenation, and stocking practices) to reduce methylmercury production are not part of the Project. Measures are included as part of the Project to ensure that contaminated sediments would not be mobilized or otherwise allowed to enter the aquatic ecosystem.

C.12.4 Environmental Consequences

Significance Criteria. Appropriate significance criteria have been identified based on the CEQA Appendix G Environmental Checklist, significance threshold guidance from the County of Los Angeles (County of Los Angeles, 1987), and relevance to this analysis based on local conditions and the project description. For purposes of the CEQA analysis in this report, water quality impacts are considered significant if the Project would:

- Criterion WQ1: Violate any water quality standard or waste discharge requirement, or otherwise degrade water quality, including through providing substantial additional sources of polluted runoff or through mobilization of contaminated sediments.
- Criterion WQ2: Degrade groundwater quality through the introduction or mobilization of pollutants.

Impact Assessment Methodology. This impact analysis is based on an assessment of baseline conditions relevant to the site, including ambient water quality, beneficial uses identified in the Lahontan Regional Board's Basin Plan, and existing impairments to waterbodies as listed on the CWA 303d list of impaired and threatened waters that have been identified and reported to the USEPA, which are presented in Section C.12.1. These baseline conditions were evaluated based on their potential to be affected by construction activities as well as operation and maintenance activities related to the Project and alternatives. Potential impacts were then identified based on the predicted interaction between construction, operation, and maintenance activities with the affected environment. Standard Project commitments, described in Appendix A, were considered as Project features in the impact analysis.

Impacts are described in terms of location, context and intensity, and identified as being either short- or long-term, and direct or indirect in nature. Beneficial as well as adverse impacts are identified, with a discussion of the effect and risk to public health and safety, and potential violation of environmental laws.

C.12.4.1 Proposed Action/Project

This section describes the direct and indirect effects of the Project on surface and ground water quality. Direct and indirect effects on surface and ground water hydrology are described in Section C.7.

Direct and Indirect Effects Analysis

Violate any water quality standard or waste discharge requirement, or otherwise degrades water quality, including through providing substantial additional sources of polluted runoff or through mobilization of contaminated sediments (Criterion WQ1)

Impact WQ-1: The Project would violate water quality standards or waste discharge requirements, or otherwise degrade water quality.

The Project includes construction of a subterranean grade control structure within the reservoir, excavation of accumulated sediment to restore 1992 design water storage and flood control capacity, ongoing annual sediment removal to maintain reservoir design capacity, and maintenance or improvement of the roadbed along the sediment disposal haul route to prevent or repair damage to affected roadways. None of these activities would affect water quality upstream of the reservoir. The only waterbodies that could be impacted by the Project are Littlerock Reservoir, Little Rock Wash (downstream of the reservoir and dam), and any unnamed streams along the sediment disposal haul route.

Project activities that could impact water quality include soil disturbance, the accidental release of hazardous materials, and the discharge of contaminated water associated with dewatering activities.

The excavation of accumulated sediment is by definition a soil-disturbing activity. Soil disturbance can lead to increased erosion and sedimentation, and can mobilize pollutants that may have attached to the sediment. All excavation work would occur during the dry season and within the reservoir. Any loose or stockpiled soil not immediately removed to a disposal site would be naturally redistributed along the bed of the reservoir. This sediment would be confined by Littlerock Dam. If soil disturbance associated with excavation were followed by a series of very large storm events that overtopped the dam, an increased amount of fine sediments could be transported downstream. However, this rapid overtopping would be a rare event and would have a negligible effect on sediment transport downstream. Prior to excavation and off-site transport of any accumulated sediments, a sediment testing program would be implemented to identify any potential contaminants. Any sediment that is discovered to be contaminated would be transported to an approved hazardous material storage facility for disposal. No contaminated sediment would be discharged to any waterbody.

Sediments and fish tissue from Littlerock Reservoir were sampled on August 4, 2014. Fifteen samples, including 11 sediment samples and 4 fish tissue samples, were collected and analyzed for the presence of mercury, chlorinated pesticides, and PCB congeners. For chlorinated pesticides (including DDT), no analyte was detected at or above the method detection limit. For PCB congeners, one analyte (PCB138) was detected in three of the 11 samples. However, the amount of PCB138 that was detected is extremely small. The three sample results range from 1.1 to 1.9 parts per billion (ppb). The method detection limit for this analyte is 1.0 ppb, and the reporting limit (RL) is 5.0 ppb. All 11 sediment samples tested positive for the presence of mercury. Mercury was analyzed as total mercury (Hg), and the element was not speciated in this analysis. Therefore, it is unknown what percentage of this mercury is organic mercury versus methylmercury. The sample results range from 0.0032 to 0.0213 parts per million (ppm). The Agency for Toxic Substances and Disease Registry reports that normal levels of mercury in soil range from 0.02 to 0.625 ppm (ATSDR, 1999). All but one of the sediment sample results fall below the lower value of this range, and the one result that falls within this range lies at the extreme lower end of the range. The sampling results, presented in Appendix C, show that the sediment in Littlerock Reservoir is mostly free of contaminants, and that in cases where a contaminant was detected, the level of contamination is extremely low.

Disposal of clean sediment would occur at the PWD property or in abandoned mining pits shown on Figure B-1. Although one small, ephemeral stream crosses the PWD property, sediment would be placed and graded so that it would not enter the stream channel through subsequent erosion and sedimentation. No mounding of sediment above adjacent grades would occur. If an abandoned mining pit is chosen as the preferred disposal site, all disposal would occur substantially below the surrounding grade, and no sediment would leave the site or enter any waterbody.

SPC HYDRO-1, provided in Appendix A, would ensure that excavated material to be stockpiled on the PWD alternate sediment storage site would not obstruct or divert flow in the ephemeral watercourse that crosses that property. Compliance with the Federal Clean Water Act would ensure no sedimentation from the stockpile during construction. No Project-related erosion in this watercourse is expected. Sedimentation from the stockpile would be minor due to compliance with existing regulations.

Construction of the grade control structure would also result in soil disturbance. However, this disturbance would also occur only within the reservoir, and any loose or stockpiled soil would similarly be confined by Littlerock Dam. Road maintenance and improvement along the sediment disposal haul route could also lead to soil disturbance. However, the haul routes follow paved roads, and any soil disturbance related to maintenance or improvement of the roadways would be minimal and short-term. No new roads would be created, and no paved surfaces would be converted to bare soil conditions.

Excavation and disposal of accumulated sediments, construction of the grade control structure, and maintenance and improvement of haul route roadways would involve the operation of heavy machinery and construction vehicles. The operation of these vehicles and machinery could result in a spill or accidental release of hazardous materials, including fuel, engine oil, engine coolant, and lubricants. Project activities would occur during the dry season and therefore the chance that any spilled or accidentally released hazardous materials could be carried by runoff into receiving waters would be minimal. Additionally, any spill or accidental release within the reservoir would be contained by Littlerock Dam and would be prevented from entering any other waterbody. Hazardous materials could be spilled or accidentally released along the haul route, either during sediment disposal or roadway maintenance. However, because these activities would occur during the dry season, and due to the generally arid nature of the Project area, the likelihood that any hazardous material would enter a waterbody would be negligible. Additionally, the implementation of SPC WQ-1, which requires the preparation of a Spill Response Plan, would further reduce the potential for any adverse impact to water quality.

Construction of the grade control structure may require dewatering or diversion of stream flow. However, this dewatered or diverted water would be contained by the Littlerock Dam, downstream of the grade control structure. No dewatered or diverted water would be discharged to any receiving water. The excavation and removal of accumulated sediment may require dewatering of the excavation site. In the event that this water would need to be discharged to Little Rock Wash, downstream of Littlerock Dam, all required dewatering and discharge permits would be obtained prior to any discharge. In conformance with dewatering and discharge permit requirements, any dewatered or diverted water would be tested and treated (if necessary) prior to discharge downstream of Littlerock Dam.

SPCs Applicable to Impact WQ-1

SPC WQ-1 (Prepare Spill Response Plan)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

CEQA Significance Conclusion

The implementation of SPCs WQ-1 and HYDRO-1 would ensure this impact is less than significant (Class III).

Degrade groundwater quality through the introduction or mobilization of pollutants (Criterion WQ2)

Impact WQ-2: The Project would degrade groundwater quality through the introduction or mobilization of pollutants.

No groundwater resources would be utilized for the Project, and no new wells would be constructed. Therefore, no new pathways for groundwater contamination would be introduced as a result of the Project. Project activities could degrade groundwater quality if pollutants were introduced either through infiltration of polluted discharge or infiltration of a spilled hazardous material. Littlerock Reservoir sits on bedrock and is not underlain by any groundwater basin. Water contained in the reservoir does not directly interact with groundwater resources. However, water discharged to Little Rock Wash (downstream of Littlerock Dam) could infiltrate into the Antelope Valley Groundwater Basin. Excavation and removal of accumulated sediments could require dewatering activities that would result in a discharge of water to Little Rock Wash. If this water carried pollutants, those pollutants could infiltrate into the groundwater basin. However, conformance with required dewatering and discharge permits would ensure that no contaminated water would be discharged to Little Rock Wash and that no pollutants would infiltrate into the groundwater basin.

Project activities could result in a spill or accidental release of hazardous materials within the reservoir or along the haul route. However, because these activities would occur during the dry season, and due to the generally arid nature of the Project area, the likelihood that any hazardous material would infiltrate into the groundwater would be negligible. The use of herbicides within the Weed Control Plan, including the control methods to be used, would be prepared consistent with the Forest Service's *Plan for Invasive Plants, Angeles National Forest and San Gabriel Mountains National Monument Environmental Assessment (EA)* (September 2015). Control of weeds would be important to ensure successful establishment of native vegetation along the Reservoir and to prevent new infestations along the access roads. However, manual treatments and herbicide use could result in indirect impacts to water quality both at the Reservoir and at the PWD property potentially used for temporary sediment storage unless appropriate precautions are implemented, as outlined in the *Plan for Invasive Plants EA*. Any herbicide use would conform to the FS's *Plan for Invasive Plants EA*, including formulations to be used and the methods of application. Adhering to this existing FS guidance on weed control would ensure that any mechanical or chemical weed control implemented as part of the proposed Project would not result in secondary impacts to water quality.

CEQA Significance Conclusion

The potential for spilled or accidentally released hazardous materials to infiltrate into the groundwater basin would be very small due to the generally dry conditions of the Project area during the proposed work schedule resulting in less than significant impacts (Class III).

C.12.4.2 Alternative 1: Reduced Sediment Removal Intensity Alternative

Direct and Indirect Effects Analysis

Violate any water quality standard or waste discharge requirement, or otherwise degrades water quality, including through providing substantial additional sources of polluted runoff or through mobilization of contaminated sediments (Criterion WQ1)

Impact WQ-1: The Project would violate water quality standards or waste discharge requirements, or otherwise degrade water quality.

Project activities under this alternative related to Impact WQ-1 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. The potential for a spill or accidental release of hazardous materials to enter receiving waters would remain the same, and would be minor. Impact WQ-1 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.12.4.1.

SPCs Applicable to Impact WQ-1

SPC WQ-1 (Prepare Spill Response Plan)

SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)

CEQA Significance Conclusion

The implementation of SPCs WQ-1 and HYDRO-1 would ensure this impact is less than significant (Class III).

Degrade groundwater quality through the introduction or mobilization of pollutants (Criterion WQ2)

Impact WQ-2: The Project would degrade groundwater quality through the introduction or mobilization of pollutants.

Project activities under this alternative related to Impact WQ-2 would be very similar to those described under the Project. The only difference is that fewer disposal trucks would be utilized, but over a longer period each season for a greater number of years. The potential for a spill or accidental release of hazardous materials to infiltrate into the groundwater basin would remain the same, and would be negligible. Impact WQ-2 impacts and CEQA significance for Alternative 1 are the same as those described for the Project. See Section C.12.4.1.

CEQA Significance Conclusion

The potential for spilled or accidentally released hazardous materials to infiltrate into the groundwater basin would be very small due to the generally dry conditions of the Project area during the proposed work schedule resulting in less than significant impacts (Class III).

C.12.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually. This lost capacity could be addressed either by breaching the dam and allowing the natural flow of Little Rock Creek to overtop the dam, or by demolishing the dam and removing approximately 2.8 million cubic yards of sediment and dam concrete. Whether the dam was breached or demolished, it is likely that substantial downstream erosion and sedimentation would result. Dewatering activities will likely be required. Hazardous materials will be used during demolition and excavation, and could be spilled into waterways (Impact WQ-1). It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect downstream resources from degradation. Therefore, this alternative would result in a direct and adverse impact.

Project activities under this alternative related to Impact WQ-2 would be similar to those described under the Project. Demolition and excavation of the accumulated sediment would require a larger number of dump trucks and other construction equipment. However, the potential for a spill or accidental release of hazardous materials to infiltrate into the groundwater basin would remain the same, and would be negligible. Impact WQ-2 impacts and CEQA significance for Alternative 2 are the same as those described for the Project. See Section C.12.4.1.

CEQA Significance Conclusion

It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect downstream resources from degradation, resulting in significant and unavoidable impacts (Class I). The potential for a spill or accidental release of hazardous materials to infiltrate into the groundwater basin would remain the same as that under the proposed Project and Alternative 1, resulting in less than significant impacts (Class III).

C.12.5 Impact Summary

Impact WQ-1 for the Project and Alternative 1 is adverse, but not significant (Class III). Impact WQ-1 is significant and unavoidable under the No Action Alternative (Class I). Impact WQ-2 for the Project, Alternative 1, and Alternative 2 is adverse, but not significant (Class III). Table C.12-4 summarizes impact significance.

Table C.12-4. Summary of Impacts and Mitigation Measures – Water Quality

Impact	Impact Significance				Mitigation Measures/SPC
	Proposed Action	Alt. 1	Alt. 2: No Action	NFS Lands[1]	
WQ-1: The Project would violate water quality standards or waste discharge requirements, or otherwise degrade water quality	Class III	Class III	Class I	Yes	SPC WQ-1 (Prepare Spill Response Plan) SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels)
WQ-2: The Project would degrade groundwater quality through the introduction or mobilization of pollutants	Class III	Class III	Class III	Yes	None

1 - Indicates whether this impact is applicable to National Forest System lands.

C.13 Wildfire Prevention and Suppression

This section describes effects on wildfire prevention and suppression that would be caused by implementation of the Project. The following discussion addresses existing environmental conditions in the affected area, identifies and analyzes environmental impacts for the alternatives, and recommends measures to reduce or avoid adverse impacts anticipated from the components of the Project or alternatives. In Section C.13.2, existing laws and regulations relevant to wildfire prevention and suppression are also described. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with the implementation of the Project.

C.13.1 Affected Environment

The Wildfire Study Area is defined for the purposes of this report as the following:

- The direct and indirect protection zones that encompass the Reservoir, as determined by the Forest Service on NFS lands; and
- The dump truck routes and sediment storage/disposal sites that are located in Fire Zone 4 and Areas of High Fire Hazard, as defined by Los Angeles County.

The following discussion provides further detail on these zones.

C.13.1.1 Forest Service Protection Zones

In 2003, the Healthy Forests Restoration Act was enacted in order to expedite the preparation and implementation of hazardous fuels reduction projects on federal land. This act established the designation of Wildland/Urban Interface zones within national forests, which is defined as a variable width up to 1.5 miles from communities at risk or as defined in individual community fire protection plans (USFS, 2005c).

In order to apply the act to NFS lands within the ANF, the Forest Service's 2005 Land Management Plan identifies Wildland/Urban Interface (WUI) Defense Zones and WUI Threat Zones, which when combined are designed to make most structures more defendable:

WUI Defense Zone is defined as the area directly adjoining structures and evacuation routes that is converted to a less-flammable state to increase defensible space and firefighter safety. The minimum widths for this zone are determined by general vegetation type (i.e., grass, chaparral, or forest) (USFS, 2005c).

> ***Chaparral:*** *The Project Area on NFS land is characterized by desert scrub vegetation, which can be categorized as chaparral for the purposes of the WUI Defense Zone classifications. Generally, a width of 100 to 300 feet is sufficient in some chaparral conditions to provide community safety objectives. On steep slopes, a defense zone width of over 300 feet may be required. Defense Zone management activities take precedence over all other management activities within the Defense Zone, and Standard 8 (see Table C.13-1) would apply.*

WUI Threat Zone is defined as an additional strip of vegetation modified to reduce flame heights and radiant heat. This zone generally extends 1.25 miles out from the Defense Zone boundary, although the actual extent is based on fire history, local fuel conditions, weather, topography, existing and proposed fuel treatments, natural barriers to fire, and community protection plans. The object is to complete enough tree thinning and surface fuel management over time to reduce the potential for stand replacing fires. In vegetation types such as grass and chaparral, there may be no need to conduct extensive treatments in this zone (USFS, 2005c).

C.13.1.2 County of Los Angeles Fire Hazard Zones

The Safety Element of the County of Los Angeles General Plan (1990) describes the County as being at high risk of wildfires due to wet year-dry year climatic cycles, Santa Ana weather conditions (marked by hot, dry desert air), types of vegetation supported by Mediterranean climate, and the extreme inaccessibility posed by steep mountainous topography adjacent to developed areas.

The County identifies two high fire hazard areas that extend across multiple jurisdictions (e.g., city and federal) within the perimeter of the County. These areas are defined as the following:

Fire Zone 4 - This encompasses high fire hazard brush and woodland areas, areas of steep topography and little or no development. This area requires management strategies to enforce stringent fire enforcement measures including fire-resistive construction materials, brush clearance, fire breaks, and fuel load management requirements (County of Los Angeles, 1990b).

Additional Brush Fire Hazards Areas – This encompasses wildland areas outside of Fire Zone 4 that are within the jurisdiction of incorporated cities and have features similar to Fire Zone 4 (County of Los Angeles, 1990b).

The Wildfire Study Area is within both of these County high fire hazard zones. The Project components that occur south of the California aqueduct (i.e., grade control construction, sediment excavation, southern portion of the dump truck route) are located within a designated Fire Zone 4 (County of Los Angeles, 1990c). The Project components that occur north of the California aqueduct (i.e., northern portion of the dump truck route, sediment storage, and disposal) are located within an Additional Brush Fire Hazards Area (County of Los Angeles, 1990c).

C.13.2 Regulatory Framework

The Project and alternatives would traverse federal and local jurisdictions. The following discussion summarizes the associated laws, regulations and standards for these jurisdictions. Table C.13-1 provides a list of the specific policies that are applicable to wildfire prevention and suppression, and includes a discussion of the Project's consistency with each policy. An evaluation of applicable policies from the Forest Service Land Management Plan is included in Section C.9 (Recreation and Land Use).

Federal

- **National Fire Plan.** In 2000, the Secretaries of the USDA and the Department of the Interior (DOI) were directed to prepare a report recommending how to respond to severe, ongoing fire activity, reduce impacts of fires on rural communities and the environment, and ensure sufficient firefighting resources in the future. The report was the foundation for the National Fire Plan, which addresses the following five key points in wildfire management: firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability.
- The USDA and the DOI have continued to work with federal, state, local, and tribal governments, and non-governmental partners and public stakeholders to further develop a coordinated strategy to address wildland fire threats. In 2009, Congress passed the Federal Land Assistance, Management, and Enhancement Act (FLAME Act) that mandated the development of a national cohesive wildland fire management strategy. As directed by the FLAME Act, the USDA and the DOI established the Wildland Fire Leadership Council, which is an intergovernmental committee tasked with completing a three-phased planning and analysis process referred to as the Cohesive Strategy effort. The culmination of this effort was the creation of the following:

- **The National Strategy:** The Final Phase in the Development of the National Cohesive Wildland and Fire Management Strategy. The National Strategy describes how strategic investments across the nation can be focused to reduce the effects of wildfire on high risk areas. However, the guidance is not prescriptive in deciding which options to apply regionally or locally (USDA and DOI, 2014a). This document describes the following four challenges in wildfire management: (1) Managing vegetation and fuels; (2) Protecting homes, communities, and other values at risk; (3) Managing human-caused ignitions; and (4) Safely, effectively, and efficiently responding to wildfire.
- **National Action Plan**: This plan is a framework for implementing the National Strategy. For each of the four challenges outlined in the National Strategy, the National Action Plan describes a range of management options and the implementation planning guidance that is applicable at all levels of planning (USDA and DOI, 2014b).

- While the Wildland Fire Leadership Council will continue to coordinate national wildfire issues, implementing the National Strategy and National Action Plan at a regional and local level is subject to the stakeholders' participation and the effectiveness of wildland fire management in local communities.
- **Angeles National Forest Fire Management Plan (2009).** The Angeles National Forest Fire Management Plan (2009) is a fundamental strategic document that guides the full range of fire management-related activities within the Angeles National Forest.

Local

- **County of Los Angeles General Plan Safety Element (Adopted 1990).** Section 3.4 of the County of Los Angeles Safety Element describes the wildland fire hazards within the County, which include the dry climate, Santa Ana weather conditions, and steep topography. The high fire hazard areas delineated on the Wildland and Urban Fire Hazards Map (County of Los Angeles, 1990c) indicate portions of the County that require innovative strategies to enforce stringent fire enforcement measures including fire-resistive construction materials, brush clearance, fire breaks, and fuel-load management requirements (County of Los Angeles, 1990b). Table C.13-1 lists the goals and actions from the County of Los Angeles Safety Element that are applicable to wildfire.
- **City of Palmdale General Plan (January 1993).** There are two City of Palmdale General Plan elements that discuss high fire risk areas and fire protection services: the Safety Element and the Public Services Element, respectively. The City's fire protection services are provided by the Los Angeles County Fire Department, which has three stations located within the Palmdale Planning Area and five additional stations serving the outlying areas (City of Palmdale, 1993a). The Los Angeles County Fire Department also receives aid from the USDA Forest Service in firefighting resources. The City of Palmdale General Plan objectives and policies that are applicable to wildfire are listed in Table C.13-1.

Table C.13-1. Consistency with Applicable Wildfire Plans and Policies

Plan/Policy	Consistency	Explanation
County of Los Angeles General Plan Safety Element (December 1990)		
Goal 18: Expand and improve vegetation management efforts in wildland fire hazard areas.	Yes	The Project would restore disturbed vegetation with native seed mixes. With the incorporation of SPCs BIO-1a and BIO-2, Project activities would not affect the local vegetation, nor would they alter the fuel vegetation matrix at the Reservoir or along truck routes.

Table C.13-1. Consistency with Applicable Wildfire Plans and Policies

Plan/Policy	Consistency	Explanation
Goal 19: Promote improved watershed management practices to reduce the risk of damaging runoff and debris movement into urban areas.	Yes	The Project would restore the existing Reservoir to its 1992 design, which would improve its water storage capacity and reduce the risk of dam overflow.
Action 15.1: Continue to review all development projects proposed in Fire Zone 4 for availability of adequate emergency access and water supply for firefighting purposes. Improve the enforcement of the Water Code, including provision for periodic inspection of water utilities to verify compliance with code requirements.	Yes	The Project would not introduce new development into Los Angeles County. Use of County lands for sediment transport and temporary storage would not require designated emergency access or water supply.
Action 15.3: Continue to require property owners to undertake fuel load management practices such as brush clearance, erosion control, slope stabilization, and flammable rubbish removal. Also, continue to review development projects to ensure proper brush clearance, adequate requirements for emergency ingress and egress, and adequate fire flows for fire suppression.	Yes	The Project would not introduce new development into Los Angeles County. Use of the PWD-owned property on 47th Street for temporary sediment storage would require a conditional use permit from the County. Onsite activities would adhere to County requirements regarding brush clearance, erosion control, slope stabilization, and flammable rubbish removal.
Action 18.4: Improve wildland fire hazards assessment and rating to establish priority areas for the reduction of fire hazard to tolerable levels. Give consideration to such factors as vegetation type, slope, aspect, and proximity to development. Expand vegetation management activities to reduce fuel loading of highly flammable vegetation.	Yes	The Project would restore disturbed vegetation with native seed mixes. With the incorporation of SPCs BIO-1a and BIO-2, Project activities would not affect the local vegetation, nor would they alter the fuel vegetation matrix at the Reservoir or along truck routes.
Action 19.1: Continue to improved watershed management efforts in coordination with federal, state, and local agencies to reduce the frequency, size, and intensity of wildland fires and their related watershed damage. This includes the maintenance of fire and fuel breaks, the review of wildland fire events for potential erosion impacts, and the provision of emergency revegetation where appropriate.	Yes	The Project would not alter the amount of developed land or the designated use of the land at the Reservoir. Activities would be consolidated in paved or previously disturbed areas at the Reservoir, and would not alter established high fire hazard areas or the WUI Defense Zones and Threat Zones surrounding the Reservoir. The Project would restore disturbed vegetation with native seed mixes, and would incorporate SPCs BIO-1a and BIO-2.
Los Angeles County Code (Ordinance 2014-0040)		
Title: 32 (Fire Code), Section 4908.1: Fuel modification plan in high hazard severity zones A fuel modification plan shall be submitted and approved prior to any subdivision of land, or prior to issuing a permit for any permanent structure used for habitation, that is within a fire hazard severity zone.	Yes	Project use of the Palmdale Water District (PWD)-owned property on 47th Street for temporary sediment storage would be subject to a conditional use permit from the County. The Project would adhere to County requirements that are associated with permit approval, such as a fuel modification plan if required.
City of Palmdale General Plan Safety Element (January 1993)		
Objective S1.3: Ensure compatible development in areas within or adjacent to natural high risk fire areas (urban-wildland interface), and other high risk fire areas.	Yes	The Project would not alter the amount of developed land or the designated use of the land at the Reservoir. Project activities would be consolidated in paved or previously disturbed areas at the Reservoir, and would not alter established high fire hazard areas or the WUI Defense Zones and Threat Zones surrounding the Reservoir.

Source: City of Palmdale, 1993b; County of Los Angeles, 1990a, 1987.

C.13.3 Issues Identified During Scoping

There were no wildfire prevention and suppression issues identified during the public scoping period. See Appendix E for a summary of issues relevant to the entire Project that were raised during the scoping process.

C.13.4 Environmental Consequences

Significance Criteria. The following significance criteria for Wildfire Prevention and Suppression were derived from previous environmental impact assessments for similar projects, agency thresholds, and from the CEQA Guidelines (Appendix G, Environmental Checklist Form, Section IX). Impacts of the Project or alternatives would be considered significant and would require mitigation if:

- Criterion WF1: Project-related activities adversely affect fire prevention and suppression activities.
- Criterion WF2: Project-related activities or the presence of the Project expose communities, fire-fighters, personnel, and/or natural resources to an increased risk of wildfire.
- Criterion WF3: Project-related activities create a fuel vegetation matrix with an increased ignition potential and rate of fire spread.

Impact Assessment Methodology. The first step for this impact analysis is to establish baseline conditions for the affected environment (as described in Section C.13.1), including a summary of wildland fuels, climate, topography, high fire hazard areas, and fire protection zones. The biophysical, historical, and management characteristics of the Project area are defined by the ANF Fire Management Plan and the Los Angeles County Municipal Code (see discussion of applicable wildfire policies and fire hazard zones in Section C.13.2). The Project area is then evaluated based on its potential to be affected by design features or construction, operation, and maintenance activities related to the Project and alternatives.

C.13.4.1 Proposed Action/Project

Direct and Indirect Effects Analysis

Project-related activities adversely affect fire prevention and suppression activities (Criterion WF1)

Impact WF-1: Construction and excavation equipment and dump trucks would interfere with wildfire suppression activities.

The use and temporary storage of Project construction and excavation equipment would be consolidated within the paved and previously disturbed areas at the Reservoir. The closure of the Reservoir and the presence of Project-related equipment would not affect fire prevention activities or fire suppression work within the ANF outside of the Study Area.

Sediment removal operations may require traffic control along Forest Service roadways, specifically at the gated entrance to the Reservoir on Cheseboro Road and near the Reservoir's boat ramp. While these roadways would be closed to the public during the annual closure period, the presence of the equipment and trucks could create an obstacle for emergency fire crews in the event of a wildfire near the Study Area. The numerous dump truck trips (maximum of 945 per day) that would be required during the first 7 to 12 years of sediment removal, followed by the truck trips during operation and maintenance of the Reservoir, would also create an obstacle to wildfire crews accessing NFS lands along public roadways near the Reservoir. The implementation of SPC FIRE-1, as provided in Appendix A, would avoid Project-related conflicts with wildfire suppression.

SPCs Applicable to Impact WF-1

SPC FIRE-1 (Curtailment of Activities)

CEQA Significance Conclusion

Implementation of SPC FIRE-1 (curtailment of activities) would avoid potential conflicts with fire suppression efforts in the event of a fire or during very high or extreme weather conditions, resulting in less than significant impacts (Class III).

Project-related activities or the presence of the Project expose communities, firefighters, personnel, and/or natural resources to an increased risk of wildfire (Criterion WF2)

Impact WF-2: Construction activities or personnel could inadvertently start a vegetation fire.

The Project would be located in a Fire Zone 4 and an Additional Brush Fire Hazards Area due to the chaparral vegetation that characterizes the site, the region's wet year-dry year climatic cycles, and the frequent Santa Ana weather conditions. High fire hazard zones require specific management strategies to minimize the risk of wildfire.

While historically, industrial operations in forests, rangelands, and watersheds have not resulted in an unusual number of wildfires compared to other causes, several large fires have been caused by operation of machinery (NWCG, 1999). Potential causes of wildfire from machine use include exhaust sparks, hot exhaust manifolds and pipes, fuel leaks, overheating, track and blade sparks, short circuits, brakes, belts and pulleys, accumulated debris, and broken hydraulic line spilling on hot engine parts (NWCG, 1999). A number of standards and practices that are effective in preventing wildfires have been identified by fire agency and operating company personnel, many of which have become requirements by law, regulation, or contract clause. Additional requirements to avoid a Project-related wildfire would be incorporated into the Project as SPCs FIRE-1 through FIRE-3.

SPCs Applicable to Impact WF-2

SPC FIRE-1 (Curtailment of Activities)

SPC FIRE-2 (Preparation of a Fire Plan)

SPC FIRE-3 (Spark Arrester Requirements)

CEQA Significance Conclusion

The implementation of SPC FIRE-1 (Curtailment of Activities), FIRE-2 (Preparation of a Fire Plan), and FIRE-3 (Spark Arrester Requirements) would establish protocols for equipment inspection and maintenance, permitted activities within the Project area, and procedures for detecting and reporting wildfires, thereby ensuring that potential impacts would be less than significant (Class III).

Project-related activities create a fuel vegetation matrix with an increased ignition potential and rate of fire spread (Criterion WF3)

Impact WF-3: Project activities could alter the fuel vegetation matrix, thereby contributing to an increased fire risk.

Following the excavation and removal of sediment from the Reservoir, areas that contain vegetation disturbed during the Project would be restored with native seed mixes and live plant material. In areas where any persistent native vegetation is removed for proposed activities, the area would be revegetated and restored to its previous state. Noxious weed controls including washing of ground disturbing equipment and removal of weeds prior to disturbance would be implemented to ensure that restored areas are not colonized by invasive plants. In addition, with the incorporation of SPCs BIO-1a and BIO-2, Project-related activities would not alter the fuel vegetation matrix within the Study Area, nor would it affect the local vegetation in a manner that would contribute to an increased ignition potential or rate of fire spread.

SPCs Applicable to Impact WF-3

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

CEQA Significance Conclusion

With implementation of SPCs BIO-1a and BIO-2, potential impacts to the fuel vegetation matrix would be less than significant (Class III).

C.13.4.2 Alternative 1: Reduced Sediment Removal Intensity

Direct and Indirect Effects Analysis

Project-related activities adversely affect fire prevention and suppression activities (Criterion WF1)

Impact WF-1: Construction and excavation equipment and dump trucks would interfere with wildfire suppression activities.

Alternative 1 would be identical to the Project in regards to the use and temporary storage of construction and excavation equipment, which would be consolidated within the paved and previously disturbed areas at the Reservoir. The closure of the Reservoir and the use of proposed equipment would not affect fire prevention activities or fire suppression work within the ANF outside of the Study Area.

Sediment removal operations that would occur under Alternative 1 would differ from the Project only in regards to the weekly construction schedule. The use of trucks and equipment along Forest Service and public roadways would create an obstacle to wildfire crews in the event of an emergency fire response that would be identical to the Project. The implementation of SPC FIRE-1 would avoid conflicts with wildfire suppression under Alternative 1.

SPCs Applicable to Impact WF-1

SPC FIRE-1 (Curtailment of Activities)

CEQA Significance Conclusion

Potential conflicts with fire suppression efforts would be identical to the Project, and implementation of SPC FIRE-1 is recommended to minimize these conflicts. With the application of SPC FIRE-1, impacts to wildfire suppression activities would be less than significant (Class III).

Project-related activities or the presence of the Project expose communities, firefighters, personnel, and/or natural resources to an increased risk of wildfire (Criterion WF2)

Impact WF-2: Construction activities or personnel could inadvertently start a vegetation fire.

The setting for Alternative 1 would be identical to the Project. As described in Section C.13.1, construction activities would be located in a Fire Zone 4 and an Additional Brush Fire Hazards Area, which require specific management strategies to minimize the risk of wildfire.

The type of construction activities and equipment that would be used for Alternative 1 is the same as for the Project, and the standards and practices for preventing wildfires that apply to the Project would also apply to this alternative. To avoid a construction-related wildfire, SPCs FIRE-1 through FIRE-3 would be incorporated into Alternative 1.

SPCs Applicable to Impact WF-2

SPC FIRE-1 (Curtailment of Activities)

SPC FIRE-2 (Preparation of a Fire Plan)

SPC FIRE-3 (Spark Arrester Requirements)

CEQA Significance Conclusion

The application of clearly defined standards and practices to avoid accidental vegetation fires (i.e., SPCs FIRE-1 through FIRE-3 would ensure that potential impacts would be less than significant (Class III).

Project-related activities create a fuel vegetation matrix with an increased ignition potential and rate of fire spread (Criterion WF3)

Impact WF-3: Project activities could alter the fuel vegetation matrix, thereby contributing to an increased fire risk.

Restoration activities under Alternative 1 would be identical to those activities under the Project. Following the excavation and removal of sediment from the Reservoir, areas in which vegetation was disturbed would be restored with native seed mixes and live plant material. In areas where any persistent native vegetation is removed for proposed activities, the area would be revegetated and restored to its previous state. Implementation of noxious weed controls (e.g., washing of ground-disturbing equipment, removal of weeds prior to disturbance) would ensure that restored areas are not colonized by invasive plants. SPCs BIO-1a and BIO-2 would also minimize the alternative's effects on native flora. As described for the Project, construction-related activities under Alternative 1 would not alter the fuel vegetation matrix within the Study Area, nor would the alternative affect the local vegetation in a manner that would contribute to an increased ignition potential or rate of fire spread.

SPCs Applicable to Impact WF-3

SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities)

SPC BIO-2 (Prepare and Implement a Weed Control Plan)

CEQA Significance Conclusion

With implementation of SPCs BIO-1a and BIO-2, potential impacts to the fuel vegetation matrix would be less than significant (Class III).

C.13.4.3 Alternative 2: No Action/No Project Alternative

Direct and Indirect Effects Analysis

Under the No Action/No Project Alternative, no construction or excavation activities would occur at the Reservoir should it be allowed to fill with sediment. Without these activities, the No Action/No Project Alternative would not impact or create a conflict with fire prevention and suppression activities. However, in the event the dam must eventually be removed for safety reasons, such a project would require the use of equipment and dump trucks at the Reservoir and along Forest Service and public roadways similar or greater than the proposed action and Alternative 1. Such a project would be greater in scale than the proposed action or Alternative 1. Under this scenario, Alternative 2 would likely introduce a larger temporary workforce that would need to be trained in fire prevention behavior and protocols. These activities at the Reservoir may result in an increased potential for wildfire risk when compared to the proposed action and Alternative 1. Therefore, under this Alternative 2 scenario, mitigation similar to that described for the proposed action would be required to reduce the potential for increasing the ignition potential and rate of fire spread within the Study Area.

CEQA Significance Conclusion

Should the Reservoir be allowed to fill with sediment and left alone, no impacts would occur. At some point in the future, should the dam be removed for safety reasons, potential impacts from the use of machinery in high fire hazard zones could be slightly greater under Alternative 2 as it would be for the Project. Through the application of clearly defined standards and practices to avoid accidental vegetation fires (i.e., SPCs FIRE-1 through FIRE-3; SPC BIO-1a, SPC BIO-2), the likelihood of a vegetation fire from construction-related activities would be minimized, thereby ensuring that potential impacts would be less than significant (Class III).

C.13.5 Impact Summary

Table C.13-2 summarizes the direct and indirect environmental impacts of the Project and the alternatives on wildfire prevention and suppression. Refer to Section C.13.4 for the entire environmental analysis and the full text of recommended mitigation measures.

Table C.13-2. Summary of Impacts and Mitigation Measures – Wildfire Prevention/Suppression

Impact	Impact Significance: Proposed Action	Alt.1	Alt.2: No Action	NFS Lands[1]	Mitigation Measures/SPC
WF-1: Construction and excavation equipment and dump trucks would interfere with wildfire suppression activities.	Class III	Class III	No Impact or Class III	Yes	SPC FIRE-1 (Curtailment of Activities)
WF-2: Construction activities or personnel could inadvertently start a vegetation fire.	Class III	Class III	No Impact or Class III	Yes	SPC FIRE-1 (Curtailment of Activities) SPC FIRE-2 (Preparation of a Fire Plan) SPC FIRE-3 (Spark Arrester Requirements)
WF-3: Project activities could alter the fuel vegetation matrix, thereby contributing to an increased fire risk.	Class III	Class III	No Impact or Class III	Yes	SPC BIO-1a (Provide Restoration/ Compensation for Impacts to Native Vegetation Communities) SPC BIO-2 (Prepare and Implement a Weed Control Plan)

Notes:
1 - Indicates whether this impact is applicable to National Forest System lands.

C.14 Comparison of Alternatives

This section discusses the environmental impacts for each alternative associated with a particular issue area. The summary of alternatives comparisons in Sections C.14.1 through C.14.12 draw on the detailed discussions of the affected environment and environmental consequences of the alternatives in Section C, as well as the technical studies and other material in the appendices. The following alternative impact summaries are also presented in Table C.14-1, which identifies the key issues or concerns that distinguish each alternative.

C.14.1 Air Quality and Climate Change

C.14.1.1 Air Quality

Air Quality impacts associated with the proposed action (Project) and Alternative 1 would be identical during construction of the grade control structure, and also during operation and maintenance excavation activities when both the Project and Alternative 1 are forecast to have those activities. While Alternative 1 would reduce the number of daily truck trips and reduce the daily and annual air pollutant emissions during the excavation construction phase, the total number of days that activities would generate air pollutants is increased each year (into the months of July and August), and the number of years of the excavation construction phase would increase from the proposed 7 to 12 year period to a minimum of 13 years. Both the Project and Alternative 1 would have the same project commitments to reduce air pollutant emissions, and neither would require mitigation to reduce adverse impacts. The No Action/No Project Alternative, while having somewhat unknown construction specifics, would likely result in eventual demolition and removal of the Dam, which would generate air pollutant emissions similar to, but likely greater in quantity, than that of the Project or Alternative 1.

C.14.1.2 Greenhouse Gases

Greenhouse gas (GHG) emissions impacts associated with the proposed Project and Alternative 1 would be identical during construction of the grade control structure, and also during operation and maintenance excavation activities when both the Project and Alternative 1 are forecast to have those activities. While Alternative 1 would reduce the number of daily truck trips and reduce the daily and annual GHG emissions during the excavation construction phase, the total Project-life GHG emissions are forecast to be marginally higher for Alternative 1. Both the Project and Alternative 1 would have the same project commitments to reduce GHG emissions, and neither would require mitigation to reduce adverse impacts. The No Action/No Project Alternative, while having somewhat unknown construction specifics, may result in increased direct GHG emissions impacts during eventual demolition and removal of the Dam when compared to both the Project and Alternative 1. Further, the loss of the Reservoir under the No Action/No Project Alternative would not comply with GHG emissions reductions policies that seek to maximize local water resources and reduce the GHG emissions associated with long distance water importing.

C.14.2 Biological Resources

The proposed Project and Alternative 1 would have similar impacts for most of the biological resources present in the Project area. Alternative 1 would result in greater impacts to nesting birds because sediment removal activities would commence during the nesting season. Alternative 1 would also have greater impacts to aquatic species including arroyo toads, southwestern pond turtle, and two-striped garter snake than the Project because of the need to drain the Reservoir in June rather than after Labor

Day. Project activities conducted during July for Alternative 1 would also increase impacts to sensitive mammals. Impacts to sensitive biological resources that occur on the 47th Street East sediment removal site would be identical for the proposed Project and Alternative 1.

Implementation of the No Action/No Project Alternative would result in fewer impacts to biological resources compared to the proposed Project or Alternative 1. The No Action/No Project Alternative may benefit biological resources, over time, through the accumulation of sediment and the establishment of native riparian communities. The transition of the Reservoir to a more natural stream channel would reduce the presence of non-native fish and may increase habitat that would support arroyo toad. This assumes the Dam would not become unstable and require demolition. In the event the Dam and accumulated sediment must be removed, the extensive nature of the project (i.e., removal of approximately 2.8 million cubic yards of sediment and dam concrete) would contribute to greater impacts to native vegetation above and below the Dam compared to either the proposed Project or Alternative 1.

C.14.3 Cultural Resources

As noted above, impacts to cultural resources would be the same for the proposed Project and Alternative 1. The only potential for the proposed Project and Alternative 1 to have direct impacts to cultural resources is from unanticipated or inadvertent cultural resource discoveries. However, if such resources are encountered, impacts would be minimized through the implementation of SPC CUL-1 (Archaeological Monitoring Outside the Little Rock Creek and Reservoir Bed) and SPC CUL-2 (Unidentified Cultural Resource Discovery Procedures). No formal cemeteries or human remains are known to be located within the APE of the proposed Project and Alternative 1. However, there is always the possibility that unmarked burials may be unearthed during construction. In the unlikely event of an accidental discovery of any human remains, the procedures and provisions in SPC CUL-3 (Unidentified Human Remains Discovery Procedures) would be implemented.

Finally, under the No Action/No Project Alternative, the Project would not be implemented. Therefore, the impacts associated with the proposed Project and Alternative 1 would not occur and the Project would have no impacts to cultural resources. In the event sediment buildup led to safety issues and required demolition/removal of the Dam, it is likely similar procedures and provisions as SPCs CUL-1, CUL-2, and CUL-3 would be necessary to address inadvertent discoveries and provide detail on how these activities would be implemented.

C.14.4 Geology and Soils

The proposed Project and Alternative 1 both would have a direct and minor potential to expose construction workers to seismic and geologic hazards, such as landslide and liquefaction. This potential would be reduced through implementation of SPC GEO-1 (Geotechnical Investigation). No other adverse impacts associated with seismic hazards would occur. Under the No Action/No Project Alternative, future demolition of the Dam and earth movement on or near steeper slopes could expose construction workers to risks associated with liquefaction and landslide. The geotechnical safeguards for this potential demolition and excavation work are unknown, and therefore the No Action/No Project Alternative could result in a direct, adverse impact.

Both the proposed Project and Alternative 1 would have a direct but negligible potential to increase erosion and expose construction workers to unstable slopes. This potential would be reduced through implementation of SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels). Under the No Action/No Project Alternative, it is likely that substantial downstream erosion and sedimentation would result in the event the Dam was breached or demolished. It is unknown what project commitments would be included in this alternative, or if they would be adequate to protect downstream resources from erosion and sedimentation. Therefore, this alternative would result in a direct and adverse impact.

C.14.5 Hazards and Public Safety

The proposed Project and Alternative 1 would have a direct and minor potential to contaminate water resources or endanger public health through the use and transport of hazardous materials. This potential would be reduced through implementation of SPC WQ-1 (Prepare Spill Response Plan). Under the No Action/No Project Alternative, future demolition of the Dam and sediment excavation would require the use of hazardous materials (e.g., vehicle fuels, oils, and other vehicle maintenance fluids). As standard project commitments regarding the handling, disposal, and spill response for hazardous materials under this alternative are unknown, the No Action/No Project Alternative could result in a direct and adverse impact.

Both the proposed Project and Alternative 1 would have a negligible potential to degrade the safety and stability of Littlerock Dam, and neither alternative is expected to result in Dam failure. Similarly, the proposed Project, Alternative 1, and the No Action/No Project Alternative would have a negligible potential to increase exposure of the public to Valley Fever or to high levels of mercury in fish caught for human consumption. Impacts to highway safety from the proposed Project, Alternative 1, and the No Action/No Project Alternative would be negligible.

C.14.6 Hydrology

The proposed Project and Alternative 1 would have an indirect and minor potential for reducing groundwater levels in the Antelope Valley Groundwater Basin that would be offset by reduced need for groundwater extraction by PWD. By comparison, the No Action/No Project Alternative would, over a period of decades (possibly shorter if catastrophic sedimentation occurs in the reservoir due to fire or other watershed changes), substantially increase reliance on groundwater for local municipal use.

The Project and Alternative 1 would both reduce downstream flooding by increasing reservoir storage capacity, and maintaining that capacity for the future. The No Action/No Project Alternative would, over time, result in reduced reservoir capacity with a corresponding increase in downstream flood potential.

C.14.7 Noise

Noise impacts associated with the proposed Project and Alternative 1 would be similar. While Alternative 1 would reduce the number of daily truck trips and an overall reduction in temporary noise occurrences, the total number of days that activities would generate noise is increased (into the months of July and August). Both the Project and Alternative 1 would implement SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) and SPC NOI-2 (PWD Site Buffer Requirements) to minimize adverse impacts. The No Action/No Project Alternative, while having somewhat unknown construction specifics, would likely result in increased noise impacts when compared to both the Project and Alternative 1.

C.14.8 Recreation and Land Use

The proposed Project, Alternative 1, and the No Action/No Project Alternative would comply with applicable federal, State, and local land use or recreation plans, goals, policies, or regulations. This includes consistency with the 2005 Forest Service's Land Management Plan as well as local zoning requirements for storage or disposal of excavated sediment.

Neither the proposed Project nor the alternatives would expand existing recreational facilities nor would they convert NFS lands. However, the Project and Alternative 1 would temporarily preclude existing recreational resources at the Reservoir (Impact L-1). Under the Project and Alternative 1, the Reservoir and surrounding area would be closed annually for several months each year, but would generally be open to the public during the winter and spring months assuming that the Forest Service re-opens the Reservoir for public access. Compared with the proposed Project, Alternative 1 may double the number of years that the Reservoir would be closed to the public, and would include annual closures during the peak summer period. The No Action/No Project Alternative would not involve any construction or sediment excavation as part of the proposed management of the Reservoir, and therefore would not create a short-term disturbance of recreational resources within the Study Area.

The proposed Project, Alternative 1, and the No Action/No Project Alternative would disturb existing land uses along the dump truck routes and disposal sites (Impact L-2). Approximately 480 truck trips per day would be required under the Project, while the reduced construction schedule under Alternative 1 would require a smaller number of 180 truck trips per day. A removal of the Dam and accumulated sediment, which may be required under the No Action/No Project Alternative, could involve excavation of up to 2.8 million cubic yards of sediment and Dam concrete, which is almost twice the amount of sediment to be excavated than under the Project.

The Project and Alternative 1 would restore the Reservoir to its 1992 design capacity, and consequently would not contribute to the long-term loss or degradation of recreation at the Reservoir. The No Action/No Project Alternative would limit the future water-based recreational opportunities within the Study Area due to the reduction of Reservoir capacity from annual sediment accumulation, and may result in the permanent closure of the Reservoir if the Dam were to be removed (Impact L-3).

C.14.9 Transportation and Traffic

The proposed Project would create an adverse impact at the intersection of Pearblossom Highway and Avenue T during the afternoon peak hour. Traffic impacts associated with Alternative 1 would be less than the proposed Project, because traffic delays at the stop sign on the northbound intersection of Cheseboro Road at Pearblossom Highway would be reduced under Alternative 1. While Alternative 1 would reduce the number of daily truck trips and reduce the afternoon peak period impact at the intersection of Pearblossom Highway and Avenue T compared to the proposed Project, the delay at this intersection would remain significant when compared to baseline operating conditions. Both the proposed Project and Alternative 1 would require identical mitigation to reduce adverse impacts. The No Action/No Project Alternative, while having somewhat unknown construction specifics, could result in increased traffic impacts when compared to both the proposed Project and Alternative 1 in the event that 2.8 million cubic yards of sediment and Dam debris would need to be removed.

C.14.10 Visual Resources

Visual resource impacts associated with the proposed Project and Alternative 1 would be identical. Both the Project and Alternative 1 would not result in adverse impacts. The No Action/No Project Alternative, because it results in unknown compliance with future SOI determination of the Reservoir by the Forest Service and would result in somewhat unknown construction specifics, is considered to result in increased visual resource impacts when compared to both the proposed Project and Alternative 1.

C.14.11 Water Quality and Resources

The proposed Project and Alternative 1 would have a direct and minor potential to introduce hazardous materials to receiving waters. This potential would be minimized through implementation of SPC WQ-1 (Prepare Spill Response Plan) and SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels). No other adverse impacts to surface water quality would occur. Under the No Action/No Project Alternative, a future Dam breach or demolition would result in substantial downstream erosion and sedimentation. As it is unknown what project commitments would be included in this alternative, or if they would be adequate to protect downstream resources from degradation, the No Action/No Project Alternative would result in a direct and adverse impact.

The proposed Project, Alternative 1, and the No Action/No Project Alternative would have a negligible potential to introduce hazardous materials to the groundwater basin, and none of the alternatives are expected to degrade groundwater quality.

C.14.12 Wildfire Prevention and Suppression

The components of the proposed Project and Alternative 1 that could affect wildfire prevention and suppression are similar enough to result in identical impacts. Both the Project and Alternative 1 would utilize equipment staging areas at the Project Area, and would transport excavated sediment along Forest Service and public roadways. In order to avoid accidental fire ignition or interference with wildfire suppression activities, both the proposed Project and Alternative 1 would implement SPC FIRE-1 (Curtailment of Activities), SPC FIRE-2 (Preparation of a Fire Plan), and SPC FIRE-3 (Spark Arrester Requirements).

Restoration activities that are proposed under the proposed Project and Alternative 1 are also identical. With the implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) and SPC BIO-2 (Prepare and Implement a Weed Control Plan) to minimize the effects of construction activities on native flora, neither the Project nor Alternative 1 would create a fuel vegetation matrix with an increased ignition potential and rate of fire spread.

Under the No Action/No Project Alternative, future Dam removal would require a greater construction effort than the proposed action or Alternative 1. Under this scenario, the No Action/No Project Alternative would likely introduce a larger temporary workforce that would need to be trained in fire prevention behavior and protocols. These activities at the Reservoir may result in an increased potential for wildfire risk when compared to the proposed Project and Alternative 1

Table C.14-1. Comparison of Impacts by Alternative

Resource	Proposed Action	Alternative 1	No Action/ No Project Alternative (Alternative 2)	NFS Lands Affected
Air Quality and Climate Change	Average daily PM10 emissions would exceed the AVAQMD emissions thresholds during excavation (Impact AQ-2). Operation air pollutant emissions estimates are below the AVAQMD emissions thresholds (Impact AQ-3). GHG emissions are below AVAQMD GHG emission thresholds (Impact GHG-1).	All construction and operation air pollutant emissions estimates are below the AVAQMD emissions thresholds (Impacts AQ-2 and AQ-3). GHG emissions are below AVAQMD GHG emission thresholds, but would be slightly higher than for the proposed action due to the higher efficiencies associated with the proposed action's higher daily volume sediment hauling (Impact GHG-1).	Air pollutant emissions from eventual Dam removal construction activities may exceed AVAQMD emissions thresholds. The hauling and disposal of sediment and Dam debris that may result from dam removal would generate GHG emissions similar to, but likely greater in quantity, than that of the proposed action or Alternative 1.	Yes
Biological Resources	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects on: • Riparian habitat or other sensitive natural community (Criterion BIO1); • Fully protected, endangered, or threatened species (Criterion BIO2); • Candidate, sensitive, or special-status species (Criterion BIO3); • Federally protected wetlands (Criterion BIO4); and • Migratory species or wildlife corridors (Criterion BIO5).	Extended construction schedule would increase the likelihood of disturbing nesting birds and disturbing pupping season for ringtail (Criterion BIO2). Draining the Reservoir earlier in the season may have greater impacts to arroyo toads (Impact BIO-6).	Eventual removal of sediment and demolition of the Dam would involve an intensive construction effort that would create greater impacts to biological resources above and below the Dam (i.e., native vegetation, wildlife, jurisdictional resources) than would occur from the proposed action or Alternative 1.	Yes
Cultural Resources	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects on cultural resources (Impacts C-1 and C-2).	Alternative 1 would incorporate identical SPCs as the proposed action, and would avoid and/or minimize adverse effects on cultural resources (Impacts C-1 and C-2).	In the event that removal of sediment and demolition of the Dam were to occur, it is likely that SPCs similar to the proposed action would be implemented to avoid and/or minimize adverse effects on cultural resources.	Yes
Geology and Soils	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects due to seismic or geologic hazards (Impact G-1), or from soil erosion, slope instability, or slope failure (Impact G-2).	Fewer workers would be exposed to risks associated with unstable slopes than under the proposed action, but risks would occur over a longer period of time (Impact G-1). Soil disturbance would be less than under the proposed action, but would occur over a longer period of time (Impact G-2).	Demolition of the Dam and sediment removal would involve more earth movement than under the proposed action, and may require working on or near steeper slopes. Direct impacts to soils and risks to construction workers may be greater than under the proposed action or Alternative 1.	Yes
Hazards and Public Safety	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects to public health, including risk from hazardous material spills (Impact HAZ-1) or unsafe highway conditions (Impact HAZ-5).	Fewer workers would be exposed to risks associated with hazardous materials, but risks would occur over a longer period of time (Impact HAZ-1). Fewer disposal trucks would be utilized, which	Excavation and demolition of the Dam would require the use of hazardous materials that may contribute to soil, groundwater, or surface water contamination. As the degree to which SPCs would be incorporated into this future	Yes

Table C.14-1. Comparison of Impacts by Alternative

Resource	Proposed Action	Alternative 1	No Action/ No Project Alternative (Alternative 2)	NFS Lands Affected
		could lead to a slight reduction in unsafe highway conditions (Impact HAZ-5).	project is unknown, impacts may be greater than under the proposed action or Alternative 1.	
Hydrology	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects associated with groundwater supply, erosion and siltation, or flooding (Criteria H1 through H3).	Alternative 1 would incorporate identical SPCs as the proposed action to avoid and/or minimize adverse effects associated with groundwater supply, erosion and siltation, or flooding (Criteria H1 through H3).	May contribute to a decline in groundwater levels from a greater reliance on alternative water sources (i.e., groundwater and State Water Project) (Impact H-1). Loss of water storage capacity in the Reservoir would increase the risk of flood hazard downstream of the Dam (Impact H-3).	Yes
Noise	The proposed action would incorporate SPCs to avoid and/or minimize adverse noise impacts from mobile and stationary sources (Impacts N-1 and N-2), and to minimize impacts to sensitive receptors (Impacts N-3 and N-4).	Reduction in daily truck trips would reduce the amount of mobile noise occurring per day, but would increase the overall number of days per year that noise is generated (Impact N-1). Reduction in daily truck trips would reduce the overall daily frequency of potential vibration, but would increase the number of days where temporary vibration may be generated (Impact N-4).	Excavation and demolition of the Dam would generate construction noise. As the degree to which SPCs would be incorporated into this future project is unknown, impacts may be greater than under the proposed action or Alternative 1.	Yes
Recreation and Land Use	After the Project's initial construction and excavation during the summer and fall of the first year, annual closure of the Reservoir would occur after Labor Day until mid-November to January, for a minimum of 7 years up to 12 years (Impact L-1). Truck trips would create nuisance impacts to nearby residences (Impact L-2).	Construction and excavation would require annual closure of the Reservoir during the peak summer period (beginning July 1st of each year until mid-November to January) for a minimum of 13 years (Impact L-1). Reduction in daily truck trips would lessen the daily nuisance impacts to nearby residences, but would lengthen the time that disturbances would occur (Impact L-2).	Future excavation and demolition of the Dam would require an intensive construction effort that would create greater disturbances to residences along the truck routes and disposal sites than under the proposed action or Alternative 1 (Impact L-2). Removal of the Dam would result in the irreversible loss of a recreational resource (Impact L-3).	Yes
Transportation and Traffic	Number of truck trips would be 480 trips (240 round trips). Truck traffic under the proposed action would adversely affect the intersection of Pearblossom Highway and Avenue T (Impact T-1). The proposed action would create excessive traffic delays at the stop sign on northbound Cheseboro Road at Pearblossom Highway (Impact T-1).	Number of truck trips would be reduced to 180 trips (90 round trips). No adverse impact would occur at the intersection of Pearblossom Highway and Avenue T (Impact T-1). Traffic delays at the stop sign on northbound Cheseboro Road at Pearblossom Highway would still occur, but impacts would be reduced (Impact T-1).	Future excavation and demolition of the Dam would require an intensive construction effort that would involve a greater number of truck trips than under the proposed action or Alternative 1.	Yes

Table C.14-1. Comparison of Impacts by Alternative

Resource	Proposed Action	Alternative 1	No Action/ No Project Alternative (Alternative 2)	NFS Lands Affected
Visual Resources	The proposed action would not greatly alter the existing visual landscape and would avoid adverse effects on visual resources (Criteria VIS1 and VIS2).	Alternative 1 would be identical to the proposed action in that it would not greatly alter the existing visual landscape and would avoid adverse effects on visual resources (Criteria VIS1 and VIS2).	In the event that the Reservoir became filled with sediment, construction of a downstream flood-control channel may be required. Future flood control facilities could result in visual contrast and adverse visual impacts.	Yes
Water Quality and Resources	The proposed action would incorporate SPCs to avoid and/or minimize adverse effects associated with waste discharge and hazardous material spills (Impacts WQ-1 and WQ-2).	Alternative 1 would incorporate identical SPCs as the proposed action to avoid and/or minimize adverse effects associated with waste discharge and hazardous material spills (Impacts WQ-1 and WQ-2).	In the event that the Dam would be breached or demolished, downstream erosion and sedimentation would occur. As the degree to which SPCs would be incorporated into this future project is unknown, impacts may be greater than under the proposed action or Alternative 1.	Yes
Wildfire Prevention and Suppression	The proposed action would incorporate SPCs to avoid and/or minimize interference with wildfire suppression activities or risk of wildfire ignition (Impacts WF-1 through WF-3).	Alternative 1 would incorporate identical SPCs as the proposed action to avoid and/or minimize interference with wildfire suppression activities or risk of wildfire ignition (Impacts WF-1 through WF-3).	In the absence of construction or excavation activities, no impacts or conflicts with fire prevention and suppression activities would occur. However, In the event that the Dam would be demolished, Alternative 2 would incorporate identical SPCs as the proposed action to avoid and/or minimize interference with wildfire suppression activities or risk of wildfire ignition (Impacts WF-1 through WF-3).	Yes

C.15 Conclusion

C.15.1 NEPA Environmentally Preferred Alternative

This section utilizes the detailed discussions of the existing environmental conditions and the analysis of the environmental consequences of the alternatives in Sections C.2 through C.13 of this Draft EIS/EIR, as well as the technical studies and other material in the Appendices.

In accordance with NEPA requirements, the "preferred alternative" is a preliminary indication of the federal responsible official's preference of action, which is chosen from among the proposed action and alternatives. The preferred alternative may be selected for a variety of reasons (such as the priorities of the particular lead agency) in addition to the environmental considerations discussed in a Draft EIS. In accordance with NEPA (40 CFR Section 1502.14(e)), the Forest Service will consider the conclusions of the Draft EIS as well as public and agency comments in order to identify its preferred alternative in the Final EIS.

In addition to the preferred alternative, the federal lead agency is also required to identify an "environmentally preferable alternative" in the Record of Decision for the EIS (40 CFR Section 1505.2(b)). In contrast to the preferred alternative, the environmentally preferable alternative is the alternative that will promote the purposes expressed in NEPA's Section 101. Typically, this is the alternative that would cause the least environmental damage as well as preserve natural resources related to cultural and historical values. Therefore, the preferred alternative identified in a Final EIS may not be the same as the environmentally preferable alternative identified in the ROD. The NEPA environmentally preferable alternative is subject to all mitigation measures applicable to NFS lands identified in Section C (Affected Environment and Environmental Consequences).

Proposed Action. The proposed action was developed to meet the project objectives while avoiding biological resource impacts that were identified in the 1991/1992 Littlerock Dam and Reservoir Restoration Project EIS/EIR, for which sediment excavation was proposed but never implemented due to the presence of the federally-endangered arroyo toad at the Reservoir. The proposed action includes the construction of a grade control structure to preserve arroyo toad habitat by preventing sediment loss and headcutting upstream of Rocky Point, where critical arroyo toad habitat has been identified. The proposed action would also incorporate SPCs to minimize and/or avoid the impacts identified in Sections C.2 through C.13 (refer to Appendix A (Standard Project Commitments) for a complete list of SPCs). Resources that would be adversely impacted by the proposed action during temporary annual activities include air quality (i.e., daily PM10 emissions), traffic (i.e., number of truck trips and associated traffic delays), and recreation and land use (i.e., closure of recreation facilities and nuisance impacts to adjacent residences) (see Table C.14-1). These impacts would similarly occur under Alternative 1, although Alternative 1 includes a modification to the sediment removal schedule to lessen the severity of temporary air quality, traffic, and noise impacts (see Alternative 1 discussion below). Compared to the proposed action, the No Action/No Project Alternative would not result in short-term impacts to air quality, traffic, recreation, and land use. However, the No Action/No Project Alternative could lead to the eventual removal of the Dam, which would likely result in a more intense construction effort and greater impacts than the proposed action or Alternative 1 (see No Action/No Project discussion below).

No Action/No Project Alternative. The No Action/No Project Alternative would not involve sediment removal activities, avoiding the resource impacts identified for the proposed action and Alternative 1 over the short-term. However, sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually. As the Reservoir becomes filled with sediment against the existing Dam, a future project may be required to remove the existing Dam for safety reasons and construct new downstream levee improvements. Such a project is expected to involve sediment removal in quantities greater than or similar to the proposed action or Alternative 1. Such a project would not occur slowly on an annual basis (such as the proposed action and Alternative 1), requiring a more intense construction effort and likely resulting in greater impacts than the other alternatives over the long-term (see Table C.14-1).

Alternative 1. The Reduced Sediment Removal Intensity Alternative (Alternative 1) was expressly developed as a modification to the proposed action's annual sediment removal schedule in order to reduce the intensity of daily construction activities by extending the annual sediment removal period. By doing this, it would:

- Reduce daily PM10 emissions during excavation and construction;
- Reduce the number of daily truck trips on public roadways; and
- Reduce the frequency of periodic truck trip noise to receptors along the haul routes and allow for a more flexible construction effort (e.g., less rigid schedule, use of smaller haul trucks) to potentially reduce periodic vibration from loaded haul trucks travelling on public roadways.

Compared with the proposed action and the No Action/No Project Alternative, Alternative 1 would extend the duration of impacts to wildlife species from an extended annual construction schedule that could overlap with nesting bird periods. However, as discussed in Section C.3 (Biological Resources), the adverse effects under Alternative 1 would be reduced and/or avoided through the incorporation and implementation of SPCs. Alternative 1 would also extend the annual closure period of the Reservoir and surrounding recreation facilities during a portion of the peak summer period, which would result in a slightly greater recreational impact when compared to the other alternatives. However, as discussed in Section C.9 (Recreation and Land Use), recreational opportunities at the Reservoir have not been consistently available to the public during the additional weeks proposed for closure under Alternative 1, and currently the Reservoir is closed to public access. In addition, during drought conditions (such as the one currently occurring throughout the State), PWD is allowed to divert water from the Reservoir below the minimum pool level starting in July. Ongoing drought conditions may prevent any use of the Reservoir for water-based recreational activities during the additional weeks proposed for closure under Alternative 1. The adverse effects to recreation from slightly extending public closure of the Reservoir during the annual sediment removal period that are specific to Alternative 1 were considered less important than the reduction of the air quality, traffic, and noise impacts that are associated with this alternative.

Based on the analysis in this Draft EIS/EIR the environmentally preferable alternative would be the Reduced Sediment Removal Intensity Alternative (Alternative 1). In accordance with NEPA (40 CFR Section 1502.14(e)), the Forest Service will identify its preferred alternative (likely to be the same as the environmentally preferred alternative) in the Final EIS/EIR.

C.15.2 CEQA Environmentally Superior Alternative

In accordance with CEQA requirements, an "environmentally superior alternative" must be identified among the alternatives analyzed in an EIR or EIR/EIS. The environmentally superior alternative is the alternative found to have an overall environmental advantage compared to the other alternatives based on the impact analysis in the EIR. If the environmentally superior alternative is the No Project alternative, State CEQA Guidelines Section 15126.6(e)(2) requires the EIR to identify an environmentally superior alternative from among the other alternatives.

In the case of the Littlerock Reservoir Sediment Removal Project, the No Action/No Project Alternative may result in the need for a future project requiring the removal of the existing Dam. Such a project would require sediment removal in quantities greater than or similar to the proposed Project. In addition, such a project would require a more intense construction effort resulting from Dam removal activities that may result in greater impacts than the proposed Project (see Table C.14-1). Due to the potential scale of such a project, the No Action/No Project Alternative could result in as many as 17 significant and unavoidable impacts (Class I), and 26 significant impacts (Class II) that can be reduced to a less than significant level through feasible mitigation (see Table ES-2).

The Reduced Sediment Removal Intensity Alternative (Alternative 1) was expressly developed as a modification to the proposed Project's annual sediment removal schedule in order to reduce the intensity of daily construction activities by extending the annual sediment removal period. By doing this, it would reduce the severity of impacts associated with air quality, traffic, and noise. Alternative 1 is feasible and would reasonably achieve the objectives of the proposed Project. Alternative 1 would be environmentally superior to the proposed Project because it would:

- Reduce daily PM10 emissions during excavation and construction;
- Reduce the number of daily truck trips on public roadways; and
- Reduce the frequency of periodic truck trip noise to receptors along the haul routes and allow for a more flexible construction effort (e.g., less rigid schedule, use of smaller haul trucks) to potentially reduce periodic vibration from loaded haul trucks travelling on public roadways.

In selecting the environmentally superior alternative, consideration was given to resources that may be affected by greater impacts under Alternative 1 when compared to the proposed Project, specifically biological resources and recreation. Biological resource impacts would include adverse effects to species from an extended annual construction period that could overlap with nesting periods and/or would extend the duration of impacts within certain habitats. However, as discussed in Section C.3 (Biological Resources), these adverse effects under Alternative 1 would be reduced and/or avoided through the incorporation of SPCs. Overall impacts to biological resources would be less than significant (Class III) under Alternative 1.

Alternative 1 would result in a slightly greater recreational impact when compared to the proposed Project, as it would extend the annual closure period of the Reservoir and surrounding recreation facilities during the peak summer period. However, as discussed in Section C.9 (Recreation and Land Use), recreational opportunities at the Reservoir have not been consistently available to the public during the additional weeks proposed for closure under Alternative 1, and currently the Reservoir is closed to public access. In addition, during drought conditions (such as the one currently occurring throughout the State), PWD is allowed to divert water from the Reservoir below the minimum pool level starting in July. Ongoing drought conditions may prevent any use of the Reservoir for water-based recreational activities during the additional weeks proposed for closure under Alternative 1. As such, the adverse impacts to recreation from slightly extending public closure of the Reservoir during the annual sediment removal period that are specific to Alternative 1 were considered less important than the reduction of the air quality, traffic, and noise impacts.

PWD has identified the Reduced Sediment Removal Intensity Alternative (Alternative 1) as the CEQA Environmentally Superior Alternative.

D. Cumulative Effects

D.1 Introduction

Preparation of a cumulative impact analysis is required under both NEPA and CEQA. NEPA identifies three types of potential impacts: direct, indirect, and cumulative. "Cumulative impact" is the impact on the environment that results from the incremental impact of the proposed action (Project) when considered with other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such other actions.

Cumulative effects can result from individually minor but collectively significant actions taking place over a period (40 CFR §1508.7). Under NEPA, both context and intensity are considered. Among other considerations when considering intensity is "[w]hether the action is related to other actions with individually minor but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts" (40 CFR §1508.27[b][7]). Additionally, the Council on Environmental Quality (CEQ) recommends that agencies "look for present effects of past actions that are, in the judgment of the agency, relevant and useful because they have a significant cause-and-effect relationship with the direct and indirect effects of the proposal for agency action and its alternatives."

Under the CEQA Guidelines, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts" (14 CCR §15130[a][1]). An EIR must discuss cumulative impacts if the incremental effect of a project, combined with the effects of other projects is "cumulatively considerable" (14 CCR §15130[a]). Such incremental effects are to be "viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects" (14 CCR §15164[b][1]). Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis. Both the severity of impacts and the likelihood of their occurrence are to be reflected in the cumulative discussion, "but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion of cumulative impacts shall be guided by standards of practicality and reasonableness, and shall focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact" (14 CCR §15130[b]). This includes the requirement that an environmental impact report (EIR) take into account all "past, present, and reasonably foreseeable future projects" (CEQA Guidelines §§15355[b], 15130[b][1][A]).

The cumulative analysis must be in sufficient detail to be useful to the decision maker in deciding whether, or how, to alter a project to lessen cumulative impacts. Most of the projects listed in the cumulative projects table below (Table D-1) have been, are, or will be required to undergo their own independent environmental review under CEQA, NEPA, or both. Any contribution from the Project to the overall cumulative impact that is cumulatively considerable (i.e., has a significant incremental effect) would be required to be reduced, avoided, or minimized through the application and implementation of mitigation measures. The net effect of these mitigation measures is assumed to be a general lessening of the potential for a contribution to cumulative impacts. The key consideration is whether the remaining physical change or effect on the environment represents an adverse environmental impact.

D.2 Methodology

The list of cumulative projects provided in Table D-1 and shown in Figure D-1 includes projects completed, in the process of construction, or currently under review within a geographic area sufficiently large enough to provide a reasonable basis for evaluating cumulative impacts. Past, current, and future actions are discussed in Section D.3, if they are closely related in either time or location to the Project. The area over which the cumulative scenario is evaluated may vary by resource, because the nature and range of potential effects vary by resource (e.g., air quality impacts tend to disperse over a large area or region while biological impacts are typically more location specific). This spatial area is identified as the geographic scope for the analysis of cumulative impacts related to a particular resource.

The analysis of cumulative effects considers a number of variables including geographic (spatial) limits, time (temporal) limits, and the characteristics of the resource being evaluated. The geographic scope of the analysis is based on the nature of the geography surrounding the Project and the characteristics and properties of each resource and the region to which they apply. In addition, each project in a region will have its own implementation schedule, which may or may not coincide or overlap with the Project's schedule. This is a consideration for short-term impacts from the Project. However, in order to reflect the greatest potential for combined impacts, the cumulative analysis assumes that all projects in the cumulative scenario are constructed or operating during the construction and operating lifetime of the Project.

D.3 Applicable Cumulative Projects

Existing and future projects identified with a potentially cumulative impact were under the jurisdiction of the USDA Forest Service, Palmdale Water District (PWD), California Department of Transportation, County of Los Angeles, and the City of Palmdale. Table D-1 contains a full list of applicable cumulative projects and Figure D-1 shows the location of these projects relative to the Project. For each cumulative project, the following information is listed in Table D-1: the map identification number, responsible agency, project name, location, status, description, timeframe and distance from the Project. A few projects have been highlighted below the table to provide greater detail on the cumulative scenario.

Table D-1. Cumulative Project List

Map ID #	Responsible Agency	Project Name	Location	Status	Description	Timeframe	Distance from Project (miles)
Federal							
1	USDA Forest Service	Williamson Rock and Pacific Crest Trail	Near the confluence of Cooper Canyon and Little Rock Creek, partially within the Pleasant View Ridge Wilderness, north of Highway 2.	Public Comment Period on the Notice of Intent Completed	Proposed activities include seasonal and long term closures, and construction of a trail, trail bridge, barriers, and minor improvements to staging areas and trailheads.	Future Project	11
State							
2	CalTrans	High Desert Corridor	A new multimodal link between SR-18 in San Bernardino County and SR-14 in Los Angeles County connecting Palmdale, Lancaster, Adelanto, Victorville, Hesperia, and Apple Valley.	Public Review of Draft EIR/EIS	The California Department of Transportation is proposing to construct a new freeway/expressway connecting the City of Palmdale in Los Angeles County with the town of Apple Valley in San Bernardino County. The proposed freeway/expressway is approximately 63 miles long.	Future Project	7
Regional							
3	Palmdale Water District	Little Rock Creek Groundwater Recharge and Recovery Project	Upper Little Rock Creek; Near the California Aqueduct and travels generally in a northerly direction.		This groundwater recharge project utilizes existing active natural channel system and a series of shallow recharge basins in the adjacent floodplain, to recharge the groundwater.	Present	2
4	Palmdale Water District	Littlerock Dam	Little Rock Creek in Los Angeles County, CA, located 5 miles south of Palmdale.	Complete	The construction of Littlerock Dam & Reservoir was completed in 1924 with a water storage capacity of 4,200-acre feet. In 1994, the downstream side of the dam was reinforced and the spillway was raised to increase the storage capacity of the reservoir to 3,500 acre feet, or 1.1 billion gallons, of water.	Past Project	0
Local							
5	County of Los Angeles	Project Number: 89-003-(5)	Southwest corner of Pearblossom Highway and 47th Street East, Palmdale	Application Submittal Review	A mixed use development consisting of single-family and multi-family residences, commercial buildings, parks and recreation, a fire station, senior apartment housing, and a school site.	Future Project	4
6	City of Palmdale	Vulcan Materials Company: Conditional Use Permit (CUP) 08-01	The existing building and facilities are addressed as 6851 East Avenue T.	Approved	A request to permit and modify the existing surface mining operation.	Current Project	4

Table D-1. Cumulative Project List

Map ID #	Responsible Agency	Project Name	Location	Status	Description	Timeframe	Distance from Project (miles)
7	City of Palmdale	JV Aggregate Processing, LLC: CUP 08-08 Time Extension (TE)	The proposed mining site is located at the northeast corner of 75th Street East and the alignment of Avenue R (approximately 1,700 feet south of Palmdale Boulevard).	Approved	A two-year discretionary time extension to previously approved CUP 08-08.	Current Project	6
8	City of Palmdale	Robertson's Ready Mix, Ltd: CUP 05-22 and Reclamation Plan 90-1 Minor Modification (MM)	The mining site is located at the southeast corner of 75th Street East and the alignment of Avenue R (approximately 2,700 feet south of Palmdale Boulevard).	Approved	A request to modify the existing surface mining operation.	Current Project	6
9	City of Palmdale	Mr. Jack Barbacovi (Applicant): CUP 14-007	At the southeast corner of Avenue T and 70th Street East (7005 E. Pearblossom Highway)	Public Hearing	A request to establish a motorcross track on 55 acres of previously mined land.	Current Project	3
10	City of Palmdale	Holliday Rock Company, Inc: CUP 13-020	The mining site is located on the north side of Avenue T and south of the alignment of Avenue S between 70 Street East and the alignment of 80th Street East. The existing mining operation is comprised of four separate parcels in a flag lot shape, transected by Union Pacific Rail Road tracks. The existing building and facilities are addressed as 7311 East Avenue T.	Public Hearing	A request to permit and modify the existing surface mining operation.	Current Project	4
11	City of Palmdale	Holliday Rock Co., Inc: CUP 96-4 MM	Located on the north side of Avenue T east of 77th Street East within the Holliday Rock Company, Inc. surface mining facility.	Approved	A proposal to establish and operate a hot mix asphalt plant on approximately 2.5 acres zoned QR (Quarry and Reclamation).	Current Project	4

Source: Aspen Environmental Group, 2005. County of Los Angeles, 2014. California Department of Transportation, 2014. Palmdale Water District, 2014. USDA Forest Service, 2014. City of Palmdale, 2000; 2008; 2010; 2012; 2014a; 2014b.

D.3.1 Past Projects

D.3.1.1 Littlerock Dam (Palmdale Water District)

The effects of past actions warrant consideration in the analysis of the cumulative effects of a proposal for agency action. CEQ interprets NEPA and CEQ's NEPA regulations on cumulative effects as requiring analysis and a concise description of the identifiable present effects of past actions to the extent that they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal for action and its alternatives may have a continuing, additive, and significant relationship to those effects. However, NEPA analyses are not required to routinely list and separately analyze all individual past actions within the cumulative effects analysis area. Only those past actions that are relevant and useful because of their cause and effect relationship with the resources of concern should be included. Generally, an adequate cumulative effects analysis can be focused on the aggregate effects of past actions without delving into the historical details of individual past actions.

For this analysis, the following is a general description of the past actions that could combine with the Project to result in cumulative effects. Littlerock Reservoir is approximately 100 acres in size, and is located on Little Rock Creek. The Reservoir is contained by Littlerock Dam, which was originally constructed in 1924 to control flooding and to provide a water source to local communities. The Dam underwent a strengthening project in 1993 and 1994, which included a new spillway to increase the capacity of the Reservoir and to improve public safety (i.e., from a reduction in water depth flowing over the spillway).

Prior to construction of the Dam, Little Rock Creek was likely in a state of dynamic sediment equilibrium (Aspen Environmental Group, 2005). The Dam altered the hydraulics of the creek such that it could no longer transport sediment through the Reservoir. Over time, sediment deposition in the Reservoir contributes to a substantial reduction in its water storage capacity, which has necessitated the Project.

D.3.2 Current Projects

D.3.2.1 Vulcan Materials Company: CUP 08-01 (City of Palmdale)

A Conditional Use Permit (CUP) 08-01 was requested to modify the existing Vulcan Materials Company surface mining operation. The modifications consist of the following items:

- Obtain a CUP issued by the City of Palmdale for compliance with the requirements of Section 22.02.C. and Article 72, Quarry and Reclamation (Zone QR) of the Palmdale Zoning Ordinance;
- Add 38.66 acres for a total of 664.76 acres of mining and operations area;
- Add a future rail load-out and rail spur for transport of material;
- Allow 24-hour operations for the facility as a part of the CUP;
- Add a future access tunnel with a conveyor to transport material under Avenue T;
- Permit the future upgrade, modernization and/or replacement of an existing concrete batch plant and lightweight concrete batch plant with a total production of 300,000 cy per year; and
- Revise Reclamation Plan 88-1 under administrative approval to reflect the requested modifications and to comply with the current requirements of the Surface Mining and Reclamation Act (SMARA).

D.3.2.2 JV Aggregate Processing, LLC: CUP 08-08 Time Extension (TE) (City of Palmdale)

JV Aggregate requested a two-year time extension to previously approved CUP 08-08. The original request consists of establishing a new sand and gravel surface mining operation on 27.5 acres. It includes the following: a) hours of operation up to 24 hours per day, Monday through Saturday; b) annual production of 240,000 cubic yards of material, c) processing and crushing of recycled concrete and asphalt, and d) ongoing processing and crushing of recycled concrete and asphalt upon completion of mining activities and any required reclamation.

D.3.2.3 Robertson's Ready Mix, Ltd: CUP 05-22 and Reclamation Plan (RP) 90-1 Minor Modification (MM) (City of Palmdale)

Robertson's Ready Mix has proposed changes to the existing surface mining operation. The modifications consist of the following:

- Obtain a CUP issued by the City of Palmdale for compliance with the requirements of Section 22.02.C. and Article 72, Quarry and Reclamation (QR) of the Palmdale Zoning Ordinance;
- Add 44.5 acres of mining area for a total of 324 acres of mining and operations area;
- Add a future concrete products plant;
- Add a future asphalt concrete plant;
- Add a future lime marination plant;
- Add a future recycling plant; and
- Revise the Reclamation Plan under administrative approval to reflect the requested modifications and to comply with the current requirements of the SMARA.

D.3.2.4 CUP 14-007 (City of Palmdale)

CUP 14-007 proposes to establish a motocross track on 55 acres of mined land within the existing quarry operated by Granite Construction Company. The existing mining site extends from Avenue T on the north to Pearblossom Highway to the south and is addressed as 7005 Pearblossom Highway. This Project would be located within 55 acres already mined at a depth of approximate 70 feet. Operation of the motocross track would occur between the hours of 8:00 a.m. to 7:00 p.m.

D.3.2.5 CUP 13-020 (City of Palmdale)

CUP 13-020 requests approval for modifications to the existing Antelope Valley Quarry and Plant surface mining operation (CA Mine ID #91-19-0002). The changes consist of the following items:

- Obtain a CUP issued by the City of Palmdale for compliance with the requirements of Section 22.02.C. and Article 72, Quarry and Reclamation (Zone QR) of the Palmdale Zoning Ordinance;
- Mining, crushing, screening, sorting, loading, washing, weighing and transporting rock, sand, and gravel in accordance with the allowances and limits of the Antelope Valley Air Quality Management District (AVAQMD) operating permits;
- Production of ready mix concrete and hot mix asphalt in accordance with the allowance and limits of the AVAQMD operating permits;
- Receipt and production of recycled construction demolition materials (concrete, asphalt and similar materials);

- Permit 24 hour operation of the above listed uses and activities;
- Storage of diesel and gasoline in accordance with the allowances and limits of the AVAQMD operating permits; and
- Revise Reclamation Plan 89-1 under administrative approval to reflect the requested modifications and to comply with the current requirements of the SMARA.

D.3.2.6 Holliday Rock Co., Inc.: CUP 96-4 MM (City of Palmdale)

CUP 96-4 Major Modification establishes the operation of a hot mix asphalt plant on approximately 2.5 acres zoned QR (Quarry and Reclamation), which would be sited within the existing 313.24-acre Holliday Rock Company, Inc. sand and gravel surface mining operation located at 7747 East Avenue T.

D.3.3 Future Projects

D.3.3.1 High Desert Corridor Project (California Department of Transportation)

The High Desert Corridor Project would entail construction of a new multimodal link between SR-18 in San Bernardino County and SR-14 in Los Angeles County. It would connect Palmdale, Lancaster, Adelanto, Victorville, Hesperia, and Apple Valley. The project would be implemented in three segments: the Antelope Valley segment, the High Desert segment, and the Victor Valley segment. The two segments nearest to the Project are the Antelope Valley Segment and the High Desert Segment.

The Antelope Valley Segment would stretch from SR-14 to 100th Street East, parallel with and near Avenue P-8, in Palmdale. This 10-mile-long segment would accommodate ultimate expansion to four lanes in each direction plus a high-speed passenger rail line. New local interchanges are currently proposed at 20th Street East, 30th Street East, 50th Street East, and 90th Street East. Viaduct structures would be constructed between Division Street and 10th Street East and over Little Rock Wash. There would be several required grade separations at freeway crossings. New frontage roads would be built to maintain local accessibility where street closures are required. The existing partial interchange at SR-14/Rancho Vista Boulevard would be closed, and a full interchange would be constructed at 10th Street West to provide better weaving distance with the direct connector ramps of the SR-14/High Desert Corridor interchange.

The High Desert Segment would begin at 100th Street East and continue to US 395. This 26-mile-long segment would extend from Palmdale to Adelanto, running in a west-east direction parallel and south of Palmdale Boulevard. The freeway would be three lanes in each direction, with ROW acquired to support an ultimate facility of four lanes in each direction plus a high-speed passenger rail line. New local interchanges are currently proposed at Longview Road, 170th Street, 210th Street, and 240th Street in Los Angeles County, and Oasis Road, Sheep Creek Road, and Caughlin Road in San Bernardino County. Freeway grade separations (i.e., overcrossings or undercrossings) are also proposed. Two of the build alternatives would include constructing this segment as a toll facility.

Recognizing the High Desert Corridor as a multipurpose corridor with potential to connect to the expanding regional rail system, the Project may include a center-median High Speed Rail (HSR) feeder service between Palmdale and Victorville. This feeder service would connect the XpressWest System (a planned HSR service from Victorville to Las Vegas) with Metrolink at the Palmdale Transportation Center (39000 Clock Tower Plaza Drive East) and a planned future California HSR stop at Palmdale.

D.3.3.2 Multi-Use Development (County of Los Angeles: Project 89-003-[5])

This project consists of a mixed-use district development that includes single-family and multi-family residences, commercial buildings, parks and recreation, a fire station, senior apartment housing, and a school site. Specifically, the project would create 32 single-family lots, 12 commercial lots, 10 multi-family lots, 8 open space/recreation lots, 8 mixed-use/live-work lots, 5 public facility lots, 1 RV parking/storage lot, 1 private school lot, and 1 private street lot on 82.5 acres, with 1 remainder lot on 3.81 acres.

D.3.3.3 Little Rock Creek Groundwater Recharge and Recovery Project (Palmdale Water District)

The Groundwater Recharge Project is proposed to be a run-of river recharge project, utilizing the existing active natural channel system and a series of shallow recharge basins in the adjacent floodplain.

The proposed Groundwater Recharge Project could consist of the following:

- State Water Project and other imported waters would be discharged from the East Branch of the State Water Project aqueduct where the aqueduct crosses Little Rock Creek. Imported water would be conveyed in the active channel of Little Rock Creek toward the project endpoint located about nine miles downstream of the aqueduct.
- Imported water recharge would occur when capacity exists in the East Branch of the aqueduct, primarily in the winter time over a period of 90 to 120 days. Recharge could occur at other times of the year, provided that there is surplus State Water available or when surplus capacity in the aqueduct is available to convey non-State Water to the recharge project.

The project would be expanded as follows if the desired recharge cannot be accomplished in the active channel within the project area or if recycled water recharge is included in the recharge project:

- A diversion works would be constructed in the active channel just upstream of Palmdale Boulevard to split the remaining discharge in Little Rock Creek such that the imported water discharge remaining in Little Rock Creek can completely recharge in the active channel in the Project area.
- The diverted imported water would be conveyed to shallow off-channel basins constructed adjacent to the active channel and within the floodplain. Imported water diverted into these basins would recharge completely within the Project area.
- The off-channel basins would be constructed in a strip of land parallel to the active channel. A feeder channel would be constructed from the diversion works at Palmdale Boulevard and run along the west side of the off-channel basins. The feeder channel would convey imported water from the Little Rock Creek diversion to individual off-channel basins.
- The imported water discharge to Little Rock Creek would be modulated to ensure that all the imported water discharged to Little Rock Creek would be completely recharged in the active channel and off-channel basins in the Project area.

Recycled water recharge would be accomplished by conveying recycled water to the off-channel basins in the project area. Dilution pursuant to the Department of Public Health Draft CCR Title 22 regulations would be provided by imported water recharge in the same facilities and groundwater underflow.

The recharge and recovery capacities of the project are expected to be about 43,000 acre-feet per year and 14,000 acre-feet per year, respectively. Preliminary groundwater modeling studies have demonstrated that the recharge project would substantially reduce drawdown in PWD's service area and areas surrounding the Project. The recharge project would increase piezometric levels in the southern part of the subsidence area and provide regional benefits, including the reduction of subsidence in the central part of the Antelope Valley. For these reasons, the other State Water Project contractors in the Antelope Valley, the Antelope Valley East Kern Water Agency, and the Littlerock Irrigation District have endorsed this project, and would likely be partners in its implementation.

D.4 Cumulative Effects of the Project

D.4.1 Air Quality and Climate Change

D.4.1.1 Spatial and Temporal Boundaries

The Project is located within the Northern Los Angeles County portion of the Mojave Desert Air Basin (MDAB). For Air Quality, the geographic extent of the cumulative impact area remains within the MDAB and within the jurisdiction of the Antelope Valley Air Quality Management District (AVAQMD). The Project area is more than 15 miles south and west of the borders with the nearest jurisdictions and is separated from the South Coast Air Basin (SCAB) by the San Gabriel Mountains. A small amount of traffic could occur in other areas, such as construction employees that may commute from the SCAB or construction equipment that may need to be hauled to the site from the SCAB or San Joaquin Valley; however, these minimal traffic emissions are not considered to be of a magnitude to create cumulative air quality impacts in areas other than within the MDAB near the Project site. Therefore, the cumulative impacts could extend over the entire Project area at Littlerock Reservoir along the haul routes and near the sediment storage sites located north of the Reservoir.

The identification of cumulative projects for air quality typically ranges from within one mile of a project to as far as six miles or more from a project.[1] For localized cumulative impacts to occur, the Project's emissions would have to combine with other nearby projects to create impacts to local receptors. The effect of downwind dispersion eliminates the potential for Project-level significant cumulative air quality impacts over areas larger than a few miles. Considering the ground level type of emissions sources and emissions magnitudes for the Project, only projects located within one mile of the Reservoir site, sediment haul routes, and sediment disposal sites are considered projects that with the Project could cause cumulative impacts. Therefore, the projects listed in Table D-1 that are within one mile of the Project and its sediment transportation routes will be evaluated as those that could potentially create cumulatively significant impacts.

The Project's construction impacts are forecast to last for 7 to 12 years, during the summer or late summer and early fall, while the annual maintenance emissions are only forecast annually thereafter for less than two months each year during late summer/early fall. Only projects that have ongoing air quality emissions occurring concurrently with the Project's emissions, which occur during the daytime annually during the summer/fall period from 2017 and beyond, have the potential for creating cumulative air quality impacts, since significant air quality cumulative impacts can only occur from emission sources that are active at the same time.

[1] Many local air quality jurisdictions provide no guidance regarding the distance for the selection of cumulative projects, as is the case with the AVAQMD CEQA guidance documents. However, other jurisdictions and agencies use specific radius for specific analysis. The SCAQMD has approved CEQA analyses that have used a one-mile radius for cumulative project identification, while the California Energy Commission uses a six-mile radius for operating emissions cumulative impact evaluation for power plants.

Several of the impacts evaluated in Section C.2 are Project-specific or regulation-specific impacts and so cannot have cumulative effects. The impacts that will not be evaluated further in this section are Impacts AQ-1 (Project Construction and Operation would conflict with the approved AVAQMD Air Quality Management Plans), AQ-5 (The Project's Construction or Operations Emissions within the Angeles National Forest would exceed Applicable General Conformity Thresholds), and AQ-7 (The Project would conflict with Angeles National Forest Air Quality Strategies).

Additionally, the numeric AVAQMD emissions thresholds are project-specific thresholds and do not apply to cumulative projects that would not be co-located. Therefore, the evaluation in regards to cumulative air quality impacts addressed qualitatively below are Impacts AQ-2 (The Project's Construction Emissions Would Exceed AVAQMD Significance Criteria) and AQ-3 (The Project's Operation Emissions Would Exceed AVAQMD Significance Criteria).

Climate change is a long-term global impact, not a direct localized impact; and because the direct environmental effect of an increase in GHG emissions is the increase in global temperatures, which in turn has numerous indirect effects on the environment and humans, the area of influence for GHG emissions impacts associated with the Project would be global. However, those cumulative global impacts would be manifested as impacts on resources and ecosystems in California. Additionally, as the Climate Change/GHG analysis provided in Section C.2 concerns these cumulative global impacts, there is no separate cumulative impacts analysis performed for Climate Change.

D.4.1.2 Cumulative Effects of the Project

The potential for cumulative impacts during Project construction and maintenance are limited as the bulk of the Project emissions occur at the reservoir site and there are no cumulative projects with significant air quality impacts near the reservoir site within the Angeles National Forest (ANF). Existing emission sources are considered part of the existing ambient background cumulative condition. Past development and population growth within and surrounding the City of Palmdale near the Project site have increased the possibility that new projects would contribute to increased air pollutant emissions within the MDAB. The MDAB in the area of the Project route is nonattainment for the State 1-hour and federal 8-hour ozone standards and the State 24-hour PM10 standard. The Project area is designated as attainment/unclassified for the federal and State PM2.5, carbon monoxide, nitrogen dioxide, and sulfur dioxide ambient air quality standards. Long-term trends in reduced emissions of ozone precursors, specifically NO_x and VOCs, have led to reduced ozone formation in the Project area, and reduced transport of ozone from the adjoining SCAB and San Joaquin Valley Air Basin. However, the area continues to exceed the State 1-hour and federal 8-hour ozone standards. Additionally, while there is an overall gradual downward trend for PM10 concentrations, there has been little or no progress since 1993. As such, any increase in emissions of ozone precursors and particulate matter (and particulate matter precursors) would cause adverse Air Quality impacts.

Construction activities associated with the Project's sediment removal phase would result in PM10 emissions that exceed the AVAQMD regional daily emission thresholds, but all other pollutant emissions are below the AVAQMD daily emissions thresholds, and all pollutant emissions are well below the AVAQMD annual emissions thresholds. For cumulative assessment purposes the potential existence of nearby concurrent cumulative projects could add to the Project's adverse air pollutant emissions impacts. The cumulative projects, listed in Table D-1 and shown in Figure D-1, include no projects within a mile of the reservoir site, approximately six projects that may be within one mile of the primary sediment storage site and one project within one mile of the alternative sediment storage site. The Project would include Standard Project Commitments (SPCs) that include fugitive dust and construction equipment tailpipe emissions control (SPCs AQ-1 through AQ-5) and the other cumulative projects emissions would be also be required to have emissions controls to various degrees. The exact air pollutant emissions increases, or decreases, that may occur from the projects on the cumulative project's list are not known. However, the Project would create a source of aggregate/sand that would offset the mining that may otherwise occur at several of these cumulative projects. The combined effect of the air pollutant emissions from the Project and other cumulative projects' construction and/or operation (Impact AQ-2 and AQ-3) would be minor.

Construction activities associated with the Project would expose sensitive receptors in the populated areas along the sediment haul route and nearby the sediment disposal site to small amounts of air toxics emissions (diesel particulate matter [DPM]). However, there are no sensitive receptors located near the main emissions area, which is the reservoir site. The air toxic emissions impacts from the Project would be very low at any one given sensitive receptor location (Impact AQ-4), and would not be of a magnitude to notably contribute to a cumulative impact.

Construction equipment and operations, and the excavation and removal of reservoir sediments, may create temporary and mildly objectionable odors. These odors, in any significant strength, would generally be limited to the reservoir site. Since there is at least one mile from the reservoir site to populated areas, odors would not affect a substantial number of people. To have the potential to combine with odors from the Project, odor-generating activities from other projects would have to occur concurrently, occur in very close proximity with the odor-generating activities of the Project, and result in a cumulatively worse odor condition. However, none of the projects described in Table D-1 are near the reservoir or appear to have associated significant odor causing activities. The Project would not likely contribute to a cumulative odor impact (Impact AQ-6).

CEQA Significance Conclusion

Due to the physical separation of other cumulative projects from the main emissions source area for the Project, the incremental effect of the Project's air pollutant emissions when combined with the construction and/or operation emissions from other projects would be considered less than significant (Class III). Given that the air toxic emissions impacts from the Project would be very low at any one given sensitive receptor location, they would not be of a magnitude to contribute a significant incremental effect to cumulative health impacts. The Project's contribution to cumulative air quality impacts would not be cumulatively considerable.

D.4.1.3 Cumulative Effects of Alternative 1

The cumulative impacts from Alternative 1 would be similar to those of the Project, with two main differences. First, the emissions from the sediment excavation phase of the alternative would be lower than that of the Project and therefore would be less likely to contribute towards a cumulative effect on air quality. Second, the sediment excavation phase would be longer which would cause extended air quality impacts in later years prior to the end of the sediment excavation phase. However, all of the maximum daily and annual air pollutant emissions from this alternative would either be the same or less than the maximum emissions determined for the Project, thereby contributing a similar or smaller incremental effect towards a cumulative air quality impact.

CEQA Significance Conclusion

As described for the Project, Alternative 1 would not contribute an incremental effect on air quality emission impacts, health impacts, and odor impacts that would be cumulatively considerable. Alternative 1's cumulative contribution would be less than significant (Class III).

D.4.1.4 Cumulative Effects of the No Action/No Project Alternative

For most of the Project life, the No Action/No Project Alternative would not create direct air quality impacts, as there would be no activities performed to create air pollutant emissions. However, with this alternative the dam would fill with sediment over time and at some point it may need to be removed. At that time the amount of work required to remove the dam and the sediment behind the dam, and to restore Little Rock Creek, would be much greater than any of the activities noted for the Project. It is unclear when this may happen and if off-road and on-road equipment may be significantly less polluting than they are now or are forecast to be in the near future, but given the much greater level of effort to remove the dam and the much larger amount of sediment to be removed, those activities could contribute towards short-term, cumulative air pollutant emissions.

Additionally, the loss of this water resource would create the potential for indirect air quality impacts. However, the magnitude and location of the indirect air pollutant emissions related to the additional transport of water are highly speculative; therefore, no specific conclusions can be made in regards to the cumulative impact potential for the indirect emissions from the No Action/No Project Alternative.

CEQA Significance Conclusion

Air pollutant emissions from the No Action/No Project Alternative could contribute a significant and unavoidable incremental effect on cumulative air emissions (Class I). However, similar to the Project, the toxic emissions and odor emissions from future dam removal activities would be minimal and would not be expected to have a cumulatively considerable incremental effect on health impacts or odor impacts. The No Action/No Project Alternative's cumulative contribution to health and odor impacts would be less than significant (Class III).

D.4.2 Biological Resources

The Project is located in a biogeographic transition zone between coastal mountains and the Mojave Desert ecoregion. The combination of desert scrub, juniper woodland, and riparian communities and the unique geological and tectonic conditions (i.e., San Andreas rift zone, Little Rock Creek, and the San Gabriel Mountains), create and maintain contact zones between coastal ranges and desert regions. Some of the species found in the Project area are of significant taxonomic and evolutionary value, including least Bell's vireo and arroyo toad.

Historically, the high desert has been subject to disturbance from farming, grazing, mining, water diversion, military land uses, and infrastructure development. In many instances the conversion of natural lands through human disturbance has resulted in the displacement of native species, the restriction of regional movement corridors, and the loss of genetic diversity. Development in the western Mojave Desert has substantially altered native land forms and adversely affected native wildlife. The expansion of population centers in the Antelope Valley and ongoing renewable energy projects has resulted in the loss of open space and the degradation of natural areas that historically supported populations of unique or rare species. Construction of the Littlerock Dam fundamentally altered the existing watershed and essential stream processes necessary for the survival of species such as arroyo toads. The expansion of the Dam in 1992 increased storage of the Reservoir and further altered the quality and quantity of riparian habitat and associated species at the Reservoir.

On National Forest System (NFS) lands, ongoing and historic activities that have affected biological resources include major flood control and water diversion projects, electrical utility corridors, road construction and maintenance, mining, firefighting, and routine improvements to existing facilities such as repairs to fences, pipelines, government facilities, and water storage reservoirs. Reasonably foreseeable changes to biological resources in the ANF include improvements to and expansion of existing facilities and infrastructure (including roads), as well as the establishment of additional resources or facilities. Existing wilderness areas in the ANF would continue to be protected from development and expanded if possible (for instance, through the conversion of an Inventoried Roadless Area under consideration for wilderness designation to a designated Wilderness Area). In addition, a large portion of the ANF has been designated a National Monument which would further protect biological resources on the Forest.

Large-scale land conversion in the Antelope Valley coupled with the projects in the cumulative project list was considered in the evaluation of cumulative impacts for the Project. Because the Project would result in the permanent loss of natural lands (i.e., the 47th Street sediment disposal area and a small area at Rocky Point) this analysis considers whether the Project, after the application of SPCs, would contribute to the cumulative significant loss and degradation of habitat for plants and wildlife, including arroyo toad, desert tortoise, Mohave ground squirrel, Swainson's hawk, burrowing owl, least Bell's vireo, and other special-status species.

D.4.2.1 Spatial and Temporal Boundaries

The area of cumulative effect for biological resources varies by a species' life history, mobility, distribution, and specific range in the Project area. The "geographic scope" of the analysis of cumulative impacts to biological resources refers to the area within which cumulative impacts are likely to occur. For the Project, the majority of the cumulative effects analysis makes a broad, regional evaluation of the impacts of existing and reasonably foreseeable future projects that threaten plant communities and wildlife within 20 miles of the Project area. For desert tortoise, Swainson's hawk, and Mohave ground squirrel, this analysis of cumulative effects considers the range of the species in the western Mojave Desert. For other biological resources, including arroyo toad and riparian communities, the watershed boundaries were used in consideration of the ongoing protection of these resources in the ANF.

D.4.2.2 Cumulative Effects of the Project

Vegetation

The Project would result in 11.6 acres of permanent and 65.3 acres of temporary disturbance to vegetation and unvegetated landforms including riparian woodlands, herbaceous wetland, unvegetated lake bottom, and sandy wash. Approximately 5.8 acres of juniper woodland and 5.5 acres of disturbed habitat would be lost at the 47th Street disposal site. Past and foreseeable future actions in the Project area would result in considerable loss of native vegetation, particularly to desert communities such as creosote bush scrub and possibly juniper woodlands. The loss of desert scrub communities in combination with reasonably foreseeable projects would contribute to the cumulative loss of vegetation in the region (Impact BIO-1). Implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), and SPC WQ-1

(Prepare Spill Response Plan) would reduce the Project's contribution to cumulative impacts on vegetation.

Construction of the grade control structure and sediment removal activities would result in soil disturbance that could introduce or spread weeds to the Project area, haul roads, or sediment disposal sites. The spread of existing weeds or the introduction of new weed populations that occur from the Project could combine with effects from other past and reasonably foreseeable projects in the region to contribute to cumulative impacts in the region (Impact BIO-2). Implementation of SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), and SPC BIO-1b (Worker Environmental Awareness Program) would reduce the Project's contribution to cumulative impacts from the spread of weeds.

Habitat-Related Impacts to Wildlife

Common wildlife in the region has been subject to extensive disturbance from habitat loss and direct mortality. Ongoing development, including the Project, would continue to remove habitat and contribute to cumulative impacts to wildlife in the region (Impact BIO-3). Implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), and SPC BIO-2 (Prepare and Implement a Weed Control Plan) would reduce the Project's contribution to cumulative impacts to common wildlife.

Impacts to vegetation, as identified under Impact BIO-1, would remove habitat for birds in the region, and when combined with past and reasonably foreseeable projects would contribute to the loss of nesting birds or raptors (Impact BIO-4). Implementation of SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-1b (Worker Environmental Awareness Program), and required dust control measures would reduce the Project's contribution to cumulative impacts to nesting birds.

Threatened and Endangered Plant Species

Listed plant populations are not expected to occur in the Project area, and therefore the Project would not contribute to the cumulative loss of sensitive plants in the region (Impact BIO-5).

Threatened and Endangered Wildlife

Arroyo toads have been documented at the upstream edge of the Project area and may be subject to habitat loss or mortality. Past actions such as the construction of Littlerock Dam and natural events including droughts and fire have resulted in considerable cumulative effects to arroyo toads in the region (Impact BIO-6). Implementation of SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures), SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring), SPC BIO-6c (Seasonal Surveys During Water Deliveries), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC Hydro-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), SPC WQ-1 (Prepare Spill Response Plan), and required dust measures would reduce the Project's contribution to the cumulative loss of arroyo toad.

Threatened and Endangered Reptiles

Desert tortoise has been subject to extensive habit loss in the western Mojave Desert from residential development, agriculture, military actions, and infrastructure development. Populations of desert tortoise in the Mojave Desert are thought to be declining (USFWS, 2011). The proposed 47th Street East sediment disposal site was characterized as supporting moderate- to high-quality desert tortoise habitat; however, desert tortoise has not been detected on the Project site and has a low potential to occur. Therefore the Project would not contribute to the cumulative loss of desert tortoise in the region.

Threatened or Endangered Fish

There are no known threatened or endangered fish in the Littlerock Reservoir, Little Rock Creek, or the proposed sediment disposal areas. Threatened or endangered fish are not expected to be affected by the Project.

Threatened, Endangered, or Fully Protected Birds

California condors have not been observed at the Project site but are known from the ANF and western Antelope Valley. Loss of foraging habitat and the conversion of natural lands which support large mammals and other prey items has adversely affected this species. Condors are not expected to frequent semi-natural lands around Palmdale but may occur in the foothills of the ANF. The Project, when combined with past and reasonably foreseeable projects, would contribute to the cumulative loss of condor habitat in the region (Impact BIO-7). Implementation of SPC BIO-7 (Monitor Construction and Remove Trash and Microtrash), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), and SPC BIO-2 (Prepare and Implement a Weed Control Plan) would reduce the Project's contribution to cumulative impacts to condor.

The primary effect of past and foreseeable projects on southwestern willow flycatchers, least Bell's vireos, and yellow-billed cuckoos is the loss of riparian habitat and the introduction or spread of brown headed cow birds, a known nest parasite (Impact BIO-8). Most of the Project's impacts to native vegetation or landforms would be temporary, and habitat would be replaced through restoration along the Reservoir. Implementation of SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's contribution toward cumulative impacts to these species.

Approximately 5.8 acres of juniper woodland habitat which could be used as foraging for the Swainson's hawk would be lost at the 47th Street disposal site (Impact BIO-9). The Project, when combined with past and reasonably foreseeable projects including a proposed housing development, would contribute to the cumulative loss of habitat for this species in the region. Implementation of SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's Hawks), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's contribution to habitat loss to this species.

The Project would not remove or alter foraging habitat for bald eagles and would not contribute to cumulative impacts in the region. The anticipated loss of habitat for golden eagles from the Project, when combined with past and reasonably foreseeable projects including a proposed housing development, would contribute to the cumulative loss of habitat for this species in the region (Impact BIO-10). Implementation of SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat), SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's Hawks), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-2 (Prepare and

Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's contribution to habitat loss for golden eagles.

Threatened, Endangered, or Fully Protected Mammals

Ringtail, a fully protected species in California, has not been observed in the Project area but likely occurs throughout the ANF. The loss of riparian areas or access to water adversely affects this species. Although temporary, the Project would contribute to the cumulative habitat loss for this species (Impact BIO-11). Implementation of SPC BIO-11 (Conduct Focused Surveys for Ringtail and Avoid Denning Areas), SPC BIO-1a (Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's contribution to habitat loss for the ringtail.

Special-Status Plants

Sensitive plants in the region have been subject to widespread habitat loss from development and habitat degradation from the spread of invasive plant species. The Project's contribution to habitat loss for sensitive plants in combination with past and reasonably foreseeable projects would contribute to cumulative impacts to these species (Impact BIO-12). Implementation of SPC BIO-5 (Conduct Preconstruction Surveys for Sensitive Plants and Avoid Occurrences of Listed Plants), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), and SPC BIO-2 (Prepare and Implement a Weed Control Plan) would reduce the Project's contribution to cumulative impacts to sensitive plants.

Special-Status Invertebrates

Large-scale habitat conversion and disruption of natural stream flows has adversely affected the shoulderband snail and the San Emigdio blue butterfly throughout the region. The Project's contribution to habitat loss in combination with past and reasonably foreseeable projects would contribute to cumulative impacts to these species (Impact BIO-13). Implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's cumulative impacts to these species.

Special-Status Reptiles and Amphibians

Past projects including the construction of the Littlerock Dam have adversely affected the southwestern pond turtle. Although limited in scale, the Project's contribution to habitat loss in combination with past and reasonably foreseeable projects would contribute to cumulative impacts to this species (Impact BIO-14). Implementation of SPC BIO-14 (Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures) which includes clearance surveys for southwestern pond turtles prior to vegetation or sediment removal, relocation of stranded or displaced animals, and construction monitoring. SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's cumulative impacts to the southwestern pond turtle.

The region-wide loss of riparian vegetation and the disruption of natural stream hydrology has substantially altered habitat for the two-striped garter snake and Coast Range newt. Although limited in scale, the Project's contribution to habitat loss in combination with past and reasonably foreseeable projects would contribute to cumulative impacts to these species (Impacts BIO-15 and BIO-16). Implementation of SPC BIO-15 (Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures), SPC BIO-16 (Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC BIO-6c (Seasonal Surveys During Water Deliveries), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), SPC WQ-1 (Prepare Spill Response Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's cumulative impacts to the two-striped garter snake and Coast Range newt.

Terrestrial herpetofauna occupy a wide range of habitat in the Project area including desert scrub and riparian areas. Because of ongoing habitat loss, the Project's contribution to habitat loss in combination with past and reasonably foreseeable projects would contribute to cumulative impacts to these species (Impact BIO-17). Implementation of SPC BIO-17 (Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), SPC WQ-1 (Prepare Spill Response Plan), SPC WQ-2 (Prepare a Storm Water Pollution Prevention Plan [SWPPP]), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's contribution to cumulative impacts to these species.

Other Species of Special Concern

Burrowing owls were not detected in the Project area but may be a periodic visitor to the proposed 47th Street sediment disposal site. This species has been subject to widespread habitat loss in the western Mojave Desert. Because of ongoing habitat loss, the Project's contribution to habitat loss in combination with past and reasonably foreseeable projects would contribute to cumulative impacts to this species (Impact BIO-18). The Project would also contribute to cumulative impacts from habitat fragmentation and edge effects, noise and lighting, increased road kills, increased risk of fire from weed invasion and increased ignition sources (vehicles on Cheseboro Road). Implementation of SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls), SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat) SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's hawks), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's contribution to cumulative impacts to burrowing owl.

Impacts to vegetation would remove habitat for birds designated as Forest Service Sensitive and California Species of Special Concern in the region, and would contribute to the decline in available nest sites and foraging habitat. The Project, when combined with past and reasonably foreseeable projects, would contribute to cumulative impacts to these species (Impact BIO-19). Implementation of SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-8 (Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat), SPC BIO-9 (Conduct Pre-Construction Surveys for Swainson's Hawks), SPC BIO-18 (Conduct Surveys for Burrowing Owls and Implement Monitoring, Avoidance, and Minimization Measures), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's contribution to cumulative impacts to these species.

Special-Status Mammals

Across the region, bats have been subject to loss of roost and foraging sites because of the degradation of riparian habitat and loss of groundwater. Because of ongoing habitat loss, the Project's contribution to habitat loss in combination with past and reasonably foreseeable projects would contribute to cumulative impacts to bats (Impact BIO-20). The Project would also cumulatively increase the risk of vehicles strikes along Cheseboro Road during early morning and dusk. Implementation of SPC BIO-20 (Survey for Maternity Colonies or Hibernaculum for Roosting Bats), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's contribution to cumulative impacts to bats.

The Project area likely supports a variety of small cryptic special-status mammals, which have been subject to extensive habitat loss and degradation in the western Mojave Desert and the foothills of the San Gabriel Mountains. Because of ongoing habitat loss, the Project's contribution to habitat loss in combination with past and reasonably foreseeable projects would contribute to cumulative impacts to these species (Impact BIO-21). Implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's contribution to cumulative impacts to these species.

Desert kit fox and American badger have been subject to extensive habitat loss in the western Mojave Desert and the foothills of the San Gabriel Mountains. Because of ongoing habitat loss, the Project's contribution to habitat loss in combination with past and reasonably foreseeable projects would contribute to cumulative impacts to these species (Impact BIO-22). Implementation of SPC BIO-22 (Conduct Surveys for American Badger and Desert Kit Fox and Avoid During the Breeding Season), SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), and SPC AQ-5 (Reduce Off-Road Vehicle Speeds) would reduce the Project's contribution to cumulative impacts to these species.

Bighorn sheep are periodic visitors to the Reservoir. Historically this species likely ranged along the lower foothills of the San Gabriel Mountains and conducted intermountain movement across the desert valleys. Ongoing development in the region has disrupted movement and fragmented habitat. The Project's contribution to habitat loss in combination with past and reasonably foreseeable projects would contribute to cumulative impacts to these species (Impact BIO-23). Should sheep occur in the Project area, vehicle traffic would add to cumulative impacts from disturbance or mortality from collisions with vehicles. Implementation of SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), SPC AQ-5 (Reduce Off-Road Vehicle Speeds), SPC FIRE-1 (Curtailment of Activities), SPC FIRE-2 (Preparation of a

Fire Plan), and SPC FIRE-3 (Spark Arrester Requirements) would reduce the Project's contribution to cumulative impacts to this species.

Construction of the Littlerock Dam, water diversions, and large-scale development have substantially altered the hydrology of the region. Although the Project itself would result in a minor loss of jurisdictional features, the Project would contribute to cumulative impacts in the region (Impact BIO-24). Implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC AQ-2 (Fugitive Dust Controls), SPC AQ-5 (Reduce Off-Road Vehicle Speeds), SPC HYDRO-1 (Fill From Reservoir Excavation Will Not Be Placed in Stream Channels), and SPC WQ-1 (Prepare Spill Response Plan) would reduce the Project's contribution to cumulative impacts to jurisdictional waters.

There are no known bird or bat migratory corridors that would be directly impeded by the Project, and the Project would not contribute to the cumulative loss of established wildlife migratory corridors in the region (Impact BIO-25).

Although the Project would result in adverse impacts to Management Indicator Species (MIS), the affected area would be limited 65 acres or less (See Table C.3-12). MIS would also be affected by other projects such as Williamson Rock and Pacific Crest Trail Projects, fuels treatments, and special use permitted activities that would likely continue over the life of the Project. These cumulative projects would result in unknown acreages of habitat loss for MIS. While a large portion of the ANF has been proposed as a National Monument, which would increase protection for NFS lands, construction of the Littlerock Dam, water diversions, and mining have already affected MIS on NFS lands. The Project would contribute to cumulative impacts on MIS in the region (Impact BIO-26). Implementation of SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities), SPC BIO-1b (Worker Environmental Awareness Program), SPC BIO-2 (Prepare and Implement a Weed Control Plan), SPC BIO-4 (Conduct Pre-Construction Surveys and Monitoring for Breeding Birds), SPC BIO-6a (Conduct Surveys and Implement Avoidance Measures), SPC BIO-6b (Conduct Clearance Surveys and Construction Monitoring), and SPC BIO-6c (Seasonal Surveys During Water Deliveries) would reduce the Project's contribution to cumulative impacts to MIS.

CEQA Significance Conclusion

The Project's contribution to biological resource impacts (i.e., Impacts BIO-1 through BIO-26), in combination with past and reasonably foreseeable projects, would be cumulatively considerable. Each of the cumulative impact discussions for Impact BIO-1 through Impact BIO-26 describes the SPCs that would be implemented to minimize the incremental adverse effects of the Project. With incorporation of the identified SPCs, the Project's contribution to cumulative impacts to biological resources would be reduced to a level that is less than significant (Class II).

D.4.2.3 Cumulative Effects of Alternative 1

Alternative 1 would result in the same cumulative impacts to biological resources as the proposed Project. The incremental effect of Alternative 1 on cumulative biological resource impacts is identical to the discussion for the Proposed Action/Project above.

D.4.2.4 Cumulative Effects of the No Action/No Project Alternative

Under the No Action/No Project Alternative, cumulative impacts to biological resources would not occur. If the Dam becomes unstable and must be removed, cumulative biological resource impacts would be greater and encompass a wider area compared to the Project. While it is unknown what other cumulative projects may occur in the future, it is likely that these projects would contribute to cumulative impacts that are similar to Impacts BIO-1 through BIO-26 described for the Project.

CEQA Significance Conclusion

If Dam removal were to occur under the No Action/No Project Alternative, the incremental effect of potential impacts to biological resources would be greater than the Project-related impacts described above. Cumulative biological resource impacts associated with future removal of the Dam would be significant and unavoidable (Class I).

D.4.3 Cultural Resources

D.4.3.1 Spatial and Temporal Boundaries

The geographic scope for the analysis of cumulative impacts on cultural resources encompasses projects within 11 miles of the Project. This is a relatively wide geographic scope because most impacts to cultural resources occur on the site of the resource itself through physical disturbance or encroachment. The proximity of these resources to the Project would be of interest only to the extent that proximity would considerably affect the context or integrity of the resource.

Within 11 miles of the Project, there are currently at least 11 past, present, and future projects that would disturb a total of more than 3,000 acres. As well, linear utility and transportation projects within 11 miles of the Project are anticipated to have impacts along a total of more than 30 miles. Table D-1 provides a list of specific projects that are considered in the cultural cumulative scenario by jurisdiction and their location to the Project.

D.4.3.2 Cumulative Effects of the Project

The Project would not impact significant known archaeological resources; however, there is a potential for unanticipated and previously unidentified cultural resources to be present within the Project area (Impact C-1). This potential is considered to be low and the Project would implement SPC CUL-1 to monitor during excavation of previously undisturbed soils and SPC CUL-2 to treat previously unidentified cultural resources (see Appendix A), thus reducing the Project's contribution to cumulative impacts.

In addition, the other projects identified in Table D-1 would also be expected to have mitigation measures that would reduce potential impacts on archeological resources, but impacts could remain even after mitigation. Federally licensed projects, such as the Williamson Rock and Pacific Crest Trail Project and the Littlerock Dam Project, would require, or have required, compliance with Section 106 of the National Historic Preservation Act to consider and resolve adverse effects to significant cultural resources. Likewise, compliance with CEQA for projects such as the Little Rock Creek Groundwater Recharge and Recovery Project, the Vulcan Materials Company CUP 08-01 Project, the Motorcross Track CUP 14-007 Project, and the Holliday Rock Co., Inc. CUP 96-4 Project would be expected to reduce impacts on archaeological resources, but impacts could remain adverse. Given the lack of identified cultural resources in the Project area, the Project would not have the potential to combine with impacts from past, present, or future projects to result in a cumulative impact to historical and archaeological resources.

With regard to disturbance of human remains, the Project could contribute an incremental effect to cumulative impacts within the region (Impact C-2). Although no human remains have been identified within the Project area, there is a very low potential for their discovery during Project construction. In the unlikely event of an accidental discovery of human remains during Project construction, SPC CUL-3 (Unidentified Human Remains Discovery Procedures) would be implemented to reduce impacts (see Appendix A). Nonetheless, the effect would be considered adverse under federal regulations.

CEQA Significance Conclusion

With regard to previously undetected cultural resources, the Project would not contribute an incremental impact within the region that would be cumulatively considerable (Class III). However, the Project would have the potential to combine with impacts from past, present, or future projects to result in a significant and unavoidable cumulative impact to human remains (Class I).

D.4.3.3 Cumulative Effects of Alternative 1

Cumulative cultural resource impacts are the same for Alternative 1 as for the Project. The analysis provided above for the Project applies equally to this alternative.

D.4.3.4 Cumulative Effects of the No Action/No Project Alternative

Under the No Action/No Project Alternative, the Project would not be implemented. The impacts associated with the Project and Alternative 1 would not occur, and the No Action/No Project Alternative would not contribute to a cumulative cultural resource impact.

D.4.4 Geology and Soils

D.4.4.1 Spatial and Temporal Boundaries

Impacts related to the exposure of people or structures to potential substantial adverse effects due to seismic or geologic hazards would be limited to the Project area, including Littlerock Reservoir and Littlerock Dam, the potential sand and gravel pits and PWD disposal areas, and the haul route between the reservoir and the disposal areas. Therefore, the Project area is the limit of the geologic hazards cumulative analysis. This same spatial boundary would apply to slope instability and slope failure. The cumulative analysis for soil erosion includes the Project area as well as any area downstream of the Project area.

Cumulative impacts for geology and soils are assessed based on consideration of past, current, and future development, and are not limited to the projects listed in Table D-1.

D.4.4.2 Cumulative Effects of the Project

No structures would be built under the Project. Therefore no structures would be exposed to geologic hazards, and no cumulative impact for exposure of structures to geologic hazards would occur. The exposure of people to geologic hazards would be limited to the Project area. Although other projects exist very near to the potential disposal sites (such as active mining operations near to the potential sand and gravel disposal pits or a proposed mixed-use development near to the PWD disposal site), the exposure of people to geologic hazards under the Project would contribute a negligible incremental cumulative effect (Impact G-1).

Standard Project Commitments would ensure that unstable slope conditions would not be produced under the Project. Conformance with existing laws, including the Clean Water Act, would ensure that no off-site erosion would occur under the Project. Other projects, both within the Project area and downstream of the Project area, would include soil-disturbing activities. Examples of these projects include active mining operations and new highway construction. Soil disturbance under the Project/Action would contribute a negligible incremental cumulative effect (Impact G-2).

CEQA Significance Conclusion

The Project would not create an incremental impact to seismic or geologic hazards that would be cumulatively considerable (Class III).

D.4.4.3 Cumulative Effects of Alternative 1

Cumulative effects of Alternative 1 are the same as described above for the Project. No cumulatively considerable impacts would result from construction and operation of Alternative 1.

D.4.4.4 Cumulative Effects of the No Action/No Project Alternative

No impacts would occur under the No Action/No Project Alternative. This alternative would not contribute towards a cumulative impact to seismic or geologic hazards.

D.4.5 Hazards and Public Safety

D.4.5.1 Spatial and Temporal Boundaries

The area of potential cumulative effects is defined as a 0.5-mile buffer around Littlerock Reservoir and Littlerock Dam, the potential sediment disposal sites, and the haul route between the reservoir and the disposal sites. Because the Project would not transport significant quantities of hazardous materials, this cumulative analysis area defines the spatial extent of potential cumulative effects with respect to risk of upset.

Cumulative impacts for hazards and public safety are assessed based on consideration of past, current, and future development, and are not limited to the projects listed in Table D-1.

D.4.5.2 Cumulative Effects of the Project

Although other projects in the area of potential cumulative effects could result in accidental spills of hazardous waste that could contaminate water resources or expose the public to hazardous materials, the Project would result in negligible impacts with respect to releases of hazardous waste (Impact HAZ-1). Similarly, the Project impacts related to risk to public health (such as Valley Fever or unsafe highway conditions) are negligible (Impacts HAZ-3 and HAZ-5). The sediment in Littlerock Reservoir is not known to harbor the fungus associated with Valley Fever, and fugitive dust would be minimized in conformance with existing air quality regulations. Increased truck traffic would be limited to the haul route between the reservoir and the disposal sites, and would not substantially alter the existing traffic conditions. These impacts would not combine with adverse effects from similar projects to form a cumulative impact.

CEQA Significance Conclusion

The Project would result in negligible impacts with respect to releases of hazardous waste and other risks to public health. The incremental effect of the Project’s contribution to cumulative impacts would not be significant (Class III).

D.4.5.3 Cumulative Effects of Alternative 1

The cumulative impacts from Alternative 1 would be identical to the Project.

D.4.5.4 Cumulative Effects of the No Action/No Project Alternative

No impacts associated with hazards and public safety would occur under the No Action/No Project Alternative. This alternative would not contribute an incremental adverse effect in combination with other cumulative projects.

D.4.6 Hydrology

D.4.6.1 Spatial and Temporal Boundaries

All groundwater impacts related to the Project would occur within and be limited to the Antelope Valley Groundwater Basin. The Antelope Valley Groundwater Basin, and in particular the Pearland subunit of the Antelope Valley Groundwater Basin, is therefore the limit of the groundwater cumulative analysis. Surface water impacts would be limited to the watershed area of the Rosamond Dry Lake, which is therefore the limit of cumulative analysis for surface water impacts. Temporal limits are as described for each impact in the text below.

Cumulative impacts for water resources are assessed based on consideration of all past, current and future development, and are not limited to the projects listed in Table D-1.

D.4.6.2 Cumulative Effects of the Project

The overall impact of groundwater withdrawal in the Antelope Valley from past projects has been significant, and has resulted in land subsidence in some areas (USGS, 1998). However, the Pearland subunit is documented to rebound well from pumping effects during wet runoff years. Further, since the purpose of the Project is water supply for the PWD, which obtains 40 percent of its water from groundwater pumping in the Antelope Valley, groundwater pumping could be reduced by a compensating amount equivalent to the increase in surface water use from the reservoir. The Project would increase the capacity of a water source that is an alternative to groundwater, and would therefore not contribute to a greater use of groundwater supplies (Impact H-1). The Project is considered to have a negligible incremental effect on the depletion of groundwater levels at this time.

Flow pattern alterations from excavation and construction of the grade control structure within Littlerock Reservoir would be limited to the reservoir and would have no effect outside the reservoir that could contribute to an overall cumulative impact (Impact H-2). Flow patterns on the pit disposal site would not be affected by the Project, and the Project would not contribute an incremental adverse impact that would combine with the impacts from other projects. Temporary disposal of material at the PWD disposal site would be placed such that it would not disturb flow patterns. With best management practices required by existing regulations, the Project's incremental impact to erosion and siltation would be minimal.

As the Project would increase the flood control capacity of the Reservoir, it would not increase the potential for flooding (Impact H-3). Completion of the Project would create a beneficial and long-term effect on reducing the potential for future flooding.

CEQA Significance Conclusion

Given the Project's negligible effect on groundwater levels and flow patterns, and the use of best management practices to minimize effects on erosion and siltation, the Project would not contribute an incremental impact on hydrology and groundwater that would be cumulatively considerable (Class III).

D.4.6.3 Cumulative Effects of Alternative 1

Cumulative effects of Alternative 1 are the same as described above for the Project.

D.4.6.4 Cumulative Effects of the No Action/No Project Alternative

Groundwater withdrawal in the Antelope Valley from past projects is considered significant due to land subsidence and dramatic declines in groundwater levels (USGS, 1998). The No Action/No Project Alternative would increase future reliance on groundwater, therefore contributing to an incremental and adverse impact to groundwater levels (Impact H-1).

Given that no excavation and construction of a grade control structure would occur within the Reservoir under the No Action/No Project Alternative, this alternative would not contribute an incremental effect to existing flow patterns (Impact H-2).

Urbanization generally results in increased flooding due to increased impervious areas causing increased flood peaks and flood volumes. As future development occurs in the Antelope Valley, the future potential for flooding is expected to become cumulatively worse. The No Action/No Project Alternative, by eventually eliminating flood storage in Littlerock Reservoir, would increase the potential for flooding (Impact H-3). The incremental effect of the No Action/No Project Alternative to future flooding would be adverse.

CEQA Significance Conclusion

The No Action/No Project Alternative would increase future reliance on groundwater and would increase the potential for future flooding. This alternative's incremental contribution to a cumulative impact would be significant and unavoidable (Class I).

D.4.7 Noise

D.4.7.1 Spatial and Temporal Boundaries

The geographic area of analysis for cumulative impacts to noise is generally limited to areas within approximately 0.5 mile of a work site, including the haul truck routes. This area is defined as the geographic extent of the cumulative noise analysis because temporary construction and haul truck noise impacts would be localized. At distances greater than 0.5 mile, impulse noise may be briefly audible and steady construction noise would attenuate such that the level of noise would blend in with background noise levels.

Ground vibrations dissipate more rapidly than noise levels, limiting the geographic extent of ground vibration to the immediate vicinity of the vibration source. As noted in Section C.8, the geographic extent of potentially significant ground vibrations seldom extends more than 500 feet from the source of the vibrations. Vibration along the haul routes has increased over time with increased roadway use and heavy truck trips that generate localized vibrations.

Based on the geographic extent defined above, the following cumulative project was identified as applicable to the noise analysis:

- Map ID #5, County of Los Angeles mixed use development project located on the southwest corner of Pearblossom Highway and 47th Street East, approximately 0.5 mile north of the PWD site.

This cumulative project is identified, as discussed below, because cumulative projects identified in Table D-1 within the quarry boundaries are not applicable to noise with respect to impacting adjacent noise sensitive receptors. Furthermore, because this cumulative project is greater than 500 feet away, there is no potential for cumulative vibration impacts.

D.4.7.2 Cumulative Effects of the Project

Noise in the Reservoir has likely been steady over time, with the main noise source during low water periods being use of the area for off-highway vehicle (OHV) recreational activities. Along the haul routes and near the PWD site, continued residential development and traffic growth is slowly changing the quiet desert area such that ambient noise levels existing today are higher than would have occurred prior to such development, especially during daytime hours when traffic and human activity are greatest. Cumulative projects identified in Table D-1 would not overlap with temporary noise within the Reservoir or along proposed haul truck routes where existing residential receptors exist and are not regularly subjected to truck traffic.

No residential receptors are located within 0.5 mile of the quarry sediment disposal locations. While cumulative project Map ID #9 (motocross track) may generate noise levels outside normal daytime quarry operations, sediment disposal activities within the quarries would occur within normal quarry operating hours and would not expose receptors to noise. Project activities would also have no cumulative contribution to noise within the quarries in combination with other projects identified within the quarries (Map IDs #6-8, 10, and 11 in Table D-1). Therefore, the Project would not contribute to cumulative noise within the quarries. The potential for cumulative impacts is limited to temporary noise from periodic activities occurring at the PWD sediment staging location that may impact adjacent residential receptors (Impacts N-1 and N-3).

Construction of the County of Los Angeles mixed use development project (Map ID #5) would be located 0.5 mile north of the PWD site and could occur concurrently with sediment removal activities. Therefore, cumulative consideration is given with respect to temporary noise impacts that could occur to the residential area on 43rd Street East, adjacent to the west of both sites. These residences are located within the City of Palmdale, which does not have any applicable exterior noise standards for temporary construction noise. However, a 75 dBA threshold is utilized (similar to that in Section C.8). Project activities within the PWD site are expected to attenuate to exterior noise levels less than 52-61 dBA Lmax at the nearest residential structure exterior (approximately 900 feet away). Construction noise from this cumulative development project would also be expected to attenuate similarly. Therefore, where cumulative construction noise would be greatest (at residences between the two sites, approximately 1,320 feet away), temporary noise from either project would attenuate to below 60 dBA Lmax.

While periodic activities at the PWD site could combine with this cumulative project (only if activities overlap), any increase in ambient daytime noise levels are considered negligible, with the Project's contribution not considered adverse. Furthermore, SPCs NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) and NOI-2 (PWD Site Buffer Requirements) would be implemented as part of the Project and would reduce the Project's contribution to cumulative noise to the maximum extent feasible.

CEQA Significance Conclusion

While periodic activities at the PWD site could combine with identified cumulative projects (only if activities overlap), any increase in ambient daytime noise levels are considered negligible. With the inclusion of the SPCs described above, the Project's incremental contribution to a cumulative noise impact would be less than significant (Class III).

D.4.7.3 Cumulative Effects of Alternative 1

The cumulative effects of Alternative 1 with respect to noise would be similar to the impacts described above for the proposed Project. By starting the initial sediment removal period on July 1 (annually), instead of after Labor Day, the potential for overlapping temporary noise would be slightly increased. However, Alternative 1 would slightly reduce the amount of daily mobile noise that would contribute to an overall cumulative effect.

CEQA Significance Conclusion

As described for the proposed Project, periodic activities from Alternative 1 at the PWD site that combine with other identified projects would have a negligible contribution to the overall cumulative noise effect. With the inclusion SPCs NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan) and NOI-2 (PWD Site Buffer Requirements), the alternative's incremental contribution to a cumulative noise impact would be less than significant (Class III).

D.4.7.4 Cumulative Effects of the No Action/No Project Alternative

Under the No Action/No Project Alternative, any noise generating activities would not occur until well into the future when the Reservoir became filled with sediment. As discussed in Section C.8, it is unknown what specific activities would occur outside the Reservoir. At such a time when the Reservoir would become filled with sediment, the cumulative projects identified within Table D-1 would be completed and any operational noise would be integrated into the ambient noise conditions of their surrounding area. While noise producing activities are likely associated with eventual Dam removal activities that may occur under the No Action/No Project Alternative, any contribution to cumulative noise is unknown but would be temporary.

CEQA Significance Conclusion

The noise levels that may be generated from future projects in combination with the construction noise associated with future Dam removal is speculative. The contribution of the No Action/No Project Alternative to cumulative noise levels would be short-term and therefore would be considered less than significant (Class III).

D.4.8 Recreation and Land Use

D.4.8.1 Spatial and Temporal Boundaries

The geographical area for a cumulative analysis of recreation and land use impacts is defined by the land uses that are located within 0.5 mile of the proposed truck routes and sediment storage and disposal sites, as well as recreational resources within five miles of the Project area. Project impacts to existing land uses would be localized, as they are associated with the adverse effects of noise, emissions, and traffic from numerous truck trips and construction equipment that would be concentrated along the proposed routes and at the proposed storage/disposal sites. In contrast, public closure of recreational resources within five miles of the Project could contribute to adverse cumulative effects on recreation. As Project impacts to land use and recreation would be short-term (i.e., during proposed construction and maintenance phases), cumulative impacts would be associated with the adverse effects from other projects within the timeframe of Project activities.

D.4.8.2 Cumulative Effects of the Project

None of the projects described in Section D.3 or listed in Table D-1 would preclude or disturb an existing recreational resource during the proposed closure of the Reservoir (Impact L-1). The construction of other Projects may adversely affect existing residences along the proposed truck routes and sediment storage/disposal sites, such as the construction of a mixed-use development in Los Angeles County along 47th Street East and Pearblossom Highway (see Table D-1, Map ID #5). This proposed mixed-use development may create nuisance impacts to nearby residences that are similar to the Project (i.e., truck traffic, noise, and construction equipment emissions), and that may affect the same existing land uses impacted by the Project (Impact L-2). If construction of the County's mixed-use development project were to occur during the construction or maintenance phases of the Project, the Project would contribute to a cumulative disturbance of existing land uses.

CEQA Significance Conclusion

If the construction and maintenance phases of the Project were to occur concurrently with the construction of the County's mixed-used development project (see Table D-1, Map ID #5), the incremental disturbance effect of the Project to adjacent land uses would be cumulatively considerable. Adverse cumulative impacts resulting from the Project would be reduced through the Project's SPCs, including SPC AQ-1 (Limit Engine Idling), SPC AQ-2 (Fugitive Dust Controls), SPC AQ-3 (Off-Road Engine Specifications), SPC AQ-4 (On-Road Engine Specifications), SPC AQ-5 (Reduce Off-Road Vehicle Speeds), and SPC NOI-1 (Prepare a Construction Noise Complaint and Vibration Plan). However, given the proximity of existing residences to the truck routes and sediment storage/disposal sites, and the proximity of other proposed development to these same land uses, the Project's contribution to a cumulative land use disturbance would be significant and unavoidable (Class I).

D.4.8.3 Cumulative Effects of Alternative 1

The cumulative impacts from Alternative 1 would be identical to the Project.

D.4.8.4 Cumulative Effects of the No Action/No Project Alternative

Given that proposed construction and maintenance activities would not occur under the No Action/No Project Alternative, this alternative would not contribute to short-term cumulative impacts to existing recreational resources (Impact L-1), nor would it create a cumulative disturbance to existing residences or other adjacent land uses (Impact L-2). However, future No Action/No Project activities that may involve demolishing the Dam and removing 2.8 million cubic yards of sediment and concrete would contribute to a cumulative land use disturbance if they were concurrent with the construction of other projects in the vicinity of the proposed truck routes and disposal sites.

At this time, there are no foreseeable closures to recreational facilities that could contribute to a cumulative long-term degradation of a recreational resource (Impact L-3).

CEQA Significance Conclusion

If the No Action/No Project Alternative includes the future removal of the Dam and accumulated sediment, this alternative could contribute to a cumulative disturbance of existing residences. Any construction and removal activities that were to occur concurrently with the construction of other projects in the vicinity of proposed truck routes and disposal sites would create an incremental adverse effect to adjacent land uses that would be cumulatively considerable. The alternative's cumulative impact would be significant and unavoidable (Class I).

D.4.9 Transportation and Traffic

D.4.9.1 Spatial and Temporal Boundaries

For the purposes of the cumulative analysis of transportation impacts, only other projects that make a contribution to traffic along the same roadways utilized as the Project are considered (refer to Section C.10). During all phases of the Project, roadway segments where related trips would combine with cumulative projects could experience appreciable increases in traffic. Therefore, the study area for cumulative impacts includes other projects that might contribute traffic to the same intersections and street segments. A wide variety of activities and development contribute to the cumulative traffic conditions including residential, commercial, and industrial development in the local area. Therefore, all projects identified in Table D-1 have been considered with respect to this cumulative traffic analysis.

D.4.9.2 Cumulative Effects of the Project

As discussed in Section C.10, the traffic analysis for the Project is completed for future years 2022 and 2027 for both the initial and ongoing sediment removal phases of the Project. These future Project conditions include cumulative traffic volume growth as part of the future baseline. The Project traffic analysis is a cumulative analysis with respect to additional traffic volumes generated by the cumulative projects identified in Table D-1 on study area roadway segments and intersections.

As shown in Table C.10-10, Project traffic would have an adverse contribution to cumulative traffic at the intersection of Pearblossom Highway and Avenue T during the afternoon peak period. Project contribution to this intersection during this peak period would result in an LOS D delay. As shown in Table C.10-11, the Project would not contribute an adverse number of daily operational trips during ongoing sediment removal activities after the Reservoir design capacity has been restored. However, the Project would contribute an adverse incremental effect to cumulative traffic impacts during the initial sediment removal phase (Impact T-1). This impact would be reduced with the implementation of Mitigation Measure T-1 and SPC TRA-1. It should be noted that the implementation of cumulative project #2 (High Desert Corridor Freeway) is expected to reduce the traffic volumes on Pearblossom Highway. However, to ensure the most conservative analysis has been prepared, Tables C.10-10 and C.10-11 do not assume any reduction in traffic volumes on Pearblossom Highway under both future year 2022 and 2027 scenarios.

With regard to a cumulative impediment to emergency vehicle access, the implementation of Mitigation Measure T-1 and SPC TRA-1 would minimize the Project's cumulative contribution (Impact T-2). All future development that may generate traffic on study area roadway segments would be subject to Caltrans and other applicable regulations pertaining to vehicle weight and oversize vehicle trips. Additional development of the County of Los Angeles, particularly expansion of the existing mining quarries (as identified in Table D-1) would generate the use of large oversized trucks on public roadways and highways that would continue roadway wear and damage (Impact T-3). However, each individual project would require Caltrans and other approvals and permits pertaining to these issues. The implementation of SPC TRA-2 (Pavement Rehabilitation – Public or National Forest Roadways) would minimize the Project's contribution to cumulative roadway damage impacts to the degree feasible.

CEQA Significance Conclusion

During the initial sediment removal phase, the Project would contribute an incremental effect to traffic impacts that, when combined with the potential traffic impacts of other projects, would be cumulatively considerable (Class I). With regard to the Project's incremental effect on emergency vehicle access and roadway damage, the implementation of Mitigation Measure T-1 and SPCs TRA-1 and TRA-2 would reduce the Project's cumulative contribution to a less than significant level (Class II).

D.4.9.3 Cumulative Effects of Alternative 1

The cumulative effects of Alternative 1 with respect to transportation and traffic would be similar to that described above for the Project. By starting the initial sediment removal period on July 1 (annually), instead of after Labor Day and reducing the number of daily truck trips, the contribution to cumulative impacts on traffic delay would be reduced for Alternative 1. However, the contribution to cumulative impacts from traffic associated with sediment transport in subsequent years, conflicts with emergency access, and roadway damage would be similar or identical to that described above for the proposed Project. The inclusion of Mitigation Measure T-1 and SPCs TRA-1 and TRA-2, would further reduce cumulative impacts from Alternative 1.

CEQA Significance Conclusion

During the initial sediment removal phase, Alternative 1 would contribute an incremental effect to traffic impacts that, when combined with the potential traffic impacts of other projects, would be cumulatively considerable (Class I). With regard to Alternative 1's incremental effect on emergency vehicle access and roadway damage, the implementation of Mitigation Measure T-1 and SPCs TRA-1, and TRA-2 would reduce the cumulative contribution to a less than significant level (Class II).

D.4.9.4 Cumulative Effects of the No Action/No Project Alternative

Under the No Action/No Project Alternative, any traffic-generating activities would not occur until well into the future when the Reservoir became filled with sediment. As discussed in Section C.10, it is unknown what specific activities would occur outside the Reservoir. At such a time when the Reservoir would become filled with sediment, the cumulative projects identified within Table D-1 would be completed and integrated into the existing traffic conditions of their surrounding area. While traffic generation would occur should eventual Dam removal be required as part of the No Action/No Project Alternative, any contribution to cumulative traffic impacts is speculative. If removal of the Dam were to occur under the alternative, associated construction activities would have an adverse contribution to cumulative traffic impacts.

CEQA Significance Conclusion

If future removal of the Dam were to occur under the No Action/No Project Alternative, the alternative's incremental effect on traffic impacts during dam removal and excavation activities would be cumulatively considerable and unavoidable (Class I).

D.4.10 Visual Resources

D.4.10.1 Spatial and Temporal Boundaries

The geographic area of analysis for cumulative impacts to visual resources is limited to areas within approximately 0.5 mile of a site where visual change would occur. This area is defined as the geographic extent of the cumulative visual analysis because the Project's permanent visual changes occur at or below surface grade. At distances greater than 0.5 mile, visual changes would blend in with existing views and topography.

Based on the geographic extent defined above, the following cumulative project was identified as applicable to the visual resource analysis:

- Map ID #5, County of Los Angeles mixed use development project located on the southwest corner of Pearblossom Highway and 47th Street East, approximately 0.5 mile north of the PWD site.

This sole project is identified, as discussed below, because cumulative projects within the quarry boundaries are not applicable to visual resources with respect to impacting viewsheds of sensitive receptors.

D.4.10.2 Cumulative Effects of the Project

The visual quality of the Reservoir has remained steady over time, with the main change in visual appearance being tree removal. Along the haul routes and near the PWD site, continued residential development and traffic growth is changing the once desert area to a more urbanized landscape. Haul trucks would occur on existing roadways and not create a new source of visual contrast. No residential receptors are located within 0.5 mile of the quarry sediment disposal locations. Furthermore, sediment disposed at the quarry would either be placed below surface grade to backfill exhausted mining pits or stockpiled with sand and rock mined at the quarry. Such activities would not contribute to a cumulative visual impact when considered in conjunction with cumulative Map IDs #6 through 11 in Table D-1.

The potential for cumulative impacts is limited to periodic activities occurring at the PWD sediment staging location that may impact adjacent public views. Construction of the County of Los Angeles mixed use development project (Map ID #5) would be located 0.5 mile north of the PWD site and would increase overall visual sense of urbanized developed in the area. Project activities within the PWD site would be temporary, but include the presence of heavy equipment and removal of vegetation within the northeast corner of the property only.

While periodic activities at the PWD site could combine with this cumulative project, the Project's contribution to cumulative impacts are not considered adverse because the temporary storage of sediment and presence of construction equipment does not change the overall open space feel of the site (Impact V-1). While the cumulative project (Map ID #5) would result in permanent visual changes from public views at adjacent roadways and residences, the Project would not result in permanent visual contrast.

CEQA Significance Conclusion

Given that proposed Project activities at the PWD site would not result in permanent impacts to the visual landscape, the Project would not contribute an incremental effect to an overall cumulative impact on visual resources. Cumulative impacts to visual resources would be less than significant (Class III).

D.4.10.3 Cumulative Effects of Alternative 1

The cumulative visual impacts of Alternative 1 would be similar or identical to that described above for the proposed Project. By starting the initial sediment removal period on July 1 (annually), instead of after Labor Day, the number of days where activities may occur at the PWD site could be slightly increased. However, the overall potential for visual contrast would not be altered. Therefore, Alternative 1 would not contribute to a cumulative visual contrast and would not result in long-term adverse impacts.

CEQA Significance Conclusion

Alternative 1 would not result in permanent impacts to the visual landscape. The alternative’s incremental effect to a cumulative impact on visual resources would be less than significant (Class III).

D.4.10.4 Cumulative Effects of the No Action/No Project Alternative

Under the No Action/No Project Alternative, visual change would occur slowly within the Reservoir as it fills with sediment. As discussed in Section C.11, it is unknown what specific activities would occur outside the Reservoir. At such a time when the Reservoir would become filled with sediment, the cumulative projects identified within Table D-1 would be completed and incorporated into the ambient visual conditions of their surrounding area. While visual contrast of some level is likely associated with eventual construction activities of the No Action/No Project Alternative, any contribution to cumulative visual change is speculative but would likely be temporary.

CEQA Significance Conclusion

In the event that the Dam would be removed, the No Action/No Project Alternative would contribute to a cumulative impact on visual resource. The alternative’s incremental effect to a cumulative impact on visual resources would be short-term, and at this time would be expected to be less than significant (Class III).

D.4.11 Water Quality and Resources

D.4.11.1 Spatial and Temporal Boundaries

The area of potential cumulative effects for water quality and resources is defined as the Project area, including Littlerock Reservoir and Littlerock Dam, the potential sand and gravel pits and PWD disposal areas, and the haul route between the reservoir and the disposal areas. Additionally, this cumulative effects analysis includes any area downstream of the Project area as well as the upstream contributing area for Littlerock Reservoir, which is defined as the Rock Creek Hydrologic Area. For groundwater, the area of potential cumulative effects is defined as the Antelope Valley Groundwater Basin.

Cumulative impacts for water quality and resources are assessed based on consideration of past, current, and future development, and are not limited to the projects listed in Table D-1.

D.4.11.2 Cumulative Effects of the Project

It is possible that other projects within the area of potential cumulative effects could violate water quality standards or waste discharge requirements, or contaminate groundwater through the introduction or mobilization of pollutants. Examples of projects that could result in these potential impacts include active mining operations and new highway construction. However, the incremental effects associated with the Project for water quality degradation are negligible.

CEQA Significance Conclusion

The Project would not contribute an incremental effect on either surface or ground water quality that would be cumulatively considerable (Class III).

D.4.11.3 Cumulative Effects of Alternative 1

The cumulative impacts from Alternative 1 would be identical to the Project.

D.4.11.4 Cumulative Effects of the No Action/No Project Alternative

No impacts associated with water quality would occur under the No Action/No Project Alternative. This alternative would not contribute an incremental adverse effect in combination with other cumulative projects.

D.4.12 Wildfire Prevention and Suppression

D.4.12.1 Spatial and Temporal Boundaries

The geographic area for a cumulative analysis of wildfire prevention and suppression is defined by the direct and indirect protection zones that encompass the Reservoir, as well as the high fire hazard areas (i.e., Fire Zone 4, Additional Brush Fire Hazards Areas) that are traversed by the Project. The aforementioned areas are susceptible to wildfire given their climate, type of vegetation found, and topography (see Section C.13). The Project's impacts on wildfire prevention and suppression would be short-term in that they would only occur during the proposed construction and maintenance phases (e.g., accidental vegetation fire from equipment; temporary impediment to fire-fighting crews from equipment and dump trucks). Other projects that may be constructed in this defined geographic area during the Project's construction and maintenance activities could create similar impacts wildfire prevention and suppression that may contribute to an adverse cumulative effect.

D.4.12.2 Cumulative Effects of the Project

Impacts to wildfire prevention and suppression could occur from construction of other projects in the defined geographic area for the wildfire cumulative analysis (see discussion above). Other projects that may create construction-related impacts similar to the Project include the mixed-use development in Los Angeles County along 47th Street East and Pearblossom Highway (see Table D-1, Map ID #5) and the improvement project for Williamson Rock and the Pacific Crest Trail (see Table D-1, Map ID #1).

The identified cumulative projects may require the use of construction equipment along public roadways that could interfere with wildfire suppression activities (Impact WF-1). Construction activities or personnel affiliated with other projects could also inadvertently start a vegetation fire (Impact WF-2). Any disturbance to the surrounding vegetation that would result from these other Projects may contribute to a future fuel-vegetation matrix with an increased ignition potential and rate of fire spread (Impact WF-3).

Potential conflicts to wildfire prevention and suppression from other identified projects in the geographic area would be similar to the Project. If construction of the County's mixed-use development project or the Williamson Rock and Pacific Crest Trail improvements were to occur during the construction or maintenance phases of the Project, the Project would contribute an incremental adverse effect to the overall cumulative impact to wildfire suppression activities.

CEQA Significance Conclusion

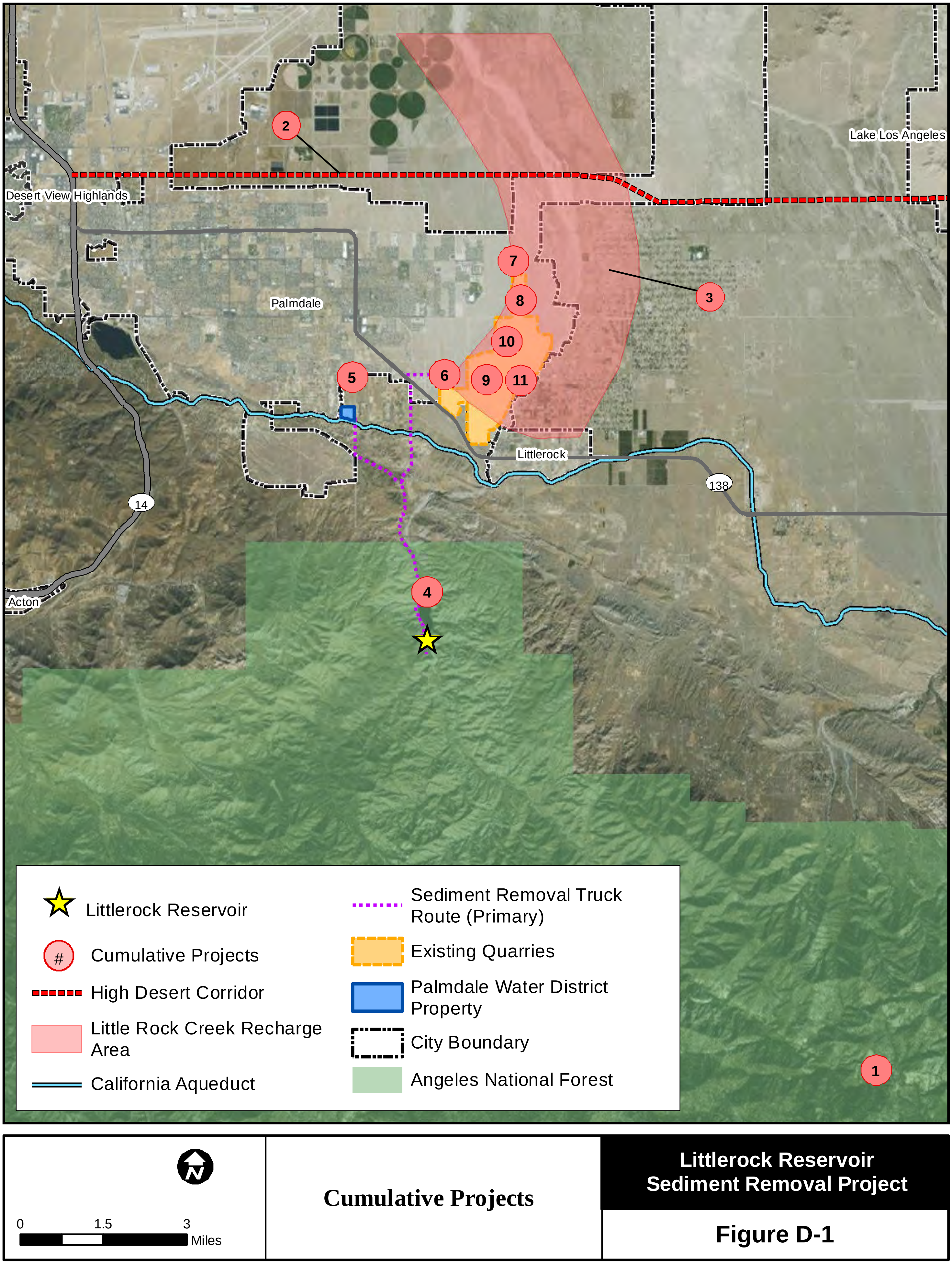
In order to avoid adverse impacts, the Project would implement SPC FIRE-1 (Curtailment of Activities) to temporarily halt Project construction in the event of a fire or during extreme weather conditions, as well as SPCs FIRE-2 (Preparation of a Fire Plan) and FIRE-3 (Spark Arrester Requirements) to avoid a Project-related vegetation fire. The Project would also implement SPCs BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) and BIO-2 (Prepare and Implement a Weed Control Plan) to minimize effects on native flora. With implementation of SPCs FIRE-1, FIRE-2, FIRE-3, BIO-1a, and BIO-2, the incremental impact of the Project on wildfire prevention and suppression would be reduced to a level that is less than significant (Class II).

D.4.12.3 Cumulative Effects of Alternative 1

The cumulative impacts from Alternative 1 would be identical to the Project.

D.4.12.4 Cumulative Effects of the No Action/No Project Alternative

The No Action/No Project Alternative would not involve the use of construction equipment at the Reservoir, nor would it introduce a temporary workforce that would need to be trained in fire prevention behavior and protocols. Under this alternative, there would be no new activities at the Reservoir that may result in a vegetation fire; expose communities, firefighters, personnel, or natural resources to an increased wildfire risk; or alter the existing fuel-vegetation matrix. Given that the No Action/No Project Alternative would not affect wildfire prevention and suppression activities, this alternative would not contribute to a cumulative impact.



Cumulative Projects

Littlerock Reservoir Sediment Removal Project

Figure D-1

May 2016

E. Other Federal Requirements and CEQA Considerations

Section E.1 includes discussions of various topics required by NEPA and/or CEQA, including a description of the long-term implications of the Project, the Project's unavoidable adverse effects, and possible growth-inducing effects. Section E.2 discusses applicable federal environmental regulations and describes how compliance with these regulations will occur as part of the USDA Forest Service's review of the Project.

E.1 Long-Term Implications

E.1.1 Short-term Uses and Long-term Productivity

The Council on Environmental Quality (CEQ) NEPA Regulations (40 CFR Part 1500 et seq.) require that an EIS discuss issues related to environmental sustainability. In general, this EIS discussion is not included as environmental effects for which either significance is defined, or mitigation is recommended. However, the discussion, as it relates to environmental consequences, must be included in the EIS, including consideration of "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (42 USC Section 4332[C] [iv]).

In this section, the short-term effects and uses of various components of the environment in the vicinity of the Project are related to long-term effects and the maintenance and enhancement of long-term productivity. "Short term" refers to the total duration of the Project, whereas "long term" refers to an indefinite period beyond the construction and maintenance of the Project. The specific impacts of the Project vary in kind, intensity, and duration according to the activities occurring at any given time. The Project involves tradeoffs between long-term productivity and short-term uses of the environment.

Construction activities would result in a number of temporary impacts that would cease upon completion of the construction phase. Such impacts include the temporary closure of the Recreation Area; soil disturbance that could mobilize any pollutants attached to the sediment; temporary disturbance to approximately 65 acres of vegetation and unvegetated areas that include riparian woodlands, herbaceous wetland, unvegetated lake bottom, and sandy wash; emissions of air pollutants during Project construction and excavation phases; and disturbance (e.g., noise, traffic) to existing residences adjacent to truck routes and sediment disposal sites. Each of these impacts is described in detail in Section C (Affected Environment and Environmental Consequences). Section C also includes a discussion of SPCs that have been incorporated into the Project to avoid or reduce potential impacts, as well as additional mitigation measures that have been proposed to further minimize impacts to the extent feasible.

As described in Section A.2 (Purpose and Need), the Project has been designed to create a long-term benefit of increasing the capacity of a water resource that serves the City of Palmdale and the surrounding unincorporated communities. By restoring the Reservoir to its 1992 design capacity, PWD would be able to enhance its supply of water during a time of drought, continue to provide recreational opportunities at the Reservoir, and maintain the Dam's ability to provide debris control and flood protection for downstream areas.

E.1.2 Irreversible and Irretrievable Commitment of Resources

Pursuant to Section 15126.2(c) of CEQA Guidelines, an EIR must address significant irreversible and irretrievable environmental changes that would be caused by a proposed project. NEPA Section 1502.16 also requires an EIS to include a discussion of "any irreversible and irretrievable commitments of resources which would be involved in the proposed action/project (Project) should it be implemented." These changes include uses of nonrenewable resources during construction and operation, long-term or permanent access to previously inaccessible areas, and irreversible damages that may result from project-related accidents.

Implementation of the Project would result in the consumption of energy as it relates to the fuel needed for construction-related activities. As provided in Appendix B, total fossil fuels used by construction vehicles and equipment associated with the Project would include approximately 92,277 gallons of gasoline and 1,210,480 gallons of diesel fuel. The anticipated equipment, vehicles, and materials required for construction and maintenance activities are detailed in Section B.2 (Overview of the Proposed Action/Project).

As described in Sections B.2.2 and B.2.3, excavated sediment would be reused as much as possible (e.g., using Reservoir bed materials for soil cement during construction of the grade control structure; recycling excavated material for use on PWD and other municipal projects). PWD has also incorporated SPC GHG-1 (Recycle Construction Wastes) into the Project, which would require recycling of construction waste and removed sediment to the extent feasible (see Appendix A).

E.1.3 Unavoidable Adverse Effects

As required by the CEQ NEPA Regulations (40 C.F.R. § 1502.16) and Section 15126.2(b) of the CEQA Guidelines, this EIS/EIR describes the adverse or significant environmental effects that cannot be avoided through implementation of the Project or alternatives. In Section C of this document, the direct, indirect, and cumulative environmental effects of the Project are discussed in detail. Impacts that are significant and cannot be avoided or reduced to less than significant levels through the application of feasible mitigation measures or SPCs have been characterized as Class I impacts. All significant and unavoidable Class I impacts resulting from the Project and alternatives are summarized below. Refer to Sections C.2 through C.13 for a complete description of these impacts.

E.1.3.1 Air Quality and Climate Change

Under the No Action/No Project Alternative (Alternative 2), air pollutant emissions generated from potential construction activities associated with dam removal may exceed AVAQMD emissions thresholds, which would contribute to significant and unavoidable impacts (Class I). The Project and Alternative 1 would not exceed AVAQMD emissions thresholds with the exception of the average daily PM10 emissions during excavation activities. However, with implementation of SPCs AQ-1 through AQ-5, pollutant emissions impacts from the Project and Alternative 1 would be less than significant.

E.1.3.2 Cultural Resources

The Project and Alternative 1 could uncover, expose, and/or damage human remains during construction and maintenance activities. The effect would be considered adverse under the regulations in the National Historic Preservation Act, and therefore treatment of the remains, other than protection in place, would result in a significant and unavoidable impact (Class I).

E.1.3.3 Geology and Soils

Under the No Action/No Project Alternative (Alternative 2), demolition of the Dam and removal of the accumulated sediment could expose construction workers to risks associated with liquefaction and landslide. The geotechnical safeguards for this potential demolition and excavation work are unknown, and therefore could result in a direct, significant and unavoidable impact (Class I). Removal of the Dam under the No Action/No Project Alternative would also contribute to substantial erosion and sedimentation, which would significantly affect downstream resources downstream (Class I).

E.1.3.4 Hazards and Public Safety

Under the No Action/No Project Alternative (Alternative 2), future demolition of the Dam could result in spills and leaks of hazardous materials that may contribute to soil, groundwater, or surface water contamination. As standard project commitments regarding the handling, disposal, and spill response for hazardous materials under a Dam removal project are unknown, the No Action/No Project Alternative could result in a direct and adverse impact that was significant and unavoidable (Class I). A future breach or demolishing the Dam under the No Action/No Project Alternative would also expose downstream communities to dam safety or degradation issues, contributing to a significant and unavoidable safety impact (Class I).

E.1.3.5 Hydrology

The No Action/No Project Alternative (Alternative 2) would eventually result in an increased reliance on groundwater extraction to supply the greater Palmdale area with water, with expected declines in groundwater levels. This alternative would also eliminate the flood-control capacity of the Reservoir due to increased sedimentation, which would increase the flood hazard downstream of the Dam. Impacts from the No Action/No Project Alternative would be significant and unavoidable (Class I).

E.1.3.6 Noise

Under the No Action/No Project Alternative (Alternative 2), noise generated from possible Dam removal activities may not comply with all applicable Los Angeles County and City of Palmdale regulations pertaining to noise and vibration performance standards and allowable construction hours. While such a determination is speculative, possible noise impacts of the No Action/No Project Alternative would be considered significant and unavoidable (Class I).

E.1.3.7 Recreation and Land Use

The Project and alternatives would disturb nearby residences along the truck routes and disposal sites during sediment transport and disposal from construction-related noise and traffic, which would create a significant and unavoidable nuisance impact (Class I). While the proposed action would not preclude or limit future recreation opportunities during peak recreation periods, Alternative 1 may double the number of years that the Recreation Area would be temporarily closed to the public and would require closure earlier in the season. As such, Alternative 1 would create a significant and unavoidable impact to a recreational resource (Class I). The No Action/No Project Alternative (Alternative 2) could contribute to the eventual demolition of the Dam, which would create an irreversible impact (Class I) from the loss of the Recreation Area.

E.1.3.8 Transportation and Traffic

The No Action/No Project Alternative (Alternative 2) may require eventual removal of the Dam as well as 2.8 million cubic yards cubic yards of sediment and Dam debris, which would generate construction traffic that would create a significant, unavoidable impact (Class I).

E.1.3.9 Water Quality

Under the No Action/No Project Alternative (Alternative 2), substantial downstream erosion and sedimentation would likely result from an eventual breach or demolishing of the Dam. Hazardous materials that would be used during demolition and excavation could be spilled into waterways. Given that Project commitments for this alternative are unknown, impacts to water quality would be considered significant and unavoidable (Class I).

E.1.4 Growth-inducing Effects

Section 15126.2(d) of the CEQA Guidelines requires that an EIR discuss the ways in which a proposed project may foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. The CEQ NEPA Regulations also provide for discussing the growth-inducing impacts of a project. As stated in 40 C.F.R. § 1508.8(b) of the Guidelines, "Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems." The discussion must additionally address how a proposed project may remove obstacles to growth, or encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively.

Typically, the growth-inducing potential of a project would be considered significant if it fosters growth or a concentration of population above what is assumed in local and regional land use plans, or in projections made by regional planning authorities. Significant growth impacts could also occur if a project provides infrastructure or service capacity to accommodate growth levels beyond those permitted by local or regional plans and policies.

As described in Section A.2 (Purpose and Need), the Project would not increase the water storage capacity of the Reservoir beyond its 1992 design. Consequently, the Project would not serve to induce population growth either directly or indirectly. The construction and maintenance phases of the Project would not affect employment in the area. The Project would have a daily workforce of approximately 30 personnel, and it is anticipated that the majority of the construction personnel would come from the existing labor pool of the City of Palmdale and Los Angeles County. Project operation would not create any new jobs. Over the long term, the hiring of employees for the Project would have no impact on population growth, as no long-term employment growth would result from Project operations.

E.2 Compliance with Applicable Federal Environmental Regulations and Policies

Section E.2 discusses applicable federal environmental regulations, and describes how the Project has been developed in accordance with the requirements of these environmental statutes and regulations.

E.2.1 Endangered Species Act and Fish

The arroyo toad (*Anaxyrus californicus*) is a federally listed endangered species that is known to occur in Little Rock Creek (above Rocky Point) and Santiago Creek. This species has been fully addressed within the context of this EIS/EIR (see Section C.3, Biological Resources) and SPCs have been proposed to minimize potential impacts. In compliance with the requirements of the ESA, the USDA Forest Service will consult with the USFWS regarding the effects of the Project on the arroyo toad. As part of consultation with USFWS, the USDA Forest Service will prepare and submit a Biological Assessment for federally endangered or threatened species that could potentially be adversely affected by the Project. Subsequently, any "take" of a federally endangered or threatened species as a result of implementation of the Project would only be allowed under the context of a Biological Opinion issued by USFWS.

E.2.2 Clean Water Act

For the Project, NPDES permits would be issued by the Lahontan RWQCB. In order to comply with NPDES regulations, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared for Project construction activities. For more information about the SWPPP, see Section C.12 (Water Quality).

A Section 404 permit would be required for Project construction activities involving excavation or replacement of fill material into waters of the United States. In addition, a Water Quality Certification pursuant to Section 401 of the CWA is required for Section 404 permit actions. See Section C.12 (Water Quality) for further information on the 404 permit requirements.

E.2.3 National Historic Preservation Act

Section 106 applies to the Project because proposed grade control construction and sediment excavation would occur on NFS lands, and a permit from the USDA Forest Service is required for implementation of the Project. For cultural resources that cannot be avoided by the Project, NRHP eligibility will be evaluated and a determination of eligibility will be made by the Forest Service in concurrence with the SHPO.

E.2.4 Clean Air Act

The 1990 amendments to the federal CAA Section 176 require the U.S. EPA to promulgate rules to ensure that federal actions conform to the appropriate State Implementation Plan (SIP). These rules, known together as the General Conformity Rule (40 CFR Sections 51.850-51.860; 40 CFR Sections 93.150-93.160), require any federal agency responsible for an action in a nonattainment or attainment/maintenance area to determine that the action conforms to the applicable SIP or that the action is exempt from the General Conformity Rule requirements. This means that federally supported or funded activities will not (1) cause or contribute to any new federal air quality standard violation, (2) increase the frequency or severity of any existing federal standard violation, or (3) delay the timely attainment of any federal standard, interim emission reduction, or other milestone. Actions can be exempt from a conformity determination if an applicability analysis shows that the total direct and indirect emissions from the Project construction and operation activities would be less than specified emission rate thresholds, known as *de minimis* limits, and that the emissions would be less than 10 percent of the area emission budget.

E.2.4.1 CAA Conformity

The USDA Forest Service regulates the portion of the Project's route that goes through the ANF and the Forest Service has prepared a planning document for the ANF. The Angeles National Forest Strategy does not include any air quality strategies that would be significantly impacted by the construction or operation of the Project.

The Project is located within an area of the Mojave Desert Air Basin (MDAB) that is under the jurisdiction of the Antelope Valley Air Quality Management District. This portion of the MDAB is in nonattainment for the federal and State ozone standards and the State PM10 standard. Potential air quality impacts have been assessed in Section C.2 (Air Quality and Climate Change) of this EIS/EIR. Both short and long-term emissions of criteria pollutants resulting from the construction and operation of the Project were evaluated. As discussed in Section C.2, the annual NOx and VOC emissions for the Project were calculated to be well below the General Conformity *de minimis* thresholds for the Antelope Valley portion of the MDAB. Therefore, a comprehensive General Conformity analysis would not be required for the Project.

E.2.5 Executive Order 12898 on Environmental Justice

On February 11, 1994, President Clinton issued an "Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (Executive Order 12898), which was designed to focus federal attention on environmental and human health conditions in minority communities and low-income communities. The Order also intended to promote non-discrimination in Federal Programs substantially affecting human health and the environment. As described in Section A.5.2 (Topics not relevant to the EIS/EIR), census tract data indicates that the Project would not disproportionately affect minority or low-income populations.

E.2.5.1 Methodology

As defined by the "Final Guidance for Incorporating Environmental Justice Concerns" contained in EPA's NEPA Compliance Analysis (Guidance Document, EPA 1998), minority (people of color) and low-income populations are identified where either:

- The minority or low-income population of the affected area is greater than 50 percent of the affect area's general population; or
- The minority or low-income population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

In 1997, the President's Council on Environmental Quality issued Environmental Justice Guidance that defines minority and low-income populations as follows:

- Minorities are individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black not of Hispanic origin; or Hispanic (without double-counting non-white Hispanics falling into the Black/African-American, Asian/ Pacific Islander, and Native American categories).
- Low-income populations are identified as populations with mean annual incomes below the annual statistical poverty level.

E.2.5.2 Environmental Justice Analysis

In the following Environmental Justice analysis, the percentages of minority and low-income populations were examined for each census tract traversed by the haul truck vehicle routes, as well as the sediment storage and disposal sites. U.S. Census data is not applicable for the unoccupied portions of the Project within NFS lands. The screening analysis seeks to identify if the minority and low-income populations within these tracts is disproportionate to the larger general population or other appropriate unit of geographic analysis, which is the City of Palmdale. The results are shown in Table E-1.

Table E-1. 2012 U.S. Census ACS Demographic Characteristics[1] of Census Tracts Traversed or Within 0.5 Miles of Project Activities and the City of Palmdale

City of Palmdale				
City	**Total Population**	**Minority Population**	**Low Income Percentage**	**Minority Percentage**
Palmdale	151,841	114,115	75.4%	19.4%
Project Census Tracts				
Tract	**Total Population**	**Minority Population**	**Low Income Percentage**	**Minority Percentage**
9107.09	1,663	744	44.7%	11.9%
9108.04	3,087	622	20.1%	9.8%
9108.12	407	81	19.9%	5.7%

Source: US Census Bureau, 2014a and 2014b.

1 Because U.S. Census 2008-2012 American Community Survey (ACS) estimates come from a sample population, a certain level of variability is associated with the estimates. Supporting documentation on ACS data accuracy and statistical testing can be found on the ACS website in the Data and Documentation section available here: http://www.census.gov/acs/www/data_documentation/documentation_main/. For purposes of this analysis, U.S. Census ACS data was utilized for providing current data, consistency between the data used to identify minority and low-income populations, and consistency between the different geographies presented. For these reasons, U.S. Census ACS data is considered best available for representing the demographic makeup of Plan Area communities for this programmatic EIS/EIR. Use of published U.S. Census ACS data estimates is commonly used by Lead Agencies in compliance with Executive Order 12898, California Government Code Section 65040.12 and Public Resources Code Section 72000, as well as CEQ and EPA guidance for incorporating Environmental Justice Concerns under NEPA and CEQA.

As identified above in Table E-1, no census tracts identified as being traversed or within 0.5 mile of any Project activities contain a minority or low-income population greater than 50 percent or disproportionate to the larger general population or other appropriate unit of geographic analysis, which is the City of Palmdale. Therefore, any identified significant impacts that cannot be mitigated associated with the Project would not be disproportionate to minority or low-income populations within the affected area of the Project. No Environmental Justice impacts would occur.

F. List of Preparers and Persons Consulted

F.1 Public Participation and Notification

An important part of the environmental review process is to engage the public and agencies early to effectively address issues, comments, and concerns in the EIS/EIR. Public participation and notification starts with scoping and goes through to the Final EIS/EIR. For the Littlerock Sediment Removal Project, the scoping period commenced on March 7, 2014 and ended on April 15, 2014. During scoping, the PWD and USDA Forest Service provided opportunities for the public, agencies, and interested parties to provide comments on the scope and content of the EIS/EIR. The key components of these activities are summarized below.

F.1.1 NEPA/CEQA Notices

- The USDA Forest Service published the Notice of Intent in the Federal Register on March 19, 2014, which commenced the NEPA scoping period.
- The PWD submitted the Notice of Preparation (NOP) to the State Clearinghouse on March 7, 2014 (SCH# 2005061171), commencing the CEQA 30-day scoping period.

F.1.2 Public Notices

- The PWD distributed over 1,000 NOPs to property owners, agencies, other interested parties, and to public repository sites. The NOP announces the preparation of the EIS/EIR, provided Project information, and announced the public scoping meeting.
- Advertisements regarding the EIS/EIR and the public scoping meeting were placed in five local and regional newspapers from March 10 to 15, 2014.

F.1.3 Public Scoping Meeting

The PWD and USDA Forest Service held one scoping meeting on March 25, 2014 at the PWD Boardroom. Representatives of the PWD, USDA Forest Service, and the EIS/EIR technical team attended the scoping meeting to respond to questions regarding the Project. However, no members of the public attended the meeting despite the public notifications.

F.1.4 Scoping Comments

Thirteen written comment letters were submitted on the Project. Some of the key issues are summarized below:

- A traffic study was requested to evaluate how Project traffic may impact local streets.
- Concerns with the potential for impacts on cultural resources and a request to continue to involve tribal representatives and the Native American Heritage Commission.
- Residents expressed concern with the potential for Valley Fever and requested that another area be considered for the deposit site.
- Request to include information on sensitive plants, fish and wildlife in the EIS/EIR and to address known concentrations of mercury and polychlorinated biphenyls at the reservoir.
- Permits may be needed from the City of Palmdale and the US Army Corps of Engineers.

Appendix E provides details on the public participation and notification conducted on the Project. Refer to the appendix for all of the scoping comments provided on the Project.

F.2 Organizations and Persons Consulted

Table F-1. Organizations and Persons Consulted

Name/Agency or Company	Title or Role
Jesse Bennett, USFWS	Federal Endangered Species Act Compliance
Antall Szijj, Army Corps of Engineers	Regulatory Office
Gary Lippner, DWR (North Central District)	Regional Planning and Coordination Branch Chief
Paul Larson, DWR (North Central District)	California-Nevada and Watershed Assessment, Senior Engineer
Mary Guerin, DWR (Southern District)	Senior Environmental Scientist
David Inouye, DWR (Southern District)	Senior Land and Water Use Analyst
Alan De Salvio, MDAQMD	Supervising Air Quality Engineering
Tim Hovey, CDFW	Arroyo toad and fisheries
Scott Harris, CDFW	Biological Resources and CEQA considerations
Kelly Schmoker, CDFW	State Endangered Species Act Compliance
Sara Rains, CDFW	State 1600-1608 Permitting
Juan Carrillo, Assistant Planner, City of Palmdale	Cumulative Projects List
Ruben Ramirez, Cadre Environmental	Arroyo toad ecology
Lawrence Hunt, Hunt and Associates	Arroyo toad ecology
William Haas, Pacific Coast Conservation Alliance	Arroyo toad and vertebrate ecology
Lori Clifton, Hi-Grade Materials, Inc.	Sediment Disposal

F.3 Preparers and Contributors

Table F-2. CEQA and NEPA Lead Agencies

Name	Role
Palmdale Water District	
Dennis LaMoreaux	General Manager
Matthew Knudson	Assistant General Manager
James Riley	Engineering/ Grant Manager
U.S. Forest Service	
Wilburn Blount	District Ranger, Santa Clara Mojave Rivers Ranger District, Angeles National Forest
Lorraine Gerchas	Lands Program Manager, Recreation & Lands Special Uses, Real Estate Management
Justin Seastrand	Environmental Coordinator
David S. Peebles	Archaeologist
Leslie Welch	Biologist
Nathan Sill	Biologist
Teresa Sue	Biologist
Peter Johnston	Biologist
Katy Vin Zant	Biologist

Table F-3. Consultant Team

Name	Project Role	Education/Certifications	Years of Experience
Aspen Environmental Group			
Negar Vahidi	EIS/EIR Project Manager, Land Use Technical Lead	B.A. Political Science (with Highest Honors) Master of Public Administration (MPA)	20
William Walters, P.E.	Air Quality and Climate Change	B.S. Chemical Engineering, Professional Engineer (P.E.)	28
Philip Lowe	Hydrology	B.S. Wildlife Management M.S. Watershed Management Professional Engineer (PE)	35
Scott Debauche, CEP	Project Description, Visual/Aesthetics, Noise, Transportation and Traffic; Deputy Project Manager	B.S. Urban Planning and Design Board Certified Environmental Planner (CEP) #12040973	18
Sandra Alarcón-Lopez	Public Involvement	BA, Speech and Hearing Sciences MA, Architecture and Urban Planning	30
Tatiana Inouye	Recreation and Land Use, Wildfire Prevention and Suppression; Project Assistant	B.S. Biology Master of Environmental Science and Management	10
Chris Huntley	Deputy Project Manager/Biological Resources/Permitting Technical Lead	B.A. Biology	17
Jared Varonin, CFP	Biological Resources, Jurisdictional Delineations	B.S. Ecology and Systematic Biology	14
Carla Wakeman	Biological Resources	B.A. Biology M.A. Biology	20
Justin Wood	Biological Field Studies, Jurisdictional Delineations	B.S. Biology M.S. Biology	13
Jennifer Lancaster	Biological Resources	B.S., Biology M.S., Biology	13
Matthew Long	Geology and Soils, Water Quality and Resources	B.A. Comparative Literature Master of Public Policy (MPP) Master of Environmental Science (MESc)	7
Andrew Flores	Cumulative Projects	B.A. Politics Master of Urban and Regional Planning (MURP)	8
Mark Tangard	Document Production, Word Processing	BA (with highest honors), Geography	40
Emily Chitiea	Document Production, Editor	B.A. English Literature	3
Tracy Popiel	GIS Specialist	B.S., Biology M.A., Geography	8
Garland and Associates			
Richard Garland, P.E.	Transportation and Traffic	MS Civil Engineering; BS Civil Engineering; P.E. Traffic Engineering	32
Applied Earthworks			
Tiffany C. Clark	Cultural Resources	M.A. Anthropology Ph.D. Anthropology	20
Joan George	Cultural Resources	B.S. Physical Anthropology	17

F.4 Distribution of the EIS/EIR

The PWD and USDA Forest Service issued the Draft EIS/EIR on May 6, 2016. The Draft document provided a detailed analysis of 13 environmental disciplines and an evaluation of alternatives to the proposed project, including the No Project/No Action alternative. The key components of the Draft EIS/EIR noticing and distribution are highlighted below.

F.4.1 NEPA/CEQA Notices

- The USDA Forest Service published the Notice of Availability in the Federal Register on May 6, 2016, which commenced the NEPA public review period.
- The PWD submitted a Notice of Completion to the State Clearinghouse on May 6, 2016 (SCH# 2005061171), commencing the CEQA 45-day public comment period.

F.4.2 Public Notices

Copies of the full Draft EIS/EIR and appendices were sent to 15 different local, State, and federal agencies and to four repositories. An additional 10 agencies and organizations and 8 tribal government representatives received electronic copies of the Draft EIS/EIR on CD; some agencies received both a hard copy and an electronic copy of the document. This distribution also included a Notice of Availability (NOA) with each document. The following agencies received a copy of the Draft EIS/EIR:

Hard Copies
– Angeles National Forest
– Antelope Valley Air Quality Management District
– California Department of Fish and Wildlife
– California Department of Water Resources
– City of Palmdale
– County of Los Angeles
– Regional Water Quality Control District
– Littlerock Creek Irrigation District
– National Agricultural Library
– Palmdale Water District
– US Army Corps of Engineers
– US EPA
– US Fish and Wildlife Service
– US Forest Service
– US Office of Environmental Policy and Compliance

Electronic (CDs)
- Acton Town Council
- Agua Dulce Town Council
- Antelope Valley East Kern Water Agency
- City of Lancaster
- City/County Native American Indian Commission
- Edwards Air Force Base
- Fernandeño Tataviam Band of Mission IndiansKern Valley Indian Council
- Kitanemuk & Yowlumne Tejon Indians
- Littlerock Lake Resort
- Littlerock Town Council
- Sacred Site Committee of AV
- San Fernando Band of Mission Indians
- Subcommittee on Water Resources and the Environment
- Tehachapi Indian Tribes
- Ti'At Society – Inter-tribal Council of Pimu
- USDA Animal and Plant Health Inspection Service
- Vasquez Rocks County NA

- The PWD distributed more than 950 NOAs to property owners and other interested parties. The NOA provided information on how to access the Draft EIS/EIR, information about the Project, the date and time of the informational workshop, and how to comment on the EIS/EIR.
- Advertisements regarding the Draft EIS/EIR and the public workshop were placed in the same five local and regional newspapers used during scoping.

F.4.3 Public Scoping Meeting

The PWD and USDA Forest Service will conduct one public workshop on May 19, 2016 at the PWD Boardroom. Representatives of the PWD, USDA Forest Service, and the EIS/EIR technical team will attend the workshop to respond to questions regarding the Project.

F.4.4 Public Review Comments

All written comments submitted on the Project will be responded to in the Final EIS/EIR (response to comments). The PWD and the USDA Forest Service will accept written comments from May 6 through June 20, 2016. Written comments must be submitted by, or postmarked on or before, June 20, 2016. Please submit comments to:

Forest Service/Palmdale Water District
c/o Aspen Environmental Group
5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301

By Electronic Mail: E-mail communications are welcome and will be accepted as official comments; however, please remember to include your name and return address in the email message. Email messages should be sent to: **LSRP@aspeneg.com.**

G. References

Executive Summary

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B. Description of Proposed Action/Project and Alternatives

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C. Affected Environment and Environmental Consequences

C.1 Introduction and Environmental Analysis

None

C.2 Air Quality and Climate Change

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None

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H. Glossary and Acronyms

H.1 Glossary

100 Year Flood – A stream flow caused by a discharge that is exceeded, on the average, only once in 100 years. A 100 year flood has a 1 percent chance of occurrence in any given year.

A-weighting – A frequency measure of noise, which simulates human perception.

Acre-foot – A unit of measure for water demand and supply. The volume of 1 acre-foot would cover 1 acre to a depth of 1 foot and is equal to 325,851 gallons.

Air Quality Standard – The specified average concentration of an air pollutant in ambient air during a specified time period, at or above which level the public health may be at risk; equivalent to AAQS.

Ambient Air – Any unconfined portion of the atmosphere; the outside air.

Ambient Noise Level – Noise from all sources, near and far. The ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Baseline – A set of existing conditions against which change is to be described and measured.

Carbon Monoxide (CO) – A colorless, odorless, toxic gas produced by incomplete combustion of carbon in fossil fuels.

Community Noise Equivalent Level (CNEL) – The averaging of noise levels on a measurement scale of decibels that increases the actual noise measurement, to account for an increased sensitivity to noise during late evening, nighttime, and morning hours.

Cultural Resource – Any object or specific location of past human activity, occupation, or use, identifiable through historical documentation, inventory, or oral evidence.

Cumulative impact – Two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts.

dBA – The A-weighted decibel scale representing the relative insensitivity of the human ear to low-pitched sounds; decibels (dB) are logarithmic units that compare the wide range of sound intensives to which the human ear is sensitive.

Emission – Unwanted substances released by human activity into air or water.

Emission limit – A regulatory standard that restricts the discharge of an air pollutant into atmosphere.

Environment – The physical conditions that exist in the area and that would be affected by a proposed project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance. The area involved is where significant direct or indirect impacts would occur as a result of the project. The environment includes both natural and artificial conditions.

Environmental Impact Report (EIR) – An environmental assessment that considers the significant environmental effects of a proposed project in accordance with the California Environmental Quality Act (CEQA).

Environmental Impact Statement (EIS) – An environmental assessment of a major Federal action that may significantly affect the quality of the human environment in accordance with the National Environmental Policy Act (NEPA).

Fugitive dust – Airborne soil particles.

Groundwater – Water formed underground in soil pore spaces and in the fractures of rock formations. It is stored in and moves slowly through geologic formations of soil, sand, and rocks called aquifers.

Impact – The effect of the project that would occur absent mitigation measures. Direct impacts are those that are caused by and immediately related to the proposed project. Indirect impacts would occur later in time or farther removed in distance, but are still reasonably foreseeable effects of the proposed project.

Invertebrate – Animals that lack a spinal column.

Lead Agency – The agency responsible for preparation of the document. For the proposed Littlerock Reservoir Sediment Removal Project, the Palmdale Water District is the Lead Agency under CEQA and the U.S. Forest Service is the Lead Agency under NEPA.

Leq – Energy-equivalent sound level; average level of sound determined over a specific period of time.

Level of Service (LOS) – A measure of roadway congestion, ranging from A (free-flowing) to F (highly congested).

Liquefaction – The process of making or becoming liquid (soils).

Mitigation – Measures that avoid or substantially reduce the proposed project's significant environmental impacts by avoiding or minimizing the degree of impact, or rectifying or compensating for the impact after it occurs.

Nitrogen dioxide (NO2) – A molecule of one nitrogen and two oxygen atoms. Results usually from further oxidation of nitric oxide (NO) in the atmosphere. Ozone accelerates the conversion.

Nitrogen oxides (NOx) – A gaseous mixture of nitric oxide (NO), nitrogen dioxide (NO2), and nitrous oxide (N2O) that is formed when nitrogen (N2) combines with oxygen (O2).

Ozone (O3) – A molecule of three oxygen atoms. Ozone is a colorless gas formed by a complex series of chemical and photochemical reaction of reactive organic gases, principally hydrocarbons, with the oxides of nitrogen, which is harmful to the public health, the biota, and some materials.

Particulate Matter (particulates) – Very fine sized solid matter or droplets, typically averaging one micron or smaller in diameter. Also called "aerosol."

ppm – Parts per million, a measure of the amount of one substance found in a second, which is the carrier.

Project – The whole of an action that has the potential for resulting in a physical change in the environment, directly or ultimately.

Riparian – Of or relating to wetlands adjacent to rivers and streams.

Ruderal – Growing where the natural vegetation cover has been disturbed.

Sensitive receptor – Land uses adjacent to or within proximity to the proposed project that could be impacted by construction, operation, and maintenance activities.

Significant impact – A substantial, or potentially substantial, adverse change in any of the physical conditions in the area affected by the proposed project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance.

Siltation – The increased concentration of suspended sediments, and the increased accumulation of fine sediments on the bottoms of water bodies where they are undesirable.

Species – A taxonomic entity that can include recognized subspecies, varieties, population segments, or other genetically or geographically distinct units.

Standard Project Commitments (SPCs) – Mechanisms that have been incorporated into the proposed project design to avoid or reduce impacts from project construction and operation.

State Implementation Plan (SIP) – A document required periodically from each county by EPA that indicates the progress and the planning of the Antelope Valley Air Quality Management District for improving the quality of its air.

Stormwater runoff – Runoff from rain and snowmelt that flows over land or impervious surfaces and does not percolate into the ground. It accumulates debris, chemicals, sediment, or other pollutants that could adversely affect water quality.

Sulfur dioxide (SO2) – A corrosive and poisonous gas produced from the complete combustion of sulfur in fuels.

Sulfur oxide (SOx) – The group of compounds formed during combustion or thereafter in the atmosphere of sulfur compounds in the fuel, each having various levels of oxidation, ranging from two oxygen atoms for each sulfur atom to four oxygen atoms.

Terrestrial – Related to or living on land. Terrestrial biology deals with upland areas as opposed to shorelines or coastal habitats.

Viewshed – The landscape that can be directly seen under favorable atmospheric conditions, from a particular point/area or along a transportation corridor.

- Foreground View: 0 to 1 mile.
- Middleground View: 1 to 3 miles.
- Background View: 3 to 5 miles.

Visual contrast – Opposition or unlikeness of different forms, lines, colors, or textures in a landscape. Generally, increased visual contrast within foreground distances would be more noticeable to viewers than increased visual contrast within background distances.

Visual quality – The relative value of a landscape from a visual perception point of view.

Visual sensitivity – The concern by viewers with changes to visual quality. Visual sensitivity is generally higher in natural or unmodified landscapes.

Volatile organic compounds (VOCs) – Gas emissions from certain solids or liquids (e.g., paint, pesticides, building materials). VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects.

Watershed – The area contained within a drainage divide above a specified point on a stream.

Wetland – Lands transitional between obviously upland and aquatic environments. Wetlands are generally highly productive environments with abundant fish, wildlife, aesthetic, and natural resource values. For this reason, coupled with the alarming rate of their destruction, they are considered valuable resources, and several regulations and laws have been implemented to protect them.

H.2 Acronyms

AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
ANF	Angeles National Forest
APE	Area of Potential Effect
ARB	Air Resources Board
ARPA	Archeological Resources Protection Act
AVAQMD	Antelope Valley Air Quality Management District
BEIG	Best environmental design practices
BGEPA	Bald and Golden Eagle Protection Act
BMPs	Best Management Practices
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards
Cal/OSHA	California Office of Safety and Health Administration (
CalEPA	California Environmental Protection Agency
Cal-IPC	California Invasive Plant Council
CARB	California Air Resources Board
CBLUZ	Critical Biological Land-Use Zone
CCH	Consortium of California Herbaria
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEP	Certified Environmental Planner
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CI	Coccidioides immitis
CNDDB	California Natural Diversity Data Base
CNEL	Community Noise Equivalent Level
CO	Carbon Monoxide
CPRC	California Public Resources Code
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CUP	Conditional Use Permit
CVC	California Vehicle Code
CWA	Clean Water Act

DFW	Department of Fish and Wildlife
DLC	Desired Landscape Character
DMV	Department of Motor Vehicles
DOI	Department of the Interior
DOT	Department of Transportation
DPM	Diesel particulate matter
DPR	Department of Pesticide Regulation
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources’
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
EPA	Environmental Protection Agency
EPS	Emissions Performance Standard
ESA	Endangered Species Act
GCC	Global climate change
GHG	Greenhouse Gas
GWP	Global warming potential
HA	Hydrologic Areas
HCP	Habitat Conservation Plan
HSR	High Speed Rail
HSWA	Hazardous and Solid Waste Act
HU	Hydrologic Units
HWCL	Hazardous Waste Control Law
ICU	Intersection capacity utilization
IPCC	Intergovernmental Panel on Climate Change
IWMB	Integrated Waste Management Board
LAC	Los Angeles County
LACDRP	Los Angeles County Department of Regional Planning
LADRP	Los Angeles County Department of Regional Planning
LOP	Limited operating period
LOS	Levels of service
LSA	Lake and Streambed Alteration Agreement
MBTA	Migratory Bird Treaty Act
MDAB	Mojave Desert Air Basin
MDL	Method detection limits
MI	Management Indicator
MIS	Management Indicator Species
MM	Minor Modification
MPA	Master of Public Administration
MPP	Master of Public Policy
MURP	Master of Urban and Regional Planning
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Planning
NCP	National Contingency Plan
NEPA	National Environmental Policy Act

NFS	National Forest System
NHPA	National Historic Preservation Act
NO	Nitric oxide
NOA	Notice of Availability
NOI	Notice of Intent
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSR	New Source Review
OEHHA	Office of Environmental Health Hazard Assessment
OHV	Off-highway vehicle
OSHA	Occupational Safety and Health Administration
PCB	Pesticides, polychlorinated biphenyl
PCE	Passenger car equivalency
PE	Professional Engineer
PM10	Respirable particulate matter
PM2.5	Fine particulate matter
PSD	Prevention of Significant Deterioration
PWD	Palmdale Water District
QR	Quarry and Reclamation
RCRA	Recovery Act of 1976
RL	Reporting limit
ROD	Record of Decision
ROWs	Rights-of-way
RP	Reclamation Plan
RPS	Renewable Portfolio Standard
RWQCBs	Regional Water Quality Control Boards
SARA	Superfund Amendments and Reauthorization Act
SCAB	South Coast Air Basin
SCCIC	South Central Coastal Information Center
SDWA	Safe Drinking Water Act
SEA	Significant Ecological Area
SHPO	State Historic Preservation Office
SIOs	Scenic Integrity Objectives
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SMARA	Surface Mining and Reclamation Act
SMS	Scenery Management System
SPC	Standard Project Commitment
SUAs	Special-Use Authorizations
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TCP	Traditional cultural property
TE	Time Extension
TIS	Traffic Impact Studies

TMDL	Total Maximum Daily Load
USACE	U.S. Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFS	USDA Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOCs	Volatile organic compounds
WBD	Watershed Boundary Dataset
WDR	Waste discharge requirements
WMPHCP	West Mojave Plan Habitat Conservation Plan
WQO	Water Quality Order
WUI	Wildland/Urban Interface

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Appendix A

Standard Project Commitments

APPENDIX A – STANDARD PROJECT COMMITMENTS

The following Standard Project Commitments (SPCs) are part of the proposed action. Table 1 lists the SPCs that Palmdale Water District (PWD), and its contractors, will implement during all activities associated with the proposed action.

Table 1. Littlerock Sediment Removal Project SPCs

ID	Standard Project Commitment	Issue Areas Affected
AQ-1	Limit Engine Idling. Vehicle engine idling shall be limited to the extent feasible, and shall be limited to a maximum duration of 3 minutes per event.	Air Quality, Recreation and Land Use
AQ-2	Fugitive Dust Controls. Fugitive dust controls shall conform with applicable AVAQMD Rule 403 (c) requirements for all phases of the project; a Dust Control Plan (DCP) will be submitted to the APCO for approval if more than 5 acres would be disturbed or if more than 2,500 cubic yards of material will be excavated per day for at least three days (for each phase of the project as applicable); and in addition to the Rule 403 (c) requirements or to specify requirements where that rule provides options, the following specific additional fugitive dust control measures will be used during the main excavation phase of the project: • Install wheel washers or wash the wheels of trucks and other heavy equipment where vehicles exit unpaved roadways on the site and the sediment disposal area. • Street sweeping shall be conducted to cleanup any carryout from unpaved areas and reduce paved road silt content. • Water the disturbed areas of the active construction sites and active unpaved roadways used during construction at least four times per day and more often if uncontrolled fugitive dust is noted. • Cover all trucks hauling sediment and other loose material, or require at least two feet of freeboard. • Travel routes shall be developed to minimize both unpaved road travel. • Sediment excavation will be conducted in areas of the reservoir bed that are near the maintained reservoir water level so that the sediment excavated is naturally wet or excavation will occur in areas that are watered prior to excavation. • Sediment storage areas will have non-toxic dust suppressants sprayed over their active surface area at the end of each year's excavation period. • Establish a vegetative ground cover (in compliance with biological resources impact Mitigation Measures) or otherwise create stabilized surfaces on all unpaved areas disturbed by the project, not including areas located within the maximum pool elevation of the Littlerock Reservoir, within 21 days after active construction operations have ceased each year. The reservoir level will be allowed to rise as fast as nature allows to levels above each year's annual excavation areas.	Air Quality, Biology, Recreation and Land Use
AQ-3	Off-Road Engine Specifications. All off-road construction diesel engines not registered under CARB's Statewide Portable Equipment Registration Program, which have a rating of 50 horsepower or more, shall meet, at a minimum, the Tier 3 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, section 2423(b)(1) unless that such engine is not available for a particular item of equipment. In the event a Tier 3, or higher tier, engine is not available for any off-road engine larger than 50 horsepower, that engine shall be equipped with a Tier 2 engine equipped with a catalyzed diesel particulate filter (soot filter), unless certified by engine manufacturers that the use of such devices is not practical for specific engine types. Equipment properly registered under and in compliance with CARB's Statewide Portable Equipment Registration Program are in compliance with this project commitment.	Air Quality, Recreation and Land Use

Table 1. Littlerock Sediment Removal Project SPCs		
ID	Standard Project Commitment	Issue Areas Affected
AQ-4	On-Road Engine Specifications. All on-road construction vehicles shall meet all applicable California on-road emission standards. This does not apply to construction worker personal vehicles.	Air Quality, Recreation and Land Use
AQ-5	Reduce Off-Road Vehicle Speeds. Vehicle speeds shall remain below 15 mph off-pavement to minimize dust and reduce wildlife impacts.	Air Quality, Biology, Recreation and Land Use
BIO-1a	Provide Restoration/Compensation for Impacts to Native Vegetation Communities. Refer to the discussion following Table 1 for the full text of this SPC.	Biology, Wildfire Prevention
BIO-1b	Worker Environmental Awareness Program. The PWD shall prepare a Worker Environmental Awareness Program (WEAP) that will be implemented for construction crews by a qualified biologist(s). Training materials and briefings shall include but not be limited to: discussion of the Federal and State Endangered Species Acts, Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act; the consequences of non-compliance with these acts; identification and values of plant and wildlife species and significant natural plant community habitats; fire protection measures; sensitivities of working on NFS lands and identification of T&E and Forest Service sensitive species; hazardous substance spill prevention and containment measures; a contact person in the event of the discovery of dead or injured wildlife; and review of mitigation requirements. The WEAP shall include the protocol to be followed when road kill is encountered in the work area or along access roads to minimize potential for additional mortality of scavengers, including listed species such as the California condor. On NFS lands, road kill shall be reported to the Forest Service or other applicable agency within 24 hours. On non-NFS lands, road kill shall be reported to the appropriate local animal control agency within 24 hours. Training materials and a course outline shall be provided to Forest Service for review and approval at least 30 days prior to the start of construction. Maps showing the location of special-status wildlife, fish, or populations of rare plants, exclusion areas, or other construction limitations (i.e., limited operating periods and arroyo toad exclusion areas) will be provided to the environmental monitors and construction crews prior to ground disturbance. PWD shall provide the Forest Service a list of construction personnel who have completed training prior to the start of construction, and this list shall be updated by PWD as required when new personnel start work. No construction worker may work in the field for more than 5 days without participating in the WEAP.	Biology
BIO-2	Prepare and Implement a Weed Control Plan. The PWD shall prepare and implement a Weed Control Plan, which shall be part of the Habitat Restoration and Revegetation Plan. The Weed Control Plan, including the control methods to be used, shall be prepared consistent with the FS's *Plan for Invasive Plants, Angeles National Forest and San Gabriel Mountains National Monument Environmental Assessment*. The Weed Control Plan will be implemented during construction of the grade control structure, sediment removal, and operation and maintenance. The Weed Control Plan shall be submitted to the Forest Service for approval of the weed control methods, practices, and timing. The Weed Control Plan shall include the following: a. A pre-construction weed inventory shall be conducted for all areas subject to ground-disturbing activity. Weed populations that: (1) are rated High or Moderate for negative ecological impact in the California Invasive Plant Inventory Database (Cal-IPC, 2006); and (2) aid and promote the spread of wildfires (such as cheatgrass, Saharan mustard, and medusa head); and (3) are considered by the FS as species of priority (for NFS lands only) shall be mapped and described according to density and area covered. In areas subject to ground disturbance, weed infestations shall be treated prior to sediment removal activities according to control methods and practices for invasive weed populations designed in consultation with the Forest Service. The Weed Control Plan shall be updated and utilized for eradication and monitoring for annual sediment removal activities. b. Weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the Forest Service, and Fish and Wildlife Service where appropriate. The application of herbicides shall be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the Forest Service, and implemented by a Licensed Qualified Applicator. Herbicides shall not be applied during or within 24 hours of a	Biology, Wildfire Prevention

Table 1. Littlerock Sediment Removal Project SPCs		
ID	Standard Project Commitment	Issue Areas Affected
	more than 30% anticipated rain event. In riparian areas only water-safe herbicides shall be used. Herbicides shall not be applied according to the prescriptions in the manufacturer label. Where manual and/or mechanical methods are used, disposal of the plant debris will follow the regulations set by the Forest Service. The timing of the weed control treatment shall be determined for each plant species in consultation with the Forest Service (on NFS lands). c. Surveying and monitoring for weed infestations shall occur annually for years one to five post construction of the grade structure and bi-annually thereafter. For the life of the Project (on NFS lands) the PWD will survey for new invasive weed populations every two years. Treatment of identified weed populations shall occur at a minimum of once annually should they occur in the disturbance area. When no new seedlings or resprouts are observed at treated sites for three consecutive, normal rainfall years, the weed population can be considered eradicated and weed control efforts may cease for that impact site. d. All seeds and straw materials shall be weed-free rice straw, and all gravel and fill material, if used, shall be certified weed free. Gravel and fill must be from a quarry approved by a Forest Service botanist. All plant materials used during restoration shall be native, certified weed-free, and approved by the Forest Service. All erosion control material must be biodegradable. Wattles wrapped in “photodegradable” plastic will not be acceptable. e. Prior to work on NFS lands, all vehicles traveling off road and all ground disturbing equipment shall be washed (including wheels, undercarriages, fuel pans, skid plates and bumpers) before entering Forest Service lands. On non-federal lands vehicles and equipment shall be washed prior to commencing work in off road areas. Vehicles shall be cleaned at existing construction yards or legally operating car washes. In addition, tools such as chainsaws, hand clippers, pruners, etc. shall be washed before entering all Project work areas. PWD shall notify NFS at least 2 working days prior to moving each piece of equipment on to NFS land, unless otherwise agreed. Notification will include a Certificate of Cleaning Equipment. Upon request of NFS, arrangements will be made for NFS to inspect each piece of equipment prior to it being placed in service. This requirement for notification does not apply to handheld equipment and tools. All washing on NFS lands shall take place where rinse water is collected and disposed of in either a sanitary sewer or landfill, unless otherwise approved by the Forest Service. A Certificate of Cleaning Equipment log shall be kept for all vehicle/equipment/tool washing that states the date, time, location, type of equipment washed, methods used, and staff present. The log shall include the signature of a responsible staff member. Logs shall be available to the Forest Service for inspection at any time and shall be submitted to the Forest Service on a monthly basis.	
BIO-4	Conduct Pre-Construction Surveys and Monitoring for Breeding Birds. The PWD shall conduct pre-construction surveys for nesting birds prior to any vegetation removal, staging of equipment, sediment removal activities, or other ground disturbance that will occur during the breeding period (from January 15 through August 31 for raptors and humming birds and March 15 through September 1 for other birds). This action will be required for all activities including annual sediment removal. The biologists conducting the surveys shall be Forest Service approved experienced bird surveyors familiar with standard nest-locating techniques. Surveys shall be conducted in all areas within a 500-foot buffer of any area proposed for Project disturbance and no more than 3 days prior to the initiation of any vegetation removal, staging of equipment, sediment removal activities, or other ground-disturbance activities. If breeding birds with active nests are identified, a 300-foot buffer shall be established around the nest site and no construction activities shall be allowed within the buffer until the young have fledged from the nest or the nest fails. The 300-foot buffer may be adjusted after review by a qualified ornithologist based on existing conditions, including ambient noise, topography, and disturbance with concurrence from the Forest Service, as appropriate. A Forest Service approved biological monitor shall be responsible for recording the results of pre-construction surveys and copies of all monitoring reports shall be submitted to the Forest Service at the end of each breeding season.	Biology

Table 1. Littlerock Sediment Removal Project SPCs		
ID	Standard Project Commitment	Issue Areas Affected
BIO-5	Conduct Preconstruction Surveys for State and Federally Threatened, Endangered, Proposed, Petitioned, Candidate, and Forest Service Sensitive Plants and Avoid Any Located Occurrences of Listed Plants. The PWD shall conduct focused surveys for federal- and state-listed and other special-status plants. All special-status plant species (including listed threatened or endangered species, Forest Service Sensitive, and all CRPR 1A, 1B, 2, 3, and 4 ranked species) subject to project disturbance shall be documented by the pre-construction survey report. Surveys shall be conducted during the appropriate season in all suitable habitat located within the Project disturbance areas and access roads and within 100 feet of disturbance areas and access roads. Surveys shall be conducted by a qualified botanist approved by the Forest Service. The field surveys and reporting must conform to current CDFW botanical field survey protocol (CDFG, 2009) or more recent updates, if available. The reports will describe any conditions that may have prevented target species from being located or identified, even if they are present as dormant seed or below-ground rootstock (e.g., poor rainfall, recent grazing, or wildfire). Prior to any vegetation removal, the PWD shall submit pre-construction field survey reports along with maps showing locations of survey areas and special-status plants to the Forest Service for review and approval. If federally or State-listed plants are detected in disturbance areas or within 100-feet of the disturbance areas, the PWD would avoid these populations and notify the Forest Service, USFWS, and CDFW as appropriate. The PWD shall avoid impacts to any State or federally listed plants. If Project activities result in the loss of more than 10 percent of the known individuals within the Forest Service Sensitive, and/or special-status plant species (List 1.B and List 2 only) occurrence to be impacted, the PWD shall preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted). The compensation lands must be occupied by the impacted Forest Service Sensitive or CRPR 1 or 2 ranked plants or be considered appropriate by the Forest Service to off-set the loss of these plants. Occupied habitat will be calculated on the project site and on the compensation lands as including each special status plant occurrence and a surrounding 100-foot buffer area. Off-site compensation shall be incorporated into SPC BIO-1a (Restoration/Compensation for Impacts to Native Vegetation Communities) for review and approval by the Forest Service, as applicable.	Biology
BIO-6a	Conduct Surveys and Implement Avoidance Measures. Prior to any project activities at Rocky Point (the proposed grade control location) PWD shall have a FS approved biologist conduct clearance surveys for arroyo toads and implement protective measures to reduce the potential for arroyo toads to be present in the work area. After ensuring egg masses or any other life stage of arroyo toads is not present PWD will place exclusion fencing around the grade control structure work area. This will require placing fencing and a screened culvert in the channel to prevent animals from moving into the work area.	Biology
BIO-6b	Conduct Clearance Surveys and Construction Monitoring. After the placement of exclusion fencing PWD will have a FS approved biologist conduct five nights of clearance surveys during suitable weather conditions to relocate toads from the work area. Prior to the onset of construction activities, PWD shall provide all personnel who will be present on work areas within or adjacent to arroyo toad habitat with the following information: (a) a detailed description of the arroyo toad including color photographs; (b) the protection the arroyo toad receives under the Endangered Species Act and possible legal action that may be incurred for violation of the Act; (c) the protective measures being implemented to conserve the arroyo toad and other species during construction activities associated with the Project; and (d) a point of contact if arroyo toads are observed. For all areas in which this species has been documented PWD shall develop and implement a monitoring plan that includes the following measures in consultation with the USFWS and Forest Service. A. PWD shall retain a qualified biologist with demonstrated expertise with arroyo toads to monitor all construction activities in occupied arroyo toad habitat and within 300-feet of Rocky Point. The resumes of the proposed biologists will be provided to the Forest Service for concurrence. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to or within	Biology

Table 1. Littlerock Sediment Removal Project SPCs		
ID	Standard Project Commitment	Issue Areas Affected
	habitat that supports populations of arroyo toad. B. All trash that may attract predators of the arroyo toad will be removed from work sites or completely secured at the end of each work day. Prior to the onset of any construction activities, PWD shall meet on-site with staff from the Forest Service and the authorized biologist. PWD shall provide information on the general location of construction activities within arroyo toad habitat and the actions taken to reduce impacts to this species. C. Any arroyo toads found during clearance surveys or otherwise removed from work areas will be placed in nearby suitable, undisturbed habitat (i.e., above Rocky Point at a pre-selected location in consultation with the USFWS and Forest Service. The authorized biologist will determine the best location for their release, based on the condition of the vegetation, soil, and other habitat features and the proximity to human activities. Clearance surveys shall occur on a daily basis in the work area. D. The authorized biologist will have the authority to stop all activities until appropriate corrective measures have been completed. E. To ensure that diseases are not conveyed between work sites by the authorized biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times. F. PWD shall restrict work to daylight hours, except during the placement of soil cement, or unless otherwise authorized by the Forest Service in order to avoid nighttime activities when arroyo toads may be present on the access roads. Traffic speed shall be maintained at 15 mph or less in the work area. G. A qualified biologist must permanently remove, from within the Project area, any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible and ensure that activities are in compliance with the California Fish and Game Code. H. No stockpiles of materials will occur in areas occupied by arroyo toads. I. Any spills of any fluids that may be hazardous to aquatic fauna (gasoline, hydraulic fluid, motor oil, etc.) in areas that may contain arroyo toads will be reported to the Forest Service and USFWS within four hours.	
BIO-6c	Seasonal Surveys During Water Deliveries. PWD shall conduct annual surveys along the upper limit of the Reservoir during the months of March to June if water deliveries would result in a two-inch or greater reduction in water surface elevations in these areas. The authorized biologist would inspect the margin of the reservoir for egg masses or any other life stage of arroyo toads. At the completion of the survey the authorized biologist will prepare a letter report to document the conditions along the upstream margin of the Reservoir. If more than one egg string is present and the authorized biologist determines the reduction of water surface elevations may result in the loss of the egg string PWD will contact the USFWS and Forest Service prior to continued water deliveries.	Biology
BIO-7	Monitor Construction and Remove Trash and Microtrash. PWD shall retain a qualified biologist with demonstrated knowledge of California condor to monitor all construction and sediment removal activities within the ANF. The resumes of the proposed biologist(s) will be provided to the Forest service for concurrence. This biologist(s) will be referred to as the authorized biologist hereafter. If a condor is observed in the Project area the authorized biologist will have the authority to stop all activities within 500 feet of the condor until it leaves the area. All condor sightings in the Project area will be reported to the CDFW, USFWS and Forest. Should condors be found roosting within 0.5 miles of the sediment removal or construction area, no construction activity shall occur between 1 hour before sunset to 1 hour after sunrise, or until the condors leave the area. Should condors be found nesting within 1.5 miles of the construction area, no construction activity will occur until further authorization occurs from the CDFW, USFWS and Forest Service on NFS lands. Microtrash. Workers will be trained on the issue of microtrash – what it is, its potential effects to California condors, and how to avoid the deposition of microtrash. In addition, daily sweeps of the work area will occur to collect and remove trash in locations with the potential for California condors to occur. Worker Education. PWD will train all workers on the project concerning the California condor.	Biology

Table 1. Littlerock Sediment Removal Project SPCs		
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	Information will include: species description with photos and/or drawings indicating how to identify the California condor and how to distinguish condors from turkey vultures and golden eagles; protective status and penalties for violation of the ESA; avoidance measures being implemented on the Project; and contact information for communicating condor sightings. Reporting. All California condor sightings in the Project area will be reported directly to the CDFW, USFWS, and Forest Service.	
BIO-8	Conduct Protocol Surveys for Least Bell's Vireo and Avoid Occupied Habitat. If construction or sediment removal activities are scheduled to occur during the breeding season (March 15 through September 15) PWD shall have a qualified ornithologist conduct protocol surveys in suitable habitat within 500 feet of disturbance areas including Cheseboro Road below the dam. In known occupied habitat for listed riparian birds, PWD shall conduct focused surveys of the Project and adjacent areas within 500 feet. The surveys shall be of adequate duration to verify potential nest sites if work is scheduled to occur during the breeding season. If a territory or nest is confirmed in a previously unoccupied area, the CDFW, USFWS and Forest Service shall be notified within 48 hours. In coordination with the CDFW, USFWS, and Forest Service a 300-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted as determined by a qualified biologist in coordination with the CDFW, USFWS and Forest Service. The biologist shall have the authority to halt the construction or sediment removal activities and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge.	Biology
BIO-9	Conduct Pre-Construction Surveys for Swainson's Hawks. If ground disturbance occurs at the 47th Street East sediment disposal site during the breeding season PWD shall retain a qualified ornithologist and conduct pre-construction surveys within one-half mile of the sediment disposal site in regions with suitable nesting habitat for Swainson's hawks. The survey periods will follow a specified schedule: Period I occurs from 1 January to 20 March, Period II occurs from 20 March to 5 April, Period III occurs from 5 April to 20 April, Period IV occurs from 21 April to 10 June, and Period V occurs from June 10 to July 30. Surveys are not recommended during Period IV because identification is difficult, as the adults tend to remain within the nest for longer periods of time. No fewer than three surveys per period in at least two survey periods shall be completed immediately prior to the start of Project construction. If a nest site is found, consultation with CDFW shall be required to ensure Project construction will not result in nest disturbance. If present PWD shall implement a 0.25 mile non-disturbance buffer between 1 March and 15 September, or until the nest has been abandoned or the chicks have fledged. These buffer zones may be adjusted as appropriate in consultation with a qualified ornithologist and CDFW.	Biology
BIO-11	Conduct Focused Surveys for Ringtail and Avoid Denning Areas. If vegetation clearing will occur during the breeding season for ringtail cat (March 1 through June 30), a qualified biologist will conduct focused surveys for potential dens within all areas proposed for clearing and grading including a 200 foot buffer. Any active dens will be avoided, and a 200-foot disturbance-free buffer will be established. This buffer may be adjusted in coordination with the CDFW and the Forest Service, depending on the specific location and current activity occurring in the area. Once the young have left the den or the breeding attempt has failed, normal vegetation clearing and earth moving activities can resume. All activities that involve the ringtail shall be documented and reported to the CDFW and the Forest service within 30 days of the activity.	Biology
BIO-14	Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures. Prior to ground disturbance or vegetation clearing in the Reservoir or below the dam on PWD access road PWD shall retain a qualified biologist to conduct focused surveys for southwestern pond turtle in the Reservoir and Little Rock Creek. The resume of the proposed biologists will be provided to the Forest service for concurrence prior to conducting the surveys. This biologist will be referred to as the authorized biologist hereafter. Focused surveys shall consist of a minimum of four daytime surveys, to be completed between 1 April and 1 September. The survey schedule may be adjusted in	Biology

Table 1. Littlerock Sediment Removal Project SPCs		
ID	Standard Project Commitment	Issue Areas Affected
	consultation with the Forest Service, as appropriate, to reflect the existing weather or stream conditions. The qualified biologist shall conduct focused, systematic surveys for southwestern pond turtle nesting sites. The survey area shall include all suitable nesting habitat located within 200 feet of occupied habitat in which Project-related ground disturbance will occur. This area may be adjusted based on the existing topographical features on a case-by-case basis with the approval of the Forest Service. Surveys will entail searching for evidence of pond turtle nesting, including remnant eggshell fragments, which may be found on the ground following nest depredation. If a southwestern pond turtle nesting area would be adversely impacted by construction activities, PWD shall avoid the nesting area. If avoidance of the nesting area is determined to be infeasible, the authorized biologist shall coordinate with CDFW and Forest Service to identify if it is possible to relocate the pond turtles. Eggs or hatchlings shall not be moved without the written authorization from the CDFW and Forest Service. A qualified biologist with demonstrated expertise with southwestern pond turtles shall monitor construction activities where pond turtles are present. The authorized biologist will be present during all activities immediately adjacent to, or within, habitat that supports populations of southwestern pond turtles. If the installation of fencing is deemed necessary by the authorized biologist, one clearance survey for southwestern pond turtles shall be conducted at the time of the fence installation. Clearance surveys for southwestern pond turtles shall be conducted by the authorized biologist prior to the initiation of vegetation clearing or construction each day until the top three feet of sediment has been removed from the reservoir.	
BIO-15	Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures. Prior to ground disturbance or vegetation clearing in the Reservoir or below the dam on PWD access road PWD shall retain a qualified biologist to conduct focused surveys for two-striped garter snakes where suitable habitat is present and directly impacted by construction vehicle access, or maintenance. The resume of the proposed biologists will be provided to the Forest service for concurrence prior to conducting the surveys. This biologist will be referred to as the authorized biologist hereafter. Focused surveys shall consist of a minimum of four daytime surveys within one week of vegetation clearing. The survey schedule may be adjusted in consultation with the Forest service to reflect the existing weather or stream conditions. The authorized biologist will be present during all activities immediately adjacent to or within habitat that supports populations of the two-striped garter snake. Clearance surveys for garter snakes shall be conducted by the authorized biologist prior to the initiation of construction each day. Any snakes found within the area of disturbance or potentially affected by the Project will be relocated to the nearest suitable habitat that will not be affected by the Project.	Biology
BIO-16	Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures. Prior to ground disturbance or vegetation clearing in the Reservoir (at Rocky Point only) or below the dam on PWD access road PWD shall retain a qualified biologist to conduct surveys for coast range newts where suitable habitat is present and directly impacted by construction vehicle access, or maintenance. The resume of the proposed biologists will be provided to the Forest service for concurrence prior to conducting the surveys. This biologist will be referred to as the authorized biologist hereafter. Focused surveys shall consist of a minimum of four daytime surveys within one week of vegetation clearing. The survey schedule may be adjusted in consultation with the Forest service to reflect the existing weather or stream conditions. The authorized biologist will be present during all activities immediately adjacent to or within habitat that supports populations of the coast range newts. Clearance surveys for coast range newts shall be conducted by the authorized biologist prior to the initiation of construction each day in suitable habitat. Any coast range newts found within the area of disturbance or potentially affected by the Project will be relocated to the nearest suitable habitat that will not be affected by the Project.	Biology
BIO-17	Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures. Prior to ground disturbance or vegetation clearing at all Project locations PWD shall retain a qualified biologist to conduct surveys for terrestrial herpetofauna where suitable habitat is present and directly impacted by construction vehicle access, or maintenance. The resume of the proposed biologists will be provided to the Forest service for	Biology

Table 1. Littlerock Sediment Removal Project SPCs		
ID	Standard Project Commitment	Issue Areas Affected
	concurrence prior to conducting the surveys. This biologist will be referred to as the authorized biologist hereafter. Focused surveys shall consist of a minimum of three daytime surveys and one nighttime survey within one week of vegetation clearing. The survey schedule may be adjusted in consultation with the Forest service to reflect the existing weather or stream conditions. The authorized biologist will be present during all activities immediately adjacent to or within habitat that supports terrestrial herpetofauna. Clearance surveys for terrestrial herpetofauna shall be conducted by the authorized biologist prior to the initiation of construction each day in suitable habitat. Terrestrial herpetofauna found within the area of disturbance or potentially affected by the Project will be relocated to the nearest suitable habitat that will not be affected by the Project.	
BIO-18	Conduct Protocol Surveys for Burrowing Owls. Refer to the discussion following Table 1 for the full text of this SPC.	Biology
BIO-20	Survey for Maternity Colonies or Hibernaculum for Roosting Bats. Prior to ground disturbance or vegetation clearing at all Project locations PWD shall retain a qualified biologist to conduct surveys for sensitive bats. Surveys shall be conducted no more than 15 days prior to grading near or the removal of trees or other structures. The resume of the proposed biologists will be provided to the Forest service for concurrence prior to conducting the surveys. Surveys shall also be conducted during the maternity season (1 March to 31 July) within 300 feet of project activities. If active maternity roosts or hibernacula are found, the structure, tree or feature occupied by the roost shall be avoided (i.e., not removed), if feasible. If avoidance of the maternity roost is not feasible the biologist will implement the following actions. Maternity Roosts. If a maternity roost will be impacted/removed by the Project, and no alternative maternity roost exists in proximity, substitute roosting habitat for the maternity colony shall be provided in an adjacent area free from project impacts. Alternative roost sites will be designed to meet the needs of the specific species and will be constructed/installed in coordination with CDFW and Forest service. By making the roosting habitat available prior to eviction, the colony will have a better chance of finding and using the roost. Alternative roost sites must be of comparable size and proximal in location to the impacted colony. The CDFW and Forest Service shall be notified of any hibernacula or active nurseries within the construction zone. Exclusion of bats prior to eviction from roosts. If non-breeding bat hibernacula are found in trees scheduled to be removed, the individuals shall be safely evicted, under the direction of a qualified biologist, by opening the roosting area to allow airflow through the cavity or other means determined appropriate by the bat biologist (e.g., installation of one-way doors). In situations requiring one-way doors, a minimum of one week shall pass after doors are installed and temperatures should be sufficiently warm for bats to exit the roost because bats do not typically leave their roost daily during winter months in southern coastal California. This action should allow all bats to leave during the course of one week. Roosts that need to be removed in situations where the use of one-way doors is not necessary in the judgment of the qualified biologist shall first be disturbed by various means at the direction of the bat biologist at dusk to allow bats to escape during the darker hours, and the roost tree shall be removed or the grading shall occur the next day (i.e., there shall be no less or more than one night between initial disturbance and the grading or tree removal). A concise letter report will be submitted to the Forest service documenting the results of bat surveys and any evictions that were required.	Biology
BIO-22	Conduct Surveys for American Badger and Desert Kit Fox and Avoid During the Breeding Season. Prior to ground disturbance or vegetation clearing at the 47th Street sediment disposal site and within 200 feet of the Reservoir PWD shall retain a qualified biologist to conduct surveys for American badger and desert kit fox. Surveys shall be conducted no more than 15 days prior to site mobilization, grading near or sediment. The resume of the proposed biologists will be provided to the Forest service for concurrence prior to conducting the surveys. If present, occupied American badger and desert kit fox dens shall be flagged and ground-disturbing activities avoided within 100 feet of the occupied den. Maternity dens shall be avoided during pup-rearing season (15 February through 1 July) and a minimum 200-foot buffer established. Buffers may be modified with the concurrence of the CDFW and Forest Service. Maternity dens shall be flagged for avoidance, identified on construction maps, and a biological monitor shall be present during construction activities.	Biology

Table 1. Littlerock Sediment Removal Project SPCs		
ID	Standard Project Commitment	Issue Areas Affected
	Inactive Dens. Inactive dens that would be directly impacted by the placement of fill shall be excavated either by hand or mechanized equipment under the direct supervision of the biologist and backfilled to prevent reuse by badgers or kit fox. Potentially and known active dens shall not be disturbed during the whelping/pupping season (February 1 – September 30). A den may be declared "inactive" after three days of monitoring via camera(s) or a tracking medium have shown no kit fox or American badger activity. Passive Relocation. If avoidance of a non-maternity den is not feasible, badgers shall be relocated by slowly excavating the burrow (either by hand or mechanized equipment under the direct supervision of the biologist, removing no more than 4 inches at a time) before or after the rearing season (15 February through 1 July). Relocation of badgers shall occur only after consultation with the CDFW and the Forest Service. Kit fox shall be passively hazed only outside the pupping season. A written report documenting any exclusion events shall be provided to the Forest service and CDFW within 30 days of relocation.	
CUL-1	Archaeological Monitoring Outside the Little Rock Creek and Reservoir Bed. Archaeological monitoring shall be conducted by a qualified archaeologist familiar with the types of prehistoric and historical resources that could be encountered within the Project area. A monitor(s) shall be present for all ground disturbing activities that involve excavation of previously undisturbed soil (pre-dam ground surface level) outside of the Little Rock Creek and Reservoir bed. A monitoring program shall be developed and implemented by PWD, in consultation with the Forest Service, to ensure the effectiveness of monitoring. Intermittent monitoring may occur in areas of moderate archaeological sensitivity at the discretion of the principal archaeologist. A Native American monitor may be required at culturally sensitive locations specified by the Forest Service following government-to-government consultation with Native American tribes. PWD shall retain and schedule any required Native American monitors.	Cultural Resources
CUL-2	Unidentified Cultural Resource Discovery Procedures. If previously unidentified cultural resources are unearthed during construction activities, construction work in the immediate area of the find shall be halted and directed away from the discovery until a qualified archaeologist assesses the significance of the resource. Once the find has been inspected and a preliminary assessment made, PWD would consult with the Forest Service to make the necessary plans for evaluation and treatment of the find(s). SPC CUL-1 shall also be implemented for CUL-2.	Cultural Resources
CUL-3	Unidentified Human Remains Discovery Procedures. PWD shall follow all State and federal laws, statutes, and regulations that govern the treatment of human remains. Avoidance and protection of inadvertent discoveries which contain human remains shall be the preferred protection strategy with complete avoidance of impacts to such resources protected from direct Project impacts by Project redesign. If human remains are discovered during construction, all work shall be diverted from the area of the discovery and the Forest Service authorized officer shall be informed immediately. If the remains are determined to be of Native American origin and are on federal land, then the remains shall be treated in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA). If non-Native American human remains are discovered on federal land, then the County coroner would be contacted to determine the appropriate course of action. If the human remains are not on federal land, the remains shall be treated in accordance with Health and Safety Code Section 7050.5, CEQA Section 15064.5(e), and Public Resources Code Section 5097.98. PWD shall assist and support the Forest Service, as appropriate, in all required NAGPRA and Section 106 actions, government to-government and consultations with Native Americans, agencies and commissions, and consulting parties as requested by the Forest Service. PWD shall comply with and implement all required actions and studies that result from such consultations.	Cultural Resources
FIRE-1	Curtailment of Activities. All construction activities shall be curtailed in the event of a fire or when fuel and weather conditions get into the "very high" and "extreme" ranges, as determined by the USDA Forest Service through daily Project Activity Level (PAL) designations. The specific Project-related activities to be halted during very high or extreme weather conditions would be at the discretion of the USDA Forest Service.	Wildfire Prevention

Table 1. Littlerock Sediment Removal Project SPCs		
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FIRE-2	Preparation of a Fire Plan. PWD, in coordination with their contractor, shall prepare a Fire Plan to be filed with the USDA Forest Service no less than one week prior to the start of construction that includes the following: (1) responsibilities of PWD and the Forest Service in regards to fire prevention and inspection of work areas; (2) personnel in charge of overseeing Fire Plan implementation; (3) staff and equipment that can be used for fighting fire; and (4) emergency measures for construction curtailment.	Wildfire Prevention
FIRE-3	Spark Arrester Requirements. The exhausts of all equipment powered by gasoline, diesel, or other hydrocarbon fuel shall be equipped with spark arresters that have been approved by the USDA Forest Service, as indicated in the most recent publication of the agency's "Spark Arrester Guide."	Wildfire Prevention
GHG-1	Recycle Construction Wastes. Construction wastes (asphalt, concrete, and other wastes as appropriate) and the removed sediment will used, re-used, or recycled to the extent feasible.	Greenhouse Gases
GEO-1	Geotechnical Investigation. Prior to construction, PWD (using a licensed geologist or engineer) shall perform a design-level geotechnical investigation, which shall include evaluation of soil and slope stability hazards as a result of seismic failure in areas of planned grading and excavation, and provide recommendations for development of grading and excavation plans. Based on the results of the geotechnical investigations, appropriate support and protection measures shall be designed and implemented to maintain the stability of soils and slopes adjacent to work areas during and after construction.	Geology and Soils
HYDRO-1	Fill From Reservoir Excavation Will Not Be Placed in Stream Channels. With the exception of temporary stockpiles at the reservoir during excavation, material excavated from the reservoir bed would not be placed within a watercourse, or in a manner that would divert or obstruct the flow path or floodplain of any watercourse.	Biology, Geology and Soils, Hydrology, Water Quality
LAND-1	Obtain Necessary Conditional Use Permits. PWD shall temporarily store or permanently dispose of the excavated sediment from Littlerock Reservoir only at a location that has a Conditional Use Permit (CUP) from the local jurisdiction (i.e., County of Los Angeles or City of Palmdale) for sediment storage or disposal. PWD shall consult with the local jurisdiction to ensure compliance with the requirements of the CUP.	Recreation and Land Use
LAND-2	Design Grading to Accommodate OHV Access. The sediment removal Excavation Plan shall ensure OHV ingress/egress is available to the Reservoir bottom from the existing boat ramp.	Recreation and Land Use
NOI-1	Prepare a Construction Noise Complaint and Vibration Plan. Prior to construction, a Construction Noise Complaint and Vibration Plan shall be prepared by PWD. The Plan shall establish a telephone number for use by the public to report any nuisance noise conditions associated with Project activities occurring outside the ANF. PWD shall ensure that: • A noise and vibration liaison is assigned to respond to all public construction noise complaints, and • Either (a) the telephone number is staffed by the noise and vibration liaison during construction hours; or (b) the phone number is connected to an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at entrances to the Reservoir and PWD sediment storage site on 47th Street in a manner visible to passersby. The Plan shall detail how PWD would respond to noise and vibration complaints and document the resolution of those complaints.	Noise, Recreation and Land Use
NOI-2	PWD Site Buffer Requirements. Project activities within the PWD property located on 47th Street East shall not occur within 500 feet of any residential structure.	Noise, Recreation and Land Use
TRA-1	Prepare Traffic Control Plan. A Traffic Control Plan shall be prepared by PWD available for review, inspection, and input by Caltrans, Forest Service, Los Angeles County, and the City of Palmdale. The Plan shall include, but is not limited to: • The location and need for flagmen and other temporary traffic control devices, including within the ANF, at the PWD sediment staging site, at the intersection of Cheseboro Road and Pearblossom Highway to ensure safe left turn movements onto Pearblossom Highway; • Travel time restrictions for trucks to avoid traveling along the Cheseboro Road - Pearblossom Highway – Avenue T haul route during the afternoon peak period; i.e., from	Transportation, Hazards and Public Safety

Table 1. Littlerock Sediment Removal Project SPCs		
ID	Standard Project Commitment	Issue Areas Affected
	4:00 to 6:00 p.m., to the extent feasible, utilizing Cheseboro Road, Barrel Springs Road, 47th Street E, Pearblossom Highway, and Avenue T; • The need for a fair-share contribution to the funding of future improvements at the intersections of Cheseboro Road/Pearblossom Highway and Pearblossom Highway/Avenue T in the event afternoon peak period restrictions cannot be utilized. • The need for any oversize vehicle, weight restriction, or encroachment permits; • Assurance of emergency access to and through the Reservoir and PWD site work areas; • Procedures for haul trucks to immediately pull into the shoulder when emergency vehicles with sirens on are travelling in their vicinity; • Designated work area access locations; • Driveway turning restrictions; and • Designated parking/staging locations for workers and equipment.	
TRA-2	Pavement Rehabilitation – Public or National Forest Roadways. PWD and/or its contractor shall conduct a before-and-after evaluation of pavement conditions along the sediment haul routes to document any damage caused by the haul truck activities. The documentation shall include written descriptions and photographs of pre-Project and post-Project pavement conditions. Any pavement or other infrastructure damage caused by the haul trucks shall be repaired/rehabilitated to pre-Project conditions or better. This measure shall be subject to review, approval, and inspection by the Los Angeles County Department of Public Works, the City of Palmdale Department of Public Works, USFS, and Caltrans, depending on who has jurisdiction over the route.	Transportation
WQ-1	Prepare Spill Response Plan. A Spill Response Plan would be prepared prior to the start of construction activities. This plan would describe the required materials and methodology to quickly and effectively contain and remove any spill or accidental release of hazardous materials. Required materials may include protective clothing, absorbent materials, hand tools for minor excavation and soil removal, and appropriate containers for hazardous materials and contaminated soil. The Spill Response Plan would include worker training on proper containment and disposal of hazardous materials. The requirements of the Spill Response Plan would be repeated and described in the SWPPP.	Biology, Water Quality, Hazards and Public Safety
WQ-2	Prepare a Storm Water Pollution Prevention Plan (SWPPP). A SWPPP shall be developed for the Project in compliance with the federal Clean Water Act, and Notices of Intent shall be filed with the State Water Resources Control Board and the applicable Regional Water Quality Control Board (Lahontan). The SWPPP shall be stored at Project work sites for reference by Project personnel and for inspection review by the Environmental Monitor. The SWPPP shall include Best Management Practices (BMPs) that would be adhered to during Project activities in order to stabilize disturbed areas and reduce the potential for erosion and sedimentation, among other effects. BMPs may include but are not limited to those described below. • Erosion minimizing efforts such as straw wattles, water bars, covers, silt fences, and sensitive area access restrictions (for example, flagging) shall be installed before and during clearing and grading activities. • Mulching, seeding, or other suitable stabilization measures shall be used to protect exposed areas during ground-disturbing activities. • Measures such as use of regular inspections and oil pans or other comparable devices shall be used to ensure that contaminants are not discharged from the construction sites. • Silting/sedimentation basin(s) shall be established in appropriate locations to capture eroded soils and other materials, and would be regularly cleared to maintain capacity. • Straw wattles or other comparably effective devices (as determined by the Civil Engineer, in consultation with the Environmental Monitor) shall be placed on the downslope sides of work areas to direct runoff from the work areas into temporary sedimentation basins. • All erosion control materials shall be biodegradable and natural fiber. All BMPs required by the SWPPP shall be checked and maintained regularly and after all large storm events. Proper implementation will be verified regularly by the onsite Environmental Monitor.	Water Quality, Hazards and Public Safety

The full text for SPC BIO-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) and SPC BIO-18 (Conduct Protocol Surveys for Burrowing Owls) is provided below. Please refer to Table 1 for the full text of all other SPCs that are applicable to the proposed action.

BIO-1a **Provide Restoration/Compensation for Impacts to Native Vegetation Communities.** The PWD shall restore all areas outside the permanent sediment removal area. Prior to disturbance, PWD shall have a qualified biologist document the community type and acreage of vegetation that would be subject to project disturbance. Impacts to all native trees and oaks with would be documented by identifying the species, number, location, and DBH.

The PWD shall prepare a Habitat Restoration and Revegetation Plan for the Project, which includes plans for restoration, enhancement/re-vegetation and/or the acquisition of off-site habitat. The plan shall include at minimum: (a) maps depicting the location of the mitigation site(s) (off site mitigation may be required); (b) locations and details for top soil storage (c) the plant species to be used; (d) seed and cutting collecting guidelines; (e) time of year that the planting would occur and the methodology of the planting; (f) a description of the irrigation methodology for container plants; (g) measures to control exotic vegetation on site; (h)performance standards; (i) a detailed monitoring program; j) locations and impacts to all native trees, k) and locations of temporary or permanent gates, barricades, or other means to control unauthorized vehicle access on access to restoration areas.

The PWD would use locally collected seed mix, locally collected cuttings, etc. to revegetate areas disturbed by construction activities. All habitats dominated by non-native species prior to Project disturbance shall be revegetated using appropriate native species. Forest Service approval is required for seeding on NFS land. No commercially purchased seeds, stock, etc. would be accepted without the approval of the Forest Service on NFS lands and must be certified to be free of noxious weeds. The Habitat Restoration and Revegetation Plan shall include a monitoring element. Post seeding and planting, monitoring would be yearly from years one to five and every other year from years six to ten, or until the success criteria are met. If the survival and cover requirements have not been met, PWD is responsible for replacement planting to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements as previously mentioned.

The replacement ratios for permanent impacts to riparian vegetation are 3:1 and 1.5:1 for juniper woodland. Individual native trees which are to be removed shall be replaced as follows: trees from 1 to 5 inches DBH shall be replaced at 3:1; trees from 5 to 12 inches shall be replaced at 5:1; trees from 12 to 24 inches shall be replaced at 10:1; and trees from 24 to 36 inches shall be replaced at 15:1. All planting locations, procedures, and results shall be evaluated by a qualified biologist and Forest Service botanist (as applicable).

The creation or restoration of habitat shall be monitored annually for years one to five on both Forest Service lands and private lands and bi-annually for years six to ten on Forest Service lands, or until the performance standards are met, after mitigation site construction to assess progress and identify potential problems with the restoration site. Remediation activities (e.g. additional planting, removal of non-native invasive species, or erosion control) shall be taken during the 10-year period if necessary to ensure the success of the restoration effort. If the mitigation fails to meet the established performance standards after the 10-year maintenance and monitoring period, monitoring and remedial activities shall extend beyond the 10-year period until the standards are met or unless otherwise specified by the Forest Service on NFS lands. If a fire occurs in a revegetation area within the 10-year monitoring period, PWD shall be responsible for a one-time replacement.

Compensation Land Selection Criteria. Criteria for the acquisition, initial protection and habitat improvement, and long-term maintenance and management of compensation lands would include all of the following:

A. Compensation lands will provide habitat value that is equal to or better than the quality and function of the habitat impacted by the Project, taking into consideration soils, vegetation type, topography, human-related disturbance, wildlife movement opportunity, proximity to other protected lands, management feasibility, and other habitat values, subject to review and approval by PWD and Forest Service;

B. To the extent that proposed compensation habitat may have been degraded by previous uses or activities, the site quality and nature of degradation must support the expectation that it will regenerate naturally when disturbances are removed;

C. Be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;

D. Not have a history of intensive recreational use or other disturbance that might cause future erosion or other habitat damage, and make habitat recovery and restoration infeasible;

E. Not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;

F. Not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat;

G. Must provide wildlife movement value equal to that on the project site, based on topography, presence and nature of movement barriers or crossing points, location in relationship to other habitat areas, management feasibility, and other habitat values; and

H. Have water and mineral rights included as part of the acquisition, unless PWD and Forest Service, in consultation with CDFW and USFWS, agree in writing to the acceptability of land without these rights.

BIO-18 **Conduct Protocol Surveys for Burrowing Owls.** Concurrent with desert tortoise clearance surveys at the 47th Street East sediment disposal site PWD shall retain a qualified biologist to conduct pre-construction surveys for burrowing owls in accordance with CDFW guidelines (CDFG 2012). Pre-construction surveys for burrowing owls shall occur no more than 15 days prior to initiation of ground disturbance or site mobilization activities. The survey area shall include the 47th Street East sediment disposal site and surrounding 500 foot survey buffer where access is legally available. If an active burrowing owl burrow is detected within 500 feet from the Project Disturbance Area the following avoidance and minimization measures shall be implemented.

Establish Non-Disturbance Buffer. Occupied burrows shall not be disturbed during the nesting season (1 February through 31 August). Owls present on site after 1 February will be assumed to be nesting unless evidence indicates otherwise. The protected buffer will remain in effect until 31 August, or based upon monitoring evidence, until the young owls are foraging independently or the nest is no longer active. The non-disturbance buffer and fence line may be reduced by a qualified biologist if project-related activities that might disturb burrowing owls would be conducted during the non-breeding season (September 1st through January 31st). Signs shall be posted in English and Spanish at the fence line indicating no entry or disturbance is permitted within the fenced buffer.

Passive Relocation. During the non-breeding season, the birds may be passively relocated. Relocation of owls during the non-breeding season will be performed by a qualified biologist using one-way doors, which should be installed in all burrows within the impact area and left in place for at least four nights. These one-way doors will be removed and the burrows hand excavated prior to the initiation of grading. To avoid the potential for owls evicted from a burrow to occupy other burrows within the impact area, one-way doors will be placed in all potentially suitable burrows within the impact area when eviction occurs. Any damaged or collapsed burrows will be replaced with artificial burrows in adjacent habitat at a 2:1 ratio.

Monitoring: If construction activities would occur within 500 feet of the occupied burrow during the nesting season (February 1 – August 31st) the Designated Biologist or Biological Monitor shall monitor to determine if these activities have potential to adversely affect nesting efforts, and shall implement measures to minimize or avoid such disturbance.

Compensation for the Loss of foraging habitat. If present PWD would offset the loss of up to six acres of foraging habitat by the acquisition and preservation of undisturbed areas of the project site mitigation lands outside of the Project site or a combination of both.

Compensation Land Selection Criteria. Criteria for the acquisition, initial protection and habitat improvement, and long-term maintenance and management of compensation lands will include all of the following:

A. Compensation lands will provide habitat value that is equal to or better than the quality and function of the habitat impacted by the Project, taking into consideration soils, vegetation, topography, human-related disturbance, wildlife movement opportunity, proximity to other protected lands, management feasibility, and other habitat values, subject to review and approval by PWD and Forest Service (as applicable);

B. To the extent that proposed compensation habitat may have been degraded by previous uses or activities, the site quality and nature of degradation must support the expectation that it will regenerate naturally when disturbances are removed;

C. Be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;

D. Not have a history of intensive recreational use or other disturbance that might cause future erosion or other habitat damage, and make habitat recovery and restoration infeasible;

E. Not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;

F. Not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat;

G. Must provide wildlife movement value equal to that on the project site, based on topography, presence and nature of movement barriers or crossing points, location in relationship to other habitat areas, management feasibility, and other habitat values; and

H. Have water and mineral rights included as part of the acquisition, unless PWD and Forest Service, in consultation with CDFW and USFWS, agree in writing to the acceptability of land without these rights.

Appendix B

Air Quality Calculations

Littlerock Reservoir Sediment Removal Project
Emission Calculation Assumptions

Proposed Project General Assumptions

1) Work occurs as noted in the Construction Schedule, with no work assumed to occur during the wet season.
2) The soil cement batch plant and sand screening plant will be placed on the paved parking area on the west side of the lake adjacent to the boat ramp.
3) The soil cement batch plant and sand screening plants will require 150 hp and 100 hp diesel engine/generators, respectively, to run the various motors associated with the batch plants.
4) Silt content testing of the sediment to be removed ranges from 0.1% to 5% with an average less than 2%. As a worst case assumption 4%, which represents SCAQMD factor for gravel roads, will be used in the emission calculations.
5) Total sediment removal and monthly removal values are provided in the Construction Schedule
6) Emissions for sediment use after delivery to the sediment storage site are not considered part of the project and have not been estimated. However, beneficial use of this sediment would displace other sand/aggregate mining and transportation which could reduce emissions that would otherwise occur.

Offroad Equipment Emission Calculation Assumptions

1) Emission factors are derived from the CARB OFFROAD model, interpolating the horsepower between the two nearest horsepower sized equipment given in that database.
2) Emission factors from 2016 are conservatively assumed to calculate the emissions for all activities, including those starting in 2017 or later.
3) Equipment type, number, and usage estimates are used as estimated in consultation with the project design engineer.

Onroad Equipment Emission Calculations Assumptions

1) Emission factors are derived from the CARB EMFAC2011 database, where the vehicles have been assigned three classes, passenger (i.e. employee vehicles and pickups), delivery (all nonpassenger vehicles smaller than heavy-heavy duty trucks), and heavy-heavy duty trucks.
2) Emission factors from 2016 are conservatively assumed to calculate the emissions for all activities, including those starting in 2017 or later.
3) Trip estimates are based on import/export quantities, equipment and worker trips estimated in consultation with the project design engineer.
4) As a worst case assumption all vehicle trips are assumed to start and end in AVAQMD jurisdiction, even though some worker and materials will likely come from other jursidictions, such as SCAQMD.

Fugitive Dust Emission Calculations Assumptions

1) Unpaved road distances are estimated by assuming travel routes conducted at the site and the sediment storage area.

2) Unpaved road emission factors are calculated using the most current version of USEPA AP-42 Section 13.2.1 and use the following assumptions: 1) Silt content is assumed to be 4% on average (Site soil classification test summary actually suggests less but 4% is SCAQMD assumption for gravel roads); 2) average vehicle weight based on VMT estimate for unpaved roads
3) Paved road emission factors are calculated using the most current version of USEPA AP-42 Section 13.2.1 and use the following assumptions: 1) Silt loading is assumed to be reduced to 0.02 g/m3 when street sweeper is assumed (downstream excavation and O&M excavation) and 0.06 g/m3 when not (GCS construction); 2) average vehicle weight is calculated based on VMT average basis.
4) Earthmoving emission factors are calculated using the recent version of USEPA AP-42 Section 11.9 for Dozing and Grading, and Section 13.2.4 for soil handling (drop emissions).
5) Due to working with very coarse materials and work areas being in depressions wind erosion potential is considered negligible.

Equipment/Truck Assumptions

1) Sediment truck load volume is assumed to be 12 cubic yards per truckload.
2) Short duration clean, grub, staging and cleanup phases needed, cleanup needed after each season of work.
3) A grader is required for the duration of the primary excavation at the project site and the disposal site to maintain access roads.

Littlerock Reservoir Sediment Removal Project
Project Construction Emission Totals

Average Daily Emissions (lbs/day)

GROUND CONTROL STRUCTURE

Average Daily (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.64	5.46	3.20	0.01	0.21	0.13
Offroad Vehicles/Equipment	9.58	33.64	114.83	0.11	5.42	4.99
Fugitive Dust	---	---	---	---	27.71	6.28
Totals	10.21	39.10	118.03	0.12	33.34	11.41
AVAQMD Significance Thresholds	137	548	137	137	82	82
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*Yes*	*No*

DOWNSTREAM EXCAVATION

Average Daily (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	5.82	28.44	40.26	0.13	2.30	1.68
Offroad Vehicles/Equipment	12.90	25.26	84.77	7.89	10.76	9.90
Fugitive Dust	---	---	---	---	129.26	27.61
Totals	18.72	53.70	125.03	8.02	142.32	39.19
AVAQMD Significance Thresholds	137	548	137	137	82	82
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*Yes*	*No*

DOWNSTREAM EXCAVATION w/Alternate Sediment Storage Site

Average Daily (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	4.19	22.06	28.13	0.09	1.63	1.17
Offroad Vehicles/Equipment	12.90	25.26	84.77	7.89	10.76	9.90
Fugitive Dust	---	---	---	---	106.34	22.11
Totals	17.09	47.32	112.90	7.98	118.73	33.19
AVAQMD Significance Thresholds	137	548	137	137	82	82
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*Yes*	*No*

Alternative 1 Excavation

Average Daily (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	2.45	13.76	16.04	0.05	0.94	0.67
Offroad Vehicles/Equipment	8.95	15.85	49.78	6.00	7.73	7.11
Fugitive Dust	---	---	---	---	50.65	10.31
Totals	11.40	29.61	65.81	6.06	59.32	18.09
AVAQMD Significance Thresholds	137	548	137	137	82	82
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

Alternative 1 Excavation w/Alternative Sediment Storage Site

Average Daily (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	1.82	11.30	11.37	0.04	0.68	0.48
Offroad Vehicles/Equipment	8.95	15.85	49.78	6.00	7.73	7.11
Fugitive Dust	---	---	---	---	42.30	8.31
Totals	10.77	27.15	61.14	6.04	50.71	15.90
AVAQMD Significance Thresholds	137	548	137	137	82	82
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

Annual Emissions (tons/year)

GROUND CONTROL STRUCTURE

Annual (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.02	0.20	0.12	0.00	0.01	0.00
Offroad Vehicles/Equipment	0.35	1.24	4.25	0.00	0.20	0.18
Fugitive Dust	---	---	---	---	1.03	0.23
Totals	0.38	1.45	4.37	0.00	1.23	0.42
AVAQMD Significance Thresholds	25	100	25	25	15	15
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*Yes*	*No*

DOWNSTREAM EXCAVATION

Annual (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.19	0.91	1.29	0.00	0.07	0.05
Offroad Vehicles/Equipment	0.41	0.81	2.71	0.25	0.34	0.32
Fugitive Dust	---	---	---	---	4.14	0.88
Totals	0.60	1.72	4.00	0.26	4.55	1.25
AVAQMD Significance Thresholds	25	100	25	25	15	15
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

DOWNSTREAM EXCAVATION w/Alternate Sediment Storage Site

Annual (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.13	0.71	0.90	0.00	0.05	0.04
Offroad Vehicles/Equipment	0.41	0.81	2.71	0.25	0.34	0.32
Fugitive Dust	---	---	---	---	3.40	0.71
Totals	0.55	1.51	3.61	0.26	3.80	1.06
AVAQMD Significance Thresholds	25	100	25	25	15	15
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

Alternative 1 Excavation

Annual (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.13	0.72	0.84	0.00	0.05	0.04
Offroad Vehicles/Equipment	0.47	0.83	2.61	0.32	0.41	0.37
Fugitive Dust	---	---	---	---	2.66	0.54
Totals	0.60	1.55	3.46	0.32	3.11	0.95
AVAQMD Significance Thresholds	25	100	25	25	15	15
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

Alternative 1 Excavation w/Alternative Sediment Storage Site

Annual (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.10	0.59	0.60	0.00	0.04	0.02
Offroad Vehicles/Equipment	0.47	0.83	2.61	0.32	0.41	0.37
Fugitive Dust	---	---	---	---	2.22	0.44
Totals	0.57	1.43	3.21	0.32	2.66	0.83
AVAQMD Significance Thresholds	25	100	25	25	15	15
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

ANNUAL MAINTENANCE

Average Daily (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	2.34	13.15	15.27	0.05	0.89	0.64
Offroad Vehicles/Equipment	8.99	16.18	49.02	5.94	7.65	7.04
Fugitive Dust	---	---	---	---	49.05	10.03
Totals	11.33	29.34	64.29	5.99	57.60	17.71
AVAQMD Significance Thresholds	137	548	137	137	82	82
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

ANNUAL MAINTENANCE

Annual (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.05	0.26	0.31	0.00	0.02	0.01
Offroad Vehicles/Equipment	0.18	0.32	0.98	0.12	0.15	0.14
Fugitive Dust	---	---	---	---	0.98	0.20
Totals	0.23	0.59	1.29	0.12	1.15	0.35
AVAQMD Significance Thresholds	25	100	25	25	15	15
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

ANNUAL MAINTENANCE w/Alternate Sediment Storage Site

Average Daily (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	1.75	10.86	10.90	0.04	0.65	0.46
Offroad Vehicles/Equipment	8.99	16.18	49.02	5.94	7.65	7.04
Fugitive Dust	---	---	---	---	40.32	7.94
Totals	10.74	27.04	59.92	5.98	48.62	15.44
AVAQMD Significance Thresholds	137	548	137	137	82	82
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

ANNUAL MAINTENANCE w/Alternate Sediment Storage Site

Annual (Offroad: No Engine Mitigation; Onroad: No Engine Mitigation)

	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.03	0.22	0.22	0.00	0.01	0.01
Offroad Vehicles/Equipment	0.18	0.32	0.98	0.12	0.15	0.14
Fugitive Dust	---	---	---	---	0.81	0.16
Totals	0.21	0.54	1.20	0.12	0.97	0.31
AVAQMD Significance Thresholds	25	100	25	25	15	15
Exceeds Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

Littlerock Reservoir Sediment Removal Project

Construction Schedule

		2016				
Grade Control Structure	Employees	July	Aug	Sep	Oct	Notes
Clear and Grub, Cofferdam	9	10				Schedule for all phases assumes 5 days per week 8 hours per day work schedule
Excavation	12	12	10			
Soil Cement Application	14		12	12		
Filling and Cleanup	12			8	10	
Available Work Days		22	22	20	22	

Vehicle Trips Estimate		July	Aug	Sep	Oct	Trip Dist	Unpaved	Veh. Class	Notes
Construction Employee Trips		234	288	264	120	40	0.00	Passenger	
Equipment Delivery/Misc		39	37	35	27	60	0.00	HHDT	Added one misc trip per day
Cement Delivery Trips			45	45		60	0.00	HHDT	9500 cubic yards soil cement (cement at 20 percent volume and truck load is 25 tons with dry cement at 94 lbs/yd)
Dump Truck Trips - Excavation		2,273	2,290			0.23	0.23	HHDT	50000 cubic yards at 12 yds per trip and 600 feet per trip one way
Dump Truck Trips - Soil cement			396	396		0.23	0.11	HHDT	9500 cubic yards soil cement at 12 yds per trip and 600 feet per trip one way
Dump Truck Trips Filling				1,500	1,875	0.23	0.23	HHDT	40,500 cubic yards at 12 yds per trip and 600 feet per trip one way
Non-sediment waste trips		10	2	2		60	0.13	HHDT	
Fueling		22	22	20	10	30	1.00	Delivery	One per day
Construction Management		22	22	20	10	60	1.00	Passenger	One per day
Crew Truck		44	44	40	20	40	1.00	Delivery	Two per day

Proposed Project		2017-2023			
Downstream Excavation	Employees	Sep	Oct	Nov	Notes
Clear and Grub	6	2			Schedule for excavation phase assumes 6 days per week and 11 active hours per day work schedule
Excavation/Removal	30	21	26	13	
Clean up	6			2	
Available Work Days		23	26	23	

	Total	Sep	Oct	Nov	
Excavation by Month	172,800	60,480	74,880	37,440	Cubic yards

Vehicle Trips Estimate		Sep	Oct	Nov	Trip Dist	Unpaved	Veh. Class	Notes
Construction Employee Trips		642	780	402	40	0	Passenger	
Offsite Dump Truck Trips		5,040	6,240	3,120	13.62	0.5	HHDT	Distance to alternate sediment storage site is 9.34 miles with 0.5 miles assumed unpaved
Equipment Delivery		10		10	60	0	HHDT	
Fueling		23	26	15	30	1	Delivery	
Construction Management		23	26	15	60	1	Passenger	
Crew Truck		46	52	26	40	1	Delivery	

Alternative 1

		2017-2029					
Downstream Excavation	Employees	July	Aug	Sep	Oct	Nov	Notes
Clear and Grub	6	2					Schedule for excavation phase assumes 5 days per week and 8 active hours per day work schedule
Excavation/Removal	20	19	22	20	21	19	
Clean up	6					2	
Available Work Days		21	22	23	26	21	

	Total	July	Aug	Sep	Oct	Nov	
Excavation by Month	109,080	20,520	23,760	21,600	22,680	20,520	Cubic yards

Vehicle Trips Estimate		July	Aug	Sep	Oct	Nov	Trip Dist	Unpaved	Veh. Class	Notes
Construction Employee Trips		392	440	400	420	392	40	0	Passenger	
Offsite Dump Truck Trips		1,710	1,980	1,800	1,890	1,710	13.62	0.50	HHDT	Distance to alternate sediment storage site is 9.34 miles with 0.5 miles assumed unpaved
Equipment Delivery		10				10	60	0	HHDT	
Fueling		21	22	20	21	21	30	1	Delivery	
Construction Management		21	22	20	21	21	60	1	Passenger	
Crew Truck		42	44	40	42	38	40	1	Delivery	

Annual O&M - 38,000 cy per year

Downstream Excavation	Employees	Sep	Oct	Notes
Clear and Grub	6	2		Schedule for excavation phase assumes 6 days per week and 11 active hours per day work schedule
Excavation/Removal	20	21	15	
Clean up	6		2	
Available Work Days		23	26	

	Total	Sep	Oct
Excavation by Month	38,880	22,680	16,200

Vehicle Trips Estimate		Sep	Oct	Trip Dist	Unpaved	Veh. Class	Notes
Construction Employee Trips		432	312	40	0	Passenger	
Offsite Dump Truck Trips		1,890	1,350	13.62	0.5	HHDT	Distance to alternate sediment storage site is 9.34 miles with 0.5 miles assumed unpaved
Equipment Delivery		10	10	60	0	HHDT	
Fueling		23	17	30	1	Delivery	
Construction Management		23	17	60	1	Passenger	
Crew Truck		46	30	40	1	Delivery	

Appendix C

Biological Resources Information

C.1 Survey Methodologies

APPENDIX C-1 – SURVEY METHODOLOGIES

Botanical Surveys

Focused botanical field surveys were conducted by Aspen periodically from May 2007 to June 2012. The entire Vegetation Study Area was surveyed by walking "meandering transects" (Nelson, 1987) throughout accessible portions of the Vegetation Study Area with particular attention given to areas of suitable habitat for sensitive plant species. All plant species observed were identified in the field or collected for later identification. Plants were identified using keys, descriptions, and illustrations in Hickman (1993), Munz (1974), applicable volumes of the Flora of North America (1993+), and other regional references. In conformance with CDFG (2009), surveys were (a) floristic in nature, (b) consistent with conservation ethics, (c) systematically covered all habitat types on the sites, and (d) well documented, by a Biological Resources Technical Report (Aspen, 2012) and by voucher specimens to be deposited at Rancho Santa Ana Botanic Garden. Surveys were completed during multiple years and at all locations that would be subject to proposed sediment removal activities.

Limitations. Botanical surveys were floristic in nature and conducted during a time of year when a broad assemblage of the flora in the region would be represented. However, some plant species, even under ideal survey conditions, remain inconspicuous or dormant. As a result, it is possible that some species may not have been identified during the survey.

Vegetation Mapping

Vegetation maps were prepared by drawing vegetation boundaries onto high-resolution aerial images in the field, then digitizing these polygons into Geographic Information Systems (GIS). The maps were then ground-truthed in the field to verify vegetation community types. Mapping was done electronically using ArcGIS (Version 10) and a 22-inch diagonal flat screen monitor with aerial photos with an accuracy of one foot. Most boundaries shown on the maps are accurate within approximately three feet; however, boundaries between some vegetation types are less precise due to difficulties in interpreting aerial imagery and accessing stands of vegetation.

Vegetation descriptions and names are based on Sawyer et al. (2009) and have been defined at least to the alliance level, and in some cases to the association level. Some of the vegetation in the Vegetation Study Area does not match the names and descriptions in Sawyer et al. (2009). Therefore, descriptive vegetation community names have been adapted in the same style. In addition, each vegetation type has been referenced to *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland, 1986) and to applicable sections of *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer, 1988), whenever possible.

Limitations. The vegetation composition in the Project Area has varied during the course of the studies. Large aggregations of willow and cottonwood trees present in the Reservoir prior to 2011 have been lost through inundation and now occur in lower densities along the margin of the Reservoir. In addition, vegetation densities in southern California riparian systems vary over time, depending on flood scouring events (Faber et al., 1989; Holland and Keil, 1995). Vegetation communities can also overlap in certain characteristics, and over time, may shift from one community type to another. Note also that all vegetation maps and descriptions are subject to imprecision resulting from several sources, including:

- Vegetation types typically intergrade on the landscape, without precise boundaries. In some cases, vegetation boundaries are distinct, often resulting from events such as wildfire or flood. These boundaries may become much less apparent after years of post-disturbance succession. Therefore, mapped boundaries represent best professional judgment, but should not be interpreted as literal delineations between sharply defined vegetation types.

- Natural vegetation tends to exist in general recognizable types, but also may vary over time and geographic region. Written descriptions cannot reflect all local or regional variation. Many stands of natural vegetation do not fit strictly into any named type. Therefore, a mapped unit is given the best name available in the classification, but this name does not imply that the vegetation unambiguously matches written descriptions.
- Vegetation tends to be patchy. Small patches of one named type are often included within larger stands mapped as units of another type. For these surveys, the minimum mapping unit was approximately three feet. Smaller inclusions are described in the text, but are not visible on the maps.
- Photo interpretation of some types may be difficult. Accuracy of a vegetation map will vary depending on the level of ground-truthing efforts.

Wildlife Surveys

Common wildlife. Wildlife species were detected during field surveys (diurnal and nocturnal) by sight, calls, tracks, scat, or other diagnostic clues (e.g., bones, feathers, prey remains). In addition to species actually observed, expected wildlife usage of the site was determined according to known habitat preferences of regional wildlife species and knowledge of their relative distributions in the area. Reconnaissance-level surveys for common wildlife were performed by methodically walking the perimeter of the Reservoir (where accessible), the adjacent foothills, and areas upstream and downstream from the Reservoir. Surveys were conducted at an average pace of approximately one mile per hour and biologists halted approximately every 150 feet to listen for wildlife, or whenever necessary to identify species or record data.

Invertebrates. Biologists searched for terrestrial insects and other invertebrates on flowers and leaves, under loose bark on trees, and under stones and logs on the ground throughout the Study Area. Butterflies and other aerial species were noted when observed. Larger aquatic invertebrates were sampled during aquatic surveys within the Study Area (see methodology below). Randomly selected areas within appropriate microhabitats (e.g., leaf litter, underneath felled logs, etc.) were hand raked or visually inspected to determine the presence or absence of gastropods.

Fish. Surveys were performed by methodically walking active portions of Littlerock Creek from just south of Rocky Point to the upstream extent of the Study Area. All areas where standing or flowing water was present were visually inspected. Visual observations for presence of fish were conducted in portions of the channel where water was relatively shallow (<1 foot) and clear (majority of survey area). Dip nets with 1/8-inch mesh were utilized to probe under and around boulders. In areas with water deeper than one foot, block netting with 1/8-inch mesh was installed along the downstream sections. Using 1/8-inch-mesh netting, biologists then seined each section from the upstream extent of the deeper water downstream towards the block netting, and documented all fish present within the area. Biologists also conducted informal creel census surveys to assess the fish assemblage in the reservoir by interviewing anglers and observing their catch. This yielded useful information on the most common fish caught by shore anglers.

Amphibians. Surveys were performed by methodically walking the western perimeter of the Reservoir (including pooled areas west of the main access road) and within the Littlerock Creek channel upstream of Rocky Point and downstream of the dam. Surveys were also conducted by boat along the eastern shore and within the small tributary drainages that feed the Reservoir from the west. Diurnal and nocturnal surveys were conducted during the time of year and at ambient temperatures when amphibians would be active. Visual observations were made to confirm the presence or absence of tadpoles and adults in ephemeral pools or slow moving areas of the active channel of Littlerock Creek, in the Reservoir, and in storm water basins that border the Reservoir.

Arroyo toad (focused surveys). Arroyo toads are known from Littlerock Creek and designated critical habitat for this species has been identified above Rocky Point. Multiple focused surveys for arroyo toad were performed by methodically walking the western perimeter of the Reservoir (including pooled areas west of the main access road), within the Littlerock Creek channel upstream of Rocky Point and downstream of the dam, the small tributaries that flow into the Reservoir, and within the lower portion of Santiago Creek. Surveys were conducted during the day to search for egg masses, tadpoles or metamorphs, and at night to observe foraging toads and to listen for reproductive calls.

The focus of the arroyo toad surveys was to maintain a baseline of the distribution of animals in the Project Area and to evaluate if this species is moving into the Reservoir or adjacent recreation areas. To date Aspen has not detected this species below Rocky Point however it is likely this species can be periodically found in this area. Protocol surveys for this species were conducted at Rocky Point in 2015.

Reptiles*.* Surveys for reptiles were performed by methodically walking through the Study Area and visually inspecting microhabitat sites (e.g., basking sites, rock outcrops, leaf litter, woodpiles, etc.). Focused reptile surveys were conducted during daylight hours when ambient temperatures were such that reptiles would be active (i.e., between 75 and 95 degrees Fahrenheit), and at night concurrent with the amphibian surveys. All refugia sites searched were returned to their original state after inspection.

Desert Tortoise (Protocol Surveys). Protocol surveys for this species were conducted at the 47th Street disposal site on April 26, 2014. No sign of this species was detected.

Common birds (focused non-protocol surveys). Surveys for birds were conducted during calm winds between dawn and 11:00 a.m. and at dusk. Bird species were identified by sight and sound. Particular attention was given to the riparian corridor below the dam and the large cottonwood and willow trees that occur along the margin of the Reservoir. The adjacent uplands were also searched.

Bald and golden eagles (focused non-protocol surveys). Focused surveys for bald and golden eagles included an inspection of the Reservoir, adjacent uplands, mountains, and major lakes and reservoirs in the region. This included surveys of Lake Palmdale, Bouquet Reservoir, and Lake Elizabeth. Searches for bald eagle, a species known as an occasional winter visitor at the Reservoir, were also conducted during routine bird and wildlife surveys.

Least Bell's vireo (focused protocol surveys). Focused or protocol surveys for the federally and state-listed endangered least Bell's vireo (*Vireo bellii pusillus*) were conducted annually in the spring and summer from 2010 to 2012. Protocol-level surveys for the least Bell's vireo were conducted in conformance with USFWS Least Bell's Vireo Survey Guidelines (USFWS, 2001). Protocol surveys were conducted no less than ten days apart, between dawn and 11:00 a.m., within all portions of the Study Area containing suitable riparian habitat and within adjacent habitat suitable for foraging. Surveys were conducted by slowly walking along and through riparian habitats within the study area at an average pace of approximately 1.2 miles per hour. While visually searching for and listening for songs, scolds, and calls. Additional, non-protocol surveys included monthly surveys in 2012 to monitor existing bird use downstream of the Reservoir.

Terrestrial mammals. Surveys for terrestrial mammals were conducted in the Study Area within specific areas containing suitable microhabitats. Special attention was given to areas that may be affected by sediment removal activities and in which the vegetation and soil structure was conducive to habitation by small mammals, such as the upland stream terraces and adjacent uplands. Biologists recorded all animal observations and visually searched for animal signs (e.g., scat, footprints, fur, burrows, etc.).

Mohave Ground Squirrel Habitat Assessment. A habitat assessment for this species were conducted at the 47th Street disposal site in April 2015 by Phoenix Biological Consulting. No sign of this species was detected. . The site visit consisted of walking the perimeter of the site boundary and several transects within the site to determine the suitability for MGS habitat. The biologist (Ryan Young) recorded soil texture, dominant shrubs & annuals, habitat types, sign of mammal types present and surrounding habitat. The dominant shrubs consisted of California juniper (*Juniperus californica*), Joshua tree (*Yucca brevifolia*) and Mormon tea (*Ephedra nevadensis*). Small mammal burrows are present but it is assumed that these burrows are from antelope ground squirrels (*Ammospermophilus leucurus*). The results of the site visit and CNDDB analysis suggest that the site is not suitable for MGS. This assertion is based on the following criteria:

- Presence of California ground squirrels (*Spermophilus beecheyi*).
- The site is outside the southern edge of the known range.
- There are no recent MGS records near the project site (Figure A; CNDDB, 2015).
- The dominant plants on site are not considered suitable MGS forage plants (Figure B).
- The site is relatively isolated from potential occupied habitat to the north.

Bats. Monitoring for bat calls was conducted using a SongMeter™ SM2 acoustic monitoring and data logging recorder fitted with an SMX-US omnidirectional microphone sensitive to frequencies over 150 kilohertz. Recorded bat calls were analyzed using Song Scope Bioacoustics Software. To enhance identification accuracy, Song Scope files identified to individual bat species were split into individual electronic wave files, which were scrubbed to separate bat echolocation calls from noise and digitally adjusted for microphone frequency response, in order to confirm the species identification using Sonobat. Bat monitoring was conducted at a single location adjacent to the creek for two 24-hour periods and set to passively record bat calls between 1900 and 0600 hours on 17–18 May and 17–18 June 2012. Bat calls were also actively detected and recorded using a portable Echo Meter EM3 during nocturnal surveys.

Limitations. The focus of wildlife surveys was to determine the presence of special-status wildlife species and the potential for habitat to support these species within the Study Area. It is acknowledged that some wildlife species with a nocturnal pattern of activity or species that are otherwise difficult to detect may not have been identified during the survey.

C.2 Plant Species Observed

APPENDIX C-2 – PLANT SPECIES OBSERVED

Plant Species Observed Within the Vegetation Study Area

Latin Name	Common Name	Abundance	Voucher
VASCULAR PLANTS			
FILICALES	FERN FAMILIES (SEVERAL INCLUDED TOGETHER)		
Marsilea vestita	Hairy cloverfern	Scarce	4,342
CUPRESSACEAE	CYPRESS FAMILY		
Cupressus sp.	Unid. cypress	Uncommon	
Juniperus californica	California juniper	Common	
EPHEDRACEAE	EPHEDRA FAMILY		
Ephedra nevadensis (?)	Desert tea	Uncommon	
Ephedra viridis	Green ephedra	Occasional	
PINACEAE	PINE FAMILY		
* Pinus sp.	Unid. ornamental	Uncommon	
Pinus monophylla	Pinyon pine	Common	
ANACARDIACEAE	CASHEW FAMILY		
Toxicodendron diversilobum	Poison oak	Uncommon	
APIACEAE	CELERY FAMILY		
* Conium maculatum	Poison hemlock	Uncommon	
APOCYNACEAE	DOGBANE FAMILY		
* Nerium oleander	Ornamental oleander	Uncommon	
ASCLEPIADACEAE	MILKWEED FAMILY		
Asclepias fascicularis	Narrow-leaved milkweed	Uncommon	
ASTERACEAE	ASTER FAMILY		
Acamptopappus sphaerocephalus	Desert goldenhead	Uncommon	4,757
Ambrosia acanthicarpa	Annual sandbur	Occasional	
Artemisia douglasiana	Douglas mugwort	Occasional	
Artemisia dracunculus	Tarragon	Occasional	
Artemisia ludoviciana	Western mugwort	Occasional	
Artemisia tridentata	Great Basin sagebrush	Common	
Baccharis salicifolia	Mulefat	Occasional	
Brickellia californica	Calif. brickellbush	Uncommon	
Calycoseris parryi	Yellow tackstem	Scarce	1,571
* Centaurea melitensis	Tocalote	Uncommon	
Chaenactis glabriscula	Yellow pincushion	Uncommon	1,597
Chaenactis steveioides	Broad-flowered pincushion	Occasional	1,567
* Chamomilla suaveolens	Pineapple weed	Uncommon	1,580
(Matricaria matricarioides)			
Chrysothamnus nauseosus	Common rabbitbrush	Occasional	
Cirsium occidentale	California thistle	Scarce	4,759

Plant Species Observed Within the Vegetation Study Area

	Latin Name	Common Name	Abundance	Voucher
	var. californicum (?)			
*	Cirsium vulgare	Bull thistle	Uncommon	
*	Conyza bonariensis	Flax-leaved horseweed	Uncommon	
	Conyza canadensis	Horseweed	Uncommon	
	Coreopsis bigelovii	Bigelow coreopsis	Uncommon	1,599
	Encelia actoni	Acton brittlebush	Occasional	
	Ericameria cooperi	Cooper goldenbush	Uncommon	1,625
	Ericameria linearifolia	Narrowleaf goldenbush	Uncommon	
	Eriophyllum confertiflorum	Golden yarrow	Uncommon	
	Eriophyllum wallacei	Wallace's woolly daisy	Uncommon	
	Gnaphalium canescens	Perennial cudweed	Uncommon	
*	Gnaphalium luteo-album	Pearly everlasting	Scarce	
	Gnaphalium palustre	Meadow everlasting	Uncommon	1,568B
	Gnaphalium stramenium	Cotton batting	Uncommon	4,782
	Gutierrezia sarothrae	Common matchweed	Occasional	
	Heterotheca grandiflora	Telegraph weed	Uncommon	
	Hymenoclea salsola	Cheesebush	Uncommon	1,646
*	Lactuca serriola	Prickly lettuce	Scarce	
	Lasthenia californica	California goldfields	Uncommon	
	Layia glandulosa	White tidy tips	Uncommon	1,588
	Lepidospartum squamatum	Scalebroom	Occasional	
	Lessingia filaginifolia	Chaparral aster	Occasional	
	(Corethrogyne filaginifolia)			
	Microseris lindleyi (M. linearifolia,	Silver puffs	Uncommon	1,631
	Uropappus lindleyi)			
	Nicolletia occidentalis	Hole-in-the-sand plant	Scarce	4,773
	Rafinesquia californica	Calif. chicory	Uncommon	
	Senecio flaccidus v. douglasii	Sand-wash butterweed	Uncommon	4,766
*	Sonchus asper	Prickly sow-thistle	Occasional	
*	Sonchus oleraceus	Common sow thistle	Uncommon	
	Stephanomeria exigua	Wreath plant	Uncommon	
	Stephanomeria pauciflora	Wire-lettuce	Uncommon	
	Stephanomeria virgata	Wreath plant	Uncommon	
	Stylocline gnaphalioides	Everlasting nest-straw	Scarce	
	Stylocline psilocarphoides	Perk's nest-straw	Scarce	1,618
	Syntrichopappus fremontii	Freemont's syntrchopappus	Uncommon	1,622
**	Syntrichopappus lemmonii	Lemmon's syntrichopappus	Scarce	1,563
	Tetradymia comosa	Hairy horsebrush	Uncommon	
	Tetradymia spinosa (?)	Cottonthorn	Uncommon	1,645
	Xanthium strumarium	Cocklebur	Uncommon	

Plant Species Observed Within the Vegetation Study Area

	Latin Name	Common Name	Abundance	Voucher
	Xylorhiza tortifolia	Mojave aster	Scarce	
	(Machaeranthera tortifolia)			
BETULACEAE		BIRCH FAMILY		
	Alnus rhombifolia	White alder	Uncommon	
BORAGINACEAE		BORAGE FAMILY		
	Amsinckia tessellata	Checker fiddleneck	Occasional	
	Cryptantha barbigera	Bearded cryptantha	Uncommon	1,568A
	Cryptantha circumscissa	Cushion cryptantha	Uncommon	1,628
	Cryptantha decipiens	Gravelbar cryptantha	Scarce	1,587B
	Cryptantha muricata	Prickly cryptantha	Occasional	1,587A
	Cryptantha nevadensis var. rigida	Nevada cryptantha	Uncommon	1,644
	Cryptantha oxygona	Sharpnut cryptantha	Uncommon	1,603
	Cryptantha pterocarya	Winged cryptantha	Scarce	1,592
	Heliotropium curassavicum	Salt heliotrope	Occasional	
	Pectocarya linearis	Comb-bur	Uncommon	1,649
	Pectocarya setosa	Comb-bur	Uncommon	
	Plagiobothrys arizonicus	Arizona popcornflower	Uncommon	1,574
BRASSICACEAE		MUSTARD FAMILY		
	Arabis pulchra	Beautiful rock-cress	Uncommon	
*	Brassica geniculata	Short-pod mustard	Uncommon	
	(Hirschfeldia incana)			
	Descurainia pinnata	Tansy mustard	Scarce	1,569
	Descurainia sophia	Flixweed, tansy mustard	Uncommon	1,593
	Lepidium fremontii	Fremont pepper-grass	Uncommon	
	Rorippa curvisiliqua (?)	Western yellow-cress	Scarce	4,761
	Rorippa nasturtium-aquaticum	Water-cress	Uncommon	
	Rorippa sphaerocarpa (?)	Round fruited yellow-cress	Scarce	4,785
*	Sisymbrium officinale	Hedge mustard	Uncommon	
*	Sisymbrium irio	London rocket	Uncommon	
	Stanleya pinnata	Prince's plume	Uncommon	
	Thysanocarpus lacinatus	Fringe-pod	Uncommon	1,586
CACTACEAE		CACTUS FAMILY		
*	Opuntia basilaris	Short-jointed beavertail cactus	Scarce	4,775
	var. brachyclada			
	Opuntia basilaris var. basilaris	Common beavertail cactus	Occasional	
	Opuntia echinocarpa	Silver cholla	Uncommon	
CAMPANULACEAE		BELLFLOWER FAMILY		
	Nemacladus longiflorus	Long flowered thread plant	Scarce	1,623A
	var. breviflorus			
	Nemacladus sigmoideus	Small flowered thread plant	Scarce	1,623B

Plant Species Observed Within the Vegetation Study Area

	Latin Name	Common Name	Abundance	Voucher
	CARYOPHYLLACEAE	CARNATION FAMILY		
	Minuartia douglasii	Douglas sandwort	Scarce	1,564
	CHENOPODIACEAE	GOOSEFOOT FAMILY		
	Atriplex canescens	Four-winged saltbush	Occasional	
*	Chenopodium album (?)	Common goosefoot	Uncommon	
	Chenopodium berlandieri	Pit seed goosefoot	Uncommon	
*	Chenopodium botrys	Jerusalem oak goosefoot	Uncommon	4,333
	Chenopodium californicum	California goosefoot	Uncommon	
*	Chenopodium murale	Nettle-leaved goosefoot	Uncommon	
	Grayia spinosa	Spiny hop-sage	Occasional	1,583
*	Salsola tragus	Russian thistle, tumbleweed	Uncommon	
	CRASSULACEAE	STONECROP FAMILY		
	Dudleya lanceolata	Lance-leaved dudleya	Uncommon	1,590
	CUCURBITACEAE	CUCUMBER FAMILY		
	Marah fabacea	California man-root	Scarce	1,619
	CUSCUTACEAE	DODDER FAMILY		
	Cuscuta sp.	Unid. witch's hair	Uncommon	
	DATISCACEAE	DATISCA FAMILY		
	Datisca glomerata	Durango root	Scarce	4,343
	ERICACEAE	MANZANITA FAMILY		
	Arctostaphylos glauca	Bigberry manzaniga	Uncommon	1,582
	EUPHORBIACEAE	SPURGE FAMILY		
	Chamaesyce albomarginata	Rattlesnake spurge	Occasional	
	(Euphorbia albomarginata)			
	FABACEAE	PEA FAMILY		
*	Albizia julibrissin	Silktree	Uncommon	
	Astragalus didymocarpus	Dwarf locoweed	Scarce	1,626
	Lotus humistriatus	Hill lotus	Scarce	1,632
	Lotus scoparius	Deerweed	Uncommon	
	Lotus strigosus	Strigose lotus	Uncommon	1,620
	Lupinus bicolor	Miniature lupine	Uncommon	
	Lupinus concinnus	Sand lupine	Uncommon	
	Lupinus sparsiflorus	Coulter lupine	Uncommon	1,594
*	Melilotus alba	White sweet-clover	Occasional	
*	Parkinsonia aculeata	Mexican palo verde	Scarce	4,788
*	Robinia pseudoacacia	Black locust	Uncommon	
	Trifolium microcephalum	Maiden clover	Scarce	4,777
	Trifolium willdenovii	Valley clover	Uncommon	4,776
	Trifolium sp.	Unid. clover	Scarce	4,764
	GENTIANACEAE	GENTIAN FAMILY		

Plant Species Observed Within the Vegetation Study Area

	Latin Name	Common Name	Abundance	Voucher
	Centaurium exaltatum	Desert centaury	Uncommon	4,338
GERANIACEAE		GERANIUM FAMILY		
*	Erodium cicutarium	Red-stemmed filaree	Uncommon	
HYDROPHYLLACEAE		WATERLEAF FAMILY		
	Emmenanthe penduliflora	Whispering bells	Uncommon	
	Eridictyon trichocalyx	Yerba santa	Occasional	1,610
	Eucrypta chrysanthemifolia	Common eucrypta	Uncommon	
	Nemophila menziesii	Baby blue-eyes	Uncommon	
	Phacelia cryptantha	Limestone phacelia	Uncommon	1,566
	Phacelia distans	Common phacelia	Occasional	
	Phacelia imbricata	Broad-sepaled phacelia	Uncommon	1,589
	Phacelia longipes	Longstalk phacelia	Uncommon	1,595
	Pholistoma membranaceum	White fiesta-flower	Scarce	1,575
	Turricula parryi	Poodle bush	Occasional	4,758
LAMIACEAE		MINT FAMILY		
	Salazaria mexicana	Bladder sage, paper bag bush	Occasional	1,641
	Salvia columbariae	Chia	Occasional	
	Salvia dorrii (S. carnosa)	Blue desert sage	Occasional	1,562
	Stachys albens	White hedge-nettle	Uncommon	4,786
	Stachys ajugoides (incl. S. rigida)	Hedge nettle	Scarce	
LOASACEAE		STICK-LEAF FAMILY		
	Mentzelia veatchiana	Veatch's stick-leaf	Uncommon	1,600
MELIACEAE		MAHOGANY FAMILY		
*	Melia azedarach	China berry	Uncommon	
NYCTAGINACEAE		FOUR O'CLOCK FAMILY		
	Mirabilis laevis	Desert wishbone bush	Uncommon	
OLEACEAE		OLIVE FAMILY		
	Forestiera pubescens	Desert olive	Uncommon	
ONAGRACEAE		EVENING PRIMROSE FAMILY		
	Camissonia boothii	Shredding evening primrose	Uncommon	4,779
	ssp. decorticans			
	Camissonia campestris (?)	Field evening primrose	Uncommon	1,621
	Camissonia pallida	Pale suncup	Scarce	1,647
	Epilobium brachycarpum	Summer cottonweed	Uncommon	
	(E. paniculatum)			
	Epilobium canum	California fuchsia	Uncommon	
	(Zauschnaria californica)			
	Epilobium ciliatum	Willow-herb	Occasional	
	Epilobium densiflorum (?)	Dense-flowere willow-herb	Scarce	4,334
	Oenothera californica	California evening primrose	Uncommon	

Plant Species Observed Within the Vegetation Study Area				
	Latin Name	Common Name	Abundance	Voucher
	OROBANCHACEAE	BROOMRAPE FAMILY		
	Orobanche californica ssp. feudgei	California broomrape	Uncommon	1,605
	PAPAVERACEAE	POPPY FAMILY		
	Eschscholzia californica	Calif. poppy	Uncommon	
	Eschscholzia minutiflora	Small-flowered poppy	Scarce	1,624
	Platystemon californicus	Cream cups	Scarce	1,635
	PLATANACEAE	SYCAMORE FAMILY		
	Platanus racemosa	California sycamore	Uncommon	
	POLEMONIACEAE	PHLOX FAMILY		
	Eriastrum densifolium	Perennial woolly-star	Uncommon	4,767
	ssp. densifolium			
	Eriastrum sapphirinum	Sapphire woollystar	Uncommon	1,613
	Gilia brecciarum	Nevada gilia	Scarce	1,638
	Gilia splendens	Splendid gilia	Uncommon	1,596
	Gilia sp.	Unid. gilia	Scarce	1,601
	Leptodactylon californicum	California prickly-phlox	Scarce	
	Linanthus aureus	Golden linanthus	Scarce	1,642
	Linanthus bigelovii	Biglow's linanthus	Uncommon	1,636
	Linanthus parryae	Parry's linanthus	Uncommon	1,627
	Loeseliastrum matthewsii	Desert calico	Scarce	1,648
	POLYGONACEAE	BUCKWHEAT FAMILY		
	Centrostegia thurberi	Thurber spineflower	Uncommon	1,584
	(Chorizanther thurberi)			
	Chorizanthe brevicornu	Brittle spine-flower	Uncommon	
	Chorizanthe staticoides	Turkish rugging	Occasional	1,617
	Chorizanthe watsonii	Watson spineflower	Uncommon	
	Chorizanthe xanti var. xanti	Riverside spineflower	Uncommon	1,629
	Eriogonum cithariforme var. agninum	Cithara buckwheat	Uncommon	1,570
	Eriogonum elongatum	Wand buckwheat	Uncommon	
	Eriogonum pusillum	Puny buckwheat	Uncommon	1,581
	Eriogonum spp.	2 or more unidentified annuals		
*	Polygonum arenastrum	Common knotweed	Occasional	
	(P. aviculare)			
	Polygonum lapathifolium	Willow smartweed	Occasional	
	PORTULACACEAE	PURSLANE FAMILY		
	Calyptridium monandrum	Common calyptridium	Uncommon	
	Claytonia parviflora	Miner's lettuce	Uncommon	1,606
*	Portulaca oleracea	Common purslane	Uncommon	
	RANUNCULACEAE	BUTTERCUP FAMILY		
	Delphinium parishii	Parish larkspur	Uncommon	1,561

Plant Species Observed Within the Vegetation Study Area

Latin Name		Common Name	Abundance	Voucher
ROSACEAE		ROSE FAMILY		
	Purshia glandulosa	Desert bitterbrush	Occasional	
RUBIACEAE		COFFEE FAMILY		
	Galium angustifolium	Bedstraw	Uncommon	
*	Galium aparine	Goose grass	Uncommon	
SALICACEAE		WILLOW FAMILY		
	Populus fremontii	Fremont cottonwood	Common	
	Salix exigua	Sandbar willow	Occasional	
	Salix goodingii	Black willow	Occasional	
	Salix laevigata	Red willow	Occasional	
	Salix lasiolepis	Arroyo willow	Occasional	
SAURACEAE		LIZARD TAIL FAMILY		
	Anemopsis californica	Yerba mansa	Uncommon	
SCROPHULARIACEAE		SNAPDRAGON FAMILY		
	Castilleja linariifolia	Desert paintbrush	Scarce	
	Castilleja minor ssp. spiralis	Lesser paintbrush	Uncommon	4,336
	Collinsia callosa	Desert collinsia	Scarce	1,565
	Mimulus cardinalis	Scarlet monkeyflower	Occasional	
	Mimulus floribundus	Showy monkeyflower	Uncommon	4,337
	Mimulus guttatus	Seep monkeyflower	Occasional	
*	Mimulus johnstonii	Johnston's monkeyflower	Scarce	1,572
	Mimulus moschatus	Musk monkeyflower	Uncommon	4,335
	Mimulus parishii	Parish's monkey-flower	Scarce	4,770
	Mimulus pilosus	Downy monkey-flower	Uncommon	
	Penstemon centranthifolius	Scarlet bugler	Uncommon	
*	Verbascum virgatum	Wand muellin	Occasional	4,765
	Veronica americana	American brooklime	Scarce	
*	Veronica anagallis-aquatica (?)	Water speedwell	Uncommon	
SIMAROUBACEAE		QUASSIA FAMILY		
*	Ailanthus altissima	Tree of heaven	Scarce	
SOLANACEAE		NIGHTSHADE FAMILY		
	Datura wrightii (D. meteloides)	Jimsonweed	Occasional	
	Lycium andersonii	Anderson thornbush	Uncommon	
	Lycium cooperi	Peach desert thorn	Uncommon	
*	Nicotiana glauca	Tree tobacco	Uncommon	
*	Solanum elaeagnifolium	Silver-leaf nightshade	Uncommon	4,789
TAMARICACEAE		TAMARISK FAMILY		
	Tamarix ramosissima	Mediterranean tamarisk	Occasional	
URTICACEAE		NETTLE FAMILY		
	Urtica dioica ssp. holosericea	Stinging nettle	Uncommon	

Plant Species Observed Within the Vegetation Study Area

	Latin Name	Common Name	Abundance	Voucher
	VERBENACEAE	VERVAIN FAMILY		
	Verbena bracteata	Bracted verbena	Occasional	4,762
	Verbena lasiostachys	Western verbena	Uncommon	
	VISCACEAE	MISTLETOE FAMILY		
	Phoradendron densum	Leafy juniper mistletoe	Uncommon	
	Phoradendron macrophyllum	Mistletoe (on sycamore or	Uncommon	
	ZYGOPHYLLACEAE	CALTROP FAMILY		
	Larrea tridentata	Creosote bush	Common	
*	Tribulus terrestris	Puncture vine	Uncommon	
	CYPERACEAE	SEDGE FAMILY		
	Carex alma (?)	Sturdy sedge	Uncommon	4,339
	Carex fracta (?)	Fragile-sheathed sedge	Uncommon	4,781
	Carex praegracilis	Clustered field-sedge	Occasional	
	Carex senta (?)	Rough sedge	Uncommon	4,340
*	Cyperus difformis (?)	Variable flatsedge	Scarce	4,769
	Cyperus eragrostis	Tall umbrella sedge	Uncommon	
	Eleocharis parishii	Parish spike-sedge	Uncommon	4,770
	Scirpus microcarpus	Small-fruited bulrush	Uncommon	
	JUNCACEAE	RUSH FAMILY		
	Juncus sp. (1 or more unid. spp.)			4,344
	Juncus arcticus (incl. vars.	Wire-grass	Uncommon	
	balticus and mexicanus)			
	Juncus bufonius	Toad rush	Occasional	
	Juncus macrophyllus	Long-leaved rush	Uncommon	1,585
	Juncus rugulosus	Wrinkled rush	Uncommon	4,345
	Juncus tiehmii	Nevada rush	Uncommon	4,331
	Juncus xiphioides	Iris-leaved rush	Occasional	4,346
	LILIACEAE	LILY FAMILY		
	Allium fimbriatum var. fimbriatum	Fringed onion	Scarce	1639
	Bloomeria crocea	Golden stars	Scarce	
	Calochortus kennedyi	Kennedy's mariposa lily	Scarce	1,643
	Dichelostemma capitata	Wild hyacinth, bluedicks	Uncommon	
	(Brodiaea pulchella)			
	Yucca brevifolia	Joshua tree	Occasional	
	Yucca whipplei	Chaparral yucca	Occasional	
	(Hesperoyucca whipplei)			
	POACEAE	GRASS FAMILY		
	Agrostis exarata	Western bentgrass	Occasional	4,787
*	Agrostis viridis (A. semiverticillata)	Water bentgrass	Uncommon	
*	Avena fatua	Wild oat	Scarce	

Plant Species Observed Within the Vegetation Study Area

Latin Name	Common Name	Abundance	Voucher
* Bromus diandrus	Ripgut brome	Occasional	
* Bromus hordeaceus (B. mollis)	Soft chess	Uncommon	
* Bromus madritensis	Red brome	Occasional	
ssp. rubens (B. rubens)			
* Bromus tectorum	Cheat grass	Occasional	
* Cynodon dactylon	Bermuda grass	Uncommon	
Distichlis spicata	Saltgrass	Uncommon	
Elymus elymoides	Bottlebrush squirreltail	Uncommon	
(Sitanion hystrix v. hystrix)			
* Hordeum murinum	Hare barley	Uncommon	
* Leptochloa uninervia	Sprangletop	Uncommon	4,768
Melica imperfecta	Common melic	Uncommon	
* Stipa milaceum (Piptatherum m.)	Smilo grass	Uncommon	
* Poa annua	Annual bluegrass	Uncommon	
* Poa pratensis	Kentucky bluegrass	Occasional	
Poa secunda	Nodding bluegrass	Occasional	
* Polypogon monspeliensis	Rabbitfoot grass	Occasional	
* Schismus barbatus	Mediterranean schismus	Occasional	
Stipa hymenoides (Oryzopsis	Indian ricegrass	Uncommon	
hymenoides, Achnatherum hymenoides)			
Stipa speciosa	Desert needlegrass	Uncommon	
(Achnatherum speciosum)			
Vulpia microstachys	Annual fescue	Uncommon	1,602
(Festuca microstachys, F. reflexa, F. pacifica, F. confusa)			
* Vulpia myuros (Festuca myuros,	Annual fescue	Uncommon	
F. megalura)			
TYPHACEAE	CATTAIL FAMILY		
Typha domingensis	Slender cattail	Uncommon	
Typha latifolia	Broad-leaved cattail	Occasional	
ZANNICHELLIACEAE	HORNED PONDWEED FAMILY		4,341
Zannichellia palustris	Horned pondweed	Scarce	

Alien species are indicated by asterisk, special status species indicated by two asterisks. This list includes only species observed within the Vegetation Study Area. Others may have been overlooked or unidentifiable due to season. Plants were identified using keys, descriptions, and illustrations in Abrams (1923-1951), Hickman (1993), and Munz (1974). Taxonomy and nomenclature generally follow Hickman. Vouchers, indicated by Justin Wood's collection numbers, will be deposited at Rancho Santa Ana Botanic Garden.

C.3 Weed Descriptions

APPENDIX C-3 – WEED DESCRIPTIONS

Noxious weeds present a severe threat to natural habitats. When noxious weeds become established in an area, they can cause a permanent or long-lasting change in the environment by increasing vegetative cover, thereby creating a dense layer that prevents native vegetation from germinating, and essentially halting normal successional processes that would typically allow an area to recover from disturbance. Weed populations can also alter edaphic and hydrological conditions and structure through nitrogen fixation (as in Spanish broom, *Spartium junceum*) or draining of the water table (as in giant reed [*Arundo donax*]). Monocultures of noxious weeds typically create an unfavorable environment for wildlife. Consequently, mutualistic species necessary for native plant life cycles, such as seed dispersers, fossorial mammals, or pollinators, can be lost from the area. Heavy infestations can also significantly reduce the recreational or aesthetic value of open space. This being said, weed control efforts are costly, labor intensive, often require several years of follow-up monitoring and a combination of control methods to completely eradicate populations, and in many cases pose significant risk to native plants that may occur within the weed control area. Even still, the ecological costs and risks associated with not managing noxious weed populations are so great that these exceed risks posed by most control methods (DiTomaso, 1997).

Weed species occurring in the Study Area and along the haul routes are ranked by three threat levels as defined by Cal-IPC (Cal-IPC, 2012):

- **High** – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
- **Moderate** – These species have substantial and apparent (but generally not severe) ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
- **Limited** – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.
- **Evaluated Not Listed** – Sufficient information is lacking to assign a rating or the available information indicates that the species does not have significant impacts at the present time

Species Accounts

High Risk Invasive Plant Species

Tamarisk (Tamarix sp.)

Cal-IPC Pest Rating: High.

Present at the project site: Yes.

This species occurs in a large stand on the east side of the southern extent of the Reservoir. Current levels of this species are low however the salt cedar can quickly colonize open stream terraces after scouring events provided a source population is present.

Description:

Tamarisk is a type of woody shrub or small tree in the tamarisk family (Tamaricaceae) that invades desert washes and arid riparian areas throughout the western U.S. The Tehachapi Mountains are known to support at least four related Eurasian species with the common names Chinese tamarisk (*T. chinensi*), French tamarisk (*T.gallica*), smallflower tamarisk (*T. parviflora*), and saltcedar (*T. ramosissima*). Tamarisk reproduces by seed and by root sprouting or even disconnected stem fragments. Seedlings have very low survivorship because the deep root system that would protect them from desiccation or being washed away in floods is undeveloped (DiTomaso and Healy, 2007). Once this root system forms, however, tamarisk trees are associated with several negative effects, including draining of the water table, loss of diversity, and reduced habitat quality for many bird and wildlife species. Seed germination is not inhibited in saline soils, and the plants can tolerate saline conditions quite well. The plants can extract groundwater efficiently from deep in the soil profile and sequester the resulting salts in their leaf tissues. When these tissues decompose on the soil surface, they increase soil salinity, making the site less suitable for native species. Once established, tamarisk can spread quickly through vegetative means.

Control:

<u>Prevention</u>: Sites with intact native riparian vegetation are resistant to tamarisk invasion because the seedlings are such poor competitors. Minimizing impacts in riparian and desert wash habitats and restoring any necessary impacts with native vegetation will thus reduce the potential for tamarisk invasion into new areas.

<u>Mechanical</u>: Trees cut from the soil surface re-sprout from the root system, so aboveground tree removal should be followed with herbicidal methods as outlined below. Otherwise, the root system will need to be manually removed, which may cause more soil disturbance than necessary and leave the site open to new invasions.

<u>Biocontrol</u>: In 2002, the saltcedar beetle (*Diorhabda elongata*) was released in efforts to control tamarisk, but it is not yet known how effective the species will be in control of these species (DiTomaso and Healy 2007).

<u>Fire Management</u>: Burning is not recommended because plants re-sprout readily following fire.

<u>Herbicide</u>: Cut stumps should be painted with an herbicide preparation specifically approved for use in aquatic and wetland ecosystems in California. Care should be taken to use a strong enough application to kill the root crown bud. Repeat applications are required the following year when seedlings germinate in the spring. Young plants are easily scraped with a Hula Hoe or pulled by hand.

Moderate Risk Invasive Plant Species

Tocalote (Centaurea melitensis)

Cal-IPC Pest Rating: Moderate.

Present at the project site: Yes.

This species occurs in a single location along Cheseboro Road downstream of the dam structure.

Description:

Tocalote, also known as Maltese star-thistle, is an annual plant in the sunflower family (Asteraceae) that is native to southern Europe. It is widely distributed throughout California, with larger, more problematic populations being found in central-western and southwestern regions of the state within grassland and oak woodland communities. Dense infestations of tocalote threaten natural ecosystems by displacing native plants and animals. This species has an earlier phenology (annual timing of life stages) than the closely related, more widespread yellow star-thistle (*C.solstitialis*), and generally flowers from April to June (Bossard et al., 2000). Tocalote also is similar in appearance to yellow star-thistle. As it flowers and senesces earlier in the year than yellow star-thistle, control treatments should be timed appropriately. Otherwise, mechanical and herbicidal control techniques developed and used for yellow star-thistle are also effective for tocalote infestations (DiTomaso and Healy 2007).

Control:

Prevention: When working in areas infested with tocalote, equipment (including undercarriages) should be carefully cleaned before moving to a non-infested area. The collection and export of fill soils, pasture hay, and crops from infested areas should be avoided or minimized to the maximum extent practicable.

Mechanical: Mowing can provide effective treatment of infested areas if mowed at the correct time, which is immediately after the earliest 2 to 5% of plants have begun to produce flower heads, usually in April or early May (DiTomaso and Healy 2007). Mowing too early may cause plants to become bushier and produce more flower heads. Treatments should continue for at least 2 to 3 years, after which spot eradication may be required indefinitely.

Biocontrol: Responsible rangeland management, where range is grazed by sheep, goats, or cattle to a moderate degree can help prevent establishment or spread of populations in grasslands. Infested areas can be treated by high-intensity grazing between the period when the plant bolts (April) to just before the plant produces spiny seed heads in May-June. Biocontrol insects used to control yellow star-thistle may also feed on tocalote flower heads, but are more attracted to, and better at damaging yellow star-thistle.

Fire Management: Prescribed burning of tocalote can reduce populations if timed correctly, but to avoid heavy damage to native vegetation, burns should be timed to occur after other annual plants have dried but before tocalote seeds are produced. Due to its late spring-early summer flowering period, burning may be difficult to implement for tocalote.

Herbicide: Herbicide treatments by foliar spray or wick application are generally used to control or reduce spot infestations, or as follow-up to more intensive mechanical, grazing, or fire management-based treatments.

Shortpod Mustard (*Hirschfeldia incana*)

Cal-IPC Pest Rating: Moderate.

Present at the project site: Yes.

Summer mustard is distributed at several locations along the main access road adjacent to the Reservoir.

Description:

Shortpod mustard (*Hirschfeldia incana*) is an annual or short-lived perennial forb in the mustard family (Brassicaceae) that is native to Eurasia. It matures quickly in the spring and produces a large amount of biomass in infested areas, potentially outcompeting native species through shading or an early reduction in soil moisture. Reproduction occurs by seeds, which are sticky when wet and are thus easily transferred by equipment, vehicles, or people working or traveling through infested areas when moisture is present (Brooks 2004). Similar to other invasive mustard species, shortpod mustard can build up a large, long-lived seed bank at infestation sites. This species often invades areas dominated by exotic annual grasses and can contribute to type conversion of woodlands and scrublands into annual grasslands by adding to the early season fuel load of an area, as this can increase the amount of fuel available for fires. Fire frequency and intensity can increase such that shrub and tree species can no longer establish or survive. While the species is generally considered a successional plant, and thus might be expected to decrease in density or extent with increasing time since disturbance, the typically large seed bank in combination with repeated disturbance in riparian areas or associated with heavy grazing can favor the establishment of long-term infestations (Brooks 2004).

Black mustard (*Brassica nigra*) is very similar in appearance to shortpod mustard, and the two species are often difficult to tell apart in the field. The ecological effects of black mustard invasion are virtually identical to shortpod mustard in how it impacts ecosystems, but black mustard tends to be taller, may regularly produce denser infestations than shortpod mustard, and may be more widespread. It can readily invade chaparral and sensitive coastal sage scrub habitats, contributing to increased fire frequency and intensity leading to type conversion of these habitats into annual grasslands. Deeply buried black mustard seeds may remain viable for as much as 50 years under field conditions (DiTomaso and Healy 2007).

Control:

Prevention: Disturbance and fire favor establishment of these mustard species. Additionally, shortpod mustard may be more likely to invade areas already dominated by annual grasses (Brooks 2004). Therefore, protection and sound management of remaining bunchgrass grasslands and quick eradication of initial infestations in scrub- or woodlands is recommended.

Mechanical: Black and shortpod mustard are best controlled mechanically by hand-pulling of plants each year after they have bolted but before they produce seed. The plants have a fairly weak root system, and as annuals, do not re-sprout from root fragments left in the soil. Over time, this can deplete the seed banks and allow native or grassy vegetation to dominate previously infested areas. Mowing, particularly when timing is poor, can produce plants that branch heavily from the base, and could produce even more seed than undisturbed plants.

Fire Management: Burning is not recommended for shortpod mustard control as it can damage co-occurring native vegetation due to heavy fuel loads, as well as the fact that shortpod and other exotic mustard species appear to be somewhat fire-adapted and can increase in density following fires.

Herbicide: Because early season mustards such as these emerge early in the growing season, often before native vegetation has broken dormancy, it is thought that early post-emergence herbicidal treatments may be effective for members of this group (Bossard et al. 2000), but more research is needed to develop a standardized, optimized methodology for control of these species.

Tree Tobacco (Nicotiana glauca)

Cal-IPC Pest Rating: Moderate.

Present at the project site: Yes.

This species occurs in a single location along Cheseboro Road downstream of the dam structure.

Description:

Tree tobacco is a shrub or tree in the nightshade family (*Solanaceae*), native to South America. Leaves and other structures of this species contain the highly toxic alkaloid anabasine, which can cause fetal deformities or even death in livestock that graze the plants. Tree tobacco occurs on sandy or gravelly soils, usually near streams, lakes, or ditches, although the plants are extremely drought tolerant and can withstand long periods of hot, dry weather (Guertin and Halvorson 2003). Tree tobacco plants are short-lived and the species does not appear to produce dense infestations in California (Cal-IPC, 2012), although the species is spreading throughout lower elevations of Arizona and California. While toxic to livestock, the plant is beneficial for native species such as hummingbirds and hawkmoths. Little is known about specifics of reproduction in this species, and optimal control methods are still being developed.

Control:

Prevention: In Australia, it has been observed that stem densities are significantly reduced in non-grazed plots, possibly due to the competition from native wetland vegetation (Florentine and Westbrooke 2005). As wetland areas are often grazed heavily by livestock in arid areas, protection of native emergent wetland vegetation by excluding livestock from sensitive areas may prevent seedling establishment or spread of existing infestations.

Mechanical: No mechanical methods of control other than hand-pulling are known, although cutting before herbicide application is an accepted control method for many weedy, woody species.

Herbicide: Optimal methods for control are still being developed, but glyphosate applied as foliar spray, drizzle, or as a treatment to cut-stumps all showed high levels of initial success when applied in fall (Oneto et al. 2004), although later regrowth was not assessed and other timing regimes were not compared in the 2004 publication.

C.4 Wildlife Species Observed

APPENDIX C-4 – WILDLIFE SPECIES OBSERVED IN THE STUDY AREA

Wildlife Observed in the Study Area During 2007 – 2014 Surveys

Common Name	Latin Name
REPTILES	
Southwestern pond turtle	*Actinemys marmorata*
California legless lizard	*Anniella pulchra*
Coastal whiptail	*Aspidoscelis tigris stejnegeri*
Red racer	*Coluber flagellum piceus*
Southern pacific rattlesnake	*Crotalus helleri*
San Diego nightsnake	*Hypsiglena ochrorhyncha klauberi*
California kingsnake	*Lampropeltis getula californiae*
Coast horned lizard	*Phrynosoma blainvillii*
Gopher snake	*Pituophis catenifer*
San Diego gopher snake	*Pituophis catenifer annectens*
Southwestern threadsnake	*Rena humilis humilis*
Long-nosed Snake	*Rhinocheilus lecontei*
Patch-nosed snake	*Salvadora hexalepis*
Western fence lizard	*Sceloporus occidentalis*
Two-striped garter snake	*Thamnophis hammondi*
Red-eared slider	*Trachemys scripta elegans*
California lyresnake	*Trimorphodon lyrophanes*
Western/California side-blotched lizard	*Uta stansburiana elegans*
FISH	
Bluegill	*Lepomis macrochiru*
Largemouth bass	*Micropterus salmoides*
Rainbow Trout	*Oncorhyncus mykiss*
Goldfish	*Carassius auratus auratus*
AMPHIBIANS	
Western/California toad	*Anaxyrus boreas halophilus*
Arroyo toad	*Anaxyrus californicus*
California chorus frog	*Pseudacris cadaverina*
Baja California chorus frog	*Pseudacris hypochondriaca*
Bullfrog*	*Lithobates catesbeiana*
MAMMALS	
Pallid bat	*Antrozous pallidus*
Coyote	*Canis latrans*
Big Brown Bat	*Eptesicus fuscus*
Greater bonneted bat	*Eumops perotis*
Black-tailed jackrabbit	*Lepus californicus*

Wildlife Observed in the Study Area During 2007 – 2014 Surveys

Common Name	Latin Name
Bobcat	*Lynx rufus*
California vole	*Microtus californicus*
California black bear	
Long-tailed weasel	*Mustela frenata*
California myotis	*Myotis californicus*
Western small-footed myotis	*Myotis ciliolabrum*
Yuma myotis	*Myotis yumanensis*
Desert shrew	*Notiosorex crawfordi*
Mule deer	*Odocoileus hemionus*
California ground squirrel	*Otospermophilus beecheyi*
Canyon bat	*Parastrellus hesperus*
Deer mouse	*Peromyscus maniculatus*
Mountain lion	*Puma concolor*
Raccoon	*Procyon lotor*
Desert cottontail	*Sylvilagus audubonii*
Mexican free-tailed bat	*Tadarida brasiliensis*
Botta's pocket gopher	*Thomomys bottae*
Gray fox	*Urocyon cinereoargenteus*
BIRDS	
Sharp-shinned hawk	*Accipiter striatus*
Spotted sandpiper	*Actitis macularia*
White-throated swift	*Aeronautes saxatalis*
Red-winged blackbird	*Agelaius phoeniceus*
So. Cal. rufous-crowned sparrow	*Aimophila ruficeps canescens*
Sage sparrow	*Amphispiza belli*
American wigeon	*Anas americana*
Northern shoveler	*Anas clypeata*
Mallard	*Anas platyrhynchos*
Gadwall	*Anas strepera*
Western scrub-jay	*Aphelocoma californica*
Black-chinned hummingbird	*Archilochus alexandri*
Great blue heron	*Ardea herodias*
Ring-necked duck	*Aythya collaris*
Oak titmouse	*Baeolophus inornatus*
Great horned owl	*Bubo virginianus*
Bufflehead	*Bucephala albeola*
Red-tailed hawk	*Buteo jamaicenis*
Green heron	*Butoroides virescens*
California quail	*Callipepla californica*
Anna's hummingbird	*Calypte anna*

Wildlife Observed in the Study Area During 2007 – 2014 Surveys

Common Name	Latin Name
Costa's hummingbird	*Calypte costae*
Cactus wren	*Campylorhynchus brunneicapillus*
Wilson's warbler	*Cardellina pusilla*
House finch	*Carpodacus mexicanus*
Turkey vulture	*Cathartes aura*
Vaux's swift	*Chaetura vauxi*
Wrentit	*Chamaea fasciata*
Killdeer	*Charidrius vociferus*
Lark sparrow	*Chondestes grammacus*
Lesser nighthawk	*Chordeiles acutipennis*
Western wood-pewee	*Contopus sordidulus*
Common raven	*Corvus corax*
Western flycatcher	*Empidonax difficilis*
Willow flycatcher	*Empidonax traillii*
Brewer's blackbird	*Euphagus cyanocephalus*
American kestrel	*Falco sparverius*
American coot	*Fulica americana*
Common yellowthroat	*Geothlypis trichas*
Bald eagle	*Haliaeetus leucocephalus*
Barn swallow	*Hirundo rustica*
Bullock's oriole	*Icterus bullockii*
Song sparrow	*Melospiza melodia*
California towhee	*Melozone crissalis*
Brown-headed cowbird	*Molothrus ater*
Ash-throated flycatcher	*Myiarchus cinerascens*
Black-crowned night-heron	*Nycticorax nycticorax*
Mountain quail	*Oreortyx pictus*
Orange-crowned warbler	*Oreothlypis celata*
Nashville warbler	*Oreothlypis ruficapilla*
Western screech-owl	*Otus kennicottii*
Ruddy duck	*Oxyura jamaicensis*
Lazuli bunting	*Passerina amoena*
Cliff swallow	*Petrochelidon pyrrhonota*
Phainopepla	*Phainopepla nitens*
Black-headed grosbeak	*Pheucticus melanocephalus*
Double-crested cormorant	*Phlacrocorax auritus*
Nuttall's woodpecker	*Picoides nuttallii*
Downy woodpecker	*Picoides pubescens*
Spotted towhee	*Pipilo maculatus*
Western tanager	*Piranga ludoviciana*

Wildlife Observed in the Study Area During 2007 – 2014 Surveys

Common Name	Latin Name
Summer tanager	*Piranga rubra cooperi*
Eared grebe	*Podiceps nigricollis*
Pied-billed grebe	*Podilymbus podiceps*
Bushtit	*Psaltriparus minimus*
Great-tailed grackle	*Quiscalus mexicanus*
Rock wren	*Salpinctes obsoletus*
Black phoebe	*Sayornis nigricans*
Rufous hummingbird	*Selasphorus rufus*
Yellow-rumped warbler	*Setophaga coronata*
Yellow warbler	*Setophaga petechia*
Lawrence’s goldfinch	*Spinus lawrencei*
Lesser goldfinch	*Spinus psaltria*
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Caspian tern	*Sterna caspia*
European starling	*Sturnus vulgaris*
Tree swallow	*Tachycineta bicolor*
Violet-green swallow	*Tachycineta thalassina*
Bewick’s wren	*Thryomanes bewickii*
California thrasher	*Toxostoma redivivum*
Solitary sandpiper	*Tringa solitaria*
House wren	*Troglodytes aedon*
Western kingbird	*Tyrranus verticalis*
Barn owl	*Tyto alba*
Least Bell's vireo	*Vireo bellii pusillus*
Warbling vireo	*Vireo gilvus*
Mourning dove	*Zenaida macroura*

C.5 Plant and Wildlife Descriptions

APPENDIX C-5 – PLANT AND WILDLIFE DESCRIPTIONS SPECIES ACCOUNTS

Plants With the Potential to Occur

California androsace (*Androsace elongata* ssp. *acuta*)

Status: California androsace has a CRPR 4.2, and is a U.S. Forest Service Watch List species. This species is not federally or State listed as threatened or endangered.

General Distribution: This species occurs from Oregon, throughout California, and into Baja California at elevations of 492 to 3,936 ft.

Distribution in the Study Area: There are several populations on the foothill desert slopes of the San Gabriel and Liebre Mountains. Suitable habitat is present.

Habitat and Habitat Associations: California androsace occurs in coastal scrub, chaparral, cismontane woodland, meadows and seeps, and valley and foothill grassland habitats.

Natural History: California androsace is an annual herb that is highly localized and often overlooked; many occurrences have been extirpated and it is very rare in Southern California. It flowers from March through June.

Threats: California androsace is possibly threatened by grazing, trampling, non-native plants, alteration of fire regimes, and recreational activities. It may also be threatened by wind energy development.

Slender silver moss (*Anomobryum julaceum*)

Status: Slender silver moss has a CRPR 2.2 This species is not federally or State listed as threatened or endangered.

General Distribution: This species occurs infrequently in California, but is abundant in Oregon. It can be found on road cuts at elevations of 300 to 3,000 feet.

Distribution in the Study Area: This species is represented in southern California from a single collection made from the high elevations of the San Gabriel Mountains. Suitable habitat is present in the project area.

Habitat and Habitat Associations: Slender silver moss grows on mesic soils and rocks along creeks in broadleaf and coniferous forests.

Natural History: Slender silver moss is a non-vascular moss.

Threats: This species may be threatened by human activities such as vehicle use, since it is often found along road cuts.

San Gabriel manzanita (*Arctostaphylos gabrielensis*)

Status: San Gabriel manzanita has a CRPR 1B.2, FSS This species is not federally or State listed as threatened or endangered.

General Distribution: This species is endemic to the San Gabriel Mountains near Mill Creek Summit, with an elevation range of 1900 to 5000 feet.

Distribution in the Study Area: This species is known from the upper watershed but the project area is below the elevation range for this species. It has a low potential to disperse into the project area from the upper watershed.

Habitat and Habitat Associations: San Gabriel manzanita is a large perennial evergreen shrub that grows on rocky chaparral habitats.

Natural History: San Gabriel manzanita blooms in March.

Threats: The primary threat to this species is development.

Palmer's mariposa lily (*Calochortus palmeri* var. *palmeri*)

Status: Palmer's mariposa lily has a CRPR 1B.2, and is designated a U.S. Forest Service Sensitive species. This species is not federally or State listed as threatened or endangered.

General Distribution: This species is endemic to California, and has been found in Kern, Los Angeles, Riverside, Santa Barbara, San Bernardino, San Luis Obispo, and Ventura counties. It occurs at elevations of 3,281-7,841 ft.

Distribution in the Study Area: This species was not observed during recent surveys but is known from the general area.

Habitat and Habitat Associations: Palmer's mariposa lily is found in wet meadows and seeps in lower montane coniferous forest and chaparral habitats.

Natural History: Palmer's mariposa lily is a perennial bulb that blooms from May through July.

Threats: This species is threatened by development, grazing, non-native plants, recreational activities and vehicles (CNPS, 2012).

Plummer's mariposa lily (*Calochortus plummerae*)

Status: Plummers's mariposa lily is a CRPR List 1B.2 species and is considered a U.S. Forest Service Sensitive species. This species is not federally or State listed as threatened or endangered.
General Distribution: Plummer's mariposa lily is known to occur in Riverside, San Bernardino, Orange, Los Angeles, and Ventura counties at elevations between 100 and 1,700 meters AMSL.

Distribution in the Study Area: This species was not documented within the Vegetation Study Area. The project is just outside of the known geographic range for this species but suitable habitat is present within the Vegetation Study Area.
Habitat and Habitat Associations: This bulbiferous herb is typically found in chaparral, coastal scrub, cismontane woodland, lower montane coniferous forest, and grassland, often on granitic and/or rocky soils, and blooms between May and July (CNPS, 2012).

Natural History: Perennial bulbs, including Plummer's mariposa lily, may persist below ground without producing flowers or even leaves during years of poor rainfall or other environmental causes. This species is identified by its (usually) toothed petal margins; petals covered with long yellow hairs inside; and its round, slightly depressed nectar gland at the base of each petal surrounded by hairs but without hairs on the nectary surface itself (Hickman, 1993). Seed dispersal for Calochortus is limited, with no obvious adaptations for wind or animal dispersal; fruits are capsular and borne close to the ground, with relatively heavy, passively dispersed seeds that lack fleshiness, sticktights, or (except in one species) wings (Patterson and Givnish, 2003). Typically, Calochortus flowers are generalists in terms of their pollinators, although bees have been observed to be the primary pollinator in some Calochortus species, such as Lyall's mariposa lily (*C. lyallii*) (Dilley *et al.*, 2000; Miller, 2000).

Threats: In addition to the direct loss of individuals, Plummer's mariposa lily is vulnerable to several effects related to urbanization. Non-native plant species, which compete for light, water, and nutrients, have been found to invade native vegetation communities and become established after repeated burnings, changes in surface and subsurface hydrologic conditions (changes in irrigation and runoff), use of chemical pollutants, clearing of vegetation, trampling, or following periods of drought and overgrazing, all of which are possible side effects of nearby human habitation. The successful invasion of exotic plant species may alter habitats and displace native species over time, leading to extirpation of natives such as the Plummer's mariposa lily.

Alkali mariposa lily (*Calochortus striatus*)

Status: Alkali mariposa lily has a CRPR 1B.2 and is designated a U.S. Forest Service Sensitive species. This species is not federally or State listed as threatened or endangered.

General Distribution: The geographic range of Alkali mariposa lily includes the southern Sierra Nevada; the western, central and southern Mojave Desert; the north base of the San Bernardino Mountains; the southern San Joaquin Valley; and disjunctly in southern Nevada. It occurs at elevations between 230ft and 5,232 feet.

Distribution in the Study Area: The species is known from alkaline soils in the Mojave Desert. Poor quality habitat was observed at the northern end of the haul roads but it is not expected in the project area.

Habitat and Habitat Associations: Alkali mariposa lily occurs in seasonally moist alkaline areas of arid lands (alkali meadows, ephemeral washes, vernally moist depressions, seeps; Fiedler, 1985) in chaparral, chenopod scrub, and Mojavean desert scrub of southern California and southern Nevada.

Natural History: It is a perennial growing from a bulb; it has two or three slender, grass-like leaves that wither by the time the plant flowers (April through June). The flowers about 20-30 mm long, white to lavender with conspicuous purple veins. In dry years, the bulbs may remain dormant and no plants may be visible above-ground. It is threatened by the lowering of water tables, urbanization, trampling or grazing by cattle, and perhaps competition with native and non-native grasses (Greene and Sanders, no date).

Threats: Alkali mariposa lilies face threats from urbanization, grazing, trampling, road construction, hydrological alterations, and water diversions that result in the lowering of the water table (CNPS, 2012).

Peirson's morning-glory (*Calystegia peirsonii*)

Status: Peirson's morning glory has a CRPR 4.2. This species is not federally or State listed as threatened or endangered.

General Distribution: It is a rhizomatous perennial herb occurring in the San Gabriel and Liebre Mountains and the Antelope Valley of Los Angeles County (Allan et al., 1995), from about 100 ft. to 5000 feet elevation.

Distribution in the Study Area: This species was not observed during recent surveys but is known from the general area.

Habitat and Habitat Associations: It is a perennial vine found climbing over shrubs in coastal sage scrub, chaparral, and woodlands, often in the first few years following wildfire. It was known only from a few collections prior to 1970, but it is fairly common in the Newhall-Mint Canyon region (Boyd, 1999).

Natural History: This perennial vine blooms from April to June.

Threats: Primary threats to this species include grazing and development (CNPS, 2012).

Pygmy poppy (*Canbya candida*)

Status: Pygmy poppy has a CRPR 4.2 and is designated a U.S. Forest Service Sensitive species. This species is not federally or State listed as threatened or endangered.

General Distribution: Pygmy poppy is found in the foothills of the south-eastern Sierra Nevada range, the San Gabriel and San Bernardino Mountains, and in the Antelope Valley. It occurs at elevations of 1,968-4,790 feet.

Distribution in the Study Area: Suitable habitat is preset within the Vegetation Study Area and numerous historic records are known from the area.

Habitat and Habitat Associations: Pygmy poppy occurs in Joshua tree woodland, Mojavean desert scrub, or pinyon and juniper woodland habitats with gravelly, granitic, or sandy soils.

Natural History: Pygmy poppy is an annual herb of desert shrublands, only one or a few centimeters wide and tall. It may flower between March and June, depending on rainfall, and may not germinate at all in dry years.

Threats: This species may be threatened by land use changes, vehicles, and invasive non-native plants (CNPS, 2012).

Mt. Gleason Indian paintbrush (*Castilleja gleasonii*)

Status: Mt. Gleason Indian paintbrush has a CRPR 1B.2, is State-listed as Rare, and is designated a U.S. Forest Service Sensitive species. This species is not federally or State listed as threatened or endangered.

General Distribution: Mt. Gleason Indian paintbrush is endemic to the San Gabriel Mountains of Los Angeles County.

Distribution in the Study Area: This species is known from higher elevation of the San Gabriel Mountains but several collections from lower elevations have been made. Suitable habitat is present.

Habitat and Habitat Associations: This species grows in rocky places within lower montane coniferous forest and pinyon and juniper woodland communities at elevations of 3800 to 7,120 feet (CNPS, 2007).

Natural History: Mt. Gleason Indian paintbrush is a perennial hemi-parasitic herb in the figwort family (Scrophulariaceae) that blooms from May to June.

Threats: Threats to this species include recreational activities such as fuel wood harvesting, off-highway vehicle activities, and close proximity to trails and campgrounds (CNPS, 2007).

Mojave Indian paintbrush (*Castilleja plagiotoma*)

Status: Mojave Indian paintbrush has a CRPR 4.3 and is designated a U.S. Forest Service Sensitive species. This species is not federally or State listed as threatened or endangered.

General Distribution: Mojave paintbrush is endemic to California, and is found in Kern, Los Angeles, San Bernardino, and San Luis Obispo counties at elevations between 984 and 8,200 feet.

Distribution in the Study Area: This species was not detected during recent surveys but suitable habitat is present within the Vegetation Study Area and it is known from the general vicinity.

Habitat and Habitat Associations: Mojave paintbrush is associated with Great Basin scrub, Joshua tree woodland, lower montane coniferous forest, and pinyon and juniper woodland habitats.

Natural History: Mojave paintbrush is a hemi-parasitic, perennial herb that blooms from April through June.

Threats: Threats to this species include recreational activities and road maintenance (CNPS, 2012).

San Fernando Valley spineflower (*Chorizanthe parryi* var*. fernandina*)

Status: San Fernando Valley spineflower has a CRPR 1B.1 and is designated a U.S. Forest Service Sensitive species. It is listed as Endangered under the California Endangered Species Act and is a Candidate for federal listing.

General Distribution: It was historically known from the foothills surrounding the San Fernando Valley in Los Angeles County and from one site in Orange County. It had been presumed extinct, but was rediscovered on the Ahmanson Ranch in 1999 (Ventura County) in 1999 (Boyd, 2001). Since then it has been discovered at Newhall Ranch (Los Angeles County; FWS, 2002) and there are historic records from Newhall and Castaic (Boyd, 1999). It occurs at elevations of 490 to 4,000 feet.

Distribution in the Study Area: The project area is outside of the historic range of the species; however, suitable habitat is present.

Habitat and Habitat Associations: This species is found in sandy places, generally in coastal or desert shrublands; historically from San Fernando Valley, adjacent foothills, and coastal Orange County; it is now known only in E Ventura and W Los Angeles Counties; its habitat is open shrubland, generally on mesas or moderate slopes, in fine, silty sedimentary soils. It may also occur on alluvial benches or as occasional waifs in washes.

Natural History: San Fernando Valley spineflower is a low-growing annual species, flowering between April and June. It persists as long as a year after flowering season due to its wiry structure, and can be identified by its characteristic long straight spines even in dried condition.

Threats: This species is seriously threatened by development and non-native plants; most of its historical habitat is heavily urbanized.

California satintail (*Imperata brevifolia*)

Status: California satintail has a CRPR 2.1. This species is not federally or State listed as threatened or endangered.

General Distribution: California satintail occurs throughout the southwest U.S. at elevations below 4,000 feet. In California, it is known from only four extant occurrences, in Ventura, Los Angeles, and San Bernardino counties.

Distribution in the Study Area: Suitable habitat is present within the Vegetation Study Area but it was not detected during recent surveys and is not known from the area.

Habitat and Habitat Associations: Meadows and seeps within chaparral, coastal scrub, and Mojavean desert scrub communities.

Natural History: California satintail is a perennial grass that blooms from September to May.

Threats: Agriculture and development are threats to this species (CNPS, 2012).

Ocellated Humboldt lily (*Lilium humboldtii* ssp. *ocellatum*)

Status: Ocellated Humboldt lily has a CRPR of 4.2 and is a U.S. Forest Service Watch List species. This species is not federally or State listed as threatened or endangered.

General Distribution: It grows in shaded riparian woodlands of the Coast Ranges, Peninsular Ranges, and Transverse Ranges, from San Luis Obispo County to San Diego County, and inland to the San Bernardino and San Jacinto Mountains. Its elevation range is from just above sea level to about 6000 feet.

Distribution in the Study Area: This species is known from deep shaded canyons throughout the San Gabriel Mountains but it was not detected during recent surveys and is not known from the area.

Habitat and Habitat Associations: Riparian woodland openings within chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest communities; generally on gravelly soils within gullies.

Natural History: Depending on elevation, it may flower as early as March, but generally flowers in early to mid-summer in montane habitats.

Threats: This species may be threatened by development and horticultural collecting.

Lemon lily (*Lilium parryi*)

Status: Mojave Indian paintbrush has a CRPR 1B.2 and is designated a U.S. Forest Service Sensitive species. This species is not federally or State listed as threatened or endangered.

General Distribution: Lemon lily can be found in suitable habitats with elevations of 4,000 to 9,000 feet.

Distribution in the Study Area: Known from the upper reaches of the drainage but the project area is below the elevation range for this species and the project area lacks suitable habitats.

Habitat and Habitat Associations: Lemon lily can be found in meadows and seeps within lower and upper montane coniferous forests communities.

Natural History: Lemon lily is a perennial bulb that blooms from July to August.

Threats: Threats to this species include horticultural collecting, water diversion, recreational activities, and grazing (CNPS, 2012).

San Gabriel linanthus (*Linanthus concinnus*)

Status: San Gabriel linanthus has a CRPR 1B.2 and is designated a U.S. Forest Service Sensitive species. This species is not federally or State listed as threatened or endangered.

General Distribution: This species is endemic to the San Gabriel Mountains of southern California, occuring at elevations of 5,000 to 9,200 feet.

Distribution in the Study Area: Known from higher elevation areas of the San Gabriel Mountains, the project area is well below the elevation range of the species.

Habitat and Habitat Associations: San Gabriel linanthus is associated with dry rocky slopes within chaparral and montane coniferous forest communities.

Natural History: San Gabriel linanthus is an annual herb that blooms from April to July.

Threats: This species is threatened by recreational activities and road maintenance.

Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*)

Status: Sagebrush loeflingia has a CRPR 2.2. This species is not federally or State listed as threatened or endangered.

General Distribution: Sagebrush loeflingia is widespread at scattered locations in California deserts and more common to the east (Nevada) at elevations of 2,200 to 5,300 feet.

Distribution in the Study Area: The species is known from very few locations in the vicinity of alkali flats to the north of the project area. Poor quality habitat was observed at the northern end of the haul roads but it is not expected in the project area.

Habitat and Habitat Associations: Sagebrush loeflingia is found in sandy soils (dunes) in Great Basin scrub and Sonoran desert scrub.

Natural History: It is an annual herb, flowering in April or May, depending on rainfall. Like most desert annuals, it may not germinate at all during drought years.

Threats: This species may be threatened by grazing and vehicles.

Peirson's lupine (*Lupinus peirsonii*)

Status: Peirson’s lupine has a CRPR 1B.3 and is designated a U.S. Forest Service Sensitive species. This species is not federally or State listed as threatened or endangered.

General Distribution: This species is known only from the San Gabriel Mountains, at elevations of 3,200 to 8,200 feet.

Distribution in the Study Area: This species is not known from the project vicinity but it is known from the upper reaches of the watershed, could be present within the vegetation study area as a wash-down waif species.

Habitat and Habitat Associations: Peirson's lupine occurs on gravelly or rocky slopes within Joshua tree woodland, lower and upper montane coniferous forest, and pinyon and juniper woodland communities.

Natural History: This species is a perennial herb that blooms from April to May.

Threats: This species may be threatened by development in the San Gabriel Mountains.

Davidson's bush-mallow (*Malacothamnus davidsonii*)

Status: Davidson's bush-mallow has a CRPR 1B.2. This species is not federally or State listed as threatened or endangered.

General Distribution: Its geographic range is the western margin of the San Gabriel Mountains and San Fernando Valley (Allan et al., 1995) and reportedly from the central coast ranges (Monterey and San Luis Obispo Counties; Tibor, 2001); between about 600 and 2,800 feet elevation.

Distribution in the Study Area: There are very few records of this species within the general vicinity of the project area.

Habitat and Habitat Associations: Davidson's bush-mallow occurs in chaparral, coastal sage scrub, cismontane woodland, riparian woodland, and open sandy alluvial benches and washes.

Natural History: Davidson's bush-mallow is a shrub that flowers in summer (June - September) but can be identified without flowers, by characteristics of its stems and leaves.

Threats: In Los Angeles County, this species may be threatened by urbanization (CNPS, 2012).

Robbins' nemacladus (*Nemacladus secundiflorus* var. *robbinsonii*)

Status: Robbins' nemacladus has a CRPR 1B.2. This species is not federally or State listed as threatened or endangered.

General Distribution: Known occurrences of this species have been recorded as far north as San Benito Canyon, and as far south as the San Gabriel Mountains, at elevations of 875 to 4250 feet.

Distribution in the Study Area: The subspecies is known from a single location in the San Gabriel Mtns, east of the Project Area. No suitable habitat is present.

Habitat and Habitat Associations: This species can be found in openings in chaparral and foothill grasslands.

Natural History: Robbins' nemacladus is an annual herb that blooms from April through June.

Threats: Road maintenance and widening may be a threat to this species (CNPS, 2012).

Woolly mountain-parsley (*Oreonana vestitia*)

Status: Wooly mountain parsley has a CRPR 1B.3 and is designated a U.S. Forest Service Sensitive species. This species is not federally or State listed as threatened or endangered.

General Distribution: Wooly mountain-parsley occurs at elevations of 6,500 to 11,500 feet in the San Gabriel and San Bernardino mountains, as well as near Walker Pass.

Distribution in the Study Area: This species is not known from the project vicinity and the project area is well below the elevation range of this species.

Habitat and Habitat Associations: This species grows along ridge tops and on rocky soils such as dry gravel or talus in lower and upper montane coniferous forest and subalpine coniferous forest.

Natural History: Wooly mountain-parsley is a perennial herb that blooms from March to September.

Threats: Threats to this species include foot traffic and recreational activities within its habitat (CNPS, 2012).

Rock Creek broomrape (*Orobanche valida* ssp. *valida*)

Status: Rock Creek broomrape has a CRPR 1B.2 and is designated a U.S. Forest Service Sensitive species. This species is not federally or State listed as threatened or endangered.

General Distribution: In California, this species has occurs in the San Gabriel and the Topatopa Mountains, at elevations of 4,000 to 7,000 feet.

Distribution in the Study Area: This species is not known from the project vicinity and the project area is below the elevation range of this species.

Habitat and Habitat Associations: Rock Creek broomrape grows on granitic soils within chaparral and pinyon and juniper woodland communities.

Natural History: Rock Creek broomrape is a parasitic, perennial herb that blooms from May through July.

Threats: This species may possibly be threatened by non-native plants and recreational activities (CNPS, 2012).

Mason's neststraw (*Stylocline masonii*)

Status: Mason's neststraw is a federal species of concern and has a CRPR 1B.1.

General Distribution: Mason's neststraw is known only from the southern San Joaquin Valley and adjacent inner coastal ranges (Morefield, 1992) and the desert slopes of the Liebre Mountains in Los Angeles County (Ross and Boyd, 1996), between 300 and 1300 feet in elevation (and rarely to almost 4000 feet).

Distribution in the Study Area: This species is not known from the project vicinity but suitable habitat is present.

Habitat and Habitat Associations: Mason's neststraw occurs in open, dry sandy soils in juniper woodland or saltbush scrub vegetation.

Natural History: Mason's neststraw is a diminutive ephemeral annual herb that flowers between March and May.

Threats: A major threat to Mason's neststraw is disturbances from land use conversion.

Greata's aster (*Symphytotrichum greatae*)

Status: Greata's aster has a CRPR 1B.3. This species is not federally or State listed as threatened or endangered.

General Distribution: Its geographic range is the Liebre and San Gabriel Mountains, between about 1000 and 6600 feet elevation.

Distribution in the Study Area: Greata's aster is known from the upper watershed and although the habitat in the project area is not ideal, it has some potential to occur.

Habitat and Habitat Associations: Greata's aster generally occurs along streams, near springs, or where ground water nears the surface in chaparral, woodlands, and lower montane forests.

Natural History: This species is a tall, perennial herb with daisy-like flowers, which blooms from June through October.

Threats: Greata's aster is threatened by recreational activities, trail maintenance, and non-native plants (CNPS, 2012).

Wildlife With the Potential to Occur

Invertebrates

Trask shoulderband snail (*Helminthoglypta traskii*)

Status: The trask shoulderband snail is considered a CDFW Special Animal. This taxon is not federally or State listed as threatened or endangered.

General Distribution: This snail is a southern California endemic, known from Ventura, Los Angeles, Orange, and San Diego Counties (Magney, 2005).

Distribution in the Study Area: Although there are no known records from the Study Area, the Study Area is located within the known geographic distribution for this species. Suitable habitat occurs throughout the Study Area. All areas of suitable habitat should be considered potentially occupied.

Habitat and Habitat Associations: Trask shoulderband snails are terrestrial and occur in a variety of habitats, including coastal sage scrub, chaparral, oak woodland, and riparian woodland.

Natural History: Haplotrema is a genus of predatory, air-breathing terrestrial snails. The shells of these snails vary in size from relatively small to medium and usually consist of a low, flattened spire and very wide umbilicus. The structure of the radula, or teeth, is unusual in this genus. The haplotrematids have fewer cusps than most snails, but they are considerably elongated (hence the name "lancetooth"), suitable for predatory behavior. The known diet of these snails consists entirely of other terrestrial mollusks (Pilsbry, 1946).

Members of the genus Helminthoglypta are air-breathing, terrestrial snails. Shells are relatively medium to large in size, with no apertural teeth, but usually with a reflected apertural lip. These snails possess a single dart apparatus with one stylophore (dart sac) and two mucus glands which are utilized to create love darts. Love darts, shaped in many distinctive ways which vary considerably between species, are hard, sharp, calcareous or chitinous darts that are used as part of the sequence of events during courtship before actual mating takes place.

Threats: There are no identified threats to these species.

San Emigdio blue butterfly (*Plebulina emigdionis*)

Status: The San Emigdio blue butterfly is designated by CDFW as a California Special Animal. This taxa is not federally or State listed as threatened or endangered.

General Distribution: The San Emigdio blue butterfly is restricted to southern California in lower Sonoran and riparian habitats from the Owens Valley south to the Mojave River, and west to northern Ventura and Los Angeles Counties. The primary location where this species has been collected is along the Mojave River near Victorville, but isolated colonies have been reported in Bouquet and Mint canyons near Castaic, in canyons along the north side of the San Gabriel Mountains near the desert's edge, and in arid areas south of Mount Abel near San Emigdio Mesa (Emmel and Emmel, 1973; Murphy, 1990).

Distribution in the Study Area: There are no known recent records for this species in the Study Area. The Study Area is located within the known geographic distribution for this species. Suitable habitat occurs within limited portions of the Study Area.

Habitat and Habitat Associations: This butterfly can be locally abundant in association with its primary host plant, four-wing saltbush (*Atriplex canescens*), but has also been observed in association with quail brush (*A. lentiformis*).

Natural History: Although its primary host plant is widespread throughout the western United States, the distribution of the San Emigdio blue butterfly is much more localized, suggesting that other factors may determine habitat suitability (Murphy, 1990). For example, habitat suitability may, at least in part, be attributed to a suspected symbiotic relationship with at least one ant species, Formica pilicornis (Ballmer and Pratt, 1991). These ants presumably extract droplets containing glucose and amino acids from the nectary glands of San Emigdio blue butterfly larvae and provide the butterfly larvae protection from predators.

San Emigdio blue butterfly adults are active from late April to early September. The species can have up to three broods per year, with the first brood generally occurring in late April to May, the second brood in late June to early July, and the third brood in August to early September (Emmel and Emmel, 1973). Adults are generally observed perching on their host plant or other plants in the immediate vicinity, and nectaring on nearby flowers.

Threats: The San Emigdio blue butterfly has a limited distribution and often occurs in small, isolated colonies. These characteristics make colonies vulnerable to direct and indirect habitat disturbance, given the limited extent of occupied habitat and limited potential for recolonization. Many colonies in the Mojave Desert and Owens Valley are isolated from anthropogenic disturbances, but other colonies found closer to growing urban areas may be situated near major roads, railroad tracks, and other developments, which may contribute to further decline.

Amphibians

Arroyo Toad (*Anaxyrus californicus*)

Status: The arroyo toad is listed as federally endangered by the USFWS and is a CDFW Species of Special Concern. This species is considered a Forest Service Sensitive Species.

General Distribution: The distribution of arroyo toads historically extended from the upper Salinas River system in San Luis Obispo County south into coastal Baja California (Jennings and Hayes, 1994). Adults are primarily nocturnal and usually active between the first major rains in January and February to early August (Cunningham, 1962). After males emerge from stream terrace over-wintering sites, they precede females to breeding pools and call nightly from February or March through July (Holland and Goodman, 1998).

Distribution in the Study Area: Occurrences of this species is well documented within the Study Area. Most recently, arroyo toads were detected south of Rocky Point during focused surveys conducted in 2011. The Study Area is located within the known geographic distribution for this species (CDFG, 2008). Suitable habitat occurs in the southern extent of the Study Area within the confines of Littlerock Creek, areas of Littlerock Creek upstream of the Study Area, and within Santiago Creek. This species has the potential to move into the Reservoir area as the water level recedes. All areas of suitable habitat are considered potentially occupied however this species has not been detected below Rocky Point as of 2014.

Habitat and Habitat Associations: Arroyo toads have one of the most specialized breeding habitat requirements of any amphibian in California. Adults require overflow pools adjacent to the inflow channel of streams that are generally 3rd order or greater and generally free of predators. Normally, shallow pools with sandy or gravely bottoms surrounded by little woody vegetation are preferred. However, Aspen has observed this species breeding in flooded pools and along the margins of the reservoir above Rocky Point. Regular disturbance in the form of flooding is required to maintain areas of sparsely vegetated, sandy stream channels and terraces, which are used by adults and subadults for foraging and burrowing (USFWS, 2001). Outside the breeding season, arroyo toads use a wide range of habitats in both upland (to a distance of at least 3,740 feet from the upland-riparian ecotone) and riparian areas (Holland and Sisk, 2001). Upland habitats used by arroyo toads include coastal sage scrub, chaparral, oak woodland, grassland, riparian, and agricultural habitats (Griffin, 1999; USFWS, 2001).

Natural History: The arroyo toad is a medium-sized toad, and adults range from 2.2 to 2.6 inches in length (USFWS, 1999). Dorsal coloration ranges from cream to light gray to light greenish-gray. Formerly considered a subspecies of the southwestern toad (*B. microscaphus*), the arroyo toad was elevated to full species status by Gergus (1998). Arroyo toads typically begin migrating to breeding sites in February or March, and migrations continue through July (Holland and Goodman, 1998). Males produce a trilling call from suitable breeding sites along the stream to attract females. When a female approaches, the male clasps the female across the abdomen (amplexus). The female arroyo toad then deposits 2,000 to 10,000 eggs in two long strands that are fertilized externally by the amplectic male (Sweet 1991 in Jennings and Hayes, 1994). Larvae require 65 to 85 days to complete metamorphosis (Jennings and Hayes, 1994; Holland and Goodman, 1998), at which time they are approximately 0.5 to 0.9 inches in length (Holland and Goodman, 1998). Even newly metamorphic individuals are able to burrow into loose sand. Juveniles initially remain near the natal pool until reaching a length of about 1.2 inches, when they may begin dispersing into adjacent riparian vegetation and become nocturnal (Jennings and Hayes, 1994; Holland and Goodman, 1998). Sexual maturity is typically attained in 2 years, though males can reach maturity in one year under favorable environmental conditions (Jennings and Hayes, 1994).

Jennings and Hayes (1994) stated that the arroyo toad has been extirpated from 76 percent of its total historic range in the United States (which is limited to California). They cite loss of habitat to agriculture and urbanization, changes to the hydrological regime in streams and rivers within their historic range, and predation from introduced aquatic species as significant factors in the decline of the arroyo toad. Those and other factors, such as human use and disturbance in and near aquatic habitats (e.g., campgrounds, off-road vehicle use), placer mining, and cattle grazing are threats to remaining populations (Jennings and Hayes, 1994). Additionally, fire and drought have produced severe declines in populations that are already stressed (Jennings and Hayes, 1994).

Threats: Major threats to this species include the direct loss of aquatic, riparian, and upland habitat, alteration of natural flow regimes, water pollution, and the introduction of exotic predators. Invasion of exotic plant species can also degrade arroyo toad habitat by altering natural flow regimes (USACE and CDFG, 2010). In the project area threats include non-native fish and illegal OHV activity.

Mountain (foothill) yellow-legged frog (*Rana boylii*)

Status: Mountain yellow-legged frog is a CDFW Species of Special Concern. This species is not federally or State listed as threatened or endangered.

General Distribution: Range includes Pacific drainages from the upper reaches of the Willamette River system, Oregon (west of the Cascades crest), south to the upper San Gabriel River, Los Angeles County, California, including the Coast Ranges and Sierra Nevada foothills in the United States (Stebbins, 2003). The species occurred at least formerly in a disjunct location in northern Baja California. [Natureserve, 2012]

Distribution in the Study Area: Although suitable habitat occurs within portions of the Study Area, it is outside the known range of this subspecies.

Habitat and Habitat Associations: In the mountains of southern California, inhabits rocky streams in narrow canyons and in the chaparral belt from 984 ft. to over 12,000 ft. in elevation. [CaliforniaHerps, 2011]

Natural History: This small frog differs from the related red-legged frog in having yellow on its hind limbs and having no well-developed dorsolateral folds (Natureserve, 2012). Most often found in or close to water and preys on a variety of terrestrial and aquatic invertebrates with mating and egg laying activities taking place from March – May (CaliforniaHerps, 2011).

Threats: Primary threats to this species include predation by non-native amphibians and fish, cattle grazing, off highway vehicle use, excessive flooding and poor water quality.

Western spadefoot (*Spea hammondii*)

Status: The western spadefoot toad is a CDFW Species of Special Concern. This species is not federally or State listed as threatened or endangered.

General Distribution: The western spadefoot toad is endemic to California and northern Baja California. The species ranges from the north end of California's great Central Valley near Redding, south, east of the Sierras and the deserts, into northwest Baja California (Jennings and Hayes, 1994; Stebbins, 2003; all as cited in USACE and CDFG, 2010).

Distribution in the Study Area: There are no known records for this species in the Study Area within a 15 mile radius. The Study Area is located just outside the known geographic distribution for this species. Pockets of suitable habitat occur within the Study Area.

Habitat and Habitat Associations: Although the species primarily occurs in lowlands, it also occupies foothill and mountain habitats. Within its range, the western spadefoot toad occurs from sea level to 1,219 meters (4,000 feet) AMSL, but mostly at elevations below 910 meters (3,000 feet) AMSL (Stebbins, 2003; as cited in USACE and CDFG, 2010). Holland and Goodman (1998) report that riparian habitats with suitable water resources may also be used. The species is most common in grasslands with vernal pools or mixed grassland/coastal sage scrub areas (Holland and Goodman, 1998; as cited in USACE and CDFG, 2010).

Natural History: The western spadefoot toad is almost completely terrestrial, remaining underground eight to 10 months of the year and entering water only to breed (Jennings and Hayes, 1994; Holland and

Goodman, 1998; Storey *et al.*, 1999; all as cited in USACE and CDFG, 2010). The species aestivates in upland habitats near potential breeding sites in burrows approximately one meter in depth (Stebbins, 1972) and adults emerge from underground burrows during relatively warm rainfall events to breed. While adults typically emerge from burrows from January through March, they may also emerge in any month between October and April if rain thresholds are met (Stebbins, 1972; Morey and Guinn, 1992; Jennings and Hayes, 1994; Holland and Goodman, 1998; all as cited in USACE and CDFG, 2010).

Eggs are deposited in irregular small clusters attached to vegetation or debris (Storer, 1925; as cited in USACE and CDFG, 2010) in shallow temporary pools or sometimes ephemeral stream courses (Stebbins, 1985; Jennings and Hayes, 1994; all as cited in USACE and CDFG, 2010) and are usually hatched within six days. Complete metamorphosis can occur rapidly, within as little as three weeks (Holland and Goodman, 1998; as cited in USACE and CDFG, 2010), but may last up to 11 weeks (Burgess, 1950; Feaver, 1971; Jennings and Hayes, 1994; all as cited in USACE and CDFG, 2010).

Western spadefoot toads likely do not move far from their breeding pool during the year (Zeiner *et al.*, 1988; as cited in USACE and CDFG, 2010), and it is likely that their entire post-metamorphic home range is situated around a few pools. However, opportunistic field observations indicate that they readily move up to at least several hundred meters from breeding sites (NatureServe, 2012).

Threats: Loss of aquatic and adjacent upland habitats supporting the life cycle of the western spadefoot toad is a primary threat to this species, but other factors related to urban development probably are contributing to this species' decline.

Coast Range newt (*Taricha torosa torosa*)

Status: The Coast Range newt is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The Coast Range newt occurs along the coast ranges of California, from Mendocino County south to Los Angeles County and disjunctly south to the Cuyumaca Mountains in San Diego County (NatureServe, 2012). This subspecies has also been recorded along the southern Sierra Nevada from Tulare County to Kern County (Kuchta and Tan, 2006).

Distribution in the Study Area: Suitable habitat occurs onsite. Nearest recorded occurrence is approximately 14.5 miles southeast of the Study Area in the west fork of Bear Creek.

Habitat and Habitat Associations: This subspecies breeds in ponds, reservoirs, and streams. Terrestrial adults occupy various adjacent upland habitats, including grasslands, woodlands, and forests (NatureServe, 2012).

Natural History: The Coast Range newt belongs to the genus *Taricha*, whose members are readily distinguishable from all other western salamanders by a distinctive tooth pattern, lack of costal grooves, and rough skin (except in breeding males) (Stebbins, 2003). Migration towards suitable breeding grounds usually occurs at night following the first rains in the fall (CDFG, 2008). Upon arriving at breeding sites, adults become aquatic and may remain at these sites for several weeks. Breeding typically occurs between December and May with optimal peaks between February and April (NatureServe, 2012). Adults migrate back to subterranean refuges during the spring and remain at these aestivation sites through the summer. Larvae normally transform in the summer or fall, or when water dries up, of their first year (CDFG, 2008). Metamorphosed individuals feed on earthworms, snails, slugs, sow bugs, and various other invertebrates. Some adults, especially females may consume conspecific eggs. Larvae eat small aquatic organisms and decomposing organic material (Stebbins, 1951).

Threats: This subspecies has suffered marked population declines likely due to the introduction of exotic predators, including green sunfish (*Lepomis cyanellus*), mosquito fish, and crayfish (*Procambarus* sp.) (Stebbins, 2003).

San Gabriel Mountains slender salamander (*Batrachoseps gabrieli*)

Status: The San Gabriel Mountains slender salamander is a U.S. Forest Service Sensitive Species. This taxon is not federally or State listed as threatened or endangered.

General Distribution: This species is known from select localities in the San Gabriel Mountains and the Mt. Baldy area of Los Angeles County and the western end of the San Bernardino Mountains in San Bernardino Co., with an elevation range of 1,200 -5,085 feet (Stebbins, 2003).

Distribution in the Study Area: The San Gabriel slender salamander is not known to occur in Study Area but could potentially utilize Littlerock Creek and adjacent riparian areas. The Study Area is outside of the known range of this species but it is known from the portions of the San Gabriel Mountains to the south of the Study Area.

*Habitat and Habitat Association*s: This species occurs on talus slopes surrounded by a variety of conifer and montane hardwood species, including bigcone spruce, pine, white fir, incense cedar, canyon live oak, black oak, and California laurel (Wake, 1996; Stebbins, 2003).

Natural History: Known to seek cover in cavities below talus rocks and under logs. Because of the need for moisture, near-surface activity is probably limited to a few winter and early spring months (Wake, 1996). Summer and fall drought probably cause individuals to retreat deep into the talus slope (Wake, 1996).

Threats: Habitat degradation is the main threat to this species.

Reptiles

Coastal western whiptail (*Aspidoscelis tigris stejnegeri*)

Regulatory Status: The coastal western whiptail is a CDFW Special Animal.

Range and Distribution: This subspecies is found in coastal southern California, mostly west of the Peninsular Ranges and south of the Transverse Ranges. Its range extends north into Ventura County and south to Baja California.

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic distribution for this species (CDFG, 2008), and suitable habitat is present. This species was observed within a sandy drainage west of the Reservoir during surveys conducted in 2012.

Habitat Requirements and Natural History: The coastal western whiptail occurs in a variety of habitats, including valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, mixed conifer, juniper, chamise-redshank chaparral, mixed chaparral, desert scrub, desert wash, alkali scrub, and annual grasslands. This species is most commonly associated with areas of dense vegetation, but are also found around sandy areas along gravelly arroyos or washes (Stebbins, 2003).

The coastal western whiptail is a subspecies of the western whiptail (*A. tigris*). It is characterized by a jerking gait and nearly constant movement when active. The reproductive season generally occurs between May and August; however, this may vary depending on local conditions. Generally, a single clutch of eggs is laid each year (Pianka, 1970). Coastal western whiptails forage actively, hunting a wide variety of ground-dwelling invertebrates, including grasshoppers, ants, beetles, termites, and spiders (Stebbins, 2003). The diet may change seasonally to reflect prey abundance and availability (Vitt and Ohmart, 1977). This species is generally active in the morning, but may be active throughout the day under cloudy conditions (Vitt and Ohmart, 1977).

Threats: There are no identified threats to this species.

Silvery legless lizard (*Anniella pulchra*)

Regulatory Status: The silvery legless lizard is a CDFW Species of Special Concern and a Forest Service Sensitive Species.

Range and Distribution: The silvery legless lizard occurs from Contra Costa County, California, south through the Coast, Transverse, and Peninsular Ranges; through parts of the San Joaquin Valley; and, along the western edge of the southern Sierra Nevada and western edge of the Mojave Desert (Jennings and Hayes, 1994). Its reported elevation range extends from sea level to approximately 5,700 feet in the Sierra Nevada foothills, but most historic localities along the central and southern California coast are below 3,500 feet (Jennings and Hayes, 1994). This fossorial species is rarely seen and may be more abundant than it appears.

Potential for Occurrence within the Study Area: The Study Area is located within the known geographic range for this species (CDFG, 2008), and suitable habitat is present within limited portions of the Study Area. During surveys conducted in April 2012, one individual was observed, after a light rain, under a woodpile adjacent to the Reservoir.

Habitat Requirements and Natural History: The silvery legless lizard requires sandy or loose loamy soils under sparse vegetation for burrowing and is strongly associated with soils that contain high moisture content. It has been found in beach, chaparral, and pine-oak woodland habitat, and sycamore, cottonwood, or oak riparian habitat on stream terraces. It is most common in coastal dune, valley-foothill, chaparral, and coastal scrub habitats (Zeiner *et al.*, 1988).

The silvery legless lizard is a member of the family Anniellidae, commonly known as North American legless lizards. The silvery, gray, or beige dorsal side of this subspecies is separate from the yellow ventral side by a dark line (Stebbins, 2003). Little is known about specific habitat requirements for courtship and breeding (CDFG, 2008). Breeding occurs in early spring through July. The gestation period lasts for approximately four months (Jennings and Hayes, 1994). Live young are born in September, October, or occasionally as late as November, with litter size ranging from one to four, but two is most common (Stebbins, 1954). Soil moisture is essential for the subspecies; individuals will die if unable to reach a moist substrate (Stephenson and Calcarone, 1999). Silvery legless lizards have a relatively low thermal preference, allowing for active behavior on cool days, early morning, and even at night during warmer periods (Bury and Balgooyen, 1976). This subspecies typically forages at the base of shrubs or other vegetation either on the surface or just below the surface in leaf litter or sandy soils. The diet consists of insect larvae, small adult insects, and spiders (Stebbins, 1954).

Threats: The subspecies has been extirpated from approximately 20 percent of its known historical range (Lind, 1998a). Potential threats to local populations include wildfires that destroy desert shrub habitat.

Southwestern pond turtle (*Actinemys marmorata pallida*)

Status: The southwestern pond turtle is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: This subspecies occurs from northwestern Baja California north through western California to the central region of the state, where it intergrades with the northwestern pond turtle (*C. m. marmorata*) (Seeliger, 1945; Bury, 1970).

Distribution in the Study Area: This species was observed within the Study Area (above and below the Reservoir) during surveys conducted in 2012. The Study Area is located within the known geographic distribution for this species.

Habitat and Habitat Associations: Southwestern pond turtles inhabit permanent or nearly permanent bodies of water in a wide variety of habitat types. Suitable basking sites, such as partially submerged logs, vegetation mats, or open mud banks are a required element for this subspecies.

Natural History: The southwestern pond turtle is a subspecies of western pond turtle (*C. marmorata*) which represent the only abundant native turtles in California. This species is thoroughly aquatic and is possesses a low carapace typically olive, brown, or blackish in color (Stebbins, 2003). The subspecies usually lays a clutch of 3 to 14 eggs between April and August as females may move overland up to over 300 feet to find suitable nesting sites. Nests have been observed in many soil types from sandy to very hard and soils must be at least four inches deep for nesting (CDFG, 2008). Most activity is diurnal, but some crepuscular and nocturnal behavior has been observed (CDFG, 2008). Southwestern pond turtles feed on aquatic plants, insects, worms, fish, amphibian eggs and larvae, crayfish, and carrion (Stebbins, 2003).

Threats: Western pond turtles are estimated to be in decline across 75-80 percent of their range (Stebbins, 2003). The primary reason for this decline has been attributed to loss of suitable habitat associated with urbanization, agricultural activities, and flood control and water diversion projects (Jennings *et al.*, 1992).

Coast (San Diego) horned lizard (*Phrynosoma coronatum* [*blainvillii* population])

Status: The coast (San Diego) horned lizard is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The coast (San Diego) horned lizard's historic range extended from the Transverse Ranges in Kern, Los Angeles, Santa Barbara, and Ventura Counties south through the Peninsular Ranges of southern California and into Baja California, Mexico as far south as San Vicente; however, the current range is much more fragmented (Jennings and Hayes, 1994).

Distribution in the Study Area: This species was documented within a sandy drainage, adjacent to the main access road through the Reservoir, during surveys conducted in 2012. The Study Area is located within the known geographic distribution for this species; suitable habitat occurs in portions of the Study Area.

Habitat and Habitat Associations: The coast (San Diego) horned lizard occurs in a wide variety of habitats throughout its range, though is found primarily in chaparral and mixed chaparral-coastal sage scrub, to stands of pure coastal sage scrub. It is also known to occur in riparian habitats, washes, and most desert habitats. They are occasionally locally abundant in conifer-hardwood and conifer forests.

This species is most common in open, sandy areas where abundant populations of native ant species (e.g., *Pogonomyrmex* and *Messer* spp.) are present.

Natural History: The coast (San Diego) horned lizard is a flat bodied lizard with a wide, oval-shaped body and scattered enlarged pointed scales on the upper body and tail. Coast (San Diego) horned lizards are oviparous and lay one clutch of 6-17 (average 11-12) eggs per year from May through early July (Jennings and Hayes, 1994). Incubation occurs for two months and hatchlings first appear in late July and early August. It is surface active primarily from April to July. This species spends a considerable amount of time basking, either with the body buried and head exposed, or with the entire body oriented to maximize exposure to the sun. Although little is known about longevity in the wild, adults are thought to live for at least eight years (Jennings and Hayes, 1994). They primarily eat native harvester ants (*Pogonmyrmex* spp.) and do not appear to eat invasive Argentine ants that have replaced native ants in much of central and southern California. This species is an opportunistic feeder, and while harvester ants can comprise upwards of 90% of their diet, they will feed on other insect species when those species are abundant (Jennings and Hayes, 1994). Defense tactics used by this species include remaining motionless to utilize its cryptic appearance, only running for the nearest cover when disturbed or touched. Captured lizards puff up with air to appear larger, and if roughly handled, will squirt blood from a sinus in each eyelid (Jennings and Hayes, 1994).

Threats: Though once common throughout much of coastal and cismontane southern California, coast (San Diego) horned lizards have disappeared from much of their former range. Their population decline is mainly attributed to habitat loss due to urbanization and agricultural conversion. The introduction of non-native Argentine ants (*Iridomyrmex humilis*), which are inedible to horned lizards and tend to displace native carpenter and harvester ants, is another factor in their decline.

Two-striped garter snake (*Thamnophis hammondii*)

Regulatory Status: The two-striped garter snake is a CDFW Species of Special Concern and Forest Service Sensitive Species.

Range and Distribution: This species occurs along a continuous range from northern Monterey County south through the South Coast and Peninsular Ranges to Baja California. Isolated populations also occur through southern Baja California, Catalina Island, and desert regions along the Mojave and Whitewater Rivers in San Bernardino and Riverside Counties, respectively (Jennings and Hayes, 1994). This species typically occurs at elevations ranging between sea level and approximately 8,000 feet (Jennings and Hayes, 1994).

Habitat Requirements and Natural History: This species is primarily associated with aquatic habitats that border riparian vegetation and provide nearby basking sites (Jennings and Hayes, 1994). These areas typically include perennial and intermittent streams and ponds in a variety of vegetation communities, including chaparral, oak woodland, and forest habitats (Jennings and Hayes, 1994). During the winter, two-striped garter snakes will seek refuge in upland areas, such as adjacent grassland and coastal sage scrub (Rossman et al., 1996).

After several taxonomic revisions, the two-striped garter snake has been recognized as a separate species where it had previously been considered a subspecies of the western aquatic garter snake (*T. couchii*) (Rossman and Stewart, 1987). This species is usually morphologically distinguished by the lack of a mid-dorsal stripe. The two-striped garter snake breeds from late March to early April and young are typically born between late July and August; however, young have been observed as late as November (Rossman et al., 1996; Jennings and Hayes, 1994). It hibernates during the winter months, but may be active above ground on warm winter days (Jennings and Hayes, 1994). The mainly aquatic diet of this species consists primarily of fish, fish eggs, and tadpoles and metamorphs of toads and frogs. It will also consume worms and newt larvae (Jennings and Hayes, 1994).

Threats: Lind (1998b) noted that quantity and quality of habitat for the two-striped garter snake is declining throughout much of its range. More than 40 percent of its historic range has been lost (Jennings and Hayes, 1994). Primary factors for the decline of this species in southern California include habitat conversion and degradation resulting from urbanization, construction of reservoirs, and cement-lining of stream channels.

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic distribution for this species, and suitable habitat is present. Two-striped garter snake was documented within aquatic habitat upstream and downstream from the Reservoir during surveys conducted in 2012.

Coastal rosy boa (*Charina trivirgata roseofusca*)

Status: The rosy boa is designated by CDFW as a California Special Animal. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The rosy boa in California ranges from Los Angeles, eastern Kern, and southern Inyo counties, and south through San Bernardino, Riverside, Orange, and Diego counties (Spiteri, 1988; Stebbins, 2003; Zeiner *et al.,* 1988). The species occurs at elevations from sea level to 5,000 feet AMSL in the Peninsular and Transverse mountain ranges. Within its range in southern California, the rosy boa is absent only from the southeastern corner of California around the Salton Sea and the western and southern portions of Imperial County (Zeiner *et al.,* 1988).

Distribution in the Study Area: Suitable habitat is present within the Study Area outside the perimeter of the Reservoir. This species was reported approximately 6 miles west of the Study Area in June 2009 along a transmission line corridor.

Habitat and Habitat Associations: The rosy boa inhabits rocky shrubland and desert habitats and is attracted to oases and streams but does not require permanent water (Stebbins, 2003). In coastal areas, the rosy boa occurs in rocky chaparral-covered hillsides and canyons, while in the desert it occurs on scrub flats with good cover (Zeiner *et al.,* 1988).

Natural History: Rosy boas are primarily nocturnal but may be active at dusk and rarely in the daytime (Stebbins, 2003). Rosy boas are active between April and September (Holland and Goodman, 1998). The rosy boa may aestivate in the hottest months and hibernate in the coolest months of the year, remaining inactive in burrows or under surface debris (NatureServe, 2012). There is little information on the foraging habits or prey species for the rosy boa. Holland and Goodman (1998) and Stebbins (2003) indicate that this species preys upon small mammals (including pocket mice (*Chaetodipus* and *Perognathus* spp.) and young woodrats), reptiles, amphibians, and birds.

Threats: This species may be threatened with local extirpation in coastal regions of southern California resulting from development-related habitat fragmentation and isolation of populations. The species is noted to search black top roads for prey (Stebbins, 2003), making it vulnerable to road mortality. Other potential threats related to urban development include the use of rodenticides near open space, which could result in fewer mammal burrows that provide refugia and a reduced prey base, collecting of snakes (the rosy boa is popular in the pet trade (NatureServe, 2012)), and habitat degradation (*e.g.*, trampling of vegetation and introduction of exotic species).

San Bernardino ringneck snake (*Diadophis punctatus modestus*)

Status: The San Bernardino ringneck snake is designated by CDFW as a California Special Animal. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The ringneck snake is widespread in California and is absent only from large portions of the Central Valley, high mountains, desert, and areas east of the Sierra–Cascade crest (Zeiner *et al.,* 1988). Currently there are six recognized subspecies in California occurring at elevations ranging from sea level to 2,150 meters (7,050 feet) AMSL (Zeiner *et al.,* 1988). The San Bernardino ringneck snake subspecies is found along the southern California coast from the Santa Barbara area south to northern San Diego County, and inland into the San Bernardino Mountains.

Distribution in the Study Area: Suitable habit occurs within the Study Area, and this species was detected during surveys.

Habitat and Habitat Associations: The ringneck snake is found in moist habitats, including woodlands, hardwood and conifer forest, grassland, sage scrub, chaparral, croplands/hedgerows, and gardens (NatureServe, 2012; Stebbins, 2003).

Natural History: A fair amount of information is available for the full species ringneck snake (*Diadophis punctatus*), while less information is available for the subspecies San Bernardino ringneck snake (*D. p. modestus*). Therefore, much of this discussion is based on the life history of the full species ringneck snake, with expected similarities occurring in behaviors and habitat associations with the San Bernardino ringneck snake subspecies.

During the day in the spring and summer, ringneck snakes are typically found under surface objects (Holland and Goodman, 1998; Zeiner *et al.,* 1988), with crepuscular (dawn and dusk) and some nocturnal activity observed during the summer (Holland and Goodman, 1998; Zeiner *et al.,* 1988). Ringneck snakes may aestivate during the heat of summer and are generally inactive and hibernate during the winter (NatureServe, 2012).

Threats: Habitat degradation is the main threat to San Bernardino ringneck snakes.

Desert Tortoise (*Gopherus agassizii*)

Status: The desert tortoise is a state and federally listed threatened species.

General Distribution: The Mojave desert tortoise occurs throughout most of the Mojave and Colorado Deserts in southern California, southern Nevada, and the southwestern tip of Utah from below sea-level to an elevation of 7,300ft (USFWS, 2011).

Distribution near Project site: While no nearby desert tortoise records were found during the literature review, tortoises may occur at low density in the desert habitats surrounding the City of Palmdale. This species is not expected to occur at the Reservoir or the 47th Street East sediment disposal site.

Habitat and Habitat Associations: Desert tortoise habitats include many landforms and vegetation types of the Mojave and Sonoran deserts, except the most precipitous slopes. Friable soils, such as sand and fine gravel, are important for burrow excavation and nesting, and the availability of suitable soils is a limiting factor to desert tortoise distribution.

Natural History: Desert tortoises spend much of their lives in burrows. Tortoises are long-lived and grow slowly. They require 13 to 20 years to reach sexual maturity. Their reproductive rates are low, though their reproductive lifespan is long. Mating may occur during spring and fall.

Identified Threats: Threats to the desert tortoise include degradation and loss of habitat (including through the spread of nonnative, invasive plants), disease, raven predation on juvenile tortoises, collection for the pet trade, and direct mortality and crushing of burrows by off-highway vehicles.

San Bernardino mountain kingsnake (*Lampropeltis zonata parvirubra*)

Status: The San Bernardino mountain kingsnake is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The San Bernardino mountain kingsnake is only known to occur within the San Bernardino Mountains and San Jacinto Mountains bioregions above 4,500 feet (Fisher and Case, 1997).

Distribution in the Study Area: While suitable habitat occurs within the Study Area it is outside of the known geographic distribution for this species.

Habitat and Habitat Associations: San Bernardino mountain kingsnakes are restricted to rock outcrops, talus, and steep shady canyons within coniferous and mixed coniferous, hardwood, or riparian woodlands and other edge habitats when associated with coniferous habitat.

Natural History: This species is normally diurnally and crepuscularly active from mid-March to mid-October at lower elevations with a reduced period at higher elevations (Newton and Smith 1975; Zeiner et al. 1988; Holland and Goodman, 1998). Their diet is known to include lizards, lizard eggs, smaller snakes, nestling birds and eggs, and small mammals.

Threats: Poaching is a major threat to this species. Firewood harvesting is another threat, as collection of fallen wood removes the ground debris that is a limiting habitat requirement for this species.

Birds

Swainson's hawk (*Buteo swainsoni*)

Status: The Swainson's hawk is state listed as threatened.

General Distribution: Swainson's hawk inhabits grasslands, sage-steppe plains, and agricultural regions of western North America during the breeding season, and winters in grassland and agricultural regions from Central Mexico to southern South America (Zeiner et al., 1990). The North American breeding range extends north from California to British Columbia east of the Sierra Nevada and Cascade Ranges, east to Saskatchewan, and south to northern Mexico. In California, the nesting range is primarily restricted to portions of the Sacramento and San Joaquin valleys, northeast California, and the Western Mojave, including the Antelope Valley (Bloom, 1980).

Distribution near the Project site: Swainson's hawk was reported in the CNDDB 8 miles north of the Project site. This species is a known nester in the Antelope Valley.

Habitat and Habitat Associations: Swainson's hawk breeds primarily in arid interior valleys and high desert with scattered large trees or riparian woodland corridors surrounded by open fields, desert scrub, or agricultural land. It prefers large, flat, open, undeveloped landscapes that include suitable grassland or agricultural foraging habitat and sparsely distributed trees for nesting. In some areas of the Antelope Valley, urban nest sites have been recorded.

Natural History: Nesting Swainson hawk pairs in California are highly traditional in their use of nesting territories and nesting trees. One to four eggs are usually laid in early to mid-April, and incubation continues for 34-35 days until mid-May when young begin to hatch. The brooding period typically continues through early to mid-July. Swainson's hawks feed primarily on small rodents and typically forage in large fields that support low vegetative cover (to provide access to the ground) and provide the highest densities of prey (Bechard et al., 1990). In agricultural regions, these habitats include fields of hay and grain crops; certain row crops, such as tomatoes and sugar beets; and lightly grazed pasturelands.

Identified Threats: Swainson hawk declines have been attributed to loss of suitable breeding habitat. These birds are also threatened by ingesting pesticide-covered insects.

Occurrence probability near the Project site: This species is known to nest in the Western Antelope Valley. In the region it nests in rural areas adjacent to crops and in Joshua tree woodland. This species has not been document to nest in dense urban areas. While the Project is located within the Swainson hawk’s known range, no suitable breeding and limited foraging habitat is located at the 47th Street East sediment disposal site.

Cooper’s hawk (*Accipiter cooperii*)

Regulatory Status: Cooper’s hawk is a CDFW Watch List Species that was removed from the Species of Special Concern list in 2008.

Range and Distribution: Cooper’s hawk is widespread, occurring throughout much of the United States, southern Canada, and northern Mexico.

Habitat Requirements and Natural History: Cooper’s hawk breeds in small and large deciduous, conifer, and mixed woodlands. It also nests in pine plantations and suburban and urban environments (Curtis et al., 2006). In California, this species nests predominately in oaks and pines. It utilizes a variety of habitat types with vegetative cover and often hunts on the edges of wooded areas (Palmer, 1988).

One of three accipiter species in California, the Cooper’s hawk is a medium-sized bird adapted to woodlands. This species shows a high degree of sexual dimorphism, with females generally up to one-third larger than males. Eastern and western individuals also differ in size. It generally starts breeding at two years of age and lays one clutch of 3 to 6 eggs from early April to late May (Rosenfield and Bielefeldt, 1993). This species feeds primarily on birds (70 to 80 percent of the diet) (Zeiner et al., 1990a).

Threats: Habitat destruction (including logging and development), pesticide contamination, and shooting have been identified as the primary threats to the Cooper’s hawk. In California, breeding populations have increased and expanded into urban areas, and populations are considered stable (Shuford and Gardali, 2008).

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic range for this species and suitable foraging and nesting habitat occurs within portions of the Study Area. A review of online eBird data reports observations of this species at the Reservoir.

Sharp-shinned hawk (*Accipiter striatus*)

Regulatory Status: The sharp-shinned hawk is a CDFW Watch List Species that was removed from the Species of Special Concern list in 2008.

Range and Distribution: This species breeds from central and western Alaska and the greater portion of Canada south to central and south-central California, central Arizona, New Mexico, Texas, northern parts of the Gulf states, and into Mexico (AOU, 1998). Wintering grounds extend from the southern portions of Canada south throughout the United States and Mexico into Central America. In

California, the sharp-shinned hawk breeds throughout the state, including the northern half of the state, and, to a lesser extent, the mountains of southern California (Small, 1994).

Habitat Requirements and Natural History: In California, this species typically nests in coniferous forests, often within riparian areas or on north-facing slopes (Stephenson and Calcarone, 1999). Where conifers are scarce, cottonwoods, poplars, and other tall riparian trees may be used for nest sites (Bent, 1937). Foraging habitat during the breeding season is essentially the same as that chosen for nesting. During the winter, however, males tend to hunt most frequently among hedgerows, field edges and other ecotonal habitats, while females typically hunt in extensive stands of forest or riparian areas (Meyer, 1987).

This species is a small hawk with a pronounced size difference among males and females. Although the sexes are alike in color and pattern, the male is often substantially smaller than the female. This size difference is more evident in this species than most other hawks. The sharp-shinned hawk, which is presumed to be serially monogamous, breeds from April through August with peak breeding activity occurring between late May and July. During this period, the male exhibits undulating courtship flights teamed with high bouts of soaring and calling. Once nesting begins, the male brings food to the female and nestlings until they fledge after roughly 60 days. Fledging is timed to coincide with fledging of prey birds, providing a food supply for young, inexperienced hunters (CDFG, 2008). Although small birds comprise the primary source of food, sharp-shinned hawks also take small mammals, reptiles, amphibians, and insects.

Threats: The primary threat to this species is the loss of suitable habitat as a result of large stand-replacing wildfires.

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic year-round range for this species (CDFG, 2008). Suitable nesting habitat occurs within limited portions of the Study Area; suitable foraging habitat occurs throughout the Study Area. Sharp-shinned hawk was observed in the Study Area during surveys conducted in 2010.

Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)

Regulatory Status: The southern California rufous-crowned sparrow is a CDFW Watch List Species that was removed from the Species of Special Concern list in 2008.

Range and Distribution: The rufous-crowned sparrow is a year-round resident throughout its range. Historically, four of the subspecies of rufous-crowned sparrow bred in coastal California from Mendocino County south through northwestern Baja California Norte (Thorngate and Parsons, 2005). Southern California rufous-crowned sparrow ranges from San Luis Obispo County south to San Diego County (Garrett and Dunn, 1981). This subspecies is increasingly restricted due to urbanization and agricultural development in Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties (Collins, 1999).

Habitat Requirements and Natural History: The southern California rufous-crowned sparrow typically breeds in sparsely vegetated scrubland on hillsides and canyons between 200 and 4.600 feet elevation. This subspecies is often found in coastal sage scrub dominated by California sagebrush, but will also utilize coastal bluff scrub, low-growing serpentine chaparral, and the edges of tall chaparral habitats (Thorngate and Parsons, 2005). It thrives in recently burned habitats, and can be found utilizing these open areas for years (Thorngate and Parsons, 2005).

Natural History: The southern California rufous-crowned sparrow is one of five subspecies of rufous-crowned sparrow that occur in the United States. Twelve additional subspecies occur in Mexico (Collins, 1999). This species nests on the ground and has a typical clutch size of three to four eggs (Thorngate and Parsons, 2005). Nests are well hidden at the base of bushes, grass tussocks, or overhanging rock concealed by vegetation or rock (Thorngate and Parsons, 2005). This species forages at or near the ground in areas of dense grass or herbaceous cover, and is rarely observed foraging in the open. It gleans insects from low shrubs, grasses, and herbaceous vegetation (Thorngate and Parsons, 2005).

Threats: This subspecies is extremely sensitive to edge effects and appears to avoid small fragments of habitat in favor of large tracts away from edges (Thorngate and Parsons, 2005). It is threatened by urbanization and agricultural conversion of habitat (Thorngate and Parsons, 2005).

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic year-round range for southern California rufous-crowned sparrow. Suitable breeding and foraging habitat occurs throughout the Study Area. It was observed within the Study Area during surveys conducted in 2012 and was documented breeding within areas upstream and downstream from the Reservoir.

Great blue heron (*Ardea herodias*)

Regulatory Status: The great blue heron is a CDFW Special Animal.

Range and Distribution: This species is fairly common year-round throughout most of California. Few rookeries are found in southern California, but many are scattered throughout northern California. Knowledge of specific rookery locations is incomplete (Mallette, 1972; Belluomini, 1978; Garrett and Dunn, 1981).

Habitat Requirements and Natural History: The great blue heron is most commonly found in or near shallow estuaries and fresh or saline emergent wetlands. However, it can also occur along riverine and rocky marine shores, in croplands, pastures, and in mountains above foothills.

This species is the largest and most widespread heron in North America. It is a large, grayish bird with a long “S”-shaped neck, long legs, and a long, thick bill. It is typically distinguishable by a white crown stripe surrounded by a black plume, extending from behind the eye to the back of the neck. It usually arrives at breeding grounds in February and courtship and nest building begin shortly thereafter. Breeding territories are small, usually including only the nest site and immediately surrounding areas (Cottrille and Cottrille, 1958; Mock, 1976). Secluded groves of tall trees near shallow water are preferred for nesting sites. Feeding areas can occur as far as ten miles away and may be defended vigorously, especially during the non-breeding season (Palmer, 1962; Krebs, 1974; Kushlan, 1976). Although this species will occasionally eat small rodents, amphibians, reptiles, insects, and birds, 75 percent of its diet is fish (Cogswell, 1977). When hunting, the great blue heron stands motionless, or walks slowly, in shallow water, or less commonly, in open fields, and grasps prey with its bill, rarely impaling the intended target. This species typically roosts in secluded, tall trees.

Threats: This species is sensitive to human disturbance near nests, and probably to pesticides and herbicides in nesting and foraging areas (Jackman and Scott, 1975).

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic year-round range for this great blue heron (CDFG, 2008). Suitable rookery habitat occurs within portions of the Study Area and suitable foraging habitat occurs throughout the Study Area. This species was documented within and downstream from the Reservoir during surveys conducted in 2012.

Costa's hummingbird (*Calypte costae*)

Regulatory Status: The Costa's hummingbird is a CDFW Special Animal. This taxon is not federally or state listed as threatened or endangered.

Range and Distribution: This species breeds in central California, southern Nevada, and southwestern Utah south to Santa Barbara Island, Baja California, and offshore islands, southern Arizona, west-central Mexico, and southwestern New Mexico. Wintering populations occur in southern California and southwestern Arizona south to Sinaloa, Mexico (Terres, 1980; AOU, 1998). Costa's hummingbird occurs as a permanent resident in Ventura County (CDFG, 2008).

Habitat Requirements and Natural History: Costa's hummingbird occurs in more arid habitats than other hummingbirds of California, including desert wash, desert riparian edges, coastal scrub, desert scrub, low-elevation chaparral, and palm oases. This species most commonly occurs along canyons and washes when nesting (NatureServe, 2011).

Costa's hummingbird is the second smallest bird in North America, displaying an iridescent violet crown and gorget down the side of the neck and greenish sides and flanks. This species breeds from March through May in the deserts, and from April through July along the coast (CDFG, 2008). As is usual in hummingbirds, all nesting activities are performed by the female. Nests are located in a wide variety of trees, cacti, shrubs, woody forbs, and sometimes vines, often in proximity to conspecific nests (Bent, 1940). Costa's hummingbird feeds on the flower nectar of various herbaceous and woody plants; however, small insects and spiders are also consumed. During the winter, non-native flowering shrubs may become an important food source (Garrett and Dunn, 1981).

Threats: No persistent threats have been identified for this species.

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic range for Costa's hummingbird and suitable breeding and foraging habitat occurs throughout the Study Area. This species was observed within the Study Area during surveys conducted in 2012 and breeding individuals were confirmed within areas downstream of the Reservoir. All areas of suitable habitat should be considered potentially occupied.

Lawrence's goldfinch (*Carduelis lawrencei*)

Regulatory Status: Lawrence's goldfinch is a CDFW Special Animal and a USFWS Bird of Conservation Concern. This taxon is not federally or state listed as threatened or endangered.

Range and Distribution: Lawrence's goldfinch breeds from the western foothills of the Sierra Nevada and the Coast Ranges in Shasta County south to northern Baja California. The wintering range for this species extends from the coastal slope of the Coast Ranges in southern California to northern Baja California, and from the Lower Colorado River Valley in Needles, California, and east to southern Texas, and south to Sonora, Mexico.

Habitat Requirements and Natural History: This species breeds in a variety of habitats throughout its range in southern California, including mixed conifer-oak forest, blue oak savannah, pinyon-juniper woodland, chaparral, riparian woodland, and desert oases (Garrett and Dunn, 1981; Lehman, 1994; Roberson and Tenney, 1993; Unitt, 1984). However, it prefers xeric open oak woodland bordering chaparral in the upper foothills. Arid, open woodlands with adjacent bushy areas, such as chaparral or tall weedy fields, characterize typical nesting habitat. This species is often found nesting in proximity to foraging habitat and open water (Davis, 1999).

This small, conspicuous songbird reaches a height of four to five inches and possesses distinctly bright yellow coloration on its breast and wing bars; however, females are much less distinct. The breeding season for this species begins as early as late May and can last into September, with peak activity occurring between late April and August. Nests are typically constructed on the outer branches of trees, particularly oaks (Grinnell and Miller, 1944). Both parents continue to provision the young for five to seven days after fledging, at which time the young join the parents on foraging bouts. Lawrence's goldfinch feeds primarily on seeds of native plant species, particularly fiddleneck (*Amsinckia* spp.) during the spring months, and chamise (*Adenostoma fasciculatum*), mistletoe (*Phoradendron* spp.), coffee berry (*Rhamnus californica*), and annual grasses during other seasons (Davis, 1999). Lawrence's goldfinch often forms large flocks, particularly in winter. However, both males and females of this species will rigorously defend territories from conspecific intruders during the breeding season.

Threats: Recent survey data (1980 to 2000) indicates that there has been a substantial, but not significant, decline in populations of this species across its range. Populations in Arizona and California have been reported as significantly declining (Sauer et al., 1996). However, this species seems to be well adapted to a wide range of woodland habitats and may even thrive, to some extent, from non-intensive human disturbance that increases annual plant populations.

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic range for Lawrence's goldfinch and suitable foraging habitat occurs throughout the Study Area. Suitable breeding habitat is present within portions of the Study Area. This species was observed at the Reservoir and within the southern extent of the Study Area in 2012. All areas of suitable habitat should be considered potentially occupied.

Vaux's swift (*Chaetura vauxi vauxi*)

Regulatory Status: Vaux's swift is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

Range and Distribution: This species breeds from southwestern Canada through the western United States to Mexico, Central America, and northern Venezuela. (Cornell, 2012)

Habitat Requirements and Natural History: Hollow trees are this species' favored nesting and roosting sites (Cornell, 2012). Vaux's swift is the smallest swift in North America. This species constructs a nest of woven twigs held together by its own saliva (Cornell, 2012). Like most swifts, this species is predominantly insectivorous and makes up to 50 trips a day for food when feeding young.

Threats: The primary threat to Vaux's swift is habitat loss.

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic range for Vaux's swift and suitable foraging habitat occurs throughout the Study Area. Suitable breeding habitat is also present within the Study Area. This species was observed within the Study area during surveys conducted in 2012. All areas of suitable habitat should be considered potentially occupied.

Yellow warbler (*Dendroica petechia brewsteri*)

Regulatory Status: The yellow warbler is a CDFW Species of Special Concern. This taxon is not federally or state listed as threatened or endangered.

Range and Distribution: The breeding range for the yellow warbler includes the Pacific coast from the northern limits of the boreal forests in Alaska and Canada south to the southern United States and northern Baja California. The winter range extends from the coasts of northern Mexico to northern South America (Lowther et al., 1999). Although this species is primarily a summer resident in southern California, some small winter populations remain in the lowlands (Garrett and Dunn, 1981).

Habitat Requirements and Natural History: In southern California, this species breeds in riparian woodlands situated within lowlands and canyons (Garrett and Dunn, 1981; Lehman, 1994; Roberson and Tenney, 1993; Unitt, 1984). Suitable habitat typically consists of riparian forests containing sycamores, cottonwoods, willows, and alders (Stephenson and Calcarone, 1999).

There is a considerable morphological variation within the *D. petechia* species. Of the three recognized groups of subspecies, only the “yellow” group breeds in North America. The “yellow” group is further divided into nine subspecies, which are distinguished by slight differences in plumage color and patterns of breast streaking in males (Lowther et al., 1999). The yellow warbler migrates annually between breeding grounds in North America and wintering grounds in the neotropics, and is highly territorial on both breeding and wintering grounds (Lowther et al., 1999). During migration, yellow warblers form flocks and will often join with flocks of other species, including warblers, vireos, and flycatchers. The primary diet of the yellow warbler consists of arthropods, such as bees, wasps, caterpillars, flies, beetles, and true bugs, which are usually gleaned from leaf surfaces. However, this subspecies will occasionally sally to capture prey in flight. Males typically forage higher in trees than females (Lowther et al., 1999).

Threats: Nest parasitism by brown-headed cowbird (*Malothrus ater*) has been implicated as a major cause in population declines of yellow warblers in southern California (Garrett and Dunn, 1981; Stephenson and Calcarone, 1999; Unitt, 1984).

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic range for the yellow warbler and suitable breeding and foraging habitat occurs throughout the Study Area. This species was observed within the Study Area during surveys conducted in 2012 and breeding individuals were confirmed within areas upstream and downstream of the Reservoir. All areas of suitable habitat should be considered potentially occupied.

Bald Eagle (*Haliaeetus leucocephalus*)

Regulatory Status: The bald eagle is state listed as endangered and designated as a Forest Service Sensitive Species.

Range and Distribution: The bald eagle occurs throughout most of North America. Historically, it bred throughout the mountains of coastal California. Currently, breeding populations exist on the Los Padres and San Bernardino National Forests. This species has also been documented in Ventura County at Casitas Lake. The bald eagle has not nested within or adjacent to the Angeles National Forest in Los Angeles County for at least 30 years. However, a bald eagle was sighted in a riparian area on the Tejon Ranch on August 24, 1994 (Bautista and Brown, personal observation.). This species is occasionally seen on or near the Santa Clara/Mojave Rivers Ranger District during the winter, but apparently none are resident birds. The bald eagle is a fairly common winter migrant at a few inland waters in southern California (Zeiner et al., 1990a). The largest wintering population of bald eagles in southern California is at Big Bear Lake in the San Bernardino Mountains. The bald eagle has been successfully reintroduced as a breeding species on Santa Catalina Island after becoming extirpated from the Channel Islands in the 1950s.

Habitat Requirements and Natural History: This species requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches (Zeiner et al., 1990a). Perches must be high in large, stoutly limbed trees, on snags or broken-topped trees, or on rocks near water (Zeiner et al., 1990a). The bald eagle is primarily a fish eater; however, it will opportunistically utilize avian and mammalian prey and carrion if readily available, especially in the nonbreeding season (Evans, 1982; Zeiner et al., 1990a). It swoops from hunting perches, or soaring flight, to pluck fish from the water (Evans 1982; Zeiner et al., 1990a). This species roosts communally in winter in dense, sheltered, remote conifer stands (Zeiner et al., 1990a).

The bald eagle is monogamous and first breeds at four to five years of age (Zeiner et al., 1990a). Courtship flights consist of the pair soaring together for long periods at great heights, occasionally locking talons and somersaulting downward several hundred feet (Evans, 1982). Breeding season is February through July, but may start as early as November (Zeiner et al., 1990a). Nests are located 50 to 200 feet above ground, usually below tree crown (Zeiner et al., 1990a), and typically near a permanent water source (Zeiner et al., 1990a). Where suitable nest trees are scarce, nests are placed on ridges, cliffs, and on sea stacks (Evans, 1982). In southern California, nesting most often occurs in large trees near water, but occasionally nests are on cliffs or the ground. Eagle nests are characteristically large, ranging from a minimum of three feet in width and depth to 16 feet deep and 10 feet across; size and shape are determined partly by the supporting branches (Evans, 1982). Clutch size is one to three eggs and incubation usually lasts 34 to 36 days (Evans, 1982; Zeiner et al., 1990a). The semi-altricial young hatch asynchronously (Zeiner et al., 1990a). Fledging occurs at ten to 12 weeks (Evans, 1982).

Occasionally raccoons, bobcats, crows, and, sometimes gulls, prey on eggs and small young, forcing the adults away from the nest (Evans, 1982). Organochlorine (DDE) interferes with normal calcium metabolism, resulting in thin-shelled eggs, which cannot withstand normal incubation (Evans, 1982). Dieldrin, PCBs, and mercury have been linked to embryonic and early chick mortality (Evans, 1982). High concentrations of dieldrin and DDT are known to result in mortality of bald eagles (Evans, 1982).

Bald eagles are considered long-lived, with the oldest wild bird reported near Haines, Alaska at 28 years old (Schempf, 1997). In captivity, bald eagles may live 40 years or more (USFWS, 1999).

Threats: Illegal shooting remains the greatest single known cause of bald eagle mortality (Evans, 1982). Roughly half of all recorded bald eagle deaths are a direct result of shooting (Evans, 1982). Other causes of mortality include impact injuries (usually a result of collision with a power line or transmission tower), electrocution, trapping injuries (eagles caught in "sight bait" sets for fur bearers), automobile or train accidents, and poisoning from contaminated coyotes or other carcasses (Evans, 1982). Territories have been abandoned after disturbance from logging, recreational developments, and other human activities near nests (Zeiner et al., 1990a).

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic range for bald eagle and suitable foraging habitat occurs throughout the Study Area. This species was observed at Littlerock Reservoir in 2007 (L. Welch, District Biologist, personal communication), and within the Reservoir and the southern extent of the Study Area during surveys conducted in 2012.

Summer Tanager (*Piranga rubra*)

Regulatory Status: Summer tanager is a CDFW Species of Special Concern.

Range and Distribution: The summer tanager is found in the eastern and southwestern United States, Central America, and South America, and regularly occurs north of Mexico. It primarily breeds in the eastern United States from New Jersey south to Florida, west to southern Illinois, and south to Texas. It also breeds in portions of New Mexico, Arizona, California, and Baja California. It winters in Central Mexico, south through Central America, and as far south as Bolivia and Brazil.

Habitat Requirements and Natural History: Western populations of summer tanagers occupy riparian woodlands dominated by willows (*Salix* spp.) and cottonwoods (*Populus* spp.) at lower elevations (Robinson, 1996; Rosenberg et al., 1982, 1991), and mesquite (*Prosopis* spp.) and tamarisk (*Tamarix* spp.) habitats at higher elevations (Robinson, 1996). During the winter, this species occurs in open and second-growth habitats within its range, typically below 3,900 feet elevation (Robinson, 1996).

*M*ales begin to arrive at the breeding grounds in April, slightly before the females. Nests are constructed on a large, horizontal limb of a tree, usually cottonwood or willow, within riparian vegetation approximately 10 to 20 feet above the ground (Zeiner et al., 1990a). The nest is constructed in an open-cup shape from dried herbaceous vegetation, and is usually placed among or under leaves (Robinson, 1996).

The summer tanager commonly feeds on bees and wasps, often foraging for larvae from hives and nests (Robinson, 1996). It also feeds on other insects, spiders, and small fruits and berries. It captures flying insects during short sallies from a perch and gleans insects and fruits from leaf and bark surfaces of trees and shrubs (Robinson, 1996).

Threats: There is little specific threat information for the summer tanager. Robinson (1996) describes habitat destruction as the largest effect of human activities on the summer tanager. In the southwest, particularly in southern California and the Colorado River valley, populations of summer tanagers have declined due the loss of riparian willow and cottonwood forest habitat. Nest parasitism by brown-headed cowbirds may also be a factor contributing to declining populations.

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic range for summer tanager and suitable foraging habitat occurs throughout the Study Area. Suitable breeding habitat is also present within the Study Area. This species was observed downstream of the Reservoir during surveys conducted in 2012.

Least Bell's vireo (*Vireo bellii pusillus*)

Status: The least Bell's vireo was listed as federally endangered by the USFWS on May 2, 1986 (51 FR 16474-16482). Critical habitat was designated on February 2, 1994 (59 FR 4845-4867). This taxon is listed as State endangered and considered a USFWS Bird of Conservation Concern.

General Distribution: The least Bell's vireo was historically widespread in riparian woodlands of the Central Valley and low-elevation riverine valleys of California and northern Baja California. However, over 95 percent of historic riparian habitat has been lost throughout its former range, which may have accounted for 60 to 80 percent of the original population throughout the state of California (USFWS, 1986). The current breeding distribution for this subspecies in California is restricted to Kern, San Diego, San Bernardino, Riverside, Ventura, Los Angeles, Santa Barbara, and Imperial Counties.

Distribution in the Study Area: This species was observed within the Study Area during surveys conducted from 2010 – 2012 and breeding individuals were confirmed below the Reservoir. The Study Area is located within the known geographic range for this species and suitable breeding and foraging habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: During the breeding season, least Bell's vireo is a low-elevation riparian obligate that inhabits dense, willow-dominated habitats with lush understory vegetation and in the immediate vicinity of water. Most areas that support viable populations are in early stages of succession where most woody vegetation is between five and ten years old (Franzeb, 1989; Gray and Greaves, 1984).

Natural History: The least Bell's vireo is one of four recognized subspecies of Bell's vireo (*V. bellii*) and is the western-most occurring subspecies, breeding entirely within California and northern Baja California. This subspecies is a small vireo with a short, straight bill and plumage varying from drab gray to green above and white to yellow below. The breeding season for least Bell's vireo begins with males arriving at breeding sites to establish territories, typically by late March. Females settle on male territories within two days of arriving to breeding sites and courtship begins immediately, lasting for 1-2 days before a nest site is selected and both birds construct the nest. Both sexes brood and feed the young. After the breeding season is complete, the least Bell's vireo leaves its breeding range to winter in Baja California. This subspecies typically forages in riparian habitat, feeding primarily on small insects and spiders (Chapin, 1925). Feeding will also occasionally occur in oak woodlands and adjacent chaparral habitats (Salata, 1983).

Threats: The primary threats that have been identified for this subspecies include the loss of lowland riparian habitat and nest parasitism by the brown-headed cowbird (USFWS, 1998). Surveys conducted in 2012 detected brown headed cowbirds at Littlerock creek.

Tricolored blackbird (*Agelaius tricolor*)

Status: The tricolored blackbird is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: This species is primarily a permanent resident across its range in California and occurs throughout the Central Valley and in coastal districts from Sonoma County south to Baja California.

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; suitable breeding and foraging habitat occurs, depending on water levels, within the upper extents of the Reservoir (changes year to year). Nearest recorded occurrence is approximately seven miles northwest of the Study Area in Lake Palmdale.

Habitat and Habitat Associations: The tricolored blackbird breeds near fresh water, preferably in emergent wetland with tall dense cattails (*Typha* spp.) or tules, but also in thickets of willows, blackberry, wild rose, and tall herbs (CDFG, 2008). This species forages primarily in grassland and cropland habitats.

Natural History: The tricolored blackbird is distinguishable from similar species by dark red shoulder patches with broad white tips bordering the distal side. This highly gregarious species is highly colonial and nesting areas must be large enough to support a minimum colony of roughly fifty pairs (Grinnell and Miller, 1944). Tricolored blackbirds are polygynous and during the breeding season, which typically occurs from mid-April into late July, each male may claim several mates nesting in his small territory. Foraging generally occurs in the vicinity of colony sites; however, some breeding individuals have been documented leaving nest sites as far as four miles to feed (Orians, 1961).

Threats: Some of the threats that have been identified for this species include loss of habitat due to draining of freshwater marshes and cowbird parasitism.

Bell's sage sparrow (*Amphispiza belli bellie*)

Status: Bell's sage sparrow is a CDFW Watch List species. This taxon is not federally or State listed as threatened or endangered.

General Distribution: Five subspecies of sage sparrow are recognized, two of which are migratory (County of Riverside, 2008). The subspecies Bell's sage sparrow (formerly known as Bell's sparrow), *A. b. belli*, occurs as a non-migratory resident on the western slope of the central Sierra Nevada Range and in the coastal ranges of California southward from Marin County and Trinity County, extending into north-central Baja California (County of Riverside, 2008).

Distribution in the Study Area: There are no known records for this species in the Study Area; suitable habitat is present within the Study Area outside of the Reservoir footprint. Nearest recorded occurrence, from 2005, is approximately 13 miles northwest of the Study Area.

Habitat and Habitat Associations: Bell's sage sparrow is uncommon to fairly common in dry chaparral and coastal sage scrub along the coastal lowlands, inland valleys, and lower foothills of the mountains within its range. The Bell's sage sparrow often occupies chamise chaparral in the northern part of its range (Gaines, 1988; Unitt, 1984) and in coastal San Diego County (Bolger *et al.,* 1997). At higher elevations in southern California, Bell's sage sparrow often occurs in big sagebrush (County of Riverside, 2008).

Natural History: Sage sparrows primarily forage on the ground, usually near or under the edges of shrubs (Zeiner *et al.,* 1990a; County of Riverside, 2008). During the breeding season, the species consumes adult and larval insects, spiders, seeds, small fruits, and succulent vegetation (County of Riverside, 2008). Bell's sage sparrow usually nests in sagebrush or chaparral, and may have two broods per nesting season (Ehrlich *et al.,* 1988). In Riverside County, nests of Bell's sage sparrow have been found in brittlebush, black sage, California buckwheat, California sagebrush, and bush mallow. In other locations, chamise, white sage, cholla, ceanothus, and willows have been used by the species (County of Riverside, 2008). Sage sparrows also nest occasionally in bunchgrass or on the ground under shrubs (County of Riverside, 2008).

Threats: The largest threat to the sage sparrow is the loss and fragmentation of appropriate shrub habitat. Like other species, it has lost suitable habitat to urbanization and agricultural conversion, especially in southern California (County of Riverside, 2008). This species is also vulnerable to brown-headed cowbird nest parasitism (County of Riverside, 2008), which is increased near habitat edges. Grazing may result in habitat degradation and reduction of populations, such as on San Clemente Island where removal of grazing animals resulted in the recovery of native vegetation and sage sparrow populations (County of Riverside, 2008). Proximity to humans also increases the possibility of predation by domestic cats.

Golden eagle (*Aquila chrysaetos*)

Status: The golden eagle is on CDFW Watch List and a California Fully Protected species. This taxon is not federally or State listed as threatened or endangered.

General Distribution: In North America, this species breeds locally from northern Alaska eastward to Labrador and southward to northern Baja California and northern Mexico. The species winters from southern Alaska and southern Canada southward through the breeding range. The golden eagle ranges from sea level up to 11,500 feet AMSL (Grinnell and Miller, 1944).

Distribution in the Study Area: There are no known records for this species within the Study Area; limited suitable nesting habitat for this species occurs within the Study Area but does occur on portions of the ANF. Suitable foraging habitat is present within Study Area.

Habitat and Habitat Associations: The golden eagle requires rolling foothills, mountain terrain, and wide arid plateaus deeply cut by streams and canyons, open mountain slopes and cliffs, and rock outcrops (Zeiner *et al.,* 1990a).

Natural History: The golden eagle requires rolling foothills, mountain terrain, and wide arid plateaus deeply cut by streams and canyons, open mountain slopes and cliffs, and rock outcrops (Zeiner *et al.,* 1990a). Nest construction in southern California occurs in fall and continues through winter (Dixon, 1937). This species nests on cliffs with canyons and escarpments and in large trees (generally occurring in open habitats) and is primarily restricted to rugged, mountainous country (Garrett and Dunn, 1981; Johnsgard, 1990). It is common for the golden eagle to use alternate nest sites, and old nests are reused. The nests are large platforms composed of sticks, twigs, and greenery that are often three meters (10 feet) across and one meter (three feet) high (Zeiner *et al.,* 1990a).

Threats: A major threat to this species is human disturbance in the form of habitat loss as well as human development and activity adjacent to golden eagle habitat. Accidental deaths attributed to increased development include collisions with vehicles, power lines, and other structures; electrocution; hunting; and poisoning (Franson *et al.,* 1995). Golden eagles avoid developed areas; the golden eagle population in California has undergone a decline within the past century due to a decrease in open habitats (Grinnell and Miller, 1944). If nests are disturbed by humans, abandonment of these nests in early incubation will typically occur (Thelander, 1974); thereby threatening the species' reproductive success.

Short-eared owl (*Asio flammeus*)

Status: The short-eared owl is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: This species is a widespread winter migrant in California, primarily occurring in the Central Valley, the western Sierra Nevada foothills, and along the coastline. Short-eared owls very irregularly breed along the southern California coast (Garrett and Dunn, 1981).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; suitable habitat is not present within the Study Area. Limited suitable habitat may be present along the proposed haul routes.

Habitat and Habitat Associations: The short-eared owl is usually found in open areas with few trees, including annual grasslands, prairies, dunes, meadows, agricultural fields, and emergent wetlands. Tall grasses, brush, ditches, and wetlands are used for resting and roosting cover (Grinnell and Miller, 1944).

Natural History: This species is a big-headed, short-necked owl with tawny to buff-brown plumage and whitish belly. Short-eared owls typically breed from early March through July (Bent, 1938; as cited in USACE and CDFG, 2010). Courtship activities consist of aerial displays and hooting (Pitelka *et al.*, 1955; as cited in USACE and CDFG, 2010). Clutches usually consist of 5-7 eggs, however, may be higher during periods of high prey abundance. Females incubate the eggs and care for the semialtrical young while males bring food to females at the nest. This species is primarily a crepuscular hunter and the great majority of their diet consists of small mammals (Holt and Leasure, 1993; Clark, 1975).

Threats: Numbers of this species have declined over much of its range due to the destruction and fragmentation of grassland habitats, grazing, and increased levels of predation (Remsen, 1978; Holt and Leasure, 1993).

Long-eared owl (*Asio otus*)

Status: The long-eared owl has been designated by CDFW as a California Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The long-eared owl (*Asio otus*) occurs in North America, Europe, Asia, and northern Africa between elevations from near sea level to over 2,000 meters (6,560 feet) AMSL (Zeiner *et al.,* 1990a). In North America, this species breeds from British Columbia east across Canada and the United States and south to southern California, southern Arizona, and northern Mexico. It also winters in most of its breeding range, except in the northernmost areas. The long-eared owl's wintering range extends from southern Canada and northern New England to the Gulf states and to the Jalisco, Michoacan, Guerrero, and Oaxaca states in Mexico (Marks *et al.,* 1994).

Distribution in the Study Area: Suitable habit occurs within the Study Area; however, there are no known reports of this species within or adjacent to the Study Area. This species is known to occur on portions of the ANF to the southwest of the Study Area

Habitat and Habitat Associations: The long-eared owl primarily uses riparian habitat for roosting and nesting, but can also use live oak thickets and other dense stands of trees (Zeiner *et al.,* 1990a). It appears to be more associated with forest edge habitat than with open habitat or forest habitat (Holt, 1997). The long-eared owl usually does not hunt in the woodlands where it nests, but in open space areas such as fields, rangelands, and clearings. At higher elevations, the species is found in conifer stands that are usually adjacent to more open grasslands and shrublands (Marks *et al.,* 1994). In California, long-eared owls also nest in dense or brushy vegetation amid open habitat (Bloom, 1994). Long-eared owls have also been known to nest in caves, cracks in rock canyons, and in artificial wicker basket nests (Marks *et al.* 1994; Garner and Milne, 1997).

Natural History: The long-eared owl eats mostly voles and other rodents, though it also occasionally eats birds and other vertebrates (Armstrong, 1958). It typically begins hunting before sunset, especially during the nesting season and while feeding its young (Bayldon, 1978). The long-eared owl uses abandoned crow, magpie, hawk, heron, and squirrel nests in a variety of trees with dense canopy (Call, 1978; Marks, 1986). The nest is usually three to 15 meters (9.8 to 49.2 feet) above the ground; rarely is the nest on the ground or in a tree cavity (Karalus and Eckert, 1974). Breeding season extends from early March to late July (Call, 1978).

Threats: Resident populations of the long-eared owl in California have been declining since the 1940s, especially in southern California (Grinnell and Miller 1944; Remsen 1978; Bloom, 1994). Habitat destruction, including grasslands used for foraging, fragmentation of riparian nesting habitat and live oak groves, and proximity to urban development are cited as major factors in the decline of populations in California (Marks *et al.* 1994; Bloom 1994; Remsen, 1978). Nesting long-eared owls appear to be particularly sensitive to human activity. Human disturbance usually flushes females from active nests, and while females usually return within 10 minutes of the disturbance, eggs and hatchlings are vulnerable to predation while the nest is exposed (Marks, 1986). Other urban-related factors that could affect long-eared owls are nighttime lighting, which may disrupt activity patterns and expose nests to nocturnal predators; use of pesticides, which may cause secondary poisoning and reduction or loss of prey; and predation and harassment by pet, stray, and feral cats and dogs.

Burrowing owl (*Athene cunicularia*)

Status: The burrowing owl is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The burrowing owl breeds from southern interior British Columbia, southern Alberta, southern Saskatchewan, and southern Manitoba, south through eastern Washington, central Oregon, and California to Baja California, east to western Minnesota, northwestern Iowa, eastern Nebraska, central Kansas, Oklahoma, eastern Texas, and Louisiana, the southern portion of Florida, and south to central Mexico. The species is also locally distributed throughout suitable habitat in Central and South America to Tierra del Fuego, and in Cuba, Hispaniola, the northern Lesser Antilles, Bahama Islands, and in the Pacific Ocean off the west coast of Mexico (County of Riverside, 2008; as cited in USACE and CDFG, 2010). The western subspecies, western burrowing owl, occurs throughout North and Central America west of the eastern edge of the Great Plains south to Panama (County of Riverside, 2008; as cited in USACE and CDFG, 2010). The winter range of the western burrowing owl is much the same as the breeding range, except that most individuals apparently vacate the northern areas of the Great Plains and the Great Basin (County of Riverside, 2008; as cited in USACE and CDFG, 2010).

Distribution in the Study Area: There are no known records for this species in the Study Area; nearest CNDDB record for this species occurs approximately 10 miles to the northwest. While suitable habitat for this species does not occur within the Study Area it does occur along portions of the proposed haul routes and at the sediment disposal site.

Habitat and Habitat Associations: In California, western burrowing owls are yearlong residents of flat, open, dry grassland and desert habitats at lower elevations (Bates, 2006; as cited in USACE and CDFG, 2010). They typically inhabit annual and perennial grasslands and scrublands characterized by low-growing vegetation and also may occur in areas that include trees and shrubs if the cover is less than 30% (Bates, 2006; as cited in USACE and CDFG, 2010); however, they prefer treeless grasslands. Although western burrowing owls prefer large, contiguous areas of treeless grasslands, they have also been observed in fallow agriculture fields, golf courses, cemeteries, road allowances, airports, vacant lots in residential areas and university campuses, and fairgrounds when nest burrows are present (Bates 2006; County of Riverside, 2008; as cited in USACE and CDFG, 2010). The availability of numerous small mammal burrows, such as those of California ground squirrel (*Spermophilus beecheyi*), is a major factor in determining whether an area with apparently suitable habitat supports western burrowing owls (Coulombe, 1971; as cited in USACE and CDFG, 2010).

Natural History: The majority of western burrowing owls that breed in Canada and the northern United States are believed to migrate south during September and October and north during March and April, and into the first week of May. These individuals winter within the breeding habitat of more southern-located populations. Thus, winter observations may include both the migrant individuals as well as the resident population (County of Riverside, 2008; as cited in USACE and CDFG, 2010). Western burrowing owls occurring in Florida are predominantly non-migratory, as are populations in southern California (Thomsen, 1971; as cited in USACE and CDFG, 2010). Western burrowing owls in northern California are believed to migrate (Coulombe, 1971; as cited in USACE and CDFG, 2010). In many parts of the United States, the western burrowing owl's breeding range has been reduced and it has been extirpated from certain areas, including western Minnesota, eastern North Dakota, Nebraska, and Oklahoma (Bates 2006; as cited in USACE and CDFG, 2010).

Western burrowing owls are opportunistic feeders, primarily feeding on arthropods, small mammals, and birds, and often need short grass, mowed pastures, or overgrazed pastures for foraging (County of

Riverside, 2008; as cited in USACE and CDFG, 2010). Western burrowing owls are primarily crepuscular in their foraging habits but hunting has been observed throughout the day (Thomsen 1971; Marti 1974; all as cited in USACE and CDFG, 2010). Insects are often taken during daylight, whereas small mammals are taken more often after dark (County of Riverside, 2008; as cited in USACE and CDFG, 2010).

Threats: Factors related to declines in western burrowing owl populations include the loss of natural habitat due to urban development and agriculture; other habitat destruction; predators, including domestic dogs; collisions with vehicles; and pesticides/poisoning of ground squirrels (Grinnell and Miller 1944; Zarn 1974; Remsen 1978; as cited in USACE and CDFG, 2010). A ranking of the most important threats to the species included loss of habitat, reduced burrow availability due to rodent control, and pesticides (James and Espie 1997; as cited in USACE and CDFG, 2010).

Ferruginous hawk (*Buteo regalis*)

Status: The California horned lark is designated a CDFW Watch List species. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The ferruginous hawk (*Buteo regalis*) occurs throughout western North America from southernmost Canada between the Great Plains and Rocky Mountains, south to northern Arizona and New Mexico. This species breeds from southeast Alberta and extreme southwest Manitoba south to the northwest corner of Texas, west to the Great Basin, Columbia River Basin regions of eastern Oregon and southeast Washington. It was more recently discovered breeding in California (Small, 1994). The ferruginous hawk most commonly winters from southern California, Colorado, Arizona, and New Mexico to northern Texas. Northern populations are completely migratory, while birds from southern breeding locations appear to migrate short distances or to be sedentary (Bechard and Schmutz, 1995). The ferruginous hawk is an uncommon winter resident and migrant at lower elevations and open grasslands in the Modoc Plateau, Central Valley, and Coast Ranges of California (Polite and Pratt, 1999).

Distribution in the Study Area: There are no known records for this species in the Study Area; nearest CNDDB record for this species occurs approximately 10 miles to the northwest. This species is a known winter resident in the Antelope Valley. Limited foraging habitat is present within the Study Area.

Habitat and Habitat Associations: The ferruginous hawk forages in open grasslands, agriculture (primarily grazing lands), sagebrush flats, desert scrub, and fringes of pinyon–juniper habitats (Polite and Pratt, 1999). Birds seem to show a strong preference for elevated nest sites (boulders, creek banks, knolls, low cliffs, buttes, trees, large shrubs, utility structures, and haystacks), but will nest on nearly level ground when elevated sites are absent and when located far from human activities (Bechard and Schmutz, 1995). Their winter range consists of open terrain from grassland to desert.

Natural History: Nest-building generally occurs in March in southern to mid-latitudes and birds occur on breeding areas from late February through early October (NatureServe, 2012). In California, it has been reported that this species prefers native grassland and shrubland habitats over cropland, and areas with no perches for their nest sites (Janes, 1985). Clutch size for this species is usually two to four with an incubation period of about 32 to 33 days. Young fledge in 35 to 50 days (Natureserve, 2012).

Threats: The major threat to this species is the loss of breeding and wintering habitat. Local declines of ferruginous hawk have been noted (*e.g.*, Woffinden and Murphy, 1989); but a widespread decline was not evident as of the early 1990s (57 FR 37507–37513; Olendorff, 1993). Olendorff (1993) attributed population declines to the effects of cultivation, grazing, poisoning, and controlling small mammals, mining, and fire in nesting habitats, with cultivation being the most serious source of impact. Impacts from collisions with stationary or moving structures or objects, pesticides and other contaminants, and shooting and trapping are not considered significant for this species.

Northern harrier (*Circus cyaneus*)

Status: The northern harrier is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The northern harrier is found throughout the northern hemisphere. In North America, this species breeds from Alaska and the southern Canadian provinces south to Baja California, New Mexico, Texas, Kansas, and North Carolina (Limas, 2001).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; suitable breeding and foraging habitat occurs within the Study Area.

Habitat and Habitat Associations: Northern harriers use a wide variety of open habitats in California, including deserts, coastal sand dunes, pasturelands, croplands, dry plains, grasslands, estuaries, flood plains, and marshes (MacWhirter and Bildstein, 1996; as cited in USACE and CDFG, 2010). The species can also forage over coastal sage scrub or other open scrub communities.

Natural History: The northern harrier's owl-like facial disk and white rump patch, which is prominent in flight, distinguish this species from all other North American falconiformes (Alsop III, 2001). Many California populations, including those in Ventura County, are residents, and many migrating harriers winter in California (CPIF, 2000). The breeding season for this species typically occurs between mid-March to early April. During this period, males, and occasionally females, exhibit uniquely characteristic courtship flights consisting of a series of nose dives (Bent, 1937). The northern harrier is predominately monogamous, but polygyny occurs when prey abundance is high. Nests are built on the ground. Clutch size averages five, and incubation lasts 30-32 days with nestlings fledging at 30-35 days. Hatching occurs from April through June (CPIF, 2000). This bird relies on hearing as well as sight while hunting and primarily feeds on small mammals, but will also take reptiles, amphibians, birds, and invertebrates.

Threats: The primary threat to northern harriers is habitat loss through development and agricultural conversion (CPIF, 2000).

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)

Status: The western yellow-billed cuckoo is state listed as endangered and is listed as a federal candidate for listing.

General Distribution: The yellow-billed cuckoo occurs as a breeding bird in temperate North America, south to Mexico, and the Greater Antilles. It possibly breeds in Central America and northwestern South America, although its breeding range may be confused by reports of non-breeding adult vagrants outside of known breeding areas during the breeding season. The northern limit of its distribution extends west from southern Maine through southern New Hampshire, Vermont, northern and central New York, extreme southwestern Quebec, southern Ontario, the Upper Peninsula of Michigan, northern Minnesota, and possibly into southeastern North Dakota and northeastern and western South Dakota (Hughes 1999; as cited in USACE and CDFG, 2010). Its breeding range extends southward along the Atlantic Coast to southern Florida, and west to the extreme eastern portion of Wyoming, the eastern plains of Colorado, and throughout Texas (Hughes 1999; as cited in USACE and CDFG, 2010).

Distribution in the Study Area: There are no known records for this species in the Study Area; there are no CNDDB records for this species within a 15 mile radius of the Study Area; the Study Area is located within the known geographic distribution for this species; extremely limited breeding and foraging habitat occurs in the Study Area.

Habitat and Habitat Associations: Breeding habitat for the western yellow-billed cuckoo primarily consists of large blocks of riparian habitat, particularly cottonwood–willow riparian woodlands (66 FR 38611–38626; as cited in USACE and CDFG, 2010). Laymon and Halterman (1989; as cited in USACE and CDFG, 2010) proposed that the suitable habitat for the western yellow-billed cuckoo for California be defined as habitat classified as willow–cottonwood with a patch size greater than 80 hectares (198 acres) and width greater than 600 meters (1,270 feet). It prefers dense riparian thickets with dense low-level foliage near slow-moving water sources.

Natural History: The western yellow-billed cuckoo's range is considered to be where it formerly bred from southwestern British Columbia, western Washington, northern Utah, central Colorado, and western Texas south and west to southern Baja California, Sinaloa, and Chihuahua in Mexico (Hughes, 1999; as cited in USACE and CDFG, 2010). In California, the western yellow-billed cuckoo's breeding distribution is now thought to be restricted to isolated sites in the Sacramento, Amargosa, Kern, Santa Ana, and Colorado river valleys (Laymon and Halterman, 1987; as cited in USACE and CDFG, 2010). Nests are constructed in willows on horizontal branches in trees, shrubs, and vines, but cottonwoods (Populus spp.) are used extensively for foraging and humid lowland forests are used during migration (Hughes, 1999; as cited in USACE and CDFG, 2010).

The western yellow-billed cuckoo is a long-distance migrant, though details of its migration patterns are not well known (Hughes, 1999; as cited in USACE and CDFG, 2010). It is a relatively late spring migrant, arriving on the breeding grounds starting mid- to late May (Franzreb and Laymon, 1993; as cited in USACE and CDFG, 2010). The migratory route of western yellow-billed cuckoos is not well known because few specimens collected on wintering grounds have been ascribed to the western or eastern subspecies. The western yellow-billed cuckoo likely moves down the Pacific Slope of Mexico and Central America to northwestern South America (Hughes, 1999; as cited in USACE and CDFG, 2010).

Yellow-billed cuckoos generally forage for caterpillars and other large insects by gleaning (Hughes 1999; as cited in USACE and CDFG, 2010). They occasionally prey on small lizards, frogs, eggs, and young birds as well (Zeiner *et al.*, 1990a; as cited in USACE and CDFG, 2010). Foraging occurs extensively in cottonwood riparian habitat (Hughes, 1999).

Threats: The western yellow-billed cuckoo is sensitive to habitat fragmentation and degradation of riparian woodlands due to agricultural and residential development (Hughes, 1999; as cited in USACE and CDFG, 2010), and major declines among western populations reflect local extinctions and low colonization rates (Laymon and Halterman, 1989; as cited in USACE and CDFG, 2010).

White-tailed kite (*Elanus leucurus*)

Status: The white-tailed kite is a CDFW Fully Protected Species. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The white-tailed kite is a permanent resident in California, southern Texas, Washington, Oregon, and Florida. It also occurs as a resident from Mexico into parts of South America (Dunk, 1995). In California, this species inhabits coastal and valley lowlands and is typically found in agricultural areas. It has increased population numbers and range in recent decades (Zeiner *et al.*, 1990a).

Distribution in the Project Areas: There are no known records for this species in the Study Area or surrounding areas. The Study Area is located within the known geographic distribution for this species; limited breeding and foraging habitat occurs in the Study Area.

Habitat and Habitat Associations: The white-tailed kite inhabits savanna, open woodlands, marshes, desert grasslands, partially cleared lands, and cultivated fields (Dunk, 1995). This species roosts in trees with dense canopies as well as saltgrass and Bermuda grass (Zeiner *et al.*, 1990a).

Natural History: The white-tailed kite is a medium-sized, long-winged raptor with red eyes. This monogamous species breeds from February to October, with peak activity occurring between May and August. Incubation is solely performed by the female; however, during incubation and the nestling period, the male feeds the female and provides her with food to feed the young (CDFG, 2008). The white-tailed kite is the only North American kite that hovers while hunting, usually less than thirty meters above the ground before descending vertically upon prey (Alsop III, 2001; Zeiner *et al.*, 1990a). This species primarily feeds on voles and other small mammals but will also take birds, insects, reptiles, and amphibians. Although white-tailed kites are non-migratory, individuals may become nomadic in response to prey availability (Zeiner *et al.*, 1990a).

Threats: While the white-tailed kite is reported to have increased in numbers and range over the past several decades, it is still vulnerable to habitat loss due to development.

Willow flycatcher (*Empidonax traillii*), including Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

Status: The willow flycatcher is state-listed endangered at the species level, and the southwestern willow flycatcher subspecies is federally and state listed as endangered.

General Distribution: The southwestern willow flycatcher has a known United States breeding range in six states: Arizona, New Mexico, California, southwestern Colorado, extreme southern portions of Nevada and Utah, and, possibly, western Texas. In California, its breeding range extends from the Mexican border north and inland to the City of Independence in the Owens Valley east of the Sierra Nevada, to the South Fork Kern River in the San Joaquin Valley and coastally to the Santa Ynez River in Santa Barbara County (Craig and Williams 1998; as cited in USACE and CDFG, 2010). The southwestern willow flycatcher was formerly a common summer resident throughout California, but has been extirpated from most of its historic breeding range in California.

Distribution in the Study Area: Five willow flycatchers of unknown subspecies were identified below the Littlerock Dam and in Littlerock Creek during Project surveys in May 2012. No breeding activity was documented, and the individuals were determined to be migrants. The Study Area is located within the known geographic distribution for the southwestern willow flycatcher but is well south of the breeding range for other willow flycatcher subspecies. Suitable breeding habitat for southwestern willow flycatcher is not present within the Study Area as this species prefers riparian areas of greater density than are present. Suitable foraging habitat occurs throughout the Study Area.

Habitat and Habitat Associations: The southwestern willow flycatcher is a riparian-obligate species restricted to complex streamside vegetation. Four general habitat types are used by the southwestern willow flycatcher at its breeding sites: monotypic high-elevation willow; exotic monotypes (e.g., dense stands of tamarisk (Tamarix spp.) or Russian olive (Elaeagnus angustifolius)), especially in the desert southwest; native broadleaf-dominated riparian forest; and mixed native/exotic forests (Sogge *et al.*, 1997; as cited in USACE and CDFG, 2010). Of these, native broadleaf-dominated and mixed native/exotic are the primary habitats used by southwestern willow flycatcher in California. The native broadleaf-dominated habitat is composed of a single species, such as Goodding's or other willow (Salix spp.) species,, or a mixture of broadleaf trees and shrubs, including cottonwood (Populus spp.), willow, box elder (Acer negundo), ash (Fraxinus spp.), and alder (Alnus spp.). Stands are usually three to 15 meters (10 to 50 feet) in height and are characterized by trees of different size classes, yielding multiple layers of canopy (Sogge *et al.*, 1997; as cited in USACE and CDFG, 2010).

Natural History: Willow flycatchers are late spring migrants and have a breeding season of three months or less (Sedgwick 2000; as cited in USACE and CDFG, 2010). The earliest spring arrival of the willow flycatcher in southern California is typically between late April and early May. When a willow flycatcher is observed in southern California after about June 22, or if nesting activity is observed, it can be concluded that the individual is E. t. extimus (southwestern willow flycatcher). By this date, most migrant willow flycatchers have passed through southern California; however, migrant willow flycatchers may again be observed—virtually always away from the coast—in late July as they pass through the region heading south to their wintering area (Sogge *et al.* 1997; as cited in USACE and CDFG, 2010).

Breeding territory sizes of the southwestern willow flycatcher vary greatly in relation to population density, habitat quality, and nesting stage (USFWS 2002c; as cited in USACE and CDFG, 2010). The observed range of territory sizes is 0.1 to 2.30 hectares (0.26 to 5.70 acres), with most in the range of 0.2 to 0.5 hectares (0.5 to 1.2 acres) (USFWS 2002c; as cited in USACE and CDFG, 2010). Clutches of two to four eggs are laid in the third week in June, with fledglings first appearing in mid-July (Sanders and Flett 1989; as cited in USACE and CDFG, 2010). Fledglings stay close to the nest and to each other for three to five days after leaving the nest and stay in the area for a minimum of 14 to 15 days (Sogge *et al.* 1997; as cited in USACE and CDFG, 2010).

Threats: The decline of southwestern willow flycatchers is primarily due to loss, fragmentation, and degradation of suitable riparian habitat resulting from urbanization, recreation, water diversion and impoundments, channelization, invasive plant species, overgrazing by livestock, and conversion of riparian habitat to agricultural land (USFWS, 2002; Sedgwick, 2000; all as cited in USACE and CDFG, 2010). Channelization, bank stabilization, levees, and other flow control structures, surface water diversions, and groundwater pumping for agricultural, industrial, and municipal uses are major factors in the deterioration of suitable southwestern willow flycatcher habitat.

California horned lark (*Eremophila alpestris actia*)

Status: The California horned lark is designated a CDFW Watch List species. This taxon is not federally or State listed as threatened or endangered.

General Distribution: Horned larks (*Eremophila alpestris*) have a holarctic distribution, ranging from the Arctic south to central Asia and Mexico. There are numerous regional subspecies representing the superspecies across this holarctic range, including the California horned lark (*Eremophila alpestris* ssp. *actia*). Horned larks are common and abundant residents in a variety of open habitats, usually where trees and shrubs are absent and can be found from sea level to elevations of 4,000 meters (13,123 feet) AMSL (Beason, 1995). In general, the northernmost populations of horned lark are migratory, moving south during the winter into remaining areas of the breeding range. There are also southward movements into areas south of the breeding range, particularly in the southeastern United States (Beason, 1995). The California horned lark breeds and resides in the coastal region of California from Sonoma County southeast to the United States–Mexico border, including most of the San Joaquin Valley, and eastward to the foothills of the Sierra Nevada (Grinnell and Miller, 1944; AOU, 1998).

Distribution in the Study Area: There are no known records for this species in the Study Area; there are no CNDDB records for this species within a 15 mile radius of the Study Area. Limited breeding and foraging habitat occurs in the Study Area.

Habitat and Habitat Associations: It is found in grasslands along the coast and deserts near sea level and alpine dwarf-shrub habitat above the tree line. It is less common in mountain regions, on the north coast, and in coniferous or chaparral habitats (McCaskie *et al.,* 1979). The California horned lark uses predominantly agriculture, grassland, and disturbed areas for foraging, as well as sparse shrub and scrub habitats (Garrett and Dunn, 1981). In winter, flocks frequent roadsides, feedlots, and fields where manure from feedlots is spread.

Natural History: California horned larks breed from March through July, with a peak in activity in May and they frequently raise two broods in a season (Zeiner *et al.,* 1990a).

Threats: In addition to direct loss of habitat and fragmentation, California horned larks are vulnerable to several effects related to agriculture and urbanization. Increased use of pesticides, specifically Carbofuran and Fenthion, have been shown to poison and kill horned larks (Beason, 1995). The demonstrated deleterious effects of these pesticides illustrate that horned larks may be vulnerable to certain chemicals because of their ground-foraging habits and seasonally varying diet. Pesticides may also cause a decline in prey abundance. Mowing of grasslands occupied by nesting horned larks substantially increased nest failures (Kershner and Bollinger, 1996). Horned lark nests can also be parasitized by brown-headed cowbirds, especially after the first brood when there are multiple broods in a single season (Beason, 1995). Other development- and human-related impacts expected to affect this species include construction-related dust; noise and ground vibration; nighttime lighting, which may induce physiological stress and increase predation by nocturnal predators; and increased predation by pet, stray, and feral cats and dogs. Areas of increased moisture may attract Argentine ants that prey on nestlings.

Merlin (*Falco columbarius*)

Status: The merlin is a CDFW Watch List Species that was removed from the Species of Special Concern list in 2008. This taxon is not federally or State listed as threatened or endangered.

General Distribution: In North America, this species breeds from the northward tree limit in Alaska and Canada southward to southern Alaska, Oregon, Idaho, South Dakota, the northern Great Lakes region, New York, Maine, and Nova Scotia. Breeding does not occur in California; however, this species does occur in most of the western half of the state below roughly 4000 feet through the winter season (September to May) (CDFG, 2008).

Distribution in the Study Area: There are no known records for this species in the Study Area or surrounding areas; this species is a winter resident that does not breed in California; the Study Area is located within the known geographic winter distribution for this species; suitable foraging habitat occurs throughout the Study Area.

Habitat and Habitat Associations: The merlin occurs in a wide variety of habitats, including marshes, deserts, seacoasts, open woodlands, fields, and communities in early successional stages (Garrett and Dunn, 1981).

Natural History: The merlin is a small, averaging twelve inches in length, member of the falcon family (Falconidae) with a long tail and long, pointed wings. This species winters in California from September to May and wanders, but does not apparently defend, foraging territories throughout the winter range

(Becker and Sieg, 1987; Warkentin and Oliphant, 1990; Sodhi and Oliphant, 1992). Merlins primarily prey on small birds, which are captured on the ground or in the air, after direct pursuit (CDFG, 2008). Small mammals and insects are also consumed, the latter of which may be taken while young merlins are developing their predatory skills.

Threats: There are no persistent threats identified for this species; however, because merlins feed primarily on birds, numbers have been likely reduced due to pesticide use.

Prairie Falcon (*Falco mexicanus*)

Status: The prairie falcon is a CDFW Watch List Species that was removed from the Species of Special Concern list in 2008, and a USFWS Bird of Conservation Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: This species is an uncommon permanent resident that occurs throughout California with the exception of the humid northwest coastal belt (Small, 1994).

Distribution in the Study Area: There are no known records for this species in the Study Area. The CNDDB reports one historic occurrence approximately 10 miles to the west of the Study Area. Marginal (at best) nesting habitat occurs within the Study Area; suitable foraging habitat occurs throughout the Study Area.

Habitat and Habitat Associations: The prairie falcon occurs in a wide variety of habitats from annual grasslands to alpine meadows, but is most commonly associated with perennial grasslands, savannahs, rangelands, some agricultural fields, and desert scrub areas (CDFG, 2008). This species usually nests on sheltered cliff ledges overlooking open areas.

Natural History: This species is a medium-sized falcon with a dark brown cap and cheek and distinct dark mustache markings. Prairie falcons breed in mid-April on cliff edges or rock outcrops in open areas. The male rarely takes an active role in the incubation process; however, may provide food to the female during this time (Stephenson and Calcarone, 1999). Hatchlings are tended by both adults until fledging at roughly forty days (Baicich and Harrison, 1997). Prairie falcons prey primarily on small passerine birds; however, lizards, ground squirrels, and other small mammals are also consumed (Steenhof, 1998). This species utilizes two hunting strategies, including flushing a prey item while flying along a concealed route until the last moment and patrolling along long distances close to the ground until surprising and attacking a prey item (Dunne *et al.*, 1988).

Threats: The loss of suitable foraging habitat to human development, particularly in coastal California, has been identified as a primary threat to this species.

American peregrine falcon (*Falco peregrinus anatum*)

Status: The peregrine falcon is a California Fully Protected species.

General Distribution: The peregrine falcon has a worldwide distribution that is more extensive than that of any other bird. In North America, the peregrine falcon breeds from Alaska to Labrador, southward to Baja California and other parts of northern Mexico, and east across central Arizona through Alabama. Its distribution is patchy in North America, and populations in the eastern United States are still chiefly in urban areas (AOU, 1998; White *et al.*, 2002; as cited in USACE and CDFG, 2010).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; suitable breeding habitat does not occur within but may be present in areas adjacent to the Study Area; foraging habitat occurs throughout the Study Area.

Habitat and Habitat Associations: Peregrine falcons in general use a large variety of open habitats for foraging, including tundra, marshes, seacoasts, savannahs, grasslands, meadows, open woodlands, and agricultural areas. Sites are often located near rivers or lakes (AOU, 1998; Brown, 1999; Snyder, 1991; all as cited in USACE and CDFG, 2010). Riparian areas, as well as coastal and inland wetlands, are also important habitats year-round for this species. The species breeds mostly in woodland, forest, and coastal habitats (Zeiner et al,. 1990a; Brown, 1999; all as cited in USACE and CDFG, 2010).

Natural History: In California, the American peregrine falcon is an uncommon breeder or winter migrant throughout much of the state. It is absent from desert areas (Zeiner *et al.*, 1990a; as cited in USACE and CDFG, 2010). Active nests have been documented along the coast north of Santa Barbara, in the Sierra Nevada, and in other mountains of northern California. As a transient species, the American peregrine falcon may occur almost anywhere that suitable habitat is present (Garrett and Dunn, 1981; as cited in USACE and CDFG, 2010).

The diet of the American peregrine falcon primarily consists of birds that, while most are pigeon-sized, can be as small as hummingbirds or as large as small geese (White *et al.*, 2002; as cited in USACE and CDFG, 2010). Other prey species include jays, flickers, meadowlarks, starlings, woodpeckers, shorebirds, and other readily available birds. The American peregrine falcon may feed on large numbers of rodents when present (Brown, 1999; as cited in USACE and CDFG, 2010).

Breeding requires cliffs or suitable surrogates that are close to preferred foraging areas. Nests are typically located in cliffs between 50 and 200 meters (164 to 656 feet) tall that are prominent in the landscape. American peregrine falcons have also been known to nest in trees and on small outcrops. Tall buildings, bridges, or other tall man-made structures are also suitable for nesting (White *et al.*, 2002; as cited in USACE and CDFG, 2010). The nest site usually provides a panoramic view of open country and often overlooks water. It is always associated with an abundance of avian prey, even in an urban setting. A cliff or building nest site may be used for many years (Brown, 1999; as cited in USACE and CDFG, 2010). The nest site itself usually consists of a rounded depression or scrape with accumulated debris that is occasionally lined with grass (Call, 1978; as cited in USACE and CDFG, 2010). Higher-quality nest sites confer greater protection from the elements and have greater breeding success (Olsen and Olsen, 1989; as cited in USACE and CDFG, 2010).

Threats: There are no persistent threats identified for this species.

California condor (*Gymnogyps californianus*)

Status: The California condor is listed as both state and federally endangered and is a California Fully Protected species.

General Distribution: The southern California population of the California condor is largely confined to the semi-arid, rugged mountain ranges surrounding the southern San Joaquin Valley, including the Coast Ranges from Santa Clara County south to Los Angeles County, the Transverse Ranges, Tehachapi Mountains, and southern Sierra Nevada (Zeiner *et al.*, 1990a; as cited in USACE and CDFG, 2010). The California condor has also historically occurred in northern Baja California, Mexico; northern California; Oregon; Washington; and south British Columbia, Canada in the early nineteenth century (Harris, 1941; Koford, 1953; Wilbur, 1978; Kiff, 2000; Snyder and Snyder, 2000; all as cited in USACE and CDFG, 2010).

Distribution in the Study Area: There are no known records for this species in the Study Area although they have been observed flying over the San Gabriel Mountains. Suitable breeding habitat is not present within the Study Area but the animal may periodically forage in the region.

Habitat and Habitat Associations: California condors require vast expanses of open savannah, grasslands, and foothill chaparral, with cliffs, large trees, and snags for roosting and nesting (Zeiner *et al.*, 1990a; as cited in USACE and CDFG, 2010).

Natural History: Prior to all California condors being removed from the wild for captive breeding in the late 1980s, nonbreeding California condors often moved north to Kern and Tulare counties in April and returned south in September to winter in the Tehachapi Mountains, Mount Pinos, and Ventura and Santa Barbara counties (Zeiner et al,. 1990a; as cited in USACE and CDFG, 2010). Since that time, California condors have been reintroduced into suitable habitat in eastern Ventura County as well as in the Ventana Wilderness area along the coast south of San Francisco.

The California condor requires an adequate food supply, open habitat in which food can readily be found and accessed, and reliable air movements that allow extended soaring flight (Snyder and Schmitt, 2002; as cited in USACE and CDFG, 2010). Most foraging has been documented in grasslands and oak woodlands, where individuals can easily launch into flight from nearly any location by running downhill, and where winds deflected by topographic relief usually provide the uplift necessary for extended flight (Snyder and Schmitt, 2002; as cited in USACE and CDFG, 2010). Most California condors forage within 50 to 70 kilometers (31 to 43 miles) of nesting areas, with core foraging areas ranging around 2,500 to 2,800 square kilometers (1,553 to 1,740 miles). This wide-ranging foraging area appears to be an adaptation to unpredictable food supplies.

The California condor primarily feeds on mammalian carrion, although remains of reptiles and birds have been occasionally found within nests (Collins *et al.*, 2000; as cited in USACE and CDFG, 2010). California condors are scavengers of fresh medium- to large-sized carcasses, such as sheep, cattle, deer, and elk (Koford, 1953; Snyder and Snyder, 2000; Collins *et al.*, 2000; all as cited in USACE and CDFG, 2010). California condors are not known to feed on vehicle-killed animals, but in recent years, hunter-shot mule deer, shot or poisoned coyotes, and ground squirrels were consumed when available (Snyder and Schmitt, 2002; as cited in USACE and CDFG, 2010).

California condors typically breed annually but frequently breed less often. Observations of new pair formations have been observed in late fall and early winter (Snyder and Schmitt 2002; as cited in USACE and CDFG, 2010). Once pairs have been formed, the California condors stay together year round for multiple years. California condors lay only one egg; this can occur from the last week of January through the first week of April, with an incubation period averaging 57 days. The hatching of the eggs ranges between the last week of March and the first week of June. The chicks are tended by both parents until the chicks are fledged, which occurs five and a half to six months after hatching. The chicks are fully dependent on their parents for approximately another six months, ending roughly a year after hatching, from early March to mid-May (Snyder and Schmitt, 2002; as cited in USACE and CDFG, 2010).

Threats: Major threats to this species include lead poisoning, collisions, poisoning due to ingestion of antifreeze, drowning and shooting. An increase in power lines and utility poles, which can result in collisions and electrocution; microtrash (e.g., bottle caps, pull tabs, broken glass, cigarette butts, small plastic items, lead bullets, and shell casings, which condors can ingest); long-term habitat degradation; and contaminants other than lead and antifreeze also have the potential to affect individuals.

Yellow-breasted chat (*Icteria virens*)

Status: The yellow-breasted chat is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: Although this species is a widespread summer resident in eastern North America, its distribution is much more fragmented in the west. In California, yellow-breasted chat primarily occurs in the northern portion of the state and is considered scarce in the central and southern portions.

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; limited breeding and foraging habitat occurs in the Study Area.

Habitat and Habitat Associations: In southern California, this species utilize dense riparian thickets and brushy tangles near watercourses for breeding (Garrett and Dunn, 1981). Similar habitat is used during migration (Dunn and Garrett, 1997).

Natural History: The yellow-breasted chat is the largest member of the warbler family (Parulidae). Its yellow throat and breast, olive underparts and white spectacles distinguish this species from other similar birds. The yellow-breasted chat breeds in April or May through August. Females initiate nest construction, which begins shortly after pair formation, above ground in dense shrubs along a river or stream. Both parents tend to nestlings until they fledge at roughly nine days (Stephenson and Calcarone, 1999). This species feeds primarily on insects and spiders that are gleaned from the foliage of low trees and shrubs; however, berries and other fruits are also consumed (CDFG, 2008).

Threats: The loss and degradation of riparian habitat have resulted in a marked decline of breeding populations of yellow-breasted chat in California. Nest parasitism by brown-headed cowbird (*Molothrus ater*) has also contributed to declines (Gaines, 1974; Remsen, 1978).

Loggerhead shrike (*Lanius ludovicianus*)

Status: The loggerhead shrike is a CDFW Species of Special Concern and a USFWS Bird of Conservation Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The breeding range of the loggerhead shrike includes Alberta, Saskatchewan, and Manitoba in Canada; the majority of the United States except the Pacific Northwest; and Mexico (Yosef, 1996). This species is a common resident and winter visitor in lowlands and foothills throughout California.

Distribution in the Study Area: Although not documented within the Study Area an occurrence of this species is reported from the CNDDB approximately 2.5 miles east of the Study Area. Suitable foraging and breeding habitat occurs within the Study Area.

Habitat and Habitat Associations: The loggerhead shrike prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. This species most often occurs in open-canopied valley foothill hardwood forests, valley-foothill hardwood-conifer forests, valley foothill riparian, pinyon-juniper woodlands, desert riparian, and Joshua tree habitats.

Natural History: The loggerhead shrike is a large-headed bird with a hooked beak and whitish underparts. The breeding season for this species generally begins in late January or early February, earlier than those of other sympatric passerine species, and lasts through July (Stephenson and Calcarone, 1999). Nests are typically constructed in well-concealed microsites in densely foliaged trees or shrubs (Miller, 1931; Bent, 1950). Females typically feed nestlings until fledging occurs at 16 to 20 days; however, males will feed nestlings if females are absent from the nest for extended periods of time (Stephenson and Calcarone, 1999). This species preys primarily on large insects, but will also take small birds, mammals, amphibians, reptiles, fish, carrion, and various invertebrates. Loggerhead shrikes often impale their prey on barbed wire or other sharp objects.

Threats to Species: Breeding Bird Survey data indicate that loggerhead shrike populations are declining in most states (Sauer *et al.*, 1996). Threats include habitat loss and degradation, shooting, and pesticide and other toxic contamination.

Long-billed curlew (*Numenius americanus*)

Status: The long-billed curlew is a CDFW Watch List Species. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The breeding range of this migratory species extends from eastern New Mexico and the Texas panhandle, north through western Kansas, central Nebraska, central South Dakota, and western North Dakota and west to portions of Montana and southern Alberta, Saskatchewan, Manitoba, and British Columbia. In the Great Basin the curlew ranges from Utah west to California and north into eastern Washington and British Columbia. Winter distribution is scattered across the southern United States. Long-billed curlews winter from California, into western Nevada, Arizona, eastern New Mexico, western and southern Texas, and coastal Louisiana south to Baja, California, and Guatemala. Wintering curlews are found in small numbers along the Atlantic coast from South Carolina to Florida as well. [NRCS, 2010]

Distribution in the Study Area: There are no known recent records for this species in the Study Area; there are a variety of eBird records for this species approximately 20 miles to the north within the Lancaster Area. Suitable habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: Generally nest in short grasses including grass prairies or agricultural fields and move to denser grasslands after young have fledged. Long-billed curlews winter at the coast and in Mexico.

Natural History: The long-billed curlew is the largest nesting or regularly-occurring sandpiper in North America. The bird usually feeds in flocks. Using its long bill, it probes the mud near its habitat, foraging for suitable food. The usual food consists of crabs and various other small invertebrates. The species also feeds on grasshoppers, beetles and other insects. This bird has occasionally been known to eat the eggs of other birds. The long-billed curlew is a precocial bird, and the chicks leave the nest soon after hatching. Both parents look after the young.

Threats: Development and urbanization along the coastal habitats threaten this species.

Osprey (*Pandion haliaetus*)

Status: The osprey is a CDFW Watch List Species. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The osprey is one of only two wild bird species with a worldwide distribution (the other is peregrine falcon). In California, this species typically breeds in the northern part of the state from the Cascade Range south to Lake Tahoe and along the coast to Marin County (Stephenson and Calcarone, 1999). Osprey is an uncommon visitor along the coast of southern California (Zeiner *et al.*, 1990a).

Although this species is almost entirely migratory across its range, some areas of southern California, including Ventura County, support year-round residents (Ferguson-Lees and Christie, 2001).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; there are a variety of eBird records for this species approximately 20 miles to the north within the Lancaster Area. Suitable habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: This species most commonly occurs along rivers, lakes, reservoirs, and sea coasts, often crossing land between bodies of water (AOU, 1998). Nests are typically found in tree snags, on cliffs, and among various manmade structures, usually near or above water.

Natural History: The osprey is easily distinguished by its unmarked white belly, wing shape, and flight style. This species typically breeds between late March and early June as the male arrives to breeding sites first followed by the female a few days later (Johnsgard, 1990). Nests consist of a massive accumulation of sticks and other debris and may be added to and used in successive years (Stephenson and Calcarone, 1999). A single brood of three eggs is incubated by both sexes. Ospreys hunt by initially scanning water surfaces from an elevated perch, often followed by a period of hovering, and then diving from heights of roughly 16-23 feet above the water (Stephenson and Calcarone, 1999). Prey consists almost entirely of salt or freshwater surface feeding fish; however, reptiles, sick or injured birds, crustaceans, or small mammals are sometimes taken (Ferguson-Lees and Christie, 2001).

Threats: Threats that have been identified for this species include disturbance from recreation and other activities near nests, development near lakes and rivers, and removal of suitable nesting sites.

Vermilion flycatcher (*Pyrocephalus rubinus*)

Status: The vermilion flycatcher is designated by CDFW as a California Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: In California, the vermilion flycatcher was formerly considered a more common and widespread breeder along the lower Colorado River, Imperial Valley, Coachella Valley, upper Mojave River drainage, and San Diego County (Grinnell and Miller 1944; Garrett and Dunn, 1981); but its breeding range has declined throughout this area (Wolf and Jones, 2000). Currently, in California, there are some isolated breeding populations in the lowlands in the south central and southeast portions of the state, including San Bernardino, Riverside, San Diego, Santa Barbara, Ventura, and Kern counties (Wolf and Jones, 2000). Zeiner *et al.* (1990a) state that there are sporadic breeding populations in desert oases west and north of the Morongo Valley and Mojave Narrows in San Bernardino County. It has been recorded in summer along the Santa Clara River near Castaic and at Frazier Park, Kern County; however, there has been no evidence of breeding, and these observations are likely vagrants (Garrett and Dunn, 1981).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; there is a 2010 eBird record for this species approximately 7 miles to the northwest at Lake Palmdale. Suitable habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: This species is found in riparian thickets near open, mesic habitats. It breeds in cottonwood, willow, mesquite, oak, sycamore, and other vegetation in desert riparian communities that are located adjacent to irrigated fields, irrigated ditches, or pastures (Zeiner *et al.* 1990a; Wolf and Jones, 2000).

Natural History: Although the vermilion flycatcher is largely a resident species, where it does show migratory movements, the male arrives to the breeding locations in February or March and females arrive afterwards, typically in March or April, depending on location (Wolf and Jones, 2000). Males play a large role in determining the nest site, which is built in a horizontal fork or branch under a canopy in an area free of leaves, about eight to 20 feet above ground (Wolf and Jones, 2000; Tinkham, 1949). The nest is a shallow open cup, loosely constructed out of small twigs, forbs, rootlets, grasses, fibers, or other similar materials and is lined with feathers and hair (Wolf and Jones, 2000).

Threats: This species primarily is threatened by the degradation and loss of habitat. The abundance and distribution of this species has been drastically reduced over the last 50 years in the lower Colorado River Valley. Water management, such as groundwater pumping and damming, can reduce and degrade riparian habitat and remove vegetation, such as cottonwoods and willows, that is critical to its breeding. Urbanization and human development have also degraded or reduced vermilion flycatcher habitat. Like other riparian bird species, however, several other potential human- or development-related factors may affect the vermilion flycatcher. Construction-related impacts include dust; noise and ground vibration; diminished water quality and altered hydrology; increased human activity in close proximity to foraging areas; and lighting, which may alter foraging behavior, induce physiological stress, and increase predation risk. Long-term effects related to development include increased human activity; noise; lighting; diminished water quality and altered hydrology; predation and harassment by pet, stray, and feral cats and dogs and other mesopredators; and pesticides, which may reduce insect prey or cause secondary poisoning.

Bank swallow (*Riparia riparia*)

Status: The bank swallow is state listed as threatened.

General Distribution: A neotropical migrant found primarily in riparian and other lowland habitats in California west of the deserts during the spring-fall period. A spring and fall migrant in the interior, less common on coast; an uncommon and very local summer resident. Casual in southern California in winter; a few winter records along central coast to San Mateo Co. (McCaskie *et al.*, 1988).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; There are numerous eBird records for this species approximately 20 miles to the northwest near the City of Lancaster. Suitable habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: This swallow requires fine-textured or sandy banks or cliffs to dig horizontal nesting tunnels/burrows (CDFG, 1999).

Natural History: Predominantly a colonial breeder; colonies range in size of 10 to 1,500 nesting pairs in California, although most colonies have 100-200 nesting pairs. Forages by hawking insects during long, gliding flights. Feeds predominantly over open riparian areas, but also over brushland, grassland, wetlands, water, and cropland. Feeds on a wide variety of aerial and terrestrial soft-bodied insects including flies, bees, and beetles. Uses holes dug in cliffs and river banks for cover. Will also roost on logs, shoreline vegetation, and telephone wires. [CDFG, 1999].

Threats: Channelization and stabilization of banks of nesting rivers, and other destruction and disturbance of nesting areas, are major factors causing the marked decline in numbers in recent decades (CDFG, 1999)

Allen's hummingbird (*Selasphorus sasin*)

Status: The Allen's hummingbird is a CDFW Special Animal. This taxon is not federally or State listed as threatened or endangered.

General Distribution: This species is a permanent resident in Ventura County. It also occurs as a common summer resident and migrant along much of the California coast.

Distribution in the Study Area: There are no known recent records for this species in the Study Area. There are several eBird records for this species approximately 5 miles to the northwest and 10 miles to the east. Suitable habitat occurs throughout the Study Area.

Habitat and Habitat Associations: Breeding for this species most commonly occurs in coastal scrub, valley and foothill hardwood forests, valley and foothill riparian forests, and urban habitats. Allen's hummingbird also occurs in a variety of woodland and scrub habitats as a migrant (CDFG, 2008).

Natural History: This species is a small hummingbird with a green back and crown and distinctive rufous markings on the flanks and tail. The Allen's hummingbird often attaches its nest to more than one lateral support on eucalyptus, juniper, willow, other trees, vines, shrubs, or ferns (CDFG, 2008). Breeding occurs from mid-February through early August with peak activity occurring in April. Large mating territories are rigorously defended as are smaller feeding territories (Legg and Pitelka, 1956). The primary diet of this species consists of nectar taken from a variety of herbaceous and woody flowering plants; however, small insects and spiders may also be consumed (CDFG, 2008).

Threats: No persistent threats have been identified for this species.

Le Conte's thrasher (*Toxostoma lecontei*)

Status: The Le Conte's thrasher is designated by CDFW as a California Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The Le Conte's thrasher is found throughout the Southwestern United States and Northwestern Mexico.

Distribution in the Study Area: There are no known records for this species in the Study Area. The CNDDB reports occurrences of this species approximately 5 miles northeast of the Study Area. Suitable habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: Sparse desert scrub such as creosote bush, Joshua tree, and saltbush scrubs, or sandy-soiled cholla-dominated vegetation. Nests in dense, spiny shrubs or densely branched cactus in desert wash habitat.

Natural History: The Le Conte's thrasher forages on the ground for insects and spiders, as well as some seeds and berries.

Threats: In some parts of its range, the Le Conte's Thrasher has lost extensive habitat to development. Irrigated lawns, groves, and fields are not compatible with its need for desert vegetation.

Gray vireo (*Vireo vicinior*)

Status: The gray vireo is a Forest Service Sensitive Species, a CDFW Species of Special Concern, and a USFWS Bird of Conservation Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The gray vireo is rare west of the Colorado River and more common to the east. In California, this species is a summer resident at disjunct locations in the mountains of the eastern Mojave Desert, in the Transverse Ranges (San Gabriel, San Bernardino, and Little San Bernardino mountains), and in the Peninsular ranges (Unitt, 2008).

Distribution in the Study Area: There are no known records for this species in the Study Area. Disjunct localities occur both to the east and to the west. Suitable breeding and foraging habitat occurs in chaparral surrounding the Study Area on NFS lands. Depending on water levels and vegetation density, it could forage within the upper extents of the Reservoir (changes year to year). Nearest recorded occurrence is approximately eight miles east of the Study Area in the Valyermo area (Garrett, 1999).

Habitat and Habitat Associations: The gray vireo requires habitats with dense shrub cover between one and five feet from the ground. In the Transvers Ranges, it has been recorded in mixed chaparral and juniper woodlands (Unitt, 2008).

Natural History: The gray vireo is a summer visitor in most of its California range, typically occurring March to August or September. While data on breeding season is limited in California, available data suggest it extends at least from late April through July. Gray vireos feed mainly on insects, and its winter diet may also include some vegetation including the fruit of the elephant tree. (Unitt, 2008)

Threats: Some of the threats that have been identified for this species include loss or degradation of habitat from improper fire management and cowbird parasitism.

Mammals

Mohave ground squirrel (*Xerospermophilus mohavensis*)

Status: The Mohave ground squirrel is state listed as threatened.

General Distribution: Mohave ground squirrel has one of the smallest geographic ranges of the 28 ground squirrel species in North America (Hall, 1981). It occurs in the western Mojave Desert in portions of Inyo, Kern, San Bernardino, and Los Angeles counties.

Distribution near Project site: There have been no recent Mojave ground squirrel sightings near the Project site in over 20 years however it is possible remnant populations of this species still remain. This species is well known from core populations on Edwards Air Force base located north of the project site.

Habitat and Habitat Associations: The Mohave ground squirrel is found in many desert vegetation and soil types, mainly on deep, sandy to gravelly soils on flat to moderately sloping terrain (Best, 1995; MGSWG, 2011). Soil characteristics are particularly important because Mohave ground squirrels construct burrows to provide shelter, temperature regulation, and protection from predators (USFWS, 2010).

Natural History: Mohave ground squirrels are small brown squirrels around 1 ¼ to 1 ½ inches tall and approximately 8-9 inches in length. They feed on a variety of shrub and annual plant species, but the most common food plants include winterfat (*Krascheninnikovia lanata*), spiny hopsage (*Grayia spinosa*) and several saltbush (*Atriplex spp*.) species (Stewart, 2005).

Identified Threats: The decline of Mohave ground squirrels have been attributed to habitat loss from human development.

Occurrence probability at Project site: The Mohave ground squirrel is not expected to occur on the project site and has limited potential to occur at the sediment disposal site.

Nelson’s bighorn sheep (*Ovis canadensis nelsoni*)

Regulatory Status: The Nelson’s (San Gabriel Mountains) bighorn sheep is a Forest Service Sensitive Species and a California Fully Protected Species.

Range and Distribution: Historically, bighorn sheep were distributed from Baja California to Texas in the south and to the Canadian Rockies in the north, with the eastern boundary reaching western Nebraska and the western boundary in California extending from Mount Shasta in the north to the crest of the central and southern Sierra Nevada to the Transverse Ranges and the east side of the Peninsular Ranges in the south (Cowan, 1940). Traditional taxonomy dating back more than half a century (Cowan, 1940) broke bighorn sheep from the southwestern desert region into four subspecies, one of which, the Nelson bighorn, included bighorn from the Transverse Ranges through most of the desert mountain ranges of California, and adjacent Nevada and northern Arizona to Utah (Shackleton, 1985). Recent research (Ramey, 1993, 1995; Wehausen and Ramey, 1993) has found a lack of support for Cowan's (1940) desert subspecies and instead has found previously unrecognized north-south variation of the Nelson Bighorn (Wehausen and Ramey, 1993, 1999).

Habitat Requirements and Natural History: Basic to the biology of bighorn sheep is agility on steep rocky terrain, an adaptation used to escape predators. Consequently, within the desert, preferred habitat of bighorn is primarily on or near mountainous terrain above the desert floor. Also fundamental to the biology of bighorn sheep is the use of eyesight as the primary sense for detecting predators at sufficient distances to assure adequate time to reach safe terrain (Bleich et al., 1990b). Thus, preferred habitat of bighorn sheep is visually open, as well as steep and rocky. Because of scant rainfall and hot summer temperatures that limit most vegetation to low stature, most Mojave Desert mountain ranges satisfy these habitat requirements well. Surface water is another element of desert bighorn habitat considered important to population health (Turner and Weaver, 1980).

Bighorn sheep have a large rumen, relative to body size (Krausman et al., 1993), which allows digestion of grasses, even in a dry state (Hanly, 1982). This gives them flexibility to select diets that optimize nutrient content from available forage. Consequently, bighorn sheep feed on a large variety of plant species and diet composition varies seasonally and among locations. The nutritional quality of their diet depends on growth activity of forage species and varies greatly among seasons, years, and locations (Wehausen and Hansen, 1988; Wehausen, 1992a), and is influenced greatly by precipitation and temperature (Wehausen, 1992b). While diet quality in the Mojave Desert varies greatly among years, it is most predictably high in late winter and spring (Wehausen, 1992a), and this period coincides with the peak of lambing. Desert bighorn have a long lambing season that can begin in December and end in June in the Mojave Desert, and a small percentage of births commonly occur in summer as well (Thompson and Turner, 1982; Bunnell, 1982; Wehausen, 1991). The gestation period for bighorn sheep is about 174 days (Hass, 1995).

Threats: Potential threats must be approached from the standpoint of individual populations and metapopulations (BLM, no date A). Actions that impair the ability of bighorn sheep to move between mountain ranges (e.g. fencing along highways or other boundaries, canals, and high densities of human habitation) will limit the potential for natural colonization and gene exchange, both of which are key to metapopulation viability (BLM, no date A). Cattle grazing also poses a threat to this species, by creating competition for and reducing the availability of surface water sources for the bighorn sheep.

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic range for this species and suitable habitat occurs within portions of the Study Area. Nelson's bighorn sheep have been observed at the Reservoir by Forest Service staff (Chris Huntley, personal communication, 10 September 2012). This species appears to be a periodic visitor to the Reservoir.

Ringtail (*Bassariscus astutus*)

Status: The ringtail is a CDFW Fully Protected Species. This taxon is not federally or State listed as threatened or endangered.

General Distribution: This species is widely distributed throughout California with the exceptions of the northeastern deserts and the Central Valley.

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species and it is known to occur within sections of the San Gabriel Mountains. Suitable habitat is present within portions of the Study Area.

Habitat and Habitat Associations: Ringtails occur in a variety of habitats, including chaparral, coastal sage scrub, riparian scrub, oak woodlands, and riparian woodlands. This species prefers habitats in proximity to permanent water.

Natural History: Some authors consider ringtails a subfamily of the family Procyonidae, which includes the raccoons and coatis (Burt and Grossenheider, 1954). Ringtails are long, slender animals with large ears and eyes, semi-retractile claws, and distinct black and white bands on a bushy tail. This species nests in rock recesses, hollow trees, logs, snags, abandoned burrows, or woodrat nests and breeding typically occurs between February and May (NatureServe, 2012). Ringtails are opportunistic feeders, but primarily prey on rodents, rabbits, birds, bird eggs, reptiles, and invertebrates (Zeiner *et al.*, 1990b).

Threats: While no persistent threats have been identified for this species, the degradation of preferred riparian habitats has been suggested as a potential threat (Stephenson and Calcarone, 1999).

Pallid San Diego pocket mouse (*Chaetodipus fallax pallidus*)

Status: The pallid San Diego pocket mouse is designated by CDFW as a California Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The pallid San Diego pocket mouse occurs mainly in arid coastal and desert border areas in San Diego Co., in Riverside Co. southwest of Palm Springs, in San Bernardino Co. from Cactus Flat in the San Bernardino Mts. to Oro Grande and east to Twenty-nine Palms. Elevational range from sea level to 4500 feet (Santa Rosa Mts., Riverside Co.) and 6000 feet (Cactus Flat, north slope San Bernardino Mts.) (Zeiner, et al., 1990b).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species. Nearest CNDDB for this record is approximately 7 miles to the southeast of the Study Area. Suitable habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: The pallid San Diego pocket mouse prefers to inhabit desert wash, desert scrub, desert succulent scrub and/or pinyon-juniper woodland.

Natural History: This is a nocturnal species that is active year-round, although surface activity may be reduced during cold periods (Zeiner, et al., 1990b). The primary diet consists of seeds of forbs, grasses and shrubs, which are transported in cheek pouches. Predators include foxes, coyotes, badgers, owls and snakes.

Threats: A potential threat to this species is urban expansion and development.

Pallid bat (*Antrozous pallidus*)

Regulatory Status: The pallid bat is a CDFW Species of Special Concern and a Forest Service Sensitive Species.

Range and Distribution: Pallid bats have a broad geographic range, extending from southern British Columbia to central Mexico and from California east to the Midwestern United States (Harvey et al., 1999). This species occurs most commonly below elevations of roughly 6,000 feet (Stephenson and Calcarone, 1999). Pallid bats are year-round residents in California (Philpott, 1997).

Habitat Requirements and Natural History: The pallid bat occurs in a variety of habitats, including grasslands, shrublands, woodlands, scattered desert scrub, agricultural fields, and mixed conifer forests (Barbour and Davis, 1969; Hermanson and O'Shea, 1983; Orr, 1954; Philpott, 1997). It appears to prefer edges and open areas without trees (SNFPA, 2001). Roosting sites include rock crevices, mines, caves, tree hollows, buildings, bridges, and culverts (Hermanson and O'Shea, 1983; Tactarian, 2001).

The pallid bat is a large, light-colored bat with prominent ears. It is a social species, communicating through a variety of vocalizations to indicate territorial boundaries, direct individuals to roosting sites, and facilitate mother-infant relations (Nagorsen and Brigham, 1993). Pallid bat maternity colonies form in early April and may contain from 12 to 100 individuals (Zeiner et al., 1990b). The diet primarily consists of large arthropods, including scorpions, crickets, moths, and praying mantids, which are gleaned from the ground or the surfaces of vegetation (Hermanson and O'Shea, 1983). Emergence from roosting sites typically begins 30 to 60 minutes after sunset, but can vary seasonally (Hermanson and O'Shea, 1983; Zeiner et al., 1990b). Foraging is usually concentrated into two periods, with the first activity peak occurring 90 to 190 minutes after sunset, and the second occurring just prior to dawn (Hermanson and O'Shea, 1983; Zeiner et al., 1990b). Nagorsen and Brigham (1993) report that the pallid bat will travel up to 2.5 miles between day roosts and foraging areas. Between activity periods, it may remain torpid for up to five hours (O'Shea and Vaughn, 1977). This species is known to hibernate, but will periodically rouse to forage for food and water (Philpott, 1997).

Threats: Some of the threats that have been associated to the decline of this species in southern California include the destruction of buildings that provide suitable roosting and maternal colony sites, eradication of roosting colonies due to public health concerns, and urban expansion (Brown-Berry, 2002). As bat species often exhibit high site fidelity to maternity roosts and are highly sensitive to disturbance at these sites, local extirpations may be attributed to roost disturbance (Hermanson and O'Shea, 1983; Orr, 1954; O'Shea and Vaughn, 1977; Philpott, 1997).

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic range for pallid bat (CDFG, 2008). Roosting habitat is present including old water tunnels and suitable foraging habitat occurs throughout the Study Area. This species was detected downstream of the dam during surveys conducted in May 2012.

Townsend's big-eared bat (*Corynorhinus townsendii*)

Status: The Townsend's big-eared bat is designated by CDFW as a California Species of Special Concern, and is a U.S. Forest Service Sensitive species. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The Townsend's big-eared bat ranges throughout the western United States, British Columbia, Canada, and Mexico (Kunz and Martin, 1982). In the United States, it occurs in a continuous distribution in all the western states and east into western South Dakota, northwestern

Nebraska, southwestern Kansas, western Oklahoma, and western Texas (Kunz and Martin, 1982). It also is known from isolated gypsum caves in northeast Texas, Oklahoma, and Kansas and from limestone areas in Arkansas, Missouri, Oklahoma, Kentucky, Virginia, and West Virginia (Kunz and Martin, 1982). These relict populations are thought to reflect post-Pleistocene climates (Kunz and Martin, 1982). In California, the CNDDB (CDFG, 2007A) contains 212 records for this species, of which 52 are from four counties in southern California: San Bernardino (33 records), San Diego (10 records), Riverside (five records) and Imperial (four records). There are no records for Los Angeles, Orange, or Ventura counties.

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species. Roosting and foraging habitat occur within portions of the Study Area.

Habitat and Habitat Associations: The big-eared bat is primarily associated with mesic habitats characterized by coniferous and deciduous forests, although it also occurs in xeric areas (Kunz and Martin, 1982). In California, this species was historically associated with limestone caves and lava tubes located in coastal lowlands, agricultural valleys, and hillsides with mixed vegetation; it occurs in all parts of California, with the exception of alpine and subalpine areas of the Sierra Nevada (Zeiner et al., 1990b). The species also occurs in man-made structures and tunnels (Kunz and Martin, 1982); and it has been suggested that the big-eared bat has become more common in the western United States due to the availability of man-made structures (Kunz and Martin, 1982).

Natural History: Big-eared bats are relatively sedentary and are not known to disperse or migrate large distances.

Maternity roosts are established in the warm parts of caves, mines, and buildings, with one or more clusters of females numbering up to about 100 individuals. Summer roosts of males are solitary. Young are born from late spring to early summer and are fully weaned by 42 days of age. First flight occurs by about 18 to 21 days. Big-eared bats take a variety of prey on the wing from the edge of forested habitats but also glean prey from vegetation to forage, including small moths, beetles, flies, lacewings, wasps, bees, and ants.

Threats: Big-eared bats are very sensitive to human disturbances and a single disturbance of a maternity roost or hibernation site may cause abandonment (Zeiner et al., 1990b). All known limestone cave sites in California, for example, have been abandoned (Zeiner et al., 1990b). Other plausible threats to big-eared bats resulting from construction activities include disturbances of day roosts from human activity, noise, and dust, as well as effects of dust on insect prey. Potential long-term impacts from urban development also include human and pet, stray, and feral animals' disturbances of roost sites, roost site and foraging habitat degradation, such as trampling and invasive species, and pesticides that may cause secondary poisoning and affect prey abundance.

Spotted bat (*Euderma maculatum*)

Status: The spotted bat is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The spotted bat has been found at a small number of localities, mostly in the foothills, mountains and desert regions of southern California. [CDFG, 2000]

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: Habitats occupied include arid deserts, grasslands and mixed conifer forests. Elevational range extends from below sea level in California to above 3000 m (10000 ft) in New Mexico. [CDFG, 2000]

Natural History: This bat prefers to roost in rock crevices but is occasionally found in caves and buildings; cliffs provide optimal roosting habitat. Moths are the principal food source of this species (CDFG, 2000). This species feeds in flight, over water, and near the ground, using echolocation to find prey and prefers sites with adequate roosting habitat, such as cliffs.

Threats: Threats to the spotted bat may include loss of habitat to development and the use of insecticides.

Western mastiff bat (*Eumops perotis californicus*)

Status: The western mastiff bat is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The western mastiff bat occurs in two populations; one from the southwestern United States to central Mexico and the other from the northern and central portions of South America (Harvey *et al.*, 1999). The western or California mastiff bat subspecies primarily occurs from low to mid elevations in southern and central California southeast to Texas and south to central Mexico (Best *et al.*, 1996).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: The western mastiff bat utilizes a variety of habitat types including desert scrub, chaparral, mixed conifer forest, giant sequoia forests, and montane meadows (Philpott, 1997). In southern California this bat typically roosts in semiarid areas with low-growing chaparral that does not obstruct cliffs or rock outcrops (Best *et al.*, 1996). Because of its large wingspan, this bat requires roosts that have at least 2 m of free space to drop from to initiate flight. These bats utilize natural crevices in granitic and sandstone cliffs as well as crevices in buildings for roosting (Best *et al.*, 1996; NatureServe, 2012).

Natural History: The western mastiff bat is the largest bat in the United States with a total length of 15.7 to 18.5 cm (NatureServe, 2012). This bat breeds in early spring with most births likely occurring from June through July, and females usually give birth to one offspring (NatureServe, 2012). Colonies typically consist of less than 100 individuals (NatureServe, 2012). Western mastiff bats are primarily insectivorous, and the diet contains a high proportion of moths (Philpott, 1997). Predators include peregrine falcon, American kestrel, red-tailed hawk, and barn owl (Best *et al.*, 1996).

Threats: Threats to the western mastiff bat include loss of habitat to development and the use of insecticides (Williams, 1986). In the southwest, loss of large open ponds used for drinking water threaten this subspecies, and activities that disturb or destroy cliff habitat (such as water impoundments, highway construction, and quarry operations) pose a threat as well (Texas Parks and Wildlife, 2009).

Western red bat (*Lasiurus blossevillii*)

Status: The Western red bat is designated by CDFW as a California Species of Special Concern, and is a U.S. Forest Service Sensitive species. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The western red bat (*Lasiurus blossevillii*) occurs in California from Shasta County and Mendocino County in the north, and through the central coastal region and the Central Valley west of the Sierra Nevada/Cascade ranges to coastal southern California (Cryan, 2003; Zeiner *et al.,* 1990b), east into Arizona and New Mexico, and south into Baja California and mainland Mexico to South America (Cryan, 2003). The species inhabits California year-round but makes seasonal movements within the state and, possibly, to Arizona and New Mexico (Cryan, 2003).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area

Habitat and Habitat Associations: Red bats (*Lasiurus* spp.) typically roost in trees, occasionally in shrubs, and even on the ground (Shump and Shump, 1982). They are usually solitary, but different bats may use different roosts on different days, and they occasionally form nursery colonies. Day roosts are commonly located in edge habitats adjacent to streams, open fields, and urban areas (Shump and Shump, 1982).

Natural History: Red bats take a variety of prey, including moths, crickets, flies, true bugs, beetles, and cicadas (Shump and Shump, 1982). They generally forage in grasslands, shrublands, open woodlands, and croplands, but they also take advantage of congregations of insects attracted to streetlights and building floodlights. Births occur in about mid-June and young develop rapidly, with flight occurring by 21 to 42 days of age (Shump and Shump, 1982).

Threats: Like other bats, western red bats probably are generally vulnerable to human activity and related impacts. Unlike many other bat species, due to their use of day roosts in trees, shrubs, and sometimes on the ground, western red bats are especially vulnerable to predation by domestic cats, as well as opossums, great horned owls, kestrels, and roadrunners. Other plausible threats to western red bats resulting from construction activities include disturbances of day roosts from human activity, noise, and dust, as well as effects of dust on insect prey. Potential long-term impacts from urban development, in addition to pet, stray, and feral animals, include human disturbances of roost sites, roost site and foraging habitat degradation, such as trampling and invasive species, and pesticides that may cause secondary poisoning and affect prey abundance.

Hoary bat (*Lasiurus cinereus*)

Status: The hoary bat is a CDFW Special Animal. This taxon is not federally or State listed as threatened or endangered.

General Distribution: This species is the most widespread North American bat and occurs throughout California, although distribution is patchy in the southeastern deserts.

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: The hoary bat occurs in a wide variety of environments, but prefers open habitats or habitat mosaics with access to trees for cover. Open areas or habitat edges are also preferred for foraging.

Natural History: This species is distinguishable by its size and color, exhibiting distinct white markings on hair tips over most of the body (Burt and Grossenheider, 1954). Hoary bats breed in autumn and young are typically born between mid-May and early June (Zeiner *et al.*, 1990b). Females bear young while roosting in trees and may leave the young at the roosting site while foraging (Zeiner *et al.*, 1990b). Typically a solitary species, hoary bats are known to forage with many other bat species (CDFG, 2008). The primary diet of hoary bats consists of moths that are taken in flight; however, other flying insects are also consumed (Black, 1974, Whitaker *et al.*, 1977, 1981). There is a relatively high incidence of rabies in this species (Shump and Shump, 1982). No important predators are known, but owls likely prey on hoary bats (Zeiner *et al.*, 1990b).

Threats: No persistent threats have been identified for this species.

California leaf-nosed bat (*Macrotus californicus*)

Status: California leaf-nosed bat is listed as a CDFW Special Animal. This taxon is not federally or State listed as threatened or endangered.

General Distribution: This species has a limited distribution which extends from northwestern Mexico (Sonora and Sinaloa) and Baja California into Arizona, southern Nevada, and southern California (CDFG, 1998).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: The California leaf-nosed bat appears to be confined to lowland Sonoran Desert habitat below 900 m. This species also appears to be totally dependent on either caves or mines for roosting. Although it has occasionally been found night roosting in buildings or bridges, its maternity, mating, and overwintering sites are all in mines or caves. [CDFG, 1998]

Natural History: This bat is colonial, forming large seasonal aggregations. Females congregate in the spring and summer in maternity colonies of typically 100 to 200 bats (Barbour and Davis, 1969; Vaughan, 1959), although colonies of only 6-20 bats are also found. Within the larger colonies, clusters of five to 25 females will be associated with a single "harem" male that defends the cluster against intruding males (Brown and Berry, 1991). Large male roosts may also form. Each female bears a single young between mid-May and early July. Maternity colonies disband once the young are independent in late summer. In September and October, males aggregate in "display" roosts, which may be separate from the maternity sites, where they are visited by females for mating (Pierson, 1998). Although pregnancy is initiated immediately, embryos undergo several months of "delayed development," remaining at a very early embryonic stage until development resumes in March (Bradshaw, 1962). The total gestation period is almost nine months. This species also forms larger, mixed sex aggregations of up to 2,000 bats in winter. Unlike vespertilionids, phyllostomids do not hibernate. *M. californicus* has a narrow thermal-neutral zone, and appears incapable of entering torpor (Pierson, 1998). [CDFG, 1998]

Threats: Potential threats to this species include renewed mining, abandoned mine closures, disturbance from the public, urban expansion, loss of foraging habitat, landfills and military activities.

Western small-footed myotis (*Myotis ciliolabrum*)

Regulatory Status: Western small-footed myotis is a CDFW Special Animal.

Range and Distribution: The western small-footed myotis is widespread throughout western North America, from western Canada south through the western United States to northern Baja California and central Mexico (Hall, 1981; as cited in USACE and CDFG, 2010). In the United States, the species occurs in all states west of, and including, North Dakota to the north and Texas to the south. The species is absent from the coastal regions of Washington, Oregon, and California south to about Ventura County (Zeiner et al., 1990b; as cited in USACE and CDFG, 2010).

Habitat Requirements and Natural History: The western small-footed myotis occurs in a wide variety of arid upland habitats at elevations ranging from sea level to 8,800 feet (Zeiner et al., 1990b; as cited in USACE and CDFG, 2010). Habitats used by this species include riparian areas, woodlands, and brushy uplands (Holloway and Barclay, 2001; Zeiner et al., 1990b; all as cited in USACE and CDFG, 2010). Western small-footed myotis day roosts include rock crevices, caves, tunnels and mines, and, sometimes buildings and abandoned swallow nests (Holloway and Barclay, 2001; as cited in USACE and CDFG, 2010). They also use day roosts as nocturnal roosts (i.e., they may return to the day roost during the night) or may use buildings and concrete underpasses strictly as nocturnal roosts (Holloway and Barclay, 2001; as cited in USACE and CDFG, 2010).

In California, this species occurs in coastal southern California, the foothills of the Sierra Nevada, and the Great Basin Desert, and is absent from the higher elevations in the mountains and from the lower elevations in the Mojave and Colorado deserts (Zeiner et al., 1990b; as cited in USACE and CDFG, 2010).

Western small-footed myotis forage for moths, true flies, gnats, midges, mosquitoes, true bugs, and beetles, often along the margins of trees and over water (Zeiner et al., 1990b; as cited in USACE and CDFG, 2010). Females establish maternity roosts, which may be solitary or colonial (with up to 20 individuals), where young are born and raised (Zeiner et al., 1990b; as cited in USACE and CDFG, 2010). Males appear to establish solitary roosts during the breeding season (Zeiner et al., 1990b; as cited in USACE and CDFG, 2010). Births generally occur in May and June, with a peak in late May (Zeiner et al., 1990b; as cited in USACE and CDFG, 2010), and first flight by young occurs by about one month of age (Wilson and Ruff, 1999; as cited in USACE and CDFG, 2010).

Threats: No documented threats to western small-footed myotis colonies have been reported in the scientific literature, but, like most bats, this species is likely to be very sensitive to human disturbance. Because it may roost in abandoned buildings and under bridges, it is vulnerable to vandalism, extermination, or inadvertent disturbance of roost sites.

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic range for western small-footed myotis (CDFG, 2008). Roosting habitat including old tunnels is present and suitable foraging habitat occurs throughout the Study Area. This species was detected while actively monitoring just upstream of the dam structure in July 2012.

Fringed myotis (*Myotis thysanodes*)

Status: The fringed myotis is designated by CDFW as a California Special Animal. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The fringed myotis is widespread throughout the western United States, southern British Columbia, Canada, Mexico, and Central America (O'Farrell and Studier, 1980).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: The fringed myotis typically occurs in a wide variety of desert, grass, and woodland habitats at middle elevations of 1,200 to 2,850 meters AMSL (3,937 to 9,350 feet) but is known from lower elevations along the west coast and may occur in pine–fir associations at higher elevations (O'Farrell and Studier, 1980). Individuals observed in desert/steppe habitats were within a one-hour flight of forest and riparian habitats (O'Farrell and Studier, 1980).

Natural History: During their most active season (April through September), fringed myotis leave their roosts at sundown and forage for small beetles, which comprise about 73% of their diet, in the vegetation canopy (O'Farrell and Studier, 1980). They return to the roost by daylight. Females establish maternity colonies in late April in caves, tunnels, mines, and buildings where young are born and raised. Males establish solitary roost areas during the breeding season. Females leave by late September and probably migrate or disperse to winter hibernacula (Wilson and Ruff, 1999). Young are born in late June to early July (O'Farrell and Studier, 1980). Young develop rapidly, with flight occurring by 16 days of age, and are fully developed by 20 to 21 days.

Threats: The fringed myotis is sensitive to disturbance of roost sites by humans, potentially resulting in abandonment (O'Farrell and Studier 1980; Wilson and Ruff, 1999). Such disturbances could also disrupt the interaction of females and young, such as females failing to retrieve young that have fallen from the neonate cluster, which can result in mortality of the young. Other plausible threats to fringed myotis resulting from construction activities include disturbances of day roosts from human activity, noise, and dust, as well as effects of dust on insect prey. Potential long-term impacts from urban development also include pet, stray, and feral animals' disturbances of roost sites; roost site and foraging habitat degradation, such as trampling and invasive species; and pesticides that may cause secondary poisoning and affect prey abundance.

Long-legged myotis (*Myotis volans*)

Status: The long-legged myotis is designated by CDFW as a California Special Animal. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The long-legged myotis (*Myotis volans*) is widespread throughout western North America, from extreme southeastern Alaska and western Canada (British Columbia and Alberta) south into Baja California and central Mexico (Hall, 1981). In California, it occurs throughout the state except for the Central Valley, eastern Lassen and Modoc counties, and the non-mountainous regions of the Mojave and Colorado deserts (Zeiner *et al*., 1990b).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; potential breeding and suitable foraging habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: The long-legged myotis is a yearlong resident of California and primarily occurs in coniferous forests, but it also uses riparian and oak woodland habitats for roosting and foraging (Warner and Czaplewski 1984; Wilson and Ruff 1999; Zeiner *et al*., 1990b). Day roosts during warmer months typically are in hollow trees and under the bark of exfoliating trees (Zeiner *et al*., 1990b) but also include abandoned buildings, cracks in the ground, and crevices in canyons and cliff faces (Warner and Czaplewski, 1984). Johnson *et al.* (2007) found that the long-legged myotis in a forested region of north-central Idaho used snags for roosts located mid-slope. This species uses caves and tunnels as winter hibernation areas, indicating local seasonal migrations. In addition to using forests and woodlands, the long-legged myotis also forages in coastal scrub, chaparral, and desert habitat (Zeiner *et al.,* 1990b). Johnson *et al.* (2007) suggest that habitat selection is a function of preferred prey availability. Long-legged myotis occur at elevations ranging from 60 to 3,770 meters (197 to 12,370 feet) but are most commonly found at 2,000 to 3,000 meters (6,560 to 9,840 feet).

Natural History: Long-legged myotis appear to be opportunistic feeders, foraging both within and above the forest canopy and congregating with other bat species at areas of high insect concentrations (Zeiner *et al.,* 1990b). They may be moth specialists, but they also feed on a variety of insects, including true flies, gnats, midges, mosquitoes, termites, true bugs, leafhoppers, ants, bees, wasps, lacewings, and beetles. They are active throughout the night, with a peak of foraging activity three to four hours after dark (Warner and Czaplewski, 1984). Large maternity colonies of several hundred individuals are formed in day roosts (Zeiner *et al.,* 1990b). Timing of births is variable and occurs from May to August, possibly in relation to climate (Czaplewski, 1984). Young have been observed flying by mid-July (Zeiner *et al.,* 1990b).

Threats: No documented threats to long-legged myotis colonies have been reported in the scientific literature, but, like most bats, this species is likely very sensitive to human disturbance and because it may also roost in abandoned buildings, it is vulnerable to vandalism, extermination, or inadvertent disturbance of roost sites.

Yuma myotis (*Myotis yumanensis*)

Regulatory Status: The Yuma myotis is a CDFW Special Animal.

Range and Distribution: The Yuma myotis is widespread throughout western North America from British Columbia, Canada, south through the western United States to Baja California and central Mexico (Hall, 1981). In the United States, the species occurs in all of Washington and Oregon, most of California, western Idaho and Montana, the extreme western portion of Nevada, the southeastern half of Utah, all of Arizona and New Mexico, and western Texas. It occurs throughout California, except for the most arid parts of the Mojave and Colorado deserts (Zeiner et al., 1990b).

Habitat Requirements and Natural History: Although the Yuma myotis occurs in a wide variety of life zones at elevations ranging from sea level to 10,820 feet, its actual distribution is closely associated with access to water (Zeiner et al., 1990b). Forests and woodlands are primary habitats, and foraging usually occurs within open, uncluttered habitats. Foraging flights are low over water sources such as ponds, streams, and stock ponds (Brigham et al., 1992; Zeiner et al., 1990b). Yuma myotis day roosts include rock crevices, caves, mines, buildings, abandoned swallow nests, and large, live trees (Evelyn et al., 2004; Zeiner et al., 1990b).

Females establish colonial maternity roosts with up to several thousand individuals, and this is where young are born and raised (Zeiner et al., 1990b). Males appear to establish solitary roosts during the breeding season or roost with other bat species (Wilson and Ruff, 1999; Zeiner et al., 1990b). Births are variable, but generally occur in late May to mid-June, with a peak in early June in California (NatureServe, 2007; Zeiner et al., 1990b). Time of first flight is unknown. The Yuma myotis typically forages over water sources for moths, true flies, gnats, midges, mosquitoes, termites, true bugs, caddis flies, ants, bees, and wasps (Brigham et al., 1992).

Threats: No documented threats to Yuma myotis colonies have been reported in the scientific literature, but, like most bats, this species is likely to be very sensitive to human disturbance. Because it may roost in large trees, abandoned buildings, and under bridges, it is vulnerable to vandalism, extermination, or inadvertent disturbance of roost sites. Other plausible threats to Yuma myotis resulting from construction activities include disturbances of day roosts from human activity, noise, and dust, as well as effects of dust on insect prey. Potential long-term impacts from urban development include disturbance of roost sites by humans and domestic animals; degradation of foraging habitat and roost sites; and introduction of pesticides that may cause secondary poisoning and affect prey abundance.

Potential for Occurrence in the Study Area: The Study Area is located within the known geographic range for Yuma myotis (CDFG, 2008). Roosting habitat including old tunnels is present and suitable foraging habitat occurs throughout the Study Area. This species was detected downstream of the dam structure during surveys conducted in May and July 2012.

Southern grasshopper mouse (*Onychomys torridus ramona*)

Status: The southern grasshopper mouse is designated by CDFW as a California Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The southern grasshopper mouse (*Onychomys torridus*) occurs throughout desert habitats in the southwestern United States and much of Mexico, including western Nevada; the southern portions of California, Arizona, and New Mexico; northern Baja California; western Texas; and south to central Mexico (Hall, 1981). The subspecies *O. t. ramona*, which is a California Species of Special Concern (CSC), is restricted to coastal southern California.

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located within the known geographic range for this species; Suitable habitat occurs within limited portions of the Study Area.

Habitat and Habitat Associations: The southern grasshopper mouse is found rangewide in low arid scrub and semi-scrub vegetation (Frank and Heske, 1992; McCarty, 1975), and the subspecies *O. t. ramona* (which is the subspecies designated as a California Species of Special Concern) occurs in grasslands and sparse coastal scrub habitats. Specific habitat requirements of the southern grasshopper mouse generally are unknown, but Stapp (1997) found that the southern grasshopper mouse uses open expanses and microhabitats dominated by gopher mounds and burrows, possibly because of greater prey availability (*e.g.*, arthropods using burrows for refuge), greater mobility in open expanses, and dust bathing sites in these microhabitats.

Natural History: The southern grasshopper mouse's diet consists mainly of arthropods (*e.g*., crustaceans, insects, centipedes, millipedes, and arachnids), but may also include other insects and small rodents (Baily and Sperry 1929; Horner *et al.* 1965; McCarty 1975; Stapp, 1997). The southern grasshopper mouse is primarily nocturnal and appears to be active on the surface all year round (Baily and Sperry 1929; Frank and Heske 1992; McCarty, 1975). Because of its high population turnover, relatively early age of sexual maturity, and senescence after the first year, the southern grasshopper mouse probably is subject to "boom and bust" population cycles and is perhaps at high risk of local extirpation under poor conditions.

Threats: There are no identified threats to the southern grasshopper mouse other than loss and fragmentation of grassland and sparse sage scrub habitats in coastal southern California, which probably are the greatest threats to local southern grasshopper mouse populations.

Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*)

Status: The Tehachapi pocket mouse is designated by CDFW as a California Species of Special Concern, and is a U.S. Forest Service Sensitive species. This taxon is not federally or State listed as threatened or endangered.

General Distribution: P. a. inexpectatus occupies the Tehachapi Mountains from Tehachapi Pass southwest towards Gorman, as far west as Cuddy Valley near Mount Pinos, and east along the lower slopes of the San Gabriel Mountains to Elizabeth Lake (Williams et al., 1993).

Distribution in the Study Area: There are no known recent records for this species in the Study Area; the Study Area is located outside the known geographic range for this species. This species is however known to occur on the east slopes of the San Gabriel Mountains. Suitable habitat is present within the Study Area.

Habitat and Habitat Associations: The Tehachapi pocket mouse typically occupies native and non-native grasslands, Joshua tree woodland, pinyon-juniper woodland, yellow pine woodland, and oak savannah (Williams et al., 1993). It has also been captured in open pine forests at higher elevations (Huey, 1926), in chaparral and coastal sage communities at lower elevations (Best, 1994), and on rangeland and fallow grain fields (Sulentich, 1983). It constructs burrows in loose, sandy soils (Zeiner et al., 1990b).

Natural History: Little information is available concerning the ecology of the Tehachapi pocket mouse. Other members of the species group are nocturnal granivores, foraging primarily on seeds of grasses, forbs and annuals, but also on leafy plant material and insects (Verts and Kirkland, 1988). Most other members of the genus exhibit seasonal hibernation (Verts and Kirkland, 1988), and it is expected that P. a. inexpectatus does as well.

Threats: Livestock grazing is the predominate land-use throughout much of its range. It is unclear how grazing and its subsequent effects on plant diversity and abundance affect the Tehachapi pocket mouse. Many areas within the range of the Tehachapi pocket mouse are used for wind-generated electricity production or have the potential to support wind farms. Such areas are typically crossed by a network of roads, which could lead to increased erosion in steeper terrain. Mineral extraction is another potential threat to the Tehachapi pocket mouse. In general, surface disturbing activities such as mineral extraction are incompatible with persistence of the native small mammal assemblage. Conversion of native habitats to urban use has occurred in the Elizabeth Lake area. If the subspecies persists in small, scattered populations, it is highly vulnerable to local extirpation resulting from natural or human-related events. [BLM, No Date B]

American badger (*Taxidea taxus*)

Status: The American badger is a CDFW Species of Special Concern. This taxon is not federally or State listed as threatened or endangered.

General Distribution: The vast geographic range of the American badger extends as far north as Alberta, Canada and as far south as central Mexico (Hall, 1981). This species occurs in suitable habitat throughout California with the exceptions of the humid coastal forests of Del Norte and Humboldt Counties in the northwest part of the state (Williams, 1986). The elevation range for this species occurs between below sea level at Death Valley to as high as the Arctic-Alpine Life Zone (Long, 1973).

Distribution in the Study Area: There are no known records for this species in the Study Area; the Study Area is located within the known geographic distribution for this species; suitable habitat occurs within portions of the Study Area.

Habitat and Habitat Associations: American badgers exploit a wide variety of open, arid habitats, but are most commonly found in grasslands, savannas, mountain meadows, and open areas of desert scrub (Stephenson and Calcarone, 1999). Basic requirements that have been identified for this species appear to be sufficient food (burrowing rodents), friable soils, and relatively open, uncultivated ground (Williams, 1986).

Natural History: American badgers are most often solitary animals that are primarily nocturnal, but have been reported occasionally foraging and dispersing during the daytime (Lindzey, 1978; Messick and Hornocker, 1981). This species is active year-round except at higher elevations and latitudes, where winter torpidity is common. During winter, individuals at lower elevations will exhibit reduced surface activity and may remain in a single burrow for days or even weeks (Long, 1973; Messick and Hornocker, 1981). This species is an opportunistic predator feeding on such prey resources as mice, chipmunks, ground squirrels, gophers, rabbits, and kangaroo rats. Reptiles, insects, birds, eggs, and carrion are also consumed (Williams, 1986; Zeiner *et al.*, 1990b). American badgers mate in the summer and early autumn with young born in March and early April (Long, 1973).

Threats: This species has experienced large population declines in many areas of southern California and has been steadily decreasing throughout the state over the last century (Williams, 1986). The major cause of mortality to adult badgers is vehicular accidents. Other common threats include habitat conversion to urban and agricultural uses, farming operations, shooting and trapping, poisoning, and reduction of prey base as a result of rodent control activities (Williams, 1986).

Appendix D

Sediment Test Results

October 08, 2014

Brady Daniels
Aspen Environmental Group
5020 Chesebro Road
Suite 200
Agoura Hills, CA 91301-

Project Name: Little Rock 1116.02
Physis Project ID: 1407007-001

Dear Brady,

Enclosed are the analytical results for samples submitted to PHYSIS Environmental Laboratories, Inc. (PHYSIS) on 8/15/2014. A total of 15 samples were received for analysis in accordance with the attached chain of custody (COC). Per the COC, the samples were analyzed for:

Conventionals
Percent Solids by SM 2540 B
Percent Lipids by Gravimetric
Elements
Trace Mercury by EPA 245.7
Organics
Organochlorine Pesticides & PCB Congeners by EPA 8270D

Analytical results in this report apply only to samples submitted to PHYSIS in accordance with the COC and are intended to be considered in their entirety.

Please feel free to contact me at any time with any questions. PHYSIS appreciates the opportunity to provide you with our analytical and support services.

Regards,

Misty Mercier
Extension 202
714-335-5918 cell
mistymercier@physislabs.com

ABBREVIATIONS and ACRONYMS

QM	Quality Manual
QA	Quality Assurance
QC	Quality Control
MDL	method detection limit
RL	reporting limit
R1	project sample
R2	project sample replicate
MS1	matrix spike
MS2	matrix spike replicate
B1	procedural blank
B2	procedural blank replicate
BS1	blank spike
BS2	blank spike replicate
LCS1	laboratory control spike
LCS2	laboratory control spike replicate
LCM1	laboratory control material
LCM2	laboratory control material replicate
CRM1	certified reference material
CRM2	certified reference material replicate
RPD	relative percent difference
LMW	low molecular weight
HMW	high molecular weight

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QUALITY ASSURANCE SUMMARY

LABORATORY BATCH: Physis' QM defines a laboratory batch as a group of 20 or fewer project samples of similar matrix, processed together under the same conditions and with the same reagents. QC samples are associated with each batch and were used to assess the validity of the sample analyses.

PROCEDURAL BLANK: Laboratory contamination introduced during method use is assessed through the preparation and analysis of procedural blanks is provided at a minimum frequency of one per batch.

ACCURACY: Accuracy of analytical measurements is the degree of closeness based on percent recovery calculations between measured values and the actual or true value and includes a combination of reproducibility error and systematic bias due to sampling and analytical operations. Accuracy of the project data was indicated by analysis of MS, BS, LCS, LCM, CRM, and/or surrogate spikes on a minimum frequency of one per batch. Physis' QM requires that 95% of the target compounds greater than 10 times the MDL be within the specified acceptance limits.

PRECISION: Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value and is based on RPD calculations between repeated values. Precision of the project data was determined by analysis of replicate MS1/MS2, BS1/BS2, LCS1/LCS2, LCM1/LCM2, CRM1/CRM2, surrogate spikes and/or replicate project sample analysis (R1/R2) on a minimum frequency of one per batch. Physis' QM requires that for 95% of the compounds greater than 10 times the MDL, the percent RPD should be within the specified acceptance range.

BLANK SPIKES: BS is the introduction of a known concentration of analyte into the procedural blank. BS demonstrates performance of the preparation and analytical methods on a clean matrix void of potential matrix related interferences. The BS is performed in laboratory deionized water, making these recoveries a better indicator of the efficiency of the laboratory method per se.

MATRIX SPIKES: MS is the introduction of a known concentration of analyte into a sample. MS samples demonstrate the effect a particular project sample matrix has on the accuracy of a measurement. Individually, MS samples also indicate the bias of analytical measurements due to chemical interferences inherent in the in the specific project sample spiked. Intrinsic target analyte concentration in the specific project sample can also significantly impact MS recovery.

CERTIFIED REFERENCE MATERIALS: CRMs are materials of various matrices for which analytical information has been determined and certified by a recognized authority. These are used to provide a quantitative assessment of the accuracy of an analytical method. CRMs provide evidence that the laboratory preparation and analysis produces results that are comparable to those obtained by an independent organization.

LABORATORY CONTROL MATERIAL: LCM is provided because a suitable natural seawater CRM is not available and can be used to indicate accuracy of the method. Physis' internal LCM is seawater collected at ~800 meters in the Southern California San Pedro Basin and can be used as a reference for background concentrations in clean, natural seawater for comparison to project samples.

LABORATORY CONTROL SPIKES: LCS is the introduction of a known concentration of analyte into Physis' LCM. LCS samples were employed to assess the effect the seawater matrix has on the accuracy of a measurement. LCS also indicate the bias of this method due to chemical interferences inherent in the in the seawater matrix. Intrinsic LCM concentration can also significantly impact LCS recovery.

SURROGATES: A surrogate is a pure analyte unlikely to be found in any project sample, behaves similarly to

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the target analyte and most often used with organic analytical procedures. Surrogates are added in known concentration to all samples and are measured to indicate overall efficiency of the method including processing and analyses.

HOLDING TIME: Method recommended holding times are the length of time a project sample can be stored under specific conditions after collection and prior to analysis without significantly affecting the analyte's concentration. Holding times can be extended if preservation techniques are employed to reduce biodegradation, volatilization, oxidation, sorption, precipitation, and other physical and chemical processes.

SAMPLE STORAGE/RETENTION: In order to maintain chemical integrity prior to analysis, all samples submitted to Physis are refrigerated (liquids) or frozen (solids) upon receipt unless otherwise recommended by applicable methods. Solid samples are retained for 1 year from collection while liquid samples are retained until method recommended holding times elapse.

TOTAL/DISSOLVED FRACTION: In some instances, the results for the dissolved fraction may be higher than the total fraction for a particular analyte (e.g. trace metals). This is typically caused by the analytical variation for each result and indicates that the target analyte is primarily in the dissolved phase, within the sample.

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PHYSIS QUALIFIER CODES

CODE	DEFINITION
*	see Case Narrative
ND	analyte not detected at or above the MDL
B	analyte was detected in the procedural blank greater than 10 times the MDL
E	analyte concentration exceeds the upper limit of the linear calibration range, reported value is estimated
H	sample received and/or analyzed past the recommended holding time
J	analyte was detected at a concentration below the RL and above the MDL, reported value is estimated
N	insufficient sample, analysis could not be performed
M	analyte was outside the specified recovery and/or RPD acceptance limits due to matrix interference. The associated B/BS were within limits, therefore the sample data was reported without further clarification
SH	analyte concentration in the project sample exceeded the spike concentration, therefore MS recovery and/or RPD acceptance limits do not apply
SL	analyte results for R1 and/or R2 were lower than 10 times the MDL, therefore RPD acceptance limits do not apply
NH	project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore MS recovery and/or RPD were outside the specified acceptance limits
R	Physis' QM allows for 5% of the target compounds greater than 10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy. This is often due to random error and does not indicate any significant problems with the analysis of these project samples

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ANALYTICAL REPORT

PHYSIS
TERRA AQUA AURA
ENVIRONMENTAL LABORATORIES, INC.
Innovative Solutions for Nature

PHYSIS
TERRA FAUNA FLORA AQUA AURA
ENVIRONMENTAL LABORATORIES, INC.
Innovative Solutions for Nature
1904 E. Wright Circle, Anaheim CA 92806 main: (714) 602-5320 fax: (714) 602-5321 www.physislabs.com info@physislabs.com CA ELAP #2769

Sample ID: 29128-R1 **L.R. Rocky Pt. Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**

Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

(PCB030)	NA	90			% Recovery
(PCB112)	NA	85			% Recovery
(PCB198)	NA	101			% Recovery
(TCMX)	NA	85			% Recovery
2,4'-DDD	NA	ND	1	5	ng/dry g
2,4'-DDE	NA	ND	1	5	ng/dry g
2,4'-DDT	NA	ND	1	5	ng/dry g
4,4'-DDD	NA	ND	1	5	ng/dry g
4,4'-DDE	NA	ND	1	5	ng/dry g
4,4'-DDT	NA	ND	1	5	ng/dry g
Aldrin	NA	ND	1	5	ng/dry g
BHC-alpha	NA	ND	1	5	ng/dry g
BHC-beta	NA	ND	1	5	ng/dry g
BHC-delta	NA	ND	1	5	ng/dry g
BHC-gamma	NA	ND	1	5	ng/dry g
Chlordane-alpha	NA	ND	1	5	ng/dry g
Chlordane-gamma	NA	ND	1	5	ng/dry g
cis-Nonachlor	NA	ND	1	5	ng/dry g
Dieldrin	NA	ND	1	5	ng/dry g
Endosulfan sulfate	NA	ND	1	5	ng/dry g
Endosulfan-I	NA	ND	1	5	ng/dry g
Endosulfan-II	NA	ND	1	5	ng/dry g
Endrin	NA	ND	1	5	ng/dry g
Endrin aldehyde	NA	ND	1	5	ng/dry g
Endrin ketone	NA	ND	1	5	ng/dry g
Heptachlor	NA	ND	1	5	ng/dry g
Heptachlor epoxide	NA	ND	1	5	ng/dry g
Hexachlorobenzene	NA	ND	1	5	ng/dry g
Methoxychlor	NA	ND	1	5	ng/dry g
Mirex	NA	ND	1	5	ng/dry g

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Chlorinated Pesticides — ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Oxychlordane	NA	ND	1	5	ng/dry g	
Perthane	NA	ND	5	10	ng/dry g	
trans-Nonachlor	NA	ND	1	5	ng/dry g	

Sample ID: 29129-R1 **L.R. Rocky Pt. Depth 1'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	87			% Recovery	
(PCB112)	NA	81			% Recovery	
(PCB198)	NA	94			% Recovery	
(TCMX)	NA	76			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/dry g	
2,4'-DDE	NA	ND	1	5	ng/dry g	
2,4'-DDT	NA	ND	1	5	ng/dry g	
4,4'-DDD	NA	ND	1	5	ng/dry g	
4,4'-DDE	NA	ND	1	5	ng/dry g	
4,4'-DDT	NA	ND	1	5	ng/dry g	
Aldrin	NA	ND	1	5	ng/dry g	
BHC-alpha	NA	ND	1	5	ng/dry g	
BHC-beta	NA	ND	1	5	ng/dry g	
BHC-delta	NA	ND	1	5	ng/dry g	
BHC-gamma	NA	ND	1	5	ng/dry g	
Chlordane-alpha	NA	ND	1	5	ng/dry g	
Chlordane-gamma	NA	ND	1	5	ng/dry g	
cis-Nonachlor	NA	ND	1	5	ng/dry g	
Dieldrin	NA	ND	1	5	ng/dry g	
Endosulfan sulfate	NA	ND	1	5	ng/dry g	
Endosulfan-I	NA	ND	1	5	ng/dry g	
Endosulfan-II	NA	ND	1	5	ng/dry g	
Endrin	NA	ND	1	5	ng/dry g	
Endrin aldehyde	NA	ND	1	5	ng/dry g	
Endrin ketone	NA	ND	1	5	ng/dry g	
Heptachlor	NA	ND	1	5	ng/dry g	
Heptachlor epoxide	NA	ND	1	5	ng/dry g	

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Chlorinated Pesticides ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Hexachlorobenzene	NA	ND	1	5	ng/dry g	
Methoxychlor	NA	ND	1	5	ng/dry g	
Mirex	NA	ND	1	5	ng/dry g	
Oxychlordane	NA	ND	1	5	ng/dry g	
Perthane	NA	ND	5	10	ng/dry g	
trans-Nonachlor	NA	ND	1	5	ng/dry g	

Sample ID: 29130-R1 **Boat Ramp Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	78			% Recovery	
(PCB112)	NA	78			% Recovery	
(PCB198)	NA	98			% Recovery	
(TCMX)	NA	75			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/dry g	
2,4'-DDE	NA	ND	1	5	ng/dry g	
2,4'-DDT	NA	ND	1	5	ng/dry g	
4,4'-DDD	NA	ND	1	5	ng/dry g	
4,4'-DDE	NA	ND	1	5	ng/dry g	
4,4'-DDT	NA	ND	1	5	ng/dry g	
Aldrin	NA	ND	1	5	ng/dry g	
BHC-alpha	NA	ND	1	5	ng/dry g	
BHC-beta	NA	ND	1	5	ng/dry g	
BHC-delta	NA	ND	1	5	ng/dry g	
BHC-gamma	NA	ND	1	5	ng/dry g	
Chlordane-alpha	NA	ND	1	5	ng/dry g	
Chlordane-gamma	NA	ND	1	5	ng/dry g	
cis-Nonachlor	NA	ND	1	5	ng/dry g	
Dieldrin	NA	ND	1	5	ng/dry g	
Endosulfan sulfate	NA	ND	1	5	ng/dry g	
Endosulfan-I	NA	ND	1	5	ng/dry g	
Endosulfan-II	NA	ND	1	5	ng/dry g	
Endrin	NA	ND	1	5	ng/dry g	
Endrin aldehyde	NA	ND	1	5	ng/dry g	

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Chlorinated Pesticides — ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Endrin ketone	NA	ND	1	5	ng/dry g	
Heptachlor	NA	ND	1	5	ng/dry g	
Heptachlor epoxide	NA	ND	1	5	ng/dry g	
Hexachlorobenzene	NA	ND	1	5	ng/dry g	
Methoxychlor	NA	ND	1	5	ng/dry g	
Mirex	NA	ND	1	5	ng/dry g	
Oxychlordane	NA	ND	1	5	ng/dry g	
Perthane	NA	ND	5	10	ng/dry g	
trans-Nonachlor	NA	ND	1	5	ng/dry g	

Sample ID: 29131-R1 **Boat Ramp Depth 2'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	85			% Recovery	
(PCB112)	NA	78			% Recovery	
(PCB198)	NA	97			% Recovery	
(TCMX)	NA	80			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/dry g	
2,4'-DDE	NA	ND	1	5	ng/dry g	
2,4'-DDT	NA	ND	1	5	ng/dry g	
4,4'-DDD	NA	ND	1	5	ng/dry g	
4,4'-DDE	NA	ND	1	5	ng/dry g	
4,4'-DDT	NA	ND	1	5	ng/dry g	
Aldrin	NA	ND	1	5	ng/dry g	
BHC-alpha	NA	ND	1	5	ng/dry g	
BHC-beta	NA	ND	1	5	ng/dry g	
BHC-delta	NA	ND	1	5	ng/dry g	
BHC-gamma	NA	ND	1	5	ng/dry g	
Chlordane-alpha	NA	ND	1	5	ng/dry g	
Chlordane-gamma	NA	ND	1	5	ng/dry g	
cis-Nonachlor	NA	ND	1	5	ng/dry g	
Dieldrin	NA	ND	1	5	ng/dry g	
Endosulfan sulfate	NA	ND	1	5	ng/dry g	
Endosulfan-I	NA	ND	1	5	ng/dry g	

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Chlorinated Pesticides ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Endosulfan-II	NA	ND	1	5	ng/dry g	
Endrin	NA	ND	1	5	ng/dry g	
Endrin aldehyde	NA	ND	1	5	ng/dry g	
Endrin ketone	NA	ND	1	5	ng/dry g	
Heptachlor	NA	ND	1	5	ng/dry g	
Heptachlor epoxide	NA	ND	1	5	ng/dry g	
Hexachlorobenzene	NA	ND	1	5	ng/dry g	
Methoxychlor	NA	ND	1	5	ng/dry g	
Mirex	NA	ND	1	5	ng/dry g	
Oxychlordane	NA	ND	1	5	ng/dry g	
Perthane	NA	ND	5	10	ng/dry g	
trans-Nonachlor	NA	ND	1	5	ng/dry g	

Sample ID: 29132-R1 **Fishermans Pt Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	95			% Recovery	
(PCB112)	NA	82			% Recovery	
(PCB198)	NA	97			% Recovery	
(TCMX)	NA	87			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/dry g	
2,4'-DDE	NA	ND	1	5	ng/dry g	
2,4'-DDT	NA	ND	1	5	ng/dry g	
4,4'-DDD	NA	ND	1	5	ng/dry g	
4,4'-DDE	NA	ND	1	5	ng/dry g	
4,4'-DDT	NA	ND	1	5	ng/dry g	
Aldrin	NA	ND	1	5	ng/dry g	
BHC-alpha	NA	ND	1	5	ng/dry g	
BHC-beta	NA	ND	1	5	ng/dry g	
BHC-delta	NA	ND	1	5	ng/dry g	
BHC-gamma	NA	ND	1	5	ng/dry g	
Chlordane-alpha	NA	ND	1	5	ng/dry g	
Chlordane-gamma	NA	ND	1	5	ng/dry g	
cis-Nonachlor	NA	ND	1	5	ng/dry g	

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ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Dieldrin	NA	ND	1	5	ng/dry g	
Endosulfan sulfate	NA	ND	1	5	ng/dry g	
Endosulfan-I	NA	ND	1	5	ng/dry g	
Endosulfan-II	NA	ND	1	5	ng/dry g	
Endrin	NA	ND	1	5	ng/dry g	
Endrin aldehyde	NA	ND	1	5	ng/dry g	
Endrin ketone	NA	ND	1	5	ng/dry g	
Heptachlor	NA	ND	1	5	ng/dry g	
Heptachlor epoxide	NA	ND	1	5	ng/dry g	
Hexachlorobenzene	NA	ND	1	5	ng/dry g	
Methoxychlor	NA	ND	1	5	ng/dry g	
Mirex	NA	ND	1	5	ng/dry g	
Oxychlordane	NA	ND	1	5	ng/dry g	
Perthane	NA	ND	5	10	ng/dry g	
trans-Nonachlor	NA	ND	1	5	ng/dry g	

Sample ID: 29133-R1 **Fishermans Pt Depth 2'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 01-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	92			% Recovery	
(PCB112)	NA	84			% Recovery	
(PCB198)	NA	102			% Recovery	
(TCMX)	NA	84			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/dry g	
2,4'-DDE	NA	ND	1	5	ng/dry g	
2,4'-DDT	NA	ND	1	5	ng/dry g	
4,4'-DDD	NA	ND	1	5	ng/dry g	
4,4'-DDE	NA	ND	1	5	ng/dry g	
4,4'-DDT	NA	ND	1	5	ng/dry g	
Aldrin	NA	ND	1	5	ng/dry g	
BHC-alpha	NA	ND	1	5	ng/dry g	
BHC-beta	NA	ND	1	5	ng/dry g	
BHC-delta	NA	ND	1	5	ng/dry g	
BHC-gamma	NA	ND	1	5	ng/dry g	

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Chlorinated Pesticides ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Chlordane-alpha	NA	ND	1	5	ng/dry g	
Chlordane-gamma	NA	ND	1	5	ng/dry g	
cis-Nonachlor	NA	ND	1	5	ng/dry g	
Dieldrin	NA	ND	1	5	ng/dry g	
Endosulfan sulfate	NA	ND	1	5	ng/dry g	
Endosulfan-I	NA	ND	1	5	ng/dry g	
Endosulfan-II	NA	ND	1	5	ng/dry g	
Endrin	NA	ND	1	5	ng/dry g	
Endrin aldehyde	NA	ND	1	5	ng/dry g	
Endrin ketone	NA	ND	1	5	ng/dry g	
Heptachlor	NA	ND	1	5	ng/dry g	
Heptachlor epoxide	NA	ND	1	5	ng/dry g	
Hexachlorobenzene	NA	ND	1	5	ng/dry g	
Methoxychlor	NA	ND	1	5	ng/dry g	
Mirex	NA	ND	1	5	ng/dry g	
Oxychlordane	NA	ND	1	5	ng/dry g	
Perthane	NA	ND	5	10	ng/dry g	
trans-Nonachlor	NA	ND	1	5	ng/dry g	

Sample ID: 29134-R1 **Little Rock Drainage Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 01-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	92			% Recovery	
(PCB112)	NA	90			% Recovery	
(PCB198)	NA	107			% Recovery	
(TCMX)	NA	85			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/dry g	
2,4'-DDE	NA	ND	1	5	ng/dry g	
2,4'-DDT	NA	ND	1	5	ng/dry g	
4,4'-DDD	NA	ND	1	5	ng/dry g	
4,4'-DDE	NA	ND	1	5	ng/dry g	
4,4'-DDT	NA	ND	1	5	ng/dry g	
Aldrin	NA	ND	1	5	ng/dry g	
BHC-alpha	NA	ND	1	5	ng/dry g	

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Chlorinated Pesticides — ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
BHC-beta	NA	ND	1	5	ng/dry g	
BHC-delta	NA	ND	1	5	ng/dry g	
BHC-gamma	NA	ND	1	5	ng/dry g	
Chlordane-alpha	NA	ND	1	5	ng/dry g	
Chlordane-gamma	NA	ND	1	5	ng/dry g	
cis-Nonachlor	NA	ND	1	5	ng/dry g	
Dieldrin	NA	ND	1	5	ng/dry g	
Endosulfan sulfate	NA	ND	1	5	ng/dry g	
Endosulfan-I	NA	ND	1	5	ng/dry g	
Endosulfan-II	NA	ND	1	5	ng/dry g	
Endrin	NA	ND	1	5	ng/dry g	
Endrin aldehyde	NA	ND	1	5	ng/dry g	
Endrin ketone	NA	ND	1	5	ng/dry g	
Heptachlor	NA	ND	1	5	ng/dry g	
Heptachlor epoxide	NA	ND	1	5	ng/dry g	
Hexachlorobenzene	NA	ND	1	5	ng/dry g	
Methoxychlor	NA	ND	1	5	ng/dry g	
Mirex	NA	ND	1	5	ng/dry g	
Oxychlordane	NA	ND	1	5	ng/dry g	
Perthane	NA	ND	5	10	ng/dry g	
trans-Nonachlor	NA	ND	1	5	ng/dry g	

Sample ID: 29135-R1 **LR & Santiago Above Depth 1'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 01-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	92			% Recovery	
(PCB112)	NA	81			% Recovery	
(PCB198)	NA	99			% Recovery	
(TCMX)	NA	84			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/dry g	
2,4'-DDE	NA	ND	1	5	ng/dry g	
2,4'-DDT	NA	ND	1	5	ng/dry g	
4,4'-DDD	NA	ND	1	5	ng/dry g	
4,4'-DDE	NA	ND	1	5	ng/dry g	

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Chlorinated Pesticides ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
4,4'-DDT	NA	ND	1	5	ng/dry g	
Aldrin	NA	ND	1	5	ng/dry g	
BHC-alpha	NA	ND	1	5	ng/dry g	
BHC-beta	NA	ND	1	5	ng/dry g	
BHC-delta	NA	ND	1	5	ng/dry g	
BHC-gamma	NA	ND	1	5	ng/dry g	
Chlordane-alpha	NA	ND	1	5	ng/dry g	
Chlordane-gamma	NA	ND	1	5	ng/dry g	
cis-Nonachlor	NA	ND	1	5	ng/dry g	
Dieldrin	NA	ND	1	5	ng/dry g	
Endosulfan sulfate	NA	ND	1	5	ng/dry g	
Endosulfan-I	NA	ND	1	5	ng/dry g	
Endosulfan-II	NA	ND	1	5	ng/dry g	
Endrin	NA	ND	1	5	ng/dry g	
Endrin aldehyde	NA	ND	1	5	ng/dry g	
Endrin ketone	NA	ND	1	5	ng/dry g	
Heptachlor	NA	ND	1	5	ng/dry g	
Heptachlor epoxide	NA	ND	1	5	ng/dry g	
Hexachlorobenzene	NA	ND	1	5	ng/dry g	
Methoxychlor	NA	ND	1	5	ng/dry g	
Mirex	NA	ND	1	5	ng/dry g	
Oxychlordane	NA	ND	1	5	ng/dry g	
Perthane	NA	ND	5	10	ng/dry g	
trans-Nonachlor	NA	ND	1	5	ng/dry g	

Sample ID: 29136-R1 **Waters Edge Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 01-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	81			% Recovery	
(PCB112)	NA	77			% Recovery	
(PCB198)	NA	96			% Recovery	
(TCMX)	NA	80			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/dry g	
2,4'-DDE	NA	ND	1	5	ng/dry g	

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Chlorinated Pesticides ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
2,4'-DDT	NA	ND	1	5	ng/dry g	
4,4'-DDD	NA	ND	1	5	ng/dry g	
4,4'-DDE	NA	ND	1	5	ng/dry g	
4,4'-DDT	NA	ND	1	5	ng/dry g	
Aldrin	NA	ND	1	5	ng/dry g	
BHC-alpha	NA	ND	1	5	ng/dry g	
BHC-beta	NA	ND	1	5	ng/dry g	
BHC-delta	NA	ND	1	5	ng/dry g	
BHC-gamma	NA	ND	1	5	ng/dry g	
Chlordane-alpha	NA	ND	1	5	ng/dry g	
Chlordane-gamma	NA	ND	1	5	ng/dry g	
cis-Nonachlor	NA	ND	1	5	ng/dry g	
Dieldrin	NA	ND	1	5	ng/dry g	
Endosulfan sulfate	NA	ND	1	5	ng/dry g	
Endosulfan-I	NA	ND	1	5	ng/dry g	
Endosulfan-II	NA	ND	1	5	ng/dry g	
Endrin	NA	ND	1	5	ng/dry g	
Endrin aldehyde	NA	ND	1	5	ng/dry g	
Endrin ketone	NA	ND	1	5	ng/dry g	
Heptachlor	NA	ND	1	5	ng/dry g	
Heptachlor epoxide	NA	ND	1	5	ng/dry g	
Hexachlorobenzene	NA	ND	1	5	ng/dry g	
Methoxychlor	NA	ND	1	5	ng/dry g	
Mirex	NA	ND	1	5	ng/dry g	
Oxychlordane	NA	ND	1	5	ng/dry g	
Perthane	NA	ND	5	10	ng/dry g	
trans-Nonachlor	NA	ND	1	5	ng/dry g	

Sample ID: 29137-R1 **Waters Edge Depth 2'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 01-Oct-14

(PCB030)	NA	92			% Recovery	
(PCB112)	NA	80			% Recovery	
(PCB198)	NA	99			% Recovery	

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Chlorinated Pesticides — ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(TCMX)	NA	86			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/dry g	
2,4'-DDE	NA	ND	1	5	ng/dry g	
2,4'-DDT	NA	ND	1	5	ng/dry g	
4,4'-DDD	NA	ND	1	5	ng/dry g	
4,4'-DDE	NA	ND	1	5	ng/dry g	
4,4'-DDT	NA	ND	1	5	ng/dry g	
Aldrin	NA	ND	1	5	ng/dry g	
BHC-alpha	NA	ND	1	5	ng/dry g	
BHC-beta	NA	ND	1	5	ng/dry g	
BHC-delta	NA	ND	1	5	ng/dry g	
BHC-gamma	NA	ND	1	5	ng/dry g	
Chlordane-alpha	NA	ND	1	5	ng/dry g	
Chlordane-gamma	NA	ND	1	5	ng/dry g	
cis-Nonachlor	NA	ND	1	5	ng/dry g	
Dieldrin	NA	ND	1	5	ng/dry g	
Endosulfan sulfate	NA	ND	1	5	ng/dry g	
Endosulfan-I	NA	ND	1	5	ng/dry g	
Endosulfan-II	NA	ND	1	5	ng/dry g	
Endrin	NA	ND	1	5	ng/dry g	
Endrin aldehyde	NA	ND	1	5	ng/dry g	
Endrin ketone	NA	ND	1	5	ng/dry g	
Heptachlor	NA	ND	1	5	ng/dry g	
Heptachlor epoxide	NA	ND	1	5	ng/dry g	
Hexachlorobenzene	NA	ND	1	5	ng/dry g	
Methoxychlor	NA	ND	1	5	ng/dry g	
Mirex	NA	ND	1	5	ng/dry g	
Oxychlordane	NA	ND	1	5	ng/dry g	
Perthane	NA	ND	5	10	ng/dry g	
trans-Nonachlor	NA	ND	1	5	ng/dry g	

Sample ID: 29138-R1 **Below Dam Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 01-Oct-14

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Chlorinated Pesticides ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	90			% Recovery	
(PCB112)	NA	75			% Recovery	
(PCB198)	NA	84			% Recovery	
(TCMX)	NA	89			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/dry g	
2,4'-DDE	NA	ND	1	5	ng/dry g	
2,4'-DDT	NA	ND	1	5	ng/dry g	
4,4'-DDD	NA	ND	1	5	ng/dry g	
4,4'-DDE	NA	ND	1	5	ng/dry g	
4,4'-DDT	NA	ND	1	5	ng/dry g	
Aldrin	NA	ND	1	5	ng/dry g	
BHC-alpha	NA	ND	1	5	ng/dry g	
BHC-beta	NA	ND	1	5	ng/dry g	
BHC-delta	NA	ND	1	5	ng/dry g	
BHC-gamma	NA	ND	1	5	ng/dry g	
Chlordane-alpha	NA	ND	1	5	ng/dry g	
Chlordane-gamma	NA	ND	1	5	ng/dry g	
cis-Nonachlor	NA	ND	1	5	ng/dry g	
Dieldrin	NA	ND	1	5	ng/dry g	
Endosulfan sulfate	NA	ND	1	5	ng/dry g	
Endosulfan-I	NA	ND	1	5	ng/dry g	
Endosulfan-II	NA	ND	1	5	ng/dry g	
Endrin	NA	ND	1	5	ng/dry g	
Endrin aldehyde	NA	ND	1	5	ng/dry g	
Endrin ketone	NA	ND	1	5	ng/dry g	
Heptachlor	NA	ND	1	5	ng/dry g	
Heptachlor epoxide	NA	ND	1	5	ng/dry g	
Hexachlorobenzene	NA	ND	1	5	ng/dry g	
Methoxychlor	NA	ND	1	5	ng/dry g	
Mirex	NA	ND	1	5	ng/dry g	
Oxychlordane	NA	ND	1	5	ng/dry g	
Perthane	NA	ND	5	10	ng/dry g	

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Chlorinated Pesticides ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
trans-Nonachlor	NA	ND	1	5	ng/dry g	

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Conventionals ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 29128-R1	**L.R. Rocky Pt. Surface** Method: SM 2540 B	**Matrix: Sediment** Batch ID: C-22028		**Sampled: 04-Aug-14** Prepared: 16-Sep-14		**Received: 15-Aug-14** Analyzed: 16-Sep-14
Percent Solids	NA	99.8	0.1	0.1	% Dry Weight	
Sample ID: 29129-R1	**L.R. Rocky Pt. Depth 1'** Method: SM 2540 B	**Matrix: Sediment** Batch ID: C-22028		**Sampled: 04-Aug-14** Prepared: 16-Sep-14		**Received: 15-Aug-14** Analyzed: 16-Sep-14
Percent Solids	NA	99.8	0.1	0.1	% Dry Weight	
Sample ID: 29130-R1	**Boat Ramp Surface** Method: SM 2540 B	**Matrix: Sediment** Batch ID: C-22028		**Sampled: 04-Aug-14** Prepared: 16-Sep-14		**Received: 15-Aug-14** Analyzed: 16-Sep-14
Percent Solids	NA	70.1	0.1	0.1	% Dry Weight	
Sample ID: 29131-R1	**Boat Ramp Depth 2'** Method: SM 2540 B	**Matrix: Sediment** Batch ID: C-22028		**Sampled: 04-Aug-14** Prepared: 16-Sep-14		**Received: 15-Aug-14** Analyzed: 16-Sep-14
Percent Solids	NA	62.4	0.1	0.1	% Dry Weight	
Sample ID: 29132-R1	**Fishermans Pt Surface** Method: SM 2540 B	**Matrix: Sediment** Batch ID: C-22028		**Sampled: 04-Aug-14** Prepared: 16-Sep-14		**Received: 15-Aug-14** Analyzed: 16-Sep-14
Percent Solids	NA	96.3	0.1	0.1	% Dry Weight	
Sample ID: 29133-R1	**Fishermans Pt Depth 2'** Method: SM 2540 B	**Matrix: Sediment** Batch ID: C-22028		**Sampled: 04-Aug-14** Prepared: 16-Sep-14		**Received: 15-Aug-14** Analyzed: 16-Sep-14
Percent Solids	NA	98	0.1	0.1	% Dry Weight	
Sample ID: 29134-R1	**Little Rock Drainage Surface** Method: SM 2540 B	**Matrix: Sediment** Batch ID: C-22028		**Sampled: 04-Aug-14** Prepared: 16-Sep-14		**Received: 15-Aug-14** Analyzed: 16-Sep-14
Percent Solids	NA	99.9	0.1	0.1	% Dry Weight	
Sample ID: 29135-R1	**LR & Santiago Above Depth 1'** Method: SM 2540 B	**Matrix: Sediment** Batch ID: C-22028		**Sampled: 04-Aug-14** Prepared: 16-Sep-14		**Received: 15-Aug-14** Analyzed: 16-Sep-14
Percent Solids	NA	99.8	0.1	0.1	% Dry Weight	
Sample ID: 29136-R1	**Waters Edge Surface** Method: SM 2540 B	**Matrix: Sediment** Batch ID: C-22028		**Sampled: 04-Aug-14** Prepared: 16-Sep-14		**Received: 15-Aug-14** Analyzed: 16-Sep-14
Percent Solids	NA	57.5	0.1	0.1	% Dry Weight	

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Conventionals ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 29137-R1	**Waters Edge Depth 2'** Method: SM 2540 B	**Matrix: Sediment** Batch ID: C-22028		**Sampled: 04-Aug-14** Prepared: 16-Sep-14		**Received: 15-Aug-14** Analyzed: 16-Sep-14
Percent Solids	NA	91.1	0.1	0.1	% Dry Weight	
Sample ID: 29138-R1	**Below Dam Surface** Method: SM 2540 B	**Matrix: Sediment** Batch ID: C-22028		**Sampled: 04-Aug-14** Prepared: 16-Sep-14		**Received: 15-Aug-14** Analyzed: 16-Sep-14
Percent Solids	NA	99.1	0.1	0.1	% Dry Weight	

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Elements ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 29128-R1	**L.R. Rocky Pt. Surface** Method: EPA 245.7	**Matrix: Sediment** Batch ID: E-6082		**Sampled: 04-Aug-14** Prepared: 15-Sep-14		**Received: 15-Aug-14** Analyzed: 17-Sep-14
Mercury (Hg)	NA	0.0036	0.00001	0.00002	µg/dry g	
Sample ID: 29129-R1	**L.R. Rocky Pt. Depth 1'** Method: EPA 245.7	**Matrix: Sediment** Batch ID: E-6082		**Sampled: 04-Aug-14** Prepared: 15-Sep-14		**Received: 15-Aug-14** Analyzed: 17-Sep-14
Mercury (Hg)	NA	0.0034	0.00001	0.00002	µg/dry g	
Sample ID: 29130-R1	**Boat Ramp Surface** Method: EPA 245.7	**Matrix: Sediment** Batch ID: E-6082		**Sampled: 04-Aug-14** Prepared: 15-Sep-14		**Received: 15-Aug-14** Analyzed: 17-Sep-14
Mercury (Hg)	NA	0.0154	0.00001	0.00002	µg/dry g	
Sample ID: 29131-R1	**Boat Ramp Depth 2'** Method: EPA 245.7	**Matrix: Sediment** Batch ID: E-6082		**Sampled: 04-Aug-14** Prepared: 15-Sep-14		**Received: 15-Aug-14** Analyzed: 17-Sep-14
Mercury (Hg)	NA	0.0195	0.00001	0.00002	µg/dry g	
Sample ID: 29132-R1	**Fishermans Pt Surface** Method: EPA 245.7	**Matrix: Sediment** Batch ID: E-6082		**Sampled: 04-Aug-14** Prepared: 15-Sep-14		**Received: 15-Aug-14** Analyzed: 17-Sep-14
Mercury (Hg)	NA	0.0066	0.00001	0.00002	µg/dry g	
Sample ID: 29133-R1	**Fishermans Pt Depth 2'** Method: EPA 245.7	**Matrix: Sediment** Batch ID: E-6082		**Sampled: 04-Aug-14** Prepared: 15-Sep-14		**Received: 15-Aug-14** Analyzed: 17-Sep-14
Mercury (Hg)	NA	0.0071	0.00001	0.00002	µg/dry g	
Sample ID: 29134-R1	**Little Rock Drainage Surface** Method: EPA 245.7	**Matrix: Sediment** Batch ID: E-6082		**Sampled: 04-Aug-14** Prepared: 15-Sep-14		**Received: 15-Aug-14** Analyzed: 17-Sep-14
Mercury (Hg)	NA	0.0032	0.00001	0.00002	µg/dry g	
Sample ID: 29135-R1	**LR & Santiago Above Depth 1'** Method: EPA 245.7	**Matrix: Sediment** Batch ID: E-6082		**Sampled: 04-Aug-14** Prepared: 15-Sep-14		**Received: 15-Aug-14** Analyzed: 17-Sep-14
Mercury (Hg)	NA	0.0064	0.00001	0.00002	µg/dry g	
Sample ID: 29136-R1	**Waters Edge Surface** Method: EPA 245.7	**Matrix: Sediment** Batch ID: E-6082		**Sampled: 04-Aug-14** Prepared: 15-Sep-14		**Received: 15-Aug-14** Analyzed: 17-Sep-14
Mercury (Hg)	NA	0.0213	0.00001	0.00002	µg/dry g	

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Elements

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 29137-R1	**Waters Edge Depth 2'** Method: EPA 245.7	**Matrix: Sediment** Batch ID: E-6082		**Sampled: 04-Aug-14** Prepared: 15-Sep-14		**Received: 15-Aug-14** Analyzed: 17-Sep-14
Mercury (Hg)	NA	0.0059	0.00001	0.00002	µg/dry g	
Sample ID: 29138-R1	**Below Dam Surface** Method: EPA 245.7	**Matrix: Sediment** Batch ID: E-6082		**Sampled: 04-Aug-14** Prepared: 15-Sep-14		**Received: 15-Aug-14** Analyzed: 17-Sep-14
Mercury (Hg)	NA	0.011	0.00001	0.00002	µg/dry g	

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PCB Congeners ANALYTICAL REPORT

Sample ID: 29128-R1 **L.R. Rocky Pt. Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/dry g	
PCB008	NA	ND	1	5	ng/dry g	
PCB018	NA	ND	1	5	ng/dry g	
PCB028	NA	ND	1	5	ng/dry g	
PCB031	NA	ND	1	5	ng/dry g	
PCB033	NA	ND	1	5	ng/dry g	
PCB037	NA	ND	1	5	ng/dry g	
PCB044	NA	ND	1	5	ng/dry g	
PCB049	NA	ND	1	5	ng/dry g	
PCB052	NA	ND	1	5	ng/dry g	
PCB056(060)	NA	ND	1	5	ng/dry g	
PCB066	NA	ND	1	5	ng/dry g	
PCB070	NA	ND	1	5	ng/dry g	
PCB074	NA	ND	1	5	ng/dry g	
PCB077	NA	ND	1	5	ng/dry g	
PCB081	NA	ND	1	5	ng/dry g	
PCB087	NA	ND	1	5	ng/dry g	
PCB095	NA	ND	1	5	ng/dry g	
PCB097	NA	ND	1	5	ng/dry g	
PCB099	NA	ND	1	5	ng/dry g	
PCB101	NA	ND	1	5	ng/dry g	
PCB105	NA	ND	1	5	ng/dry g	
PCB110	NA	ND	1	5	ng/dry g	
PCB114	NA	ND	1	5	ng/dry g	
PCB118	NA	ND	1	5	ng/dry g	
PCB119	NA	ND	1	5	ng/dry g	
PCB123	NA	ND	1	5	ng/dry g	
PCB126	NA	ND	1	5	ng/dry g	
PCB128	NA	ND	1	5	ng/dry g	
PCB138	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB141	NA	ND	1	5	ng/dry g	
PCB149	NA	ND	1	5	ng/dry g	
PCB151	NA	ND	1	5	ng/dry g	
PCB153	NA	ND	1	5	ng/dry g	
PCB156	NA	ND	1	5	ng/dry g	
PCB157	NA	ND	1	5	ng/dry g	
PCB158	NA	ND	1	5	ng/dry g	
PCB167	NA	ND	1	5	ng/dry g	
PCB168+132	NA	ND	1	5	ng/dry g	
PCB169	NA	ND	1	5	ng/dry g	
PCB170	NA	ND	1	5	ng/dry g	
PCB174	NA	ND	1	5	ng/dry g	
PCB177	NA	ND	1	5	ng/dry g	
PCB180	NA	ND	1	5	ng/dry g	
PCB183	NA	ND	1	5	ng/dry g	
PCB187	NA	ND	1	5	ng/dry g	
PCB189	NA	ND	1	5	ng/dry g	
PCB194	NA	ND	1	5	ng/dry g	
PCB195	NA	ND	1	5	ng/dry g	
PCB199(200)	NA	ND	1	5	ng/dry g	
PCB201	NA	ND	1	5	ng/dry g	
PCB206	NA	ND	1	5	ng/dry g	
PCB209	NA	ND	1	5	ng/dry g	

Sample ID: 29129-R1 **L.R. Rocky Pt. Depth 1'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/dry g	
PCB008	NA	ND	1	5	ng/dry g	
PCB018	NA	ND	1	5	ng/dry g	
PCB028	NA	ND	1	5	ng/dry g	
PCB031	NA	ND	1	5	ng/dry g	
PCB033	NA	ND	1	5	ng/dry g	
PCB037	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB044	NA	ND	1	5	ng/dry g	
PCB049	NA	ND	1	5	ng/dry g	
PCB052	NA	ND	1	5	ng/dry g	
PCB056(060)	NA	ND	1	5	ng/dry g	
PCB066	NA	ND	1	5	ng/dry g	
PCB070	NA	ND	1	5	ng/dry g	
PCB074	NA	ND	1	5	ng/dry g	
PCB077	NA	ND	1	5	ng/dry g	
PCB081	NA	ND	1	5	ng/dry g	
PCB087	NA	ND	1	5	ng/dry g	
PCB095	NA	ND	1	5	ng/dry g	
PCB097	NA	ND	1	5	ng/dry g	
PCB099	NA	ND	1	5	ng/dry g	
PCB101	NA	ND	1	5	ng/dry g	
PCB105	NA	ND	1	5	ng/dry g	
PCB110	NA	ND	1	5	ng/dry g	
PCB114	NA	ND	1	5	ng/dry g	
PCB118	NA	ND	1	5	ng/dry g	
PCB119	NA	ND	1	5	ng/dry g	
PCB123	NA	ND	1	5	ng/dry g	
PCB126	NA	ND	1	5	ng/dry g	
PCB128	NA	ND	1	5	ng/dry g	
PCB138	NA	ND	1	5	ng/dry g	
PCB141	NA	ND	1	5	ng/dry g	
PCB149	NA	ND	1	5	ng/dry g	
PCB151	NA	ND	1	5	ng/dry g	
PCB153	NA	ND	1	5	ng/dry g	
PCB156	NA	ND	1	5	ng/dry g	
PCB157	NA	ND	1	5	ng/dry g	
PCB158	NA	ND	1	5	ng/dry g	
PCB167	NA	ND	1	5	ng/dry g	
PCB168+132	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB169	NA	ND	1	5	ng/dry g	
PCB170	NA	ND	1	5	ng/dry g	
PCB174	NA	ND	1	5	ng/dry g	
PCB177	NA	ND	1	5	ng/dry g	
PCB180	NA	ND	1	5	ng/dry g	
PCB183	NA	ND	1	5	ng/dry g	
PCB187	NA	ND	1	5	ng/dry g	
PCB189	NA	ND	1	5	ng/dry g	
PCB194	NA	ND	1	5	ng/dry g	
PCB195	NA	ND	1	5	ng/dry g	
PCB199(200)	NA	ND	1	5	ng/dry g	
PCB201	NA	ND	1	5	ng/dry g	
PCB206	NA	ND	1	5	ng/dry g	
PCB209	NA	ND	1	5	ng/dry g	

Sample ID: 29130-R1 **Boat Ramp Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**

Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/dry g	
PCB008	NA	ND	1	5	ng/dry g	
PCB018	NA	ND	1	5	ng/dry g	
PCB028	NA	ND	1	5	ng/dry g	
PCB031	NA	ND	1	5	ng/dry g	
PCB033	NA	ND	1	5	ng/dry g	
PCB037	NA	ND	1	5	ng/dry g	
PCB044	NA	ND	1	5	ng/dry g	
PCB049	NA	ND	1	5	ng/dry g	
PCB052	NA	ND	1	5	ng/dry g	
PCB056(060)	NA	ND	1	5	ng/dry g	
PCB066	NA	ND	1	5	ng/dry g	
PCB070	NA	ND	1	5	ng/dry g	
PCB074	NA	ND	1	5	ng/dry g	
PCB077	NA	ND	1	5	ng/dry g	
PCB081	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB087	NA	ND	1	5	ng/dry g	
PCB095	NA	ND	1	5	ng/dry g	
PCB097	NA	ND	1	5	ng/dry g	
PCB099	NA	ND	1	5	ng/dry g	
PCB101	NA	ND	1	5	ng/dry g	
PCB105	NA	ND	1	5	ng/dry g	
PCB110	NA	ND	1	5	ng/dry g	
PCB114	NA	ND	1	5	ng/dry g	
PCB118	NA	ND	1	5	ng/dry g	
PCB119	NA	ND	1	5	ng/dry g	
PCB123	NA	ND	1	5	ng/dry g	
PCB126	NA	ND	1	5	ng/dry g	
PCB128	NA	ND	1	5	ng/dry g	
PCB138	NA	1.1	1	5	ng/dry g	J
PCB141	NA	ND	1	5	ng/dry g	
PCB149	NA	ND	1	5	ng/dry g	
PCB151	NA	ND	1	5	ng/dry g	
PCB153	NA	ND	1	5	ng/dry g	
PCB156	NA	ND	1	5	ng/dry g	
PCB157	NA	ND	1	5	ng/dry g	
PCB158	NA	ND	1	5	ng/dry g	
PCB167	NA	ND	1	5	ng/dry g	
PCB168+132	NA	ND	1	5	ng/dry g	
PCB169	NA	ND	1	5	ng/dry g	
PCB170	NA	ND	1	5	ng/dry g	
PCB174	NA	ND	1	5	ng/dry g	
PCB177	NA	ND	1	5	ng/dry g	
PCB180	NA	ND	1	5	ng/dry g	
PCB183	NA	ND	1	5	ng/dry g	
PCB187	NA	ND	1	5	ng/dry g	
PCB189	NA	ND	1	5	ng/dry g	
PCB194	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB195	NA	ND	1	5	ng/dry g	
PCB199(200)	NA	ND	1	5	ng/dry g	
PCB201	NA	ND	1	5	ng/dry g	
PCB206	NA	ND	1	5	ng/dry g	
PCB209	NA	ND	1	5	ng/dry g	

Sample ID: 29131-R1 **Boat Ramp Depth 2'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/dry g	
PCB008	NA	ND	1	5	ng/dry g	
PCB018	NA	ND	1	5	ng/dry g	
PCB028	NA	ND	1	5	ng/dry g	
PCB031	NA	ND	1	5	ng/dry g	
PCB033	NA	ND	1	5	ng/dry g	
PCB037	NA	ND	1	5	ng/dry g	
PCB044	NA	ND	1	5	ng/dry g	
PCB049	NA	ND	1	5	ng/dry g	
PCB052	NA	ND	1	5	ng/dry g	
PCB056(060)	NA	ND	1	5	ng/dry g	
PCB066	NA	ND	1	5	ng/dry g	
PCB070	NA	ND	1	5	ng/dry g	
PCB074	NA	ND	1	5	ng/dry g	
PCB077	NA	ND	1	5	ng/dry g	
PCB081	NA	ND	1	5	ng/dry g	
PCB087	NA	ND	1	5	ng/dry g	
PCB095	NA	ND	1	5	ng/dry g	
PCB097	NA	ND	1	5	ng/dry g	
PCB099	NA	ND	1	5	ng/dry g	
PCB101	NA	ND	1	5	ng/dry g	
PCB105	NA	ND	1	5	ng/dry g	
PCB110	NA	ND	1	5	ng/dry g	
PCB114	NA	ND	1	5	ng/dry g	
PCB118	NA	ND	1	5	ng/dry g	

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PCB Congeners — ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB119	NA	ND	1	5	ng/dry g	
PCB123	NA	ND	1	5	ng/dry g	
PCB126	NA	ND	1	5	ng/dry g	
PCB128	NA	ND	1	5	ng/dry g	
PCB138	NA	1.9	1	5	ng/dry g	J
PCB141	NA	ND	1	5	ng/dry g	
PCB149	NA	ND	1	5	ng/dry g	
PCB151	NA	ND	1	5	ng/dry g	
PCB153	NA	ND	1	5	ng/dry g	
PCB156	NA	ND	1	5	ng/dry g	
PCB157	NA	ND	1	5	ng/dry g	
PCB158	NA	ND	1	5	ng/dry g	
PCB167	NA	ND	1	5	ng/dry g	
PCB168+132	NA	ND	1	5	ng/dry g	
PCB169	NA	ND	1	5	ng/dry g	
PCB170	NA	ND	1	5	ng/dry g	
PCB174	NA	ND	1	5	ng/dry g	
PCB177	NA	ND	1	5	ng/dry g	
PCB180	NA	ND	1	5	ng/dry g	
PCB183	NA	ND	1	5	ng/dry g	
PCB187	NA	ND	1	5	ng/dry g	
PCB189	NA	ND	1	5	ng/dry g	
PCB194	NA	ND	1	5	ng/dry g	
PCB195	NA	ND	1	5	ng/dry g	
PCB199(200)	NA	ND	1	5	ng/dry g	
PCB201	NA	ND	1	5	ng/dry g	
PCB206	NA	ND	1	5	ng/dry g	
PCB209	NA	ND	1	5	ng/dry g	

Sample ID: 29132-R1 **Fishermans Pt Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/dry g	
PCB008	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB018	NA	ND	1	5	ng/dry g	
PCB028	NA	ND	1	5	ng/dry g	
PCB031	NA	ND	1	5	ng/dry g	
PCB033	NA	ND	1	5	ng/dry g	
PCB037	NA	ND	1	5	ng/dry g	
PCB044	NA	ND	1	5	ng/dry g	
PCB049	NA	ND	1	5	ng/dry g	
PCB052	NA	ND	1	5	ng/dry g	
PCB056(060)	NA	ND	1	5	ng/dry g	
PCB066	NA	ND	1	5	ng/dry g	
PCB070	NA	ND	1	5	ng/dry g	
PCB074	NA	ND	1	5	ng/dry g	
PCB077	NA	ND	1	5	ng/dry g	
PCB081	NA	ND	1	5	ng/dry g	
PCB087	NA	ND	1	5	ng/dry g	
PCB095	NA	ND	1	5	ng/dry g	
PCB097	NA	ND	1	5	ng/dry g	
PCB099	NA	ND	1	5	ng/dry g	
PCB101	NA	ND	1	5	ng/dry g	
PCB105	NA	ND	1	5	ng/dry g	
PCB110	NA	ND	1	5	ng/dry g	
PCB114	NA	ND	1	5	ng/dry g	
PCB118	NA	ND	1	5	ng/dry g	
PCB119	NA	ND	1	5	ng/dry g	
PCB123	NA	ND	1	5	ng/dry g	
PCB126	NA	ND	1	5	ng/dry g	
PCB128	NA	ND	1	5	ng/dry g	
PCB138	NA	ND	1	5	ng/dry g	
PCB141	NA	ND	1	5	ng/dry g	
PCB149	NA	ND	1	5	ng/dry g	
PCB151	NA	ND	1	5	ng/dry g	
PCB153	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB156	NA	ND	1	5	ng/dry g	
PCB157	NA	ND	1	5	ng/dry g	
PCB158	NA	ND	1	5	ng/dry g	
PCB167	NA	ND	1	5	ng/dry g	
PCB168+132	NA	ND	1	5	ng/dry g	
PCB169	NA	ND	1	5	ng/dry g	
PCB170	NA	ND	1	5	ng/dry g	
PCB174	NA	ND	1	5	ng/dry g	
PCB177	NA	ND	1	5	ng/dry g	
PCB180	NA	ND	1	5	ng/dry g	
PCB183	NA	ND	1	5	ng/dry g	
PCB187	NA	ND	1	5	ng/dry g	
PCB189	NA	ND	1	5	ng/dry g	
PCB194	NA	ND	1	5	ng/dry g	
PCB195	NA	ND	1	5	ng/dry g	
PCB199(200)	NA	ND	1	5	ng/dry g	
PCB201	NA	ND	1	5	ng/dry g	
PCB206	NA	ND	1	5	ng/dry g	
PCB209	NA	ND	1	5	ng/dry g	

Sample ID: 29133-R1 **Fishermans Pt Depth 2'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**

Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 01-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/dry g	
PCB008	NA	ND	1	5	ng/dry g	
PCB018	NA	ND	1	5	ng/dry g	
PCB028	NA	ND	1	5	ng/dry g	
PCB031	NA	ND	1	5	ng/dry g	
PCB033	NA	ND	1	5	ng/dry g	
PCB037	NA	ND	1	5	ng/dry g	
PCB044	NA	ND	1	5	ng/dry g	
PCB049	NA	ND	1	5	ng/dry g	
PCB052	NA	ND	1	5	ng/dry g	
PCB056(060)	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB066	NA	ND	1	5	ng/dry g	
PCB070	NA	ND	1	5	ng/dry g	
PCB074	NA	ND	1	5	ng/dry g	
PCB077	NA	ND	1	5	ng/dry g	
PCB081	NA	ND	1	5	ng/dry g	
PCB087	NA	ND	1	5	ng/dry g	
PCB095	NA	ND	1	5	ng/dry g	
PCB097	NA	ND	1	5	ng/dry g	
PCB099	NA	ND	1	5	ng/dry g	
PCB101	NA	ND	1	5	ng/dry g	
PCB105	NA	ND	1	5	ng/dry g	
PCB110	NA	ND	1	5	ng/dry g	
PCB114	NA	ND	1	5	ng/dry g	
PCB118	NA	ND	1	5	ng/dry g	
PCB119	NA	ND	1	5	ng/dry g	
PCB123	NA	ND	1	5	ng/dry g	
PCB126	NA	ND	1	5	ng/dry g	
PCB128	NA	ND	1	5	ng/dry g	
PCB138	NA	ND	1	5	ng/dry g	
PCB141	NA	ND	1	5	ng/dry g	
PCB149	NA	ND	1	5	ng/dry g	
PCB151	NA	ND	1	5	ng/dry g	
PCB153	NA	ND	1	5	ng/dry g	
PCB156	NA	ND	1	5	ng/dry g	
PCB157	NA	ND	1	5	ng/dry g	
PCB158	NA	ND	1	5	ng/dry g	
PCB167	NA	ND	1	5	ng/dry g	
PCB168+132	NA	ND	1	5	ng/dry g	
PCB169	NA	ND	1	5	ng/dry g	
PCB170	NA	ND	1	5	ng/dry g	
PCB174	NA	ND	1	5	ng/dry g	
PCB177	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB180	NA	ND	1	5	ng/dry g	
PCB183	NA	ND	1	5	ng/dry g	
PCB187	NA	ND	1	5	ng/dry g	
PCB189	NA	ND	1	5	ng/dry g	
PCB194	NA	ND	1	5	ng/dry g	
PCB195	NA	ND	1	5	ng/dry g	
PCB199(200)	NA	ND	1	5	ng/dry g	
PCB201	NA	ND	1	5	ng/dry g	
PCB206	NA	ND	1	5	ng/dry g	
PCB209	NA	ND	1	5	ng/dry g	

Sample ID: 29134-R1 **Little Rock Drainage Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 01-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/dry g	
PCB008	NA	ND	1	5	ng/dry g	
PCB018	NA	ND	1	5	ng/dry g	
PCB028	NA	ND	1	5	ng/dry g	
PCB031	NA	ND	1	5	ng/dry g	
PCB033	NA	ND	1	5	ng/dry g	
PCB037	NA	ND	1	5	ng/dry g	
PCB044	NA	ND	1	5	ng/dry g	
PCB049	NA	ND	1	5	ng/dry g	
PCB052	NA	ND	1	5	ng/dry g	
PCB056(060)	NA	ND	1	5	ng/dry g	
PCB066	NA	ND	1	5	ng/dry g	
PCB070	NA	ND	1	5	ng/dry g	
PCB074	NA	ND	1	5	ng/dry g	
PCB077	NA	ND	1	5	ng/dry g	
PCB081	NA	ND	1	5	ng/dry g	
PCB087	NA	ND	1	5	ng/dry g	
PCB095	NA	ND	1	5	ng/dry g	
PCB097	NA	ND	1	5	ng/dry g	
PCB099	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB101	NA	ND	1	5	ng/dry g	
PCB105	NA	ND	1	5	ng/dry g	
PCB110	NA	ND	1	5	ng/dry g	
PCB114	NA	ND	1	5	ng/dry g	
PCB118	NA	ND	1	5	ng/dry g	
PCB119	NA	ND	1	5	ng/dry g	
PCB123	NA	ND	1	5	ng/dry g	
PCB126	NA	ND	1	5	ng/dry g	
PCB128	NA	ND	1	5	ng/dry g	
PCB138	NA	ND	1	5	ng/dry g	
PCB141	NA	ND	1	5	ng/dry g	
PCB149	NA	ND	1	5	ng/dry g	
PCB151	NA	ND	1	5	ng/dry g	
PCB153	NA	ND	1	5	ng/dry g	
PCB156	NA	ND	1	5	ng/dry g	
PCB157	NA	ND	1	5	ng/dry g	
PCB158	NA	ND	1	5	ng/dry g	
PCB167	NA	ND	1	5	ng/dry g	
PCB168+132	NA	ND	1	5	ng/dry g	
PCB169	NA	ND	1	5	ng/dry g	
PCB170	NA	ND	1	5	ng/dry g	
PCB174	NA	ND	1	5	ng/dry g	
PCB177	NA	ND	1	5	ng/dry g	
PCB180	NA	ND	1	5	ng/dry g	
PCB183	NA	ND	1	5	ng/dry g	
PCB187	NA	ND	1	5	ng/dry g	
PCB189	NA	ND	1	5	ng/dry g	
PCB194	NA	ND	1	5	ng/dry g	
PCB195	NA	ND	1	5	ng/dry g	
PCB199(200)	NA	ND	1	5	ng/dry g	
PCB201	NA	ND	1	5	ng/dry g	
PCB206	NA	ND	1	5	ng/dry g	

PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB209	NA	ND	1	5	ng/dry g	

Sample ID: 29135-R1 **LR & Santiago Above Depth 1'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 01-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/dry g	
PCB008	NA	ND	1	5	ng/dry g	
PCB018	NA	ND	1	5	ng/dry g	
PCB028	NA	ND	1	5	ng/dry g	
PCB031	NA	ND	1	5	ng/dry g	
PCB033	NA	ND	1	5	ng/dry g	
PCB037	NA	ND	1	5	ng/dry g	
PCB044	NA	ND	1	5	ng/dry g	
PCB049	NA	ND	1	5	ng/dry g	
PCB052	NA	ND	1	5	ng/dry g	
PCB056(060)	NA	ND	1	5	ng/dry g	
PCB066	NA	ND	1	5	ng/dry g	
PCB070	NA	ND	1	5	ng/dry g	
PCB074	NA	ND	1	5	ng/dry g	
PCB077	NA	ND	1	5	ng/dry g	
PCB081	NA	ND	1	5	ng/dry g	
PCB087	NA	ND	1	5	ng/dry g	
PCB095	NA	ND	1	5	ng/dry g	
PCB097	NA	ND	1	5	ng/dry g	
PCB099	NA	ND	1	5	ng/dry g	
PCB101	NA	ND	1	5	ng/dry g	
PCB105	NA	ND	1	5	ng/dry g	
PCB110	NA	ND	1	5	ng/dry g	
PCB114	NA	ND	1	5	ng/dry g	
PCB118	NA	ND	1	5	ng/dry g	
PCB119	NA	ND	1	5	ng/dry g	
PCB123	NA	ND	1	5	ng/dry g	
PCB126	NA	ND	1	5	ng/dry g	
PCB128	NA	ND	1	5	ng/dry g	

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PCB Congeners — ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB138	NA	ND	1	5	ng/dry g	
PCB141	NA	ND	1	5	ng/dry g	
PCB149	NA	ND	1	5	ng/dry g	
PCB151	NA	ND	1	5	ng/dry g	
PCB153	NA	ND	1	5	ng/dry g	
PCB156	NA	ND	1	5	ng/dry g	
PCB157	NA	ND	1	5	ng/dry g	
PCB158	NA	ND	1	5	ng/dry g	
PCB167	NA	ND	1	5	ng/dry g	
PCB168+132	NA	ND	1	5	ng/dry g	
PCB169	NA	ND	1	5	ng/dry g	
PCB170	NA	ND	1	5	ng/dry g	
PCB174	NA	ND	1	5	ng/dry g	
PCB177	NA	ND	1	5	ng/dry g	
PCB180	NA	ND	1	5	ng/dry g	
PCB183	NA	ND	1	5	ng/dry g	
PCB187	NA	ND	1	5	ng/dry g	
PCB189	NA	ND	1	5	ng/dry g	
PCB194	NA	ND	1	5	ng/dry g	
PCB195	NA	ND	1	5	ng/dry g	
PCB199(200)	NA	ND	1	5	ng/dry g	
PCB201	NA	ND	1	5	ng/dry g	
PCB206	NA	ND	1	5	ng/dry g	
PCB209	NA	ND	1	5	ng/dry g	

Sample ID: 29136-R1 **Waters Edge Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 01-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/dry g	
PCB008	NA	ND	1	5	ng/dry g	
PCB018	NA	ND	1	5	ng/dry g	
PCB028	NA	ND	1	5	ng/dry g	
PCB031	NA	ND	1	5	ng/dry g	
PCB033	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB037	NA	ND	1	5	ng/dry g	
PCB044	NA	ND	1	5	ng/dry g	
PCB049	NA	ND	1	5	ng/dry g	
PCB052	NA	ND	1	5	ng/dry g	
PCB056(060)	NA	ND	1	5	ng/dry g	
PCB066	NA	ND	1	5	ng/dry g	
PCB070	NA	ND	1	5	ng/dry g	
PCB074	NA	ND	1	5	ng/dry g	
PCB077	NA	ND	1	5	ng/dry g	
PCB081	NA	ND	1	5	ng/dry g	
PCB087	NA	ND	1	5	ng/dry g	
PCB095	NA	ND	1	5	ng/dry g	
PCB097	NA	ND	1	5	ng/dry g	
PCB099	NA	ND	1	5	ng/dry g	
PCB101	NA	ND	1	5	ng/dry g	
PCB105	NA	ND	1	5	ng/dry g	
PCB110	NA	ND	1	5	ng/dry g	
PCB114	NA	ND	1	5	ng/dry g	
PCB118	NA	ND	1	5	ng/dry g	
PCB119	NA	ND	1	5	ng/dry g	
PCB123	NA	ND	1	5	ng/dry g	
PCB126	NA	ND	1	5	ng/dry g	
PCB128	NA	ND	1	5	ng/dry g	
PCB138	NA	1.5	1	5	ng/dry g	J
PCB141	NA	ND	1	5	ng/dry g	
PCB149	NA	ND	1	5	ng/dry g	
PCB151	NA	ND	1	5	ng/dry g	
PCB153	NA	ND	1	5	ng/dry g	
PCB156	NA	ND	1	5	ng/dry g	
PCB157	NA	ND	1	5	ng/dry g	
PCB158	NA	ND	1	5	ng/dry g	
PCB167	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB168+132	NA	ND	1	5	ng/dry g	
PCB169	NA	ND	1	5	ng/dry g	
PCB170	NA	ND	1	5	ng/dry g	
PCB174	NA	ND	1	5	ng/dry g	
PCB177	NA	ND	1	5	ng/dry g	
PCB180	NA	ND	1	5	ng/dry g	
PCB183	NA	ND	1	5	ng/dry g	
PCB187	NA	ND	1	5	ng/dry g	
PCB189	NA	ND	1	5	ng/dry g	
PCB194	NA	ND	1	5	ng/dry g	
PCB195	NA	ND	1	5	ng/dry g	
PCB199(200)	NA	ND	1	5	ng/dry g	
PCB201	NA	ND	1	5	ng/dry g	
PCB206	NA	ND	1	5	ng/dry g	
PCB209	NA	ND	1	5	ng/dry g	

Sample ID: 29137-R1 **Waters Edge Depth 2'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 01-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/dry g	
PCB008	NA	ND	1	5	ng/dry g	
PCB018	NA	ND	1	5	ng/dry g	
PCB028	NA	ND	1	5	ng/dry g	
PCB031	NA	ND	1	5	ng/dry g	
PCB033	NA	ND	1	5	ng/dry g	
PCB037	NA	ND	1	5	ng/dry g	
PCB044	NA	ND	1	5	ng/dry g	
PCB049	NA	ND	1	5	ng/dry g	
PCB052	NA	ND	1	5	ng/dry g	
PCB056(060)	NA	ND	1	5	ng/dry g	
PCB066	NA	ND	1	5	ng/dry g	
PCB070	NA	ND	1	5	ng/dry g	
PCB074	NA	ND	1	5	ng/dry g	
PCB077	NA	ND	1	5	ng/dry g	

PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB081	NA	ND	1	5	ng/dry g	
PCB087	NA	ND	1	5	ng/dry g	
PCB095	NA	ND	1	5	ng/dry g	
PCB097	NA	ND	1	5	ng/dry g	
PCB099	NA	ND	1	5	ng/dry g	
PCB101	NA	ND	1	5	ng/dry g	
PCB105	NA	ND	1	5	ng/dry g	
PCB110	NA	ND	1	5	ng/dry g	
PCB114	NA	ND	1	5	ng/dry g	
PCB118	NA	ND	1	5	ng/dry g	
PCB119	NA	ND	1	5	ng/dry g	
PCB123	NA	ND	1	5	ng/dry g	
PCB126	NA	ND	1	5	ng/dry g	
PCB128	NA	ND	1	5	ng/dry g	
PCB138	NA	ND	1	5	ng/dry g	
PCB141	NA	ND	1	5	ng/dry g	
PCB149	NA	ND	1	5	ng/dry g	
PCB151	NA	ND	1	5	ng/dry g	
PCB153	NA	ND	1	5	ng/dry g	
PCB156	NA	ND	1	5	ng/dry g	
PCB157	NA	ND	1	5	ng/dry g	
PCB158	NA	ND	1	5	ng/dry g	
PCB167	NA	ND	1	5	ng/dry g	
PCB168+132	NA	ND	1	5	ng/dry g	
PCB169	NA	ND	1	5	ng/dry g	
PCB170	NA	ND	1	5	ng/dry g	
PCB174	NA	ND	1	5	ng/dry g	
PCB177	NA	ND	1	5	ng/dry g	
PCB180	NA	ND	1	5	ng/dry g	
PCB183	NA	ND	1	5	ng/dry g	
PCB187	NA	ND	1	5	ng/dry g	
PCB189	NA	ND	1	5	ng/dry g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB194	NA	ND	1	5	ng/dry g	
PCB195	NA	ND	1	5	ng/dry g	
PCB199(200)	NA	ND	1	5	ng/dry g	
PCB201	NA	ND	1	5	ng/dry g	
PCB206	NA	ND	1	5	ng/dry g	
PCB209	NA	ND	1	5	ng/dry g	

Sample ID: 29138-R1 **Below Dam Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 01-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/dry g	
PCB008	NA	ND	1	5	ng/dry g	
PCB018	NA	ND	1	5	ng/dry g	
PCB028	NA	ND	1	5	ng/dry g	
PCB031	NA	ND	1	5	ng/dry g	
PCB033	NA	ND	1	5	ng/dry g	
PCB037	NA	ND	1	5	ng/dry g	
PCB044	NA	ND	1	5	ng/dry g	
PCB049	NA	ND	1	5	ng/dry g	
PCB052	NA	ND	1	5	ng/dry g	
PCB056(060)	NA	ND	1	5	ng/dry g	
PCB066	NA	ND	1	5	ng/dry g	
PCB070	NA	ND	1	5	ng/dry g	
PCB074	NA	ND	1	5	ng/dry g	
PCB077	NA	ND	1	5	ng/dry g	
PCB081	NA	ND	1	5	ng/dry g	
PCB087	NA	ND	1	5	ng/dry g	
PCB095	NA	ND	1	5	ng/dry g	
PCB097	NA	ND	1	5	ng/dry g	
PCB099	NA	ND	1	5	ng/dry g	
PCB101	NA	ND	1	5	ng/dry g	
PCB105	NA	ND	1	5	ng/dry g	
PCB110	NA	ND	1	5	ng/dry g	
PCB114	NA	ND	1	5	ng/dry g	

PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB118	NA	ND	1	5	ng/dry g	
PCB119	NA	ND	1	5	ng/dry g	
PCB123	NA	ND	1	5	ng/dry g	
PCB126	NA	ND	1	5	ng/dry g	
PCB128	NA	ND	1	5	ng/dry g	
PCB138	NA	ND	1	5	ng/dry g	
PCB141	NA	ND	1	5	ng/dry g	
PCB149	NA	ND	1	5	ng/dry g	
PCB151	NA	ND	1	5	ng/dry g	
PCB153	NA	ND	1	5	ng/dry g	
PCB156	NA	ND	1	5	ng/dry g	
PCB157	NA	ND	1	5	ng/dry g	
PCB158	NA	ND	1	5	ng/dry g	
PCB167	NA	ND	1	5	ng/dry g	
PCB168+132	NA	ND	1	5	ng/dry g	
PCB169	NA	ND	1	5	ng/dry g	
PCB170	NA	ND	1	5	ng/dry g	
PCB174	NA	ND	1	5	ng/dry g	
PCB177	NA	ND	1	5	ng/dry g	
PCB180	NA	ND	1	5	ng/dry g	
PCB183	NA	ND	1	5	ng/dry g	
PCB187	NA	ND	1	5	ng/dry g	
PCB189	NA	ND	1	5	ng/dry g	
PCB194	NA	ND	1	5	ng/dry g	
PCB195	NA	ND	1	5	ng/dry g	
PCB199(200)	NA	ND	1	5	ng/dry g	
PCB201	NA	ND	1	5	ng/dry g	
PCB206	NA	ND	1	5	ng/dry g	
PCB209	NA	ND	1	5	ng/dry g	

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Chlorinated Pesticides ANALYTICAL REPORT

Sample ID: 29121-R1 **Bass 1 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 07-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	112			% Recovery	
(PCB112)	NA	120			% Recovery	
(PCB198)	NA	94			% Recovery	
(TCMX)	NA	127			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/wet g	
2,4'-DDE	NA	ND	1	5	ng/wet g	
2,4'-DDT	NA	42.5	1	5	ng/wet g	
4,4'-DDD	NA	10.4	1	5	ng/wet g	
4,4'-DDE	NA	14.4	1	5	ng/wet g	
4,4'-DDT	NA	14	1	5	ng/wet g	
Aldrin	NA	ND	1	5	ng/wet g	
BHC-alpha	NA	ND	1	5	ng/wet g	
BHC-beta	NA	ND	1	5	ng/wet g	
BHC-delta	NA	ND	1	5	ng/wet g	
BHC-gamma	NA	ND	1	5	ng/wet g	
Chlordane-alpha	NA	1.9	1	5	ng/wet g	J
Chlordane-gamma	NA	1.2	1	5	ng/wet g	J
cis-Nonachlor	NA	1.1	1	5	ng/wet g	J
Dieldrin	NA	ND	1	5	ng/wet g	
Endosulfan sulfate	NA	ND	1	5	ng/wet g	
Endosulfan-I	NA	ND	1	5	ng/wet g	
Endosulfan-II	NA	ND	1	5	ng/wet g	
Endrin	NA	ND	1	5	ng/wet g	
Endrin aldehyde	NA	ND	1	5	ng/wet g	
Endrin ketone	NA	ND	1	5	ng/wet g	
Heptachlor	NA	ND	1	5	ng/wet g	
Heptachlor epoxide	NA	ND	1	5	ng/wet g	
Hexachlorobenzene	NA	ND	1	5	ng/wet g	
Methoxychlor	NA	ND	1	5	ng/wet g	
Mirex	NA	ND	1	5	ng/wet g	

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Chlorinated Pesticides ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Oxychlordane	NA	ND	1	5	ng/wet g	
Perthane	NA	ND	5	10	ng/wet g	
trans-Nonachlor	NA	4.4	1	5	ng/wet g	J

Sample ID: 29122-R1 **Bass 2 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 07-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	110			% Recovery	
(PCB112)	NA	112			% Recovery	
(PCB198)	NA	127			% Recovery	
(TCMX)	NA	127			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/wet g	
2,4'-DDE	NA	ND	1	5	ng/wet g	
2,4'-DDT	NA	40.2	1	5	ng/wet g	
4,4'-DDD	NA	11.8	1	5	ng/wet g	
4,4'-DDE	NA	13.5	1	5	ng/wet g	
4,4'-DDT	NA	15.4	1	5	ng/wet g	
Aldrin	NA	ND	1	5	ng/wet g	
BHC-alpha	NA	ND	1	5	ng/wet g	
BHC-beta	NA	ND	1	5	ng/wet g	
BHC-delta	NA	ND	1	5	ng/wet g	
BHC-gamma	NA	ND	1	5	ng/wet g	
Chlordane-alpha	NA	4.2	1	5	ng/wet g	J
Chlordane-gamma	NA	1.5	1	5	ng/wet g	J
cis-Nonachlor	NA	1.4	1	5	ng/wet g	J
Dieldrin	NA	ND	1	5	ng/wet g	
Endosulfan sulfate	NA	ND	1	5	ng/wet g	
Endosulfan-I	NA	ND	1	5	ng/wet g	
Endosulfan-II	NA	ND	1	5	ng/wet g	
Endrin	NA	ND	1	5	ng/wet g	
Endrin aldehyde	NA	ND	1	5	ng/wet g	
Endrin ketone	NA	ND	1	5	ng/wet g	
Heptachlor	NA	ND	1	5	ng/wet g	
Heptachlor epoxide	NA	ND	1	5	ng/wet g	

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Chlorinated Pesticides ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Hexachlorobenzene	NA	ND	1	5	ng/wet g	
Methoxychlor	NA	ND	1	5	ng/wet g	
Mirex	NA	ND	1	5	ng/wet g	
Oxychlordane	NA	ND	1	5	ng/wet g	
Perthane	NA	ND	5	10	ng/wet g	
trans-Nonachlor	NA	4.1	1	5	ng/wet g	J

Sample ID: 29123-R1 **goldfish whole fish** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 07-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	55			% Recovery	
(PCB112)	NA	88			% Recovery	
(PCB198)	NA	126			% Recovery	
(TCMX)	NA	54			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/wet g	
2,4'-DDE	NA	ND	1	5	ng/wet g	
2,4'-DDT	NA	146.2	1	5	ng/wet g	
4,4'-DDD	NA	33.4	1	5	ng/wet g	
4,4'-DDE	NA	54.7	1	5	ng/wet g	
4,4'-DDT	NA	230.9	1	5	ng/wet g	
Aldrin	NA	ND	1	5	ng/wet g	
BHC-alpha	NA	ND	1	5	ng/wet g	
BHC-beta	NA	ND	1	5	ng/wet g	
BHC-delta	NA	ND	1	5	ng/wet g	
BHC-gamma	NA	ND	1	5	ng/wet g	
Chlordane-alpha	NA	11.4	1	5	ng/wet g	
Chlordane-gamma	NA	6.2	1	5	ng/wet g	
cis-Nonachlor	NA	4.4	1	5	ng/wet g	J
Dieldrin	NA	ND	1	5	ng/wet g	
Endosulfan sulfate	NA	ND	1	5	ng/wet g	
Endosulfan-I	NA	ND	1	5	ng/wet g	
Endosulfan-II	NA	ND	1	5	ng/wet g	
Endrin	NA	ND	1	5	ng/wet g	
Endrin aldehyde	NA	ND	1	5	ng/wet g	

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ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Endrin ketone	NA	ND	1	5	ng/wet g	
Heptachlor	NA	ND	1	5	ng/wet g	
Heptachlor epoxide	NA	ND	1	5	ng/wet g	
Hexachlorobenzene	NA	2.5	1	5	ng/wet g	J
Methoxychlor	NA	ND	1	5	ng/wet g	
Mirex	NA	ND	1	5	ng/wet g	
Oxychlordane	NA	ND	1	5	ng/wet g	
Perthane	NA	ND	5	10	ng/wet g	
trans-Nonachlor	NA	17	1	5	ng/wet g	

Sample ID: 29124-R1 **white catfish whole fish whole fish** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 07-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
(PCB030)	NA	109			% Recovery	
(PCB112)	NA	115			% Recovery	
(PCB198)	NA	95			% Recovery	
(TCMX)	NA	126			% Recovery	
2,4'-DDD	NA	ND	1	5	ng/wet g	
2,4'-DDE	NA	ND	1	5	ng/wet g	
2,4'-DDT	NA	27.2	1	5	ng/wet g	
4,4'-DDD	NA	10.1	1	5	ng/wet g	
4,4'-DDE	NA	18.5	1	5	ng/wet g	
4,4'-DDT	NA	16.8	1	5	ng/wet g	
Aldrin	NA	ND	1	5	ng/wet g	
BHC-alpha	NA	ND	1	5	ng/wet g	
BHC-beta	NA	ND	1	5	ng/wet g	
BHC-delta	NA	ND	1	5	ng/wet g	
BHC-gamma	NA	ND	1	5	ng/wet g	
Chlordane-alpha	NA	3.1	1	5	ng/wet g	J
Chlordane-gamma	NA	2.2	1	5	ng/wet g	J
cis-Nonachlor	NA	2.2	1	5	ng/wet g	J
Dieldrin	NA	ND	1	5	ng/wet g	
Endosulfan sulfate	NA	ND	1	5	ng/wet g	
Endosulfan-I	NA	ND	1	5	ng/wet g	

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Chlorinated Pesticides

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Endosulfan-II	NA	ND	1	5	ng/wet g	
Endrin	NA	ND	1	5	ng/wet g	
Endrin aldehyde	NA	ND	1	5	ng/wet g	
Endrin ketone	NA	ND	1	5	ng/wet g	
Heptachlor	NA	ND	1	5	ng/wet g	
Heptachlor epoxide	NA	ND	1	5	ng/wet g	
Hexachlorobenzene	NA	ND	1	5	ng/wet g	
Methoxychlor	NA	ND	1	5	ng/wet g	
Mirex	NA	ND	1	5	ng/wet g	
Oxychlordane	NA	ND	1	5	ng/wet g	
Perthane	NA	ND	5	10	ng/wet g	
trans-Nonachlor	NA	4.1	1	5	ng/wet g	J

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Conventionals ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 29121-R1	**Bass 1 whole bass**	**Matrix: Tissue**		**Sampled: 04-Aug-14 15:30**		**Received: 15-Aug-14**
	Method: SM 2540 B	Batch ID: C-22032		Prepared: 29-Sep-14		Analyzed: 29-Sep-14
Percent Solids	NA	30.8	0.1	0.1	% Dry Weight	
	Method: Gravimetric	Batch ID: C-22033		Prepared: 30-Sep-14		Analyzed: 30-Sep-14
Percent Lipids	NA	10	0.01	0.05	% Wet Weight	
Sample ID: 29122-R1	**Bass 2 whole bass**	**Matrix: Tissue**		**Sampled: 04-Aug-14 15:30**		**Received: 15-Aug-14**
	Method: SM 2540 B	Batch ID: C-22032		Prepared: 29-Sep-14		Analyzed: 29-Sep-14
Percent Solids	NA	32	0.1	0.1	% Dry Weight	
	Method: Gravimetric	Batch ID: C-22033		Prepared: 30-Sep-14		Analyzed: 30-Sep-14
Percent Lipids	NA	13.7	0.01	0.05	% Wet Weight	
Sample ID: 29123-R1	**goldfish whole fish**	**Matrix: Tissue**		**Sampled: 04-Aug-14 15:30**		**Received: 15-Aug-14**
	Method: SM 2540 B	Batch ID: C-22032		Prepared: 29-Sep-14		Analyzed: 29-Sep-14
Percent Solids	NA	44.3	0.1	0.1	% Dry Weight	
	Method: Gravimetric	Batch ID: C-22033		Prepared: 30-Sep-14		Analyzed: 30-Sep-14
Percent Lipids	NA	27.5	0.01	0.05	% Wet Weight	
Sample ID: 29124-R1	**white catfish whole fish whole fish**	**Matrix: Tissue**		**Sampled: 04-Aug-14 15:30**		**Received: 15-Aug-14**
	Method: SM 2540 B	Batch ID: C-22032		Prepared: 29-Sep-14		Analyzed: 29-Sep-14
Percent Solids	NA	23.1	0.1	0.1	% Dry Weight	
	Method: Gravimetric	Batch ID: C-22033		Prepared: 30-Sep-14		Analyzed: 30-Sep-14
Percent Lipids	NA	4.99	0.01	0.05	% Wet Weight	

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Elements — ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 29121-R1	**Bass 1 whole bass** Method: EPA 245.7	**Matrix: Tissue** Batch ID: E-6088		**Sampled: 04-Aug-14 15:30** Prepared: 07-Oct-14		**Received: 15-Aug-14** Analyzed: 08-Oct-14
Mercury (Hg)	NA	0.5348	0.00001	0.00002	µg/wet g	
Sample ID: 29122-R1	**Bass 2 whole bass** Method: EPA 245.7	**Matrix: Tissue** Batch ID: E-6088		**Sampled: 04-Aug-14 15:30** Prepared: 07-Oct-14		**Received: 15-Aug-14** Analyzed: 08-Oct-14
Mercury (Hg)	NA	0.6601	0.00001	0.00002	µg/wet g	
Sample ID: 29123-R1	**goldfish whole fish** Method: EPA 245.7	**Matrix: Tissue** Batch ID: E-6088		**Sampled: 04-Aug-14 15:30** Prepared: 07-Oct-14		**Received: 15-Aug-14** Analyzed: 08-Oct-14
Mercury (Hg)	NA	0.3644	0.00001	0.00002	µg/wet g	
Sample ID: 29124-R1	**white catfish whole fish whole fish** Method: EPA 245.7	**Matrix: Tissue** Batch ID: E-6088		**Sampled: 04-Aug-14 15:30** Prepared: 07-Oct-14		**Received: 15-Aug-14** Analyzed: 08-Oct-14
Mercury (Hg)	NA	0.4033	0.00001	0.00002	µg/wet g	

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PCB Congeners ANALYTICAL REPORT

Sample ID: 29121-R1 **Bass 1 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 07-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/wet g	
PCB008	NA	ND	1	5	ng/wet g	
PCB018	NA	ND	1	5	ng/wet g	
PCB028	NA	1.1	1	5	ng/wet g	J
PCB031	NA	ND	1	5	ng/wet g	
PCB033	NA	ND	1	5	ng/wet g	
PCB037	NA	ND	1	5	ng/wet g	
PCB044	NA	ND	1	5	ng/wet g	
PCB049	NA	ND	1	5	ng/wet g	
PCB052	NA	ND	1	5	ng/wet g	
PCB056(060)	NA	ND	1	5	ng/wet g	
PCB066	NA	ND	1	5	ng/wet g	
PCB070	NA	4.5	1	5	ng/wet g	J
PCB074	NA	1.2	1	5	ng/wet g	J
PCB077	NA	ND	1	5	ng/wet g	
PCB081	NA	ND	1	5	ng/wet g	
PCB087	NA	ND	1	5	ng/wet g	
PCB095	NA	1.3	1	5	ng/wet g	J
PCB097	NA	ND	1	5	ng/wet g	
PCB099	NA	ND	1	5	ng/wet g	
PCB101	NA	1.8	1	5	ng/wet g	J
PCB105	NA	ND	1	5	ng/wet g	
PCB110	NA	1.3	1	5	ng/wet g	J
PCB114	NA	1.5	1	5	ng/wet g	J
PCB118	NA	1	1	5	ng/wet g	J
PCB119	NA	ND	1	5	ng/wet g	
PCB123	NA	ND	1	5	ng/wet g	
PCB126	NA	ND	1	5	ng/wet g	
PCB128	NA	ND	1	5	ng/wet g	
PCB138	NA	5.1	1	5	ng/wet g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB141	NA	ND	1	5	ng/wet g	
PCB149	NA	1.3	1	5	ng/wet g	J
PCB151	NA	ND	1	5	ng/wet g	
PCB153	NA	4.6	1	5	ng/wet g	J
PCB156	NA	ND	1	5	ng/wet g	
PCB157	NA	ND	1	5	ng/wet g	
PCB158	NA	ND	1	5	ng/wet g	
PCB167	NA	ND	1	5	ng/wet g	
PCB168+132	NA	ND	1	5	ng/wet g	
PCB169	NA	ND	1	5	ng/wet g	
PCB170	NA	2.8	1	5	ng/wet g	J
PCB174	NA	ND	1	5	ng/wet g	
PCB177	NA	ND	1	5	ng/wet g	
PCB180	NA	2.9	1	5	ng/wet g	J
PCB183	NA	ND	1	5	ng/wet g	
PCB187	NA	2	1	5	ng/wet g	J
PCB189	NA	ND	1	5	ng/wet g	
PCB194	NA	ND	1	5	ng/wet g	
PCB195	NA	ND	1	5	ng/wet g	
PCB199(200)	NA	ND	1	5	ng/wet g	
PCB201	NA	ND	1	5	ng/wet g	
PCB206	NA	ND	1	5	ng/wet g	
PCB209	NA	ND	1	5	ng/wet g	

Sample ID: 29122-R1 **Bass 2 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 07-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/wet g	
PCB008	NA	ND	1	5	ng/wet g	
PCB018	NA	ND	1	5	ng/wet g	
PCB028	NA	ND	1	5	ng/wet g	
PCB031	NA	ND	1	5	ng/wet g	
PCB033	NA	ND	1	5	ng/wet g	
PCB037	NA	ND	1	5	ng/wet g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB044	NA	ND	1	5	ng/wet g	
PCB049	NA	ND	1	5	ng/wet g	
PCB052	NA	1.7	1	5	ng/wet g	J
PCB056(060)	NA	ND	1	5	ng/wet g	
PCB066	NA	ND	1	5	ng/wet g	
PCB070	NA	ND	1	5	ng/wet g	
PCB074	NA	ND	1	5	ng/wet g	
PCB077	NA	ND	1	5	ng/wet g	
PCB081	NA	ND	1	5	ng/wet g	
PCB087	NA	ND	1	5	ng/wet g	
PCB095	NA	1	1	5	ng/wet g	J
PCB097	NA	ND	1	5	ng/wet g	
PCB099	NA	ND	1	5	ng/wet g	
PCB101	NA	1.4	1	5	ng/wet g	J
PCB105	NA	ND	1	5	ng/wet g	
PCB110	NA	1.1	1	5	ng/wet g	J
PCB114	NA	1.3	1	5	ng/wet g	J
PCB118	NA	ND	1	5	ng/wet g	
PCB119	NA	ND	1	5	ng/wet g	
PCB123	NA	ND	1	5	ng/wet g	
PCB126	NA	ND	1	5	ng/wet g	
PCB128	NA	ND	1	5	ng/wet g	
PCB138	NA	4.2	1	5	ng/wet g	J
PCB141	NA	ND	1	5	ng/wet g	
PCB149	NA	ND	1	5	ng/wet g	
PCB151	NA	ND	1	5	ng/wet g	
PCB153	NA	4.8	1	5	ng/wet g	J
PCB156	NA	ND	1	5	ng/wet g	
PCB157	NA	ND	1	5	ng/wet g	
PCB158	NA	ND	1	5	ng/wet g	
PCB167	NA	ND	1	5	ng/wet g	
PCB168+132	NA	ND	1	5	ng/wet g	

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ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB169	NA	ND	1	5	ng/wet g	
PCB170	NA	ND	1	5	ng/wet g	
PCB174	NA	ND	1	5	ng/wet g	
PCB177	NA	1.5	1	5	ng/wet g	J
PCB180	NA	4.5	1	5	ng/wet g	J
PCB183	NA	1.8	1	5	ng/wet g	J
PCB187	NA	1.9	1	5	ng/wet g	J
PCB189	NA	ND	1	5	ng/wet g	
PCB194	NA	ND	1	5	ng/wet g	
PCB195	NA	ND	1	5	ng/wet g	
PCB199(200)	NA	ND	1	5	ng/wet g	
PCB201	NA	ND	1	5	ng/wet g	
PCB206	NA	ND	1	5	ng/wet g	
PCB209	NA	ND	1	5	ng/wet g	

Sample ID: 29123-R1 **goldfish whole fish** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**

Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 07-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/wet g	
PCB008	NA	ND	1	5	ng/wet g	
PCB018	NA	ND	1	5	ng/wet g	
PCB028	NA	3.7	1	5	ng/wet g	J
PCB031	NA	ND	1	5	ng/wet g	
PCB033	NA	ND	1	5	ng/wet g	
PCB037	NA	ND	1	5	ng/wet g	
PCB044	NA	ND	1	5	ng/wet g	
PCB049	NA	ND	1	5	ng/wet g	
PCB052	NA	1.6	1	5	ng/wet g	J
PCB056(060)	NA	ND	1	5	ng/wet g	
PCB066	NA	ND	1	5	ng/wet g	
PCB070	NA	ND	1	5	ng/wet g	
PCB074	NA	ND	1	5	ng/wet g	
PCB077	NA	ND	1	5	ng/wet g	
PCB081	NA	ND	1	5	ng/wet g	

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ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB087	NA	ND	1	5	ng/wet g	
PCB095	NA	2.8	1	5	ng/wet g	J
PCB097	NA	ND	1	5	ng/wet g	
PCB099	NA	ND	1	5	ng/wet g	
PCB101	NA	2.2	1	5	ng/wet g	J
PCB105	NA	ND	1	5	ng/wet g	
PCB110	NA	2	1	5	ng/wet g	J
PCB114	NA	ND	1	5	ng/wet g	
PCB118	NA	12.4	1	5	ng/wet g	
PCB119	NA	ND	1	5	ng/wet g	
PCB123	NA	ND	1	5	ng/wet g	
PCB126	NA	ND	1	5	ng/wet g	
PCB128	NA	ND	1	5	ng/wet g	
PCB138	NA	32.9	1	5	ng/wet g	
PCB141	NA	4.4	1	5	ng/wet g	J
PCB149	NA	3.7	1	5	ng/wet g	J
PCB151	NA	ND	1	5	ng/wet g	
PCB153	NA	34.1	1	5	ng/wet g	
PCB156	NA	ND	1	5	ng/wet g	
PCB157	NA	ND	1	5	ng/wet g	
PCB158	NA	7.3	1	5	ng/wet g	
PCB167	NA	ND	1	5	ng/wet g	
PCB168+132	NA	5.6	1	5	ng/wet g	
PCB169	NA	ND	1	5	ng/wet g	
PCB170	NA	ND	1	5	ng/wet g	
PCB174	NA	ND	1	5	ng/wet g	
PCB177	NA	9.9	1	5	ng/wet g	
PCB180	NA	14.8	1	5	ng/wet g	
PCB183	NA	11.5	1	5	ng/wet g	
PCB187	NA	18.1	1	5	ng/wet g	
PCB189	NA	ND	1	5	ng/wet g	
PCB194	NA	ND	1	5	ng/wet g	

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB195	NA	ND	1	5	ng/wet g	
PCB199(200)	NA	ND	1	5	ng/wet g	
PCB201	NA	ND	1	5	ng/wet g	
PCB206	NA	ND	1	5	ng/wet g	
PCB209	NA	ND	1	5	ng/wet g	

Sample ID: 29124-R1 **white catfish whole fish whole fish** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 07-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB003	NA	ND	1	5	ng/wet g	
PCB008	NA	ND	1	5	ng/wet g	
PCB018	NA	ND	1	5	ng/wet g	
PCB028	NA	1.8	1	5	ng/wet g	J
PCB031	NA	ND	1	5	ng/wet g	
PCB033	NA	ND	1	5	ng/wet g	
PCB037	NA	ND	1	5	ng/wet g	
PCB044	NA	ND	1	5	ng/wet g	
PCB049	NA	ND	1	5	ng/wet g	
PCB052	NA	ND	1	5	ng/wet g	
PCB056(060)	NA	ND	1	5	ng/wet g	
PCB066	NA	ND	1	5	ng/wet g	
PCB070	NA	ND	1	5	ng/wet g	
PCB074	NA	ND	1	5	ng/wet g	
PCB077	NA	ND	1	5	ng/wet g	
PCB081	NA	ND	1	5	ng/wet g	
PCB087	NA	ND	1	5	ng/wet g	
PCB095	NA	ND	1	5	ng/wet g	
PCB097	NA	ND	1	5	ng/wet g	
PCB099	NA	ND	1	5	ng/wet g	
PCB101	NA	1.4	1	5	ng/wet g	J
PCB105	NA	ND	1	5	ng/wet g	
PCB110	NA	ND	1	5	ng/wet g	
PCB114	NA	2.6	1	5	ng/wet g	J
PCB118	NA	1.3	1	5	ng/wet g	J

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PCB Congeners ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
PCB119	NA	ND	1	5	ng/wet g	
PCB123	NA	ND	1	5	ng/wet g	
PCB126	NA	ND	1	5	ng/wet g	
PCB128	NA	ND	1	5	ng/wet g	
PCB138	NA	4.8	1	5	ng/wet g	J
PCB141	NA	1.1	1	5	ng/wet g	J
PCB149	NA	1.1	1	5	ng/wet g	J
PCB151	NA	ND	1	5	ng/wet g	
PCB153	NA	4.6	1	5	ng/wet g	J
PCB156	NA	ND	1	5	ng/wet g	
PCB157	NA	ND	1	5	ng/wet g	
PCB158	NA	1.3	1	5	ng/wet g	J
PCB167	NA	ND	1	5	ng/wet g	
PCB168+132	NA	ND	1	5	ng/wet g	
PCB169	NA	ND	1	5	ng/wet g	
PCB170	NA	ND	1	5	ng/wet g	
PCB174	NA	1.5	1	5	ng/wet g	J
PCB177	NA	2.2	1	5	ng/wet g	J
PCB180	NA	4.3	1	5	ng/wet g	J
PCB183	NA	1	1	5	ng/wet g	J
PCB187	NA	2.7	1	5	ng/wet g	J
PCB189	NA	ND	1	5	ng/wet g	
PCB194	NA	ND	1	5	ng/wet g	
PCB195	NA	ND	1	5	ng/wet g	
PCB199(200)	NA	ND	1	5	ng/wet g	
PCB201	NA	ND	1	5	ng/wet g	
PCB206	NA	ND	1	5	ng/wet g	
PCB209	NA	ND	1	5	ng/wet g	

QUALITY CONTROL REPORT

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Conventionals

QUALITY CONTROL REPORT

SAMPLE ID		BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS	QA CODE
Percent Lipids		**Method: Gravimetric**				**Fraction: NA**		**Prepared: 30-Sep-14**			**Analyzed: 30-Sep-14**		
29118-B1	QAQC Procedural Blank	C-22033	ND	0.01	0.05	% Wet Weight							
29121-R2	Bass 1	C-22033	12.4	0.01	0.05	% Wet Weight					21	30	PASS
Percent Solids		**Method: SM 2540 B**				**Fraction: NA**		**Prepared: 16-Sep-14**			**Analyzed: 16-Sep-14**		
29125-B1	QAQC Procedural Blank	C-22028	ND	0.1	0.1	% Dry Weight							
29128-R2	L.R. Rocky Pt.	C-22028	99.8	0.1	0.1	% Dry Weight					0	30	PASS
29118-B1	QAQC Procedural Blank	C-22032	ND	0.1	0.1	% Dry Weight							
29124-R2	white catfish whole fish	C-22032	23	0.1	0.1	% Dry Weight					0	30	PASS

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Chlorinated Pesticides — QUALITY CONTROL REPORT

Sample ID: 29118-B1 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 06-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS	QA CODE
(PCB030)	NA	76			% Recovery	100		76	50 - 150% PASS			
(PCB112)	NA	74			% Recovery	100		74	50 - 150% PASS			
(PCB198)	NA	115			% Recovery	100		115	30 - 130% PASS			
(TCMX)	NA	73			% Recovery	100		73	50 - 150% PASS			
2,4'-DDD	NA	ND	1	5	ng/wet g							
2,4'-DDE	NA	ND	1	5	ng/wet g							
2,4'-DDT	NA	ND	1	5	ng/wet g							
4,4'-DDD	NA	ND	1	5	ng/wet g							
4,4'-DDE	NA	ND	1	5	ng/wet g							
4,4'-DDT	NA	ND	1	5	ng/wet g							
Aldrin	NA	ND	1	5	ng/wet g							
BHC-alpha	NA	ND	1	5	ng/wet g							
BHC-beta	NA	ND	1	5	ng/wet g							
BHC-delta	NA	ND	1	5	ng/wet g							
BHC-gamma	NA	ND	1	5	ng/wet g							
Chlordane-alpha	NA	ND	1	5	ng/wet g							
Chlordane-gamma	NA	ND	1	5	ng/wet g							
cis-Nonachlor	NA	ND	1	5	ng/wet g							
Dieldrin	NA	ND	1	5	ng/wet g							
Endosulfan sulfate	NA	ND	1	5	ng/wet g							
Endosulfan-I	NA	ND	1	5	ng/wet g							
Endosulfan-II	NA	ND	1	5	ng/wet g							
Endrin	NA	ND	1	5	ng/wet g							
Endrin aldehyde	NA	ND	1	5	ng/wet g							
Endrin ketone	NA	ND	1	5	ng/wet g							
Heptachlor	NA	ND	1	5	ng/wet g							
Heptachlor epoxide	NA	ND	1	5	ng/wet g							
Hexachlorobenzene	NA	ND	1	5	ng/wet g							
Methoxychlor	NA	ND	1	5	ng/wet g							

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Chlorinated Pesticides QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS	QA CODE
Mirex	NA	ND	1	5	ng/wet g								
Oxychlordane	NA	ND	1	5	ng/wet g								
Perthane	NA	ND	5	10	ng/wet g								
trans-Nonachlor	NA	ND	1	5	ng/wet g								

Sample ID: 29118-BS1 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 06-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS	QA CODE
(PCB030)	NA	74			% Recovery	100	0	74	50 - 150%	PASS			
(PCB112)	NA	77			% Recovery	100	0	77	50 - 150%	PASS			
(PCB198)	NA	122			% Recovery	100	0	122	30 - 130%	PASS			
(TCMX)	NA	73			% Recovery	100	0	73	50 - 150%	PASS			
2,4'-DDD	NA	357.4	1	5	ng/wet g	500	0	71	50 - 150%	PASS			
2,4'-DDE	NA	372.7	1	5	ng/wet g	500	0	75	50 - 150%	PASS			
2,4'-DDT	NA	375.3	1	5	ng/wet g	500	0	75	50 - 150%	PASS			
4,4'-DDD	NA	449.7	1	5	ng/wet g	500	0	90	50 - 150%	PASS			
4,4'-DDE	NA	389.3	1	5	ng/wet g	500	0	78	50 - 150%	PASS			
4,4'-DDT	NA	395	1	5	ng/wet g	500	0	79	50 - 150%	PASS			
Aldrin	NA	410.6	1	5	ng/wet g	500	0	82	50 - 150%	PASS			
BHC-alpha	NA	370.5	1	5	ng/wet g	500	0	74	50 - 150%	PASS			
BHC-beta	NA	473.2	1	5	ng/wet g	500	0	95	50 - 150%	PASS			
BHC-delta	NA	427.9	1	5	ng/wet g	500	0	86	50 - 150%	PASS			
BHC-gamma	NA	300.1	1	5	ng/wet g	500	0	60	50 - 150%	PASS			
Chlordane-alpha	NA	377.5	1	5	ng/wet g	500	0	75	50 - 150%	PASS			
Chlordane-gamma	NA	346.6	1	5	ng/wet g	500	0	69	50 - 150%	PASS			
cis-Nonachlor	NA	456.9	1	5	ng/wet g	500	0	91	50 - 150%	PASS			
Dieldrin	NA	417.2	1	5	ng/wet g	500	0	83	50 - 150%	PASS			
Endosulfan sulfate	NA	482.2	1	5	ng/wet g	500	0	96	50 - 150%	PASS			
Endosulfan-I	NA	382.9	1	5	ng/wet g	500	0	77	50 - 150%	PASS			
Endosulfan-II	NA	531.9	1	5	ng/wet g	500	0	106	50 - 150%	PASS			
Endrin	NA	452.8	1	5	ng/wet g	500	0	91	25 - 125%	PASS			
Endrin aldehyde	NA	269	1	5	ng/wet g	500	0	54	0 - 125%	PASS			
Endrin ketone	NA	493.5	1	5	ng/wet g	500	0	99	25 - 125%	PASS			

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Chlorinated Pesticides — QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Heptachlor	NA	536.7	1	5	ng/wet g	500	0	107	50 - 150%	PASS				
Heptachlor epoxide	NA	508.2	1	5	ng/wet g	500	0	102	50 - 150%	PASS				
Hexachlorobenzene	NA	383.3	1	5	ng/wet g	500	0	77	50 - 150%	PASS				
Methoxychlor	NA	548.5	1	5	ng/wet g	500	0	110	50 - 150%	PASS				
Mirex	NA	558.1	1	5	ng/wet g	500	0	112	50 - 150%	PASS				
Oxychlordane	NA	432.2	1	5	ng/wet g	500	0	86	50 - 150%	PASS				
Perthane	NA	355.2	5	10	ng/wet g	500	0	71	50 - 150%	PASS				
trans-Nonachlor	NA	353.8	1	5	ng/wet g	500	0	71	50 - 150%	PASS				

Sample ID: 29118-BS2 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 06-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
(PCB030)	NA	74			% Recovery	100	0	74	50 - 150%	PASS	0	30	PASS	
(PCB112)	NA	71			% Recovery	100	0	71	50 - 150%	PASS	8	30	PASS	
(PCB198)	NA	121			% Recovery	100	0	121	30 - 130%	PASS	1	30	PASS	
(TCMX)	NA	74			% Recovery	100	0	74	50 - 150%	PASS	1	30	PASS	
2,4'-DDD	NA	330.2	1	5	ng/wet g	500	0	66	50 - 150%	PASS	7	30	PASS	
2,4'-DDE	NA	337.8	1	5	ng/wet g	500	0	68	50 - 150%	PASS	10	30	PASS	
2,4'-DDT	NA	356.8	1	5	ng/wet g	500	0	71	50 - 150%	PASS	5	30	PASS	
4,4'-DDD	NA	415.2	1	5	ng/wet g	500	0	83	50 - 150%	PASS	8	30	PASS	
4,4'-DDE	NA	365.5	1	5	ng/wet g	500	0	73	50 - 150%	PASS	7	30	PASS	
4,4'-DDT	NA	501.6	1	5	ng/wet g	500	0	100	50 - 150%	PASS	23	30	PASS	
Aldrin	NA	428.5	1	5	ng/wet g	500	0	86	50 - 150%	PASS	5	30	PASS	
BHC-alpha	NA	385.7	1	5	ng/wet g	500	0	77	50 - 150%	PASS	4	30	PASS	
BHC-beta	NA	494.6	1	5	ng/wet g	500	0	99	50 - 150%	PASS	4	30	PASS	
BHC-delta	NA	445.5	1	5	ng/wet g	500	0	89	50 - 150%	PASS	3	30	PASS	
BHC-gamma	NA	331.8	1	5	ng/wet g	500	0	66	50 - 150%	PASS	10	30	PASS	
Chlordane-alpha	NA	345.7	1	5	ng/wet g	500	0	69	50 - 150%	PASS	10	30	PASS	
Chlordane-gamma	NA	317.4	1	5	ng/wet g	500	0	63	50 - 150%	PASS	9	30	PASS	
cis-Nonachlor	NA	461.3	1	5	ng/wet g	500	0	92	50 - 150%	PASS	1	30	PASS	
Dieldrin	NA	378.4	1	5	ng/wet g	500	0	76	50 - 150%	PASS	9	30	PASS	
Endosulfan sulfate	NA	483.5	1	5	ng/wet g	500	0	97	50 - 150%	PASS	1	30	PASS	
Endosulfan-I	NA	416.7	1	5	ng/wet g	500	0	83	50 - 150%	PASS	8	30	PASS	

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Chlorinated Pesticides — QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Endosulfan-II	NA	548.9	1	5	ng/wet g	500	0	110	50 - 150%	PASS	4	30	PASS	
Endrin	NA	451	1	5	ng/wet g	500	0	90	25 - 125%	PASS	1	30	PASS	
Endrin aldehyde	NA	344.6	1	5	ng/wet g	500	0	69	0 - 125%	PASS	24	30	PASS	
Endrin ketone	NA	548.4	1	5	ng/wet g	500	0	110	25 - 125%	PASS	11	30	PASS	
Heptachlor	NA	592.1	1	5	ng/wet g	500	0	118	50 - 150%	PASS	10	30	PASS	
Heptachlor epoxide	NA	488.8	1	5	ng/wet g	500	0	98	50 - 150%	PASS	4	30	PASS	
Hexachlorobenzene	NA	403.2	1	5	ng/wet g	500	0	81	50 - 150%	PASS	5	30	PASS	
Methoxychlor	NA	683.1	1	5	ng/wet g	500	0	137	50 - 150%	PASS	22	30	PASS	
Mirex	NA	616	1	5	ng/wet g	500	0	123	50 - 150%	PASS	9	30	PASS	
Oxychlordane	NA	456.2	1	5	ng/wet g	500	0	91	50 - 150%	PASS	6	30	PASS	
Perthane	NA	335.9	5	10	ng/wet g	500	0	67	50 - 150%	PASS	6	30	PASS	
trans-Nonachlor	NA	332.5	1	5	ng/wet g	500	0	67	50 - 150%	PASS	7	30	PASS	

Sample ID: 29121-MS1 **Bass 1 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 06-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
(PCB030)	NA	112			% Recovery	100	0	112	50 - 150%	PASS				
(PCB112)	NA	126			% Recovery	100	0	126	50 - 150%	PASS				
(PCB198)	NA	130			% Recovery	100	0	130	30 - 130%	PASS				
(TCMX)	NA	117			% Recovery	100	0	117	50 - 150%	PASS				
2,4'-DDD	NA	116.7	1	5	ng/wet g	96.6	0	121	50 - 150%	PASS				
2,4'-DDE	NA	108.5	1	5	ng/wet g	96.6	0	112	50 - 150%	PASS				
2,4'-DDT	NA	169.2	1	5	ng/wet g	96.6	35	139	50 - 150%	PASS				
4,4'-DDD	NA	122.6	1	5	ng/wet g	96.6	8.8	118	50 - 150%	PASS				
4,4'-DDE	NA	135.2	1	5	ng/wet g	96.6	15.4	124	50 - 150%	PASS				
4,4'-DDT	NA	178.5	1	5	ng/wet g	96.6	11.2	173	50 - 150%	FAIL				M
Aldrin	NA	100	1	5	ng/wet g	96.6	0	104	50 - 150%	PASS				
BHC-alpha	NA	115.3	1	5	ng/wet g	96.6	0	119	50 - 150%	PASS				
BHC-beta	NA	121.4	1	5	ng/wet g	96.6	0	126	50 - 150%	PASS				
BHC-delta	NA	97.7	1	5	ng/wet g	96.6	0	101	50 - 150%	PASS				
BHC-gamma	NA	101.2	1	5	ng/wet g	96.6	0	105	50 - 150%	PASS				
Chlordane-alpha	NA	124.6	1	5	ng/wet g	96.6	1.9	127	50 - 150%	PASS				
Chlordane-gamma	NA	125.8	1	5	ng/wet g	96.6	0.6	130	50 - 150%	PASS				

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Chlorinated Pesticides — QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
cis-Nonachlor	NA	137.2	1	5	ng/wet g	96.6	1.1	141	50 - 150%	PASS				
Dieldrin	NA	98	1	5	ng/wet g	96.6	0	101	50 - 150%	PASS				
Endosulfan sulfate	NA	140.4	1	5	ng/wet g	96.6	0	145	50 - 150%	PASS				
Endosulfan-I	NA	127.9	1	5	ng/wet g	96.6	0	132	50 - 150%	PASS				
Endosulfan-II	NA	213.7	1	5	ng/wet g	96.6	0	221	50 - 150%	FAIL				M
Endrin	NA	103.6	1	5	ng/wet g	96.6	0	107	25 - 125%	PASS				
Endrin aldehyde	NA	103.7	1	5	ng/wet g	96.6	0	107	0 - 125%	PASS				
Endrin ketone	NA	132	1	5	ng/wet g	96.6	0	115	25 - 125%	PASS				
Heptachlor	NA	158.4	1	5	ng/wet g	96.6	0	164	50 - 150%	FAIL				M
Heptachlor epoxide	NA	124.9	1	5	ng/wet g	96.6	0	129	50 - 150%	PASS				
Hexachlorobenzene	NA	112	1	5	ng/wet g	96.6	0.5	115	50 - 150%	PASS				
Methoxychlor	NA	236.4	1	5	ng/wet g	96.6	0	245	50 - 150%	FAIL				M
Mirex	NA	160.5	1	5	ng/wet g	96.6	0	166	50 - 150%	FAIL				M
Oxychlordane	NA	120	1	5	ng/wet g	96.6	0	124	50 - 150%	PASS				
Perthane	NA	117.9	5	10	ng/wet g	96.6	0	122	50 - 150%	PASS				
trans-Nonachlor	NA	129.6	1	5	ng/wet g	96.6	5	129	50 - 150%	PASS				

Sample ID: 29121-MS2 **Bass 1 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**

Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 07-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
(PCB030)	NA	113			% Recovery	100	0	113	50 - 150%	PASS	1	30	PASS	
(PCB112)	NA	107			% Recovery	100	0	107	50 - 150%	PASS	16	30	PASS	
(PCB198)	NA	107			% Recovery	100	0	107	30 - 130%	PASS	19	30	PASS	
(TCMX)	NA	131			% Recovery	100	0	131	50 - 150%	PASS	11	30	PASS	
2,4'-DDD	NA	100.9	1	5	ng/wet g	99.6	0	101	50 - 150%	PASS	18	30	PASS	
2,4'-DDE	NA	110.6	1	5	ng/wet g	99.6	0	111	50 - 150%	PASS	1	30	PASS	
2,4'-DDT	NA	80.2	1	5	ng/wet g	99.6	35	45	50 - 150%	FAIL	102	30	FAIL	M
4,4'-DDD	NA	61.3	1	5	ng/wet g	99.6	8.8	53	50 - 150%	PASS	76	30	FAIL	M
4,4'-DDE	NA	109.5	1	5	ng/wet g	99.6	15.4	94	50 - 150%	PASS	28	30	PASS	
4,4'-DDT	NA	120	1	5	ng/wet g	99.6	11.2	109	50 - 150%	PASS	45	30	FAIL	M
Aldrin	NA	102.9	1	5	ng/wet g	99.6	0	103	50 - 150%	PASS	1	30	PASS	
BHC-alpha	NA	109.5	1	5	ng/wet g	99.6	0	110	50 - 150%	PASS	8	30	PASS	
BHC-beta	NA	76.7	1	5	ng/wet g	99.6	0	77	50 - 150%	PASS	48	30	FAIL	M

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Chlorinated Pesticides QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
BHC-delta	NA	79.6	1	5	ng/wet g	99.6	0	80	50 - 150%	PASS	23	30	PASS	
BHC-gamma	NA	74.2	1	5	ng/wet g	99.6	0	74	50 - 150%	PASS	35	30	FAIL	M
Chlordane-alpha	NA	100.8	1	5	ng/wet g	99.6	1.9	99	50 - 150%	PASS	25	30	PASS	
Chlordane-gamma	NA	89.4	1	5	ng/wet g	99.6	0.6	89	50 - 150%	PASS	37	30	FAIL	M
cis-Nonachlor	NA	93.2	1	5	ng/wet g	99.6	1.1	92	50 - 150%	PASS	42	30	FAIL	M
Dieldrin	NA	73.3	1	5	ng/wet g	99.6	0	74	50 - 150%	PASS	31	30	FAIL	M
Endosulfan sulfate	NA	106.4	1	5	ng/wet g	99.6	0	107	50 - 150%	PASS	30	30	PASS	
Endosulfan-I	NA	72.2	1	5	ng/wet g	99.6	0	72	50 - 150%	PASS	59	30	FAIL	M
Endosulfan-II	NA	125.8	1	5	ng/wet g	99.6	0	126	50 - 150%	PASS	55	30	FAIL	M
Endrin	NA	84.1	1	5	ng/wet g	99.6	0	84	25 - 125%	PASS	24	30	PASS	
Endrin aldehyde	NA	78.1	1	5	ng/wet g	99.6	0	78	0 - 125%	PASS	31	30	FAIL	M
Endrin ketone	NA	72.6	1	5	ng/wet g	99.6	0	52	25 - 125%	PASS	75	30	FAIL	M
Heptachlor	NA	84.5	1	5	ng/wet g	99.6	0	85	50 - 150%	PASS	63	30	FAIL	M
Heptachlor epoxide	NA	100.9	1	5	ng/wet g	99.6	0	101	50 - 150%	PASS	24	30	PASS	
Hexachlorobenzene	NA	117.5	1	5	ng/wet g	99.6	0.5	117	50 - 150%	PASS	2	30	PASS	
Methoxychlor	NA	118.1	1	5	ng/wet g	99.6	0	119	50 - 150%	PASS	69	30	FAIL	M
Mirex	NA	108	1	5	ng/wet g	99.6	0	108	50 - 150%	PASS	42	30	FAIL	M
Oxychlordane	NA	75.5	1	5	ng/wet g	99.6	0	76	50 - 150%	PASS	48	30	FAIL	M
Perthane	NA	97.9	5	10	ng/wet g	99.6	0	98	50 - 150%	PASS	22	30	PASS	
trans-Nonachlor	NA	99.5	1	5	ng/wet g	99.6	5	95	50 - 150%	PASS	30	30	PASS	

Sample ID: 29121-R2 **Bass 1 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**

Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 07-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
(PCB030)	NA	91			% Recovery	100		91	50 - 150%	PASS	21	30	PASS	
(PCB112)	NA	95			% Recovery	100		95	50 - 150%	PASS	23	30	PASS	
(PCB198)	NA	98			% Recovery	100		98	30 - 130%	PASS	4	30	PASS	
(TCMX)	NA	103			% Recovery	100		103	50 - 150%	PASS	21	30	PASS	
2,4'-DDD	NA	ND	1	5	ng/wet g						0	30	PASS	
2,4'-DDE	NA	ND	1	5	ng/wet g						0	30	PASS	
2,4'-DDT	NA	27.4	1	5	ng/wet g						43	30	FAIL	NH
4,4'-DDD	NA	7.3	1	5	ng/wet g						35	30	FAIL	SL
4,4'-DDE	NA	16.5	1	5	ng/wet g						14	30	PASS	

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Chlorinated Pesticides QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
4,4'-DDT	NA	8.4	1	5	ng/wet g						50	30	FAIL	SL
Aldrin	NA	ND	1	5	ng/wet g						0	30	PASS	
BHC-alpha	NA	ND	1	5	ng/wet g						0	30	PASS	
BHC-beta	NA	ND	1	5	ng/wet g						0	30	PASS	
BHC-delta	NA	ND	1	5	ng/wet g						0	30	PASS	
BHC-gamma	NA	ND	1	5	ng/wet g						0	30	PASS	
Chlordane-alpha	NA	1.9	1	5	ng/wet g						0	30	PASS	J
Chlordane-gamma	NA	ND	1	5	ng/wet g						18	30	PASS	
cis-Nonachlor	NA	1.2	1	5	ng/wet g						9	30	PASS	J
Dieldrin	NA	ND	1	5	ng/wet g						0	30	PASS	
Endosulfan sulfate	NA	ND	1	5	ng/wet g						0	30	PASS	
Endosulfan-I	NA	ND	1	5	ng/wet g						0	30	PASS	
Endosulfan-II	NA	ND	1	5	ng/wet g						0	30	PASS	
Endrin	NA	ND	1	5	ng/wet g						0	30	PASS	
Endrin aldehyde	NA	ND	1	5	ng/wet g						0	30	PASS	
Endrin ketone	NA	ND	1	5	ng/wet g						0	30	PASS	
Heptachlor	NA	ND	1	5	ng/wet g						0	30	PASS	
Heptachlor epoxide	NA	ND	1	5	ng/wet g						0	30	PASS	
Hexachlorobenzene	NA	1.1	1	5	ng/wet g						10	30	PASS	J
Methoxychlor	NA	ND	1	5	ng/wet g						0	30	PASS	
Mirex	NA	ND	1	5	ng/wet g						0	30	PASS	
Oxychlordane	NA	ND	1	5	ng/wet g						0	30	PASS	
Perthane	NA	ND	5	10	ng/wet g						0	30	PASS	
trans-Nonachlor	NA	5.7	1	5	ng/wet g						26	30	PASS	

Sample ID: 29125-B1 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
(PCB030)	NA	74			% Recovery	100		74	50 - 150%	PASS				
(PCB112)	NA	73			% Recovery	100		73	50 - 150%	PASS				
(PCB198)	NA	84			% Recovery	100		84	50 - 150%	PASS				
(TCMX)	NA	61			% Recovery	100		61	50 - 150%	PASS				
2,4'-DDD	NA	ND	1	5	ng/dry g									

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Chlorinated Pesticides QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS	QA CODE
2,4'-DDE	NA	ND	1	5	ng/dry g							
2,4'-DDT	NA	ND	1	5	ng/dry g							
4,4'-DDD	NA	ND	1	5	ng/dry g							
4,4'-DDE	NA	ND	1	5	ng/dry g							
4,4'-DDT	NA	ND	1	5	ng/dry g							
Aldrin	NA	ND	1	5	ng/dry g							
BHC-alpha	NA	ND	1	5	ng/dry g							
BHC-beta	NA	ND	1	5	ng/dry g							
BHC-delta	NA	ND	1	5	ng/dry g							
BHC-gamma	NA	ND	1	5	ng/dry g							
Chlordane-alpha	NA	ND	1	5	ng/dry g							
Chlordane-gamma	NA	ND	1	5	ng/dry g							
cis-Nonachlor	NA	ND	1	5	ng/dry g							
Dieldrin	NA	ND	1	5	ng/dry g							
Endosulfan sulfate	NA	ND	1	5	ng/dry g							
Endosulfan-I	NA	ND	1	5	ng/dry g							
Endosulfan-II	NA	ND	1	5	ng/dry g							
Endrin	NA	ND	1	5	ng/dry g							
Endrin aldehyde	NA	ND	1	5	ng/dry g							
Endrin ketone	NA	ND	1	5	ng/dry g							
Heptachlor	NA	ND	1	5	ng/dry g							
Heptachlor epoxide	NA	ND	1	5	ng/dry g							
Hexachlorobenzene	NA	ND	1	5	ng/dry g							
Methoxychlor	NA	ND	1	5	ng/dry g							
Mirex	NA	ND	1	5	ng/dry g							
Oxychlordane	NA	ND	1	5	ng/dry g							
Perthane	NA	ND	5	10	ng/dry g							
trans-Nonachlor	NA	ND	1	5	ng/dry g							

Sample ID: 29125-BS1 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS	QA CODE
(PCB030)	NA	90			% Recovery	100	0	90	50 - 150% PASS			

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Chlorinated Pesticides QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS	QA CODE
(PCB112)	NA	82			% Recovery	100	0	82	50 - 150%	PASS			
(PCB198)	NA	100			% Recovery	100	0	100	50 - 150%	PASS			
(TCMX)	NA	89			% Recovery	100	0	89	50 - 150%	PASS			
2,4'-DDD	NA	389.4	1	5	ng/dry g	500	0	78	50 - 150%	PASS			
2,4'-DDE	NA	393.4	1	5	ng/dry g	500	0	79	50 - 150%	PASS			
2,4'-DDT	NA	358	1	5	ng/dry g	500	0	72	50 - 150%	PASS			
4,4'-DDD	NA	409	1	5	ng/dry g	500	0	82	50 - 150%	PASS			
4,4'-DDE	NA	458.1	1	5	ng/dry g	500	0	92	50 - 150%	PASS			
4,4'-DDT	NA	406.3	1	5	ng/dry g	500	0	81	50 - 150%	PASS			
Aldrin	NA	510.9	1	5	ng/dry g	500	0	102	50 - 150%	PASS			
BHC-alpha	NA	430.6	1	5	ng/dry g	500	0	86	50 - 150%	PASS			
BHC-beta	NA	500.6	1	5	ng/dry g	500	0	100	50 - 150%	PASS			
BHC-delta	NA	398.5	1	5	ng/dry g	500	0	80	50 - 150%	PASS			
BHC-gamma	NA	472	1	5	ng/dry g	500	0	94	50 - 150%	PASS			
Chlordane-alpha	NA	441.2	1	5	ng/dry g	500	0	88	50 - 150%	PASS			
Chlordane-gamma	NA	444.1	1	5	ng/dry g	500	0	89	50 - 150%	PASS			
cis-Nonachlor	NA	502.6	1	5	ng/dry g	500	0	101	50 - 150%	PASS			
Dieldrin	NA	442.7	1	5	ng/dry g	500	0	89	50 - 150%	PASS			
Endosulfan sulfate	NA	409.7	1	5	ng/dry g	500	0	82	50 - 150%	PASS			
Endosulfan-I	NA	337.6	1	5	ng/dry g	500	0	68	50 - 150%	PASS			
Endosulfan-II	NA	342.7	1	5	ng/dry g	500	0	69	50 - 150%	PASS			
Endrin	NA	431.9	1	5	ng/dry g	500	0	86	25 - 125%	PASS			
Endrin aldehyde	NA	64.8	1	5	ng/dry g	500	0	13	0 - 125%	PASS			
Endrin ketone	NA	430.8	1	5	ng/dry g	500	0	86	25 - 125%	PASS			
Heptachlor	NA	417.8	1	5	ng/dry g	500	0	84	50 - 150%	PASS			
Heptachlor epoxide	NA	519	1	5	ng/dry g	500	0	104	50 - 150%	PASS			
Hexachlorobenzene	NA	1492.8	1	5	ng/dry g	1500	0	100	50 - 150%	PASS			
Methoxychlor	NA	432.7	1	5	ng/dry g	500	0	87	50 - 150%	PASS			
Mirex	NA	418.2	1	5	ng/dry g	500	0	84	50 - 150%	PASS			
Oxychlordane	NA	451.4	1	5	ng/dry g	500	0	90	50 - 150%	PASS			
Perthane	NA	403.6	5	10	ng/dry g	500	0	81	50 - 150%	PASS			

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Chlorinated Pesticides QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
trans-Nonachlor	NA	498.7	1	5	ng/dry g	500	0	100	50 - 150%	PASS				

Sample ID: 29125-BS2 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
(PCB030)	NA	96			% Recovery	100	0	96	50 - 150%	PASS	6	30	PASS	
(PCB112)	NA	88			% Recovery	100	0	88	50 - 150%	PASS	7	30	PASS	
(PCB198)	NA	112			% Recovery	100	0	112	50 - 150%	PASS	11	30	PASS	
(TCMX)	NA	94			% Recovery	100	0	94	50 - 150%	PASS	5	30	PASS	
2,4'-DDD	NA	392.9	1	5	ng/dry g	500	0	79	50 - 150%	PASS	1	30	PASS	
2,4'-DDE	NA	400.9	1	5	ng/dry g	500	0	80	50 - 150%	PASS	1	30	PASS	
2,4'-DDT	NA	355.8	1	5	ng/dry g	500	0	71	50 - 150%	PASS	1	30	PASS	
4,4'-DDD	NA	407.3	1	5	ng/dry g	500	0	81	50 - 150%	PASS	1	30	PASS	
4,4'-DDE	NA	470.2	1	5	ng/dry g	500	0	94	50 - 150%	PASS	2	30	PASS	
4,4'-DDT	NA	386.6	1	5	ng/dry g	500	0	77	50 - 150%	PASS	5	30	PASS	
Aldrin	NA	523.5	1	5	ng/dry g	500	0	105	50 - 150%	PASS	3	30	PASS	
BHC-alpha	NA	421.2	1	5	ng/dry g	500	0	84	50 - 150%	PASS	2	30	PASS	
BHC-beta	NA	471.2	1	5	ng/dry g	500	0	94	50 - 150%	PASS	6	30	PASS	
BHC-delta	NA	407.5	1	5	ng/dry g	500	0	81	50 - 150%	PASS	2	30	PASS	
BHC-gamma	NA	474.4	1	5	ng/dry g	500	0	95	50 - 150%	PASS	1	30	PASS	
Chlordane-alpha	NA	438.4	1	5	ng/dry g	500	0	88	50 - 150%	PASS	0	30	PASS	
Chlordane-gamma	NA	463.3	1	5	ng/dry g	500	0	93	50 - 150%	PASS	4	30	PASS	
cis-Nonachlor	NA	487.2	1	5	ng/dry g	500	0	97	50 - 150%	PASS	4	30	PASS	
Dieldrin	NA	423.7	1	5	ng/dry g	500	0	85	50 - 150%	PASS	5	30	PASS	
Endosulfan sulfate	NA	412.5	1	5	ng/dry g	500	0	82	50 - 150%	PASS	0	30	PASS	
Endosulfan-I	NA	343.4	1	5	ng/dry g	500	0	69	50 - 150%	PASS	1	30	PASS	
Endosulfan-II	NA	395.3	1	5	ng/dry g	500	0	79	50 - 150%	PASS	14	30	PASS	
Endrin	NA	429.6	1	5	ng/dry g	500	0	86	25 - 125%	PASS	0	30	PASS	
Endrin aldehyde	NA	52.5	1	5	ng/dry g	500	0	10	0 - 125%	PASS	26	30	PASS	
Endrin ketone	NA	435	1	5	ng/dry g	500	0	87	25 - 125%	PASS	1	30	PASS	
Heptachlor	NA	406.1	1	5	ng/dry g	500	0	81	50 - 150%	PASS	4	30	PASS	
Heptachlor epoxide	NA	510.3	1	5	ng/dry g	500	0	102	50 - 150%	PASS	2	30	PASS	
Hexachlorobenzene	NA	1503.1	1	5	ng/dry g	1500	0	100	50 - 150%	PASS	0	30	PASS	

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Chlorinated Pesticides QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Methoxychlor	NA	414.9	1	5	ng/dry g	500	0	83	50 - 150%	PASS	5	30	PASS	
Mirex	NA	433.5	1	5	ng/dry g	500	0	87	50 - 150%	PASS	4	30	PASS	
Oxychlordane	NA	442.1	1	5	ng/dry g	500	0	88	50 - 150%	PASS	2	30	PASS	
Perthane	NA	398.8	5	10	ng/dry g	500	0	80	50 - 150%	PASS	1	30	PASS	
trans-Nonachlor	NA	481.1	1	5	ng/dry g	500	0	96	50 - 150%	PASS	4	30	PASS	

Sample ID: 29131-MS1 **Boat Ramp Depth 2'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**

Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
(PCB030)	NA	87			% Recovery	100	0	87	50 - 150%	PASS				
(PCB112)	NA	81			% Recovery	100	0	81	50 - 150%	PASS				
(PCB198)	NA	96			% Recovery	100	0	96	50 - 150%	PASS				
(TCMX)	NA	80			% Recovery	100	0	80	50 - 150%	PASS				
2,4'-DDD	NA	48.1	1	5	ng/dry g	61.1	0	79	50 - 150%	PASS				
2,4'-DDE	NA	48	1	5	ng/dry g	61.1	0	79	50 - 150%	PASS				
2,4'-DDT	NA	23.9	1	5	ng/dry g	61.1	0	39	50 - 150%	FAIL				M
4,4'-DDD	NA	48.9	1	5	ng/dry g	61.1	0	80	50 - 150%	PASS				
4,4'-DDE	NA	50.5	1	5	ng/dry g	61.1	0	83	50 - 150%	PASS				
4,4'-DDT	NA	22.1	1	5	ng/dry g	61.1	0	36	50 - 150%	FAIL				M
Aldrin	NA	42.8	1	5	ng/dry g	61.1	0	70	50 - 150%	PASS				
BHC-alpha	NA	48.3	1	5	ng/dry g	61.1	0	79	50 - 150%	PASS				
BHC-beta	NA	50.4	1	5	ng/dry g	61.1	0	82	50 - 150%	PASS				
BHC-delta	NA	47.1	1	5	ng/dry g	61.1	0	77	50 - 150%	PASS				
BHC-gamma	NA	50.1	1	5	ng/dry g	61.1	0	82	50 - 150%	PASS				
Chlordane-alpha	NA	52.3	1	5	ng/dry g	61.1	0	86	50 - 150%	PASS				
Chlordane-gamma	NA	51.1	1	5	ng/dry g	61.1	0	84	50 - 150%	PASS				
cis-Nonachlor	NA	56.9	1	5	ng/dry g	61.1	0	93	50 - 150%	PASS				
Dieldrin	NA	35.4	1	5	ng/dry g	61.1	0	58	50 - 150%	PASS				
Endosulfan sulfate	NA	50.1	1	5	ng/dry g	61.1	0	82	50 - 150%	PASS				
Endosulfan-I	NA	31	1	5	ng/dry g	61.1	0	51	50 - 150%	PASS				
Endosulfan-II	NA	43.2	1	5	ng/dry g	61.1	0	71	50 - 150%	PASS				
Endrin	NA	35.3	1	5	ng/dry g	61.1	0	58	25 - 125%	PASS				
Endrin aldehyde	NA	12.8	1	5	ng/dry g	61.1	0	21	0 - 125%	PASS				

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ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Endrin ketone	NA	39.3	1	5	ng/dry g	61.1	0	64	25 - 125%	PASS				
Heptachlor	NA	41.4	1	5	ng/dry g	61.1	0	68	50 - 150%	PASS				
Heptachlor epoxide	NA	63.5	1	5	ng/dry g	61.1	0	104	50 - 150%	PASS				
Hexachlorobenzene	NA	52.2	1	5	ng/dry g	61.1	0	85	50 - 150%	PASS				
Methoxychlor	NA	28.2	1	5	ng/dry g	61.1	0	46	50 - 150%	FAIL				M
Mirex	NA	40.5	1	5	ng/dry g	61.1	0	66	50 - 150%	PASS				
Oxychlordane	NA	51.8	1	5	ng/dry g	61.1	0	85	50 - 150%	PASS				
Perthane	NA	52	5	10	ng/dry g	61.1	0	85	50 - 150%	PASS				
trans-Nonachlor	NA	58.2	1	5	ng/dry g	61.1	0	95	50 - 150%	PASS				

Sample ID: 29131-MS2 **Boat Ramp Depth 2'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
(PCB030)	NA	93			% Recovery	100	0	93	50 - 150%	PASS	7	30	PASS	
(PCB112)	NA	80			% Recovery	100	0	80	50 - 150%	PASS	1	30	PASS	
(PCB198)	NA	92			% Recovery	100	0	92	50 - 150%	PASS	4	30	PASS	
(TCMX)	NA	87			% Recovery	100	0	87	50 - 150%	PASS	8	30	PASS	
2,4'-DDD	NA	26.9	1	5	ng/dry g	34.4	0	78	50 - 150%	PASS	1	30	PASS	
2,4'-DDE	NA	26.4	1	5	ng/dry g	34.4	0	77	50 - 150%	PASS	3	30	PASS	
2,4'-DDT	NA	17.4	1	5	ng/dry g	34.4	0	51	50 - 150%	PASS	27	30	PASS	
4,4'-DDD	NA	28.4	1	5	ng/dry g	34.4	0	83	50 - 150%	PASS	4	30	PASS	
4,4'-DDE	NA	27.4	1	5	ng/dry g	34.4	0	80	50 - 150%	PASS	4	30	PASS	
4,4'-DDT	NA	16.9	1	5	ng/dry g	34.4	0	49	50 - 150%	FAIL	31	30	FAIL	M
Aldrin	NA	24	1	5	ng/dry g	34.4	0	70	50 - 150%	PASS	0	30	PASS	
BHC-alpha	NA	28.9	1	5	ng/dry g	34.4	0	84	50 - 150%	PASS	6	30	PASS	
BHC-beta	NA	26.2	1	5	ng/dry g	34.4	0	76	50 - 150%	PASS	8	30	PASS	
BHC-delta	NA	27.4	1	5	ng/dry g	34.4	0	80	50 - 150%	PASS	4	30	PASS	
BHC-gamma	NA	29.8	1	5	ng/dry g	34.4	0	87	50 - 150%	PASS	6	30	PASS	
Chlordane-alpha	NA	29.7	1	5	ng/dry g	34.4	0	86	50 - 150%	PASS	0	30	PASS	
Chlordane-gamma	NA	29.9	1	5	ng/dry g	34.4	0	87	50 - 150%	PASS	4	30	PASS	
cis-Nonachlor	NA	31.5	1	5	ng/dry g	34.4	0	92	50 - 150%	PASS	1	30	PASS	
Dieldrin	NA	19.5	1	5	ng/dry g	34.4	0	57	50 - 150%	PASS	2	30	PASS	
Endosulfan sulfate	NA	24.7	1	5	ng/dry g	34.4	0	72	50 - 150%	PASS	13	30	PASS	

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Chlorinated Pesticides QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Endosulfan-I	NA	21.1	1	5	ng/dry g	34.4	0	61	50 - 150%	PASS	18	30	PASS	
Endosulfan-II	NA	27.6	1	5	ng/dry g	34.4	0	80	50 - 150%	PASS	12	30	PASS	
Endrin	NA	27.1	1	5	ng/dry g	34.4	0	79	25 - 125%	PASS	31	30	FAIL	R
Endrin aldehyde	NA	7.4	1	5	ng/dry g	34.4	0	22	0 - 125%	PASS	5	30	PASS	
Endrin ketone	NA	26.9	1	5	ng/dry g	34.4	0	78	25 - 125%	PASS	20	30	PASS	
Heptachlor	NA	23.8	1	5	ng/dry g	34.4	0	69	50 - 150%	PASS	1	30	PASS	
Heptachlor epoxide	NA	37.7	1	5	ng/dry g	34.4	0	110	50 - 150%	PASS	6	30	PASS	
Hexachlorobenzene	NA	32.2	1	5	ng/dry g	34.4	0	94	50 - 150%	PASS	10	30	PASS	
Methoxychlor	NA	20.8	1	5	ng/dry g	34.4	0	60	50 - 150%	PASS	26	30	PASS	
Mirex	NA	20.9	1	5	ng/dry g	34.4	0	61	50 - 150%	PASS	8	30	PASS	
Oxychlordane	NA	30.9	1	5	ng/dry g	34.4	0	90	50 - 150%	PASS	6	30	PASS	
Perthane	NA	29.3	5	10	ng/dry g	34.4	0	85	50 - 150%	PASS	0	30	PASS	
trans-Nonachlor	NA	33.3	1	5	ng/dry g	34.4	0	97	50 - 150%	PASS	2	30	PASS	

Sample ID: 29131-R2 **Boat Ramp Depth 2'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
(PCB030)	NA	90			% Recovery	100		90	50 - 150%	PASS	6	30	PASS	
(PCB112)	NA	81			% Recovery	100		81	50 - 150%	PASS	4	30	PASS	
(PCB198)	NA	91			% Recovery	100		91	50 - 150%	PASS	6	30	PASS	
(TCMX)	NA	87			% Recovery	100		87	50 - 150%	PASS	8	30	PASS	
2,4'-DDD	NA	ND	1	5	ng/dry g						0	30	PASS	
2,4'-DDE	NA	ND	1	5	ng/dry g						0	30	PASS	
2,4'-DDT	NA	ND	1	5	ng/dry g						0	30	PASS	
4,4'-DDD	NA	ND	1	5	ng/dry g						0	30	PASS	
4,4'-DDE	NA	ND	1	5	ng/dry g						0	30	PASS	
4,4'-DDT	NA	ND	1	5	ng/dry g						0	30	PASS	
Aldrin	NA	ND	1	5	ng/dry g						0	30	PASS	
BHC-alpha	NA	ND	1	5	ng/dry g						0	30	PASS	
BHC-beta	NA	ND	1	5	ng/dry g						0	30	PASS	
BHC-delta	NA	ND	1	5	ng/dry g						0	30	PASS	
BHC-gamma	NA	ND	1	5	ng/dry g						0	30	PASS	
Chlordane-alpha	NA	ND	1	5	ng/dry g						0	30	PASS	

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Chlorinated Pesticides QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS	QA CODE
Chlordane-gamma	NA	ND	1	5	ng/dry g					0	30	PASS
cis-Nonachlor	NA	ND	1	5	ng/dry g					0	30	PASS
Dieldrin	NA	ND	1	5	ng/dry g					0	30	PASS
Endosulfan sulfate	NA	ND	1	5	ng/dry g					0	30	PASS
Endosulfan-I	NA	ND	1	5	ng/dry g					0	30	PASS
Endosulfan-II	NA	ND	1	5	ng/dry g					0	30	PASS
Endrin	NA	ND	1	5	ng/dry g					0	30	PASS
Endrin aldehyde	NA	ND	1	5	ng/dry g					0	30	PASS
Endrin ketone	NA	ND	1	5	ng/dry g					0	30	PASS
Heptachlor	NA	ND	1	5	ng/dry g					0	30	PASS
Heptachlor epoxide	NA	ND	1	5	ng/dry g					0	30	PASS
Hexachlorobenzene	NA	ND	1	5	ng/dry g					0	30	PASS
Methoxychlor	NA	ND	1	5	ng/dry g					0	30	PASS
Mirex	NA	ND	1	5	ng/dry g					0	30	PASS
Oxychlordane	NA	ND	1	5	ng/dry g					0	30	PASS
Perthane	NA	ND	5	10	ng/dry g					0	30	PASS
trans-Nonachlor	NA	ND	1	5	ng/dry g					0	30	PASS

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Elements QUALITY CONTROL REPORT

Sample ID: 29118-B1 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 245.7 Batch ID: E-6088 Prepared: 07-Oct-14 Analyzed: 08-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	ND	0.00001	0.00002	µg/wet g									

Sample ID: 29118-BS1 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 245.7 Batch ID: E-6088 Prepared: 07-Oct-14 Analyzed: 08-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	1.04	0.00001	0.00002	µg/wet g	1	0	104	75 - 125%	PASS				

Sample ID: 29118-BS2 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 245.7 Batch ID: E-6088 Prepared: 07-Oct-14 Analyzed: 08-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	1.05	0.00001	0.00002	µg/wet g	1	0	105	75 - 125%	PASS	1	30	PASS	

Sample ID: 29119-CRM1 **QAQC CRM - DOLT-2** **Matrix: Tissue** **Sampled:** **Received:**
Method: EPA 245.7 Batch ID: E-6088 Prepared: 07-Oct-14 Analyzed: 08-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	2.1458	0.00001	0.00002	µg/dry g	2.14		100	80 - 120%	PASS				

Sample ID: 29121-MS1 **Bass 1 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**
Method: EPA 245.7 Batch ID: E-6088 Prepared: 07-Oct-14 Analyzed: 08-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	0.7215	0.00001	0.00002	µg/wet g	0.1625	0.5466	108	75 - 125%	PASS				

Sample ID: 29121-MS2 **Bass 1 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**
Method: EPA 245.7 Batch ID: E-6088 Prepared: 07-Oct-14 Analyzed: 08-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	0.72312	0.00001	0.00002	µg/wet g	0.1625	0.5466	109	75 - 125%	PASS	1	30	PASS	

Sample ID: 29121-R2 **Bass 1 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**
Method: EPA 245.7 Batch ID: E-6088 Prepared: 07-Oct-14 Analyzed: 08-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	0.5584	0.00001	0.00002	µg/wet g						4	30	PASS	

Sample ID: 29125-B1 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 245.7 Batch ID: E-6082 Prepared: 15-Sep-14 Analyzed: 17-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	ND	0.00001	0.00002	µg/dry g									

Sample ID: 29125-BS1 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 245.7 Batch ID: E-6082 Prepared: 15-Sep-14 Analyzed: 17-Sep-14

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Elements QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	1.03	0.00001	0.00002	µg/dry g	1	0	103	80 - 120%	PASS				

Sample ID: 29125-BS2 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 245.7 Batch ID: E-6082 Prepared: 15-Sep-14 Analyzed: 17-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	0.997	0.00001	0.00002	µg/dry g	1	0	100	80 - 120%	PASS	3	30	PASS	

Sample ID: 29127-CRM1 **QAQC CRM - ERA 540** **Matrix: Sediment** **Sampled:** **Received:**
Method: EPA 245.7 Batch ID: E-6082 Prepared: 15-Sep-14 Analyzed: 17-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	9.4464	0.00001	0.00002	µg/dry g	9.25		102	80 - 120%	PASS				

Sample ID: 29128-MS1 **L.R. Rocky Pt. Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 245.7 Batch ID: E-6082 Prepared: 15-Sep-14 Analyzed: 17-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	0.05861	0.00001	0.00002	µg/dry g	0.05233	0.00345	105	80 - 120%	PASS				

Sample ID: 29128-MS2 **L.R. Rocky Pt. Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 245.7 Batch ID: E-6082 Prepared: 15-Sep-14 Analyzed: 17-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	0.05809	0.00001	0.00002	µg/dry g	0.05233	0.00345	104	80 - 120%	PASS	1	30	PASS	

Sample ID: 29128-R2 **L.R. Rocky Pt. Surface** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 245.7 Batch ID: E-6082 Prepared: 15-Sep-14 Analyzed: 17-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
Mercury (Hg)	NA	0.0033	0.00001	0.00002	µg/dry g						9	30	PASS	

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PCB Congeners QUALITY CONTROL REPORT

Sample ID: 29118-B1 **QAQC Procedural Blank** Method: EPA 8270D **Matrix: DI Water** Batch ID: O-6100 **Sampled:** Prepared: 29-Sep-14 **Received:** Analyzed: 06-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS	QA CODE
PCB003	NA	ND	1	5	ng/wet g							
PCB008	NA	ND	1	5	ng/wet g							
PCB018	NA	ND	1	5	ng/wet g							
PCB028	NA	ND	1	5	ng/wet g							
PCB031	NA	ND	1	5	ng/wet g							
PCB033	NA	ND	1	5	ng/wet g							
PCB037	NA	ND	1	5	ng/wet g							
PCB044	NA	ND	1	5	ng/wet g							
PCB049	NA	ND	1	5	ng/wet g							
PCB052	NA	ND	1	5	ng/wet g							
PCB056(060)	NA	ND	1	5	ng/wet g							
PCB066	NA	ND	1	5	ng/wet g							
PCB070	NA	ND	1	5	ng/wet g							
PCB074	NA	ND	1	5	ng/wet g							
PCB077	NA	ND	1	5	ng/wet g							
PCB081	NA	ND	1	5	ng/wet g							
PCB087	NA	ND	1	5	ng/wet g							
PCB095	NA	ND	1	5	ng/wet g							
PCB097	NA	ND	1	5	ng/wet g							
PCB099	NA	ND	1	5	ng/wet g							
PCB101	NA	ND	1	5	ng/wet g							
PCB105	NA	ND	1	5	ng/wet g							
PCB110	NA	ND	1	5	ng/wet g							
PCB114	NA	ND	1	5	ng/wet g							
PCB118	NA	ND	1	5	ng/wet g							
PCB119	NA	ND	1	5	ng/wet g							
PCB123	NA	ND	1	5	ng/wet g							
PCB126	NA	ND	1	5	ng/wet g							
PCB128	NA	ND	1	5	ng/wet g							

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS	QA CODE
PCB138	NA	ND	1	5	ng/wet g								
PCB141	NA	ND	1	5	ng/wet g								
PCB149	NA	ND	1	5	ng/wet g								
PCB151	NA	ND	1	5	ng/wet g								
PCB153	NA	ND	1	5	ng/wet g								
PCB156	NA	ND	1	5	ng/wet g								
PCB157	NA	ND	1	5	ng/wet g								
PCB158	NA	ND	1	5	ng/wet g								
PCB167	NA	ND	1	5	ng/wet g								
PCB168+132	NA	ND	1	5	ng/wet g								
PCB169	NA	ND	1	5	ng/wet g								
PCB170	NA	ND	1	5	ng/wet g								
PCB174	NA	ND	1	5	ng/wet g								
PCB177	NA	ND	1	5	ng/wet g								
PCB180	NA	ND	1	5	ng/wet g								
PCB183	NA	ND	1	5	ng/wet g								
PCB187	NA	ND	1	5	ng/wet g								
PCB189	NA	ND	1	5	ng/wet g								
PCB194	NA	ND	1	5	ng/wet g								
PCB195	NA	ND	1	5	ng/wet g								
PCB199(200)	NA	ND	1	5	ng/wet g								
PCB201	NA	ND	1	5	ng/wet g								
PCB206	NA	ND	1	5	ng/wet g								
PCB209	NA	ND	1	5	ng/wet g								

Sample ID: 29118-BS1 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**

Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 06-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS	QA CODE
PCB003	NA	47.4	1	5	ng/wet g	100	0	47	50 - 150%	FAIL			R
PCB008	NA	53.4	1	5	ng/wet g	100	0	53	50 - 150%	PASS			
PCB018	NA	74.6	1	5	ng/wet g	100	0	75	50 - 150%	PASS			
PCB028	NA	55.4	1	5	ng/wet g	100	0	55	50 - 150%	PASS			
PCB031	NA	66.4	1	5	ng/wet g	100	0	66	50 - 150%	PASS			

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS	QA CODE
PCB033	NA	64.1	1	5	ng/wet g	100	0	64	50 - 150%	PASS			
PCB037	NA	69.8	1	5	ng/wet g	100	0	70	50 - 150%	PASS			
PCB044	NA	63.6	1	5	ng/wet g	100	0	64	50 - 150%	PASS			
PCB049	NA	61	1	5	ng/wet g	100	0	61	50 - 150%	PASS			
PCB052	NA	62.8	1	5	ng/wet g	100	0	63	50 - 150%	PASS			
PCB056(060)	NA	79.2	1	5	ng/wet g	100	0	79	50 - 150%	PASS			
PCB066	NA	72.8	1	5	ng/wet g	100	0	73	50 - 150%	PASS			
PCB070	NA	72.1	1	5	ng/wet g	100	0	72	50 - 150%	PASS			
PCB074	NA	72.6	1	5	ng/wet g	100	0	73	50 - 150%	PASS			
PCB077	NA	79.9	1	5	ng/wet g	100	0	80	50 - 150%	PASS			
PCB081	NA	79.4	1	5	ng/wet g	100	0	79	50 - 150%	PASS			
PCB087	NA	75.7	1	5	ng/wet g	100	0	76	50 - 150%	PASS			
PCB095	NA	74.1	1	5	ng/wet g	100	0	74	50 - 150%	PASS			
PCB097	NA	81.4	1	5	ng/wet g	100	0	81	50 - 150%	PASS			
PCB099	NA	80	1	5	ng/wet g	100	0	80	50 - 150%	PASS			
PCB101	NA	75.6	1	5	ng/wet g	100	0	76	50 - 150%	PASS			
PCB105	NA	63.5	1	5	ng/wet g	100	0	63	50 - 150%	PASS			
PCB110	NA	77.3	1	5	ng/wet g	100	0	77	50 - 150%	PASS			
PCB114	NA	87.8	1	5	ng/wet g	100	0	88	50 - 150%	PASS			
PCB118	NA	86.9	1	5	ng/wet g	100	0	87	50 - 150%	PASS			
PCB119	NA	87.1	1	5	ng/wet g	100	0	87	50 - 150%	PASS			
PCB123	NA	84.9	1	5	ng/wet g	100	0	85	50 - 150%	PASS			
PCB126	NA	85.6	1	5	ng/wet g	100	0	86	50 - 150%	PASS			
PCB128	NA	90.6	1	5	ng/wet g	100	0	91	50 - 150%	PASS			
PCB138	NA	70.9	1	5	ng/wet g	100	0	71	50 - 150%	PASS			
PCB141	NA	69.4	1	5	ng/wet g	100	0	69	50 - 150%	PASS			
PCB149	NA	75.6	1	5	ng/wet g	100	0	76	50 - 150%	PASS			
PCB151	NA	80.7	1	5	ng/wet g	100	0	81	50 - 150%	PASS			
PCB153	NA	81.2	1	5	ng/wet g	100	0	81	50 - 150%	PASS			
PCB156	NA	86.3	1	5	ng/wet g	100	0	86	50 - 150%	PASS			
PCB157	NA	87.7	1	5	ng/wet g	100	0	88	50 - 150%	PASS			

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS	QA CODE
PCB158	NA	73.1	1	5	ng/wet g	100	0	73	50 - 150%	PASS			
PCB167	NA	79.9	1	5	ng/wet g	100	0	80	50 - 150%	PASS			
PCB168+132	NA	143.8	1	5	ng/wet g	200	0	72	50 - 150%	PASS			
PCB169	NA	117.2	1	5	ng/wet g	100	0	117	50 - 150%	PASS			
PCB170	NA	103.2	1	5	ng/wet g	100	0	103	50 - 150%	PASS			
PCB174	NA	71.6	1	5	ng/wet g	100	0	72	50 - 150%	PASS			
PCB177	NA	83.6	1	5	ng/wet g	100	0	84	50 - 150%	PASS			
PCB180	NA	92	1	5	ng/wet g	100	0	92	50 - 150%	PASS			
PCB183	NA	74.1	1	5	ng/wet g	100	0	74	50 - 150%	PASS			
PCB187	NA	73.1	1	5	ng/wet g	100	0	73	50 - 150%	PASS			
PCB189	NA	124.9	1	5	ng/wet g	100	0	125	50 - 150%	PASS			
PCB194	NA	148.3	1	5	ng/wet g	100	0	148	50 - 150%	PASS			
PCB195	NA	129.4	1	5	ng/wet g	100	0	129	50 - 150%	PASS			
PCB199(200)	NA	78.1	1	5	ng/wet g	100	0	78	50 - 150%	PASS			
PCB201	NA	119.6	1	5	ng/wet g	100	0	120	50 - 150%	PASS			
PCB206	NA	99.2	1	5	ng/wet g	100	0	99	50 - 150%	PASS			
PCB209	NA	125.5	1	5	ng/wet g	100	0	125	50 - 150%	PASS			

Sample ID: 29118-BS2 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 06-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS	QA CODE
PCB003	NA	60.8	1	5	ng/wet g	100	0	61	50 - 150%	PASS	26	30	PASS
PCB008	NA	71.3	1	5	ng/wet g	100	0	71	50 - 150%	PASS	29	30	PASS
PCB018	NA	74.2	1	5	ng/wet g	100	0	74	50 - 150%	PASS	1	30	PASS
PCB028	NA	72.8	1	5	ng/wet g	100	0	73	50 - 150%	PASS	28	30	PASS
PCB031	NA	87.5	1	5	ng/wet g	100	0	88	50 - 150%	PASS	29	30	PASS
PCB033	NA	87.3	1	5	ng/wet g	100	0	87	50 - 150%	PASS	30	30	PASS
PCB037	NA	92.5	1	5	ng/wet g	100	0	93	50 - 150%	PASS	27	30	PASS
PCB044	NA	86.2	1	5	ng/wet g	100	0	86	50 - 150%	PASS	29	30	PASS
PCB049	NA	81.5	1	5	ng/wet g	100	0	81	50 - 150%	PASS	29	30	PASS
PCB052	NA	83.5	1	5	ng/wet g	100	0	83	50 - 150%	PASS	29	30	PASS
PCB056(060)	NA	106.6	1	5	ng/wet g	100	0	107	50 - 150%	PASS	30	30	PASS
PCB066	NA	96.8	1	5	ng/wet g	100	0	97	50 - 150%	PASS	28	30	PASS

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB070	NA	96.2	1	5	ng/wet g	100	0	96	50 - 150%	PASS	29	30	PASS	
PCB074	NA	90	1	5	ng/wet g	100	0	90	50 - 150%	PASS	21	30	PASS	
PCB077	NA	107.3	1	5	ng/wet g	100	0	107	50 - 150%	PASS	29	30	PASS	
PCB081	NA	104	1	5	ng/wet g	100	0	104	50 - 150%	PASS	27	30	PASS	
PCB087	NA	102.2	1	5	ng/wet g	100	0	102	50 - 150%	PASS	29	30	PASS	
PCB095	NA	97	1	5	ng/wet g	100	0	97	50 - 150%	PASS	27	30	PASS	
PCB097	NA	106.2	1	5	ng/wet g	100	0	106	50 - 150%	PASS	27	30	PASS	
PCB099	NA	102.3	1	5	ng/wet g	100	0	102	50 - 150%	PASS	24	30	PASS	
PCB101	NA	100.1	1	5	ng/wet g	100	0	100	50 - 150%	PASS	27	30	PASS	
PCB105	NA	81.8	1	5	ng/wet g	100	0	82	50 - 150%	PASS	25	30	PASS	
PCB110	NA	104.2	1	5	ng/wet g	100	0	104	50 - 150%	PASS	30	30	PASS	
PCB114	NA	116.4	1	5	ng/wet g	100	0	116	50 - 150%	PASS	27	30	PASS	
PCB118	NA	115.8	1	5	ng/wet g	100	0	116	50 - 150%	PASS	29	30	PASS	
PCB119	NA	115	1	5	ng/wet g	100	0	115	50 - 150%	PASS	28	30	PASS	
PCB123	NA	111.5	1	5	ng/wet g	100	0	112	50 - 150%	PASS	27	30	PASS	
PCB126	NA	110.6	1	5	ng/wet g	100	0	111	50 - 150%	PASS	25	30	PASS	
PCB128	NA	115.5	1	5	ng/wet g	100	0	115	50 - 150%	PASS	24	30	PASS	
PCB138	NA	90	1	5	ng/wet g	100	0	90	50 - 150%	PASS	24	30	PASS	
PCB141	NA	90.1	1	5	ng/wet g	100	0	90	50 - 150%	PASS	26	30	PASS	
PCB149	NA	103	1	5	ng/wet g	100	0	103	50 - 150%	PASS	30	30	PASS	
PCB151	NA	102.5	1	5	ng/wet g	100	0	102	50 - 150%	PASS	23	30	PASS	
PCB153	NA	107.4	1	5	ng/wet g	100	0	107	50 - 150%	PASS	28	30	PASS	
PCB156	NA	112.3	1	5	ng/wet g	100	0	112	50 - 150%	PASS	26	30	PASS	
PCB157	NA	117.2	1	5	ng/wet g	100	0	117	50 - 150%	PASS	28	30	PASS	
PCB158	NA	90.3	1	5	ng/wet g	100	0	90	50 - 150%	PASS	21	30	PASS	
PCB167	NA	99.8	1	5	ng/wet g	100	0	100	50 - 150%	PASS	22	30	PASS	
PCB168+132	NA	167.7	1	5	ng/wet g	200	0	84	50 - 150%	PASS	15	30	PASS	
PCB169	NA	135.3	1	5	ng/wet g	100	0	135	50 - 150%	PASS	14	30	PASS	
PCB170	NA	109	1	5	ng/wet g	100	0	109	50 - 150%	PASS	6	30	PASS	
PCB174	NA	90.6	1	5	ng/wet g	100	0	91	50 - 150%	PASS	23	30	PASS	
PCB177	NA	107.6	1	5	ng/wet g	100	0	108	50 - 150%	PASS	25	30	PASS	

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB180	NA	118.5	1	5	ng/wet g	100	0	118	50 - 150%	PASS	25	30	PASS	
PCB183	NA	94.6	1	5	ng/wet g	100	0	95	50 - 150%	PASS	25	30	PASS	
PCB187	NA	91.7	1	5	ng/wet g	100	0	92	50 - 150%	PASS	23	30	PASS	
PCB189	NA	139.8	1	5	ng/wet g	100	0	140	50 - 150%	PASS	11	30	PASS	
PCB194	NA	172.1	1	5	ng/wet g	100	0	172	50 - 150%	FAIL	15	30	PASS	R
PCB195	NA	148.3	1	5	ng/wet g	100	0	148	50 - 150%	PASS	14	30	PASS	
PCB199(200)	NA	104.6	1	5	ng/wet g	100	0	105	50 - 150%	PASS	30	30	PASS	
PCB201	NA	125.5	1	5	ng/wet g	100	0	125	50 - 150%	PASS	5	30	PASS	
PCB206	NA	114.8	1	5	ng/wet g	100	0	115	50 - 150%	PASS	15	30	PASS	
PCB209	NA	125.9	1	5	ng/wet g	100	0	126	50 - 150%	PASS	0	30	PASS	

Sample ID: 29121-MS1 **Bass 1 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**

Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 06-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB003	NA	20	1	5	ng/wet g	19.3	0	104	50 - 150%	PASS				
PCB008	NA	21.3	1	5	ng/wet g	19.3	0	110	50 - 150%	PASS				
PCB018	NA	21.9	1	5	ng/wet g	19.3	0	113	50 - 150%	PASS				
PCB028	NA	21.9	1	5	ng/wet g	19.3	0.5	111	50 - 150%	PASS				
PCB031	NA	25.4	1	5	ng/wet g	19.3	0	132	50 - 150%	PASS				
PCB033	NA	21.5	1	5	ng/wet g	19.3	0	111	50 - 150%	PASS				
PCB037	NA	18.4	1	5	ng/wet g	19.3	0	95	50 - 150%	PASS				
PCB044	NA	18.3	1	5	ng/wet g	19.3	0	95	50 - 150%	PASS				
PCB049	NA	20	1	5	ng/wet g	19.3	0	104	50 - 150%	PASS				
PCB052	NA	20.6	1	5	ng/wet g	19.3	0	107	50 - 150%	PASS				
PCB056(060)	NA	20.8	1	5	ng/wet g	19.3	0	108	50 - 150%	PASS				
PCB066	NA	21.4	1	5	ng/wet g	19.3	0	111	50 - 150%	PASS				
PCB070	NA	24	1	5	ng/wet g	19.3	4.8	99	50 - 150%	PASS				
PCB074	NA	20.4	1	5	ng/wet g	19.3	1.5	98	50 - 150%	PASS				
PCB077	NA	32.6	1	5	ng/wet g	19.3	0	169	50 - 150%	FAIL				M
PCB081	NA	21.4	1	5	ng/wet g	19.3	0	111	50 - 150%	PASS				
PCB087	NA	21.9	1	5	ng/wet g	19.3	0	113	50 - 150%	PASS				
PCB095	NA	23	1	5	ng/wet g	19.3	1.3	112	50 - 150%	PASS				
PCB097	NA	21.5	1	5	ng/wet g	19.3	0	111	50 - 150%	PASS				

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS	QA CODE
PCB099	NA	21.7	1	5	ng/wet g	19.3	0	112	50 - 150%	PASS			
PCB101	NA	23	1	5	ng/wet g	19.3	1.7	110	50 - 150%	PASS			
PCB105	NA	21	1	5	ng/wet g	19.3	0	109	50 - 150%	PASS			
PCB110	NA	22.7	1	5	ng/wet g	19.3	1.4	110	50 - 150%	PASS			
PCB114	NA	21.2	1	5	ng/wet g	19.3	1.3	103	50 - 150%	PASS			
PCB118	NA	22.3	1	5	ng/wet g	19.3	1.5	108	50 - 150%	PASS			
PCB119	NA	24.8	1	5	ng/wet g	19.3	0	128	50 - 150%	PASS			
PCB123	NA	21.9	1	5	ng/wet g	19.3	0	113	50 - 150%	PASS			
PCB126	NA	23.7	1	5	ng/wet g	19.3	0	123	50 - 150%	PASS			
PCB128	NA	27.2	1	5	ng/wet g	19.3	0	141	50 - 150%	PASS			
PCB138	NA	25.6	1	5	ng/wet g	19.3	4.8	108	50 - 150%	PASS			
PCB141	NA	24.4	1	5	ng/wet g	19.3	0	126	50 - 150%	PASS			
PCB149	NA	22.2	1	5	ng/wet g	19.3	1.2	109	50 - 150%	PASS			
PCB151	NA	23	1	5	ng/wet g	19.3	0	119	50 - 150%	PASS			
PCB153	NA	33.7	1	5	ng/wet g	19.3	5.4	147	50 - 150%	PASS			
PCB156	NA	22.3	1	5	ng/wet g	19.3	0	116	50 - 150%	PASS			
PCB157	NA	24.8	1	5	ng/wet g	19.3	0	128	50 - 150%	PASS			
PCB158	NA	23.9	1	5	ng/wet g	19.3	0	124	50 - 150%	PASS			
PCB167	NA	21	1	5	ng/wet g	19.3	0	109	50 - 150%	PASS			
PCB168+132	NA	47.6	1	5	ng/wet g	38.6	0	123	50 - 150%	PASS			
PCB169	NA	26.5	1	5	ng/wet g	19.3	0	137	50 - 150%	PASS			
PCB170	NA	24.7	1	5	ng/wet g	19.3	1.4	121	50 - 150%	PASS			
PCB174	NA	21.3	1	5	ng/wet g	19.3	0	110	50 - 150%	PASS			
PCB177	NA	24.6	1	5	ng/wet g	19.3	0	127	50 - 150%	PASS			
PCB180	NA	24.9	1	5	ng/wet g	19.3	3.2	112	50 - 150%	PASS			
PCB183	NA	22.4	1	5	ng/wet g	19.3	0	116	50 - 150%	PASS			
PCB187	NA	24.2	1	5	ng/wet g	19.3	2	115	50 - 150%	PASS			
PCB189	NA	23.7	1	5	ng/wet g	19.3	0	123	50 - 150%	PASS			
PCB194	NA	25.3	1	5	ng/wet g	19.3	0	131	50 - 150%	PASS			
PCB195	NA	29.9	1	5	ng/wet g	19.3	0	155	50 - 150%	FAIL			M
PCB199(200)	NA	22.3	1	5	ng/wet g	19.3	0	116	50 - 150%	PASS			

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB201	NA	24.1	1	5	ng/wet g	19.3	0	125	50 - 150%	PASS				
PCB206	NA	20	1	5	ng/wet g	19.3	0	104	50 - 150%	PASS				
PCB209	NA	16.9	1	5	ng/wet g	19.3	0	88	50 - 150%	PASS				

Sample ID: 29121-MS2 **Bass 1 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 07-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB003	NA	30	1	5	ng/wet g	19.9	0	151	50 - 150%	FAIL	37	30	FAIL	M
PCB008	NA	26.4	1	5	ng/wet g	19.9	0	133	50 - 150%	PASS	19	30	PASS	
PCB018	NA	23.2	1	5	ng/wet g	19.9	0	117	50 - 150%	PASS	3	30	PASS	
PCB028	NA	32.4	1	5	ng/wet g	19.9	0.5	160	50 - 150%	FAIL	36	30	FAIL	M
PCB031	NA	21.4	1	5	ng/wet g	19.9	0	108	50 - 150%	PASS	20	30	PASS	
PCB033	NA	21.4	1	5	ng/wet g	19.9	0	108	50 - 150%	PASS	3	30	PASS	
PCB037	NA	26.2	1	5	ng/wet g	19.9	0	132	50 - 150%	PASS	33	30	FAIL	M
PCB044	NA	19.1	1	5	ng/wet g	19.9	0	96	50 - 150%	PASS	1	30	PASS	
PCB049	NA	21.8	1	5	ng/wet g	19.9	0	110	50 - 150%	PASS	6	30	PASS	
PCB052	NA	22.8	1	5	ng/wet g	19.9	0	115	50 - 150%	PASS	7	30	PASS	
PCB056(060)	NA	21.2	1	5	ng/wet g	19.9	0	107	50 - 150%	PASS	1	30	PASS	
PCB066	NA	23.2	1	5	ng/wet g	19.9	0	117	50 - 150%	PASS	5	30	PASS	
PCB070	NA	14.7	1	5	ng/wet g	19.9	4.8	50	50 - 150%	PASS	66	30	FAIL	M
PCB074	NA	23.5	1	5	ng/wet g	19.9	1.5	111	50 - 150%	PASS	12	30	PASS	
PCB077	NA	26.8	1	5	ng/wet g	19.9	0	135	50 - 150%	PASS	22	30	PASS	
PCB081	NA	17.6	1	5	ng/wet g	19.9	0	88	50 - 150%	PASS	23	30	PASS	
PCB087	NA	24.3	1	5	ng/wet g	19.9	0	122	50 - 150%	PASS	8	30	PASS	
PCB095	NA	26.9	1	5	ng/wet g	19.9	1.3	129	50 - 150%	PASS	14	30	PASS	
PCB097	NA	24.3	1	5	ng/wet g	19.9	0	122	50 - 150%	PASS	9	30	PASS	
PCB099	NA	24.2	1	5	ng/wet g	19.9	0	122	50 - 150%	PASS	9	30	PASS	
PCB101	NA	24.6	1	5	ng/wet g	19.9	1.7	115	50 - 150%	PASS	4	30	PASS	
PCB105	NA	20	1	5	ng/wet g	19.9	0	101	50 - 150%	PASS	8	30	PASS	
PCB110	NA	25.4	1	5	ng/wet g	19.9	1.4	121	50 - 150%	PASS	10	30	PASS	
PCB114	NA	22.9	1	5	ng/wet g	19.9	1.3	109	50 - 150%	PASS	6	30	PASS	
PCB118	NA	24.1	1	5	ng/wet g	19.9	1.5	114	50 - 150%	PASS	5	30	PASS	
PCB119	NA	22.4	1	5	ng/wet g	19.9	0	113	50 - 150%	PASS	12	30	PASS	

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB123	NA	22.4	1	5	ng/wet g	19.9	0	113	50 - 150%	PASS	0	30	PASS	
PCB126	NA	22.6	1	5	ng/wet g	19.9	0	114	50 - 150%	PASS	8	30	PASS	
PCB128	NA	27.9	1	5	ng/wet g	19.9	0	140	50 - 150%	PASS	1	30	PASS	
PCB138	NA	25.5	1	5	ng/wet g	19.9	4.8	104	50 - 150%	PASS	4	30	PASS	
PCB141	NA	23.7	1	5	ng/wet g	19.9	0	119	50 - 150%	PASS	6	30	PASS	
PCB149	NA	23.1	1	5	ng/wet g	19.9	1.2	110	50 - 150%	PASS	1	30	PASS	
PCB151	NA	26.4	1	5	ng/wet g	19.9	0	133	50 - 150%	PASS	11	30	PASS	
PCB153	NA	32	1	5	ng/wet g	19.9	5.4	134	50 - 150%	PASS	9	30	PASS	
PCB156	NA	23.5	1	5	ng/wet g	19.9	0	118	50 - 150%	PASS	2	30	PASS	
PCB157	NA	24	1	5	ng/wet g	19.9	0	121	50 - 150%	PASS	6	30	PASS	
PCB158	NA	27.2	1	5	ng/wet g	19.9	0	137	50 - 150%	PASS	10	30	PASS	
PCB167	NA	25.3	1	5	ng/wet g	19.9	0	127	50 - 150%	PASS	15	30	PASS	
PCB168+132	NA	54.3	1	5	ng/wet g	39.8	0	136	50 - 150%	PASS	10	30	PASS	
PCB169	NA	25.8	1	5	ng/wet g	19.9	0	130	50 - 150%	PASS	5	30	PASS	
PCB170	NA	24.8	1	5	ng/wet g	19.9	1.4	118	50 - 150%	PASS	3	30	PASS	
PCB174	NA	23.6	1	5	ng/wet g	19.9	0	119	50 - 150%	PASS	8	30	PASS	
PCB177	NA	24.6	1	5	ng/wet g	19.9	0	124	50 - 150%	PASS	2	30	PASS	
PCB180	NA	25.9	1	5	ng/wet g	19.9	3.2	114	50 - 150%	PASS	2	30	PASS	
PCB183	NA	23.6	1	5	ng/wet g	19.9	0	119	50 - 150%	PASS	3	30	PASS	
PCB187	NA	23.7	1	5	ng/wet g	19.9	2	109	50 - 150%	PASS	5	30	PASS	
PCB189	NA	27.7	1	5	ng/wet g	19.9	0	139	50 - 150%	PASS	12	30	PASS	
PCB194	NA	21.3	1	5	ng/wet g	19.9	0	107	50 - 150%	PASS	20	30	PASS	
PCB195	NA	26.2	1	5	ng/wet g	19.9	0	132	50 - 150%	PASS	16	30	PASS	
PCB199(200)	NA	22.9	1	5	ng/wet g	19.9	0	115	50 - 150%	PASS	1	30	PASS	
PCB201	NA	24.7	1	5	ng/wet g	19.9	0	124	50 - 150%	PASS	1	30	PASS	
PCB206	NA	20.5	1	5	ng/wet g	19.9	0	103	50 - 150%	PASS	1	30	PASS	
PCB209	NA	23.5	1	5	ng/wet g	19.9	0	118	50 - 150%	PASS	29	30	PASS	

Sample ID: 29121-R2 **Bass 1 whole bass** **Matrix: Tissue** **Sampled: 04-Aug-14 15:30** **Received: 15-Aug-14**

Method: EPA 8270D Batch ID: O-6100 Prepared: 29-Sep-14 Analyzed: 07-Oct-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB003	NA	ND	1	5	ng/wet g						0	30	PASS	
PCB008	NA	ND	1	5	ng/wet g						0	30	PASS	

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS		QA CODE
PCB018	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB028	NA	ND	1	5	ng/wet g					10	30	PASS	
PCB031	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB033	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB037	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB044	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB049	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB052	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB056(060)	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB066	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB070	NA	5	1	5	ng/wet g					11	30	PASS	
PCB074	NA	1.8	1	5	ng/wet g					40	30	FAIL	J,SL
PCB077	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB081	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB087	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB095	NA	1.3	1	5	ng/wet g					0	30	PASS	J
PCB097	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB099	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB101	NA	1.6	1	5	ng/wet g					12	30	PASS	J
PCB105	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB110	NA	1.6	1	5	ng/wet g					21	30	PASS	J
PCB114	NA	1	1	5	ng/wet g					40	30	FAIL	J,SL
PCB118	NA	2	1	5	ng/wet g					67	30	FAIL	J,SL
PCB119	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB123	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB126	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB128	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB138	NA	4.4	1	5	ng/wet g					15	30	PASS	J
PCB141	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB149	NA	1.1	1	5	ng/wet g					17	30	PASS	J
PCB151	NA	ND	1	5	ng/wet g					0	30	PASS	

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS		QA CODE
PCB153	NA	6.2	1	5	ng/wet g					30	30	PASS	
PCB156	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB157	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB158	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB167	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB168+132	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB169	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB170	NA	ND	1	5	ng/wet g					95	30	FAIL	SL
PCB174	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB177	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB180	NA	3.5	1	5	ng/wet g					19	30	PASS	J
PCB183	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB187	NA	2	1	5	ng/wet g					0	30	PASS	J
PCB189	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB194	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB195	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB199(200)	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB201	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB206	NA	ND	1	5	ng/wet g					0	30	PASS	
PCB209	NA	ND	1	5	ng/wet g					0	30	PASS	

Sample ID: 29125-B1 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**

Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

PCB003	NA	ND	1	5	ng/dry g
PCB008	NA	ND	1	5	ng/dry g
PCB018	NA	ND	1	5	ng/dry g
PCB028	NA	ND	1	5	ng/dry g
PCB031	NA	ND	1	5	ng/dry g
PCB033	NA	ND	1	5	ng/dry g
PCB037	NA	ND	1	5	ng/dry g
PCB044	NA	ND	1	5	ng/dry g
PCB049	NA	ND	1	5	ng/dry g

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS	QA CODE
PCB052	NA	ND	1	5	ng/dry g							
PCB056(060)	NA	ND	1	5	ng/dry g							
PCB066	NA	ND	1	5	ng/dry g							
PCB070	NA	ND	1	5	ng/dry g							
PCB074	NA	ND	1	5	ng/dry g							
PCB077	NA	ND	1	5	ng/dry g							
PCB081	NA	ND	1	5	ng/dry g							
PCB087	NA	ND	1	5	ng/dry g							
PCB095	NA	ND	1	5	ng/dry g							
PCB097	NA	ND	1	5	ng/dry g							
PCB099	NA	ND	1	5	ng/dry g							
PCB101	NA	ND	1	5	ng/dry g							
PCB105	NA	ND	1	5	ng/dry g							
PCB110	NA	ND	1	5	ng/dry g							
PCB114	NA	ND	1	5	ng/dry g							
PCB118	NA	ND	1	5	ng/dry g							
PCB119	NA	ND	1	5	ng/dry g							
PCB123	NA	ND	1	5	ng/dry g							
PCB126	NA	ND	1	5	ng/dry g							
PCB128	NA	ND	1	5	ng/dry g							
PCB138	NA	ND	1	5	ng/dry g							
PCB141	NA	ND	1	5	ng/dry g							
PCB149	NA	ND	1	5	ng/dry g							
PCB151	NA	ND	1	5	ng/dry g							
PCB153	NA	ND	1	5	ng/dry g							
PCB156	NA	ND	1	5	ng/dry g							
PCB157	NA	ND	1	5	ng/dry g							
PCB158	NA	ND	1	5	ng/dry g							
PCB167	NA	ND	1	5	ng/dry g							
PCB168+132	NA	ND	1	5	ng/dry g							
PCB169	NA	ND	1	5	ng/dry g							

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS	QA CODE
PCB170	NA	ND	1	5	ng/dry g							
PCB174	NA	ND	1	5	ng/dry g							
PCB177	NA	ND	1	5	ng/dry g							
PCB180	NA	ND	1	5	ng/dry g							
PCB183	NA	ND	1	5	ng/dry g							
PCB187	NA	ND	1	5	ng/dry g							
PCB189	NA	ND	1	5	ng/dry g							
PCB194	NA	ND	1	5	ng/dry g							
PCB195	NA	ND	1	5	ng/dry g							
PCB199(200)	NA	ND	1	5	ng/dry g							
PCB201	NA	ND	1	5	ng/dry g							
PCB206	NA	ND	1	5	ng/dry g							
PCB209	NA	ND	1	5	ng/dry g							

Sample ID: 29125-BS1 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS	QA CODE
PCB003	NA	88.9	1	5	ng/dry g	100	0	89	50 - 150% PASS			
PCB008	NA	88.4	1	5	ng/dry g	100	0	88	50 - 150% PASS			
PCB018	NA	89.4	1	5	ng/dry g	100	0	89	50 - 150% PASS			
PCB028	NA	105.5	1	5	ng/dry g	100	0	105	50 - 150% PASS			
PCB031	NA	58	1	5	ng/dry g	100	0	58	50 - 150% PASS			
PCB033	NA	91.7	1	5	ng/dry g	100	0	92	50 - 150% PASS			
PCB037	NA	98.3	1	5	ng/dry g	100	0	98	50 - 150% PASS			
PCB044	NA	93.1	1	5	ng/dry g	100	0	93	50 - 150% PASS			
PCB049	NA	93.7	1	5	ng/dry g	100	0	94	50 - 150% PASS			
PCB052	NA	95.5	1	5	ng/dry g	100	0	95	50 - 150% PASS			
PCB056(060)	NA	105.6	1	5	ng/dry g	100	0	106	50 - 150% PASS			
PCB066	NA	97.1	1	5	ng/dry g	100	0	97	50 - 150% PASS			
PCB070	NA	100.1	1	5	ng/dry g	100	0	100	50 - 150% PASS			
PCB074	NA	102.4	1	5	ng/dry g	100	0	102	50 - 150% PASS			
PCB077	NA	99.4	1	5	ng/dry g	100	0	99	50 - 150% PASS			
PCB081	NA	104.3	1	5	ng/dry g	100	0	104	50 - 150% PASS			

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS	QA CODE
PCB087	NA	101.9	1	5	ng/dry g	100	0	102	50 - 150%	PASS			
PCB095	NA	94.6	1	5	ng/dry g	100	0	95	50 - 150%	PASS			
PCB097	NA	100	1	5	ng/dry g	100	0	100	50 - 150%	PASS			
PCB099	NA	94.6	1	5	ng/dry g	100	0	95	50 - 150%	PASS			
PCB101	NA	95.3	1	5	ng/dry g	100	0	95	50 - 150%	PASS			
PCB105	NA	94.8	1	5	ng/dry g	100	0	95	50 - 150%	PASS			
PCB110	NA	102.2	1	5	ng/dry g	100	0	102	50 - 150%	PASS			
PCB114	NA	98.4	1	5	ng/dry g	100	0	98	50 - 150%	PASS			
PCB118	NA	105.3	1	5	ng/dry g	100	0	105	50 - 150%	PASS			
PCB119	NA	106.2	1	5	ng/dry g	100	0	106	50 - 150%	PASS			
PCB123	NA	102.3	1	5	ng/dry g	100	0	102	50 - 150%	PASS			
PCB126	NA	98.6	1	5	ng/dry g	100	0	99	50 - 150%	PASS			
PCB128	NA	95.4	1	5	ng/dry g	100	0	95	50 - 150%	PASS			
PCB138	NA	90.3	1	5	ng/dry g	100	0	90	50 - 150%	PASS			
PCB141	NA	96.8	1	5	ng/dry g	100	0	97	50 - 150%	PASS			
PCB149	NA	101	1	5	ng/dry g	100	0	101	50 - 150%	PASS			
PCB151	NA	102.7	1	5	ng/dry g	100	0	103	50 - 150%	PASS			
PCB153	NA	108.8	1	5	ng/dry g	100	0	109	50 - 150%	PASS			
PCB156	NA	106.9	1	5	ng/dry g	100	0	107	50 - 150%	PASS			
PCB157	NA	95.7	1	5	ng/dry g	100	0	96	50 - 150%	PASS			
PCB158	NA	99.7	1	5	ng/dry g	100	0	100	50 - 150%	PASS			
PCB167	NA	99.8	1	5	ng/dry g	100	0	100	50 - 150%	PASS			
PCB168+132	NA	180.7	1	5	ng/dry g	200	0	90	50 - 150%	PASS			
PCB169	NA	112.7	1	5	ng/dry g	100	0	113	50 - 150%	PASS			
PCB170	NA	105.6	1	5	ng/dry g	100	0	106	50 - 150%	PASS			
PCB174	NA	99.7	1	5	ng/dry g	100	0	100	50 - 150%	PASS			
PCB177	NA	100.8	1	5	ng/dry g	100	0	101	50 - 150%	PASS			
PCB180	NA	107.7	1	5	ng/dry g	100	0	108	50 - 150%	PASS			
PCB183	NA	84.9	1	5	ng/dry g	100	0	85	50 - 150%	PASS			
PCB187	NA	91.6	1	5	ng/dry g	100	0	92	50 - 150%	PASS			
PCB189	NA	113.6	1	5	ng/dry g	100	0	114	50 - 150%	PASS			

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB194	NA	117.1	1	5	ng/dry g	100	0	117	50 - 150%	PASS				
PCB195	NA	118.9	1	5	ng/dry g	100	0	119	50 - 150%	PASS				
PCB199(200)	NA	88.2	1	5	ng/dry g	100	0	88	50 - 150%	PASS				
PCB201	NA	103.3	1	5	ng/dry g	100	0	103	50 - 150%	PASS				
PCB206	NA	111.2	1	5	ng/dry g	100	0	111	50 - 150%	PASS				
PCB209	NA	105.6	1	5	ng/dry g	100	0	106	50 - 150%	PASS				

Sample ID: 29125-BS2 **QAQC Procedural Blank** **Matrix: DI Water** **Sampled:** **Received:**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB003	NA	86.8	1	5	ng/dry g	100	0	87	50 - 150%	PASS	2	30	PASS	
PCB008	NA	88.7	1	5	ng/dry g	100	0	89	50 - 150%	PASS	1	30	PASS	
PCB018	NA	96	1	5	ng/dry g	100	0	96	50 - 150%	PASS	8	30	PASS	
PCB028	NA	97.5	1	5	ng/dry g	100	0	98	50 - 150%	PASS	7	30	PASS	
PCB031	NA	88.9	1	5	ng/dry g	100	0	89	50 - 150%	PASS	42	30	FAIL	R
PCB033	NA	91.5	1	5	ng/dry g	100	0	92	50 - 150%	PASS	0	30	PASS	
PCB037	NA	96.2	1	5	ng/dry g	100	0	96	50 - 150%	PASS	2	30	PASS	
PCB044	NA	95.1	1	5	ng/dry g	100	0	95	50 - 150%	PASS	2	30	PASS	
PCB049	NA	95.5	1	5	ng/dry g	100	0	95	50 - 150%	PASS	2	30	PASS	
PCB052	NA	94.4	1	5	ng/dry g	100	0	94	50 - 150%	PASS	2	30	PASS	
PCB056(060)	NA	108.8	1	5	ng/dry g	100	0	109	50 - 150%	PASS	3	30	PASS	
PCB066	NA	97.3	1	5	ng/dry g	100	0	97	50 - 150%	PASS	0	30	PASS	
PCB070	NA	97.8	1	5	ng/dry g	100	0	98	50 - 150%	PASS	2	30	PASS	
PCB074	NA	104.2	1	5	ng/dry g	100	0	104	50 - 150%	PASS	2	30	PASS	
PCB077	NA	100.9	1	5	ng/dry g	100	0	101	50 - 150%	PASS	2	30	PASS	
PCB081	NA	101.2	1	5	ng/dry g	100	0	101	50 - 150%	PASS	3	30	PASS	
PCB087	NA	102.9	1	5	ng/dry g	100	0	103	50 - 150%	PASS	1	30	PASS	
PCB095	NA	99.2	1	5	ng/dry g	100	0	99	50 - 150%	PASS	4	30	PASS	
PCB097	NA	100.3	1	5	ng/dry g	100	0	100	50 - 150%	PASS	0	30	PASS	
PCB099	NA	97.1	1	5	ng/dry g	100	0	97	50 - 150%	PASS	2	30	PASS	
PCB101	NA	94	1	5	ng/dry g	100	0	94	50 - 150%	PASS	1	30	PASS	
PCB105	NA	92.2	1	5	ng/dry g	100	0	92	50 - 150%	PASS	3	30	PASS	
PCB110	NA	100.6	1	5	ng/dry g	100	0	101	50 - 150%	PASS	1	30	PASS	

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB114	NA	100.7	1	5	ng/dry g	100	0	101	50 - 150%	PASS	3	30	PASS	
PCB118	NA	99.9	1	5	ng/dry g	100	0	100	50 - 150%	PASS	5	30	PASS	
PCB119	NA	102.7	1	5	ng/dry g	100	0	103	50 - 150%	PASS	3	30	PASS	
PCB123	NA	101.4	1	5	ng/dry g	100	0	101	50 - 150%	PASS	1	30	PASS	
PCB126	NA	94	1	5	ng/dry g	100	0	94	50 - 150%	PASS	5	30	PASS	
PCB128	NA	96.5	1	5	ng/dry g	100	0	96	50 - 150%	PASS	1	30	PASS	
PCB138	NA	94.1	1	5	ng/dry g	100	0	94	50 - 150%	PASS	4	30	PASS	
PCB141	NA	96.1	1	5	ng/dry g	100	0	96	50 - 150%	PASS	1	30	PASS	
PCB149	NA	96.9	1	5	ng/dry g	100	0	97	50 - 150%	PASS	4	30	PASS	
PCB151	NA	99.5	1	5	ng/dry g	100	0	100	50 - 150%	PASS	3	30	PASS	
PCB153	NA	101.8	1	5	ng/dry g	100	0	102	50 - 150%	PASS	7	30	PASS	
PCB156	NA	102.8	1	5	ng/dry g	100	0	103	50 - 150%	PASS	4	30	PASS	
PCB157	NA	97.8	1	5	ng/dry g	100	0	98	50 - 150%	PASS	2	30	PASS	
PCB158	NA	95.7	1	5	ng/dry g	100	0	96	50 - 150%	PASS	4	30	PASS	
PCB167	NA	99.3	1	5	ng/dry g	100	0	99	50 - 150%	PASS	1	30	PASS	
PCB168+132	NA	183.6	1	5	ng/dry g	200	0	92	50 - 150%	PASS	2	30	PASS	
PCB169	NA	115.2	1	5	ng/dry g	100	0	115	50 - 150%	PASS	2	30	PASS	
PCB170	NA	105.5	1	5	ng/dry g	100	0	105	50 - 150%	PASS	1	30	PASS	
PCB174	NA	99.7	1	5	ng/dry g	100	0	100	50 - 150%	PASS	0	30	PASS	
PCB177	NA	99.6	1	5	ng/dry g	100	0	100	50 - 150%	PASS	1	30	PASS	
PCB180	NA	101.7	1	5	ng/dry g	100	0	102	50 - 150%	PASS	6	30	PASS	
PCB183	NA	84.5	1	5	ng/dry g	100	0	85	50 - 150%	PASS	1	30	PASS	
PCB187	NA	90.7	1	5	ng/dry g	100	0	91	50 - 150%	PASS	1	30	PASS	
PCB189	NA	111.9	1	5	ng/dry g	100	0	112	50 - 150%	PASS	2	30	PASS	
PCB194	NA	103.8	1	5	ng/dry g	100	0	104	50 - 150%	PASS	12	30	PASS	
PCB195	NA	106	1	5	ng/dry g	100	0	106	50 - 150%	PASS	12	30	PASS	
PCB199(200)	NA	83.9	1	5	ng/dry g	100	0	84	50 - 150%	PASS	5	30	PASS	
PCB201	NA	98.3	1	5	ng/dry g	100	0	98	50 - 150%	PASS	5	30	PASS	
PCB206	NA	118.1	1	5	ng/dry g	100	0	118	50 - 150%	PASS	6	30	PASS	
PCB209	NA	108.9	1	5	ng/dry g	100	0	109	50 - 150%	PASS	3	30	PASS	

Sample ID: 29131-MS1 **Boat Ramp Depth 2'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**

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PCB Congeners QUALITY CONTROL REPORT

Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS	QA CODE
PCB003	NA	10.4	1	5	ng/dry g	12.2	0	85	50 - 150%	PASS			
PCB008	NA	10.1	1	5	ng/dry g	12.2	0	83	50 - 150%	PASS			
PCB018	NA	11	1	5	ng/dry g	12.2	0	90	50 - 150%	PASS			
PCB028	NA	12.3	1	5	ng/dry g	12.2	0	101	50 - 150%	PASS			
PCB031	NA	8.8	1	5	ng/dry g	12.2	0	72	50 - 150%	PASS			
PCB033	NA	11.7	1	5	ng/dry g	12.2	0	96	50 - 150%	PASS			
PCB037	NA	11.2	1	5	ng/dry g	12.2	0	92	50 - 150%	PASS			
PCB044	NA	11.3	1	5	ng/dry g	12.2	0	93	50 - 150%	PASS			
PCB049	NA	11.5	1	5	ng/dry g	12.2	0	94	50 - 150%	PASS			
PCB052	NA	11	1	5	ng/dry g	12.2	0	90	50 - 150%	PASS			
PCB056(060)	NA	11.6	1	5	ng/dry g	12.2	0	95	50 - 150%	PASS			
PCB066	NA	11.6	1	5	ng/dry g	12.2	0	95	50 - 150%	PASS			
PCB070	NA	12.2	1	5	ng/dry g	12.2	0	100	50 - 150%	PASS			
PCB074	NA	11.6	1	5	ng/dry g	12.2	0	95	50 - 150%	PASS			
PCB077	NA	12.1	1	5	ng/dry g	12.2	0	99	50 - 150%	PASS			
PCB081	NA	11.9	1	5	ng/dry g	12.2	0	98	50 - 150%	PASS			
PCB087	NA	11.9	1	5	ng/dry g	12.2	0	98	50 - 150%	PASS			
PCB095	NA	12.5	1	5	ng/dry g	12.2	0	102	50 - 150%	PASS			
PCB097	NA	12.9	1	5	ng/dry g	12.2	0	106	50 - 150%	PASS			
PCB099	NA	12.3	1	5	ng/dry g	12.2	0	101	50 - 150%	PASS			
PCB101	NA	12.7	1	5	ng/dry g	12.2	0	104	50 - 150%	PASS			
PCB105	NA	12.7	1	5	ng/dry g	12.2	0	104	50 - 150%	PASS			
PCB110	NA	12.6	1	5	ng/dry g	12.2	0	103	50 - 150%	PASS			
PCB114	NA	11.1	1	5	ng/dry g	12.2	0	91	50 - 150%	PASS			
PCB118	NA	12.9	1	5	ng/dry g	12.2	0	106	50 - 150%	PASS			
PCB119	NA	13.1	1	5	ng/dry g	12.2	0	107	50 - 150%	PASS			
PCB123	NA	12.1	1	5	ng/dry g	12.2	0	99	50 - 150%	PASS			
PCB126	NA	10.1	1	5	ng/dry g	12.2	0	83	50 - 150%	PASS			
PCB128	NA	9.3	1	5	ng/dry g	12.2	0	76	50 - 150%	PASS			
PCB138	NA	9.5	1	5	ng/dry g	12.2	2	61	50 - 150%	PASS			

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB141	NA	10.8	1	5	ng/dry g	12.2	0	89	50 - 150%	PASS				
PCB149	NA	13.3	1	5	ng/dry g	12.2	0.5	105	50 - 150%	PASS				
PCB151	NA	12.6	1	5	ng/dry g	12.2	0	103	50 - 150%	PASS				
PCB153	NA	12.5	1	5	ng/dry g	12.2	0	102	50 - 150%	PASS				
PCB156	NA	10.3	1	5	ng/dry g	12.2	0	84	50 - 150%	PASS				
PCB157	NA	9.8	1	5	ng/dry g	12.2	0	80	50 - 150%	PASS				
PCB158	NA	9.8	1	5	ng/dry g	12.2	0	80	50 - 150%	PASS				
PCB167	NA	10.3	1	5	ng/dry g	12.2	0	84	50 - 150%	PASS				
PCB168+132	NA	21.5	1	5	ng/dry g	24.4	0	88	50 - 150%	PASS				
PCB169	NA	10.3	1	5	ng/dry g	12.2	0	84	50 - 150%	PASS				
PCB170	NA	12.3	1	5	ng/dry g	12.2	0.5	97	50 - 150%	PASS				
PCB174	NA	12	1	5	ng/dry g	12.2	0	98	50 - 150%	PASS				
PCB177	NA	11.9	1	5	ng/dry g	12.2	0	98	50 - 150%	PASS				
PCB180	NA	12.4	1	5	ng/dry g	12.2	0.8	95	50 - 150%	PASS				
PCB183	NA	10.2	1	5	ng/dry g	12.2	0	84	50 - 150%	PASS				
PCB187	NA	12	1	5	ng/dry g	12.2	0	98	50 - 150%	PASS				
PCB189	NA	12.6	1	5	ng/dry g	12.2	0	103	50 - 150%	PASS				
PCB194	NA	13.2	1	5	ng/dry g	12.2	0	108	50 - 150%	PASS				
PCB195	NA	12.5	1	5	ng/dry g	12.2	0	102	50 - 150%	PASS				
PCB199(200)	NA	10.2	1	5	ng/dry g	12.2	0	84	50 - 150%	PASS				
PCB201	NA	12.6	1	5	ng/dry g	12.2	0	103	50 - 150%	PASS				
PCB206	NA	13.2	1	5	ng/dry g	12.2	0	108	50 - 150%	PASS				
PCB209	NA	13	1	5	ng/dry g	12.2	0	107	50 - 150%	PASS				

Sample ID: 29131-MS2 **Boat Ramp Depth 2'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB003	NA	10.4	1	5	ng/dry g	11.5	0	90	50 - 150%	PASS	6	30	PASS	
PCB008	NA	10.2	1	5	ng/dry g	11.5	0	89	50 - 150%	PASS	7	30	PASS	
PCB018	NA	10.9	1	5	ng/dry g	11.5	0	95	50 - 150%	PASS	5	30	PASS	
PCB028	NA	7.7	1	5	ng/dry g	11.5	0	67	50 - 150%	PASS	40	30	FAIL	R
PCB031	NA	7.1	1	5	ng/dry g	11.5	0	62	50 - 150%	PASS	15	30	PASS	
PCB033	NA	11.3	1	5	ng/dry g	11.5	0	98	50 - 150%	PASS	2	30	PASS	

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB037	NA	13.2	1	5	ng/dry g	11.5	0	115	50 - 150%	PASS	22	30	PASS	
PCB044	NA	10.5	1	5	ng/dry g	11.5	0	91	50 - 150%	PASS	2	30	PASS	
PCB049	NA	11.4	1	5	ng/dry g	11.5	0	99	50 - 150%	PASS	5	30	PASS	
PCB052	NA	10.7	1	5	ng/dry g	11.5	0	93	50 - 150%	PASS	3	30	PASS	
PCB056(060)	NA	10.7	1	5	ng/dry g	11.5	0	93	50 - 150%	PASS	2	30	PASS	
PCB066	NA	11.3	1	5	ng/dry g	11.5	0	98	50 - 150%	PASS	3	30	PASS	
PCB070	NA	11.2	1	5	ng/dry g	11.5	0	97	50 - 150%	PASS	3	30	PASS	
PCB074	NA	11.8	1	5	ng/dry g	11.5	0	103	50 - 150%	PASS	8	30	PASS	
PCB077	NA	11	1	5	ng/dry g	11.5	0	96	50 - 150%	PASS	3	30	PASS	
PCB081	NA	11	1	5	ng/dry g	11.5	0	96	50 - 150%	PASS	2	30	PASS	
PCB087	NA	11.5	1	5	ng/dry g	11.5	0	100	50 - 150%	PASS	2	30	PASS	
PCB095	NA	12.3	1	5	ng/dry g	11.5	0	107	50 - 150%	PASS	5	30	PASS	
PCB097	NA	12.2	1	5	ng/dry g	11.5	0	106	50 - 150%	PASS	0	30	PASS	
PCB099	NA	11.6	1	5	ng/dry g	11.5	0	101	50 - 150%	PASS	0	30	PASS	
PCB101	NA	11.9	1	5	ng/dry g	11.5	0	103	50 - 150%	PASS	1	30	PASS	
PCB105	NA	10.5	1	5	ng/dry g	11.5	0	91	50 - 150%	PASS	13	30	PASS	
PCB110	NA	11.5	1	5	ng/dry g	11.5	0	100	50 - 150%	PASS	3	30	PASS	
PCB114	NA	11.1	1	5	ng/dry g	11.5	0	97	50 - 150%	PASS	6	30	PASS	
PCB118	NA	11.9	1	5	ng/dry g	11.5	0	103	50 - 150%	PASS	3	30	PASS	
PCB119	NA	12.4	1	5	ng/dry g	11.5	0	108	50 - 150%	PASS	1	30	PASS	
PCB123	NA	11.8	1	5	ng/dry g	11.5	0	103	50 - 150%	PASS	4	30	PASS	
PCB126	NA	10.2	1	5	ng/dry g	11.5	0	89	50 - 150%	PASS	7	30	PASS	
PCB128	NA	10	1	5	ng/dry g	11.5	0	87	50 - 150%	PASS	13	30	PASS	
PCB138	NA	10.1	1	5	ng/dry g	11.5	2	70	50 - 150%	PASS	14	30	PASS	
PCB141	NA	10.2	1	5	ng/dry g	11.5	0	89	50 - 150%	PASS	0	30	PASS	
PCB149	NA	12.6	1	5	ng/dry g	11.5	0.5	105	50 - 150%	PASS	0	30	PASS	
PCB151	NA	12.7	1	5	ng/dry g	11.5	0	110	50 - 150%	PASS	7	30	PASS	
PCB153	NA	12.5	1	5	ng/dry g	11.5	0	109	50 - 150%	PASS	7	30	PASS	
PCB156	NA	10.8	1	5	ng/dry g	11.5	0	94	50 - 150%	PASS	11	30	PASS	
PCB157	NA	11.6	1	5	ng/dry g	11.5	0	101	50 - 150%	PASS	23	30	PASS	
PCB158	NA	12.2	1	5	ng/dry g	11.5	0	106	50 - 150%	PASS	28	30	PASS	

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PCB Congeners — QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB167	NA	11	1	5	ng/dry g	11.5	0	96	50 - 150%	PASS	13	30	PASS	
PCB168+132	NA	19.4	1	5	ng/dry g	23	0	84	50 - 150%	PASS	5	30	PASS	
PCB169	NA	9	1	5	ng/dry g	11.5	0	78	50 - 150%	PASS	7	30	PASS	
PCB170	NA	10.6	1	5	ng/dry g	11.5	0.5	88	50 - 150%	PASS	10	30	PASS	
PCB174	NA	11.1	1	5	ng/dry g	11.5	0	97	50 - 150%	PASS	1	30	PASS	
PCB177	NA	11.5	1	5	ng/dry g	11.5	0	100	50 - 150%	PASS	2	30	PASS	
PCB180	NA	12.4	1	5	ng/dry g	11.5	0.8	101	50 - 150%	PASS	6	30	PASS	
PCB183	NA	9.4	1	5	ng/dry g	11.5	0	82	50 - 150%	PASS	2	30	PASS	
PCB187	NA	10.4	1	5	ng/dry g	11.5	0	90	50 - 150%	PASS	9	30	PASS	
PCB189	NA	11.5	1	5	ng/dry g	11.5	0	100	50 - 150%	PASS	3	30	PASS	
PCB194	NA	12.8	1	5	ng/dry g	11.5	0	111	50 - 150%	PASS	3	30	PASS	
PCB195	NA	11.7	1	5	ng/dry g	11.5	0	102	50 - 150%	PASS	0	30	PASS	
PCB199(200)	NA	9.3	1	5	ng/dry g	11.5	0	81	50 - 150%	PASS	4	30	PASS	
PCB201	NA	11.5	1	5	ng/dry g	11.5	0	100	50 - 150%	PASS	3	30	PASS	
PCB206	NA	14.3	1	5	ng/dry g	11.5	0	124	50 - 150%	PASS	14	30	PASS	
PCB209	NA	11.5	1	5	ng/dry g	11.5	0	100	50 - 150%	PASS	7	30	PASS	

Sample ID: 29131-R2 **Boat Ramp Depth 2'** **Matrix: Sediment** **Sampled: 04-Aug-14** **Received: 15-Aug-14**
Method: EPA 8270D Batch ID: O-6090 Prepared: 12-Sep-14 Analyzed: 30-Sep-14

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS		PRECISION %	PRECISION LIMITS		QA CODE
PCB003	NA	ND	1	5	ng/dry g						0	30	PASS	
PCB008	NA	ND	1	5	ng/dry g						0	30	PASS	
PCB018	NA	ND	1	5	ng/dry g						0	30	PASS	
PCB028	NA	ND	1	5	ng/dry g						0	30	PASS	
PCB031	NA	ND	1	5	ng/dry g						0	30	PASS	
PCB033	NA	ND	1	5	ng/dry g						0	30	PASS	
PCB037	NA	ND	1	5	ng/dry g						0	30	PASS	
PCB044	NA	ND	1	5	ng/dry g						0	30	PASS	
PCB049	NA	ND	1	5	ng/dry g						0	30	PASS	
PCB052	NA	ND	1	5	ng/dry g						0	30	PASS	
PCB056(060)	NA	ND	1	5	ng/dry g						0	30	PASS	
PCB066	NA	ND	1	5	ng/dry g						0	30	PASS	
PCB070	NA	ND	1	5	ng/dry g						0	30	PASS	

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS		QA CODE
PCB074	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB077	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB081	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB087	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB095	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB097	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB099	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB101	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB105	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB110	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB114	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB118	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB119	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB123	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB126	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB128	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB138	NA	2.2	1	5	ng/dry g					15	30	PASS	J
PCB141	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB149	NA	1	1	5	ng/dry g					0	30	PASS	J
PCB151	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB153	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB156	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB157	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB158	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB167	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB168+132	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB169	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB170	NA	1.1	1	5	ng/dry g					10	30	PASS	J
PCB174	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB177	NA	ND	1	5	ng/dry g					0	30	PASS	
PCB180	NA	1.6	1	5	ng/dry g					46	30	FAIL	J,SL

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PCB Congeners QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	ACCURACY LIMITS	PRECISION %	PRECISION LIMITS	QA CODE
PCB183	NA	ND	1	5	ng/dry g					0	30	PASS
PCB187	NA	ND	1	5	ng/dry g					0	30	PASS
PCB189	NA	ND	1	5	ng/dry g					0	30	PASS
PCB194	NA	ND	1	5	ng/dry g					0	30	PASS
PCB195	NA	ND	1	5	ng/dry g					0	30	PASS
PCB199(200)	NA	ND	1	5	ng/dry g					0	30	PASS
PCB201	NA	ND	1	5	ng/dry g					0	30	PASS
PCB206	NA	ND	1	5	ng/dry g					0	30	PASS
PCB209	NA	ND	1	5	ng/dry g					0	30	PASS

CHAIN OF CUSTODY

ENVIRONMENTAL LABORATORIES, INC.

Innovative Solutions for Nature

Rich Hanken

From: Brady Daniels <BDaniels@aspeneg.com>
Sent: Wednesday, August 27, 2014 8:55 AM
To: Rich Hanken
Subject: RE: Aspen - Fish & Soil?

Rich, I approve the methods proposed for testing if the eleven soil samples.

Thank you
Brady Daniels

Sent from my Android phone using TouchDown (www.nitrodesk.com)

-----Original Message-----
From: Rich Hanken [RichHanken@physislabs.com]
Received: Tuesday, 26 Aug 2014, 1:58PM
To: Brady Daniels [BDaniels@aspeneg.com]
CC: Misty Mercier [MistyMercier@physislabs.com]
Subject: RE: Aspen - Fish & Soil?

Brady,

Thank you.

Since you said you will be remotely for the next several weeks I threw together a COC for those 11 soil/sediment samples, since we are still missing that COC.

I attached the COC and will you be able to review it (this is an excel version just in case you want to make any changes) and either sign it and sent it back to us or if that isn't possible maybe you can just review it and then send back an e-mail Ok'ing the 11 samples being done for:

- Percent Solids
- Mercury
- PCBs
- OCPs

Of course let me know if there is someone else who can speak for you while you are away, if that is easier for you.

Please let me know if you have any questions.

Thank you,

Rich

Richard G. Hanken
Business Manager - Project Integrator
(714) 602-5320 ext. 212
Richhanken@physislabs.com

From: Brady Daniels [mailto:BDaniels@aspeneg.com]
Sent: Tuesday, August 26, 2014 9:21 AM
To: Rich Hanken
Subject: RE: Aspen - Fish & Soil?

Rich,

I'm working remotely for the next several weeks.

You are correct on the catfish, and all sampling methods for the fish and soil.

Billing address is the agoura hills office.
I will get contact for our accounting representative to you today.

Thank you

Sent from my Android phone using TouchDown (www.nitrodesk.com)

-----Original Message-----
From: Rich Hanken [RichHanken@physislabs.com]
Received: Tuesday, 26 Aug 2014, 9:57AM
To: Brady Daniels [BDaniels@aspeneg.com]
CC: Misty Mercier [MistyMercier@physislabs.com]
Subject: RE: Aspen - Fish & Soil?

Hi Brady,

We are still waiting to resolve a few questions (below in the e-mail).

Please answer the below questions as soon as possible and let us know if you have any questions.

Thank you,

Rich

Richard G. Hanken
Business Manager - Project Integrator
(714) 602-5320 ext. 212
Richhanken@physislabs.com

From: Rich Hanken
Sent: Wednesday, August 20, 2014 9:13 AM
To: 'Brady Daniels'
Cc: MistyMercier@Physislabs.com; project managers
Subject: Aspen - Fish & Soil?

Hello Brady,

I just wanted to remind you that we haven't received the second COC for the soil samples yet. Can you scan it and send it our way?

I also have a few quick questions.

1. The fish COC says "one whole bass sample, one bass skinless fillet, one gold fish skinless fillet, and one bass skinless fillet". – the last skinless bass is the 3rd bass so it is really the skinless white catfish, right?
2. There are no analyses on the COC for the Fish so can I go off the analyses that you were talking with Misty about?
    a. Mercury
    b. Organochlorine Pesticides (includes those legacy pesticides like the DDTs).
    c. PCB Congeners
3. Do you want anything else analyzed?
4. Are these analyses the same for the soil samples?
5. Can you give me the billing information (which is - who will be billed, their address, e-mail and phone number, etc..)

Please let me know if you have any questions.

Thanks,

Rich

Richard G. Hanken
Business Manager - Project Integrator
(714) 602-5320 ext. 212
Richhanken@physislabs.com

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PHYSIS ENVIRONMENTAL LABORATORIES, INC.

CHAIN of CUSTODY

COMPANY NAME: Aspen Enviornmental Group
EMAIL: Bdaniels@aspeneg.com
PROJECT NAME / NUMBER: Little Rock 1116.02
COC PAGE: 2 of 2

PROJECT MANAGER: Negar Vahidi
FAX:
PO #:
PHYSIS SOS #:
TYPE OF ICE USED: ☑ WET ☐ BLUE ☐ DRY

COMPANY ADDRESS: 5020 Chesebro Road, Suite 200, Agoura Hills, CA 91301
PHONE: 818-338-6625 office; 805-878-5958 cell
SAMPLED BY: Brady Daniels, Justin Wood
SHIPPED VIA: ☑ FEDEX ☐ UPS ☐ USPS ☐ Client ☐ Physis ☐ other

TURNAROUND TIME: ☑ STANDARD (15-20 business days) ☐ RUSH business days

REPORT FORMAT: ☐ I ☐ SWAMP EDD ☐ other

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PHYSIS PDF/EDD

PHYSIS MATRIX CODES
SW = seawater FW = freshwater RW = rainwater
WW = wastewater DW = drinking water
S = sediment T = tissue E = extract O = other (specify)

REQUESTED ANALYSES
PLEASE SEE PHYSIS SOS

	SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE date	time	physis matrix code	# of bottles	Percent Solids	PCB Congeners	Organochlorine Pesticides	Mercury
1	L.R. Rocky Pt.	Surface	8/4/14		S	1	x	x	x	x
2	L.R. Rocky Pt.	Depth 1'	8/4/14		S	1	x	x	x	x
3	Boat Ramp	Surface	8/4/14		S	1	x	x	x	x
4	Boat Ramp	Depth 2'	8/4/14		S	1	x	x	x	x
5	Fishermans Pt	Surface	8/4/14		S	1	x	x	x	x
6	Fishermans Pt.	Depth 2'	8/4/14		S	1	x	x	x	x
7	Little Rock Drainage	Surface	8/4/14		S	1	x	x	x	x
8	LR & Santiago Above	Depth 1'	8/4/14		S	1	x	x	x	x
9	Waters Edge	Surface	8/5/14		S	1	x	x	x	x
10	Waters Edge	Depth 2'	8/5/14		S	1	x	x	x	x
11	Below Dam	Surface	8/5/14		S	1	x	x	x	x

RELINQUISHED BY print	signature	company	date & time	RECEIVED BY print	signature	company	date & time

PHYSIS
TERRA FAUNA FLORA AQUA AURA
ENVIRONMENTAL LABORATORIES, INC.

CHAIN of CUSTODY

COMPANY NAME: Aspen Environmental Group	EMAIL: Bdaniels@aspeneg.com	PROJECT NAME / NUMBER: Little Rock 1116.02	COC PAGE: 1 of
PROJECT MANAGER: Negar Vahidi	FAX:	PO #: PHYSIS SOS #:	TYPE OF ICE USED: ☑ WET ☑ BLUE ☐ DRY
COMPANY ADDRESS: 5020 Chesebro Road, Suite 200 Agoura Hills, CA 91301	PHONE: 818 338-6625 office; 805-878-5958 cell	SAMPLED BY: Brady Daniels, Justin Wood	SHIPPED VIA: ☑ FEDEX ☐ UPS ☐ USPS ☐ Client ☐ Physis ☐ other

TURNAROUND TIME: ☑ STANDARD (15-20 business days) ☐ RUSH business days

REPORT FORMAT: ☐ PHYSIS PDF/EDD ☐ SWAMP EDD ☐ other

SPECIAL INSTRUCTIONS:
All of the fish are currently frozen whole fish. We would like one whole bass sample, one bass skinless fillet, one gold fish skinless fillet, and one bass skinless fillet.

PHYSIS MATRIX CODES
SW = seawater **FW** = freshwater **RW** = rainwater
WW = wastewater **DW** = drinking water
S = sediment **T** = tissue **E** = extract **O** = other (specify)

REQUESTED ANALYSES
PLEASE SEE PHYSIS SOS

	SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE date	SAMPLE time	physis matrix code	# of bottles
1	Bass 1	whole bass	8/4/14	15:30	FW	fish
2	Bass 2	whole bass	8/4/14	15:30	FW	
3	goldfish	whole fish	8/4/14	15:30	FW	
4	white catfish whole fish	whole fish	8/4/14	15:30	FW	
5						
6						
7						
8						
9						
10						

RELINQUISHED BY print	signature	company	date & time	RECEIVED BY print	signature	company	date & time
Brady Daniels	[signature]	Aspen	8-14-14	Richard Hanker	[signature]	Physis	8/15/14 930

PHYSIS
TERRA FAUNA FLORA AQUA AURA
ENVIRONMENTAL LABORATORIES, INC.

PHYSIS PROJECT ID
1407007-001

SAMPLE RECEIPT SUMMARY

CLIENT: Aspen
Date Received: Aug 15, 2014
Received By: RGH
Inspected By: RGH

COURIER

☐ PHYSIS ☐ CLIENT ☑ FEDEX ☐ UPS
start ____ end ____ ☐ OTHER: ____

COOLER

☑ COOLER ☐ BOX total # 2
☐ OTHER: ____

TEMPERATURE

1.5 °C
☐ WET ICE ☑ BLUE ICE
☐ DRY ICE ☐ NONE

SAMPLE INTEGRITY UPON RECEIPT

1. COC(s) included and completely filled out........ YES
2. All sample containers arrived intact........ YES
3. All samples listed on COC(s) are present........ YES
4. Information on containers consistent with information on COC(s)........ YES
5. Correct containers and volume for all analyses indicated........ YES
6. All samples received within method holding time........ YES
7. Correct preservation used for all analyses indicated........ YES
8. Name of sampler included on COC(s)........ YES

NOTES

Reset Form

1904 E. Wright Circle, Anaheim CA 92806
(714) 602-5320 main / (714) 602-5321 fax

Print Form

APPENDIX D - SUMMARY OF ANALYTICAL REPORT FOR LITTLEROCK RESERVOIR SAMPLES

Both sediments and fish tissue from Littlerock Reservoir were sampled on August 4, 2014. Fifteen samples, including 11 sediment samples and 4 fish tissue samples, were collected and analyzed for the presence of mercury, chlorinated pesticides, and PCB congeners. The sampling results contained in the analytical report are summarized below. Where appropriate, these results are analyzed in relation to their potential impact on the affected environment.

Sediment

For chlorinated pesticides (including DDT), no analyte was detected at or above the method detection limit (MDL). For PCB congeners, one analyte (PCB138) was detected in three of the 11 samples. However, the amount of PCB138 that was detected is extremely small. The three sample results range from 1.1 to 1.9 parts per billion (ppb). The MDL for this analyte is 1.0 ppb, and the reporting limit (RL) is 5.0 ppb. Because the three positive results for PCB138 in sediment all fall below the RL, the values reported are estimates. All 11 sediment samples tested positive for the presence of mercury. Mercury was analyzed as total mercury (Hg), and the element was not speciated in this analysis. Therefore, it is unknown what percentage of this mercury is organic mercury versus methylmercury. The sample results range from 0.0032 to 0.0213 parts per million (ppm). The Agency for Toxic Substances and Disease Registry reports that normal levels of mercury in soil range from 0.02 to 0.625 ppm (ATSDR, 1999). All but one of the sediment sample results fall below the lower value of this range, and the one result that falls within this range lies at the extreme lower end of the range. A recent peer-reviewed synthesis study defined a critical upper limit for mercury in soils below which 95% of the 52 species sampled (including plants, animals, and microbes) would be unharmed by chronic exposure. This limit was found to be 0.13 ppm (Tipping et al, 2010). All 11 sediment sampling results are roughly an order of magnitude below this critical upper limit.

Fish Tissue

For chlorinated pesticides, all four fish tissue samples tested positive for several analytes, including: 2,4'-DDT; 4,4'-DDD; 4,4'-DDE; Chlordane-alpha; Chlordane-gamma; cis-Nonachlor; and trans-Nonachlor. In addition to the analytes listed above, the goldfish tested positive for Hexachlorobenzene. With the exception of the goldfish, only the results for DDT, DDD, and DDE exceed the reporting limit. The highest reported values were found in the goldfish, which contained 146.2 ppb of 2,4'-DDT and 230.9 ppb of 4,4'-DDT. All four fish tissue samples tested positive for PCB congeners. However, with the exception of several positive analytes in the goldfish and one analyte (PCB138) in one of the bass, all results fell below the reporting limit. PCB138 in one of the bass was just barely above the reporting limit (5.1 ppb for a RL of 5.0 ppb). The highest level of pollutant in the goldfish was 32.9 ppb for PCB138. All four fish tissue samples tested positive for mercury. The results range from 0.3644 to 0.6601 ppm. The highest values were found in the bass. The EPA and FDA require that fish sold across state lines contain less than 1.0 ppm of mercury (ATSDR, 1999). All four samples fall below this level. The USEPA Office of Environmental Health Hazard Assessment has recently provided Advisory Tissue Levels for contaminants in fish intended for human consumption. These levels are expressed in parts per billion, and are listed in the table below. In order to allow for direct comparison, the sampling results for mercury are provided here in ppb, and range from 364.4 to 660.1. The level of mercury detected in both bass samples exceeds the "No Consumption" limit for children and women of child-bearing age (OEHHA, 2009).

Advisory Tissue Levels (ATLs) for PCBs, DDTs, and Methylmercury Based on Cancer or Non-Cancer Risk Using an 8-Ounce Serving Size (Prior to Cooking) (ppb, wet weight)				
Contaminant	Three 8-ounce Servings* a Week	Two 8-ounce Servings* a Week	One 8-ounce Servings* a Week	No Consumption
DDTs	≤520	>520-1,000	>1,000-2,100	>2,100
Methylmercury (Women aged 18-45 years and children aged 1-17 years)	≤70	>70-150	>150-440	>440
Methylmercury (Women over 45-years and men)	≤220	>220-440	>440-1,310	>1,310
PCBs	≤21	>21-42	>42-120	>120

*Serving sizes are based on an average 160 pound person. Individuals weighing less than 160 pounds should eat proportionately smaller amounts (for example, individuals weighing 80 pounds should eat one 4-ounce serving a week when the table recommends eating one 8-ounce serving a week).

Conclusions

The sampling results show that the sediment in Littlerock Reservoir is mostly free of contaminants, and that in cases where a contaminant was detected, the level of contamination is extremely low. Compared to the sediment, the fish tissue samples show a larger number of contaminants and at higher levels. The pathway for contamination of these fish remains unknown.

ATSDR (Agency for Toxic Substances and Disease Registry). 1999. Toxicological profile for Mercury. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

OEHHA (Office of Environmental Health Hazard Assessment, USEPA). 2009. Health Advisory and Safe Eating Guidelines for Fish from Coastal Areas of Southern California: Ventura Harbor to San Mateo Point. [online]: http://oehha.ca.gov/fish/so_cal/pdf_zip/SoCalAdvisoryl61809.pdf. Accessed 9 October 2014.

Tipping, E, et al, Critical Limits for Hg(II) in soils, derived from chronic toxicity data, Environmental Pollution (2010), doi:10.1016/j.envpol.2010.03.027

Appendix E

Scoping Summary Report

Aspen Environmental Group

PROJECT MEMORANDUM

5020 Chesebro Road, Suite 200, Agoura Hills, CA 91301-2285
Tel. 818-597-3407, Fax 818-597-8001, www.aspeneg.com

Date: April 23, 2014
To: **Matt Knudson**, Assistant General Manager
Palmdale Water District
From: **Sandra Alarcón-Lopez**, Public Involvement Specialist
Aspen Environmental Group

Subject: Littlerock Sediment Removal Project EIR/EIS Scoping Process

The Littlerock Sediment Removal Project (LRSP) EIR/EIS Scoping process commenced on March 7, 2014 and ended on April 15, 2014. The purpose of this memorandum is to summarize the activities related to the scoping process conducted for the Littlerock Sediment Removal Project EIR/EIS. All activities are listed with associated dates of distribution/filing/publication, as applicable. In addition, all documents prepared as part of the scoping process are attached to this memorandum.

PROJECT MAILING LIST

The project mailing list was formulated using the lists of names and addresses provided by the Palmdale Water District and the USDA, Forest Service, Angeles National Forest (Forest Service).

At the start of scoping, the mailing list included over 1,000 entries. The mailing list was updated to include addresses obtained at the public scoping meeting and to remove or correct contact names/addresses based on the mailing of the Notice of Preparation.

NOTICE OF PREPARATION

Notice of Preparation/Notice of Intent

- Palmdale Water District (PWD) published the CEQA Notice of Preparation (NOP) on March 7, 2014 (SCH#:2005061171).
- 15 Copies of the NOP were sent to the State Clearinghouse via overnight mail commencing the CEQA 30-day public scoping period (March 7 through April 15).
- The NOP was distributed via certified mail to a total of 18 addresses consisting of State and county agencies on March 10, 2014.

Notice of Intent

- The USDA, Forest Service published the Notice of Intent (NOI) in the Federal Register on March 19, 2014, commencing the NEPA public scoping comment period.

NOTICES

Public Scoping Meeting Notice

- The NOP was mailed to 1,004 interest groups and property owners on March 10, 2014 to announce the public scoping meeting and to provide background information regarding the project.

Newspaper Advertisements

A newspaper advertisement (Attachment 1) was published in the following newspapers:

- Acton Agua Dulce News – Monday, March 10

- Antelope Valley Press – Wednesday, March 12
- LA Daily News – Wednesday, March 12
- Antelope Valley Journal – Friday, March 14
- Country Journal – Saturday, March 15

PUBLIC SCOPING MEETING

A public scoping meeting was conducted on March 25, 2014 at 7:00 p.m. The meeting was held at the PWD's Boardroom. A number of informational materials were made available to meeting attendees, including:

- Meeting Sign-in Sheet
- NOP with Meeting Notice (seven-page mailer) in both English and Spanish
- Four Poster Boards (Littlerock sediment removal area, CEQA-NEPA process, Project Overview and Grade Control Structure, and Public Involvement During Scoping)
- Meeting Agenda
- Scoping Comment Form

Representatives of the PWD and the USDA, Forest Service attended the meeting. No members of the public attended the meeting despite the direct mail notice to over 1,000 property owners, interest groups, and organizations, and publication of a newspaper notice in five different newspapers on varying dates. However, a representative of a local newspaper attended the meeting and as a result two articles were published in the Antelope Valley Press regarding the project.[1]

SCOPING RELATED MATERIALS

The following scoping-related documents and materials are provided in Attachment 1 to this memorandum for your records:

- NOP
- NOI (Federal Register)
- Newspaper Advertisements (proof of publication)
- Meeting Agenda
- Meeting Sign-In Sheet
- Poster Boards
- Scoping Comment Form

SUMMARY OF PUBLIC COMMENTS RECEIVED

The information below summarizes the written scoping comments received for the LSRP. Attachment 2 includes a copy of these comment letters for your records.

<u>Comment Letter Received Prior to Public Scoping Period</u>

Littlerock Lake Resort, Richard A. Cooper, Proprietor

- Mr. Cooper purchased the business at Littlerock Dam seven plus years ago and cannot complete a USDA Forest Service request for his company's business plan due to the projected sediment removal project and related Littlerock Dam closure. He is requesting continuing information on the status of the project.

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[1] Alisha Semchuck. 2014. *"Officials air plan to dredge dam sediment."* Antelope Valley Press. Thursday, March 27, 2014. Valley Press staff and wire services. 2014. "Feds ponder changing arroyo toad protection." Antelope Valley Press. Thursday, March 27, 2014.

Comment Letters Received During Public Scoping Period

Department of the Army Los Angeles District, U.S. Army Corps of Engineers – Sherry Bellini, Regulatory Assistant

- Commenter noted that the activity may require a USACE permit and provided the link (http://www.usace.army.mil/Portals/2/docs/civilworks/permitapplication.pdf) to access the permit application on the USACE website.

Native American Heritage Commission – Dave Singleton, Program Analyst

- Commenter requests that any archaeological activity be coordinated with the NAHC if possible.
- Commenter suggests submitting the report to the planning department with site forms, site significance and mitigation measures.
- Information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum not available to the public.
- The letter includes a contact list of appropriate Native American Contacts for consultation.
- The commenter suggests that lead agencies consider avoidance of sacred sites and if not possible include mitigation and monitoring plans pursuant to California Public Resources Code Section 21083.2 in consultation with affiliated Native Americans. This should also include a provision for discovery of Native American human remains in the mitigation plan.

Transportation and Infrastructure Committee, Subcommittee on Water Resources and the Environment – David L. Wenger, Senior Staff

- Commenter would like additional information on the project. The Committee is working in a cooperative effort with other federal, county and city entities to create additional water storage space in Southern California.

California Regional Water Quality Control Board, Lahontan Region – Thomas Suk, Senior Environment Scientist

- Commenter provided the March 24, 2014 California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) fish consumption advisory and safe eating guidelines for Littlerock reservoir. A link was also provided for advisories and supporting documents at: http://www.oehha.ca.gov/fish/so cal/Littlerock.html.

California Department of Fish and Wildlife, South Coast Region – Betty J. Courtney, Environmental Program Manager

- Commenter requests that EIR/EIS include information regarding sensitive plants, fish and wildlife.
- Commenter includes specific comments on addressing the Least Bells' Vireo and provides general comments on the type of information to be considered in the project description and alternatives as well as the impact assessment.
- The commenter requests a thorough, recent floristic assessment and an inventory of rare, threatened and endangered and other sensitive species on site and within the area of potential effect.
- Commenter requests measures for avoiding impacts to nesting birds and requests restoration and re-vegetation plans as well as other measures and requirements.

California Regional Water Quality Control Board, Lahontan Region – Jan M. Zimmerman, PG Engineering Geologist

- The EIR/EIS:
  – Must evaluate known elevated concentrations of mercury and polychlorinated biphenyls at reservoir;
  – Should consider eco-friendly alternatives to stabilize the banks and channel at Littlerock Creek;

- Should provide a detailed account of the baseline conditions that will be established by the project; and
- Should include a discussion of the proposed long-term maintenance plan to maintain the established baseline conditions.

Los Angeles County Department of Public Works - Andrew Ngumba, Traffic and Lighting Division and Juan Sarda, Land Development Division

- The County requests a traffic impact analysis with Traffic Index calculations for their review and approval.

City of Palmdale – Chuck Heffernan, Director of Development Services

- Commenter requests a traffic impact study to address the impacts of additional trips from this project on the City street network.
- The City will require a temporary use permit for stockpiling.
- Commenter indicates that Alternative 1, Long Term Closure of the Reservoir, in the NOP does not specify where the sediment will be transported. The method of sediment disposal must be included as part of Alternative 1.
- Commenter notes under Alternative 2, regarding disposal of sediment within existing mining operations, that those operations require a Conditional Use Permit from the City. In addition, the Office of Mine and Reclamation must be notified of any major modification to the approved Reclamation Plan(s). If slurry pipelines are utilized, an encroachment permit will also be required.
- To ensure project success, commenter requests that the City be allowed to work closely with the lead agencies on this project.

Fernandeno Tataviam Band of Mission Indians Tribal Historic & Cultural Preservation – Caitlin B. Gulley, Tribal Historic and Cultural Preservation

- Commenter requests inclusion as a consultant if the project is within traditional Tataviam tribal lands.

Soboba Band of Luiseno Indians – Joseph Ontiveros, Director of Cultural Resources

- Commenter has no specific concerns at this time; deferring to other tribes located closer to the project area. However, he would like an opportunity to participate in any tribal consultation process.

R. Indigenous Consultants Tribal Monitoring LLC, Randy Guzman-Folkes

- Commenter would like an opportunity to participate in any tribal consultation process.

Residents of 43rd Street East- Crystal Chavez, Arturo Castaneda, Louise Williams, Cathy Hunt, Ann Salaun Rondou and Ruth E. Ybarra

- These property owners are worried about a potential health risk from Valley Fever. They cite concerns over the potential release of *Coccidioidomycosis* spores from the dried removed sediment being released into the air from dust events. They would like additional information and are asking if another deposit site is available that is not located near populated residential areas.

Attachment 1
Scoping-Related Materials

1. NOP – March 7, 2014

2. Notice of Intent and Federal Filing – March 19, 2014

3. Newspaper Advertisements

    - Acton Agua Dulce News - March 10, 2014
    - Antelope Valley Press - March 12, 2014
    - LA Daily News - March 12, 2014
    - Antelope Valley Journal - March 14, 2014
    - Country Journal - March 15, 2014

4. Meeting Agenda - March 25, 2014

5. Meeting Sign-in Sheet - March 25, 2014

6. Comment Form

Notice of Preparation

Of a Joint Environmental Impact Report/Environmental Impact Statement

And

Notice of Public Scoping Meeting/Request for Comments

On the Preparation of an Environmental Impact Report/Environmental Impact Statement

For the

Littlerock Reservoir Sediment Removal Project

March 7, 2014

TO: All Interested Parties

Si usted necesita una copia de este documento en español u otra información por favor envíe un mensaje electrónico a salopez@aspeneg.com.

Subject

The Palmdale Water District (District) and the United States Forest Service, Angeles National Forest (ANF) will direct the preparation of a joint Environmental Impact Report (EIR) and an Environmental Impact Statement (EIS) referred to as an EIR/EIS for the Littlerock Reservoir Sediment Removal Project proposed by the District. Aspen Environmental Group (Aspen), a third-party contractor, under the direction of the District, as the lead agency under California law, and the U.S. Forest Service, ANF, as the federal lead agency will prepare a Draft and Final EIR/EIS to comply with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

Summary of the Proposed Project

The Littlerock Dam and Reservoir (Reservoir) are located on Littlerock Creek below the confluence of Santiago Canyon on National Forest System lands (managed by the Angeles National Forest). The Reservoir is owned by the District, serving as a flood control facility and storage of water for agricultural and municipal water supply. Please refer to Figure 1 for a map of the proposed project area. The Reservoir:

- Serves as source of water supply storage;
- Is a recreational use area;
- Provides debris control; and
- Provides flood protection for downstream areas.

Littlerock Creek, which supplies water to the Reservoir, is a perennial stream supported by annual rainfall and snowmelt from the nearby slope of Mount Williamson. Inflow to Littlerock Reservoir is seasonal and varies widely from year to year depending on stream flows and snow melt from the Angeles National Forest.

During seasonal inflow of stormwater and snowmelt, sediment has been accumulating within the Reservoir. The Reservoir has a 1992 water storage capacity of 3,500 acre-feet. This capacity has been substantially reduced over time by the deposition of sediment behind the Dam. Current calculations conducted by the District indicate that Reservoir water storage has been reduced to 2,584 acre-feet due to annual sediment accumulation. The District is authorized to divert 5,500 acre-feet of water annually from the Reservoir.

Proposed Project Description

The proposed project would:

- Construct a grade control structure to prevent sediment loss and head cutting of the stream channel upstream of Rocky Point to preserve critical habitat and prevent impacts to the federally endangered arroyo toad;
- Remove excess reservoir sediment that has accumulated over time and to restore the Reservoir to 1992 design water storage and flood control capacity; and
- Maintain 1992 design capacity of the Reservoir.

Grade Control Structure

A grade control structure would be constructed at an area known as Rocky Point to prevent continued upstream head cutting and preserve critical habitat for the arroyo toad. The structure would be buried, with the top flush with, or slightly below, the existing channel surface. This mostly subterranean soil cement structure would span approximately 260 feet of channel (bank to bank) just downstream of Rocky Point. The maximum depth of the structure would be approximately 80 feet underground. The subterranean portion of the structure would extend downstream approximately 200 feet (in a downward stair-step design). Because the grade control structure would be constructed below grade, only the top or upper lip of the structure at the greatest point upstream would be visible when the Reservoir water level is lowered.

Sediment Removal

Upon completion of the grade control structure, the District would remove approximately 1,000,000 cubic yards of sediment, and then remove annual accumulations of sediment to restore and maintain the Reservoir to its 1992 design capacity. Temporary annual closure of the Reservoir for sediment removal activities would occur after Labor Day (with the Reservoir lowered to dead pool level) until seasonal water refill of the Reservoir suspends removal efforts (estimated between mid- November and January). The Reservoir would be closed to the public during this period. Excavation would occur just upstream of Littlerock Dam and extend approximately 3,700 feet upstream. The District's contractor would load sediment on a truck and transport it offsite to District-owned properties or locations accepting sediment for placement and spreading (disposal). These properties would be located within, or in close proximity to, the city of Palmdale. The District would seek reuse of the sediment on an annual basis prior to permanent disposal.

Annual Construction and Restoration Activities

All grade control structure construction and annual sediment removal activities would utilize Best Management Practices (BMPs) and be conducted with all required permits and approvals. Annual restoration efforts would begin immediately following the cessation of sediment removal activities and would be completed prior to opening the Reservoir to public access. Disturbed areas outside the excavated portion of the reservoir bed would be returned to pre-construction conditions or better. Native, locally collected seed mixtures and container plant material would be planted in areas that previously contained vegetation disturbed during construction of the grade control structure and sediment removal activities. At the completion of annual sediment removal activities, the District's contractor would remove all debris and repair to pre-construction conditions or better any damage to existing paved parking areas, access roads, and travel paths demonstrable to sediment removal activities.

Possible Alternatives

The District and the Forest Service have identified preliminary alternatives for consideration in the scoping process. The alternatives currently under consideration are:

- **No Project Alternative:** Under the No Project Alternative, sediment removal would not occur and sediment would continue to accumulate upstream of Littlerock Dam. In addition, no grade control structure would be built. Because no project activities would occur, the Reservoir capacity would be reduced by approximately 44 acre-feet annually. In the long term, Littlerock Reservoir would fill with sediment, entirely eliminating its flood control and water storage capacity.
- **Alternative 1 – Long-Term Closure of the Reservoir:** Under this alternative, the Reservoir would be closed year-round to the public until the District excavates and removes sediment to the maximum extent feasible to achieve 1992 design storage capacity. Once Reservoir capacity has been restored, the Reservoir would open for public use, but would be closed annually after Labor Day until seasonal water refill of the Reservoir occurs (estimated between mid- November and January) to accommodate annual sediment removal necessary to maintain Reservoir storage capacity.
- **Alternative 2 – Slurry Excavation:** Under this alternative, a slurry line would be constructed to transport dredged sediment to an off-site disposal location. Under this alternative, it is assumed transported sediment would be disposed at exhausted quarry pits within Palmdale along Avenue T, approximately 6-miles northeast of the Reservoir. This alternative would require a slurry pipeline and water return pipeline (each approximately 6-10 miles long) be constructed between the Reservoir and quarries. Preliminary analysis has indicated that sediment stockpile and processing, and water collection/pumping facilities would also be required at the quarry site(s). The feasibility of long-term agreements with quarry operators and storage capacities of the quarries to accommodate this alternative is unknown at this time.

Because of the potential significant impacts on the environment, an initial study was not prepared and the District and ANF will prepare an EIR/EIS. Note that this Notice of Preparation (NOP), and all future project-related documents are available for review at the following locations:

Palmdale Water District 2029 East Avenue Q Palmdale, CA 93550 (661) 947-4111 Hours: 8 a.m. to 5 pm. (Monday through Friday)	**USFS, Angeles National Forest Santa Clara/Mojave Rivers Ranger District** 33708 Crown Valley Road Acton, CA 93510 (661) 296-2808 Hours: 8 a.m. to 4:30 pm. (Monday through Friday)	**Angeles National Forest Supervisor's Office** 701 N Santa Anita Ave. Arcadia, CA 91006 (626) 574-1613 Hours: 8 a.m. to 4:30 pm. (Monday through Friday)

The EIR/EIS Process

As indicated in the project description, the proposed project is located on land administered by the ANF. Thus, the District would require a special use authorization from the ANF. In order to consider issuance of this permit, and based on the proposed project's potential impacts, ANF will prepare an EIS pursuant to NEPA requirements. CEQA requires District to take into account the environmental impacts that could result from the proposed project, necessitating preparation of an EIR. Based on these requirements, a joint EIR/EIS will be prepared under the direction of both agencies to satisfy the permitting and decision-making requirements of each agency prior to project approval. CEQA and NEPA also require that the EIR/EIS development process include public notice of the proposed project and address concerns that the public may have about the proposed project.

The analysis of the proposed project will result in the publication of a Draft EIR/EIS and a Final EIR/EIS. A minimum of 45 days (as required by federal NEPA regulations) will be allocated for the review and comment period of the Draft EIR/EIS. A notice of availability of the Draft EIR/EIS will be sent to the State Clearinghouse by the District and to the Federal Register by the ANF. The District and ANF will consider all comments on the Draft EIR/EIS and revise the document, as necessary, before issuing a Final EIR/EIS. The Final EIR/EIS will include responses to the comments received on the Draft EIR/EIS.

Proposed Scope of the EIR/EIS

The EIR/EIS will present the analysis of the environmental impacts of the proposed project and comparative environmental effects of the alternatives, and will identify mitigation measures for potentially significant impacts.

The EIR/EIS will address all issue areas for which potential significant impacts are anticipated. These issue areas include:

- **Air Quality.** Construction and operation emissions and effects, including the effects of on-site exhaust emissions from heavy-duty diesel and gasoline-powered construction equipment and the fugitive particulate matter from soil disturbing operations and sediment removal activities.

- **Biological Resources**. Effects on native habitat that supports sensitive species including the federally endangered arroyo toad (*Bufo californicus*) and the Forest Service Sensitive and State Species of Special Concern two-striped garter snake (*Thamnophis hammondii*); impacts to vegetation and wildlife habitat; impacts to riparian habitat above and below the reservoir, including Mojave riparian forest and southern sycamore alder riparian woodland, due to construction activities; and effects of noise and disturbance on nesting and foraging wildlife species.

- **Cultural Resources**. Sediment removal and construction activities effects on recorded cultural resources sites and unknown sites that may exist in the area of the proposed project and alternatives.

- **Land Use and Public Recreation.** Construction and operational effects on adjacent land uses and recreational resources of the Littlerock Recreation Area; potential preclusion of onsite uses; and access disruptions.

- **Traffic**. Effects of heavy-duty truck traffic from construction and sediment removal activities on travel and traffic lanes, driveways, access points, service vehicles, and recreational resources.

- **Water Resources.** Impacts to reservoir and production water quality; erosion and sedimentation; hydrological impacts; storm water runoff and flooding; impacts timing and duration; and cumulative effects of the proposed project with other related projects in the area.

Project Scoping Process and Scoping Meeting

The EIR/EIS on the proposed Littlerock Reservoir Sediment Removal Project will focus on significant environmental effects. The process of determining the focus and content of the EIR/EIS is known as scoping. Scoping helps to identify the range of actions, alternatives, environmental effects, and mitigation measures to be analyzed in depth, and eliminates from detailed study those issues that are not pertinent to the final decision on the proposed project. Scoping is also an effective way to bring together and address the concerns of the public, affected agencies, and other interested parties. Significant issues may be identified through public and agency comments.

Scoping, however, is not conducted to resolve differences concerning the merits of the project or to anticipate the ultimate decision on the proposal. Rather, the purpose of scoping is to help ensure that a comprehensive and focused EIR/EIS will be prepared that provides a firm basis for the decision-making process. Members of the public, affected federal, State, and local agencies, interest groups, and other interested parties may participate in the scoping process for this project by providing written comments or recommendations concerning the issues to be analyzed in the EIR/EIS. Written comments can be submitted at the scheduled scoping meeting at:

Palmdale Water District
March 25, 2014, 7:00 p.m.
Board Room
2029 East Avenue Q
Palmdale, CA 93550
(661) 947-4111

Attendees requiring language interpretation services at the scoping meetings must send an email message to salopez@aspeneg.com by March 18, 2014. The meeting location is wheelchair accessible.

Written comments are requested by **April 15, 2014**, and can be sent to:

Forest Service/Palmdale Water District
c/o Aspen Environmental Group
5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301

To submit comments on the scope of the project or potential environmental impacts, or to request a copy of the Draft or Final EIR/EIS, or to be added to the project mailing list, please write to the Forest Service/Palmdale Water District c/o Aspen Environmental Group.

By Electronic Mail: E-mail communications are welcome and will be accepted as official comments; however, please remember to include your name and return address in the email message. Email messages should be sent to: LSRP@aspeneg.com.

Agency Comments

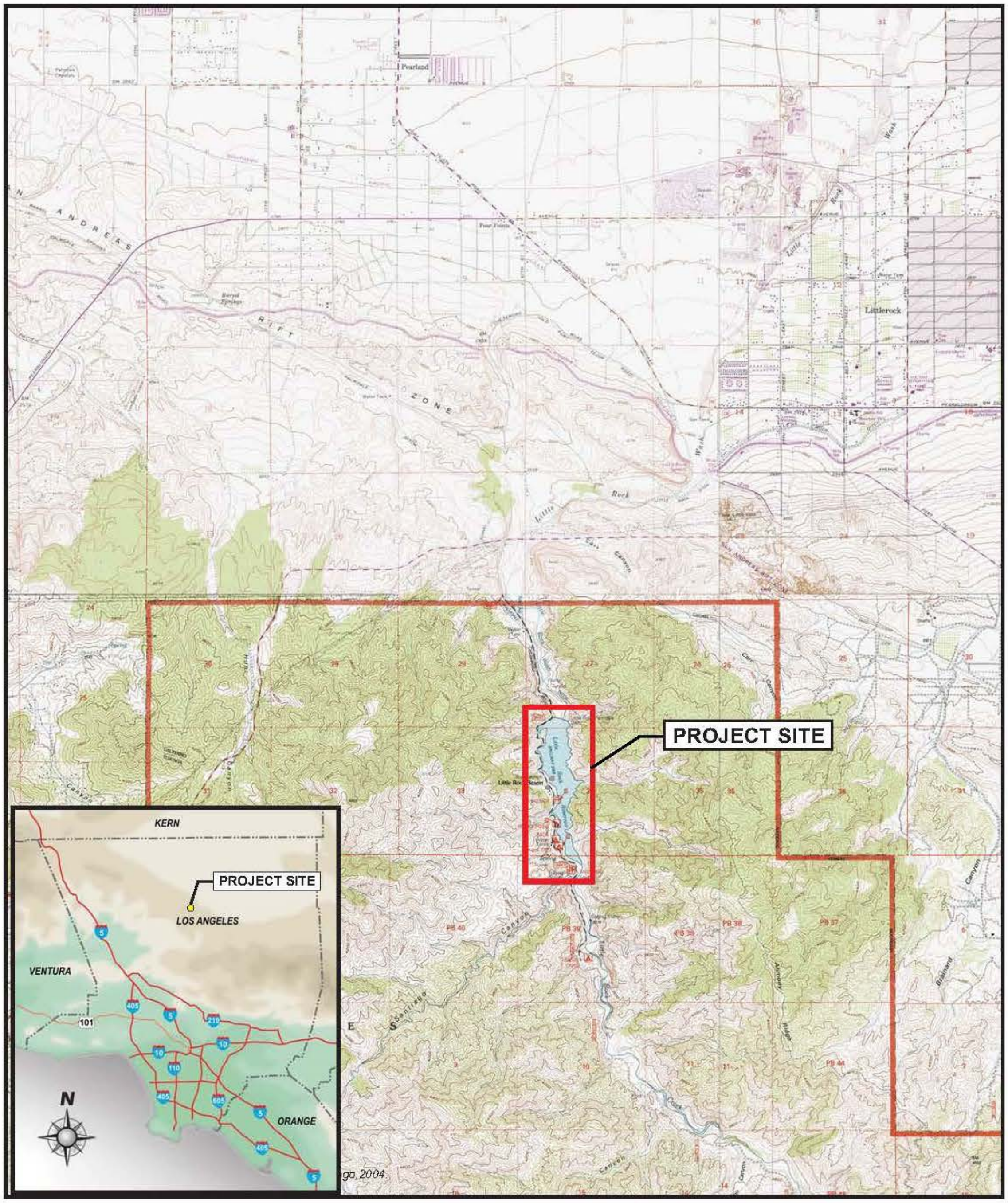
This NOP has been sent to State responsible and trustee agencies, cooperating federal agencies, and the State Clearinghouse. We need to know the views of your agency as to the scope and content of the environmental information to be included in the EIR/EIS, which reflects your agency's statutory responsibilities in connection with the proposed project. Once again, responses should identify the issues to be considered in the Draft EIR/EIS, including significant environmental issues, alternatives, mitigation measures, and whether the responding agency will be an official cooperating agency under NEPA or a responsible or State trustee agency under CEQA. Comments are requested by April 15, 2014. Please submit written comments to the address above.

For additional information related to the proposed project on National Forest System land, contact:

Lorraine Gerchas
Project Manager
Forest Service, Angeles National Forest
701 North Santa Anita Avenue,
Arcadia CA, 91006
(626) 574-5281
lmgerchas@fs.fed.us

For additional information related to the project on non-NFS lands, contact:

Mr. Matt Knudson
Assistant General Manager
Palmdale Water District, 2029 East Avenue Q
Palmdale, CA 93550
(661) 456-1018
mknudson@palmdalewater.org



Aspen Environmental Group | Project Location | Littlerock Reservoir Figure 1

Board in accordance with USDA policies. To ensure that the recommendations of the Board have been taken into account the needs of diverse groups, served by the Black Hills National Forest, membership shall include, to the extent practicable, individuals with demonstrated ability to represent the needs of men and women of all racial and ethnic groups, and persons with disabilities.

Dated: March 11, 2014.

Gregory Parham,

Assistant Secretary for Administration.

[FR Doc. 2014–06070 Filed 3–18–14; 8:45 am]

BILLING CODE 3411–15–P

DEPARTMENT OF AGRICULTURE

Forest Service

Angeles National Forest, California, Littlerock Reservoir Sediment Removal Project

AGENCY: Forest Service, (USDA).

ACTION: Notice of intent to prepare an Environmental Impact Statement.

SUMMARY: The USDA Forest Service (Forest Service) and the Palmdale Water District (District) will prepare a joint Environmental Impact Statement and Environmental Impact Report (EIS/EIR) for sediment removal and construction of a grade control structure at Littlerock Reservoir, in Los Angeles County, California. The District has submitted an application to the Forest Service for a special use authorization for the project. The Forest Service is the lead Federal agency for the preparation of this EIS/EIR in compliance with the National Environmental Policy Act (NEPA), and the District is the lead State of California agency for the preparation of the EIS/EIR in compliance with the California Environmental Quality Act (CEQA).

The Littlerock Dam and Reservoir are located on Littlerock Creek, on National Forest System (NFS) lands managed by the Angeles National Forest. The project is approximately 10 miles southwest of the city of Palmdale, California. The Dam and Reservoir are operated and maintained by the District, pursuant to a Forest Service special use permit. The facilities serve both flood control and municipal water storage purposes. The Reservoir also provides recreational opportunities for boating, fishing, swimming, picnicking, and off-highway vehicle riding.

The proposed action would construct a grade control structure midway between the dam and the southern end of the Reservoir; remove sediment from the Reservoir to restore original capacity; and maintain capacity by conducting annual sediment removal through the life of the authorization, until 2037.

The Forest Service and the District invite written comments on the scope of this proposed project. In addition, the lead agencies give notice of this analysis so that interested and affected individuals are aware of how they may participate and contribute to the final decision.

DATES: Comments concerning the scope of the analysis are requested by April 15, 2014. One public information and scoping meeting will be held at the Palmdale Water District, March 25, 2014, 7:00 p.m., 2029 East Avenue Q, Palmdale, CA 93550, (661) 947–4111. The Draft EIS/EIR is expected in September 2014 and the Final EIS/EIR is expected March 2015.

ADDRESSES: To submit comments on the scope of the project or potential environmental impacts, or to request a copy of the Draft or Final EIS/EIR, or to be added to the project mailing list, please write to the Forest Service/Palmdale Water District c/o Aspen Environmental Group, 5020 Chesebro Road, Suite 200, Agoura Hills, CA 91301. Email communications should be sent to *LSRP@aspeneg.com,* and should include name and return address. Information about the project and the environmental review process will be posted on the Internet at: *http://www.palmdalewater.org/LSR.aspx.*

FOR FURTHER INFORMATION CONTACT: For additional information related to the proposed project on NFS lands, contact Lorraine Gerchas, Project Manager, Forest Service, Angeles National Forest at 701 North Santa Anita Avenue, Arcadia, CA 91006; *lmgerchas@fs.fed.us,* 626–574–5281. For additional information related to the project on non-NFS lands, contact Mr. Matt Knudson, Assistant General Manager, Palmdale Water District, 2029 East Avenue Q, Palmdale, CA 93550, *mknudson@palmdalewater.org,* (661) 456–1018.

SUPPLEMENTARY INFORMATION:

Purpose and Need

The purpose of the project is to restore the Reservoir to 1992 water storage and flood control capacity, and maintain that capacity through annual sediment removal. The purpose of the grade control structure is to allow for sediment removal and maintenance of reservoir capacity, while preserving habitat for the arroyo toad (*Anaxyrus californicus*). The Forest Service also has a need to respond to the District's application for a special use authorization.

Proposed Action

The first component of the proposed project is construction of a grade control structure, to maintain the elevation of the reservoir bed by limiting upstream erosion. The grade control structure would be buried, with the top flush with, or slightly below, the existing reservoir bed. This mostly subterranean soil cement structure would span approximately 260 feet of channel (bank to bank) just downstream of Rocky Point. The maximum depth of the structure would be approximately 80 feet underground. The subterranean portion would extend downstream approximately 200 feet (in a downward stair-step design). Only the upper lip of the structure would be visible when the Reservoir level is lowered.

Upon completion of the grade control structure, the District would remove approximately 1,000,000 cubic yards (CY) of sediment to restore the 1992 capacity of the Reservoir. This initial removal of sediment would occur over approximately 10–15 years, between September and January each year. The final component is to remove annual accumulations of approximately 54,000 CY of sediment to maintain the capacity. Temporary annual closure of the Reservoir to public access would occur after Labor Day until seasonal water refill suspends removal efforts (estimated between mid-November and January). Excavation would occur just upstream of Littlerock Dam and extend approximately 3,700 feet upstream. The District's contractor would load sediment on a truck and transport it offsite to District-owned properties or locations accepting sediment for placement and spreading. These properties would be located within, or in close proximity to, the city of Palmdale. The District would seek reuse of the sediment on an annual basis prior to permanent disposal.

Annual restoration efforts would begin immediately following completion of sediment removal activities and would be completed prior to opening the Reservoir to public access. Disturbed areas outside the excavated portion of the Reservoir bed would be returned to pre-construction conditions or better. Native, locally collected plant material would be planted in areas where native vegetation was disturbed. At the completion of annual sediment removal activities, the District's contractor would remove all debris and repair project caused damage to existing parking areas, access roads, and travel paths.

Possible Alternatives

The Forest Service and the District have identified the following potential alternative to the proposed action:

No Action Alternative: Project activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam. Reservoir capacity would be reduced by approximately 44 acre-feet annually. In the long term, Littlerock Reservoir would fill with sediment, eliminating its flood control and water storage capacity.

Alternative 1: Long-Term Closure of the Reservoir: The Reservoir would be closed to the public for 3–4 years while sediment is removed to achieve 1992 capacity. Capacity for water storage and flood control would be achieved more quickly, but would result in a longer term public closure. Once Reservoir capacity has been restored, maintenance activities, construction of the grade control structure, and short-term, seasonal closures would be the same as the Proposed Action.

Alternative 2: Slurry Excavation: Slurry and water return pipelines (each approximately 6–10 miles long) between the Reservoir and disposal quarries would be constructed to transport sediment off-site. Sediment would be disposed at exhausted quarry pits within Palmdale along Avenue T, approximately 6-miles northeast of the Reservoir. Sediment stockpile and processing, and water collection and pumping facilities would be required at the quarry site(s). The feasibility of long-term agreements with quarry operators and storage capacities of the quarries is unknown at this time. Maintenance of reservoir capacity and construction of the grade control structure would be the same as the Proposed Action.

Responsible Official

The Forest Service Responsible Official for the preparation of the EIS/EIR is Thomas A. Contreras, Forest Supervisor, Angeles National Forest, 701 N. Santa Anita Avenue, Arcadia, CA 91006.

Nature of Decision To Be Made

The Responsible Official will decide whether to permit the proposed activities on NFS lands, or an alternative to the proposed project. If approved, the Forest Supervisor will also decide what mitigation measures and monitoring will be required. The Forest Supervisor has authority to approve only the portions of the project on NFS lands.

Preliminary Issues

The EIS/EIR will present analyze the environmental impacts of the proposed project and the alternatives, and will identify mitigation measures to lessen environmental impacts. The EIS/EIR will focus on issues for which potentially significant impacts are identified, including: air quality; biological resources; cultural resources; geology and soils; hazardous materials; land use and public recreation; traffic; and water resources.

Permits or Licenses Required

The Forest Supervisor, Angeles National Forest, would issue a Special Use Authorization for the proposed action or an alternative. Additional permits that may be required include: a Permit to Operate issued by the Antelope Valley Air Quality Management District, a National Pollutant Discharge Elimination System General Construction Permit issued by the Lahontan Regional Water Quality Control Board, a Section 404 Permit and Section 401 Certification (per the Clean Water Act) issued by the U.S. Army Corps of Engineers, Section 2081 Incidental Take Permit issued by the California Department of Fish and Wildlife, and a Streambed Alteration Agreement (Section 1602 and 1605 permits of the California Fish and Game Code) issued by the California Department of Fish and Wildlife. Local traffic control and encroachment permits may be required from the Los Angeles County Department of Public Works or the California Department of Transportation.

Comment Requested

This notice initiates the scoping process which guides the development of the EIS/EIR. The Forest Service and the District are seeking public and agency comment on the proposed project to identify major issues to be analyzed in depth and assistance in identifying potential alternatives to be evaluated.

The proposed project implements the 2006 Angeles National Forest Land Management Plan, and is subject to project level, pre-decisional administrative review pursuant to 36 CFR 218, Subparts A and B. Comments received on this notice or in subsequent environmental reviews, including names and addresses of those who comment, will be considered as part of the public record on this proposed project, and will be available for public inspection. Comments submitted anonymously will be accepted and considered; however, those who submit anonymous comments will not have standing to object to the subsequent decision. Additionally, pursuant to 7 CFR 1.27(d), any person may request the agency to withhold a submission from the public record by showing how the Freedom of Information Act (FOIA) permits such confidentiality. Persons requesting such confidentiality should be aware that, under the FOIA, confidentiality may be granted in only very limited circumstances, such as to protect trade secrets. The Forest Service will inform the requester of the agency's decision regarding the request for confidentiality. Where the request is denied, the agency will return the submission and notify the requester that the comments may be resubmitted, without names and addresses, within a specified number of days.

Early Notice of Importance of Public Participation in Subsequent Environmental Review: A Draft EIS/EIR will be prepared for comment. The comment period on the draft EIS/EIR will be 45 days from the date the Environmental Protection Agency publishes the notice of availability in the **Federal Register**.

The Forest Service believes, at this early stage, it is important to give reviewers notice of several court rulings related to public participation in the environmental review process. First, reviewers of the Draft EIS/EIR must structure their participation in the environmental review of the proposal so that it is meaningful and alerts an agency to the reviewer's position and contentions. *Vermont Yankee Nuclear Power Corp.* v. *NRDC,* 435 U.S. 519, 553 (1978). Also, environmental objections that could be raised at the Draft EIS/EIR stage but that are not raised until after completion of the Final EIS/EIR may be waived or dismissed by the courts. *City of Angoon* v. *Hodel,* 803 F.2d 1016, 1022 (9th Cir. 1986) and *Wisconsin Heritages, Inc.* v. *Harris,* 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Because of these court rulings, it is very important that those interested in this proposed action participate by the close of the 45-day EIS/EIR comment period so that substantive comments and objections are made available to the Forest Service at a time when it can meaningfully consider them and respond to them in the Final EIS/EIRS.

To assist the Forest Service in identifying issues and concerns on the proposed action, comments should be as specific as possible. Comments may also address the adequacy of the Draft EIS/EIR or the merits of the alternatives discussed in the statement. Reviewers may wish to refer to the Council on Environmental Quality Regulations for implementing the procedural provisions of NEPA (40 CFR 1503.3) in addressing these points.

Authority: 40 CFR 1501.7 and 1508.22; Forest Service Handbook 1909.15, Section 22.

Dated: March 12, 2014.

Thomas A. Contreras,

Forest Supervisor.

[FR Doc. 2014–06011 Filed 3–18–14; 8:45 am]

BILLING CODE 3410–11–P

DEPARTMENT OF AGRICULTURE

Forest Service

Notice of Public Meeting

AGENCY: Forest Service, USDA.

ACTION: Notice of public meeting.

SUMMARY: The Department of Agriculture, Forest Service will hold a workshop entitled ''Cellulose Nanomaterial—A Path Towards Commercialization'' on May 20–21, 2014 in collaboration with and co-sponsored by the National Nanotechnology Initiative (NNI). The workshop is intended to bring together executives and experts from the federal government, academia, and private sector to identify critical information gaps that need to be filled and technical barriers that need to be overcome to enable the commercialization of cellulose nanomaterials. Workshop presenters and participants will identify pathways for the commercialization of cellulosic nanomaterials and the workshop will facilitate communication across multiple industry sectors; between users and cellulose nanomaterials producers; and among government, academia and industry to determine common challenges. An important goal of the workshop is to identify the critical information gaps and technical barriers in the commercialization of cellulose nanomaterials from the perspective of nanocellulose user communities. The outcomes of the workshop are expected to be used to guide federal government and private sector investments in nanocellulose research and development. The workshop also supports the announcement last December by USDA Secretary Thomas Vilsack regarding the formation of a public private-partnership to rapidly advance the commercialization of cellulose nanomaterials. The USDA announcement can be found at: *http://www.usda.gov/wps/portal/usda/usdahome?contentid=2013%2F12%2F0235.xml.*

This workshop also supports the goals of the NNI Sustainable Nanomanufacturing Signature Initiative.

DATES: The Workshop will be held Tuesday, May 20, 2014 from 8:00 a.m. until 5:00 p.m. and on Wednesday, May 21, 2014 from 8:00 a.m. until 5:00 p.m.

ADDRESSES: The workshop will be held at the USDA Conference & Training Center, Patriots Plaza III, 355 E Street SW., Washington, DC 20024.

FOR FURTHER INFORMATION CONTACT: For information regarding this Notice, please contact Cheryl David-Fordyce at National Nanotechnology Coordination Office, by telephone 703–292–2424 or email *cdavid@nnco.nano.gov.* Additional information about the meeting, including the agenda, is posted at *http://www.nano.gov/NCworkshop.*

Registration: Registration opens on March 17, 2014 at *http://www.nano.gov/NCworkshop.* Due to space limitations, pre-registration for the workshop is required. Written notices of participation by email should be sent to *cdavid@nnco.nano.gov* or mailed to Cheryl David-Fordyce, 4201 Wilson Blvd., Stafford II, Suite 405, Arlington, VA 22230. Please provide your full name, title, affiliation and email or mailing address when registering. Registration is on a first-come, first-served basis until capacity is reached. Written or electronic comments should be submitted by email to *cdavid@nnco.nano.gov* until close of business April 30, 2014.

Meeting Accomodations: Individuals requiring special accommodation to access this public meeting should contact Cheryl David-Fordyce 703–292–2424 at least ten business days prior to the meeting so that appropriate arrangements can be made.

Dated: March 6, 2014.

Theodore H. Wegner,

Assistant Director.

[FR Doc. 2014–05352 Filed 3–18–14; 8:45 am]

BILLING CODE 3411–15–P

DEPARTMENT OF AGRICULTURE

Grain Inspection, Packers and Stockyards Administration

Opportunity for Designation in Unassigned Areas of Southeast Texas

AGENCY: Grain Inspection, Packers and Stockyards Administration, USDA.

ACTION: Notice.

SUMMARY: The Grain Inspection, Packers and Stockyards Administration (GIPSA) is asking persons or governmental agencies interested in providing official services in unassigned areas of Southeast Texas to submit an application for designation.

DATES: Applications and comments must be received by April 18, 2014.

ADDRESSES: Submit applications and comments concerning this Notice using any of the following methods:

- *Applying for Designation on the Internet:* Use FGISonline (*https://fgis.gipsa.usda.gov/default_home_FGIS.aspx*) and then click on the Delegations/Designations and Export Registrations (DDR) link. You will need to obtain an FGISonline customer number and USDA eAuthentication username and password prior to applying.
- *Submit Comments Using the Internet:* Go to Regulations.gov (*http://www.regulations.gov*). Instructions for submitting and reading comments are detailed on the site.
- *Mail, Courier or Hand Delivery:* Dexter Thomas, Acting Chief of Staff, USDA, GIPSA, OA, Room 2055–S, 1400 Independence Avenue SW., Washington, DC 20250.
- *Fax:* Dexter Thomas, 202–205–9237.
- *Email: R.Dexter.Thomas@usda.gov.*

Read Applications and Comments: All applications and comments will be available for public inspection at the office above during regular business hours (7 CFR 1.27(c)).

FOR FURTHER INFORMATION CONTACT: Dexter Thomas, 202–720–6529 or *R.Dexter.Thomas@usda.gov.*

SUPPLEMENTARY INFORMATION: GIPSA previously announced an opportunity for designation in unassigned areas of Southeast Texas in the **Federal Register** on September 27, 2013 (78 FR 59647). Applications were due by October 28, 2013. GIPSA received seven comments, representing five grain companies and two trade associations. All commenters supported Gulf Country Grain Inspection Service, Inc. (Gulf Country) designation for the geographical area announced in the **Federal Register** on September 27, 2013. Five commenters specifically recommended that Gulf Country's designation be expanded to include the Rio Grande Valley geographical area in South Texas. Two of those five commenters stated that Gulf Country could provide an equal or greater level of service at a better cost than GIPSA. Accordingly, GIPSA is announcing the opportunity for designation for unassigned areas of Southeast Texas including additional geographical area in South Texas.

Section 79(f) of the United States Grain Standards Act (USGSA) authorizes the Secretary to designate a qualified applicant to provide official services in a specified area after determining that the applicant is better

Acton Agua Dulce News
Legal Desk
P.O. Box 57
Acton, CA 93510
(661) 269-1169

PROOF OF PUBLICATION

STATE OF CALIFORNIA }
} SS
COUNTY OF LOS ANGELES }

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the assistant principal clerk of the printer of the Acton Agua Dulce News, (Acton Agua Dulce Weekly News) a newspaper of general circulation, printed and published weekly in the Community of Acton, county of Los Angeles, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Los Angeles, State of California, under date of February 8, 1989, Case Number 9391; that the notice, of which the annexed is a printed copy has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

3/10/2014

in the year 2014

I certify (or declare) under penalty of perjury that the foregoing is true and correct

M. Gayle Joyce

M. Gayle Joyce
Supervisor

NOTICE OF PUBLIC MEETING AND NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT (EIR/EIS) for the LITTLEROCK RESERVOIR SEDIMENT REMOVAL

The Palmdale Water District (District) and the United States Forest Service, Angeles National Forest (ANF) are preparing an EIR/EIS for the District's proposed Littlerock Reservoir Sediment Removal Project. The District (as a lead agency under the California Environmental Quality Act) and the Forest Service (as the lead agency under the National Environmental Policy Act) will be holding a Public Scoping Meeting to obtain input from agencies and the public on the scope and content of the EIR/EIS. The meeting will be held at the following location:

Date/Time	Tuesday, March 25, 2014, 7:00 p.m.
Location	Palmdale Water District, Board Room 2029 East Avenue Q Palmdale, CA 93550 Phone: (661) 947-4111

The meeting location is wheelchair accessible. However, if other accommodations or language interpretation is necessary, please email salopez@aspeneg.com by March 18, 2014.

Background

The Littlerock Dam and Reservoir are located on Littlerock Creek below the confluence of Santiago Canyon in the ANF. The Reservoir has a 1992 water storage capacity of 3,500 acre-feet. This capacity has been substantially reduced over time by the deposition of sediment behind the Dam. The District proposes to construct a grade control structure at an area known as Rocky Point to prevent continued upstream head cutting and preserve critical habitat for the arroyo toad. Upon completion of the grade control structure, the District would remove approximately 1,000,000 cubic yards of sediment to restore the Reservoir to its 1992 design capacity, and then remove annual accumulations of sediment to maintain capacity.

Project Information

Information regarding the proposed project and the environmental review process, Project documents, contact and mailing information can be found at:

Palmdale Water District	USFS, Angeles National Forest Santa Clara/Mojave Rivers Ranger District	Angeles National Forest Supervisor's Office
2029 East Avenue Q Palmdale, CA 93550 (661) 947-4111 Hours: 8 a.m. to 5 pm. (Monday through Friday)	33708 Crown Valley Road Acton, CA 93510 (661) 296-2808 Hours: 8 a.m. to 4:30 pm. (Monday through Friday)	701 N Santa Anita Ave. Arcadia, CA 91006 (626) 574-1613 Hours: 8 a.m. to 4:30 pm. (Monday through Friday)

The EIR/EIS public scoping period ends on April 15, 2014. During this period, comments on the scope and content of the document may be provided at the public meeting noted above, or mailed to: Forest Service/Palmdale Water District c/o Aspen Environmental Group, 5020 Chesebro Road, Suite 200, Agoura Hills, CA 91301.Comments may also be sent via e-mail to LSRP@aspeneg.com. Written comments are requested by April 15, 2014. For more information regarding the Project, the environmental review process, or to provide comments on the project, please email LSRP@aspeneg.com.

AFFIDAVIT OF PUBLICATION

(2015.5 C.C.P.)

STATE OF CALIFORNIA } s s

County of Los Angeles

NOTICE OF PUBLIC MEETING AND
NOTICE OF PREPARATION
EIR/EIS

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer of the **Antelope Valley Press**, a newspaper of general circulation, printed and published **daily** in the **City of Palmdale**, County of Los Angeles, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Los Angeles, State of California, under date of October 24, 1931, Case Number 328601; Modified Case Number 657770 April 11, 1956; also operating as the Ledger-Gazette, adjudicated a legal newspaper June 15, 1927, by Superior Court decree No. 224545; also operating as the Desert Mailer News, formerly known as the South Antelope Valley Foothill News, adjudicated a newspaper of general circulation by the Superior Court of the County of Los Angeles, State of California on May 29, 1967, Case Number NOC564 and adjudicated a newspaper of general circulation for the **City of Lancaster,** State of California on January 26, 1990, Case Number NOC10714, Modified October 22, 1990; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

March 12, 2014

I certify (or declare) under penalty of perjury that the fore-going is true and correct.

Signature

Dated: March 12, 2014

Executed at Palmdale, California

The space above for filing stamp only

NOTICE OF PUBLIC MEETING AND NOTICE OF PREPARATION
DRAFT ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT (EIR/EIS) for the LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

The Palmdale Water District (District) and the United States Forest Service, Angeles National Forest are preparing an EIR/EIS for the District's proposed Littlerock Reservoir Sediment Removal Project. The District (as a lead agency under the California Environmental Quality Act) and the Forest Service (as the lead agency under the National Environmental Policy Act) will be holding a Public Scoping Meeting to obtain input from agencies and the public on the scope and content of the EIR/EIS. The meeting will be held at the following location:

Date/Time: Tuesday, March 25, 2014, 7:00 p.m.
Location: Palmdale Water District, Board Room
2029 East Avenue Q
Palmdale, CA 93550
Phone: (661) 947-4111

If language interpretation is necessary, please email salopez@aspeneg.com by March 18, 2014.

Background. The Reservoir water storage capacity has been substantially reduced over time by the deposition of sediment behind the Dam. The District proposes to construct a grade control structure to prevent continued upstream head cutting and preserve critical habitat for the arroyo toad. Upon completion of this structure, the District would remove approximately 1,000,000 cubic yards of sediment to restore the Reservoir to its 1992 design capacity, and would then remove sediment on an annual basis to maintain capacity.
Information. Project-related documents can be found at the repositories noted below or you may visit the project website at http://www.palmdalewater.org/LSR.aspx.

Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550
(661) 947-4111
Hours: 8 a.m. to 5 pm.
(Monday through Friday)

USFS, Angeles National Forest
Santa Clara/Mojave
Rivers Ranger District
33708 Crown Valley Road
Acton, CA 93510 (661) 296-2808
Hours: 8 a.m. to 4:30 pm.
(Monday through Friday)

Angeles National Forest
Supervisor's Office
701 N Santa Anita Ave.
Arcadia, CA 91006
(626) 574-1613
Hours: 8 a.m. to 4:30 pm.
(Monday through Friday)

The EIR/EIS public scoping period ends on April 15, 2014. During this period, comments on the scope and content of the document may be provided at the public meeting noted above, or mailed to: Forest Service/Palmdale Water District, c/o Aspen Environmental Group, 5020 Chesebro Road, Suite 200, Agoura Hills, CA 91301.Comments may also be sent via e-mail to LSRP@aspeneg.com. Written comments are requested by April 15, 2014.

Valley Press
37404 SIERRA HWY., PALMDALE CA 93550
Telephone (661)267-4112/Fax (661)947-4870

PROOF OF PUBLICATION AFFIDAVIT
(2015.5 C.C.P.)

STATE OF CALIFORNIA,
County of Los Angeles,

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of the

Daily News

a newspaper of general circulation published 7 times weekly in the County of Los Angeles, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Los Angeles, State of California, under the date of May 26, 1983, Case Number Adjudication #C349217; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil) has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, towit: March 12,

all in the year 20 14

I certify (or declare) under penalty of perjury that the forgoing is true and correct.

Dated at Woodland Hills,

California, this 12th **day of** March **20** 14

[signature]

Signature

Proof of Publication of

Notice of Public Meeting and Notice of Preparation Draft (EIR/EIS)

NOTICE OF PUBLIC MEETING AND NOTICE OF PREPARATION DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT (EIR/EIS) FOR THE LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT

The Palmdale Water District (District) and the United States Forest Service, Angeles National Forest are prepari for the District's proposed Littlerock Reservoir Sediment Removal Project. The District (as a lead agency under t Environmental Quality Act) and the Forest Service (as the lead agency under the National Environmental Polic holding a Public Scoping Meeting to obtain input from agencies and the public on the scope and content of the meeting will be held at the following location:

Date/Time:	Tuesday, March 25, 2014, 7:00 p.m.
Location:	Palmdale Water District, Board Room 2029 East Avenue Q Palmdale, CA 93550 Phone: (661) 947-4111

If language interpretation is necessary, please email salopez@aspeneg.com by March 18, 2014.

Background: The Reservoir water storage capacity has been substantially reduced over time by the deposition of sec the Dam. The District proposes to construct a grade control structure to prevent continued upstream head cutting critical habitat for the arroyo toad. Upon completion of this structure, the District would remove approximately 1,0 yards of sediment to restore the Reservoir to its 1992 design capacity, and would then remove sediment on an to maintain capacity.

Information: Project-related documents can be found at the repositories noted below or you may visit the proje http://www.palmdalewater.org/LSR.aspx.

Palmdale Water District	USFS, Angeles National Forest Santa Clara/ Mojave Rivers Ranger District	Angeles Natior Supervisor's
2029 East Avenue Q	33708 Crown Valley Road	701 N Santa A
Palmdale, CA 93550	Acton, CA 93510	Arcadia, CA
(661) 947-4111	(661) 296-2808	(626) 574-
Hours: 8 a.m. to 5 pm.	Hours: 8 a.m. to 4:30 pm.	Hours: 8 a.m. to
(Monday through Friday)	(Monday through Friday)	(Monday throug

The EIR/EIS public scoping period ends on April 15, 2014. During this period, comments on the scope and c document may be provided at the public meeting noted above, or mailed to: Forest Service/Palmdale Water Distr Environmental Group, 5020 Chesebro Road, Suite 200, Agoura Hills, CA 91301. Comments may also be sent LSRP@aspeneg.com. Written comments are requested by April 15, 2014.

ANTELOPE VALLEY JOURNAL

3166 E PALMDALE BLVD STE 107, PALMDALE, CA 93550
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MELISSA JORDAN
ASPEN ENVIRONMENTAL GROUP
5020 CHESEBRO RD #200
AGOURA HILLS, CA - 91301

CNS#: 2598181

PROOF OF PUBLICATION

(2015.5 C.C.P.)

State of California)
County of LOS ANGELES) ss

Notice Type: GPN - GOVT PUBLIC NOTICE

Ad Description:

DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT (EIR/EIS) for the LITTLEROCK RESERVOIR SEDIMENT

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the ANTELOPE VALLEY JOURNAL, a newspaper published in the English language in the city of PALMDALE, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of LOS ANGELES, State of California, under date of 08/31/2000, Case No. MS002880. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

03/14/2014

Executed on: 03/14/2014
At PALMDALE, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

Notice of Public Meeting and Notice of Preparation

Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Littlerock Reservoir Sediment Removal Project

The Palmdale Water District (District) and the United States Forest Service, Angeles National For preparing an EIR/EIS for the District's proposed Littlerock Reservoir Sediment Removal Project. The (as a lead agency under the California Environmental Quality Act) and the Forest Service (as the lead under the National Environmental Policy Act) will be holding a Public Scoping Meeting to obtain inp agencies and the public on the scope and content of the EIR/EIS. The meeting will be held at the fo location:

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2029 East Avenue Q
Palmdale, CA 93550
Phone: (661) 947-4111

If language interpretation is necessary, please email salopez@aspeneg.com by March 18, 2014.

Background. The Reservoir water storage capacity has been substantially reduced over time by the dep of sediment behind the Dam. The District proposes to construct a grade control structure to prevent co upstream head cutting and preserve critical habitat for the arroyo toad. Upon completion of this structu District would remove approximately 1,000,000 cubic yards of sediment to restore the Reservoir to it design capacity, and would then remove sediment on an annual basis to maintain capacity.

Information. Project-related documents can be found at the repositories noted below or you may v project website at http://www.palmdalewater.org/LSR.aspx.

Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550
(661) 947-4111
Hours: 8 a.m. to 5 pm.
(Monday through Friday)

USFS, Angeles National Forest Santa Clara/Mojave Rivers Ranger District
33708 Crown Valley Road
Acton, CA 93510
(661) 296-2808
Hours: 8 a.m. to 4:30 pm.
(Monday through Friday)

Angeles National Fore Supervisor's Office
701 N Santa Anita Ave
Arcadia, CA 91006
(626) 574-1613
Hours: 8 a.m. to 4:30 p
(Monday through Frida

The EIR/EIS public scoping period ends on April 15, 2014. During this period, comments on the scop content of the document may be provided at the public meeting noted above, or mailed to: Forest S Palmdale Water District, c/o Aspen Environmental Group, 5020 Chesebro Road, Suite 200, Agoura H 91301.Comments may also be sent via e-mail to LSRP@aspeneg.com. Written comments are reques April 15, 2014.

CNS#

* A 0 0 0 0 0 3 3 6 4 8 1 5 *

CONCEPTS

By JOHN VAN HUIZUM

Conscience or Greed?

An analysis is a breaking up of a whole into its parts to find out their true nature, a detailed examination. For example, a doctor wants to have as many details as possible about a patient's condition in order to come to a conclusion about his over-all health. A financial analyst does the same with businesses, and in that process, can use a program like Excel to measure the health of individual enterprises for investment purposes. Another title for financial analyst is stock broker, a person who is in the business of buying and selling stock. The trick is knowing when to buy and when to sell.

The more inside information a broker has about various companies, the better he can present an attractive stock deal for a client. The broker will benefit from both, because he or she charges a commission, so the broker does not have to take any risk with his or her own money.

The greater the amount of money involved in a trade, the greater the commission to the middle-man, so investment brokers love a big deal, in the same way as a real estate broker loves to earn a commission on an expensive property.

Clients may be big, medium or small investors, but it is in the broker's financial interest to please his big investor-clients the most.

When deal makers make a killing on a certain stock by selling it, they make even more when they can find a buyer for that same stock among their existing customers. If they can convince a company or individual to sell a stock because the prospects are poor, what should they tell a new buyer of that stock, the truth or a falsehood?

This advice now becomes a matter of conscience: does the broker care or not care about the "sucker" buyer? Does he let greed override his conscience or should he tell the (small) buyer the truth?

If you want to get a glimpse into the treacherous world of rich people – also known as Wall Street – you will get it by reading the book called *New Money* by Kevin Roose. If I could, I would make it required reading for every curious grown-up.

John van Huizum is a retired businessman and a resident of Agua Dulce. He appreciates disagreement with his views for learning purposes. Feel free to call him at (661) 361-9862 (cell) or email at johnvanhuizum@gmail.com. John is selling a CD of about 1,000 published articles plus 1,500 unpublished for $10.00 plus $2.00 shipping. Please call him if interested.

NOTICE OF PUBLIC MEETING AND NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT (EIR/EIS) for the LITTLEROCK RESERVOIR SEDIMENT REMOVAL

The Palmdale Water District (District) and the United States Forest Service, Angeles National Forest (ANF) are preparing an EIR/EIS for the District's proposed Littlerock Reservoir Sediment Removal Project. The District (as a lead agency under the California Environmental Quality Act) and the Forest Service (as the lead agency under the National Environmental Policy Act) will be holding a Public Scoping Meeting to obtain input from agencies and the public on the scope and content of the EIR/EIS. The meeting will be held at the following location:

DATE/TIME: Tuesday, March 25, 2014, 7:00 p.m.

LOCATION: Palmdale Water District, Board Room 2029 East Avenue Q Palmdale, CA 93550 Phone: (661) 947-4111

The meeting location is wheelchair accessible. However, if other accommodations or language interpretation is necessary, please email salopez@aspeneg.com by March 18, 2014.

Background

The Littlerock Dam and Reservoir are located on Littlerock Creek below the confluence of Santiago Canyon in the ANF. The Reservoir has a 1992 water storage capacity of 3,500 acre-feet. This capacity has been substantially reduced over time by the deposition of sediment behind the Dam. The District proposes to construct a grade control structure at an area known as Rocky Point to prevent continued upstream head cutting and preserve critical habitat for the arroyo toad. Upon completion of the grade control structure, the District would remove approximately 1,000,000 cubic yards of sediment to restore the Reservoir to its 1992 design capacity, and then remove annual accumulations of sediment to maintain capacity.

Project Information

Information regarding the proposed project and the environmental review process, Project documents, contact and mailing information can be found at:

Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550 (661) 947-4111
Hours: 8 a.m. to 5 pm.
(Monday through Friday)

USFS, Angeles National Forest Santa Clara/Mojave Rivers Ranger District
33708 Crown Valley Road Acton, CA 93510
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Hours: 8 a.m. to 4:30 pm.
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The EIR/EIS public scoping period ends on April 15, 2014. During this period, comments on the scope and content of the document may be provided at the public meeting noted above, or mailed to: Forest Service/Palmdale Water District c/o Aspen Environmental Group, 5020 Chesebro Road, Suite 200, Agoura Hills, CA 91301.Comments may also be sent via e-mail to LSRP@aspeneg.com. Written comments are requested by April 15, 2014. For more information regarding the Project, the environmental review process, or to provide comments on the project, please email LSRP@aspeneg.com.

PUBLIC SCOPING MEETING

Littlerock Reservoir Sediment Removal Project

Tuesday, March 25, 2014
7:00 p.m.

Palmdale Water District, Board Room
2029 East Avenue Q, Palmdale, CA 93550

Agenda

- Short Presentation
  - Purpose of Scoping
  - Overview of the Proposed Project
  - Possible Alternatives
  - PWD and Forest Service Processes
  - The Environmental Review Process
  - Environmental Issue Areas
  - Public Comments
- Project Stations – where EIR/EIS staff are available to answer your questions about the project and upcoming environmental review

Sign-In Sheet – March 25, 2014

Scoping Meeting for Littlerock Sediment Removal Project-

Please print or write legibly. Thank you.

Name	Vincent Dino	**Organization**	P. W. D.
Address	37646 Grant Ct Palmdale		
Email	vjdino@yahoo.com	**Phone**	661 435 1991
Name	Robert Alvarado	**Organization**	PWD
Address	2029 E. Ave. Q Palmdale CA 93550		
Email	Robertealvarado@aol.com	**Phone**	661 406-8801
Name	Jackie Owens	**Organization**	Congressman McKeon's Office
Address	1008 W. Ave M-14 Palmdale		
Email	Jacqueline.Owens@mail.house.gov	**Phone**	
Name	Joe Estes	**Organization**	PWD Director
Address	36055 45th st. East Palmdale CA 93552		
Email	JEstesPWD@Gmail.com	**Phone**	818-795-7416
Name	Alisha Semchuck	**Organization**	The Antelope Valley Press
Address	—		
Email	asemchuck@avpress.com	**City**	
Name		**Organization**	
Address			
Email		**Phone**	
Name		**Organization**	
Address			
Email		**Phone**	
Name		**Organization**	
Address			
Email		**Phone**	
Name		**Organization**	
Address			
Email		**Phone**	

** Your name, address, and comments become public information and may be released to interested parties if requested.*

PALMDALE WATER DISTRICT
USDA FOREST SERVICE

Scoping Comments

Proposed Littlerock Reservoir Sediment Removal Project

Name*: ______________________________

Affiliation (*if any*):* ______________________________

Address:* ______________________________

City, State, Zip Code:* ______________________________

Telephone Number:* ______________________________

Email:* ______________________________

Comment:*______________________________

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**Please print or write legibly. Your name, address, and comments become public information and may be released to interested parties if requested. Thank you for your comments.*

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Insert additional sheets if needed. Comments must be postmarked by April 15, 2014. Comments may also be e-mailed to: LSRP@aspeneg.com.

Tuesday March 25, 2014

Place
Postage
Here

Forest Service/Palmdale Water District
c/o Aspen Environmental Group
5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301

ATTACHMENT 2
Scoping Comment Letters

AGENCIES

1. Department of the Army Los Angeles District, U.S Army Corp of Engineers
   Sherry Bellini, Regulatory Assistant

2. Native American Heritage Commission – Dave Singleton, Program Analyst

3. Transportation and Infrastructure Committee, Subcommittee on Water Resources and the Environment – David L. Wenger, Senior Staff

4. California Regional Water Quality Control Board, Lahontan Region
   Thomas J. Suk, Senior Environmental Scientist

5. Department of Fish and Wildlife, South Coast Region
   Betty J. Courtney, Environmental Program Manager I

6. California Regional Water Quality Control Board, Lahontan Region
   Jan M. Zimmerman, PG Engineering Geologist

7. Los Angeles County Department of Public Works – Andrew Ngumba, Traffic and Lighting Division and Juan Sarda, Land Development Division

8. City of Palmdale – Chuck Heffernan, Director of Development Services

TRIBAL GROUPS

1. Fernandeno Tataviam Band of Mission Indians Tribal Historic & Cultural Preservation – Caitlin B. Gulley, Tribal Historic and Cultural Preservation

2. Soboba Band of Luiseno Indians – Joseph Ontiveros, Director of Cultural Resources

3. R. Indigenous Consultants – Randy Guzman-Folkes, Proprietor

PUBLIC

1. Littlerock Lake Resort – Richard A. Cooper, Proprietor

2. Residents of 43rd Street East – Chrystal Chavez, Arturo Castaneda, Louise Williams, Cathy Hunt, Ann Salaun Rondou, and Ruth E. Ybarra, Property Owners

-----Original Message-----
From: Bellini, Sherry A SPL
Sent: Monday, March 17, 2014 10:13 AM
To: 'lmgerchas@fs.fed.us'; 'mknudson@palmdalewater.org'
Subject: Permit information for the Littlerock Reservoir Sediment Removal Project (SPL-2014-00194) (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Dear Ms. Gerchas and Mr. Knudson:

It has come to our attention that you are evaluating the Littlerock Reservoir Sediment Removal Project. This activity may require a U.S. Army Corps of Engineers permit.

A Corps of Engineers permit is required for:

a) structures or work in or affecting "navigable waters of the United States" pursuant to Section 10 of the Rivers and Harbors Act of 1899.
Examples include, but are not limited to,

1. constructing a pier, revetment, bulkhead, jetty, aid to navigation, artificial reef or island, and any structures to be placed under or over a navigable water;

2. dredging, dredge disposal, filling and excavation;

b) the discharge of dredged or fill material into, including any redeposit of dredged material other than incidental fallback within, "waters of the United States" and adjacent wetlands pursuant to Section 404 of the Clean Water Act of 1972. Examples include, but are not limited to,

1. creating fills for residential or commercial development, placing bank protection, temporary or permanent stockpiling of excavated material, building road crossings, backfilling for utility line crossings and constructing outfall structures, dams, levees, groins, weirs, or other structures;

2. mechanized landclearing, grading which involves filling low areas or land leveling, ditching, channelizing and other excavation activities that would have the effect of destroying or degrading waters of the United States;

3. allowing runoff or overflow from a contained land or water disposal area to re-enter a water of the United States;

4. placing pilings when such placement has or would have the effect of a discharge of fill material;

c) the transportation of dredged or fill material by vessel or other vehicle for the purpose of dumping the material into ocean waters pursuant to Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972;

d) any combination of the above.

An application for a Department of the Army permit is available on our website:
http://www.usace.army.mil/Portals/2/docs/civilworks/permitapplication.pdf .

If you have any questions, please contact me (contact information below). Please refer to this letter and SPL-2012-00194 in your reply.

sincerely,

Sherry Bellini
Regulatory Assistant

Department of the Army
Los Angeles District,
U.S. Army Corps of Engineers
915 Wilshire Blvd, Suite 930
ATTN: Regulatory Division, CESPL-RG
Los Angeles, California 90017-3409

213-452-3897
213-452-4196 fax
http://www.spl.usace.army.mil/Missions/Regulatory.aspx

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Boulevard, Suite 100
West Sacramento, CA 95691
(916) 373-3715
Fax (916) 373-5471
Web Site www.nahc.ca.gov
Ds_nahc@pacbell.net
e-mail: ds_nahc@pacbell.net

March 19, 2014

Mr. Matt Knudson
Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550

Sent by U.S. Mail
No. of Pages: 3

RE: SCH#2005061171; CEQA Notice of Preparation (NOP); draft Environmental Impact Report (DEIR) for the **"Littlerock Reservoir Sediment Removal Project;"** located in the southern Antelope Valley, in northeastern Los Angeles County, California

Dear Mr. Knudson

The Native American Heritage Commission (NAHC) has reviewed the above-referenced environmental document.

The California Environmental Quality Act (CEQA) states that any project which includes archeological resources, is a significant effect requiring the preparation of an EIR (CEQA guidelines 15064.5(b).. To adequately comply with this provision and mitigate project-related impacts on archaeological resources, the Commission recommends the following actions be required:

Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, pursuant to California Environmental Quality Act (CEQA) §15064.5(f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities. Also, California Public Resources Code Section 21083.2 require documentation and analysis of archaeological items that meet the standard in Section 15064.5 (a)(b)(f).

If there is federal jurisdiction of this project due to funding or regulatory provisions; then the following may apply: the National Environmental Policy Act (NEPA 42 U.S.C 4321-43351) and Section 106 of the National Historic Preservation Act (16 U.S.C 470 *et seq.*) and 36 CFR Part 800.14(b) require consultation with culturally affiliated Native American tribes to determine if the proposed project may have an adverse impact on cultural resources

We suggest that this (additional archaeological activity) be coordinated with the NAHC, if possible. The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. Any information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure pursuant to California Government Code Section 6254.10.

A list of appropriate Native American Contacts for consultation concerning the project site has been provided and is attached to this letter to determine if the proposed active might impinge on any cultural resources.

California Government Code Section 65040.12(e) defines "environmental justice" to provide "fair treatment of People...with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations and policies." (The California Code is consistent with the Federal Executive Order 12898 regarding 'environmental justice.' Also, applicable to state agencies is Executive Order B-10-11 requires consultation with Native American tribes their elected officials and other representatives of tribal governments to provide meaningful input into the development of legislation, regulations, rules, and policies on matters that may affect tribal communities.

Lead agencies should consider first, avoidance for sacred and/or historical sites, pursuant to CEQA Guidelines 15370(a). Then if the project goes ahead then, lead agencies include in their mitigation and monitoring plan provisions for the analysis and disposition of recovered artifacts, pursuant to California Public Resources Code Section 21083.2 in consultation with culturally affiliated Native Americans.

Lead agencies should include provisions for discovery of Native American human remains in their mitigation plan. Health and Safety Code §7050.5, CEQA §15064.5(e), and Public Resources Code §5097.98 mandates the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Sincerely,

Dave Singleton
Program Analyst

CC: State Clearinghouse

Attachment: Native American Contacts list

Native American Contacts
Los Angeles County California
March 19, 2014

Beverly Salazar Folkes
1931 Shadybrook Drive
Thousand Oaks, CA 91362
folkes9@msn.com
805 492-7255
(805) 558-1154 - cell
folkes9@msn.com
Chumash
Tataviam
Ferrnandeño

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
P.O. Box 221838
Newhall , CA 91322
tsen2u@hotmail.com
(661) 753-9833 Office
(760) 885-0955 Cell
(760) 949-1604 Fax
Fernandeño
Tataviam
Serrano
Vanyume
Kitanemuk

Fernandeno Tataviam Band of Mission Indians
Larry Ortega, Chairperson
1019 - 2nd Street, Suite #1
San Fernando CA 91340
(818) 837-0794 Office
(818) 837-0796 Fax
Fernandeno
Tataviam

Randy Guzman - Folkes
4676 Walnut Avenue
Simi Valley , CA 93063
ndnRandy@yahoo.com
(805) 905-1675 - cell
(805) 520-5915-FAX
Chumash
Fernandeño
Tataviam
Shoshone Paiute
Yaqui

LA City/County Native American Indian Comm
Ron Andrade, Director
3175 West 6th St, Rm. 403
Los Angeles , CA 90020
randrade@css.lacounty.gov
(213) 351-5324
(213) 386-3995 FAX

San Manuel Band of Mission Indians
Daniel McCarthy, M.S.., Director-CRM Dept.
26569 Community Center. Drive
Highland , CA 92346
(909) 864-8933, Ext 3248
dmccarthy@sanmanuel-nsn.
gov
(909) 862-5152 Fax
Serrano

Kitanemuk & Yowlumne Tejon Indians
Delia Dominguez, Chairperson
115 Radio Street
Bakersfield , CA 93305
deedominguez@juno.com
(626) 339-6785
Yowlumne
Kitanemuk

Kern Valley Indian Council
Robert Robinson, Co-Chairperson
P.O. Box 401
Weldon , CA 93283
brobinson@iwvisp.com
(760) 378-4575 (Home)
(760) 549-2131 (Work)
Tubatulabal
Kawaiisu
Koso
Yokuts

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list s only applicable for contacting locative Americans with regard to cultural resources for the proposed SCH#2005071171; CEQA Notice of Preparation (NOP); draft Environmental Impact Report (DEIR) for the Littlerock Reservoir Sediment Removal Project; located in the southern Antelope Valley; northeastern Los Angeles County, California.

Melissa Jordan

From: Negar Vahidi
Sent: Friday, March 21, 2014 11:31 AM
To: LSRP
Subject: FW: Littlerock Reservoir Sediment Removal Project

From: Gerchas, Lorraine M -FS [mailto:lmgerchas@fs.fed.us]
Sent: Thursday, March 20, 2014 10:40 AM
To: Blount, Wilburn M -FS; Negar Vahidi; Sandra Alarcon-Lopez; Scott Debauche; Seastrand, Justin -FS
Cc: Gerchas, Lorraine M -FS; Matthew Knudson (mknudson@palmdalewater.org)
Subject: FW: Littlerock Reservoir Sediment Removal Project

FYI

From: Wegner, David [mailto:David.Wegner@mail.house.gov]
Sent: Thursday, March 20, 2014 9:24 AM
To: Gerchas, Lorraine M -FS; 'mknudson@palmdalewater.org'
Subject: Littlerock Reservoir Sediment Removal Project

Lorraine and Matt – we have an interest in getting some additional information on the proposed project to remove sediment from Littlerock Reservoir, CA. We are working with several federal, county and city entities to create additional water storage space throughout Southern California. Might you be able to provide some additional information on this project. Also, are there a lot of these potential reservoirs in SOCAL that are facing the same issue? Thanks. Dave

David L. Wegner
Senior Staff
Transportation and Infrastructure Committee
Subcommittee on Water Resources and the Environment
B-375 Rayburn House Office Building
Washington, DC
202-226-0206

Melissa Jordan

From: Suk, Thomas@Waterboards <thomas.suk@waterboards.ca.gov>
Sent: Monday, March 24, 2014 11:52 AM
To: Bob Blount; Peter Johnston; Lorraine Gerchas; LSRP
Subject: FW: New Fish Advisory For Little Rock Reservoir: Women of Childbearing Age and Children Should Avoid Bass, Catfish, and Carp; Eat Other Species Only in Moderation

Hello ~

FYI, OEHHA's fish consumption advisories ("Safe Eating Guidelines") for Little Rock Reservoir were released today (March 24). The advisories and supporting documents are located at: http://www.oehha.ca.gov/fish/so_cal/LittleRock.html

See the press release from OEHHA, appended below, for more information. You may contact me (or OEHHA) with any questions about this study.

~tom

****
Thomas J. Suk, Senior Environmental Scientist
California Regional Water Quality Control Board, Lahontan Region
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
phone: (530) 542-5419
fax: (530) 544-2271
e-mail: thomas.suk@waterboards.ca.gov
to view our monitoring webpage, click here

From: ExternalAffairs, OEHHA@OEHHA
Sent: Monday, March 24, 2014 11:01 AM
To: ExternalAffairs, OEHHA@OEHHA
Subject: New Fish Advisory For Little Rock Reservoir: Women of Childbearing Age and Children Should Avoid Bass, Catfish, and Carp; Eat Other Species Only in Moderation

The California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) today released a new fish consumption advisory and safe eating guidelines for fish from Los Angeles County's Little Rock Reservoir.

Our press release is embedded below. Here are links to the release, health advisory, safe eating advice, and a fact sheet:

- **Press Release:** New Fish Advisory For Little Rock Reservoir: Women of Childbearing Age and Children Should Avoid Bass, Catfish, and Carp; Eat Other Species Only in Moderation (PDF)
- Health Advisory and Guidelines for Eating Fish from Little Rock Reservoir (Los Angeles County) (PDF)
- Safe eating advice for Little Rock Reservoir (PDF)
- Fact sheet for Little Rock Reservoir (PDF)

Office of Environmental Health Hazard Assessment
George V. Alexeeff, Ph.D., D.A.B.T., Director
Headquarters • 1001 I Street • Sacramento, California 95814
Mailing Address: P.O. Box 4010 • Sacramento, California 95812-4010
Oakland Office • Mailing Address: 1515 Clay Street, 16th Floor • Oakland, California 94612

Matthew Rodriquez
Secretary for
Environmental Protection

Wat

New Fish Advisory For Little Rock Reservoir: Women of Childbearing Age and Children Should Avoid Bass, Catfish, and Carp; Eat Other Species Only in Moderation

March 24, 2014
FOR IMMEDIATE RELEASE

Julian Leichty (OEHHA) 916-323-2395
Doug Smith (Lahontan) 775-762-4344

SACRAMENTO – A new state fish advisory for fish from Los Angeles County's Little Rock Reservoir recommends that all women of childbearing age and children should avoid eating largemouth bass, catfish, and carp.

Women of childbearing age and children should also limit consumption of bluegill, green sunfish, crappie, and rainbow trout to one serving a week. Women over 45 and men 18 and older can eat three servings a week of rainbow trout or two servings a week of bluegill, green sunfish, or crappie. Alternately, this group can eat one serving a week of largemouth bass, catfish, or carp.

The recommendations for each of the fish species are based on levels of methylmercury and polychlorinated biphenyls (PCBs). The advisory and eating guidelines were developed by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) using comprehensive data from sampling funded and conducted by the Lahontan Regional Water Quality Control Board.

"Eating fish provides many health benefits," said OEHHA Director Dr. George Alexeeff. "They are an excellent source of protein and can help reduce the risk of heart disease. These guidelines help anglers and their families balance these health benefits against the risks from exposure to contaminants in fish at Little Rock Reservoir."

Contamination from mercury and PCBs builds up in fish tissues, but not in water from the reservoir. Drinking water from the reservoir consistently meets or exceeds drinking water standards for both mercury and PCBs.

Methylmercury can harm the brain and nervous system, especially in fetuses and children as they grow. PCBs can affect the nervous system, and can cause cancer and other health effects.

Eating fish in amounts slightly greater than the advisory's recommendations is not likely to cause a health problem if it is done only occasionally, such as eating fish caught during an annual vacation.

The health advisory and guidelines for Little Rock Reservoir – as well as advisories and eating guidelines for other fish species and California bodies of water – are available at http://www.oehha.ca.gov/fish.html. A graphic with pictures of the fish species and the consumption advice is also available.

OEHHA is the primary state entity for the assessment of risks posed by chemical contaminants in the environment. Its mission is to protect and enhance public health and the environment by scientific evaluation of risks posed by hazardous substances.

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
(858) 467-4201
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

April 7, 2014

Mr. Matt Knudson
Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550
mknudson@palmdalewater.org

Subject: Comments on the Notice of Preparation of a Draft Environmental Impact Report/Environmental Impact Statement for Littlerock Reservoir Sediment Removal Project, Los Angeles County, SCH#2005061171

Dear Mr. Knudson:

The California Department of Fish and Wildlife (Department) has reviewed the above-referenced Notice of Preparation (NOP) for the Littlerock Reservoir Sediment Removal Project (project) draft Environmental Impact Report/Environmental Impact Statement (DEIR/DEIS). The Palmdale Water District (District) is the lead agency for the EIR under the California Environmental Quality Act (CEQA) and the U.S. Forest Service (Service) is the lead agency for the EIS under the National Environmental Policy Act (NEPA). The following statements and comments have been prepared pursuant to the Department's authority as Trustee Agency with jurisdiction over natural resources affected by the project, CEQA] Guidelines § 15386) and pursuant to our authority as a Responsible Agency under CEQA Guidelines section 15381 over those aspects of the proposed project that come under the purview of the California Endangered Species Act (Fish and Game Code § 2050 *et seq.*) and Fish and Game Code section 1600 *et seq.*

The project area is located in Littlerock Creek below the confluence of Santiago Canyon on Angeles National Forest managed lands in the Antelope Valley side of the San Gabriel Mountains. The reservoir is owned by the Palmdale Water District (District) serving as the flood control facility and storage of water for agricultural and municipal water supply.

- The Project as proposed would include the construction of a grade control structures to prevent sediment loss and head cutting of the stream channel upstream to preserve critical habitat for and prevent impacts to the federally endangered arroyo toad (*Bufo Californicus*); remove excess reservoir sediment that has accumulated over time to restore Reservoir Capacity to 1992 levels; and maintain 1992 design capacity of the Reservoir.

To enable the Department to adequately review and comment on the proposed project, from the standpoint of the protection of plants, fish and wildlife, we recommend the following information be included in the final DEIR/DEIS:

Specific Comments

1. 1. Least Bell's Vireo (*Vireo bellii pusillus*) - The EIR should pay particular attention to adverse Project impacts to and avoidance measures for least Bell's Vireo which the Department understands has been observed near the Project site below the reservoir and dam.

2. 2. Project Alternatives - Project alternatives described in the NOP may result in the disposal of sediment into mine pit depressions and other habitats. The DEIR should identify sediment disposal locations and evaluate impacts to biological resource as part of the Project as a whole. Any sediment disposal proposed for the purposes of filling depressions or mining pits should carefully evaluate presence of wetland habitat which often exists in mining pits that have exposed ground water or collected surface water. These areas should be avoided for sediment disposal as well as any other areas supporting special status species or habitats.

General Comments

To enable the Department to adequately review and comment on the proposed Project from the standpoint of the protection of plants, fish and wildlife, we recommend the following information be included in the DEIR:

3. Project Description Alternatives.

   a) Project Description. A complete discussion of the purpose and need for, and description of, the proposed Project.

   b) Plan Alternatives. A range of feasible alternatives to the Project to ensure that alternatives to the proposed Project are fully considered and evaluated; the alternatives should avoid or otherwise minimize impacts to sensitive biological resources. Specific alternative locations should be evaluated in areas with lower resource sensitivity where appropriate.

4. Resources Assessment. The NOP characterizes the project and surrounding land use as open space public land and flood control reservoir facilities with associated riparian habitats:

   a) Regional Setting. Per CEQA Guidelines, section 15125(c), information on the regional setting that is critical to an assessment of environmental impacts, with special emphasis should be placed on resources that are rare or unique to the region.

   b) Sensitive Plants. A thorough, recent floristic-based assessment of special status plants and natural communities, following the Department's Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (see http://www.dfg.ca.gov/habcon/plant/). The Department recommends that floristic, alliance- and/or association-based mapping and vegetation impact assessments be conducted within the Project area. The Manual of California Vegetation, second edition, should also be used to inform this mapping and assessment (Sawyer et al. 2008). Adjoining habitat areas should be included in this assessment where site activities could lead to direct or indirect impacts off site. Habitat mapping at the alliance level will help establish baseline vegetation conditions.

c) <u>Sensitive Wildlife Species</u>. An inventory of rare, threatened, and endangered, and other sensitive species on site and within the area of potential effect. Species to be addressed should include all those which meet the CEQA definition (see CEQA Guidelines, § 15380). This should include sensitive fish, wildlife, reptile, and amphibian species. Seasonal variations in use of the project area should also be addressed. Focused species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with the Department and the U.S. Fish and Wildlife Service.

d) <u>California Natural Diversity Database</u>. A current inventory of the biological resources associated with each habitat type on site and within the area of potential effect. The Department's California Natural Diversity Data Base in Sacramento should be contacted at www.wildlife.ca.gov/biogeodata/ to obtain current information on any previously reported sensitive species and habitat, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code. The Department recommends a 9 quad search around the project vicinity to identify potential sensitive species within the Project area.

5. <u>Impact analysis</u>. To provide a thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts, the following should be addressed in the DEIR.

a) <u>Impacts to Streams and Riparian Habitat.</u> The Department has responsibility for streams and riparian habitats. It is the policy of the Department to strongly discourage disturbance to wetlands or conversion of wetlands to uplands. All wetlands and watercourses, whether intermittent episodic or perennial, should be retained and provided with substantial setbacks which preserve the riparian and aquatic values and maintain their value to on-site and off-site wildlife populations.

(i) <u>Lake and Streambed Alteration Agreement</u>. The Department also has regulatory authority over activities in streams and/or lakes that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) of a river or stream, or use material from a streambed. For any such activities, the project applicant (or "entity") must provide written notification to the Department pursuant to section 1600 et seq. of the Fish and Game Code. Based on this notification and other information, the Department determines whether a Lake and Streambed Alteration Agreement (LSA) with the applicant is required prior to conducting the proposed activities. The Department's issuance of a LSA for a project that is subject to CEQA will require CEQA compliance actions by the Department as a Responsible Agency. The Department as a Responsible Agency under CEQA may consider the local jurisdiction's (lead agency) Environmental Impact Report for the project. To minimize additional requirements by the Department pursuant to section 1600 *et* *seq.* and/or under CEQA, the document should fully identify the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the LSA.[1]

(b) CESA-listed Species. The Department considers adverse impacts to a species protected by CESA, for the purposes of CEQA, to be significant without mitigation. As to CESA, take of any endangered, threatened, or candidate species that results from the project is prohibited, except as authorized by State law (Fish and Game Code, §§ 2080, 2085.) Consequently, any Project -related activity during the life of the Project will result in take of a species designated as endangered or threatened, or a candidate for listing under CESA, the Department recommends that the project proponent seek appropriate take authorization under CESA prior to implementing the project. Appropriate authorization from the Department may include an incidental take permit (ITP) or a consistency determination in certain circumstances, among other options (Fish and Game Code §§ 2080.1, 2081, subds. (b),(c)). Early consultation is encouraged, as significant modification to a project and mitigation measures may be required in order to obtain a CESA Permit. Revisions to the Fish and Game Code, effective January 1998, may require that the Department issue a separate CEQA document for the issuance of an ITP unless the project CEQA document addresses all project impacts to CESA-listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of an ITP. For these reasons, biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA ITP.

c) Direct Impacts. A discussion of potential adverse impacts from sediment-removal activities, staging areas, lighting, noise, human activity, exotic species, and drainage should also be included. The latter subject should address. Mitigation measures proposed to alleviate such impacts should be included.

d) Indirect Impacts. Discussions regarding indirect Project impacts on biological resources, including resources in nearby public lands, open space, adjacent natural habitats, riparian ecosystems, and any designated and/or proposed or existing reserve lands should be evaluated in the DEIR. Impacts on, and maintenance of, wildlife corridor/movement areas, including access to undisturbed habitats in adjacent areas, should be fully evaluated in the DEIR.

(e) Cumulative Impacts. A cumulative effects analysis should be developed as described under CEQA Guidelines, section 15130.

6. Mitigation for the Plan-related Biological Impacts. To avoid, minimize or mitigate impacts to sensitive species within the Project area, the following measures should be considered for inclusion into the DEIR.

   (a) Avoid Impacts to Rare Natural Communities. The DEIR should include measures to

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[1] A notification package for a LSA may be obtained by accessing the Department's web site at www.wildlife.ca.gov/habcon/1600.

fully avoid and otherwise protect Rare Natural Communities from project-related impacts. The Department considers these communities as threatened habitats having both regional and local significance.

(b) Restoration and Protection of Land for Sensitive Species. The DEIR should include mitigation measures for adverse Project -related impacts to sensitive plants, animals, and habitats. Mitigation measures should emphasize avoidance and reduction of project impacts. For unavoidable impacts, on-site habitat restoration or enhancement should be discussed in detail. If on-site mitigation is not feasible or would not be biologically viable and therefore not adequately mitigate the loss of biological functions and values, off-site mitigation through habitat creation and/or acquisition and preservation in perpetuity should be addressed.

(c) Long Term Management of Protected Lands. For proposed preservation and/or restoration, the DEIR should include measures to perpetually protect the targeted habitat values from direct and indirect negative impacts. The objective should be to offset the Plan-induced qualitative and quantitative losses of wildlife habitat values. Issues that should be addressed include, but is not limited to, restrictions on access, proposed land dedications, monitoring and management programs, control of illegal dumping, water pollution, and increased human intrusion.

(d) Nesting Birds. The Department recommends that measures be taken to avoid impacts to nesting birds during the implementation of the Project. Migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (Title 50, § 10.13, Code of Federal Regulations). Sections 3503, 3503.5, and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests including raptors and other migratory nongame birds (as listed under the Federal MBTA). Proposed activities (including, but not limited to, staging and disturbances to native and nonnative vegetation, structures, and substrates) should occur outside of the avian breeding season which generally runs from February 1-September 1 (as early as January 1 for some raptors) to avoid take of birds or their eggs. If avoidance of the avian breeding season is not feasible, the Department recommends surveys by a qualified biologist with experience in conducting breeding bird surveys to detect protected native birds occurring in suitable nesting habitat that is to be disturbed and (as access to adjacent areas allows) any other such habitat within 300 feet of the disturbance area (within 500 feet for raptors). Project personnel, including all contractors working on site, should be instructed on the sensitivity of the area. Reductions in the nest buffer distance may be appropriate depending on the avian species involved, ambient levels of human activity, screening vegetation, or possibly other factors.

(e) Habitat Restoration Plans. Plans for restoration and revegetation should be prepared by persons with expertise in southern California ecosystems and native plant revegetation techniques. Each plan should include, at a minimum: (a) the location of the mitigation site; (b) the plant species to be used, container sizes, and seeding rates; (c) a schematic depicting the mitigation area; (d) planting schedule; (e) a description of the irrigation methodology; (f) measures to control exotic vegetation on site; (g) specific success criteria; (h) a detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria and providing for conservation of the mitigation site in perpetuity.

We appreciate the opportunity to comment on the referenced NOP. Questions regarding this letter and further coordination on these issues should be directed to Scott Harris at (626) 797-3170, scott.p.harris@wildlife.ca.gov.

Sincerely,

Betty J. Courtney

Betty J. Courtney
Environmental Program Manager I
South Coast Region

References

Keeler Wolf, T. and J. Evens. 2006. Vegetation classification of the Santa Monica Mountains National Recreation Area and environs in Ventura and Los Angeles counties, California. Unpublished Report to the National Park Service. California Department of Fish and Game and California Native Plant Society, Sacramento CA.

ec: Ms. Erinn Wilson, CDFW, Los Alamitos
Mr. Scott Harris, CDFW, Pasadena
Ms. Sarah Rains, CDFW, Newbury Park
Scott Morgan, CDFW, State Clearinghouse

April 11, 2014

File: Environmental Doc Review
Los Angeles County

Forest Service/Palmdale Water District
c/o Aspen Environmental Group
5020 Chesebro Road, Suite 200
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COMMENTS ON THE PROJECT SCOPING LETTER FOR THE LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT, PALMDALE WATER DISTRICT AND UNITED STATES FOREST SERVICE, LOS ANGELES COUNTY, STATE CLEARINGHOUSE NO. 2005061171

The California Regional Water Quality Control Board, Lahontan Region (Water Board) staff received the Project Scoping Letter for the above-referenced project (Project) on March 12, 2014. The scoping letter was prepared in order to solicit input on Project alternatives and the potential impacts that should be considered in the environmental review. The Palmdale Water District is the lead agency under the California Environmental Quality Act (CEQA) and the United Stated Forest Service is the lead agency under the National Environmental Protection Act (NEPA). The lead agencies will prepare a joint Environmental Impact Report (EIR) and Environmental Impact Statement (EIS) for the Project. Water Board staff, acting as a responsible agency, is providing these comments to specify the scope and content of the environmental information germane to our statutory responsibilities pursuant to CEQA Guidelines, California Code of Regulations (CCR), title 14, section 15096. Based on our review of the materials provided, we have determined the following: (1) the EIR/EIS must evaluate the known elevated concentrations of mercury and polychlorinated biphenyls at Littlerock Reservoir; (2) more eco-friendly alternatives to stabilize the banks and channel of Littlerock Creek should be considered in the environmental review; (3) the EIR/EIS should provide a detailed account of the baseline conditions that will be established by the Project; and 4) the EIR/EIS should include a discussion of the proposed long-term maintenance plan to maintain the established baseline conditions.

WATER BOARD'S AUTHORITY

All groundwater and surface waters are considered waters of the State. Surface waters include streams, lakes, ponds, and wetlands, and may be ephemeral, intermittent, or perennial. All waters of the State are protected under California law. State law assigns responsibility for protection of water quality in the Lahontan Region to the Lahontan Water Board. Some waters of the State are also waters of the U.S. The Federal Clean

Water Act (CWA) provides additional protection for those waters of the State that are also waters of the U.S.

The *Water Quality Control Plan for the Lahontan Region* (Basin Plan) contains policies that the Water Board uses with other laws and regulations to protect the quality of waters of the State within the Lahontan Region. The Basin Plan sets forth water quality standards for surface water and groundwater of the Region, which include designated beneficial uses as well as narrative and numerical objectives which must be maintained or attained to protect those uses. The Basin Plan can be accessed via the Water Board's web site at http://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.shtml.

MERCURY AND POLYCHLORINATED BIPHENYLS

Elevated concentrations of mercury (Hg) and polychlorinated biphenyls (PCBs) are known at Littlerock Reservoir. In 2007-2008, the State Water Resources Control Board's (State Water Board) Surface Water Ambient Monitoring Program (SWAMP) conducted a statewide survey of fish tissue from lakes and reservoirs, including Littlerock Reservoir. That screening-level survey detected elevated concentrations of Hg and PCBs in the fillet tissue of fish collected from Littlerock Reservoir. The study report, published in 2010, is available at http://www.swrcb.ca.gov/water_issues/programs/swamp/lakes_study.shtml.

The Lahontan Region's SWAMP program followed up on the 2007-08 screening study by collecting additional fish from Littlerock Reservoir in 2013. That follow-up study also documented elevated levels of Hg and PCBs in fish collected from Littlerock Reservoir. Those data are available at http://www.waterboards.ca.gov/lahontan/water_issues/programs/swamp/index.shtml#ftinfo.

Based on the data from the two studies referenced above, the California Office of Environmental Health Hazard Assessment (OEHHA) issued a fish consumption advisory for Littlerock Reservoir on March 24, 2014. The advisory and supporting documents are available at http://www.oehha.ca.gov/fish/so_cal/LittleRock.html.

In response to the results of the two fish studies, and the consumption advisory issued by OEHHA, the Lahontan Regional Water Board will (in the months ahead) consider recommending (to the State Water Board and U.S. Environmental Protection Agency) that Littlerock Reservoir be placed on the Clean Water Act Section 303(d) list of impaired water bodies for Hg and PCBs.

The source(s) of Hg and PCBs at Littlerock Reservoir are not known at this time. Potential sources may include, but are not limited to, terrestrial (land-based) sources (e.g., erosion of soils naturally high in Hg, discharges from current and/or historic mining sites, unauthorized dumping) and atmospheric sources.

SPECIFIC ISSUES TO BE CONSIDERED IN THE EIR/EIS

The following issues should be considered in preparation of the EIR/EIS.

1. The EIR/EIS should evaluate the known Hg and PCB concentrations found at Littlerock Reservoir, determine (to the extent possible) the source(s) of Hg and PCBs, and consider and disclose how each of the Project alternatives may either exacerbate or ameliorate the levels of Hg and PCBs in surface waters, sediments, and fish tissue. The EIR/EIS also should identify a project design and define mitigation measures to ensure that the concentrations of Hg and PCBs in surface waters, sediments, and fish tissue are not increased by the Project, and are decreased to the extent feasible.

   One resource we recommend you consider is the State Water Board's website for its "Statewide Mercury Program" which includes a proposed Statewide Mercury Control Program for Reservoirs and proposed statewide mercury water quality objectives. The website contains state-of-the-art resources and links to numerous information sources: http://www.swrcb.ca.gov/water_issues/programs/mercury/. For example, the Mercury Control Program website lists potential control measures for Hg that should be evaluated and considered in the EIR/EIS, including, but not limited to:

   a. *Reductions in concentrations of inorganic mercury* – Reducing concentrations of inorganic mercury in reservoir sediment is one way to limit methylmercury production and its subsequent bioaccumulation in fish. Potential source controls include remediation of historic gold and mercury mines upstream of reservoirs, and stabilization of soils that are naturally high in mercury.

   b. *Changes in reservoir management* – Depending on the local characteristics, reservoirs can create a habitat and an environment that can increase the exposure risk to fish consumers. Chemical properties such as oxygen and nutrient levels, and physical properties such as water level fluctuations, can affect methylmercury production.

   c. *Changes to management of fish species* – Which fish species are present and how they are managed is an important factor in determining the severity of the problem in a given reservoir, and changes to current practices could be an important tool in addressing mercury impairments. Stocking reservoirs with less predatory fish might limit methylmercury bioaccumulation.

2. Prior to any dredging or sediment disturbing activities in Littlerock Creek and Littlerock Reservoir, the soils must be sampled and characterized so that proper handling and disposal methods can be adequately evaluated. We recommend that the soils be analyzed for heavy metals (Title 22, CCR), PCBs, volatile organic compounds, and total petroleum hydrocarbons (gas and diesel ranges).

3. The EIR/EIS should evaluate a suite of alternatives to stabilize Littlerock Creek upstream of the dam. Stream channel stabilization practices, including various types of revetments, grade control structures, and flow restrictors, have been effective in controlling sediment production caused by hydromodification activities. Bioengineering techniques reduce flow velocities and scour by increasing sediment deposition. Bioengineering includes planting vegetation that forms dense mats of flexible stems such as willow to protect or rehabilitate eroded streambanks. Structural practices, both direct and indirect, protect or rehabilitate eroded streambanks and are usually implemented in combination to provide stability to the stream system. Indirect methods include grade control structures or hydraulic barriers installed across streams to stabilize the channel and control upstream degradation.

   Vegetative methods should be used in conjunction with or over structural methods because vegetation is relatively easy to establish and maintain, is visually attractive, and is the only streambank stabilization method that can repair itself when damaged. Other advantages to using vegetative erosion control over structural control include increased pollutant attenuation and nutrient uptake capacity, habitat for fish and wildlife, and added cultural resources. Additionally, hardening the banks of streams and rivers with shoreline stabilization protection such as stone riprap revetments can accelerate the movement of surface water and pollutants from upstream, thus degrading water quality in depositional areas downstream.

4. It appears that sediment management will be the key to maintaining long term storage capacity and recreational uses of Littlerock Reservoir. We recommend that the Project proponent evaluate the feasibility of constructing an inline debris/sediment basin to capture sediment upstream of the reservoir. Regular maintenance of the basin will ensure performance to the design standard, minimize sediment influx into the reservoir, and reduce the footprint of disturbance for routine maintenance activities. Construction of an inline basin would minimize impacts to Littlerock Creek in the short-term and long-term and should be considered as a Project alternative in the EIR/EIS.

5. The Scoping Letter identified 1992 as the baseline lake conditions to be attained by the Project. The EIR/EIS needs to specifically define those baseline conditions. If one of the baseline conditions is the 1992 bathymetry of the lake, then a 1992 map of the topographic contours of the lake below the ordinary high water line will need to be provided in the EIR/EIS. If one of the baseline conditions is the 1992 contour and surface area of the lake's shoreline, then aerial photographs clearly depicting those shoreline conditions need to be included in the EIR/EIS. The EIR/EIS must include rationale that clearly justifies and defines the baseline conditions to be established by the Project.

6. The EIR/EIS should include a discussion of the proposed long-term maintenance plan that will be implemented to maintain the established baseline conditions. Specific routine and non-routine activities should be identified, such as dredging

and recontouring, and the thresholds that will trigger when maintenance activities are warranted.

GENERAL INFORMATION TO BE INCLUDED IN THE EIR/EIS

7. The EIR/EIS should identify the water quality standards that could potentially be violated by Project alternatives and use these standards when evaluating thresholds of significance for impacts. Water quality objectives and standards, both numerical and narrative, for **all** waters of the State within the Lahontan Region, including surface waters and groundwater, are outlined in Chapter 3 of the Basin Plan. Water quality objectives and standards are intended to protect the public health and welfare, and to maintain or enhance water quality in relation to the existing and/or potential beneficial uses of the water.

8. The Project area is located within the Rock Creek Hydrologic Area of the Antelope Hydrologic Unit 626.00 and overlies the Antelope Valley Groundwater Basin No. 6-44. The beneficial uses of these water resources are listed in Chapter 2 of the Basin Plan. We request that the EIR/EIS identify and list the beneficial uses of the water resources within the Project area, and include an analysis of the potential impacts to water quality and hydrology with respect to those beneficial uses.

9. All surface waters are waters of the State. Some waters of the State are "isolated" from waters of the U.S. Determinations of the jurisdictional extent of the waters of the U.S. are made by the United States Army Corps of Engineers (USACE) on a project-by-project basis. We request that the Project proponent prepare a Jurisdictional Delineation Report that describes the water resources on the Project sites and outlines the methodology used to define the extent of surface water features. A copy of the Jurisdictional Delineation Report must be submitted to the USACE for verification.

10. The Water Board requires that impacts to water resources be avoided where feasible and minimized to the extent practical. Compensatory mitigation will be required for all unavoidable permanent impacts to surface water resources. Water Board staff coordinate all mitigation requirements with staff from other federal and state regulatory agencies, including the USACE and the California Department of Fish and Wildlife. In determining appropriate mitigation ratios for impacts to waters of the State, Water Board staff considers Basin Plan requirements (minimum 1.5:1 mitigation ratio for impacts to wetlands) and utilizes *12501-SPD Regulatory Program Standard Operating Procedure for Determination of Mitigation Ratios*, published December 2012 by the USACE, South Pacific Division.

11. Obtaining a permit and conducting monitoring does not constitute adequate mitigation. Development and implementation of acceptable mitigation is required. The environmental document must specifically describe the BMPs and other measures used to mitigate Project impacts.

PERMITTING REQUIREMENTS

A number of activities associated with the Project have the potential to impact waters of the State and, therefore, may require permits issued by either the State Water Board or Lahontan Water Board. The required permits may include:

12. Streambed and lakebed alteration and/or discharge of fill material to a surface water may require a CWA, section 401 water quality certification for impacts to federal waters (waters of the U.S.), or dredge and fill waste discharge requirements for impacts to non-federal waters, both issued by the Lahontan Water Board;

13. Land disturbance of more than 1 acre may require a CWA, section 402(p) storm water permit, including a National Pollutant Discharge Elimination System (NPDES) General Construction Storm Water Permit, Water Quality Order (WQO) 2009-0009-DWQ, obtained from the State Water Board, or individual storm water permit obtained from the Lahontan Water Board; and

14. Water diversion and/or dewatering activities may be subject to discharge and monitoring requirements under either NPDES General Permit, Limited Threat Discharges to Surface Waters, Board Order R6T-2008-0023, or General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality, WQO-2003-0003, both issued by the Lahontan Water Board.

Please be advised of the permits that may be required for the proposed Project, as outlined above. Should Project implementation result in activities that will trigger these permitting actions, the Project proponent must consult with Water Board staff well in advance of Project construction. Information regarding these permits, including application forms, can be downloaded from our web site at http://www.waterboards.ca.gov/lahontan/.

Thank you for the opportunity to provide comment for the EIR/EIS preparation. If you have any questions regarding this letter, please contact me at (760) 241-7376 (jan.zimmerman@waterboards.ca.gov) or Patrice Copeland, Senior Engineering Geologist, at (760) 241-7404 (patrice.copeland@waterboards.ca.gov).

Jan M. Zimmerman, PG
Engineering Geologist

cc: State Clearinghouse (SCH 2005061171)
(via email, state.clearinghouse@opr.ca.gov)
California Department of Fish and Wildlife, South Coast Region
(via email, AskR5@wildlife.ca.gov)
Daniel Swenson, US Army Corps of Engineers, Los Angeles District
(via email, Daniel.P.Swenson@usace.army.mil)

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April 15, 2014

Forest Service/Palmdale Water District
c/o Aspen Environmental Group
5020 Cheseboro Road, Suite 200
Agoura Hills, CA 91301

NOTICE OF PREPARATION (NOP)
FOR AN ENVIRONMENTAL IMPACT REPORT (EIR)/ENVIRONMENTAL IMPACT STATEMENT (EIS)
LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT
FOREST SERVICE/PALMDALE WATER DISTRICT

Thank you for the opportunity to review the NOP EIR/EIS for the Littlerock Reservoir Sediment Removal Project. The proposed project intends to:

- Construct a grade control structure to prevent sediment loss and head cutting of the stream channel upstream of Rocky Point to preserve critical habitat and prevent impacts to the federally endangered arroyo toad;

- Remove excess reservoir sediment that has accumulated over time and to restore the Reservoir to 1992 design water storage and flood control capacity; and

- Maintain 1992 design capacity of the Reservoir.

The following are County of Los Angeles, Public Works' comments and are for your consideration and relate to the environmental document only:

<u>Transportation and Traffic Section</u>

Public Works generally agrees with the findings of the NOP EIR/EIS related to the potentially significant impact the project is expected to have to County intersections in the area. Consequently, the project is required to submit a traffic impact analysis to Public Works for review and approval. The traffic impact analysis shall also include Traffic Index calculations for all proposed haul routes.

If you have any questions regarding the Transportation and Traffic comments, please contact Mr. Andrew Ngumba of Traffic and Lighting Division at (626) 300-4851 or angumba@dpw.lacounty.gov.

If you have any other questions or require additional information, please contact Juan Sarda of Land Development Division at (626) 458-4921 or jsarda@dpw.lacounty.gov.

JS:
P:\ldpub\SUBPCHECK\Plan Checking Files\Zoning Permits\NonCounty Projects\Littlerock Reservoir Sediment Removal\2014-03-24 Submittal\2014-4-15, LITTLEROCK RESERVOIR SEDIMENT REMOVAL PROJECT , NOP EIR-EIS, DPW COMMENTS.docx

PALMDALE

a place to call home

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April 16, 2014

Mr. Matt Knudson
Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550

Re: Response to the Notice of Preparation for the Littlerock Reservoir Sediment Removal Project

Dear Mr. Knudson:

Thank you for the opportunity to provide you with written comments on the proposed Notice of Preparation for the Littlerock Sediment removal Project. In the proposed project description there are three components of the proposed project, the construction of a Grade Control Structure, Sedimentation Removal, and Annual Construction and Restoration activities. The City of Palmdale will comment on the sediment removal portion of the project.

The proposed transportation of the 1,000,000 cubic yards of sediment has the potential for severe wear and tear of City streets. A traffic impact study will be required to address the impacts of the additional trips from this project on the City street network. The study will need to address the level of service of those intersections along each proposed delivery route and mitigate impacts as necessary. It should also address and mitigate any impacts on the structural sections of the existing roads on the proposed delivery routes.

The project description indicated that the sediment will be transported off-site to properties owned by the Palmdale Water District or locations accepting sediment for placement and spreading. A Temporary Use Permit for Stockpiling will be required for this activity. No undisturbed land can be used to store/stockpile of sediment, additionally any stockpiling cannot exceed three (3) feet in height of material.

Alternative 1; Long Term Closure of the Reservoir, on the NOP does not specify where the sediment will be transported in order to maintain Reservoir storage capacity. The method of disposal of sediment must be discussed as part of Alternative 1.

Regarding the disposal of sediment within existing mining operations proposed under Alternative 2, the City wishes to note that the existing mining operations are operating under a Conditional Use Permit. Any disposal or infill of any material within the open pits will require that the selected mining operation, or operations, submit for a major modification to their CUP or that a new Conditional Use Permit application be submitted. Additionally, the Office of Mine and Reclamation will be notified of the major modification to the approved Reclamation Plan(s). Alternative 2 also identifies the potential to require slurry pipelines to transport the sediment to the selected quarry pit or pits. The City would like to comment that an encroachment permit will also be required for any work to be done in the public right of way

The City of Palmdale wishes to work closely with you to ensure that all environmental concerns and procedures are addressed in order to have a successful project. If you have any questions, please contact me at (661) 267-5200.

Sincerely,

Chuck Heffernan
Director of Development Services

cc: Susan Koleda, Acting Planning Manager
Bill Padilla, City Engineer

Larry J. Ortega Sr.
Tribal President

Fernandeño Tataviam Band of Mission Indians
Tribal Historic & Cultural Preservation

Tribal Historic & Cultural Preservation Committee
Steve Ortega
Chairman
Berta Pleitez

March 11, 2014

Beth Bagwell
Cultural Resources
Aspen Environmental Group
5020 Cheseboro Road, Suite 200
Agoura Hills, CA 91301

Re: Littlerock Reservoir Sediment Removal Project

Dear Beth Bagwell,

The Fernandeño Tataviam Band of Mission Indians thanks you for the request of consultation for your proposed project. Your project has been identified as breaking ground in traditional Tataviam tribal lands and may disturb culturally sensitive deposits.

In accordance with the National Historic Preservation Act of 1966, consultation with the tribe is legally mandated. Failure to comply with the minimum consultation requirement will result in the notification of such to applicable lead agencies. Moreover, it is required that federal agencies consult with tribal authorities before permitting archaeological excavations on tribal lands (16 U.S.C. §§ 470aa–470mm). Additionally, it is necessary to protect and preserve the access to all, if any, sites the tribe believes sacred (42 U.S.C. § 1996). As expressed in 14. Cal.Code Regs §15064.5, if significant Native American artifacts that meet the definition of a "historical resource" are found, work shall not resume until the archaeologist has recovered them for the tribal monitor.

The California Environmental Quality Act, Public Resources Code, §21000. et seq. ("CEQA"), provides that when studies indicate the existence of, or probable likelihood of, Native American human remains within the area of a proposed project, the lead agency is to work with the Native Americans identified by the Native American Heritage Commission ("NAHC") and, subsequently, consult with and request comments from the NAHC when Native American resources are affected by the project.

Please contact our offices so we can begin consultation. The Tataviam charge standard fees to fund the necessary and extensive research required to fulfill your needs. Attached is information regarding our consultation rates.

Regular updates in regards to your project would be greatly appreciated. We are looking forward to working with you on this matter to the satisfaction of all those involved

1019 Second Street, Suite 1 | San Fernando | California, 91340 | (818) 837-0794 | Fax (818) 837-0796

Sincerely,

Caitlin B. Gulley
Tribal Historic and Cultural Preservation
cgulley@tataviam-nsn.us

Enclosures

TRIBAL CULTURAL RESOURCES SERVICES

The Fernandeño Tataviam Band of Mission Indians (Tribe) has the necessary qualifications, experience and abilities to provide Native Monitoring for scared lands and burial sites to the Client. Also the Tribe is prepared to work with the Client to provide any and all documentation needed to facilitate permit process. The Tribe is agreeable to provide Native Monitoring and Consulting on the terms and conditions as set out in this Agreement.

SUMMARY OF GENERAL TERMS & CONDITIONS

1. Native Monitoring and Consulting
The Tribe would provide the services consisting of Tribal Consulting and Monitoring (the "Services"), and the Tribe would also provide the services if agree upon duration the solid disturbance of the project.

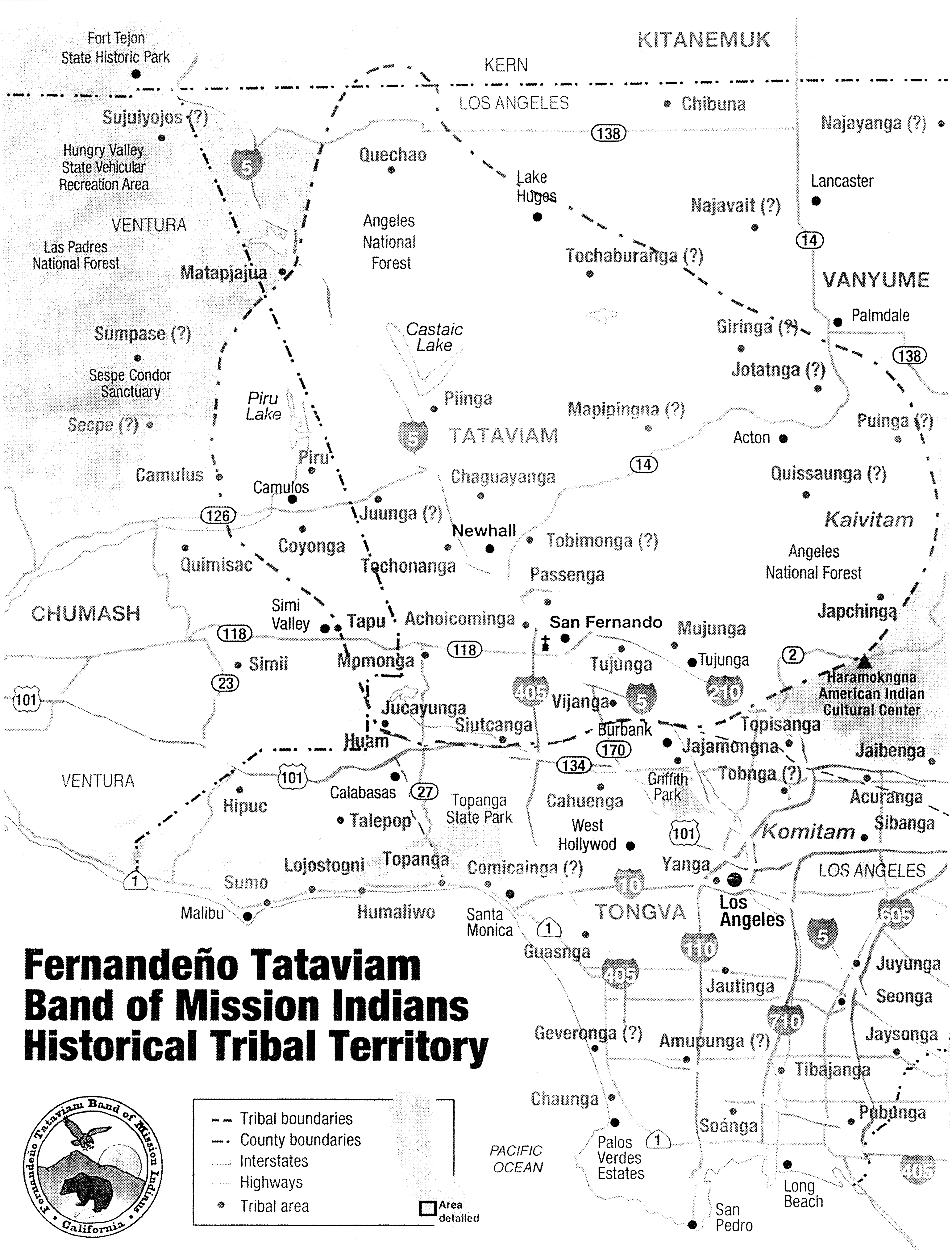
2. Compensation
For the Services provided by the Tribe will pay to the Tribe in accordance to the Fee Structure. Compensation will be set upon terms agree by both interested parties as the Services are render.

3. Fee Structure
Time spent on the project by professional, monitor, and clerical personnel will be billed hourly. The following ranges of hourly rates for various categories of personnel are currently in effect:

Hourly Rate	Category
$75	Consultation
$55	Monitoring
$35	Clerical

Hourly rates will be adjusted semi-annually to reflect changes in the cost-of-living index as published. If overtime for nonprofessional personnel is required, the premium differential figured at time and one-half of their regular hourly rates are charged at direct cost to the project. Unless otherwise stated, any cost estimate presented in a proposal is for budgetary purposes only, and is not a fixed price.

4. Capacity/Independent Contractor
It is expressly agreed that the Tribe would be acting as an independent contractor and not as an employee in providing the Services hereunder.



Fort Tejon
State Historic Park
KITANEMUK
KERN
LOS ANGELES
Chibuna
Najayanga (?)
Sujuiyojos (?)
Hungry Valley
State Vehicular
Recreation Area
5
138
Quechao
Lake
Huges
Lancaster
Najavait (?)
VENTURA
Las Padres
National Forest
Angeles
National
Forest
14
Tochaburanga (?)
Matapjajua
VANYUME
Palmdale
Castaic
Lake
Giringa (?)
Sumpase (?)
Sespe Condor
Sanctuary
138
Jotatnga (?)
Piru
Lake
Piinga
Secpe (?)
Mapipingna (?)
TATAVIAM
Puinga (?)
Acton
Piru
Camulus
Camulos
Chaguayanga
14
Quissaunga (?)
126
Juunga (?)
Kaivitam
Newhall
Coyonga
Tobimonga (?)
Quimisac
Techonanga
Angeles
National Forest
Passenga
CHUMASH
Simi
Valley
Tapu
Achoicominga
San Fernando
Mujunga
Japchinga
118
118
Simii
Mpmonga
Tujunga
Tujunga
2
23
Haramokngna
American Indian
Cultural Center
101
405
Vijanga
5
210
Jucayunga
Siutcanga
Burbank
Topisanga
Huam
170
Jajamongna
Jaibenga
134
VENTURA
101
Griffith
Park
Tobnga (?)
Hipuc
Calabasas
27
Topanga
State Park
Cahuenga
Acuranga
Talepop
West
Hollywod
101
Komitam
Sibanga
Lojostogni
Topanga
Comicainga (?)
Yanga
LOS ANGELES
1
Sumo
10
Malibu
Humaliwo
Santa
Monica
TONGVA
Los
Angeles
605
1
5
Guasnga
110
Juyunga
405
Jautinga
Fernandeño Tataviam
Band of Mission Indians
Historical Tribal Territory
Seonga
710
Geveronga (?)
Amupunga (?)
Jaysonga
Tibajanga
Chaunga
Pubunga
Fernandeño Tataviam Band of Mission Indians
California
Tribal boundaries
County boundaries
Interstates
Highways
Tribal area
Area
detailed
PACIFIC
OCEAN
Palos
Verdes
Estates
1
Soánga
405
Long
Beach
San
Pedro

SOBOBA BAND OF LUISEÑO INDIANS
EST. JUNE 19, 1883

March 12, 2014

Forest Service/PALMDALE Water District
c/o Aspen Environmental Group
5020 Chesbro Road, Ste. 200
Agoura Hills, CA 91301

Re: Notice of Preparation Littlerock Reservoir Sediment Removal Project

The Soboba Band of Luiseño Indians appreciates your observance of Tribal Cultural Resources and their preservation within the Angeles National Forest. We also appreciate you giving us the opportunity to participate in the tribal consultation process. At this time the Soboba Band of Luiseño Indians does not have any specific concerns and wishes to defer to other tribes who are closer to the project area. Please contact Anthony Morales, Chief and Tribal Chairman for the Gabrielino Tongva Band of San Gabriel Mission Indians and John Valenzuela of the San Fernando Band of Mission Indians for further information.

Sincerely,

Joseph Ontiveros
Director of Cultural Resources
Soboba Band of Luiseño Indians
P.O. Box 487
San Jacinto, CA 92581
Phone (951) 654-5544 ext. 4137
Cell (951) 663-5279
jontiveros@soboba-nsn.gov

R Indigenous Consultants
Monitor

R. Indigenous Consultants
Tribal Monitoring LLC
4676 Walnut Avenue
Simi Valley, CA 93063
Cell (805) 905-1675
ndnrandy@gmail.com
R-indigenousconsultantstribalmonitoring.com

April 1, 2014

Hello, my name is Randy Guzman-Folkes and I am from the Tataviam Band of Mission Indians, Venturano Chumash, and Shone-Paiute. My company is R. Indigenous Consultants Tribal Monitoring LLC. I take pride in providing Native American Monitoring services that protect our sacred sites, cultural resources and ancestors during grading, excavation, and site development.

R. Indigenous Consultants Tribal Monitoring LLC/Randy Guzman-Folkes is listed on the Native American Heritage Commission's Native Monitoring list. The NAHC understands the important relationship between California Indian Communities and the land, which is an Asset for cultural resources. The State and Federal Government has enacted laws that set out to preserve and safeguard theses sites and resources.

As a Native Monitor, I work in consultation with archeologists, geologists, paleontologist, and city planners. We work together to review documents such as Environmental Impact Reports, grading plans, California Environmental Quality Reports, site surveys and National Forestry Reports. However, these documents are not enough to identify sacred sites or areas of concern to tribes. Often these documents do not contain tribal input, cultural knowledge, or accurate historic background. This is why the

Federal, State, and local governments have laws in place that call for consultation and monitoring of development projects.

My family has been recognized by both the State of California and the NAHC as a, Most Likely Descendant (MLD). This means that should any development impact a cultural site or sensitive area, R. Indigenous Consultants Tribal Monitoring can provide an MLD to facilitate the correct handling of the site, artifact or culturally sensitive materials. R. Indigenous Consultants has been in the field of Native American Monitoring for over 30 years. We are eager to work with your company and to educate you about the laws that pertain to the protection and preservation of sacred sites and cultural resources.

We would be honored to work with you on your current or upcoming projects.

In Good Spirit,

Randy Guzman-Folkes

RICHARD A. COOPER, PROPRIETOR
LITTLEROCK LAKE RESORT
32700 CHESEBORO ROAD **_TELE: (661) 285-5278_**
PALMDALE, CA 93552 **_FAX: (661) 944-0270_**

January 30, 2014

Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550

RECEIVED
FEB 03 2014

RE: Pending Construction Project at Littlerock Dam

To Whom It May Concern:

I purchased the business at Littlerock Dam seven and one half years ago at which time I was asked by the U.S.D.A. Forest Service to submit my business plan for this facility. I have not been able to fully comply with their request due to your projected construction project and related closure.

After seven and one half years I believe you should be able to give me more definitive answers as to when this closure should and will take placed. I have not been able to plan for or implement any promotions for improving my business or making any long distance plans for future projects due to the unavailability of any definitive answers as to when your project will commence!

I expect to be brought up to date and kept informed as to the status of this project. You are directly affecting my ability to operate a viable business and plan for my future and the future of my business. Send all correspondence to the above address, Fax number and e-mail me at patstax2@yahoo.com.

Your immediate attention to this matter will be appreciated.

Sincerely,

LITTLEROCK LAKE RESORT

Richard A. Cooper
Owner/Operator

March 31, 2014

Forest Service/Palmdale Water District
c/o Aspen Environmental Group
5020 Cheseboro Road, Suite 200
Agoura Hills, CA 91301

REGARDING: DREDGING SEDIMENT FROM LITTLEROCK RESERVOIR

Dear Sir:

We read with interest the information related to dredging sediment from Littlerock Reservoir. According to the article in the Antelope Valley Press, March 27, 2014, page A3, current plans include depositing the dredged sediment at local sites. All of the sites listed: (a) 47th Street East south of Pearblossom Highway and north of Barrel Spring Road; (b) land in the vicinity where Cheseboro Road meets Mount Emma Road; and (c) quarries around East Avenue T and Pearblossom Highway all present major dust events for residents when the sediment dries.

If the prevailing winds blow from the southwest or the Santa Ana winds blow from the northeast, residents in the surrounding areas will be subject to major dust events and the inevitable spores of Coccidioidomycosis (San Joaquin Valley Fever). As you know, Valley Fever is well documented in the Antelope Valley with an increase in cases reported with the development of solar farms. It is also well documented that the spores are found in lake sediment.

Many thousands of people in all directions from the proposed sediment deposit sites will be put at risk for serious and sometimes fatal illnesses related not only to Valley Fever but the hazard of dust inhalation.

We understand the need to dredge the reservoir but what other deposit sites are available, in unpopulated areas, in view of the health risks associated with such deposits in residential communities?

We plan to attend the next public meeting and will be alerting neighbors to the health risks associated with the proposed sediment deposit sites.

Sincerely, concerned residents of 43rd Street East, Palmdale

Crystal Chavez

Ms. Crystal Chavez
36050 43rd Street East
Palmdale, CA 93552

See attached

Letter to Forest Service/Palmdale Water District

Name *(Print)*: ARTURO CASTANEDA

Address: 36043 E. 43RD ST

PALMDALE CA 93552

Signature: Arturo Castaneda

Name *(Print)*: Louise Williams

Address: 36028 43rd St

Palmdale Ca 93552

Signature: Louise Williams

Name *(Print)*: Cathy Hunt

Address: 36038 43rd St East

Palmdale CA 93552

Signature: Cathy Hunt

Name *(Print)*: Ann Salaun Rondeau

Address: 36060 43rd St E

Palmdale CA 93552

Signature: Ann S Rondeau

Letter to Forest Service/Palmdale Water District

Name *(Print)*: RUTH E. YBARRA

Address: 36033 43RD St. E.

Palmdale, Ca. 93552

Signature: Ruth E. Ybarra

Name *(Print)*: ______________________

Address: ______________________

____

Signature: ______________________

Name *(Print)*: ______________________

Address: ______________________

____

Signature: ______________________

Name *(Print)*: ______________________

Address: ______________________

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Signature: ______________________

Appendix F

Army Corps of Engineers, 404(B)(1) Evaluation Summary

APPENDIX F – ARMY CORPS OF ENGINEERS, 404(B)(1) EVALUATION SUMMARY

1.0 Introduction

This document identifies the information in the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Littlerock Reservoir Sediment Removal Project that is applicable to Section 404 of the Clean Water Act (CWA). This summary has been prepared to facilitate and support the permit application required by the U.S. Army Corps of Engineers (Corps) to evaluate the Project under Section 404(b)(1).

As described in the EIS/EIR Section B, the Palmdale Water District (PWD) is seeking authorization to: (1) construct a subterranean grade control structure within the Littlerock Reservoir at Rocky Point; (2) restore the Reservoir to 1992 water storage and flood control capacity through an initial removal of approximately 1,165,000 cubic yards of sediment; and (3) maintain Reservoir capacity through ongoing annual removal of newly accumulated sediment.

The Project would be primarily located within the Littlerock Reservoir, which is a man-made feature formed by the impoundment of water by the Littlerock Dam. The Reservoir is located within the boundaries of the Santa Clara Mojave Rivers Ranger District of the Angeles National Forest, approximately 10 miles southeast of the City of Palmdale and four miles south of the community of Littlerock in northern Los Angeles County. Sediment that is excavated from the Reservoir would be used to backfill exhausted mining pits located at existing quarries within the City of Palmdale or temporarily stored at a 21-acre site owned by PWD in unincorporated Los Angeles County for recycled uses.

1.1 Regulatory Setting

Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g. certain farming and forestry activities) (USEPA, 2015).

Proposed activities are regulated through a permit review process, with an individual permit required for potentially significant impacts. The Corps, per the environmental criteria set forth in the CWA Section 404(b)(1) Guidelines, reviews individual permits. These guidelines are the substantive criteria developed by the U.S. Environmental Protection Agency (EPA) and used by the Corps to evaluate proposed discharges into waters of the United States (USEPA, 2015).

The Corps may not issue a permit under Section 404 if the proposal does not meet the 404(b)(1) Guidelines, and a permit may only be issued for the least environmentally damaging practicable alternative (LEDPA), as determined by the Corps. The Corps considers practicability, which includes cost, existing technology, and logistics [40 C.F.R. 230.10(a) and 230.3(q)]. The primary component of the Corps' permit review process is the alternatives analysis. Per 40 C.F.R. 230.10(a), no discharge from a project shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact to the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences (USEPA, 1990).

A 1990 Memorandum of Agreement (MOA) between the EPA and the U.S. Department of the Army provides guidance on the type and level of "appropriate and practicable" mitigation, which demonstrates compliance with the Section 404(b)(1) Guidelines (USEPA, 1990). In determining measures to offset unavoidable impacts, mitigation should be "appropriate" to the scope and degree of those impacts and "practicable" in terms of cost, existing technology, and logistics in light of overall project purposes (USEPA, 1990). When evaluating a project, the Corps will consider whether the project provides appropriate and practicable compensatory mitigation, as well as the extent to which the project avoids or minimizes impacts.

1.2 Project Purpose *(Section 1.4 of the EA 404(b)(1) Guidelines Evaluation)*

1.2.1 Basic Project Purpose

The basic purpose for the Project is to restore PWD's water storage and flood control capacity at Littlerock Reservoir. This Reservoir is a critical part of the potable water system operated by PWD to provide service to customers in the City of Palmdale and the surrounding unincorporated communities. The Reservoir also provides debris control and flood protection for downstream areas (USFS, 1997).

1.2.2 Overall Project Purpose

The overall purpose for the Project is two-fold: (1) to restore Littlerock Reservoir to its 1992 water storage and flood control capacity, and maintain that capacity through annual sediment removal; and (2) to preserve habitat for the arroyo toad (*Anaxyrus californicus*) through construction of a grade control structure that would prevent sediment loss and headcutting of the stream channel upstream of Rocky Point.

1.2.3 Water Dependency Determination

The Project is water dependent. This Project would address ongoing siltation and sedimentation at Littlerock Reservoir through an initial removal of 1,165,000 cubic yards of accumulative sediment, which has decreased annual water storage of the Reservoir by approximately 500 acre-feet. Upon initial sediment removal, the Project includes ongoing annual removal of new sediment inflow to maintain the Reservoir's design capacity.

1.2.4 Project Purpose and Need under NEPA

Littlerock Dam and Reservoir are operated and maintained by PWD, pursuant to a USDA Forest Service (USFS) special use permit. The purpose and need for the USFS, as the NEPA Lead Agency, is to respond to an application from PWD for a special use authorization to construct the proposed grade control structure and to remove sediment from the Reservoir.

1.3 Proposed Project Description *(Section 1.5 of the EA 404(b)(1) Guidelines Evaluation)*

The proposed Project would consist of the following three components to restore and preserve the capacity of Littlerock Reservoir: (1) construction of a subterranean grade control structure, (2) initial removal of approximately 1,165,000 cubic yards of sediment (requiring approximately 7 to 12 years of removal during the fall-early winter), and (3) ongoing annual sediment removal (up to approximately 38,000 cubic yards per year during the fall-early winter). Annual site restorations would begin immediately following the cessation of annual construction activities concurrent with appropriate planting conditions and permit requirements.

Grade Control Structure. Before sediment removal can occur, a grade control structure would be constructed within the Reservoir at an area known as Rocky Point. Construction of the grade control structure is necessary to ensure that sediment removal will not result in degradation to designated critical habitat for the arroyo toad located immediately upstream of Rocky Point by inducing head-cutting (lowering) of the channel bed upstream of the structure. The proposed grade control structure and construction would include the following:

- A permanent structure of soil cement at Rocky Point and extending from bank to bank. The structure would prevent head cutting (erosion) upstream of Rocky Point, preserving arroyo toad habitat.
- Constructed mostly below grade, with only the top or upper lip of the structure and some adjacent bank protection visible in the stream surface and adjacent banks after completion.
- Temporary ground disturbance of approximately 3.5 acres. Permanent disturbance after construction would consist of the crest of the grade control structure that remains visible above grade (approximately 8 feet by 200 feet), plus bank protection adjacent to the structure. Total area of visible (above ground) soil cement bank protection after construction, including the grade control structure crest, is approximately 0.34 acres.
- Construction duration of 20 weeks to begin in July and extend through the fall.
- Construction equipment would be operated up to 12 hours per day, 6 days a week, with night construction possibly required for a maximum of 14 nights.
- Workforce ranging in size from 9 to 14 persons.
- Maximum of 30 daily worker vehicle trips and 6 daily truck delivery trips.

Initial Annual Sediment Removal. Upon completion of the grade control structure, PWD would remove approximately 1,165,000 cubic yards of sediment from the Reservoir bottom, restoring the Reservoir to 1992 design capacity. Sediment would be removed annually during a temporary closure of the Reservoir starting in 2017 after Labor Day until seasonal water refill of the Reservoir suspends removal efforts (estimated between mid-November and January). The Reservoir would be closed to the public during this period. Annual sediment removal activities restoring the Reservoir capacity would include the following:

- Excavation of approximately 1,165,000 cubic yards of accumulated sediment to restore Littlerock Reservoir to 3,500 acre-feet (af) of water storage capacity.
- Temporary annual closure of the Reservoir starting after Labor Day until seasonal water refill of the Reservoir suspends removal efforts (estimated between mid-November and January).
- Sediment removal activities would occur during daylight hours up to 12 hours per day Monday through Saturday (no work on Sundays or federal holidays).
- Maximum annual disturbance of approximately 30 acres within the Reservoir bed.
- Equipment staging within paved parking areas along Reservoir.
- Maximum of 480 (240 round trip) dump truck trips per day. Requires the use of 16 dump trucks.
- Sediment storage and disposal at one of two locations: (1) exhausted mining pits within Littlerock, with more than 1,200,000 cubic yards of capacity for long-term disposal; and (2) PWD-owned

property on 47th Street East, with up to 10,000 cubic yards of capacity for short-term storage (allowing for recycled use of sediment material).

- Annual restoration of disturbed areas.
- Minimum duration of approximately 7 years, up to 12 years, to restore 1992 design capacity.

Ongoing Annual Sediment Removal. Current estimates indicate Reservoir capacity is reduced by siltation at an average annual rate of approximately 38,000 cubic yards of sediment per year, amounting to a loss of approximately 23 af of water capacity annually. Therefore, upon restoring the Reservoir to 1992 capacity, an average of 38,000 cubic yards of sediment would be removed from the Reservoir annually. The actual amount of sediment removed from the Reservoir would be based on the expected amount of sediment deposition that occurred during each year's winter storms. Operation and maintenance sediment removal would include the following activities:

- Approximately 38,000 cubic yards of sediment removed from the Reservoir annually (actual amount removed would be based on the expected amount of sediment deposition carried into the Reservoir during each year's winter storms).
- Would occur sometime after Labor Day and be finished prior to mid-November of each year.
- Sediment removal activities would occur during daylight hours up to 12 hours per day Monday through Saturday (no work on Sundays or federal holidays).
- Maximum annual disturbance of approximately 15 acres within the Reservoir bed.
- Maximum of 180 (90 round trip) dump truck trips per day. Requires the use of 6 dump trucks.

2.0 Alternatives *(Section 4.0 of the EA 404(b)(1) Guidelines Evaluation)*

Under the Section 404(b)(1) Guidelines, the Corps must consider a number of factors when making its permit decisions, including whether there are practicable alternatives to the proposed discharge. An alternative is "practicable" if "it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purposes." 40 C.F.R. 230.10(a)(2).

In addition to the 404(b)(1) alternatives analysis, the Corps is required to analyze alternatives pursuant to NEPA. Under NEPA, the range of alternatives is governed by the rule of reason, which provides that a decision document must consider a reasonable range of alternatives as defined by the specific facts and circumstances of the proposed action. Alternatives must be feasible and consistent with the statement of purpose and need. If alternatives have been eliminated from detailed study, the decision must briefly discuss the reasons for their elimination. For this Project, the alternatives considered but eliminated from full analysis are summarized in the EIS/EIR Section B.4.6. Under NEPA, feasible alternatives selected for detailed study in the EIS/EIR must be addressed at the same level of detail as the proposed Project, thus sharply defining the issues and providing a clear basis for choice by the decision maker and the public (40 C.F.R. 1502.14.) The "No Action" alternative (i.e., no activity requiring a Corps permit) must also be included among the alternatives analyzed.

Two alternatives were fully analyzed in the EIS/EIR: (1) Reduced Sediment Removal Intensity Alternative, and (2) No Action/No Project Alternative. The following is a summary of the alternative descriptions that are included in the EIS/EIR Section B.4.5.

Reduced Sediment Removal Intensity Alternative (Alternative 1)

Under Alternative 1, construction of the grade control structure would be identical to that of the proposed Project. Once restored to design storage capacity, ongoing sediment removal to maintain Reservoir capacity would be identical to that of the proposed Project. Therefore, this alternative only differs from the proposed Project during the initial (restorative) sediment removal. Alternative 1 seeks to reduce certain environmental impacts (primarily air quality and traffic) by:

- Starting the initial sediment removal period on July 1 (annually), instead of after Labor Day.
- Sediment removal activities would occur 5 days per week, instead of 6 (with the proposed Project).
- Restoring the Reservoir to 1992 design water storage and flood control capacity within a minimum of 13 years, instead of 6 (with the proposed Project).
- Reducing the number of daily haul trips and equipment used during initial sediment removal.

Site preparation, disturbance area, construction staging/access, and annual restoration activities would be the same under Alternative 1 as that described for the proposed Project during initial/restoration sediment removal. However, the amount of equipment used, weekly construction scheduling, and construction workforce would be reduced when compared to the proposed Project. While these reductions would reduce air quality emissions and the number of daily truck trips, it would double the number of years needed to restore the Reservoir to 1992 capacity. Therefore, this alternative seeks to reduce the intensity of construction activities of the proposed Project.

No Action/No Project Alternative

Under the No Action/No Project Alternative, sediment removal activities would not occur and sediment would continue to accumulate upstream of Littlerock Dam at the annual average rate of 38,000 cubic yards per year, reducing the capacity of the Reservoir by approximately 23.6 acre-feet annually. Should the Reservoir be filled with sediment to the Dam spillway, sediment accumulated behind the Dam would be approximately 7.4 million cubic yards. As Reservoir capacity is lost each year, PWD would be forced to acquire additional water from other sources to supply communities within PWD’s service territory.

Continued sediment deposition could compromise the long-term integrity of the Dam. In this event, the California Department of Water Resources Division of Safety of Dams could require the Dam to be breached. In addition, as the Reservoir would no longer function as a viable water storage facility, it would not be in compliance with the USFS Special Use Permit under which it currently operates. Subsequently, the Dam would be demolished per the conditions identified in the USFS's Special Use Permit. Demolition of the Dam would result in the elimination of the potential for water impoundment at the Reservoir and permanent loss of this potable water source. While 7.4 million cubic yards of sediment would accumulate within the Reservoir, demolition of the Dam is estimated to only require the removal of approximately 2.8 million cubic yards of sediment and dam concrete. Such a scenario would result in a project similar to, but larger, than the proposed Project and restore Little Rock Creek stream flow through the existing Reservoir.

Either scenario potentially occurring under the No Action/No Project Alternative would eliminate any downstream flood-control benefit the dam currently provides. It would result in 23 acre-feet per year of sediment, which is currently held by the Dam, being transported naturally by flows into the downstream bed of Little Rock Creek, with potential associated reductions in flood conveyance capacity of the creek and in-stream structures such as road crossings and alteration of the in-stream habitat. The existing Reservoir area would also become similar to upstream conditions under this alternative. Riparian vegetation would be expected to recruit along the margins of the active channel and may eventually develop into a mature riparian community. Other areas of the Reservoir likely would be similar to alluvial fan communities and consist of a mosaic of upland and various riparian vegetation depending on the scour regime associated with the creek. Should this occur, the Reservoir area may develop characteristics that would support habitat for the arroyo toad and other riparian and floodplain associated species.

2.1 Practicability of Alternatives

Per 40 C.F.R. 230.10(a)(2), an alternative is "practicable" if "it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose." Consistent with the 404(b)(1) Guidelines for alternatives analysis, the following criteria are used in the discussion below to assess the practicability of the Project alternatives: (1) Overall Project Purpose and NEPA Purpose and Need; (2) Cost; (3) Technology; (4) Logistics; and (5) Environmental.

2.1.1 Overall Project Purpose and NEPA Purpose and Need Criteria

To be practicable, an alternative must meet the overall project purpose to restore Littlerock Reservoir to its 1992 water storage and flood control capacity and maintain that capacity through annual sediment removal, and to preserve habitat for the arroyo toad through construction of a grade control structure.

- **Reduced Sediment Removal Intensity Alternative (Alternative 1).** This alternative would meet the overall Project purpose. Alternative 1 would restore the Reservoir to its 1992 water storage and flood control capacity in approximately 13 years (compared with 7 to 12 years under the proposed Project), and annual sediment removal activities, as well as construction of the grade control structure, would be identical to the proposed Project.
- **No Action/No Project Alternative.** This alternative would not improve the water storage or flood control capacity of Littlerock Reservoir, and consequently would not meet the overall Project purpose and need. The No Action/No Project Alternative is required for an EIS under NEPA (40 CFR Section 1502.14[d]) and for an EIR under CEQA (Title 14 CCR Section 15126.6[e]).

2.1.2 Cost Criteria

Cost practicability for the alternatives is based on the construction costs for Reservoir excavation and the grade control structure. A 2015 probable cost estimate that was prepared for this Project included a 25 percent contingency for both the reservoir excavation and grade control cost estimates due to the preliminary nature of the plans (NHC, 2015). Cost of the grade control structure construction, including contingency, was estimated at approximately $4.2 million (NHC, 2015). The initial sediment excavation (restoring the Reservoir to design capacity), including contingency, was estimated at approximately $18.8 million (NHC, 2015). Reservoir excavation costs would be sensitive to fluctuating transportation costs for excavated material. Grade control structure costs would be sensitive to fluctuating roller compacted concrete prices.

The Project's cost estimate for initial excavation was based on the amount of excess sediment in the Reservoir in October 2013. As sediment is continually delivered to the Reservoir by natural inflow, the cost of initial excavation will be increased by an amount roughly equivalent to $800,000 per year for each year that elapses between 2013 and the year the initial excavation is completed (NHC, 2015). This also represents the annual ongoing cost for maintaining design capacity (after the 1992 design capacity has been restored).

- **Reduced Sediment Removal Intensity Alternative (Alternative 1).** Alternative 1 would involve a reduction in the amount of equipment that is required, the weekly construction scheduling, and the construction workforce compared with the proposed Project. Although the annual cost of initial excavation may be less than the Project, costs would occur over a longer period (i.e., 13 years) under Alternative 1. As construction of the grade control structure and ongoing annual sediment removal activities following initial restoration of the Reservoir would be identical to the proposed Project, the cost of these components would also be identical. Overall costs of Alternative 1 would be similar to the proposed Project.
- **No Action/No Project Alternative.** No immediate construction costs would be incurred with implementation of this alternative. However, the No Action/No Project Alternative may contribute to the need for future demolition of the Dam and removal of approximately 2.8 million cubic yards of sediment and dam concrete. Given the larger scale of such a project, this alternative would likely incur greater construction and excavation cost in the future.

2.1.3 Technology Criteria

The technology criterion applicable to the alternatives considers the following methods used for sediment excavation and construction of the grade control structure.

Grade Control. The grade control structure is proposed to be constructed of roller compacted concrete. The structure includes bank protection upstream and downstream of the grade control sill. Excavation for the structure is up to 60 feet below the existing ground and has been assumed to be open cut at a 2:1 slope with minimal shoring on the upstream and downstream sides in the reservoir and creek bed. Control of water has been assumed to involve a series of dewatering wells upstream and downstream of the structure with disposal in the reservoir (i.e., assuming that reservoir excavation is not occurring simultaneously). In addition to the dewatering wells, a low temporary berm is assumed to be constructed upstream of the structure to contain incidental runoff from upstream. A total of approximately 6,250 cubic yards of concrete is estimated for construction of the grade control sill and stepped face of the structure, and approximately 3,000 cubic yards are required for the roller compacted concrete bank protection and side slopes. Temporary excavation and backfill is required for installation of the structure and finished grading will include tie-ins to the existing slopes upstream and downstream of the structure. These slopes are assumed to be treated with simple erosion control methods involving biodegradable wattles and seeding (NHC, 2015).

Excavation. The excavation is a trapezoidal section with 4:1 side slopes and flat bottom. The proposed bottom of the excavation plan generally follows a slope of approximately 1.48 percent up the length of the Reservoir, from an elevation just above that of the existing outlet at the upstream Dam face. The bottom of the excavation plan daylights at Rocky Point, where a grade control is proposed to minimize potential disturbance to biologically sensitive areas upstream (NHC, 2015). Approximate types and numbers of equipment to be utilized include: 2 D9 Bulldozers; 1 Grader; 1 Sweeper; 1 Front End Loader (6 yard capacity); 1 Excavator; 16 Dump Trucks (12 yard capacity); 1 Water Truck (4,600 gallon capacity); 1 Fuel Truck; 1 Maintenance Truck; Brush chipper/shredders and chain saws.

- **Reduced Sediment Removal Intensity Alternative (Alternative 1).** Although this alternative would schedule initial sediment removal activities over a longer period, the same types of excavation equipment would be identical to the proposed Project. The schedule and equipment for construction of the grade control structure would also be identical to the proposed Project.
- **No Action/No Project Alternative.** As this alternative would not involve any immediate construction activities, the technology criterion is not applicable.

2.1.4 Logistics Criteria

In order to be practicable, an alternative must satisfy industry and regulatory design standards that are required for safety or are driven by design efficiencies having to do with cost controls or best engineering practices. PWD has developed Standard Project Commitments (SPCs) as part of its Project activities, some of which are highlighted in Table 5-1. See Appendix A in the EIS/EIR for a full list of the Project's SPCs. Adherence to all identified SPCs is considered part of the proposed Project, and the SPCs include the commitments PWD will incorporate during all proposed Project activities, if selected by the lead agencies in their respective decision documents. The EIS/EIR also includes several mitigation measures proposed to reduce or avoid specific impacts not covered by SPCs.

PWD and its contractors will follow approved SPCs and mitigation measures at all times during Project activities. The Project SPCs were developed to proactively protect sensitive resources at the Reservoir, reduce environmental impacts associated with Project activities, and to ensure safety during Project construction. SPCs can also evolve to become better as improvements are discovered. A number of the SPCs have been developed to specifically protect natural resources (plants, fish and wildlife, and for cultural resources). SPCs include, among other things, pre-construction flagging of sensitive resource areas and the need for other restrictions. In making final decisions on the Project, the lead agencies are allowed to weigh the feasibility and need for these SPC's, and may not make all of them applicable to the Project. If any of the SPC's are not selected, the rationale for excluding them shall be provided in the decision document, along with a determination that the impacts of the Project are still within the scope of those described in the EIS/EIR. For specific impacts that would not be sufficiently reduced or avoided by SPCs, mitigation measures have been proposed within the relevant issue area analyses for the EIS/EIR. The lead agencies will determine which measures are to be adopted as part of their decision on the Project.

All Project personnel would be subject to an annual training that covers applicable SPCs, mitigation measures, environmental laws and regulations, and applicable agency requirements, with adherence to be included as part of PWD's written contract with any contractor selected to conduct proposed Project activities. Prior to conducting Project activities, PWD personnel would review approved SPCs and mitigation measures with the selected contractor to ensure the intent and background of each procedure is clearly understood. In addition, PWD and USFS personnel (or representatives) would monitor the contractor during activities and conduct follow-up inspections of the job site at periodic intervals after the work had been completed.

- **Reduced Sediment Removal Intensity Alternative (Alternative 1).** This alternative would incorporate the same SPCs and mitigation measures as the proposed Project (see Table 5-1 below, and EIS/EIR Appendix A). The logistics for construction and implementation of Alternative 1 are identical to the proposed Project.
- **No Action/No Project Alternative.** As this alternative would not involve any immediate construction activities, proposed Project SPCs and mitigation measures are not applicable. The logistics criteria would not apply to the No Action/No Project alternative.

2.1.5 Environmental Criteria

To meet the Environmental Criteria, the alternatives must have similar or fewer impacts to aquatic resources as compared to the proposed Project, and they must not create other significant adverse environmental consequences such as impacts to federally listed as threatened or endangered species, impacts to vegetative communities, or impacts to historic properties.

- **Reduced Sediment Removal Intensity Alternative (Alternative 1).** This alternative was developed to reduce the severity of impacts associated with air quality, traffic, and noise as compared to the proposed Project. Alternative 1 would also reduce the risk of road kill as a result of fewer daily truck trips. While Alternative 1's extended construction schedule would increase the likelihood of disturbing nesting birds, impacts would remain less than significant. Draining the Reservoir earlier in the season may also have greater impacts to arroyo toads than under the proposed Project, although there would be no substantial change in the significance of these impacts. Regarding the Projects effects on cultural resources, impacts from Alternative 1 would be identical to the proposed Project.
- **No Action/No Project Alternative.** By not removing sediment as proposed, the No Action/No Project Alternative would avoid impacts to wildlife species, vegetative communities, or historic properties. However, this alternative may require eventual removal of sediment and demolition of the Dam, which would involve an intensive construction effort that would create greater impacts to biological resources above and below the Dam than from the proposed Project or Alternative 1. In the event that removal of sediment and demolition of the Dam were to occur, impacts to cultural resources would likely be similar to the proposed Project if standard mitigation measures are implemented to avoid and/or minimize adverse effects on these resources.

2.2 Practicability Analysis Findings and Conclusions

2.2.1 Reduced Sediment Removal Intensity Alternative (Alternative 1)

Alternative 1 is a practicable alternative to the proposed Project. It meets the Project's overall purpose and need. The estimated costs of this alternative would be similar to the proposed Project, while the logistics for construction and implementation are identical. Both Alternative 1 and the proposed Project would incorporate the same SPCs to proactively protect sensitive resources at the Reservoir, reduce environmental impacts associated with Project activities, and to ensure safety during Project construction. Further, Alternative 1 would reduce the severity of the proposed Project's impacts associated with air quality, traffic, and noise, while not creating new significant impacts that would require further mitigation.

2.2.2 No Action/No Project Alternative

The No Action/No Project Alternative is not a practicable alternative to the proposed Project. It would not meet the overall purpose and need to improve the water storage or flood control capacity of Littlerock Reservoir. If eventual removal of the Dam and accumulated sediment is required as a future outcome of this alternative, such a project would likely incur greater construction and excavation costs than the proposed Project, as well as create greater impacts to biological resources above and below the Dam.

3.0 Existing Conditions *(Section 1.8 of the EA 404(b)(1) Guidelines Evaluation)*

The Project area includes the Littlerock Reservoir where sediment would be removed and the grade control structure installed at Rocky Point; staging areas located within or immediately adjacent to the Reservoir; and sediment disposal areas located off National Forest System (NFS) lands. Sediment disposal/storage areas are located up to six miles north of the Reservoir and include disturbed quarries and semi natural lands.

The majority of the Project is located within the Antelope Valley Watershed, which is a large (3,387-square-mile) closed basin in the western Mojave Desert. All water that enters the watershed either infiltrates into the underlying groundwater basin, or flows toward three playa lakes located near the center of the watershed (i.e., Rosamond Lake, Rogers Dry Lake, and Buckhorn Dry Lake).

Little Rock Creek is a major intermittent drainage that transports water from the San Gabriel Mountains to the playas. During periods of normal rainfall, the creek readily overtops the dam and flows for several miles into the Antelope Valley. Little Rock Creek is home to several sensitive biological resources including the arroyo toad, two-striped garter snake, southwestern pond turtle, and a variety of rare birds including least Bell's vireo and bald eagle.

The proposed 47th Street East sediment storage site is located in the lower foothills of the San Gabriel Mountains immediately below the California Aqueduct. This site is bisected by a series of ephemeral drainages that carry surface water off the site. As a result of the dry climate in the Project area, the existing ephemeral streams typically flow only during periods of heavy rainfall.

A preliminary jurisdictional delineation of State and or federal waters/wetlands was conducted at the Reservoir, at Little Rock Creek below the dam, and at 47th Street East sediment storage site. Based on this survey the preliminary jurisdictional determination and delineation of waters report identified 92.306 Federal non-wetland waters and 97.428 acres of State jurisdictional waters. Federal wetland waters do not occur in the Reservoir or in Little Rock Creek. Littlerock Reservoir, Little Rock Creek, and the ephemeral drainages on the 47th Street East sediment disposal site would be considered "waters of the United States" and would be subject to the jurisdiction of the Corps, the California Department of Fish and Wildlife, and the Lahontan Regional Water Quality Control Board (LRWQCB).

The following summaries highlight additional site conditions that may be applicable to the Corps' review and decision-making process. A full discussion of the Project's site conditions, per resource area, can be found in the EIS/EIR, and their locations within the document are identified in Table 3-1, below.

Air Quality. The Project is located within the Mojave Desert Air Basin, under the jurisdiction of the Antelope Valley Air Quality Management District. The Project area is in nonattainment of the State and federal ozone standards and the State PM10 standard. The Project area is designated as attainment and/or unclassified for all other criteria pollutant standards. The Project area's attainment status is significantly influenced by pollutant transport from both the south (South Coast Air Basin, i.e. Los Angeles area) and the west (San Joaquin Valley Air Basin).

Biological Resources. There are currently 87 special-status wildlife taxa documented within the general region of the Study Area, with 20 of these taxa observed within or adjacent to the Project area. Two federally listed species are confirmed as occurring in the Project area: arroyo toad and least Bell' vireo. Arroyo toad is present in Little Rock Creek above Rocky Point and least Bell's vireos were documented below the dam downstream of the existing PWD access road. Approximately 24 special-status plant taxa have the potential to occur in the Project area. Native fish were not detected during the surveys. Bluegill (*Lepomis macrochirus*) and largemouth bass (*Micropterus salmoides*) were the most common non-native species detected and were found to occur in the Reservoir and portions of Little Rock creek above Rocky Point.

Cultural Resources. The Littlerock Reservoir contains no previously recorded cultural resources, and no cultural resources were identified within the Project's Area of Potential Effect (APE) during a pedestrian survey. The 47th Street East Property contains one previously recorded cultural resource (P-19-002475/CA-LAN-2475H). Documented in 1996, P-19-002475 consists of a historic-era metal can scatter dating to the late 1930s and early 1940s. In addition to rusted metal cans, it also contained fragments of bottle glass, chinaware sherds, iron pipe, metal scrap, barrel hoops, nails, and spent ammunition cartridges. During the pedestrian survey of the Project APE, no evidence of this site was observed. The area where the site was located appears to have been graded in recent years. This resource is no longer extant.

Noise. Ambient noise at Littlerock Reservoir is primarily created by birds chirping, wind noise, and periodic noise from recreationists and concessionaire activities. At residential receptor locations, the dominant noise source along the haul truck transportation routes and PWD disposal property is roadway traffic. In general, the proposed truck route areas are predominantly open space or rural residential lands where existing noise levels are generally low.

Traffic. There are four key intersections in the Project area that could potentially be affected by Project construction. Based on the existing peak hour traffic volumes, the turning movement counts, and the existing number of lanes at each intersection, the Level of Service (LOS) has been determined at each intersection. All key intersections within the Project area currently operate at LOS B (i.e., acceptable conditions) or better during the peak periods.

Water Quality. The Project area lies within the South Lahontan Hydrologic Region, one of the State's ten hydrologic regions established by the California Department of Water Resources for management purposes. The Project is subject to the water quality standards of the Water Quality Control Plan for the Lahontan Region (Basin Plan) as well as USFS water quality management objectives and strategies. The South Lahontan Hydrologic Basin Planning Area is further divided into Hydrologic Units (HU) and Hydrologic Areas (HA). The Project area lies within the Antelope HU. Littlerock Reservoir and all of the upstream contributing area, as well as both potential disposal sites, fall within the Rock Creek HA, while Little Rock Wash (downstream of the reservoir and dam) traverses both the Rock Creek HA and the Lancaster HA (LRWQCB, 1995). No Total Maximum Daily Loads (TMDLs) have been developed within the Project area. However, Littlerock Reservoir does not meet water quality standards for the Municipal and Domestic Supply beneficial use, and a TMDL is required but not yet complete. The reservoir is currently listed as impaired by metals (manganese), although the source is unknown. In addition, the RWQCB is considering listing Littlerock Reservoir as impaired by mercury and polychlorinated biphenyls (PCBs) (LRWQCB, 2014).

Table 3-1. Location of Issue Area Discussions in EIS/EIR

Issue Area	Applicable EIS/EIR Section	
	Affected Environment	Impact Assessment
Biological Resources	Section C.3.1	Section C.3.5
Essential Fish Habitat	Section C.3.1	Section C.3.5
Cultural Resources	Section C.4.1	Section C.4.5
Air Quality	Section C.2.1	Section C.2.5
Noise	Section C.8.1	Section C.8.5
Traffic	Section C.10.1	Section C.10.5
Water Quality	Section C.12.1	Section C.12.5

Source: Littlerock Reservoir Sediment Removal Project EIS/EIR (May 2016)

4.0 Environmental Consequences *(Section 5.0 of the EA 404(b)(1) Guidelines Evaluation)*

4.1 Impacts to Physical/Chemical Characteristics

Direct and indirect Impacts to the physical and chemical characteristics of the Project area would occur from implementation of the proposed Project and Alternative 1. No change to the Project area would immediately occur under Alternative 2; however, impacts would be substantial above and below the Dam if future Dam removal and sediment excavation is required. The following discussion highlights some of the Project impacts to the surrounding physical and chemical characteristics, while Table 4-1 identifies the locations within the EIS/EIR that analyze these Project impacts in detail.

Direct impacts to State and federal waters would include the removal of native riparian vegetation, alter Little Rock Creek flows within the boundary of Littlerock Reservoir, and possibly induce local erosion when inflow occurs when the reservoir is empty or filling. Indirect impacts could include alterations to the existing topographical and hydrological conditions. Operational impacts to wetland habitats would be similar to direct and indirect impacts and would primarily occur as a result of annual sediment removal activities or repairs to PWD access road below the dam.

Ground-disturbing activities in Project area could contribute to direct loss of a candidate, sensitive, or special-status species or to a loss of habitat. Direct, indirect, and operational impacts to special-status plant species may occur in a variety of ways, including the direct removal of plants during the construction of the grade control structure, during sediment removal, or from road maintenance activities north of the dam.

Construction of the grade control structure would result in soil disturbance. Restoration of the Reservoir storage capacity could also induce local erosion when the reservoir is empty or filling, due to steepening of the bed slope downstream of the grade control structure. However, this erosion would be confined to the reservoir bottom and sides below the water surface. No Project-related erosion would be expected at the disposal sites, and sedimentation from any temporary sediment stockpiles would be minor due to Project SPCs and compliance with existing regulations.

The Project would have a substantial beneficial impact on the surrounding watershed. By restoring the Reservoir to its 1992 design capacity, the Project would increase the Reservoir's volume to detain floods by 463 acre-feet (15 percent increase in volume). The Project would also improve the Reservoir's ability to provide debris control as well as continue to serve as a water resource for the surrounding communities.

Table 4-1. Impact Analyses for Physical/Chemical Characteristics in EIS/EIR

Issue Area	Applicable EIS/EIR Section		
	Proposed Project	Alternative 1	Alternative 2
Substrate	Section C.5.5.1	Section C.5.5.2	Section C.5.5.3
Current patterns and water circulation (and fluctuation)	Section C.7.5.1	Section C.7.5.2	Section C.7.5.3
Suspended particulates/turbidity	Section C.5.5.1 Section C.12.5.1	Section C.5.5.2 Section C.12.5.2	Section C.5.5.3 Section C.12.5.3
Normal water level fluctuations	Section C.7.5.1	Section C.7.5.2	Section C.7.5.3
Flood hazards and floodplain values	Section C.7.5.1	Section C.7.5.2	Section C.7.5.3

Table 4-1. Impact Analyses for Physical/Chemical Characteristics in EIS/EIR

Issue Area	Applicable EIS/EIR Section		
Storm, wave and erosion buffers	Section C.5.5.1 Section C.7.5.1 Section C.12.5.1	Section C.5.5.2 Section C.7.5.2 Section C.12.5.2	Section C.5.5.3 Section C.7.5.3 Section C.12.5.3
Erosion and accretion patterns	Section C.5.5.1 Section C.7.5.1 Section C.12.5.1	Section C.5.5.2 Section C.7.5.2 Section C.12.5.2	Section C.5.5.3 Section C.7.5.3 Section C.12.5.3
Water quality (salinity)	Section C.12.5.1	Section C.12.5.2	Section C.12.5.3
Aquifer recharge	Section C.7.5.1	Section C.7.5.2	Section C.7.5.3
Baseflow	Section C.7.5.1	Section C.7.5.2	Section C.7.5.3
Mixing zone/current velocity	Section C.7.5.1 Section C.12.5.1	Section C.7.5.2 Section C.12.5.2	Section C.7.5.3 Section C.12.5.3

Source: Littlerock Reservoir Sediment Removal Project EIS/EIR (May 2016)

4.2 Impacts to Biological Characteristics

Direct and indirect impacts to the biological characteristics of the Project area would occur from implementation of the proposed Project and Alternative 1. No change to the Project area would immediately occur under Alternative 2; however, impacts would be substantial above and below the Dam if future Dam removal and sediment excavation is required. The following discussion highlights some of the Project impacts to the surrounding biological resources, while Table 4-2 identifies the locations within the EIS/EIR that analyze these Project impacts in detail.

Implementation of the Project would affect biological resources through the removal of vegetation, altered soil conditions, loss of native seed banks, and temporary changes in the topography of the drainage. The vast majority of sediment removal activities would occur in unvegetated sandy wash. Most of the vegetation at the Reservoir is limited to scattered elements along the margin of the Reservoir and within a few well defined communities. These areas abut recreation facilities and are routinely subject to disturbance from anglers, recreationists, and off-highway vehicle use. Although the Project would remove riparian habitat, the functional value of the community in the Reservoir has been adversely affected or lost through mortality or previous disturbance and/or removal.

Habitat in the Project area has the potential to support a variety of State and federally listed wildlife species. Construction activities would disturb wildlife by limiting the ability for some species to forage at the Reservoir for several months at a time. However, access to surface water is generally present above and below the dam and work would not be conducted at night when many species are foraging. Indirect effects to aquatic species may be caused by the diversion or modification of water flows at the grade control structure, increased downstream sediment transport, or the establishment of noxious weeds. Human activities can indirectly affect wildlife by increased noise or by attracting predators such as the common raven, kit fox, and coyote from trash and litter. Operational impacts to wildlife are similar to sediment removal activities and include crushing by vehicles, trampling, increased sedimentation, dust, and the spread of exotic weeds.

The Littlerock Reservoir does not support any species of native fish. The Project would remove all non-native fish in order to improve habitat conditions for arroyo toad and other native species.

Table 4-2. Impact Analyses for Biological Characteristics in EIS/EIR

Issue Area	Applicable EIS/EIR Section		
	Proposed Project	Alternative 1	Alternative 2
Special aquatic species	Section C.3.5.1	Section C.3.5.1	Section C.3.5.3
Fish, crustaceans, mollusks, and other aquatic organisms	Section C.3.5.1	Section C.3.5.1	Section C.3.5.3
Wildlife values	Section C.3.5.1	Section C.3.5.1	Section C.3.5.3
Threatened and endangered species	Section C.3.5.1	Section C.3.5.1	Section C.3.5.3
Biological availability of possible contaminants in dredged or fill materials	Section C.3.5.1 Section C.12.5.1	Section C.3.5.1 Section C.12.5.2	Section C.3.5.3 Section C.12.5.3

Source: Littlerock Reservoir Sediment Removal Project EIS/EIR (May 2016)

4.3 Impacts to Human Use Characteristics

Direct and indirect impacts to human use characteristics of the Project area would occur from implementation of the proposed Project and Alternative 1. No change to the Project area would immediately occur under Alternative 2; however, impacts would be substantial above and below the Dam if future Dam removal and sediment excavation is required. The following discussion highlights some of the Project impacts to human uses, per issue area, while Table 4-3 identifies the locations within the EIS/EIR that analyze these Project impacts in detail.

Water Supply. The Project would increase the storage capacity of Littlerock Reservoir by 463 acre-feet. However, water diverted to Palmdale Lake would not be available for Antelope Valley Groundwater Basin recharge in Little Rock Creek downstream of the dam. While the loss of this recharge could have an adverse effect on local groundwater levels and supplies, the Project-related reduction in Little Rock Creek water available to groundwater recharge would be minor, with little or no overall effect on aquifer volume or groundwater levels due to good recovery of the local groundwater subbasin in wet years, and the compensating effect of reduced groundwater pumping as surface water sources increase. Without implementation of the Project, PWD would need to rely more heavily on additional local groundwater pumping and water from the State Water Project.

Aesthetics. Because the Reservoir would be closed to the public during the proposed activity periods, visual impacts within the ANF would be limited to times when Project activities are completed. No visual change from Project activities would be visible when the Reservoir is full. Additionally, sediment disposal within quarry disposal locations would not be visible to the public. This is because the quarry properties are large disturbed areas, setback from public viewsheds. The grade control structure bank protection would introduce a new industrial character to views from Rocky Point, and the temporary sediment storage and activities within the PWD site would expand the existing disturbed and un-vegetated portion of the site north along 47th Street. However, these changes would not significantly alter the existing visual landscape of the sites, as the overall composition of viewsheds at these locations would be largely unaltered.

Noise. Noise impacts during annual sediment removal/disposal activities would be a function of the construction equipment, the equipment location, and the timing and duration of the noise-generating activities. The use of mobile construction equipment during annual sediment removal would not exceed

75 dBA Lmax at any residential receptors. Temporary noise generated by on-site construction equipment within the Reservoir or quarry disposal locations would not impact any sensitive receptors.

Traffic/Transportation Patterns. Initial sediment removal (to restore the Reservoir design capacity) would result in a significant impact at the intersection of Cheseboro Road and Pearblossom Highway during the afternoon peak hours. The presence of large trucks along the haul routes could also result in impacts relative to overall normal traffic flow.

Safety. Any potential impacts to water quality or public health due to hazardous materials from Project activities would be minor. Discharge of pollutants to receiving waters would be related to the spill or accidental release of hazardous materials, and the potential for hazardous materials to enter any waterbody would be small due to the generally dry conditions of the Project area during the proposed work schedule. The potential for the public or construction workers to be exposed to hazardous materials also would be small due to the generally uninhabited character of the Project area and the lack of substantial known contaminants in the reservoir sediment.

Recreation. After the initial construction and excavation activities proposed throughout the summer and fall of the Project's first year (2017), the proposed Project would not preclude recreational use of the Reservoir during the peak summer months until after Labor Day, assuming that the Reservoir is opened for public use during the life of the Project. The schedule for ongoing annual excavation and sediment removal would minimize the impacts to recreationists by avoiding closure of the Reservoir during the peak recreational period. The Project does not involve any alterations to the recreational opportunities offered at the Reservoir, nor does it propose any change in the management of the Reservoir.

Property Ownership. The Reservoir is located on NFS lands and is characterized as a non-recreation special-use. Although the Reservoir is managed by PWD, its operations are subject to a special-use authorization that is administered by the USFS. The Project would store excavated sediment at two sites: (1) a 21-acre undeveloped site that is owned by PWD and is located in unincorporated Los Angeles County; and (2) privately operated sand and gravel pits that are located in the City of Palmdale. The Project is subject to the discretionary review and approval of the USFS, and PWD is coordinating with the County of Los Angeles and the City of Palmdale to meet their permitting and zoning requirements.

Land Use. The Project requires numerous dump truck trips (maximum of 480 per day) during the first seven years of sediment removal, followed by the truck trips during operation and maintenance of the Reservoir. These sediment removal activities would create nuisance impacts to nearby residences. Residents along the truck routes or disposal sites would be disturbed by the increased truck traffic along roadways, as well as by the noise and emissions from the trucks.

Historic Properties. While no known resources are within the Project APE, five cultural resources are documented within a quarter mile of the Littlerock Reservoir, and the area is considered sensitive for prehistoric and historical cultural resources. Due to various surface conditions or changes over time, not all cultural resources are expressed on the surface. Any project with ground disturbing components has the potential to directly impact unanticipated cultural resources. The only potential for direct impacts to cultural resources during the construction phase of the Project is from unanticipated or inadvertent cultural resource discoveries.

Parks, National and Historical Monuments, and Similar Areas. Littlerock Reservoir is located within the Santa Clara/Mojave Rivers Ranger District of the ANF. The portion of the Project area that is located on NFS lands would also be within the newly designated San Gabriel Mountains National Monument. A new management plan will be developed to establish goals and policies for the NFS lands within the San

Gabriel Mountains National Monument. The management plan for the monument would be incorporated as an amendment to the existing USDA Forest Service Land Management Plan, and would not affect existing permitted and authorized special uses within the ANF such as Littlerock Reservoir.

Air Quality. The Project would have to comply with all rules and regulations applicable at the time of the Project's construction and operation and would implement the air quality project commitments (see Appendix A of the EIS/EIR) that would reduce air pollutant emissions during Project construction and operation. All of the average daily and annual construction emissions are estimated to be below the AVAQMD emissions thresholds, except for average daily PM10 emissions during the excavation phase. All operation air pollutant emissions impacts are well below AVAQMD emissions thresholds. Toxic air pollutant emissions are located far from sensitive receptors or spread out over a large area and so Project emissions of toxic air pollutants would not create substantial concentrations at sensitive receptor locations.

Global Climate Change. GHG emissions for the Project are estimated to be well below AVAQMD GHG emissions thresholds. The Project would conform to GHG emissions reductions policies, goals, and regulations.

Table 4-3. Impact Analyses for Human Use Characteristics in EIS/EIR

Issue Area	Applicable EIS/EIR Section		
	Proposed Project	Alternative 1	Alternative 2
Water supply and conservation	Section C.7.5.1	Section C.7.5.2	Section C.7.5.3
Aesthetics	Section C.11.5.1	Section C.11.5.2	Section C.11.5.3
Traffic/transportation patterns	Section C.10.5.1	Section C.10.5.2	Section C.10.5.3
Noise	Section C.8.5.1	Section C.8.5.2	Section C.8.5.3
Safety	Section C.6.5.1	Section C.6.5.2	Section C.6.5.3
Recreation	Section C.9.5.1	Section C.9.5.2	Section C.9.5.3
Recreational/ commercial fisheries	Not relevant to this EIS/EIR		
Navigation	Not relevant to this EIS/EIR		
Energy needs	Section E.1.2	Section E.1.2	Section E.1.2
Mineral needs	Not relevant to this EIS/EIR		
Economics	Not relevant to this EIS/EIR		
Food & fiber production	Not relevant to this EIS/EIR		
Farmland	Not relevant to this EIS/EIR		
Property Ownership	Section C.9.5.1	Section C.9.5.2	Section C.9.5.3
Land Use	Section C.9.5.1	Section C.9.5.2	Section C.9.5.3
Historic properties	Section C.4.5.1	Section C.4.5.2	Section C.4.5.3
Parks, national and historical monuments, and similar areas	Section C.9.5.1	Section C.9.5.2	Section C.9.5.3
Air quality	Section C.2.5.1	Section C.2.5.2	Section C.2.5.3
Global climate change	Section C.2.5.1	Section C.2.5.2	Section C.2.5.3

Source: Littlerock Reservoir Sediment Removal Project EIS/EIR (May 2016)

4.4 Cumulative Impacts *(Section 6.0 of the EA 404(b)(1) Guidelines Evaluation)*

The cumulative analysis for the proposed Project is fully discussed in the EIS/EIR Section D. Section D includes a list of cumulative projects (see EIS/EIR Section D, Table D-1 and Figure D-1) that have been completed, are in the process of construction, or are currently under review within a geographic area sufficiently large enough to provide a reasonable basis for evaluating cumulative impacts. These cumulative projects are under the jurisdiction of one of several jurisdictions: USFS, PWD, California Department of Transportation, County of Los Angeles, and the City of Palmdale. A summary of the cumulative impacts of the Project per resource area is provided below. Please refer to the EIS/EIR Section D for the fully discussion of the Project's cumulative effects.

Air Quality and Climate Change. Due to the physical separation of other cumulative projects from the main emissions source area for the Project, the incremental effect of the Project's air pollutant emissions when combined with the construction and/or operation emissions from other projects would be considered less than significant. Given that the air toxic emissions impacts from the Project would be very low at any one given sensitive receptor location, they would not be of a magnitude to contribute a significant incremental effect to cumulative health impacts. The Project's contribution to cumulative air quality impacts would not be cumulatively considerable.

Biological Resources. The Project's contribution to biological resource impacts in combination with past and reasonably foreseeable projects would be cumulatively considerable. Each of the cumulative impact discussions for Impact BIO-1 through Impact BIO-26 (see EIS/EIR Section D.4.2.2) describes the SPCs that would be implemented to minimize the incremental adverse effect of the Project. With incorporation of the identified SPCs, the Project's contribution to cumulative impacts to biological resources would be reduced to a level that is less than significant.

Cultural Resources. With regard to previously undetected cultural resources, the Project would not contribute an incremental impact within the region that would be cumulatively considerable. However, the Project would have the potential to combine with impacts from past, present, or future projects to result in a cumulative impact to human remains.

Geology and Soils. As no structures would be built under the Project, no cumulative impact for exposure of structures to geologic hazards would occur. SPCs would ensure that unstable slope conditions would not be produced under the Project. Conformance with existing laws, including the Clean Water Act, would ensure that no off-site erosion would occur under the Project. Other projects, both within the Project area and downstream of the Project area, would include soil-disturbing activities; however, soil disturbance under the Project would contribute an incremental cumulative effect that was negligible.

Hazards and Public Safety. Although other projects in the area of potential cumulative effects could result in accidental spills of hazardous waste that could contaminate water resources or expose the public to hazardous materials, the Project would result in negligible impacts with respect to releases of hazardous waste. Similarly, the Project impacts related to risk to public health (such as Valley Fever or unsafe highway conditions) are negligible. The sediment in Littlerock Reservoir is not known to harbor the fungus associated with Valley Fever, and fugitive dust would be minimized in conformance with existing air quality regulations. These impacts would not combine with adverse effects from similar projects to form a cumulative impact.

Hydrology. Given the Project's negligible effect on groundwater levels and flow patterns, and the use of best management practices to minimize effects on erosion and siltation, the Project would not contribute an incremental impact on hydrology and groundwater that would be cumulatively considerable.

Noise. While periodic activities at the PWD site could combine with identified cumulative projects (only if activities overlap), any increase in ambient daytime noise levels are considered negligible. With the inclusion of the SPCs described above, the Project's incremental contribution to a cumulative noise impact would be less than significant.

Recreation and Land Use. If the construction and maintenance phases of the Project were to occur concurrently with the construction of other development projects, the incremental disturbance effect of the Project to adjacent land uses would be cumulatively considerable. Adverse cumulative impacts resulting from the Project would be reduced through the Project's air quality and noise SPCs (see Table 5-1 below, and EIS/EIR Appendix A). However, given the proximity of existing residences to the truck routes and sediment storage/disposal sites, and the proximity of other proposed development to these same land uses, the Project's contribution to a cumulative land use disturbance would be significant and unavoidable.

Transportation and Traffic. During the initial sediment removal phase, the Project would contribute an incremental effect to traffic impacts that, when combined with the potential traffic impacts of other projects, would be cumulatively considerable. With regard to a the Project's incremental effect on emergency vehicle access and roadway damage, the implementation of traffic mitigation measures and SPCs (see Table 5-1 below, and EIS/EIR Appendix A) would reduce the Project's cumulative contribution to a less than significant level.

Visual Resources. Given that Project activities at the PWD site would not result in permanent impacts to the visual landscape, the Project would not contribute an incremental effect to an overall cumulative impact on visual resources.

Water Quality and Resources. It is possible that other projects within the area of potential cumulative effect could violate water quality standards or waste discharge requirements, or contaminate groundwater through the introduction or mobilization of pollutants. Examples of projects that could result in these potential impacts include active mining operations and new highway construction. However, the incremental effects associated with the Project for water quality degradation are negligible.

Wildfire Prevention and Suppression. In order to avoid adverse impacts, the Project would implement SPCs to prevent wildfire ignition and to immediately respond to a wildfire (see EIS/EIR Appendix A). The incremental impact of the Project on wildfire prevention and suppression would be mitigable to a level that is less than significant.

5.0 Evaluation of Compliance with 404(b)(1) Guidelines *(Section 7.0 of the EA 404(b)(1) Guidelines Evaluation)*

Table 5-1 incorporates the checklist information relevant to Section 7.1 of the Environmental Assessment 404(b)(1) Guidelines Evaluation. The information summarized in Table 5-1 includes the impacts identified for specific resource areas, SPCs that have been incorporated into the Project, and the residual effects following implementation of SPCs (mitigated).

Table 5-1. Factual Determinations of Compliance with Section 404(b)(1)

Summary of Impacts	Mitigation or SPC	Effects following mitigation
Physical substrate		
▪ Proposed Project and Alternative 1 ▪ Construction of grade control would result in soil disturbance. Excavation and grading would destabilize natural or constructed slopes.	▪ SPC GEO-1: Geotechnical Investigation	Less than significant
▪ Alternative 2 ▪ If future activities require Dam removal, substantial downstream erosion and sedimentation would result.	None	Significant and unavoidable
Water circulation, fluctuation, and salinity		
▪ Proposed Project and Alternative 1 ▪ Sediment excavation and construction of grade control would alter Little Rock Creek flows within the boundary of the Reservoir. ▪ Any stockpiled sediment at the PWD disposal site would divert flow in the ephemeral watercourse.	▪ SPC HYDRO-1: Fill From Reservoir Excavation Will Not Be Placed in Stream Channels	Less than significant
▪ Alternative 2 ▪ Future loss of the Reservoir's water storage capacity would increase the flood hazard downstream of the Dam.	None	Significant and unavoidable
Suspended particulate/turbidity		
▪ Proposed Project and Alternative 1 ▪ Construction of grade control would create soil disturbance within the reservoir. ▪ Stockpiled sediment at the PWD disposal site could be eroded by stormwater runoff.	▪ SPC GEO-1: Geotechnical Investigation ▪ SPC HYDRO-1: Fill From Reservoir Excavation Will Not Be Placed in Stream Channels	Less than significant
▪ Alternative 2 ▪ If future activities require Dam removal, substantial downstream erosion and sedimentation would result.	None	Significant and unavoidable
Contaminant availability		
▪ Proposed Project and Alternative 1 ▪ No impacts to water quality, as sediment in Reservoir is mostly free of contaminants and the level of contamination for any detected contaminants being extremely low. ▪ Project could result in accidental release of hazardous materials or discharge of contaminated water associated with dewatering activities.	▪ SPC WQ-1: Prepare Spill Response Plan ▪ SPC HYDRO-1: Fill From Reservoir Excavation Will Not Be Placed in Stream Channels	Less than significant
▪ Alternative 2 ▪ Future activities that require sediment excavation and Dam removal may create substantial impacts to water quality.	Mitigation similar to measures recommended for the proposed Project would be required to reduce impacts.	Dependent on the adequacy of mitigation.
Aquatic ecosystem and organism		

Table 5-1. Factual Determinations of Compliance with Section 404(b)(1)

Summary of Impacts	Mitigation or SPC	Effects following mitigation
▪ Proposed Project and Alternative 1 ▪ Construction may impact State and federal waters through removal of riparian vegetation, discharge of fill, degradation of water quality, and increased erosion and sediment transport. ▪ Ground-disturbing activities in Project area could contribute to direct loss of a candidate, sensitive, or special-status species or to a loss of habitat.	▪ SPC BIO-1a: Provide Restoration/Compensation for Impacts to Native Vegetation Communities ▪ SPC BIO1b: Worker Environmental Awareness Program ▪ SPC BIO-2: Prepare and Implement a Weed Control Plan ▪ SPC BIO-5: Conduct Preconstruction Surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and Avoid Any Located Occurrences of Listed Plants ▪ SPC BIO-6a: Conduct Surveys and Implement Avoidance Measures ▪ SPC BIO-6b: Conduct Clearance Surveys and Construction Monitoring ▪ SPC BIO-6c: Seasonal Surveys During Water Deliveries ▪ SPC BIO-14: Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures ▪ SPC BIO-15: Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures ▪ SPC BIO-16: Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures ▪ SPC BIO-17: Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures ▪ SPC AQ-2: Fugitive Dust Controls ▪ SPC AQ-5: Reduce Off-Road Vehicle Speeds ▪ SPC HYDRO-1: Fill From Reservoir Excavation Will Not Be Placed in Stream Channels ▪ SPC WQ-1: Prepare Spill Response Plan	Less than significant
▪ Alternative 2 ▪ If future activities require sediment excavation and Dam removal, substantial impacts to aquatic ecosystems and organisms would result.	Mitigation similar to measures recommended for the proposed Project would be required to reduce impacts.	Dependent on the adequacy of mitigation.
Proposed disposal site		
▪ Proposed Project and Alternative 1 ▪ Sediment storage at PWD property may affect an onsite ephemeral stream.	▪ SPC HYDRO-1: Fill From Reservoir Excavation Will Not Be Placed in Stream Channels	Less than significant

Table 5-1. Factual Determinations of Compliance with Section 404(b)(1)

Summary of Impacts	Mitigation or SPC	Effects following mitigation
▪ Alternative 2 ▪ Disposal sites for future sediment excavation/Dam removal would impact onsite ecosystems.	Mitigation similar to measures recommended for the proposed Project would be required to reduce impacts.	Dependent on the location of sites and the adequacy of mitigation.
Cumulative effects on the aquatic ecosystem		
▪ Proposed Project and Alternative 1 ▪ Past actions such as the construction of Littlerock Dam and natural events including droughts and fire have resulted in considerable cumulative effects to candidate, sensitive, or special-status species in the region.	▪ SPC BIO-1a: Provide Restoration/Compensation for Impacts to Native Vegetation Communities ▪ SPC BIO1b: Worker Environmental Awareness Program ▪ SPC BIO-2: Prepare and Implement a Weed Control Plan ▪ SPC BIO-5: Conduct Preconstruction Surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and Avoid Any Located Occurrences of Listed Plants ▪ SPC BIO-6a: Conduct Surveys and Implement Avoidance Measures ▪ SPC BIO-6b: Conduct Clearance Surveys and Construction Monitoring ▪ SPC BIO-6c: Seasonal Surveys During Water Deliveries ▪ SPC BIO-14: Conduct Surveys for Southwestern Pond Turtle and Implement Monitoring, Avoidance, and Minimization Measures ▪ SPC BIO-15: Conduct Surveys for Two-Striped Garter Snakes and Implement Monitoring, Avoidance, and Minimization Measures ▪ SPC BIO-16: Conduct Surveys for Coast Range Newts and Implement Monitoring, Avoidance, and Minimization Measures ▪ SPC BIO-17: Conduct Surveys for Terrestrial Herpetofauna and Implement Monitoring, Avoidance, and Minimization Measures ▪ SPC AQ-2: Fugitive Dust Controls ▪ SPC AQ-5: Reduce Off-Road Vehicle Speeds ▪ SPC HYDRO-1: Fill From Reservoir Excavation Will Not Be Placed in Stream Channels ▪ SPC WQ-1: Prepare Spill Response Plan	Less than significant
▪ Alternative 2 ▪ If the Dam must be removed, cumulative biological resource impacts would be greater and encompass a wider area than the Project.	Mitigation similar to measures recommended for the proposed Project would be required to reduce impacts.	Dependent on the adequacy of mitigation.

Table 5-1. Factual Determinations of Compliance with Section 404(b)(1)

Summary of Impacts	Mitigation or SPC	Effects following mitigation
Secondary effects on the aquatic ecosystem		
▪ Proposed Project and Alternative 1 ▪ Construction would not substantially interfere with the movement of any native resident migratory fish, reptile, or amphibian species. ▪ Removal of non-native fish from Reservoir would improve habitat for arroyo toad and other native species.	None	Beneficial impact
▪ Alternative 2 ▪ Riparian vegetation would likely recruit along the margins of the active channel and may eventually develop into a mature riparian community. Project area may develop characteristics that would support habitat for arroyo toad and other species associated with riparian vegetation and floodplains. ▪ Expanded construction activities from future removal of Dam would impact sensitive species above and below the Dam.	Mitigation similar to measures recommended for the proposed Project would be required to reduce impacts from future Dam removal.	Short-term beneficial impacts; Long-term significant impacts

Source: Littlerock Reservoir Sediment Removal Project EIS/EIR (May 2016)

6.0 Findings of Compliance with the Restrictions on Discharge

The EIS/EIR identified and evaluated the Littlerock Reservoir Sediment Removal Project, which included the proposed Project as well as two alternatives to the proposed Project. The Reduced Sediment Removal Intensity Alternative would reduce the intensity of construction activities through an extended construction schedule, while the No Action/No Project Alternative would allow for continued sediment accumulation upstream of Littlerock Dam with no sediment removal. Based on information presented in Sections 4.0 and 5.0 of this 404(b)(1) Evaluation Summary, the Reduced Sediment Removal Intensity Alternative (Alternative 1) has been identified as the LEDPA. Factors supporting this determination include:

- Alternative 1 would reduce daily PM10 emissions during excavation and construction;
- Alternative 1 would reduce the number of daily truck trips on roadways;
- Alternative 1 meets the Project's overall purpose and need and would incorporate the same Project SPCs to proactively protect sensitive resources at the Reservoir, reduce environmental impacts associated with Project activities, and to ensure safety during Project construction; and
- Alternative 1 would not create new significant impacts that would require further mitigation.

7.0 References

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