SAN BERNARDINO COUNTY
INITIAL STUDY/MITIGATED NEGATIVE DECLARATION
ENVIRONMENTAL CHECKLIST FORM

This form and the descriptive information in the application package constitute the contents of Initial Study pursuant to County Guidelines under Ordinance 3040 and Section 15063 of the State CEQA Guidelines.

PROJECT LABEL:

APNs:	0232-051-01	***USGS Quad:***	San Bernardino
Applicant:	TriStar FLC, Inc. 9600 Kaiser Ct Fontana CA 92335	***T, R, Section:***	**T1S R6W Section12**
Location	8377 Sultana Avenue	***Thomas Bros***	
Project No:	PROJ-2022-00198 /CUP	***Community Plan:***	
Rep		***LUZD:***	Regional Industrial
Proposal:	A Conditional Use Permit request for a high-efficiency transloading facility for the receipt, storage, and distribution of renewable diesel to include six one-million gallon above-ground renewable diesel storage tanks, a containment area and a manifold system across two parcels totaling 11.70 acres.	***Overlays:***	

PROJECT CONTACT INFORMATION:

Lead agency:
San Bernardino County
Land Use Services Department
385 N. Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415-0182

Contact person: Steven Valdez, Planning Manager
Phone No: (909) 387-4421 ***Fax No:*** (909) 387-3223
E-mail: steven.valdez@lus.sbcounty.gov

Project Sponsor
TriStar FLC Inc
9600 Kaiser Court

Fontana, CA 92335

PROJECT DESCRIPTION:

Summary

The proposed project is to develop a high efficiency transload facility planned at the existing BNSF Railway (BNSF) Yard. The planned facility will be used for the receipt, storage and distribution of biodiesel and renewable diesel. The facility will be fully contained adjacent to six inbound railroad tracks and include a truck loading rack and six one-million gallon above-ground tanks.

Surrounding Land Uses and Setting

The project location is in an area zoned Regional Industrial. The area is primarily warehouse distribution centers for Taylored Services (warehouse distribution), Delta Children (children's furniture), lumber distribution and Verco Decking (decking). North of the project location is Ferrellgas, which operates a fuel transloading facility. There are no residences, schools or hospitals within close proximity to the project location.

Existing Land Use and Land Use Zoning Districts		
Location	**Existing Land Use**	**Land Use Zoning District**
Project Site	BNSF Railway Yard-gravel lot	Regional Industrial
North	Fuel transload facility	Regional Industrial
South	Warehouse distribution	Regional Industrial
East	Warehouse distribution	Regional Industrial
West	Warehouse distribution	Regional Industrial

Project Site Location, Existing Site Land Uses and Conditions

The project location is a vacant railway yard located to the west of existing BNSF railroad tracks. The location is a graveled yard without structures or vegetation. The location is relatively flat and does not have extensive development beyond the gravel surfacing.

ADDITIONAL APPROVAL REQUIRED BY OTHER PUBLIC AGENCIES

Federal: None.
State of California: None.
County of San Bernardino: Land Use Services Department-Building and Safety, Public Health-Environmental Health Services, Special Districts, and Public Works.
Regional: Mojave Desert Air Quality Management District.
Local: None

Site Photographs

Photograph 1: Gravel yard

Photograph 2: Gravel yard with existing track

Photograph 3: Gravel yard

Photograph 4: Gravel yard

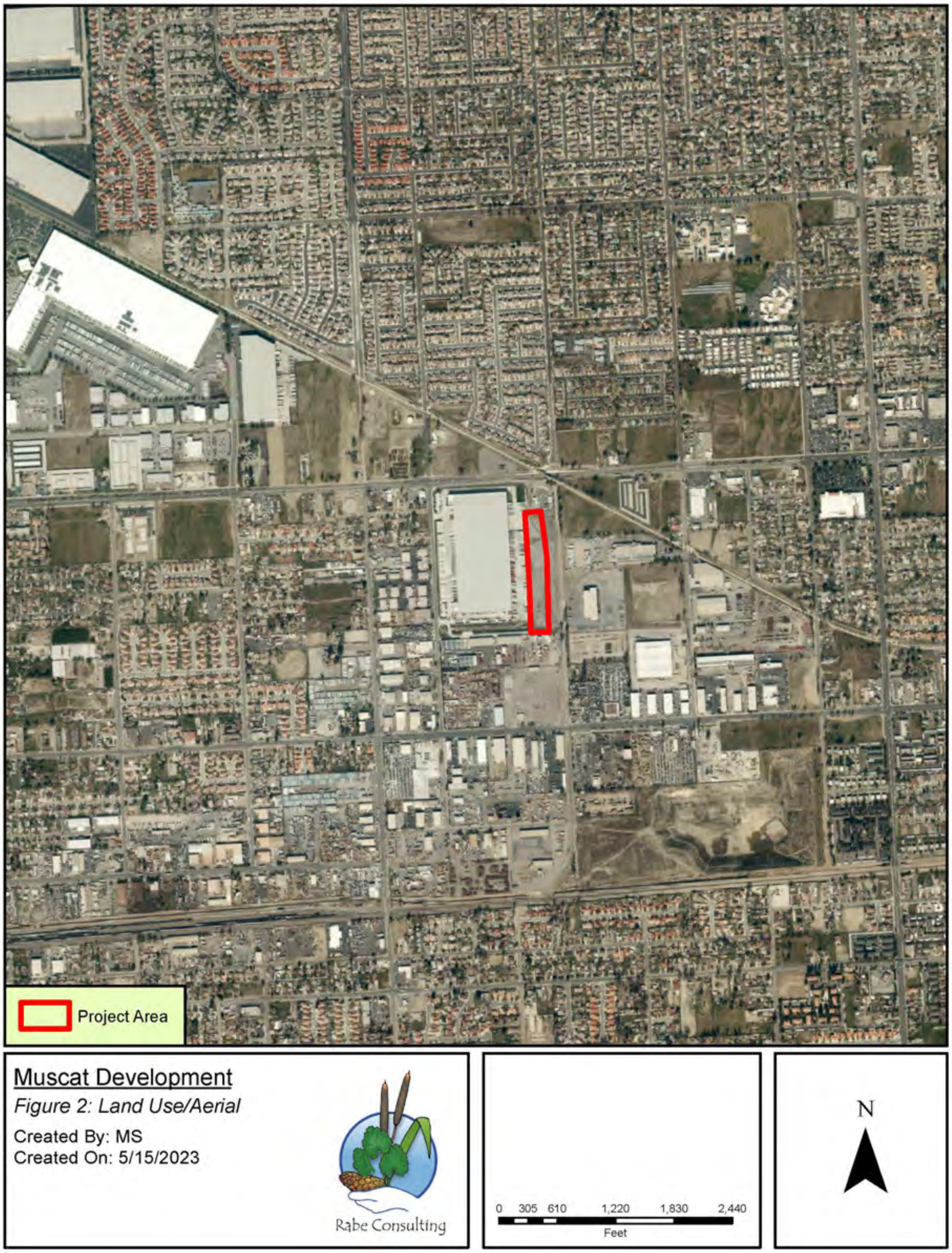


Figure 1 Land Use of the Property

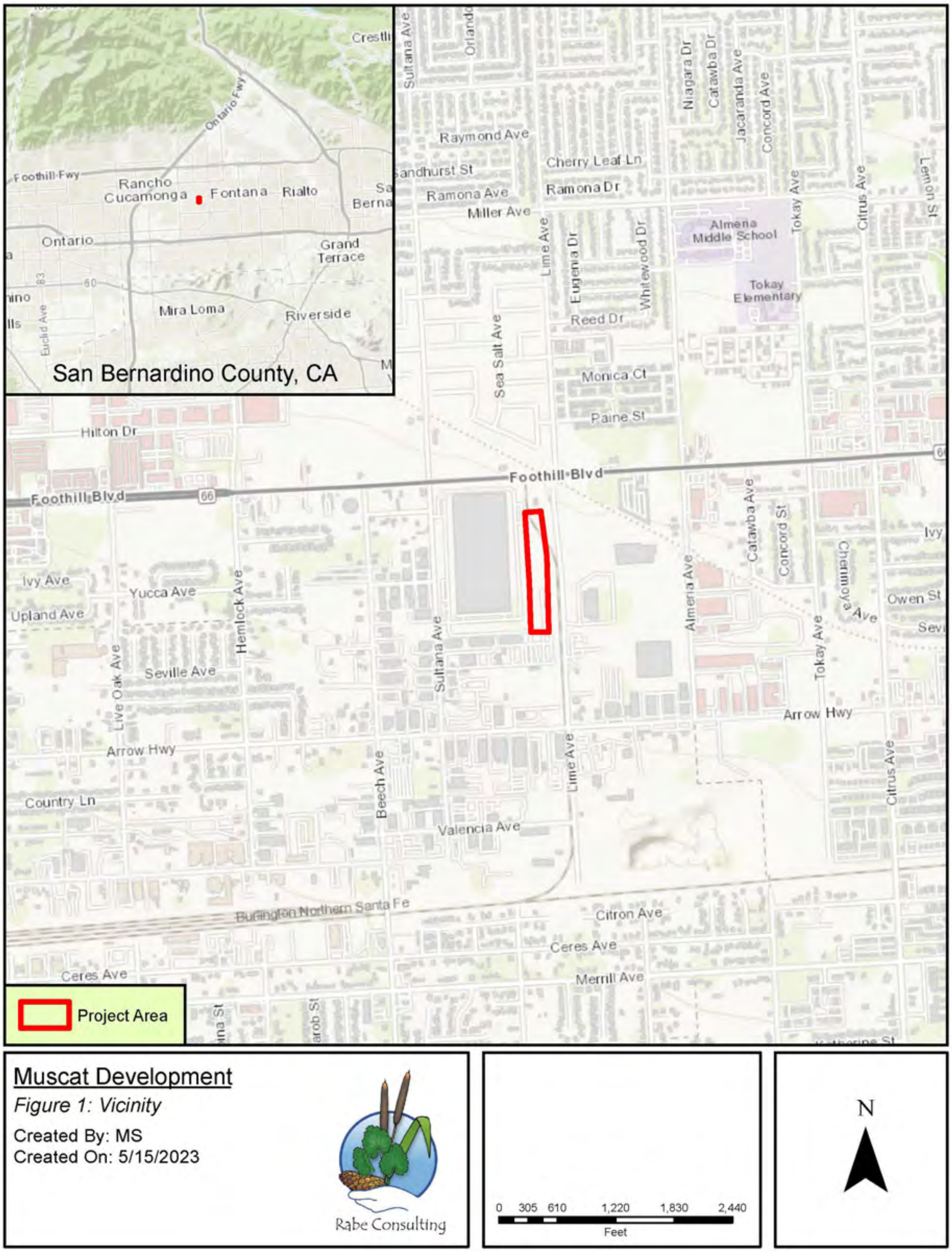


Figure 2 Project Vicinity Map

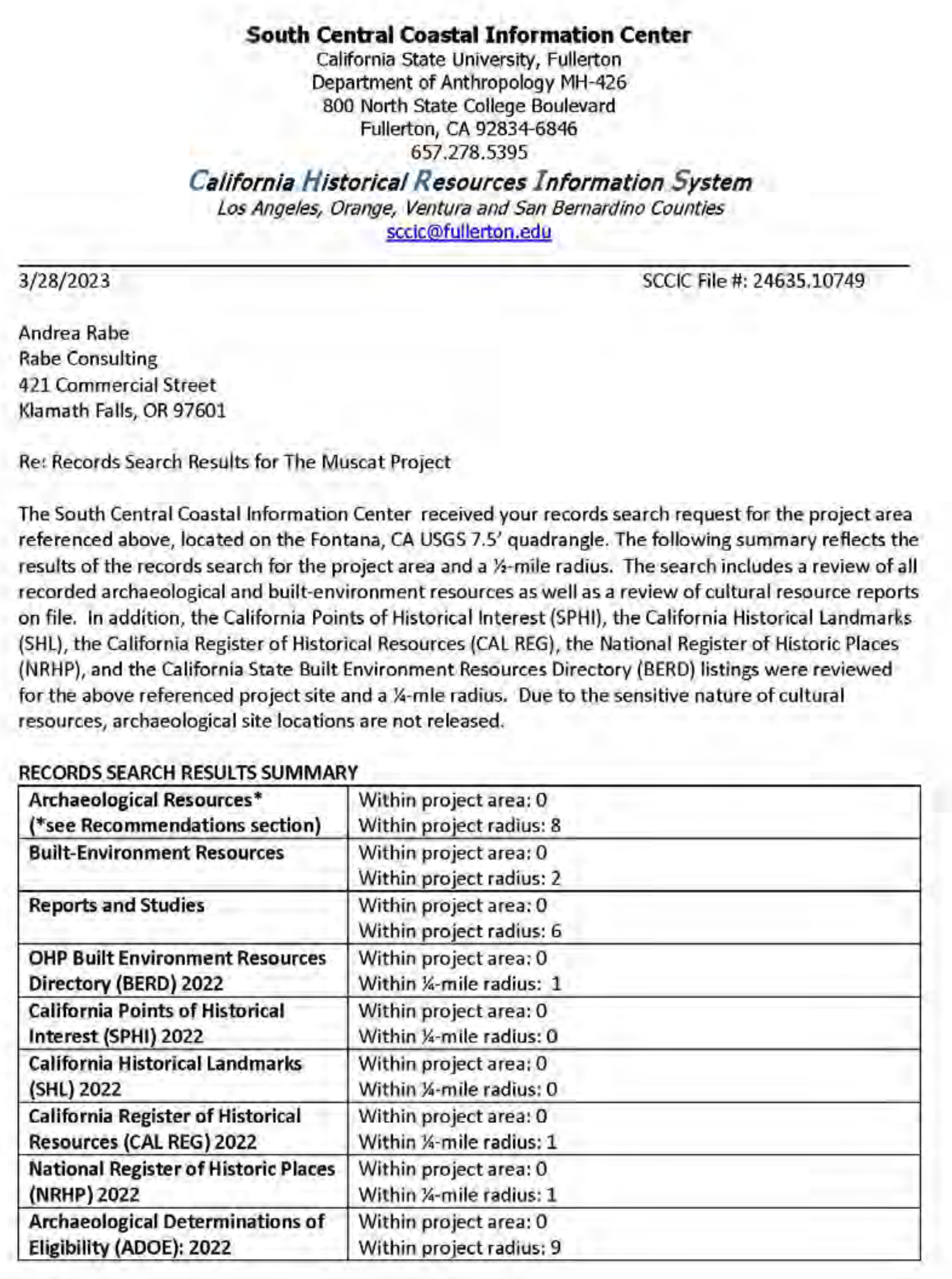
CONSULTATION WITH CALIFORNIA NATIVE AMERICAN TRIBES

Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentially, etc.?

San Bernardino County noticed the California Native American tribes traditionally and culturally affiliated with the project area. At this time there are no known cultural resources located within the project area. The South Central Coastal Information Center for the California Historical Research System reviewed the project and reported that no known cultural resources were located within the project area. The Information Center recommended that an Inadvertent Discovery Plan be in place during construction. See response letter from the Information Center below.

Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21083.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

Figure 3 Site Plan



South Central Coastal Information Center
California State University, Fullerton
Department of Anthropology MH-426
800 North State College Boulevard
Fullerton, CA 92834-6846
657.278.5395
California Historical Resources Information System
Los Angeles, Orange, Ventura and San Bernardino Counties
sccic@fullerton.edu

3/28/2023 SCCIC File #: 24635.10749

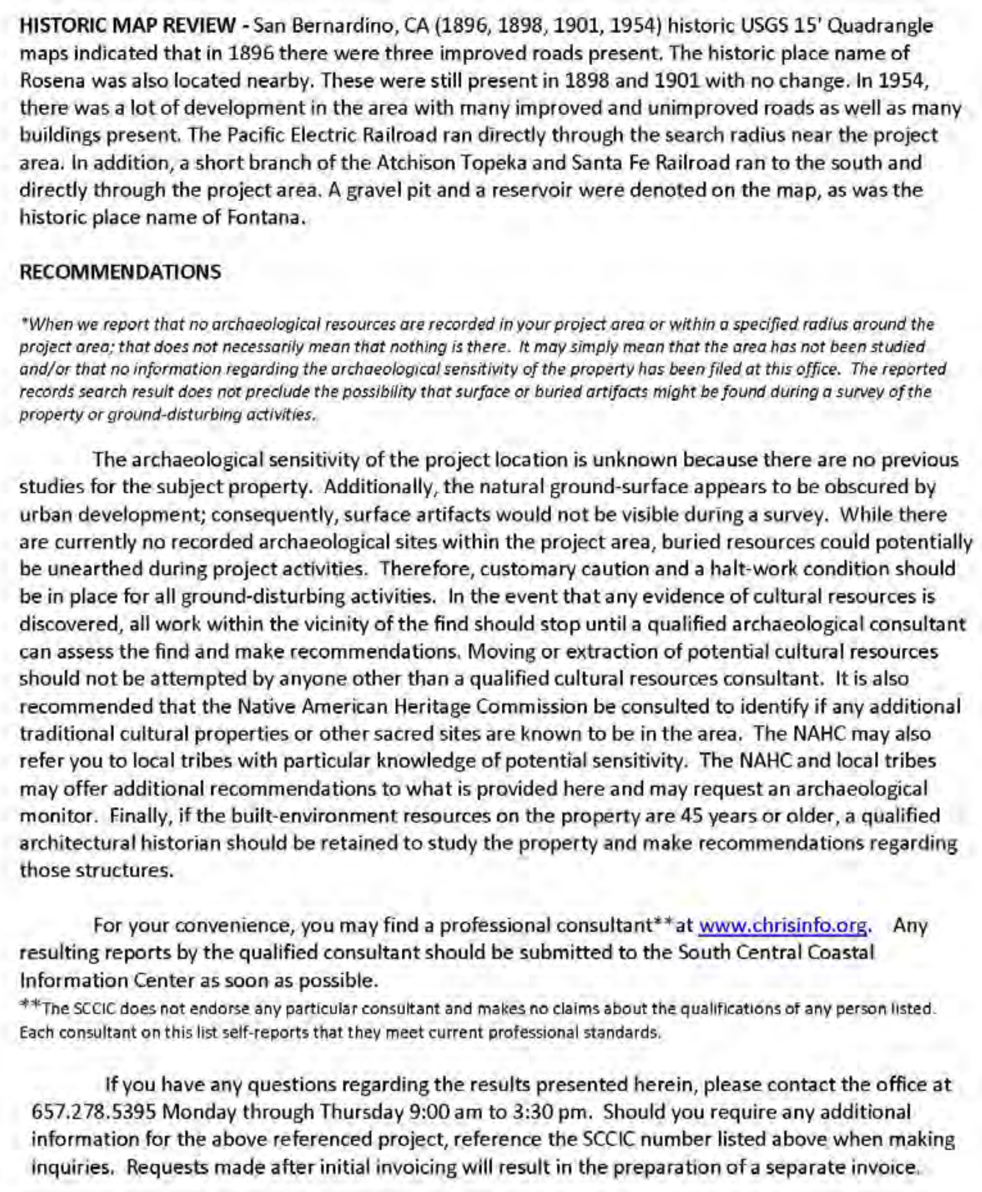
Andrea Rabe
Rabe Consulting
421 Commercial Street
Klamath Falls, OR 97601

Re: Records Search Results for The Muscat Project

The South Central Coastal Information Center received your records search request for the project area referenced above, located on the Fontana, CA USGS 7.5' quadrangle. The following summary reflects the results of the records search for the project area and a ½-mile radius. The search includes a review of all recorded archaeological and built-environment resources as well as a review of cultural resource reports on file. In addition, the California Points of Historical Interest (SPHI), the California Historical Landmarks (SHL), the California Register of Historical Resources (CAL REG), the National Register of Historic Places (NRHP), and the California State Built Environment Resources Directory (BERD) listings were reviewed for the above referenced project site and a ¼-mle radius. Due to the sensitive nature of cultural resources, archaeological site locations are not released.

RECORDS SEARCH RESULTS SUMMARY

Archaeological Resources* (*see Recommendations section)	Within project area: 0 Within project radius: 8
Built-Environment Resources	Within project area: 0 Within project radius: 2
Reports and Studies	Within project area: 0 Within project radius: 6
OHP Built Environment Resources Directory (BERD) 2022	Within project area: 0 Within ¼-mile radius: 1
California Points of Historical Interest (SPHI) 2022	Within project area: 0 Within ¼-mile radius: 0
California Historical Landmarks (SHL) 2022	Within project area: 0 Within ¼-mile radius: 0
California Register of Historical Resources (CAL REG) 2022	Within project area: 0 Within ¼-mile radius: 1
National Register of Historic Places (NRHP) 2022	Within project area: 0 Within ¼-mile radius: 1
Archaeological Determinations of Eligibility (ADOE): 2022	Within project area: 0 Within project radius: 9



HISTORIC MAP REVIEW - San Bernardino, CA (1896, 1898, 1901, 1954) historic USGS 15' Quadrangle maps indicated that in 1896 there were three improved roads present. The historic place name of Rosena was also located nearby. These were still present in 1898 and 1901 with no change. In 1954, there was a lot of development in the area with many improved and unimproved roads as well as many buildings present. The Pacific Electric Railroad ran directly through the search radius near the project area. In addition, a short branch of the Atchison Topeka and Santa Fe Railroad ran to the south and directly through the project area. A gravel pit and a reservoir were denoted on the map, as was the historic place name of Fontana.

RECOMMENDATIONS

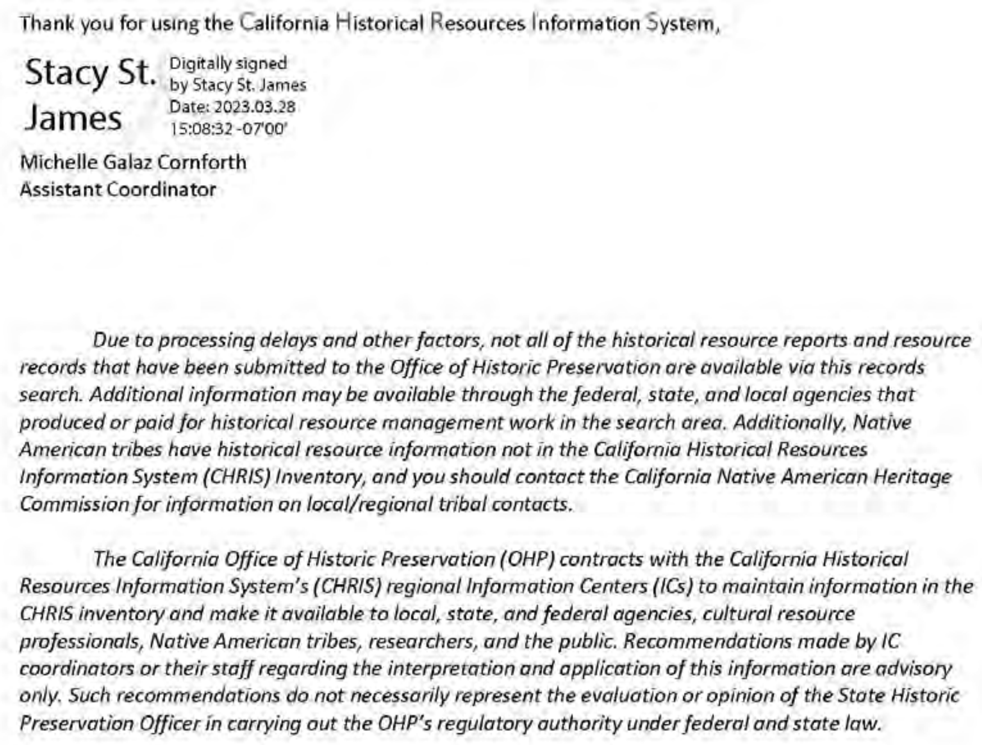
**When we report that no archaeological resources are recorded in your project area or within a specified radius around the project area; that does not necessarily mean that nothing is there. It may simply mean that the area has not been studied and/or that no information regarding the archaeological sensitivity of the property has been filed at this office. The reported records search result does not preclude the possibility that surface or buried artifacts might be found during a survey of the property or ground-disturbing activities.*

The archaeological sensitivity of the project location is unknown because there are no previous studies for the subject property. Additionally, the natural ground-surface appears to be obscured by urban development; consequently, surface artifacts would not be visible during a survey. While there are currently no recorded archaeological sites within the project area, buried resources could potentially be unearthed during project activities. Therefore, customary caution and a halt-work condition should be in place for all ground-disturbing activities. In the event that any evidence of cultural resources is discovered, all work within the vicinity of the find should stop until a qualified archaeological consultant can assess the find and make recommendations. Moving or extraction of potential cultural resources should not be attempted by anyone other than a qualified cultural resources consultant. It is also recommended that the Native American Heritage Commission be consulted to identify if any additional traditional cultural properties or other sacred sites are known to be in the area. The NAHC may also refer you to local tribes with particular knowledge of potential sensitivity. The NAHC and local tribes may offer additional recommendations to what is provided here and may request an archaeological monitor. Finally, if the built-environment resources on the property are 45 years or older, a qualified architectural historian should be retained to study the property and make recommendations regarding those structures.

For your convenience, you may find a professional consultant**at www.chrisinfo.org. Any resulting reports by the qualified consultant should be submitted to the South Central Coastal Information Center as soon as possible.

**The SCCIC does not endorse any particular consultant and makes no claims about the qualifications of any person listed. Each consultant on this list self-reports that they meet current professional standards.

If you have any questions regarding the results presented herein, please contact the office at 657.278.5395 Monday through Thursday 9:00 am to 3:30 pm. Should you require any additional information for the above referenced project, reference the SCCIC number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.



Thank you for using the California Historical Resources Information System,

Stacy St. James
Digitally signed by Stacy St. James
Date: 2023.03.28 15:08:32 -07'00'

Michelle Galaz Cornforth
Assistant Coordinator

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the California Historical Resources Information System (CHRIS) Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law.

EVALUATION FORMAT

This Initial Study is prepared in compliance with the California Environmental Quality Act (CEQA) pursuant to Public Resources Code Section 21000, et seq. and the State CEQA Guidelines (California Code of Regulations Section 15000, et seq.). Specifically, the preparation of an Initial Study is guided by Section 15063 of the State CEQA Guidelines. This format of the study is presented as follows. The project is evaluated based on its effect on 20 major categories of environmental factors. Each factor is reviewed by responding to a series of questions regarding the impact of the project on each element of the overall factor. The Initial Study checklist provides a formatted analysis that provides a determination of the effect of the project on the factor and its elements. The effect of the project is categorized into one of the following four categories of possible determinations:

Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant	No Impact

Substantiation is then provided to justify each determination. One of the four following conclusions is then provided as a summary of the analysis for each of the major environmental factors.

1. **No Impact**: No impacts are identified or anticipated and no mitigation measures are required.
2. **Less than Significant Impact**: No significant adverse impacts are identified or anticipated and no mitigation measures are required.
3. **Less than Significant Impact with Mitigation Incorporated**: Possible significant adverse impacts have been identified or anticipated and the following mitigation measures are required as a condition of project approval to reduce these impacts to a level below significant. The required mitigation measures are: (List of mitigation measures)
4. **Potentially Significant Impact**: Significant adverse impacts have been identified or anticipated. An Environmental Impact Report (EIR) is required to evaluate these impacts, which are (List of the impacts requiring analysis within the EIR).

At the end of the analysis the required mitigation measures are restated and categorized as being either self- monitoring or as requiring a Mitigation Monitoring and Reporting Program.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below will be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics
☐ Biological Resources
☐ Geology/Soils
☐ Agriculture and Forestry Resources
☐ Cultural Resources
☐ Greenhouse Gas Emissions
☐ Air Quality
☐ Energy
☐ Hazards & Hazardous Materials

☐ Hydrology/Water Quality
☐ Land Use/Planning
☐ Mineral Resources
☐ Noise
☐ Population/Housing
☐ Public Services
☐ Recreation
☐ Transportation
☐ Tribal Cultural Resources
☐ Utilities/Service Systems
☐ Wildfire
☐ Mandatory Findings of Significance

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation, the following finding is made:

☐	The proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION shall be prepared.
☐	Although the proposed project could have a significant effect on the environment, there shall not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION shall be prepared.
☐	The proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
☐	The proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
☐	Although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature: (prepared by Steven Valdez , Planning Manager) Date

Signature:(Heidi Duron, Planning Director) Date

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
I.	***AESTHETICS*** – Except as provided in Public Resources Code Section 21099, would the project:				
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b)	Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c)	In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☒
d)	Create a new source of substantial light or glare, which will adversely affect day or nighttime views in the area?	☐	☐	☐	☒

SUBSTANTIATION: *(Check ☐ if project is located within the view-shed of any Scenic Route listed in the General Plan):*
San Bernardino Policy Plan, 2020 Submitted Project Materials

a) *Have a substantial adverse effect on a scenic vista?*
No Impact. The project will not have an adverse impact on a scenic vista. There are no scenic vistas in the immediate vicinity of the project area. The project area development including a transload facility and office building with bathrooms is of similar height and format to the surrounding buildings. The project will be consistent in look and architecture to surrounding industrial developments.

b) *Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?*
No Impact. The project location does not exhibit scenic resources including trees, rock outcroppings or historic buildings. The project location is not adjacent to a state scenic highway. As no scenic resources are present, there is no impact to scenic resources from implementation of this project.

c) *In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point). If the project is in an urbanized* *area, would the project conflict with applicable zoning and other regulations governing scenic quality?*

No Impact. The project location is zoned regional industrial which is consistent with the project. The project location is not subject to other government regulations pertaining to scenic resources.

d) *Create a new source of substantial light or glare, which will adversely affect day or nighttime views in the area?*

No Impact. The project will not create a source of substantial glare or light. Lighting and building structure will be consistent with the other industrial buildings in the general area. As not substantial glare or light sources will be introduced by project implementation and therefore there will be no impact on night or daytime visibility.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
II.	**AGRICULTURE AND FORESTRY RESOURCES** - In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c)	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒

d)	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

SUBSTANTIATION: *(Check ☐ if project is located in the Important Farmlands Overlay):*

San Bernardino County Policy Plan, 2020*; *California Department of Conservation Farmland Mapping and Monitoring Program; Submitted Project Materials

a) *Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?*
No Impact. The Custom Soil Report from the Natural Resources Conservation Service (NRCS) for this Project Area can be found in the Appendix. The soil report indicates:

Soil Type	Farmland Rating
TuB- Tujunga loamy sand, 0 to 5 percent slopes	Farmland of Statewide Importance
TvC- Tujunga gravelly loamy sand, 0 to 9 percent slopes	Not Prime Farmland

Although there is Farmland of Statewide Importance located within the project area, no conversion of Farmland of Statewide Importance will occur from the project. The conversion has already occurred based on the current and past uses as a graveled railroad yard. There is no Unique or Prime Farmland within the project area.

b) *Conflict with existing zoning for agricultural use, or a Williamson Act contract?*
No Impact. The project will not conflict with zoning for agriculture or the Williamson Act, as the project location is currently zoned regional industrial.

c) *Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?*
No Impact. The project will not conflict with forestland or timberland zoned for Timber Production. The project location is zoned Regional Industrial, not Timber Production. Additionally, there are no trees or forestlands exhibited within the project area.

d) *Result in the loss of forest land or conversion of forest land to non-forest use?*
No Impact. As the project location is not forestland, the project will not result in loss of forestland or conversion of forestland.

e) *Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?*
No Impact. The project will not result in other changes which would cause a conversion of farmland or forestland.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
III.	**AIR QUALITY -** Where available, the significance criteria established by the applicable air quality management district or air pollution control district might be relied upon to make the following determinations. Would the project:				
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b)	Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
d)	Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?	☐	☐	☐	☒

SUBSTANTIATION: *(Discuss conformity with the Mojave Desert Air Quality Management Plan, if applicable):*

San Bernardino County Policy Plan, 2020*; *Submitted Project Materials

a) *Conflict with or obstruct implementation of the applicable air quality plan?*
No Impact. The project does not conflict with or obstruct an air quality plan., in particular the San Bernardino County Portion of the Mojave Desert Air Quality Management District plan which states that permits are needed for fluorine emissions, blasting emissions, point source emissions from stationary equipment, and stacks. The project does not have any of these emission items. The project does utilize truck and train traffic along with fuel pumps. None of these items require air quality permits. As the project provides infrastructure necessary for the local community to better utilize biodiesel and renewable diesel, the project supports the local air quality plan by indirectly reducing emissions from fossil fuels.

b) *Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard?*
Less Than Significant Impact. The EPA listing for air quality non-attainment areas in California. The Project Area is in an air quality non-attainment area for PM 2.5 and 8-Hour Ozone. The Project Area is in the Mojave Desert Air Quality Management Plan, which manages air quality for the air quality district in accordance with the California State Implementation Plan (SIP). The project falls under the requirements of the San Bernardino

County Portion of the Mojave Desert Air Quality Management District (AQMD). Construction will occur with best management practices in place to address air quality. Such practices may include watering roadways and construction area, covering stockpiles, and using construction equipment equipped with appropriate emission control systems. With these best management practices in place construction will not result in air quality discharges higher than allowable by the Air Quality Management Plan. Long-term the project will facilitate air quality improvement and not contribute to air quality degradation.

c) *Expose sensitive receptors to substantial pollutant concentrations?*
No Impact. The project will not result in high air quality pollutions. Therefore, there will not be exposure from the project on sensitive receptors to substantial pollutant concentrations. Sensitive air quality receptors include children, elderly, asthmatics, and others whose are at a heightened risk of negative health outcomes due to exposure to air pollution. The closest sensitive air quality receptor would be the closest single-family residence which is 645 ft from the project area. Other sensitive receptors including other residences, schools, hospitals and care facilities are farther from the project area than the closest residence. Due to this distance, the proposed project will not have an impact on the sensitive air quality receptors.

d) *Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?*
No Impact. The biodiesel and renewable diesel will be contained within tanks at all times, either on trucks or train cars. The tanks will contain the smell of the fuels. Therefore, the project will not result in other emissions, such as those leading to odors adversely affecting a substantial number of people.

The air quality report is attached in Appendix 4.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
IV.	**BIOLOGICAL RESOURCES -** Would the project:				
a)	Have substantial adverse effects, 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 the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California	☐	☐	☐	☒

	Department of Fish and Wildlife or US Fish and Wildlife Service?				
c)	Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d)	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?	☐	☐	☐	☒
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?	☐	☐	☐	☒

SUBSTANTIATION: *(Check if project is located in the Biological Resources Overlay or contains habitat for any species listed in the California Natural Diversity Database ☐):*

San Bernardino County Policy Plan, 2020*; *Submitted Project Materials; Add in Studies here

a) *Have substantial adverse effects, 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 the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?*
No Impact. The project area is not suitable habitat for sensitive plant, animal, or fish species. The project area does not have vegetation or the potential for vegetation since it is a graveled surface.

On February 28, 2023, an IPaC report was obtained from USFWS and updated on June 6, 2023. The project code is 2023-0050387 (Project name: Muscat Development Project). There are no designated critical habitats for fish, plants, or wildlife in the proposed project sites (see USFWS IPaC report in Appendix).

The IPaC report for the Project site indicates the need for consideration of seven (7) species. These species include San Bernardino Merriam's kangaroo rat (*Dipodomys merriami parvus*), Coastal California gnatcatcher (*Polioptila californica californica*), Least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii* *extimus*), Santa Ana sucker (*Catostomus santaanae*), monarch butterfly (*Danaus plexippus*), and San Diego ambrosia (*Ambrosia pumila*).

Habitat requirements for the species are found in the website links listed in the IPaC report and are summarized in the table. The table also indicates whether or not the habitat needs of the species are present at the project site.

Table 1. IPaC list of federally listed species with the potential to be affected by the Project.

Scientific	**Common**	**Federal Status**	**General Habitat***	**Habitat Present within Action Area (Yes/No)**	**Species Present in Area (Yes/No)**
Mammals					
Dipodomys merriami parvus	San Bernardino Merriam's Kangaroo Rat	Endangered	San Bernardino kangaroo rats are found on the gentle slopes of alluvial fans, on flood plains, along washes, and on adjacent upland areas with soils containing sand, loam, and gravel deposited by rivers and streams. They also occupy areas where sandy soils are wind deposited.	**No, preferred habitat is not present**	**No**
Birds					
Polioptila californica californica	Coastal California Gnatcatcher	Threatened	The gnatcatcher is found on the coastal slopes of southern California, from southern Ventura southward through Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties into Baja California, Mexico.	**No, preferred habitat is not present**	**No**

Vireo bellii pusillus	Least Bell's Vireo	Endangered	Least Bell's vireos winter in southern Baja California, Mexico, where they occupy a variety of habitats, including mesquite scrub within arroyos, palm groves, and hedgerows bordering agricultural and residential areas.	**No, preferred habitat is not present**	**No**
Empidonax traillii extimus	South-western Willow Flycatcher	Endangered	Southwestern willow flycatchers are neotropical migrants that breed in patches of riparian habitat throughout the American southwest.	**No, preferred habitat is not present**	**No**
Fishes					
Catostomus santaanae	Santa Ana Sucker	Threatened	The Santa Ana sucker is found in three disjunct populations that occupy portions of the San Gabriel, Los Angeles, and Santa Ana River basins in Southern California.	**No, preferred habitat is not present**	**No**
Insects					
Danaus plexippus	Monarch Butterfly	Candidate	The habitat of the monarch butterfly is open fields and meadows with milkweed.	**No, preferred habitat is not present**	**No**
Flowering Plants					
Ambrosia pumila	San Diego Ambrosia	Endangered	The species generally occurs in open habitats in coarse substrates near drainages and in upland areas on clay slopes. San Diego ambrosia also occurs in a variety of associations dominated by sparse grasslands or marginal wetlands, such as river terraces, pools, and alkali playas.	**No, preferred habitat is not present**	**No**

*Information on General Habitat comes from website links provided in the IPaC Resource List (USFWS 2020) attached at the Appendix.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act protects all of the birds native to North American except upland game birds within the project area. Some of these birds are assumed to be present during migration and nesting seasons near the project area. However, the project area is not suitable migratory bird nesting habitat.

California Natural Diversity Database (CNDBB)

CNDBB was also consulted for a list of potential sensitive status plants, animals and fish within the project area. As the project area does not exhibit vegetation, streams or wetlands and consists of a gravel yard, the project area is not habitat for any of the sensitive status plants.

b) *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?*
No Impact. The project area does not include any riparian areas or other sensitive natural communities, as the project area consists entirely of a gravel yard.

c) *Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*
No Impact. The project area does not exhibit wetland areas including depressional wetlands, vernal pools, marshes or other freshwater wetlands. Therefore, the project will not include placement or removal of fill materials in a wetland area. No removal-fill permit is needed from the Army Corps of Engineers for implementation of this project.

d) *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?*
No Impact. There are no streams or wetlands in the project area, there are no native resident or migratory fish within the project area. Since there are no fish in the project area, implementation of the project will not impact fish, their habitat or their migration. The project area is in a developed industrial area, which does not function as native resident habitat or function as a migratory wildlife corridor. The project area is not conducive to use as a native wildlife nursery site.

e) *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?*
No Impact. There are no trees or other vegetation within the project area, there is no conflict with a tree or vegetation preservation ordinance.

f) *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?*
No Impact. There is no Habitat Conservation Plan or Natural Community Conservation Plan for the project area.

The biological report is attached in Appendix 5.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
V.	**CULTURAL RESOURCES -** Would the project:				
a)	Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☐	☒
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c)	Disturb any human remains, including those outside of formal cemeteries?	☐	☐	☐	☒

SUBSTANTIATION: (Check if the project is located in the Cultural ☐ or Paleontologic ☐ Resources overlays or cite results of cultural resource review): ***San Bernardino County Policy Plan, 2020; Cultural Historical Resources Information System (CHRIS), South Central Coast Information Center, California State University, Fullerton; Submitted Project Materials***

a) *Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?*
No Impact. There are no known historic resources within the project area. Southern Central Coast Information Center (report attached above) did a records search of the CHRIS database and did not identify any known historic resources within the project area. Due to the disturbed and surfaced nature of the project area, a cultural resource survey was not completed as it would not have been informational. Additionally, there was no built environment within the project area (i.e., no buildings), so a historic resource survey was not completed. As there are no known historic resources within the project area, the project will not result in impacts to a known historic resource. An inadvertent discovery plan (IDP) will be in place during construction and used to address any historic resources that may be encountered during construction.

b) *Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?*
No Impact. There are no known archaeological resources within the project area. Southern Central Coast Information Center (report attached above) did a records search of the CHRIS database and did not identify any known archaeological resources within the project area. As there are no known archaeological resources within the project area, the project will not result in impacts to a known archaeological resource. An inadvertent discovery plan (IDP) will be in place during construction and used to address any archaeological resources that may be encountered during construction.

c) *Disturb any human remains, including those outside of formal cemeteries?*
No Impact. There are no known human remains or cemeteries within the project area, so the project will not impact any known human remains. An IDP will be in place during

construction, and used to address any human remains which may be encountered during construction. If human remains are encountered, mitigation would be negotiated with the tribes of interest and SHPO.

Therefore, no impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
VI.	**ENERGY** – Would the project:				
a)	Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☐	☒
b)	Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

SUBSTANTIATION: San Bernardino County Policy Plan, 2020;Submitted Materials

a) *Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*

No Impact. The project is designed to facilitate the distribution of renewable diesel and biodiesel. The project will construct a high efficiency transload facility planned at the existing Burlington Northern Santa Fe Railroad (BNSF). The planned facility will be used for the receipt, storage and distribution of biodiesel and renewable diesel. The facility will efficiently transload fuels from the railroad to trucks for local distribution. Construction and operation will be conducted in an efficient manner to reduce costs and energy consumption.

Renewable diesel and biodiesel will offset the use of non-renewable petroleum products. Negative environmental consequences of fossil fuels and concerns about petroleum supplies have spurred the search for renewable transportation biofuels. To be a viable alternative, a biofuel should provide a net energy gain, have environmental benefits, be economically competitive, and be producible in large quantities without reducing food supplies. We use these criteria to evaluate, through life-cycle accounting, ethanol from corn grain and biodiesel from soybeans. Ethanol yields 25% more energy than the energy invested in its production, whereas biodiesel yields 93% more. Compared with ethanol, biodiesel releases just 1.0%, 8.3%, and 13% of the agricultural nitrogen, phosphorus, and pesticide pollutants, respectively, per net energy gain. Relative to the fossil fuels they displace, greenhouse gas emissions are reduced 12% by the production and combustion of ethanol and 41% by biodiesel. Biodiesel also releases less air pollutants per net energy gain than ethanol. (Hill, Nelson, Tilman, and Tiffany, 2006)

b) *Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?* **No Impact.** The project is in support of the state's renewable energy plans for reducing fossil fuel consumption and replacing it with biodiesel and renewable diesel.

Therefore, no impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
VII.	**GEOLOGY AND SOILS** - Would the project:				
a)	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
	i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map Issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
	ii. Strong seismic ground shaking?	☐	☐	☐	☒
	iii. Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
	iv. Landslides?	☐	☐	☐	☒
b)	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c)	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e)	Have soils incapable of adequately supporting the use of septic tanks or	☐	☐	☐	☒

	alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				
f)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

SUBSTANTIATION: *(Check* ☐ *if project is located in the Geologic Hazards Overlay District):* ***San Bernardino County General Plan, 2007; Submitted Project Materials***

San Bernardino County Policy Plan, 2020; Submitted Project Materials

a) i-iv) *Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map Issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. Strong seismic ground shaking? Seismic-related ground failure, including liquefaction? Landslides?*
No Impact. The project location is relatively flat and currently used as a rail yard. The project will continue to use the project location for train and truck traffic, with a small office building. These activities are similar to the current use and therefore there is no change expected in the underlying faults and land formations. The project will not pose a potential to cause adverse effects due to impacts on a Faultline or hill slope.(GeoTech Report is attached in Appendix 1)

b) *Result in substantial soil erosion or the loss of topsoil?*
No Impact. The project location is currently surfaced in gravel. Post project, the project location will gravel and paved surfaces. Since the surfaces are not soil, and particularly unvegetated soils, there will not be substantial soil erosion or loss of topsoil during project operation. During project construction best management practices will be employed to reduce and eliminate erosion from the project area.

c) *Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off site landslide, lateral spreading, subsidence, liquefaction or collapse?*
No Impact. The soil within the project site is considered stable. It is not conducive to landslides, lateral spreading, subsidence, liquefaction or collapse. The project location is relatively flat, reducing the potential for landslides.

d) *Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?*
No Impact. Based on the soil types reported in the NRCS soil survey (attached in Appendix), the soils within the project area are not considered expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994). As there are no expansive soils within the project area, the project will not cause substantial risk to life and limb from construction on expansive soils.

e) *Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?*
No Impact. It is anticipated that the project office building will be connected to the municipal wastewater treatment system. If the project is not connected, the soils are appropriate for an on-site wastewater treatment system. The soils are not hydric in nature and do not exhibit a high water table (NRCS soil survey data).

f) *Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*
No Impact. There are no unique paleontological resources or site or unique geologic features within the project area. As a result, the project will not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
VIII.	**GREENHOUSE GAS EMISSIONS –** Would the project:				
a)	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
b)	Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

SUBSTANTIATION:
San Bernardino County Policy Plan, 2020; Submitted Project Materials

a) *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*
No Impact. The project will have truck traffic associated with the transload facility. Beyond the truck traffic, there will not be additional sources of greenhouse gas emissions. The project is to develop a high efficiency transload facility for biodiesel and renewable diesel. By transloading the biodiesel and renewable diesel from train cars to trucks for local distribution, there will be more biodiesel and renewable diesel available in the local area. This will allow for more use of biodiesel and renewable diesel in the general area, instead of traditional fossil fuels. The distribution trucks will use biodiesel, which will reduce the indirect effects of greenhouse gas emissions from the distribution trucks delivering the biofuel. As a result, the project overall will result in a decrease in greenhouse gas emissions.

b) *Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?*
No Impact. The project does not conflict with any plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases, including the San

Bernardino County Regional Greenhouse Gas Reduction Plan (2021) and the City of Fontana General Plan (2018). On the contrary, the project promotes the reduction of greenhouse gas emissions by providing a transload center to facilitate distribution of biodiesel and renewable diesel in the local project area.

The Greenhouse Gas Study is attached in Appendix 6.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
IX.	**HAZARDS AND HAZARDOUS MATERIALS –** Would the project:				
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

SUBSTANTIATION:

San Bernardino County Policy Plan, 2020;

a) *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*
No Impact. The project will not cause significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. The routine transport of hazardous materials will be conducted in rail cars and trucks which are placarded appropriately. The rail cars and trucks will be in good working condition and regularly inspected. The transload facility is in an industrial area which already has fuel transload facilities.

b) *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*
No Impact. The transload facility will not store fuels in tanks at the project location. The biodiesel and renewable diesel will be transferred from the rail cars directly to distribution trucks. The project location will have a spill prevention control and countermeasure (SPCC) plan in place during project operation. The plan will reduce the spills and effects from contamination in the event of a spill. With the SPCC plan in place, the project will not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

c) *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*
No Impact. The project location is not within a half mile of a school. The closest school is 0.6 miles from the project area. As there are no schools in close proximity, the project will not be handling hazardous materials in close proximity to a school.

d) *Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?*
No Impact. The project location is not on the list of on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

e) *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?*
No Impact. The project is not with an airport land use plan. The closest airport is more than five miles to the east of the project location. Due to the distance to the closest airport, the project would not result in a safety hazard or excessive noise for people residing or working in the project area.

f) *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

No Impact. The project is using existing roadways for access. The project is not blocking any roads or railways or changing any access routes. As a result, the project will not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

g) *Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?*
No Impact. The project area is not in a known wildland fire area. The project area is relatively flat in surrounded by other industrial uses. The project will not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
X.	**HYDROLOGY AND WATER QUALITY -** Would the project:				
a)	Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☐	☒
b)	Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
	i. result in substantial erosion or siltation on- or off-site;	☐	☐	☐	☒
	ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite;	☐	☐	☐	☒
	iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of runoff; or	☐	☐	☐	☒
	iv. impede or redirect flood flows?	☐	☐	☐	☒

d)	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e)	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

SUBSTANTIATION:

San Bernardino County Policy Plan, 2020; Submitted Project Materials

a) *Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?*

No Impact. The project will not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The stormwater plan will address stormwater drainage for the project area and ensure that the discharge is infiltrated or treated according to water quality standards prior to leaving the project area. The wastewater from the office will be delivered to a municipal wastewater treatment system or dispose of through an onsite septic system.

b) *Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?*

No Impact. The project will not be using groundwater and no well is proposed for the project area. The project area already has a compacted gravel surface, which is typically considered an impervious surface. Since the project area currently has impervious and would still have impervious surface after project construction, there is not an anticipated change in groundwater infiltration within the project area. The project will not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

c) *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: result in substantial erosion or siltation on- or off-site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite; create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of runoff; or impede or redirect flood flows?*

No Impact. The project area already exhibits impervious surface throughout the site. Therefore, project implementation will not increase impervious surface or increase surface runoff. The stormwater management plan will be implemented for the project area such that proposed drainage improvements for the site would not result in substantial erosion or siltation on- or off-site.

i. The stormwater management plan adequately improves drainage such that the project would not result in substantial erosion or siltation on- or off-site.
ii. Since there is not an increase in impervious surface or the filling of a wetland or waterway associated with the project, there will not be an increase in runoff rate or volume that would cause flooding.

iii. The project will not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of runoff, as the project will follow the stormwater management plan which is designed to eliminate the concern of exceeding capacity of drainage systems.

iv. The project area is relatively flat without channelized surface flow. The project will not change these characteristics, and therefore will not impede or redirect flow.

The Water Quality Management Plan is attached in Appendix 2.

d) *In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?*
No Impact. Pollutants are contained in trucks or train cars within the project area. As a result, the project would not result in release of pollution due to project inundation from flood hazard, tsunami, or seiche zones. The SPCC plan will also address containment of potential spills.

e) *Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?*
No Impact. The project is designed to comply with water quality standards and not impede sustainable groundwater management plans.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
XI.	**LAND USE AND PLANNING -** Would the project:				
a)	Physically divide an established community?	☐	☐	☐	☒
b)	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

SUBSTANTIATION:

San Bernardino County Policy Plan, 2020;

a) *Physically divide an established community?*
No Impact. The project area is located in an already established industrial area. The project will not divide an established community.

b) *Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?*

No Impact. The project is consistent with the land use zoning designation of Regional Industrial. The project does not conflict with a land use plan, policy or regulation adopted for the purpose of avoiding or mitigation and environmental effect.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
XII.	**MINERAL RESOURCES -** Would the project:				
a)	Result in the loss of availability of a known mineral resource that will be of value to the region and the residents of the state?	☐	☐	☐	☒
b)	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

SUBSTANTIATION: *(Check ☐ if project is located within the Mineral Resource Zone Overlay):*

San Bernardino County Policy Plan, 2020;

a) *Result in the loss of availability of a known mineral resource that will be of value to the region and the residents of the state?*
No Impact. The project transloads biodiesel and renewable diesel products. The products are not considered mineral products and are renewable. The project does not involve the use of a mineral resource.

b) *Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?*
No Impact. The project location is not designated as a mineral recovery location, and therefore does not impact locally important mineral recovery areas. The project location is designated “Regional Industrial”.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
XIII.	**NOISE -** Would the project result in:				
a)	Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise	☐	☐	☐	☒

	ordinance, or applicable standards of other agencies?				
b)	Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c)	For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

SUBSTANTIATION: *(Check if the project is located in the Noise Hazard Overlay District ☐ or is subject to severe noise levels according to the General Plan Noise Element ☐):*

San Bernardino County General Plan, 2020; Submitted Project Materials

a) *Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*
No Impact. The project is in an existing industrial area, with existing train and truck traffic. The ambient noise level in this area takes includes the train and truck traffic. This project would generate train and truck traffic noise at similar noise levels to the current ambient level. The project would not create noise in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

b) *Generation of excessive groundborne vibration or groundborne noise levels?*
No Impact. The project does not generate excessive groundborne vibration or groundborne noise levels. Groundborne vibration and noise levels from the project would be from truck and train traffic. These vibrations and noise levels are similar to the ambient levels in this general area, as the area already has train and truck traffic.

c) *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the project area to excessive noise levels?*
No Impact. The closest airport is more than five miles from the project area to the east. Due to the long distance (greater than 2 miles) from the project area to the airport, the project would not expose people residing or working in the project area to excessive noise levels.

Noise Analysis is attached Appendix 3.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
XIV.	**POPULATION AND HOUSING -** Would the project:				
a)	Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b)	Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

SUBSTANTIATION:

San Bernardino County Policy Plan, 2020; Submitted Project Materials.

a) *Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?*
No Impact. The project will provide jobs for truck drivers and yard attendants, but will not induce substantial unplanned population growth directly or indirectly. The project does not provide houses or extend roads or infrastructure.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?
No Impact. The project location is currently a vacant rail yard. There are no existing houses in or adjacent to the project area which would need to be replaced or relocated. The project will not displace people or houses.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
XV.	**PUBLIC SERVICES**				
a)	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant				

environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire Protection?	☐	☐	☒	☐
Police Protection?	☐	☐	☒	☐
Schools?	☐	☐	☒	☐
Parks?	☐	☐	☒	☐
Other Public Facilities?	☐	☐	☒	☐

SUBSTANTIATION:

San Bernardino County Policy Plan, 2020;

a) *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: Fire Protection? Police Protection? Schools? Parks? Other Public Facilities?*
Less than Significant Impact. The project is in the developed industrial area within unincorporated area of Fontana. Fire and Police protection already cover the project location and would continue to do so after project construction. The project would not increase the services needed for fire and police protection in the project location.

The project does not increase children within or around the project area. As the project does not increase the presence of children, there will be no added students at schools or parks in the general area.

The project does not have an impact on other public facilities.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
XVI.	**RECREATION**				
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility will occur or be accelerated?	☐	☐	☐	☒
b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

SUBSTANTIATION:

San Bernardino County Policy Plan, 2020;

a) *Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility will occur or be accelerated?*
No Impact. The project will not lead to the increase in the number of children or families in the general area of the project location, as a result of the development or operation. Therefore, there will not be an increased use of existing parks or other recreational facilities. Since the project location does not increase park use, there will not be deterioration of the existing parks and recreational facilities in the general area.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?
No Impact. The project does not include recreational facilities or require the construction of recreational facilities. Therefore, there will not be an impact from new recreational facilities.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
XVII.	**TRANSPORTATION** – Would the project:				
a)	Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	☒
b)	Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)?	☐	☐	☐	☒
c)	Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d)	Result in inadequate emergency access?	☐	☐	☐	☒

SUBSTANTIATION:

San Bernardino County Policy Plan, 2020;	
a)	*Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?* **No Impact.** The project will utilize existing access roads, which are used within the existing industrial area. The project will not conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.
b)	*Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)?* **No Impact.** The project will not conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b) as the project will not increase the number of vehicle miles traveled. The project will not increase vehicle miles traveled for other transportation users in the general area by causing a change in traffic patterns (i.e., around a facility) or providing a destination for travelers/vehicle drivers. The distribution trucks will be providing delivery of biofuel to existing delivery points. The trucks will not be adding vehicle miles as the delivery point already receive fuel (typically not biofuel) and delivery trucks are servicing the existing delivery points (typically interstate/highway truck fueling stops).
c)	*Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?* **No Impact.** The project will use existing roads and not introduce any geometric configurations which are adverse to some types of traffic including farm equipment.
d)	*Result in inadequate emergency access?* **No Impact.** The project will not result in inadequate emergency access. The project is using existing access roads in a developed industrial area.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
XVIII. TRIBAL CULTURAL RESOURCES				
a) Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☒
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource	☐	☐	☐	☒

Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

SUBSTANTIATION:

San Bernardino County Policy Plan, 2020; Cultural Historical Resources Information System (CHRIS), South Central Coast Information Center, California State University, Fullerton; Submitted Project Materials

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a) *Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k).*

No Impact. The are no known tribal resources within the project area. An Inadvertent Discovery Plan (IDP) will be in place during construction and used to provide instructions in the event of a archaeological or tribal resource being located during construction. The IDP identifies the tribes to be contacted in case of an inadvertent discovery, in particular including Yuhaaviatam, Morongo Band of Mission Indians, Gabrielen Band of Mission Indians (Kizh Nation) and San Manuel Nation (formerly the San Manuel Band of Mission Indians).

b) *Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?*

No Impact. The are no known tribal resources within the project area. An IDP will be in place during construction and used to provide instructions in the event of a archaeological or tribal resource being located during construction. The IDP identifies the tribes to be contacted in case of an inadvertent discovery, in particular including Yuhaaviatam, Morongo Band of Mission Indians, Gabrielen Band of Mission Indians (Kizh Nation) and San Manuel Nation (formerly the San Manuel Band of Mission Indians).

No significant adverse impacts are identified or anticipated and no mitigation measures are required at this time.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
XIX.	**UTILITIES AND SERVICE SYSTEMS -** Would the project:				

a)	Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
b)	Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒
c)	Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d)	Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	☒
e)	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

SUBSTANTIATION:

County of San Bernardino Policy Plan 2020; Submitted Project Materials

a) *Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?*

No Impact. The project will use existing utilities within the project area including, electricity, potable water, and wastewater disposal. Besides routing of utilities within the project area, no additional utilities will be needed. No new or expanded water, wastewater treatment or storm water drainage will occur within the project area. The project has a storm water treatment plan addressing the stormwater from the project area.

b) *Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?*

No Impact. The project involves minimal use of water, limited to the staff bathroom located in the office building. The municipal water system servicing the project area has adequate capacity to provide this water.

c) *Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?*
No Impact. Wastewater from the project includes wastewater from a staff bathroom. The local wastewater treatment facility has capacity for this small amount of wastewater.

d) *Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?*
No Impact. The project will not generate an excess of waste, and particularly not above state standards. Waste will be limited to standard waste from the small office. Waste will be disposed through a waste management company. Waste will be sorted between recyclables and waste. Recyclables will placed in separate handling containers from the waste.

e) *Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?*
No Impact. The project will comply with the waste reduction measures required by the state. When possible, items will be recycled which will help in reducing waste volume.

The Water Quality Management Plan is attached in Appendix 2.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
XX. WILDFIRE: If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water resources, power lines or other utilities) that may exacerbate fire	☐	☐	☐	☒

	risk or that may result in temporary or ongoing impacts to the environment?				
d)	Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

SUBSTANTIATION:

County of San Bernardino Policy Plan 2020;

a) *Substantially impair an adopted emergency response plan or emergency evacuation plan?*

No Impact. The project will not substantially impair an adopted emergency response plan or emergency evacuation plan. The project will not alter existing emergency response or evacuation routes. The project will use existing access roads and railways. There will not be impedance of the road or rail ways from this project.

b) *Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from wildfire or the uncontrolled spread of a wildfire?*

No Impact. The project location is not in an area with steep slopes or high natural vegetation fuel loads. The project occupants should not be exposed to pollutant concentrations from a wildfire due to slope, prevailing winds, and other factors. Due to the nature of the project location, the project is not expected to exacerbate wildfire risks.

c) *Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water resources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?*

No Impact. The project will not require installation or maintenance of associated infrastructure that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment. The project will utilize existing access roads and existing railroad tracks. No additional infrastructure will be installed as part of this project.

d) *Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?*

No Impact. The project is not in an upslope area which could potentially cause flooding or landslides downstream. The project will follow the stormwater management plan which manage runoff in a manner that eliminates exposure of people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

	Issues	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
XXI.	**MANDATORY FINDINGS OF SIGNIFICANCE:**				
a)	Does the project have the potential to substantially degrade the quality of the	☐	☐	☐	☒

	environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☒
c)	Does the project have environmental effects, which would cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

a) *Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?*
No Impact. The project does not have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. The project area is currently a graveled yard, which is devoid of vegetation and without streams or wetlands. Based on the current conditions, the project area is not habitat for fish or wildlife or sensitive plant communities. Project implementation will not decrease the potential for habitat, as there is not currently habitat present.

b) *Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?*
No Impact. The project does not have impacts that would cumulatively be considerable. There are minimal expected impacts from the project as it is in already developed lot, in an industrial area and is consistent with the local zoning designation of Regional Industrial.

c) *Does the project have environmental effects, which would cause substantial adverse effects on human beings, either directly or indirectly?*
No Impact. All potential impacts have been thoroughly evaluated and have been deemed to be neither individually significant nor cumulatively considerable in terms of any adverse effects upon the region, the local community or its inhabitants. At a minimum, the project will be required to meet the conditions of approval for the project to be implemented. It is anticipated that all such conditions of approval will further ensure that no potential for adverse impacts will be introduced by construction activities, initial or future land uses authorized by the project approval.

Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

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Appendix 1 –Geotech Report

Proposed Biodiesel Project

Geotechnical Engineering Report

December 14, 2022 | Terracon Project No. CB225189

Prepared for:

BNSF Railway
740 E. Carnegie Drive
San Bernardino, California 92408

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December 14, 2022

BNSF Railway
740 E. Carnegie Drive
San Bernardino, California 92408

Attn: Jason Sanchez
P: 909-386-4470
E: Jason.Sanchez@bnsf.com

Re: Geotechnical Engineering Report
Proposed Biodiesel Project
Muscat Yard
Fontana, California
Terracon Project No. CB225189

Dear Mr. Sanchez:

We have completed the scope of Geotechnical Engineering services for the above referenced project in general accordance with Terracon Proposal No. PCB225189 dated October 28, 2022. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations and floor slabs for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon

Sean Paroski, EIT	Keith P. Askew, PE, GE
Staff Engineer	Department Manager

Table of Contents

Attachments

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed diesel storage tanks, pipeline, and pump house to be located at Muscat Yard in Fontana, California. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Seismic site classification per CBC
- Site preparation and earthwork
- Foundation design and construction
- Floor slab design and construction
- Lateral earth pressures
- Pavement sections

The geotechnical engineering Scope of Services for this project included the advancement of test borings, laboratory testing, engineering analysis, and preparation of this report.

Drawings showing the site and boring locations are shown on the Site Location and Exploration Plan, respectively. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs and/or as separate graphs in the Exploration Results section.

Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	A conceptual development plan prepared by Separation by Design was received via email on October 19, 2022. The conceptual plan was appended with requested boring locations. The scope was discussed with the project team during a teleconference on October 21, 2022, and a list of project design elements was received by email on October 21, 2022.

Item	Description
Project Description	The project consists of a biodiesel loading facility, including six reservoirs with a diameter of 55 feet, concrete loadout/containment pads, pipe bridges, and heavy-duty pavement capable of supporting heavy truck loading. The project is located within the Muscat Yard, an approximately 9.5-acre site.
Proposed Structure	Structures associated with the project includes six reservoirs, six concrete loadout/containment pads, pipe bridges and new pavement. The project also includes constructing six new industrial side-tracks. Design of the new tracks (subgrade preparation, subballast, ballast) was not requested and will be provided by others.
Construction Details	The design of the reservoirs was not provided. We assumed they will be of steel construction with concrete ringwall or concrete mat foundations. The capacity of each reservoir is approximately 1.1 million gallons. The pipe bridges will support 12-inch diameter pipes. The loadout/containment pads will be 8 inches thick with a double mat construction.
Finished Floor Elevation	Finished floor elevations were not provided. They are assumed to be at or near existing grade of approximately 1,266 feet (loadout/containment) and 1,270 to 1,274 for the reservoirs.
Maximum Loads	Anticipated structural loads were not provided. In the absence of information provided by the design team, we used the following loads in estimating settlement based on our experience with similar projects. ▪ Fuel tanks: 2,650 psf ▪ Bridge foundations: 50 kips
Grading/Slopes	The site is relatively planar and significant cuts and/or fills are not anticipated.
Below-Grade Structures	Except for buried utilities, below-grade structures are not anticipated.
Free-Standing Retaining Walls	None anticipated
Pavements	Paved driveway and parking will be constructed on approximately 8 ½ acres of the parcel. A preferred pavement surfacing has not been identified to us as part of the preliminary information. Asphalt/Concrete surfacing

Item	Description
	is common in the area for projects of this nature and is the assumed preference. Unless information is provided prior to the report, the anticipated ACI traffic categories and daily truck traffic will be assumed to consist of: ■ Category D: Heavy duty trucks, 25 trucks per day We assume that the traffic classification for asphalt concrete will consist of: ■ Class IV: Heavy trucks, up to 25 fully loaded 5-axle semi-trailers per day The pavement design period is 20 years.
Stormwater	Requirements for infiltration testing were not indicated. Infiltration testing is not included within our scope.
Design Criteria	CBC 2022 BNSF Standards and Specifications American Railway Engineering and Maintenance-of-Way Association (AREMA)

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located at Muscat Yard in Fontana, California, approximately 9½ acres located behind the Ferrellgas building located at 15559 Foothill Blvd, Fontana, CA 92335. Center of site: 34.1041° N / 117.4653° W (approximate) See Site Location
Existing Improvements	The site is a previously graded rail yard. One industrial side track traverses the yard. This track will be removed as part of site development. Another industrial lead track is located along the eastern site boundary.

Current Ground Cover	Surfaced with gravel and earth. Light vegetation is visible on portions of the site on Google Earth.
Existing Topography	Slopes gradually downward from Foothill Boulevard, from elevation 1,279 feet to elevation 1,258 feet per Google Earth.

Geotechnical Characterization

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project.

Subsurface soils encountered in our borings generally consisted of medium dense to very dense sands and gravels with varying amounts of silt extending to the maximum depth of the borings to 86 feet below existing ground surface (bgs). Fill soil consisting of silty sand was encountered in borings B-3 and B-4 to depths of approximately 3 to 5 feet bgs. A surface layer of highly weathered asphalt up to 3 inches thick was encountered in borings B-2, B-5, and B-6. Refusal was encountered on concrete immediately under the asphalt and aggregate base layer in boring B-5.

The individual logs can be found in the Exploration Results attachment of this report.

Groundwater

The borings were advanced using a hollow-stem auger drilling technique that allow short term groundwater observations to be made while drilling. Seepage was encountered at approximately 80 feet bgs in boring B-2. According to groundwater data collected from a nearby well with State Well No. 01S06W12P001S (approximately 0.7 miles south of the project site) historic high groundwater levels were recorded at greater than 300 feet bgs.[1] Groundwater conditions may change because of seasonal variations in rainfall, runoff, and other conditions not apparent at the time of drilling. Long-term groundwater monitoring was outside the scope of services for this project. Groundwater conditions may be different at the time of construction.

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[1] Data collected from the California State Groundwater Management Agency's Data Viewer website (https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#gwlevels)

Laboratory Results

Laboratory tests were conducted on selected soil samples and the test results are presented in the Exploration Results section and on the boring logs. To evaluate the potential deformation that may be caused by the addition of water to subsurface soils, hydroconsolidation testing was performed on selected, relatively undisturbed samples. The test results indicate a collapse potential of 0.8% (B-1 at 5 feet), and 1.1% (B-2 at 2.5 feet) when saturated under a confining pressure of 2,000 psf. A modified proctor test was conducted on a bulk soil sample collected from boring B-1 from 1 – 5 feet bgs (resulting in a maximum dry density of 131 pcf and an optimum water content of 7.2%) and boring B-3 from 1 – 5 feet bgs (resulting in a maximum dry density of 135 pcf and an optimum water content of 5.4%).

Seismic Design Considerations

Seismic Design Parameters

Based on the soil properties encountered at the site and as described on the exploration logs and results, it is our opinion that the Seismic Site Classification is C. The 2022 California Building Code (CBC) Seismic Design Parameters have been generated using the SEAOC/OSHPD Seismic Design Maps Tool. This web-based software application calculates seismic design parameters in accordance with ASCE 7-16 and 2022 CBC. The seismic design parameters for the tower and support structures are based on seismic design category and mapped acceleration parameters modified for soil profile. The seismic design parameters according to the 2022 CBC are provided in the following table.

Description	Value
2022 California Building Code Site Classification (CBC)[1]	C[2]
Site Latitude (°N)	34.1041
Site Longitude (°W)	117.4653
S_S Spectral Acceleration for a 0.2-Second Period	1.978
S_1 Spectral Acceleration for a 1-Second Period	0.746
F_a Site Coefficient for a 0.2-Second Period	1.2
F_v Site Coefficient for a 1-Second Period	1.4
PGA_M Site Modified Peak Ground Acceleration	1.019
De-aggregated Modal Magnitude[3]	7.9

1. Seismic site classification in general accordance with the *2019 California Building Code*.
2. The 2022 California Building Code (CBC) requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope does not include the 100-foot soil profile determination. Borings were extended to a maximum depth of 86 feet, and this seismic site class definition considers that similar or denser soils continue below the maximum depth of the subsurface exploration. Additional exploration to deeper depths would be required to confirm the conditions below the current depth of exploration.
3. These values were obtained using the on-line Unified Hazard Tool by the USGS (https://earthquake.usgs.gov/hazards/interactive/) for a return period of 2% in 50 years accessed.

A site-specific ground motion study may generate less conservative coefficients and acceleration values which may reduce construction costs. We recommend consulting with a structural engineer to evaluate the need for such study and its potential impact on construction costs. Terracon should be contacted if a site-specific ground motion study is desired.

Liquefaction

Liquefaction is a mode of ground failure that results from the generation of high pore-water pressures during earthquake ground shaking, causing loss of shear strength, and is typically a hazard where loose sandy soils exist below groundwater. San Bernardino County has designated certain areas as potential liquefaction hazard zones. These are areas considered at a risk of liquefaction-related ground failure during a seismic event, based upon mapped surficial deposits and the presence of a relatively shallow water table.

The subsurface materials generally consist of medium dense to very dense sands and gravels with varying amounts of silt extending to the maximum depth of the borings approximately 86 feet bgs. Groundwater was not encountered during the course of drilling and has historically been greater than 100 feet bgs.

According to the County of San Bernardino geologic hazard maps, the site is not located within an area having liquefaction potential. Based on the subsurface conditions encountered and the depth to groundwater, the potential for liquefaction at the site is low.

Geotechnical Overview

The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the test borings, provided that the recommendations provided in this report are implemented in the design and construction phases of this project.

We recommend that the proposed fuel tanks be supported by shallow foundation system (ring-foundation or mat slab) supported on engineered fill. The loadout/containment pads may be supported on a mat foundation system bearing on engineered fill. The pipe bridge may be supported by either shallow spread footings bearing on engineered fill or drilled piers.

The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the Exploration Results), engineering analyses, and our current understanding of the proposed project. The General Comments section provides an understanding of the report limitations.

Earthwork

Earthwork is anticipated to include demolition, clearing and grubbing, excavations, and engineered fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

Site Preparation

Strip and remove existing vegetation, debris, pavements, and other deleterious materials from proposed building areas. Exposed surfaces should be free of mounds and depressions which could prevent uniform compaction. The site should be initially graded to create a relatively level surface to receive fill, and provide for a relatively uniform thickness of fill beneath proposed building structures.

Fill materials were encountered in the areas around borings B-3 to and B-4 to depths of approximately 3 to 5 feet bgs. The fill soils consisted of silty sand and are likely associated with the previous development of the site.

Terracon does not have any documentation to show if the grading operations were monitored or the fill materials were compacted and tested when placed. If such documentation exists, Terracon should be notified and the recommendations in this report appropriately modified as needed. We recommend that undocumented fill soils be removed within the proposed building area.

In addition, concrete or cemented material was encountered near the surface in boring B-5 that prevented the advancement of a hollow-stem auger. Our field exploration was unable to determine the lateral extent of this material or its estimated depth. We recommend that this material be removed within the proposed building area.

Evidence of utilities such as manhole covers or utility markings were not observed onsite. Although no evidence underground facilities such as septic tanks, cesspools, or basements was observed during the site reconnaissance, such features could be encountered during construction. If unexpected fills, utilities, or underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Subgrade Preparation

We recommend that the soils within the footprint of the proposed structures be removed to a minimum depth of 1 foot below the bottom of foundations, or to 3 feet below existing grades, whichever is greater, and replaced with engineered fill. On-site soils are considered suitable to be used as structural fill materials. Structural fill placed beneath the entire footprint of the building should extend horizontally a minimum distance of 1 foot beyond the outside edge of footings.

Subgrade soils beneath exterior slabs and pavements should be removed to a depth of 1 foot beneath existing grade, or below bottom of slab or pavement section including any base materials. The exposed surface should then be scarified, moisture conditioned, and compacted to a minimum depth of 10 inches. In the event the demolition activities result in disturbance of deeper soils, the subgrade preparation and compaction should extend to the depth of undisturbed soils.

All exposed areas which will receive fill, once properly cleared and benched where necessary, should be scarified to a minimum depth of 10 inches, moisture conditioned, and compacted per the compaction requirements in this report. Fill soils should then be placed to the design grades in accordance with the compaction requirements outlined in this report. The moisture content and compaction of subgrade soils should be maintained until foundation, slab, or pavement construction.

Based upon the subsurface conditions determined from the geotechnical exploration, subgrade soils exposed during construction are anticipated to be relatively workable. However, the workability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors. If unworkable conditions develop, workability may be improved by scarifying and drying.

Excavation

Excavation penetrating the dense soils, gravels, cobbles, and concrete or cemented material may require the use of specialized heavy-duty equipment, to facilitate rock break-up and removal. Consideration should be given to obtaining a unit price for difficult excavation in the contract documents for the project.

The bottom of excavations should be thoroughly cleaned of loose soils and disturbed materials prior to backfill placement and/or construction.

Onsite soils consist of cohesionless sandy soils. Such soils have the tendency to cave and slough during excavations. Therefore, formwork may be needed for foundation excavations.

Individual contractors are responsible for designing and constructing stable, temporary excavations. Excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current OSHA excavation and trench safety standards.

Fill Material Types

All fill materials should be inorganic soils free of vegetation, debris, and fragments larger than 6 inches in size. Pea gravel or other similar non-cementitious, poorly-graded materials should not be used as fill or backfill without the prior approval of the geotechnical engineer.

Clean on-site soils or approved imported materials may be used as fill material for the following:

- general site grading
- foundation areas
- pavement areas
- foundation backfill
- exterior slab areas

Imported Fill Materials: Imported fill materials should meet the following material property requirements. Regardless of its source, compacted fill should consist of approved materials that are free of organic matter and debris.

	Percent Finer by Weight
Gradation	(ASTM C 136)
3″	100
No. 4 Sieve	50-100
No. 200 Sieve	10-40

- Liquid Limit .... 30 (max)
- Plasticity Index .... 15 (max)
- Maximum expansion index* .... 20 (max)

*ASTM D 4829

The contractor shall notify the Geotechnical Engineer of import sources sufficiently ahead of their use so that the sources can be observed and approved as to the physical characteristic of the import material. For all import material, the contractor shall also submit current verified reports from a recognized analytical laboratory indicating that the import has a "not applicable" (Class S0) potential for sulfate attack based upon current ACI criteria and is "mildly corrosive" to ferrous metal and copper. The reports shall be accompanied by a written statement from the contractor that the laboratory test results are representative of all import material that will be brought to the job.

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Fill lifts should not exceed 10 inches loose thickness.

Fill Placement and Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Material Type and Location	Per the Modified Proctor Test (ASTM D 1557)		
	Minimum Compaction Requirement (%)	Range of Moisture Contents for Compaction Above Optimum	
		Minimum	Maximum
On-site granular soils and low volume change imported fill:			
Beneath foundations	90	0%	+3%
Beneath slabs	90	0%	+3%
Miscellaneous backfill	90	0%	+3%
Utility trenches [1]	90	0%	+3%
Bottom of excavation receiving fill	90	0%	+3%

1. Upper 12 inches should be compacted to 95% within pavement and structural areas. Low-volume change imported soils should be used in structural areas.

Utility Trench Backfill

Any soft or unsuitable materials encountered at the bottom of utility trench excavations should be removed and replaced with structural fill or bedding material in accordance with public works specifications for the utility being supported. This recommendation is particularly applicable to utility work requiring grade control and/or in areas where subsequent grade raising could cause settlement in the subgrade supporting the utility. Trench excavation should not be conducted below a downward 1:1 projection from existing foundations without engineering review of shoring requirements and geotechnical observation during construction.

On-site materials are considered suitable for backfill of utility and pipe trenches from 1 foot above the top of the pipe to the final ground surface, provided the material is free of organic matter and deleterious substances.

Trench backfill should be mechanically placed and compacted as discussed earlier in this report. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Where trenches are placed beneath slabs or footings, the backfill should satisfy the gradation and expansion index requirements of engineered fill discussed in this report. Flooding or jetting for placement and compaction of backfill is not recommended.

Grading and Drainage

Positive drainage should be provided during construction and maintained throughout the life of the development. Infiltration of water into utility trenches or foundation excavations should be prevented during construction. Planters and other surface features which could retain water in areas adjacent to the building or pavements should be sealed or eliminated. In areas where sidewalks or paving do not immediately adjoin the structure, we recommend that protective slopes be provided with a minimum grade of approximately 5 percent for at least 10 feet from perimeter walls. Backfill against footings, exterior walls, and in utility and sprinkler line trenches should be well compacted and free of all construction debris to reduce the possibility of moisture infiltration.

Roof drainage should discharge into splash blocks or extensions when the ground surface beneath such features is not protected by exterior slabs or paving. Sprinkler systems and landscaped irrigation should not be installed within 5 feet of foundation walls.

Exterior Slab Design and Construction

Exterior slabs-on-grade, exterior architectural features, and utilities founded on, or in backfill may experience some movement due to the volume change of the backfill. To reduce the potential for damage caused by movement, we recommend:

- minimizing moisture increases in the backfill;
- controlling moisture-density during placement of backfill;
- using designs which allow vertical movement between the exterior features and adjoining structural elements;
- placing effective control joints on relatively close centers.

Earthwork Construction Considerations

Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of grade-supported improvements such as floor slabs and pavements. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction.

We recommend that the earthwork portion of this project be completed during extended periods of dry weather if possible. If earthwork is completed during the wet season (typically November through April) it may be necessary to take extra precautionary measures to protect subgrade soils. Wet season earthwork operations may require additional mitigative measures beyond that which would be expected during the drier summer and fall months. This could include diversion of surface runoff around exposed soils and draining of ponded water on the site. Once subgrades are established, it may be necessary to protect the exposed subgrade soils from construction traffic.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred.

Excavations or other activities resulting in ground disturbance have the potential to affect adjoining properties and structures. Our scope of services does not include review of available final grading information or consider potential temporary grading performed by the contractor for potential effects such as ground movement beyond the project limits. A preconstruction/ precondition survey should be conducted to document nearby property/infrastructure prior to any site development activity. Excavation or ground disturbance activities adjacent or near property lines should be monitored or instrumented for potential ground movements that could negatively affect adjoining property and/or structures.

Construction Observation and Testing

The earthwork efforts should be observed by the Geotechnical Engineer (or others under their direction). Observation should include documentation of adequate removal of surficial materials (vegetation, topsoil, and pavements), evaluation and remediation of existing fill materials, as well as proofrolling and mitigation of unsuitable areas delineated by the proofroll.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, as recommended by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. Where not specified by local ordinance, one density and water content test should be performed for every 50 linear feet of compacted utility trench backfill and a minimum of one test performed for every 12 vertical inches of compacted backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated by the Geotechnical Engineer. If unanticipated conditions are observed, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

Shallow Foundations

If the site has been prepared in accordance with the requirements noted in Earthwork, the following design parameters are applicable for shallow foundations.

Ring Foundation – Design Recommendations

Item	Description
Foundation Type	Reinforced concrete ring-wall foundations
Maximum Net Allowable Bearing Pressure [1, 2]	3,000 psf
Required Bearing Stratum [3]	Engineered fill extending to a minimum depth of 1 foot below the bottom of foundations, or 3 feet below existing grades, whichever is greater.
Minimum Foundation Dimensions	24 inches
Minimum Embedment below Finished Grade [4]	24 inches
Estimated Total Settlement from Structural Loads [2]	Less than 1 inch
Estimated Differential Settlement [2, 5]	About 1/2 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation.
2. Values provided are for maximum loads noted in Project Description. Additional geotechnical consultation will be necessary if higher loads are anticipated.
3. Unsuitable, loose, or soft soils should be overexcavated and replaced per the recommendations presented in Earthwork.
4. Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.
5. Differential settlements are noted for equivalent-loaded foundations and bearing elevation as measured over a span of 50 feet.

Conventional Foundation – Design Recommendations

Item	Description
Foundation Type	Conventional Shallow Spread Footings
Maximum Net Allowable Bearing Pressure [1, 2]	3,000 psf
Required Bearing Stratum [3]	Engineered fill extending to a minimum depth of 1 foot below the bottom of foundations, 3 feet below existing grades, whichever is greater.
Minimum Foundation Dimensions	Columns: 24 inches wide
Minimum Embedment below Finished Grade [4]	24 inches
Ultimate Passive Resistance [5]	435 pcf
Ultimate Coefficient of Sliding Friction [6]	0.43
Estimated Total Settlement from Structural Loads [2]	Less than 1 inch
Estimated Differential Settlement [2, 7]	About 1/2 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation.
2. Values provided are for maximum loads noted in Project Description. Additional geotechnical consultation will be necessary if higher loads are anticipated.
3. Unsuitable or soft soils should be overexcavated and replaced per the recommendations presented in Earthwork.
4. Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.
5. Use of passive earth pressures requires the footing forms be removed and compacted structural fill be placed against the vertical footing face. A factor of safety of 2.0 is recommended.
6. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions. A factor of safety of 1.5 is recommended.
7. Differential settlements are noted for equivalent-loaded foundations and bearing elevation as measured over a span of 40 feet.

Mat Foundation Design Recommendations

Item	Description
Foundation Support	Engineered fill extending to a minimum depth of 1 foot below the bottom of foundations, or 3 feet below existing grades, whichever is greater.
Net Allowable Bearing pressure [1, 2] (On-site soils or structural fill)	3,000 psf (for widths 5 to 15 feet)
Minimum Embedment Depth	12 inches
Estimated Total Static Settlement from Structural Loads [2]	about 1 inch
"Estimated Differential Settlement [2, 5]	About 1/2 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied.
2. Values provided are for maximum loads noted in Project Description. The foundation settlement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footings, the thickness of compacted fill, and the quality of the earthwork operations.
3. Use of passive earth pressures requires the footing forms be removed and compacted structural fill be placed against the vertical footing face. A factor of safety of 2.0 is recommended.
4. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions. A factor of safety of 1.5 is recommended.
5. Differential settlements are as measured over a span of 40 feet.

A modulus of subgrade reaction (Kv_1) of 200 pounds per cubic inch (pci) should be used. Other details including treatment of loose foundation soils, superstructure reinforcement and observation of foundation excavations as outlined in this report are applicable for the design and construction of a mat foundation at the site.

The subgrade modulus (Kb) for the mat is affected by the size of the mat foundation and would vary according the following equation:

$$Kb = Kv_1 \times (B+1)^2 / 4B^2$$

Where: Kv_1 is the modulus of vertical subgrade reaction

B is the width of the mat foundation.

Thus for a footing width of B = 10 ft bearing on the onsite soils, the subgrade modulus would be:

$$Kb = 200 \text{ x } (10+1)^2 /(4\text{x } 10^2) = 60 \text{ pci}$$

Finished grade is defined as the lowest adjacent grade within five feet of the foundation. The allowable foundation bearing pressure applies to dead loads plus design live load conditions. The design bearing pressure may be increased by one-third when considering total loads that include wind or seismic conditions. The weight of the foundation concrete below grade may be neglected in dead load computations.

Foundations should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement. Foundation excavations should be observed by the geotechnical engineer. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

Foundation Construction Considerations

As noted in Earthwork, the footing excavations should be evaluated under the observation of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

Deep Foundations

Drilled pier recommendations are provided for the proposed diesel pipe bridge. We recommend drilled piers be designed and constructed as presented below.

Drilled Shaft Axial Loading

Axial compressive loads may be supported on straight-sided drilled piers. Allowable compressive side friction capacity is provided for different pile diameters (1.5 feet to 3.5 feet) in the Attachments of this report. The allowable uplift capacities should only be based on two-thirds of the allowable side friction of the shaft; however, the weight of the foundation should be added to these values to obtain the actual allowable uplift capacities for drilled shafts. The allowable skin friction and end bearing values are based on factors of safety of 2.5 and 3, respectively.

Drilled Shaft Lateral Loading

The following table lists input values for use in LPILE or GROUP analyses. Since deflection or a service limit criterion will most likely control lateral capacity design, no safety/resistance factor is included with the parameters. The table below also provides allowable passive lateral earth pressures for the lateral design of light pole foundations or other foundations.

L-Pile Design Input Parameters[1]							
ique	Depth Below Finished Grade Surface (feet)		L-PILE Soil Type	Effective Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)	Allowable Passive Resistance (psf)[2]
	Top	Bottom					
1	2	5	Reese (Sand)	115	30	--	230
2	5	7.5	Reese (Sand)	116	34	--	270
3	7.5	20	Reese (Sand)	105	40	--	320

1. Default K values in LPILE may be utilized.
2. These values include a factor of safety of 1.5.

The axial and lateral capacities of the upper 2 feet should neglected. The load capacities provided herein are based on the stresses induced in the supporting soil strata. The structural capacity of the shafts/piles should be checked to assure they can safely accommodate the combined stresses induced by axial and lateral forces. Lateral deflections of shafts/piles should be evaluated using an appropriate analysis method, and will depend upon the pile's diameter, length, configuration, stiffness and "fixed head" or "free head" condition. We can provide additional analyses and estimates of lateral deflections for specific loading conditions upon request. The load-carrying capacity of shafts/piles may be increased by increasing the diameter and/or length.

Drilled Shaft Construction Considerations

Drilling for the proposed drilled shafts to design depths should be possible with conventional single flight power augers. For drilled shaft depths above the depth of groundwater, temporary steel casing will likely be required to properly drill and clean shafts prior to concrete placement.

We do not anticipate drilled shafts to extend below the depth of groundwater. However, if foundation concrete cannot be placed in dry conditions, a tremie should be used for concrete placement.

In the event drilled hole walls slough during drilling, we recommend the use of slurry drilling methods with polymers to keep the solids in suspension during the drilling. Drilled shaft foundation concrete should be placed within 6 inches of the shaft base of the slurry-filled excavation immediately after completion of drilling and cleaning. The tremie should remain inserted several feet into the fresh concrete as it displaces the slurry upward and until placement is complete. The slurry should have a sand content no greater than 1% at the time concrete placement commences. The maximum unit weight of the slurry should be established in consultation with Terracon. Due to potential sloughing and raveling, foundation concrete quantities may exceed calculated geometric volumes.

If casing is used for drilled shaft construction, it should be withdrawn in a slow continuous manner maintaining a sufficient head of concrete to prevent infiltration of water or the creation of voids in shaft concrete. Shaft concrete should have a relatively high fluidity when placed in cased shaft holes or through a tremie. Shaft concrete with slump in the range of 6 to 8 inches is recommended.

Formation of mushrooms or enlargements at the tops of shafts should be avoided during shaft drilling. If mushrooms develop at the tops of the shafts during drilling, sono-tubes should be placed at the shaft tops to help isolate the shafts.

Free-fall concrete placement in drilled shafts will only be acceptable if provisions are taken to avoid striking the concrete on the sides of the hole or reinforcing steel. The use of a bottom-dump hopper, or an elephant's trunk discharging near the bottom of the hole where concrete segregation will be minimized, is recommended.

The contractor should check for gas and/or oxygen deficiency prior to any workers entering the excavation for observation and manual cleanup. All necessary monitoring and safety precautions as required by OSHA, State or local codes should be strictly enforced.

We recommend that all drilled shaft installations be observed on a full-time basis by an experienced geotechnical engineer in order to evaluate that the soils encountered are consistent with the recommended design parameters. If the subsurface soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

Temporary steel casing may be required to properly drill and clean drilled piers prior to concrete placement. A water and polymer displacement method may also be considered as a means of maintaining pier integrity during construction. Foundation concrete should be placed immediately after completion of drilling and cleaning.

Drilled pier bearing surfaces must be thoroughly cleaned prior to concrete placement. A representative of the Geotechnical Engineer should inspect the bearing surface and foundation pier configuration. If the subsurface soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

The installation of drilled straight-shafts may likely require the use of the slurry displacement method and/or temporary steel casing with water pumps, if groundwater encountered. If drilled straight-shaft installation is attempted without utilizing slurry displacement method or temporary casing, zones of sloughing soils and/or groundwater inflow may occur during construction. Therefore, we recommend that provisions be incorporated into the plans and specifications to utilize slurry or casing to control sloughing and/or groundwater seepage during shaft construction.

Closely spaced piers should be drilled and filled alternately, allowing the concrete to set at least eight hours before drilling the adjacent pier. All excavations should be filled with concrete as soon after drilling as possible. In no event should pier holes be left open overnight. To prevent concrete from striking the walls of the pier and causing caving, the concrete should be placed with appropriate equipment so that the concrete is not allowed to fall freely more than 5 feet. All loose materials should be thoroughly cleaned from the bottom of the pier excavation.

Floor Slabs

Design parameters for floor slabs assume the requirements for Earthwork have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the subgrade beneath the floor slab.

Floor Slab Design Parameters

Item	Description
Floor Slab Support[1]	Engineered fill extending to a minimum depth of 1 foot below the bottom of foundations, or 3 feet below existing grades, whichever is greater.
Subbase	None
Estimated Modulus of Subgrade Reaction [2]	200 pounds per square inch per inch (psi/in) for point loads. (The modulus was obtained based on estimates obtained from NAVFAC 7.1 design charts). This value is for a small loaded area (1 Sq. ft or less) such as for forklift wheel loads or point loads and should be adjusted for larger loaded areas.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, when the project includes humidity-controlled areas, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut contraction joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations, refer to the ACI Design Manual. Joints or cracks should be sealed with a waterproof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Floor Slab Construction Considerations

Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed, and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should observe the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

Lateral Earth Pressures

For engineered fill comprised of on-site soils or imported low volume change materials above any free water surface, recommended equivalent fluid pressures for unrestrained foundation elements are:

ITEM	VALUE[1, 2]
Active Case	35 psf/ft
Passive Case	435 psf/ft
At-Rest Case	54 psf/ft
Coefficient of Friction	0.43

1. The values are based on engineered fill materials used as backfill.
2. Uniform, horizontal backfill, compacted to at least 90% of the ASTM D 1557 maximum dry density

The lateral earth pressures herein do not include any factor of safety and are not applicable for submerged soils/hydrostatic loading. Additional recommendations may be necessary if such conditions are to be included in the design.

Fill against foundation should be compacted to densities specified in the Earthwork section of this report.

Pavements

General Pavement Comments

Pavement designs are provided for the traffic conditions and pavement life conditions as noted in Project Description and in the following sections of this report. A critical aspect of pavement performance is site preparation. Pavement designs noted in this section must be applied to the site which has been prepared as recommended in the Earthwork section.

Pavement Design Parameters

Design of asphalt concrete (AC) pavements is based on the procedures outlined in the Caltrans "Highway Design Manual" (Caltrans, 2020). Design of Portland cement concrete (PCC) pavements are based upon American Concrete Institute (ACI) 330R-08; "Guide for Design and Construction of Concrete Parking Lots."

An estimated preliminary R-value of 50 was assumed for the subgrade soils supporting the pavement sections presented below. A modulus of subgrade reaction of 200 pci and a modulus of rupture of 600 psi were used for the PCC pavement designs.

The structural sections are predicated upon proper compaction of the utility trench backfills and the subgrade soils as prescribed by in Earthwork, with the upper 12 inches of subgrade soils and all aggregate base material brought to a minimum relative compaction of 95 percent in accordance with ASTM D 1557 prior to paving. The aggregate base should meet Caltrans requirements for Class 2 base.

The pavement designs were based upon the results of preliminary geotechnical testing and should be verified by additional sampling and R-value testing during construction when the actual subgrade soils are exposed.

Pavement Section Thicknesses

The table below provides options for AC and PCC Sections. Traffic Indices and truck traffic are assumed values and should be verified by the project Civil engineer.

Asphalt Concrete Design		
Usage	Assumed Traffic Class	Recommended Structural Section
Truck Lanes	IV[1]	6″ HMA[2]/9″ Class 2 AB[3]

1. Heavy trucks, up to 25 fully loaded 5-axle semi-trailers per day (ESAL = 2,959,968)
2. HMA = hot mix asphalt
3. AB = aggregate base

Portland Cement Concrete Design		
Layer	Assumed Traffic Category	Thickness (inches)
PCC	D[1]	7.0
Aggregate Base[2]	D	--

1. ADTT = 25 (Category D)
2. Aggregate base is not required. Compacted on-site material is considered competent.

Recommended structural sections were calculated based on assumed TIs and our preliminary sampling and testing.

Terracon does not practice traffic engineering. We recommend that the project civil engineer or traffic engineer verify that the ESALs and ADTT traffic indices used are appropriate for this project.

Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic maintenance should be anticipated. Therefore, preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Maintenance consists of both localized maintenance (e.g., crack and joint sealing and patching) and global maintenance (e.g., surface sealing). Preventive maintenance is usually the priority when implementing a pavement maintenance program. Additional engineering observation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Final grade adjacent to paved areas should slope down from the edges at a minimum 2 percent.
- Subgrade and pavement surfaces should have a minimum 2 percent slope to promote proper surface drainage.
- Install below-pavement drainage systems surrounding areas anticipated for frequent wetting.
- Install joint sealant and seal cracks immediately.
- Seal all landscaped areas in or adjacent to pavements to reduce moisture migration to subgrade soils.
- Place compacted, low permeability backfill against the exterior side of curb and gutter.
- Place curb, gutter and/or sidewalk directly on clay subgrade soils rather than on unbound granular base course materials.

Corrosivity

The results of laboratory sulfides, soluble sulfate, chlorides, electrical resistivity, redox potential, total salts, and pH testing are presented in our appendix within the

Exploration Results section. The values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Results of soluble sulfate testing indicate samples of the on-site soils tested possess negligible sulfate concentrations when classified in accordance with Table 19.3.1.1 of the ACI Design Manual. Concrete should be designed in accordance with the exposure class S0 provisions of the ACI Design Manual, Section 318, Chapter 19.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly effect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Attachments

Exploration and Testing Procedures

Field Exploration

Boring Designation	Approximate Boring Depth or Refusal (feet)	Location
B-1	50 ½	Biodiesel tanks
B-2	86	Biodiesel tanks
B-3	21 ¼	Pipe bridge
B-4	45	Biodiesel tanks
B-5A to B-5C	½	Containment pad
B-6	21	Containment pad
B-7	6 ½	Truck drive lanes

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal accuracy of about ±10 feet) and referencing existing site features. If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: We advanced the borings with a track-mounted drill rig using continuous flight hollow stem augers. Four samples were generally obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. A 3-inch O.D. split-barrel sampling spoon with 2.5-inch I.D. ring lined sampler was also used for sampling soils at the project site. Ring-lined, split-barrel sampling procedures are similar to standard split spoon sampling procedure. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with auger cuttings after their completion.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following types of tests:

- Moisture Content
- Dry Unit Weight
- Particle-size Distribution (Gradation) of Soils Using Sieve Analysis
- One-dimensional Consolidation
- Corrosion Suite

The laboratory testing program often included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in accordance with the Unified Soil Classification System.

Site Location and Exploration Plans

Contents:

Note: All attachments are one page unless noted above.

Site Location

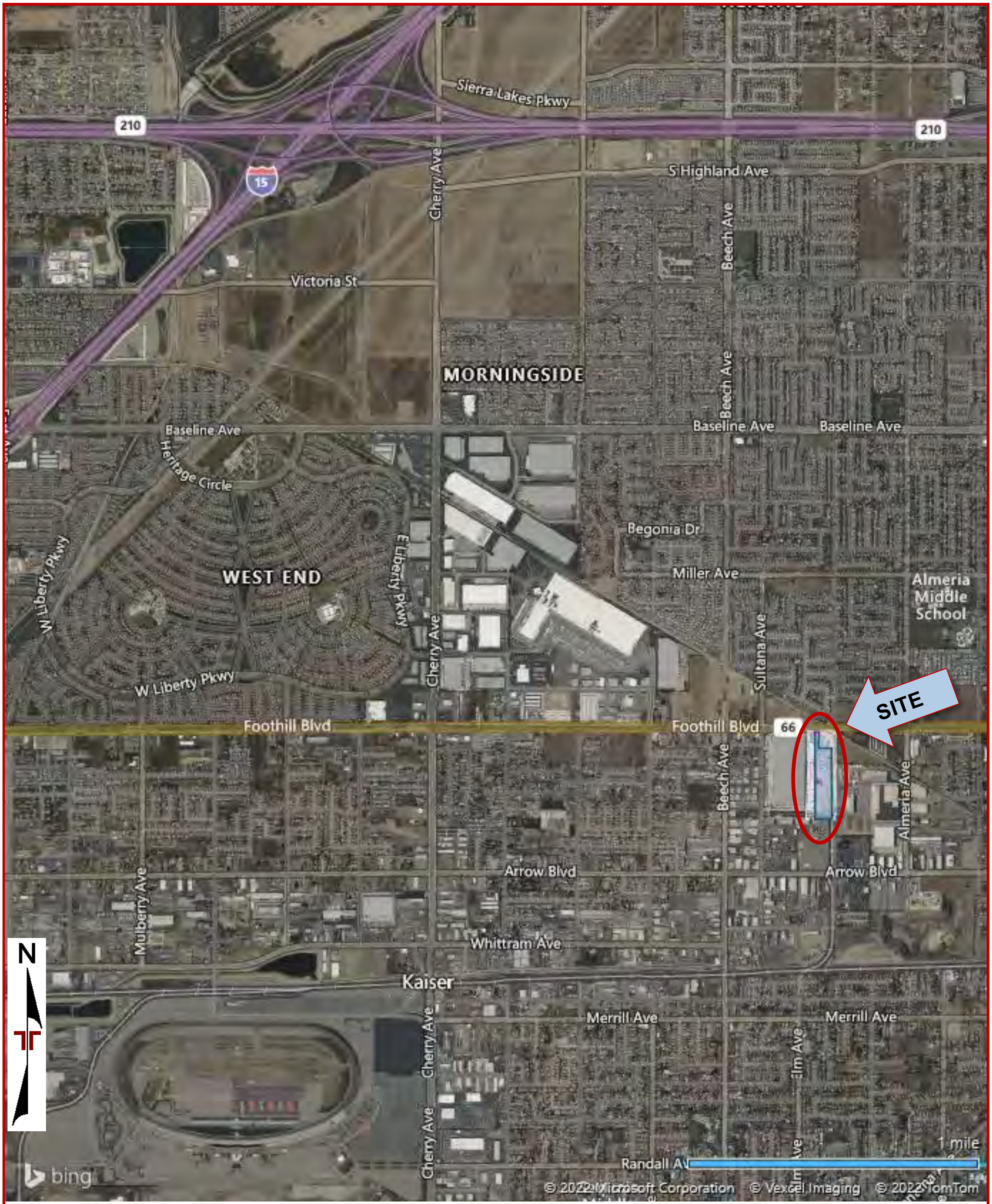


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

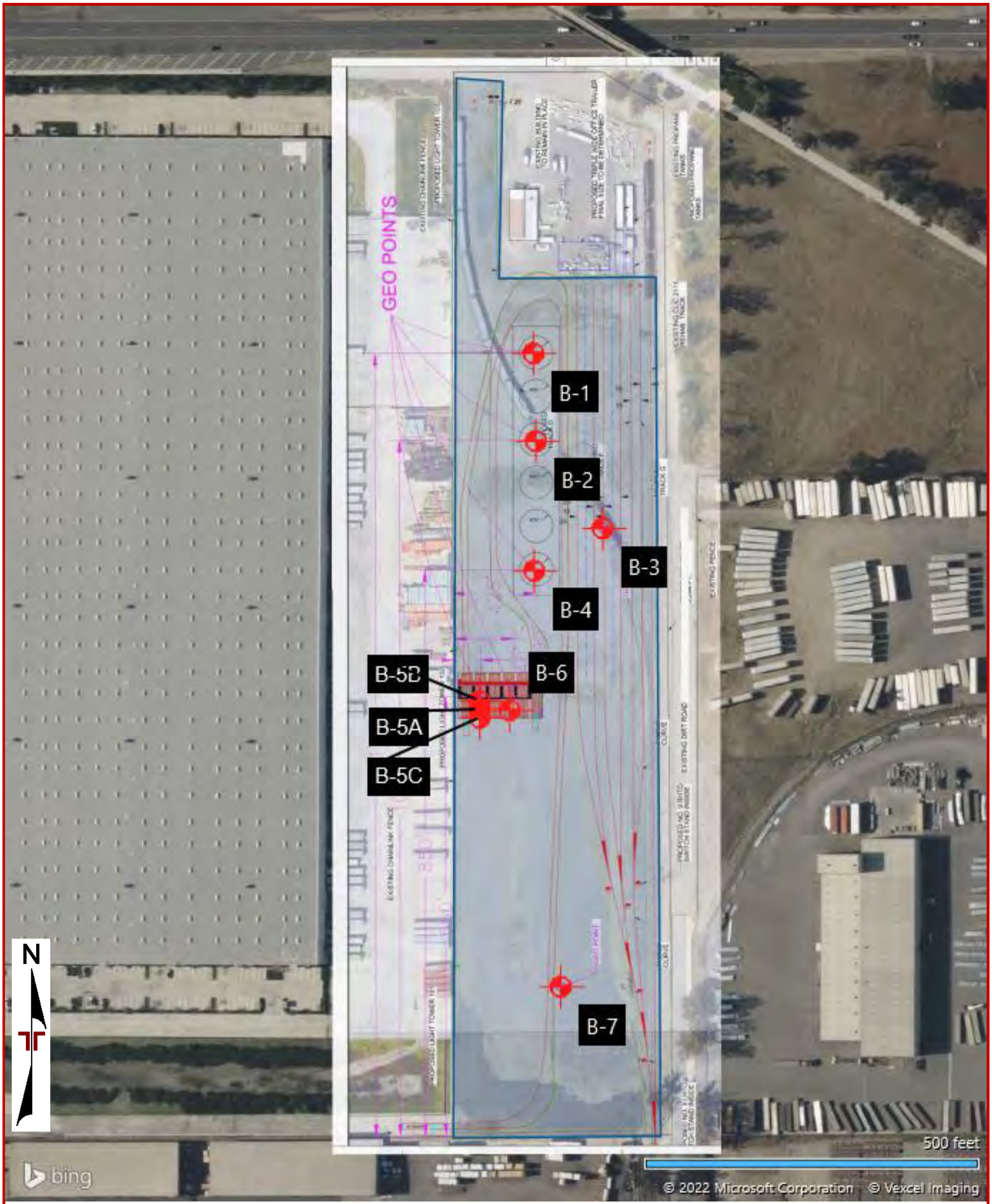


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Note: All attachments are one page unless noted above.

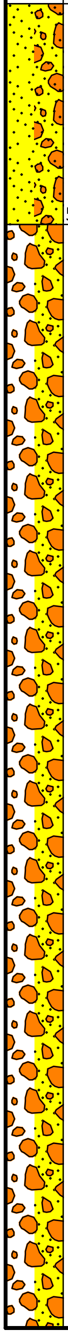
Proposed Biodiesel Project, BNSF Muscat Yard
15559 Foothill Blvd | Fontana, CA
Terracon Project No. CB225189

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 34.1052° Longitude: -117.4653°



Graphic Log	Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		POORLY GRADED SAND WITH GRAVEL (SP), gravel up to 2.5", fine to coarse grained, olive brown, medium dense							
				⧗	27-26-27	0.8	111		4
	5.0	**POORLY GRADED GRAVEL WITH SAND (GP)**, gravel up to 3", fine to coarse grained, olive brown, dense	5	⧗	28-31-30	1.6			
		very dense		⧗	21-50/5"				4
		medium dense	10	⧗	14-20-21	1.2	122		
		cobbles, medium to coarse grained, brown, very dense	15	⨯	24-34-50/6"				4
			20	⨯	7-50/2"				
			25	⨯	46-50/3"				
			30						

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 34.1052° Longitude: -117.4653°

Graphic Log	Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	35.0	**POORLY GRADED GRAVEL WITH SAND (GP)**, gravel up to 3", fine to coarse grained, olive brown, dense *(continued)*			☒	36-50/2"				
	40.0	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, gravel up to 3", fine to coarse grained, olive brown, very dense	35		☒	45-47-13 N=60				9
	50.5	**POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, gravel up to 3", fine to coarse grained, olive brown, very dense	40			50/1"				
			45			50/1"				
			50		☒	50/6"				
		Boring Terminated at 50.5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

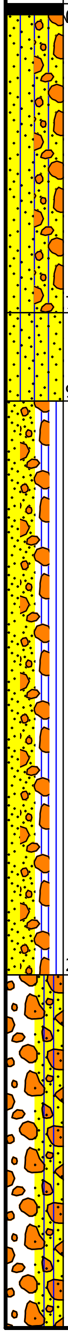
Boring Started
11-22-2022

Boring Completed
11-22-2022

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 34.1048° Longitude: -117.4653°



Depth (Ft.)		Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
0.3	**ASPHALT**, 3 inches thick, highly weathered								
	SILTY SAND WITH GRAVEL (SM), light brown, medium dense				26-25-23	1.0	123		16
		5			16-22-28	1.2	121		
7.0	**SILTY SAND (SM)**, olive brown, medium dense				8-10-12	11.1	111	NP	45
9.0	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, olive brown, very dense	10			22-50/6"	2.5	97		
	dense	15			24-34-29 N=63				7
	very dense	20			31-23-50/2"				
22.0	**POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, bluish gray, very dense	25			39-50/5"				6
		30							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
▽ While drilling
▽ At completion of drilling

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
11-21-2022

Boring Completed
11-21-2022

Notes

Advancement Method
8 in. Hollow-stem Auger

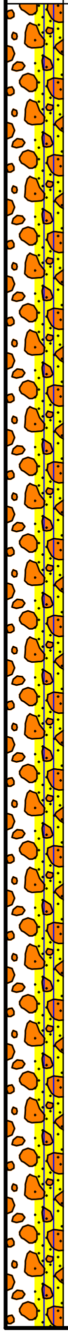
Abandonment Method
Boring backfilled with auger cuttings upon completion.

1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 34.1048° Longitude: -117.4653°



Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), bluish gray, very dense *(continued)*			☒	50/4"				
	35		☒	50/5"				
	40		☒	25-45-50/3"				
	45		☒	50/5"				
	50		☒	21-50/5"				
dense	55		☒	15-35-49 N=84				6
	60							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
▽ While drilling
▽ At completion of drilling

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
11-21-2022

Boring Completed
11-21-2022

Notes

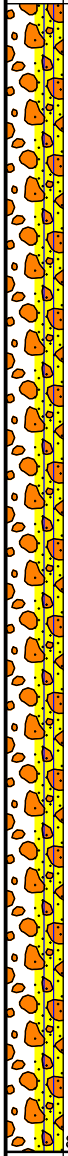
Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 34.1048° Longitude: -117.4653°



Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), bluish gray, very dense *(continued)* very dense			☒	33-44-50/6"				
		65		☒	50/6"				
		70		☒	50/5"				
		75		☒	50/5"	6.7			
		80	▽ ▽	☒	50/4"	3.3			
		85		☒	50/4"	9.8			
86.0	***Auger Refusal on Boulder at 86 Feet***			☒	50/2"				

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
▽ While drilling
▽ At completion of drilling

Notes

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
11-21-2022

Boring Completed
11-21-2022

Proposed Biodiesel Project, BNSF Muscat Yard
15559 Foothill Blvd | Fontana, CA
Terracon Project No. CB225189

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-3

Location: See Exploration Plan

Latitude: 34.1045° Longitude: -117.4650°

Depth (Ft.)		Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
5.0	**FILL - SILTY SAND (SM)**, fine to medium grained, olive brown with black, medium dense			⧗	6-8-15	8.1	106		
7.5	**SILTY SAND WITH GRAVEL (SM)**, gravel up to 3", fine to coarse grained, olive brown, medium dense	5		⧗	18-16-24	2.7	113		
	POORLY GRADED GRAVEL WITH SAND (GP), gravel up to 3", medium to coarse grained, olive brown, very dense			⧗	50/6"	0.8	104		
		10		⧗	30-50/2"				
		15		☒	31-30-50/2"				
21.3		20		☒	19-36-50/3"				

Boring Terminated at 21.25 Feet

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-4

Location: See Exploration Plan

Latitude: 34.1043° Longitude: -117.4653°

Graphic Log Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
3.0	**FILL - SILTY SAND (SM)**, trace gravel up to 1", fine to medium grained, olive brown								
5.0	**SILTY SAND WITH GRAVEL (SM)**, gravel up to 2", fine to coarse grained, olive brown, medium dense			⧗	15-13-17	1.7	117		
10.0	**POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, gravel up to 3", fine to coarse grained, olive brown, medium dense	5		⧗	23-25-23	1.8	122		7
				⧗	22-23-23	2.1	121		
	POORLY GRADED SAND (SP), trace gravel up to 1", medium to coarse grained, medium dense	10		⧗	23-24-24	1.5	109		4
20.0	dense	15		☒	19-20-23 N=43				
	POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), gravel up to 2", medium to coarse grained, olive brown, very dense	20		☒	29-38-46 N=84				9
	gray	25		☒	34-34-50/2"				
		30							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

Proposed Biodiesel Project, BNSF Muscat Yard
15559 Foothill Blvd | Fontana, CA
Terracon Project No. CB225189

1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-4

Graphic Log	Location: See Exploration Plan Latitude: 34.1043° Longitude: -117.4653° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), gravel up to 2", medium to coarse grained, olive brown, very dense *(continued)*			☒	15-45-43 N=88				
	35.0 **POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, gravel up to 2", medium to coarse grained, olive brown, very dense	35		☒	22-23-50/4"				10
	40.0 **POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, gravel up to 2", medium to coarse grained, gray, very dense	40		☒	50/6"				8
	45.0 ***Auger Refusal on Cobbles at 45 Feet***	45			50/0"				

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

Proposed Biodiesel Project, BNSF Muscat Yard
15559 Foothill Blvd | Fontana, CA
Terracon Project No. CB225189

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-5A

Location: See Exploration Plan

Latitude: 34.1037° Longitude: -117.4656°

Graphic Log	Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	0.3 **ASPHALT**, 3 inches thick, highly weathered								
	0.5 **AGGREGATE BASE COURSE**, 3 inches thick								
	Auger Refusal on Concrete at 0.5 Foot								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-5B

Graphic Log	Location: See Exploration Plan Latitude: 34.1038° Longitude: -117.4656° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	0.3 **ASPHALT**, 3 inches thick, highly weathered								
	0.5 **AGGREGATE BASE COURSE**, 3 inches thick								
	Auger Refusal on Concrete at 0.5 Foot								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

Boring Log No. B-5C

Graphic Log	Location: See Exploration Plan Latitude: 34.1037° Longitude: -117.4656° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	0.3 **ASPHALT**, 3 inches thick, highly weathered								
	0.5 **AGGREGATE BASE COURSE**, 3 inches thick								
	Auger Refusal on Concrete at 0.5 Foot								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

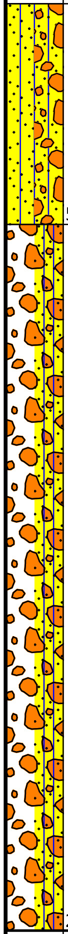
1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-6

Location: See Exploration Plan

Latitude: 34.1037° Longitude: -117.4654°

Depth (Ft.)



SILTY SAND WITH GRAVEL (SM), gravel up to 3", fine to coarse grained, olive brown, medium dense

5.0

POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), gravel up to 3", fine to coarse grained, dense

very dense

21.0

Boring Terminated at 21 Feet

Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
			10-9-18	7.2	112		
5			20-27-43	1.8			
			19-25-44	2.2	124		
10			18-50/3"				
15			25-50/3"				
20			21-50/4"				

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

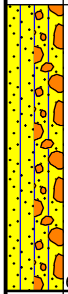
Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

Boring Log No. B-7

Graphic Log	Location: See Exploration Plan Latitude: 34.1026° Longitude: -117.4652° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	**SILTY SAND WITH GRAVEL (SM)**, gravel up to 3", fine to coarse grained, olive brown, dense								
				⧗	43-44-47	5.0	119		
		5		⧗	12-25-34	3.1	122		
	6.5								
	Boring Terminated at 6.5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

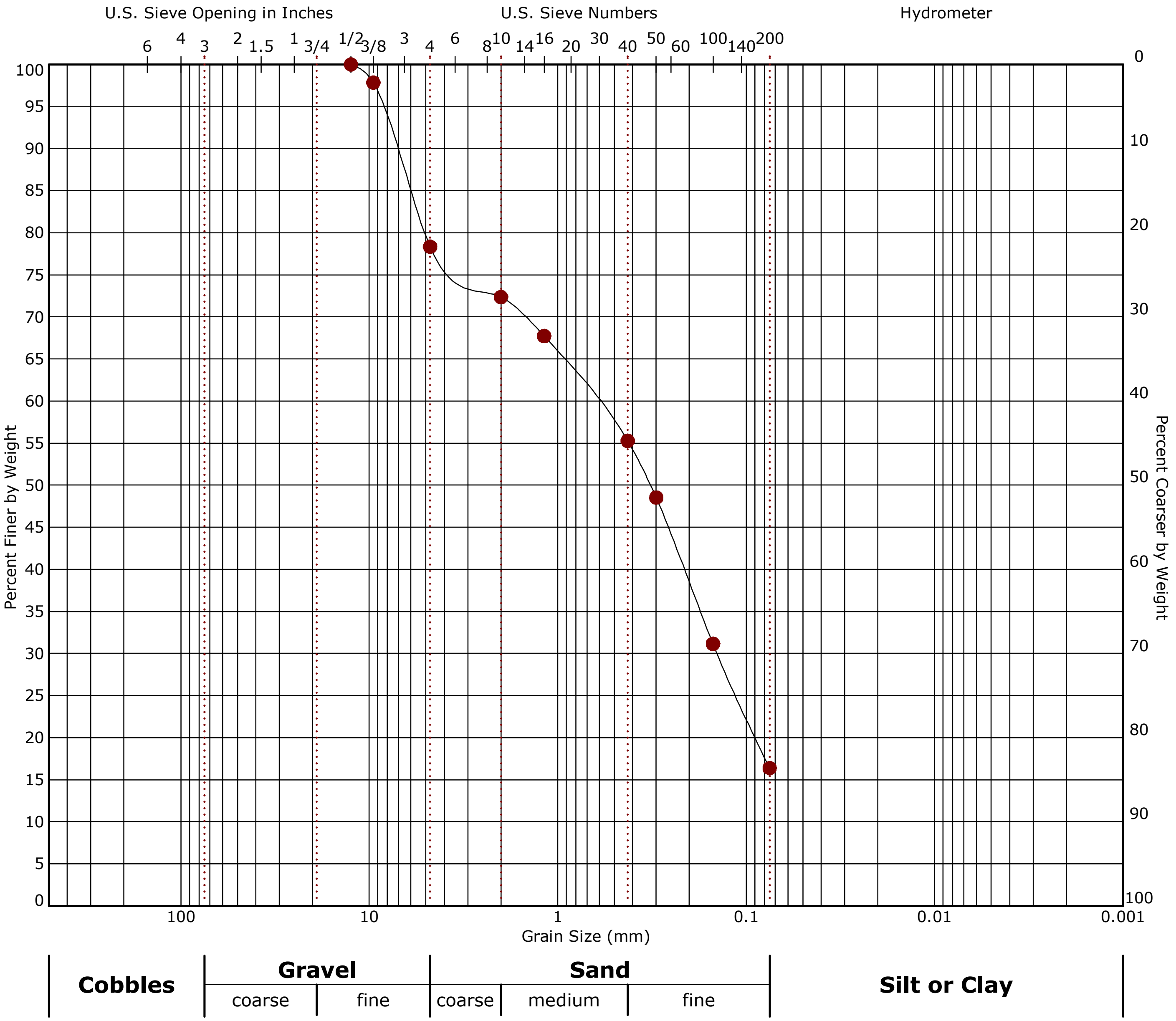
Boring Completed
11-22-2022

Proposed Biodiesel Project, BNSF Muscat Yard
15559 Foothill Blvd | Fontana, CA
Terracon Project No. CB225189

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Grain Size Distribution

ASTM D422 / ASTM C136



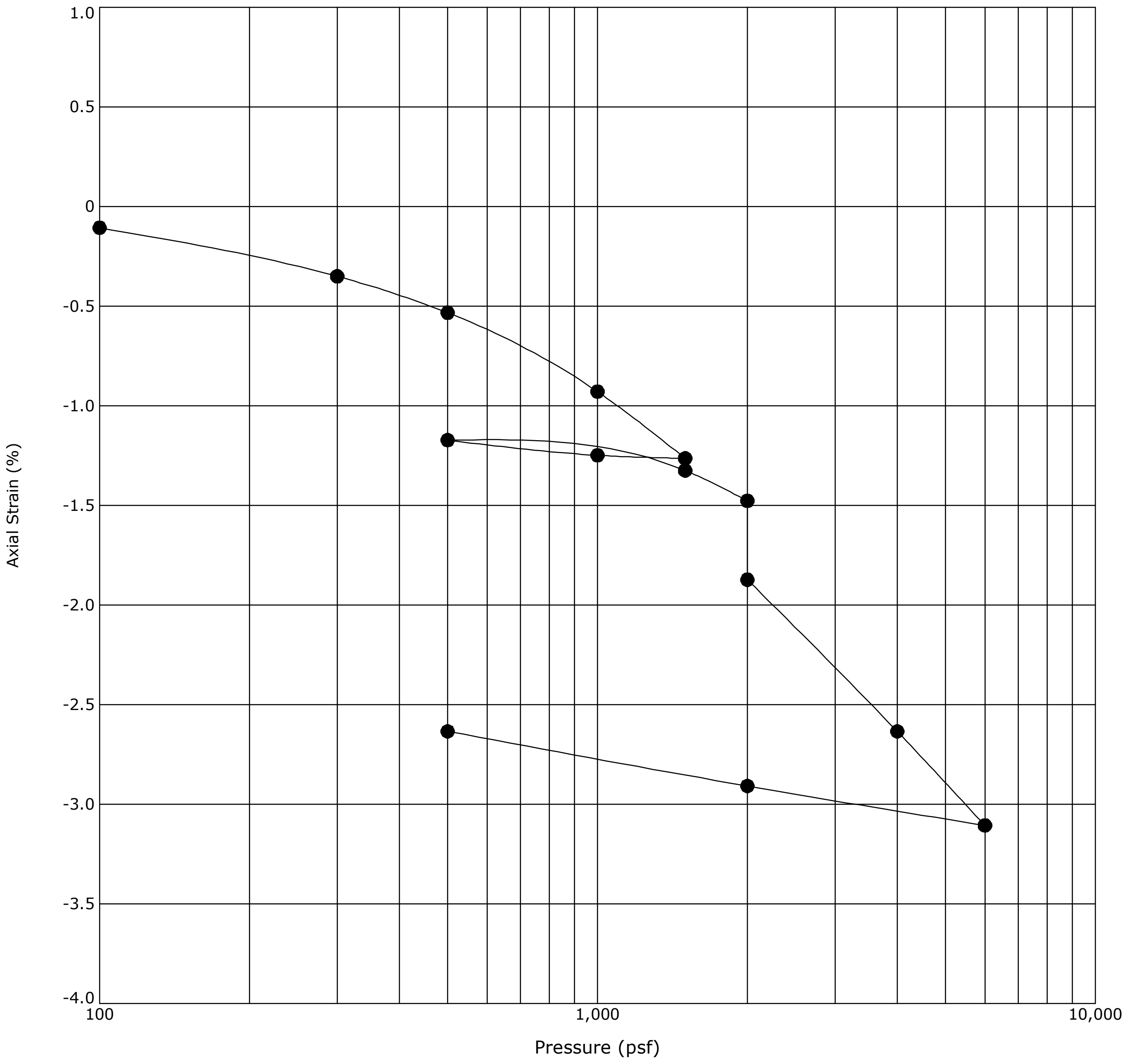
Boring ID	Depth (Ft)	Description	USCS	LL	PL	PI	Cc	Cu
● B-2	2 - 5	SILTY SAND with GRAVEL	SM					

Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-2	2 - 5	12.5	0.626	0.142		0.0	21.7	62.0	16.4		

1355 E Cooley Dr, Ste C
Colton, CA

Swell Consolidation Test

ASTM D2435



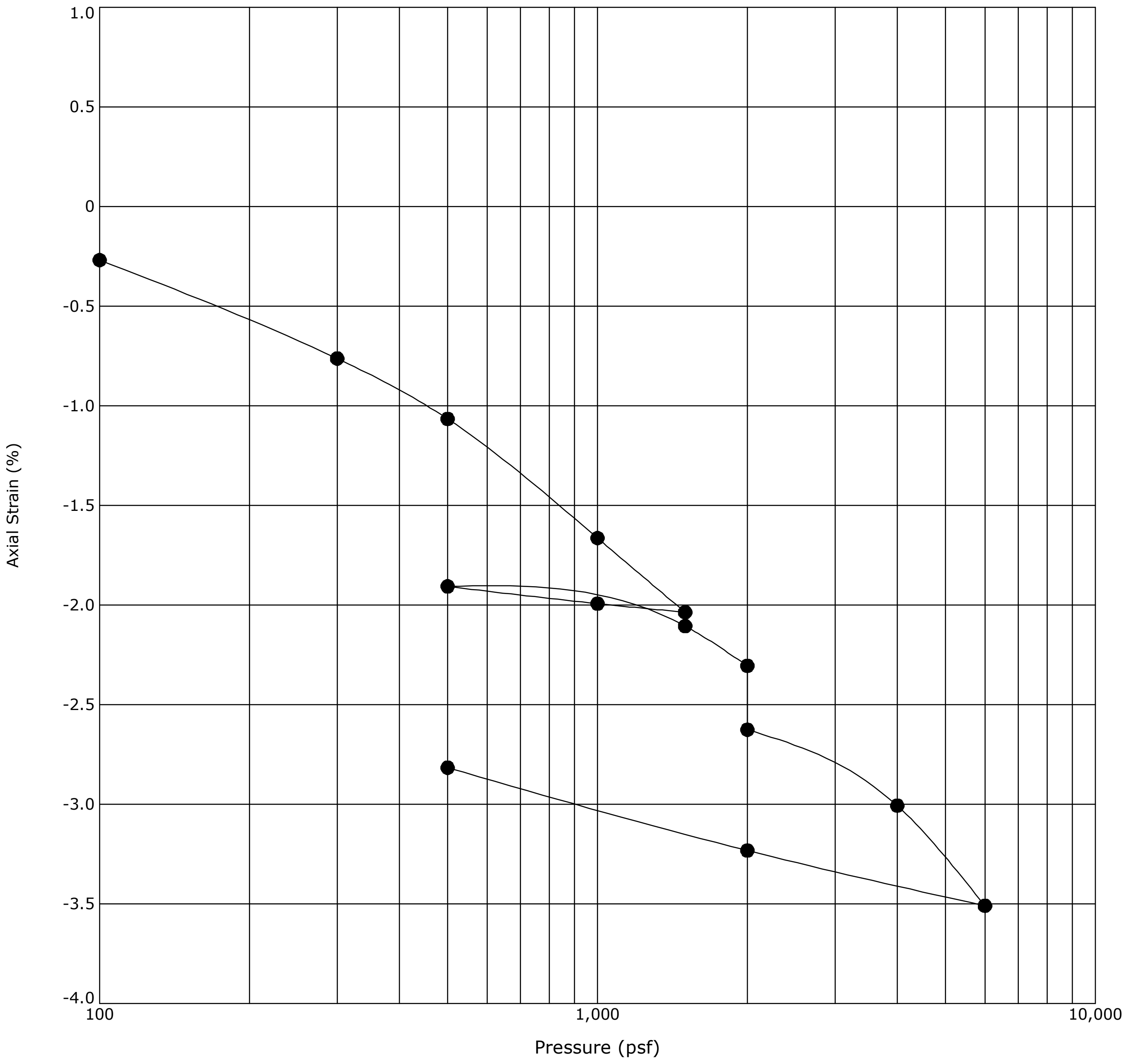
	Boring ID	Depth (Ft)	Description	USCS	γ_d(pcf)	WC (%)
●	B-4	2.5 - 4	SILTY SAND with GRAVEL	SM	115	2.0

Notes: Sample saturated at 2,000 psf

1355 E Cooley Dr, Ste C
Colton, CA

Swell Consolidation Test

ASTM D2435

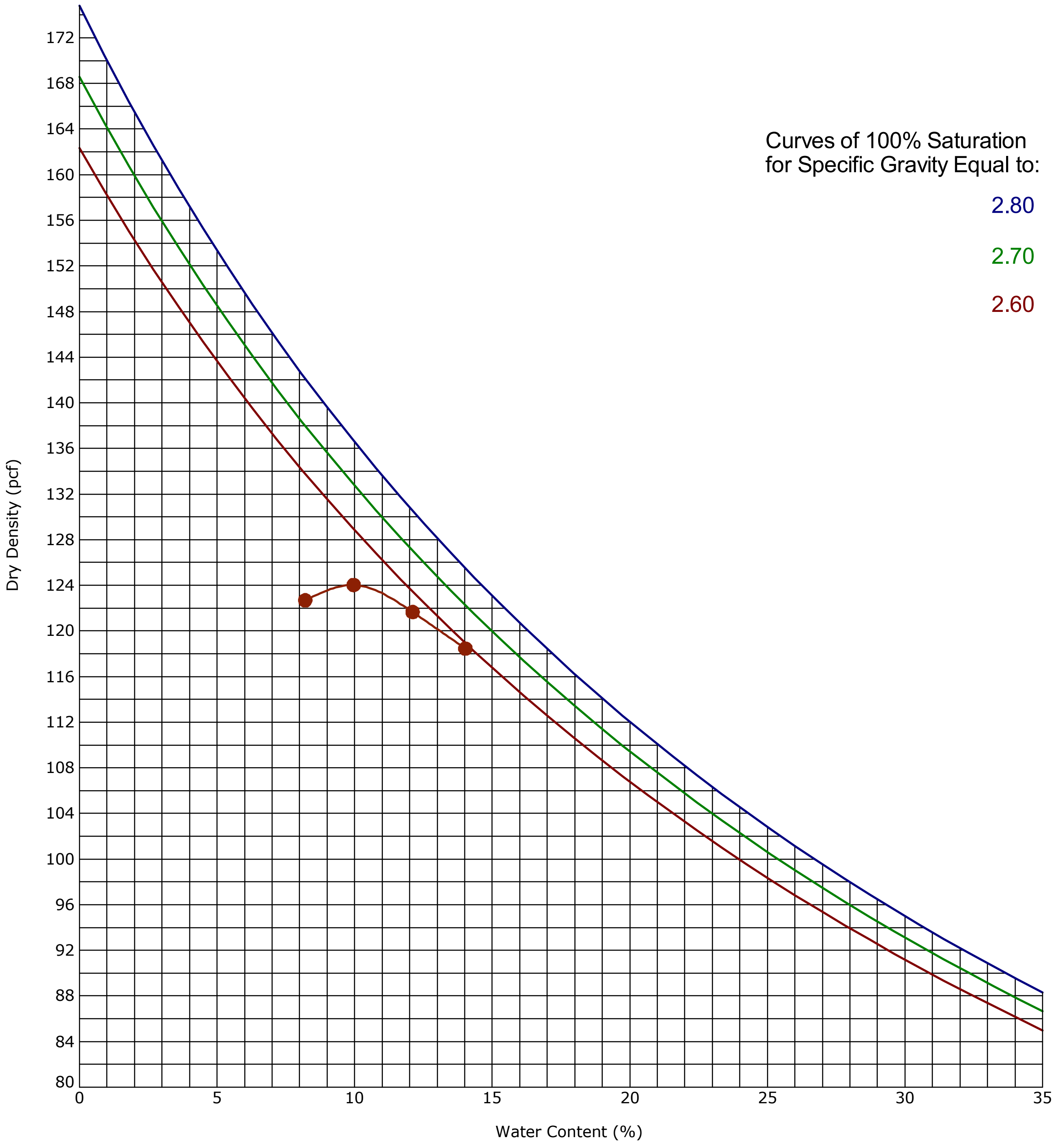


	Boring ID	Depth (Ft)	Description	USCS	γ_d(pcf)	WC (%)
●	B-6	2.5 - 4	SILTY SAND with GRAVEL	SM	116	14.9

Notes: Sample saturated at 2,000 psf

Moisture-Density Relationship

ASTM D698/D1557



Boring ID	Depth (Ft)	Description of Materials
B-2	2 - 5	SILTY SAND with GRAVEL

Fines (%)		LL	PL	PI	Test Method	Maximum Dry Density (pcf)	Optimum Water Content (%)
16					ASTM D1557 Method B	124.0	9.9

750 Pilot Road, Suite F
Las Vegas, Nevada 89119
(702) 597-9393

Client	Project
BNSF Railway Company	Proposed Biodisel Project, BNSF Muscat Yard, Fontana

Sample Submitted By: Terracon (CB) Date Received: 12/6/2022 Lab No.: 22-0815

Results of Corrosion Analysis

Sample Number	2-A
Sample Location	B-2
Sample Depth (ft.)	2.0-5.0
pH Analysis, ASTM G 51	8.03
Water Soluble Sulfate (SO4), ASTM C 1580 (mg/kg)	92
Sulfides, AWWA 4500-S D, (mg/kg)	Nil
Chlorides, ASTM D 512, (mg/kg)	72
Red-Ox, ASTM G 200, (mV)	+735
Total Salts, AWWA 2540, (mg/kg)	117
As-Received Resistivity, ASTM G 57, (ohm-cm)	59170
Resistivity, ASTM G 57, (ohm-cm)	5723

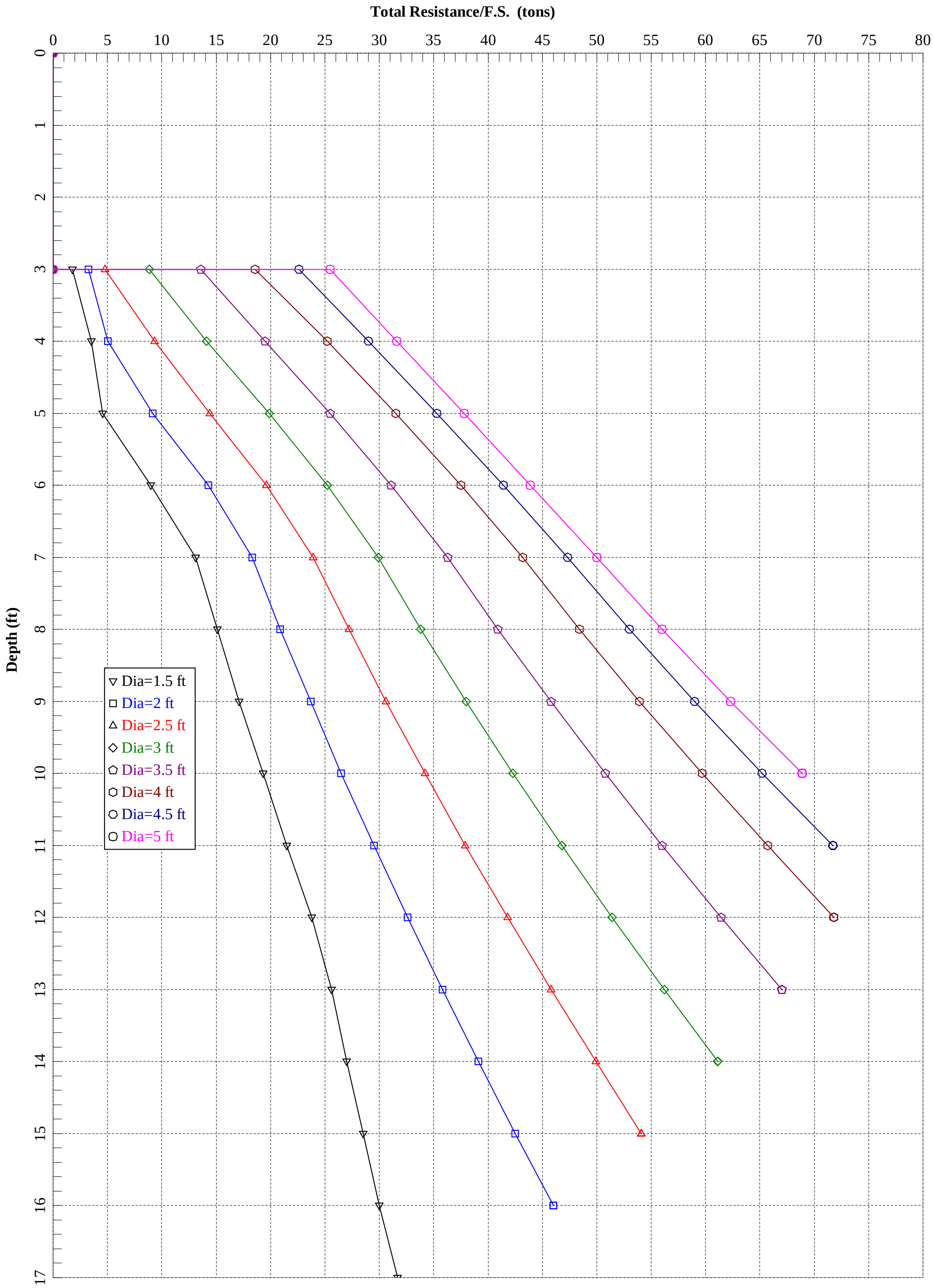
N. Campo

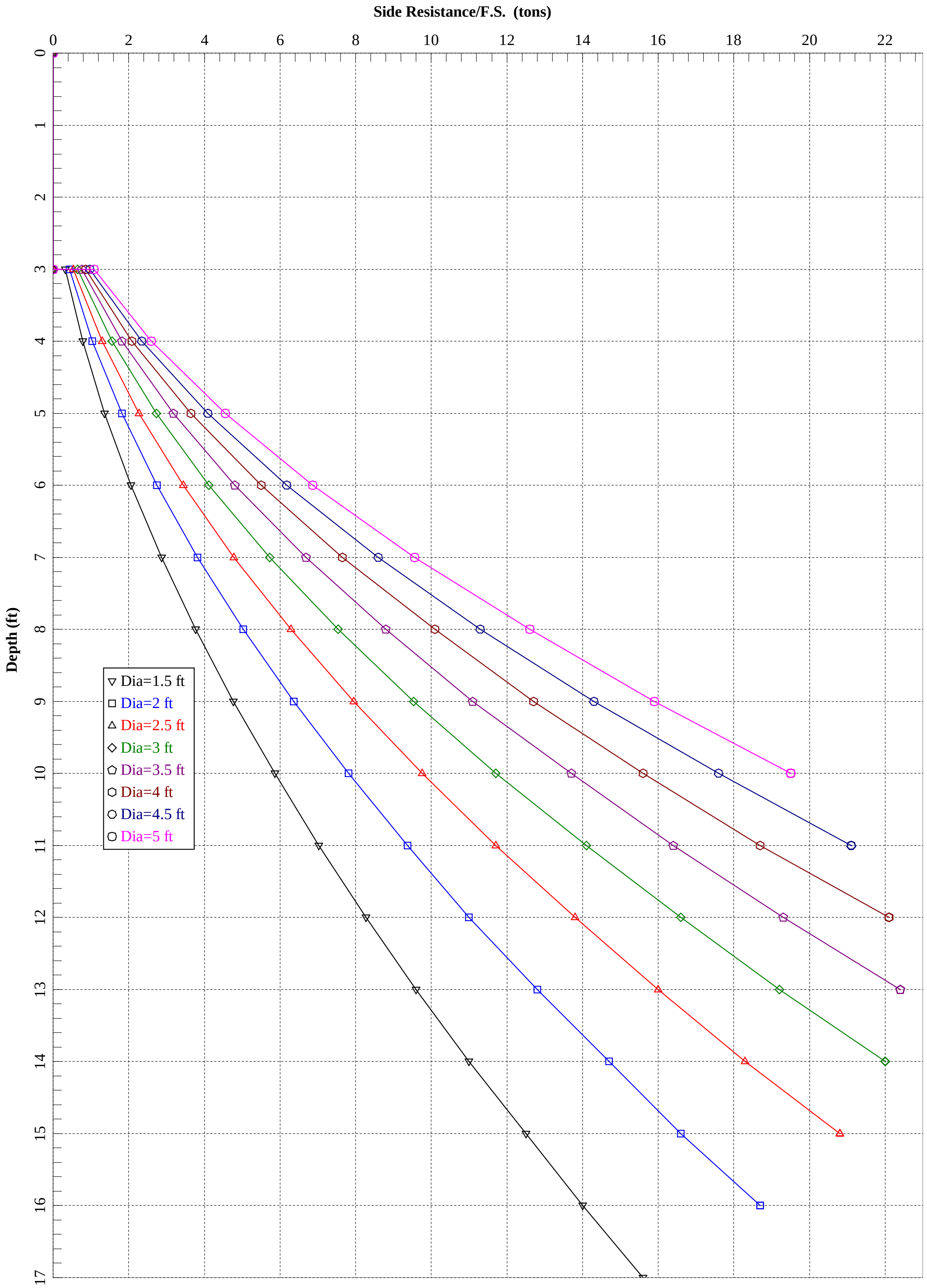
Analyzed By: ____________________
Nathan Campo
Engineering Technician II

Supporting Information

Contents:

Note: All attachments are one page unless noted above.


Total Resistance/F.S. (tons)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
▽ Dia=1.5 ft
□ Dia=2 ft
△ Dia=2.5 ft
◇ Dia=3 ft
⬠ Dia=3.5 ft
⬡ Dia=4 ft
○ Dia=4.5 ft
○ Dia=5 ft



Side Resistance/F.S. (tons)
0
2
4
6
8
10
12
14
16
18
20
22
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
▽ Dia=1.5 ft
□ Dia=2 ft
△ Dia=2.5 ft
◇ Dia=3 ft
⬠ Dia=3.5 ft
⬡ Dia=4 ft
○ Dia=4.5 ft
○ Dia=5 ft

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING

Auger	Shelby Tube	Split Spoon
Rock Core	Macro Core	Modified California Ring Sampler
Grab Sample	No Recovery	Modified Dames & Moore Ring Sampler

WATER LEVEL

- ▽ Water Initially Encountered
- ▽ Water Level After a Specified Period of Time
- ▼ Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	**Hand Penetrometer**
(T)	**Torvane**
(b/f)	**Standard Penetration Test (blows per foot)**
N	**N value**
(PID)	**Photo-Ionization Detector**
(OVA)	**Organic Vapor Analyzer**
(WOH)	Weight of Hammer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.			**CONSISTENCY OF FINE-GRAINED SOILS** (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance			
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength, Qu, psf**	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**
Very Loose	0 - 3	0 - 6	Very Soft	less than 500	0 - 1	< 3
Loose	4 - 9	7 - 18	Soft	500 to 1,000	2 - 4	3 - 4
Medium Dense	10 - 29	19 - 58	Medium-Stiff	1,000 to 2,000	4 - 8	5 - 9
Dense	30 - 50	59 - 98	Stiff	2,000 to 4,000	8 - 15	10 - 18
Very Dense	> 50	≥ 99	Very Stiff	4,000 to 8,000	15 - 30	19 - 42
			Hard	> 8,000	> 30	> 42

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N]
					Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P]
					Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

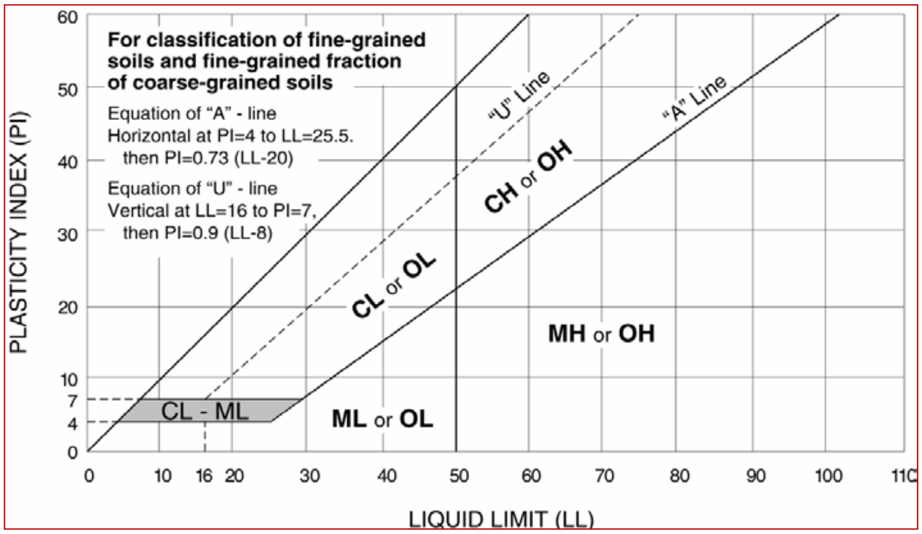
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Appendix 2 –Water Quality Management Plan

Final
Water Quality Management Plan

For:

Bio Fuel Transloading Pad and Containment Pit

8377 SULTANA AVE, FONTANA, CA 92335

APN 0232-051-01

WQMP-2023-00073 | PROJ-2022-00198/CUP | GRAD-2023-00143

Prepared for (Building Owner):

BNSF

740 E Carnegie Dr

San Bernardino, CA 92408

909.386.4020

Building Tenant

Tristar Companies FLC, Inc.

9600 Kaiser Way

Fontana, CA 92335

909.823.3000

Prepared by:

Russell Consulting & Engineering

1750 N Harvard Blvd #109

Los Angeles, CA 90027

310.614.4116

Submittal Date: June 26, 2023

Revision Date: _____

Approval Date:_____________________

Project Owner's Certification

This Water Quality Management Plan (WQMP) has been prepared for BNSF by Russell Consulting & Engineering. The WQMP is intended to comply with the requirements of the County of San Bernardino and the NPDES Areawide Stormwater Program requiring the preparation of a WQMP. The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with San Bernardino County's Municipal Storm Water Management Program and the intent of the NPDES Permit for San Bernardino County and the incorporated cities of San Bernardino County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors in interest and the city/county shall be notified of the transfer. The new owner will be informed of its responsibility under this WQMP. A copy of the approved WQMP shall be available on the subject site in perpetuity.

"I certify under a penalty of law that the provisions (implementation, operation, maintenance, and funding) of the WQMP have been accepted and that the plan will be transferred to future successors."

.

Project Data

Permit/Application Number(s):	WQMP-2023-00073	Grading Permit Number(s):	GRAD-2023-00143
Tract/Parcel Map Number(s):	N/A	Building Permit Number(s):	PROJ-2022-00198/CUP
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN 0232-051-01

Owner's Signature

Owner Name: Jennifer Fitzgerald

Title	Regional Manager of Economic Development, California		
Company	BNSF		
Address	740 E Carnegie Dr, San Bernardino, CA 92408		
Email	jennifer.fitzgerald@bnsf.com		
Telephone #	909.386.4020		
Signature		Date	

Preparer's Certification

Project Data			
Permit/Application Number(s):	WQMP-2023-00073	Grading Permit Number(s):	GRAD-2023-00143
Tract/Parcel Map Number(s):	N/A	Building Permit Number(s):	PROJ-2022-00198/CUP
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN 0232-051-01

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan were prepared under my oversight and meet the requirements of Regional Water Quality Control Board Order No. R8-2010-0036."

Engineer: ROBERT RUSSELL, P.E. C84132		PE Stamp Below REGISTERED PROFESSIONAL ENGINEER ROBERT T RUSSELL No. C-84132 Exp. 09-30-2023 CIVIL STATE OF CALIFORNIA
Title	PRINCIPAL	
Company	RUSSELL CONSULTING & ENGINEER	
Address	1750 N HARVARD BLVD #109	
Email	rob@russellce.com	
Telephone #	310.614.4116	
Signature		
Date		

Table of Contents

Forms

Section 1 Discretionary Permit(s)

Form 1-1 Project Information

<table>
<tr><td colspan="2">Project Name</td><td colspan="4">Bio Fuel Transloading Pad and Containment Pit</td></tr>
<tr><td colspan="2">Project Owner Contact Name:</td><td colspan="4">Jennifer Fitzgerald, BNSF</td></tr>
<tr><td>Mailing Address:</td><td>740 E Carnegie Dr
San Bernardino, CA 92408</td><td>E-mail Address:</td><td>jennifer.fitzgerald@bnsf.com</td><td>Telephone:</td><td>909.386.4020</td></tr>
<tr><td colspan="2">Permit/Application Number(s):</td><td>WQMP-2023-00073</td><td>Tract/Parcel Map Number(s):</td><td colspan="2">N/A</td></tr>
<tr><td colspan="2">Additional Information/ Comments:</td><td colspan="4"></td></tr>
<tr><td colspan="2">Description of Project:</td><td colspan="4">Secondary Containment Fuel catchment system:
Transloading: new 92’ x 68’-8” concrete truck loading containment pad w/pit. Drains to Tank Enclosure.
Bio-Fuel Storage Tank Enclosure: new 455’ x 75’ open air enclosure to hold six 1M gallon storage silo tanks.
Drainage Area:
Transloading: 6,350 sf
Tank Enclosure: 34,830 sf
41,180 sf (100% impervious)
Stormwater runoff will be clarified and pumped out of enclosure via Oil Water Separator and daylight discharge to site.</td></tr>
<tr><td colspan="2">Provide summary of Conceptual WQMP conditions (if previously submitted and approved). Attach complete copy.</td><td colspan="4">Overall project site is being graded and improved under separate permit. Site runoff will be collected in area drains and discharge into underground infiltration system.</td></tr>
</table>

Section 2 Project Description

2.1 Project Information

This section of the WQMP should provide the information listed below. The information provided for Conceptual/ Preliminary WQMP should give sufficient detail to identify the major proposed site design and LID BMPs and other anticipated water quality features that impact site planning. Final Project WQMP must specifically identify all BMP incorporated into the final site design and provide other detailed information as described herein.

The purpose of this information is to help determine the applicable development category, pollutants of concern, watershed description, and long term maintenance responsibilities for the project, and any applicable water quality credits. This information will be used in conjunction with the information in Section 3, Site Description, to establish the performance criteria and to select the LID BMP or other BMP for the project or other alternative programs that the project will participate in, which are described in Section 4.

Form 2.1-1 Description of Proposed Project

1 Development Category (Select all that apply):

☒ Significant re-development involving the addition or replacement of 5,000 ft² or more of impervious surface on an already developed site	☐ New development involving the creation of 10,000 ft² or more of impervious surface collectively over entire site	☐ Automotive repair shops with standard industrial classification (SIC) codes 5013, 5014, 5541, 7532- 7534, 7536-7539	☐ Restaurants (with SIC code 5812) where the land area of development is 5,000 ft² or more
☐ Hillside developments of 5,000 ft² or more which are located on areas with known erosive soil conditions or where the natural slope is 25 percent or more	☐ Developments of 2,500 ft² of impervious surface or more adjacent to (within 200 ft) or discharging directly into environmentally sensitive areas or waterbodies listed on the CWA Section 303(d) list of impaired waters.	☐ Parking lots of 5,000 ft² or more exposed to storm water	☐ Retail gasoline outlets that are either 5,000 ft² or more, or have a projected average daily traffic of 100 or more vehicles per day

☐ Non-Priority / Non-Category Project *May require source control LID BMPs and other LIP requirements. Please consult with local jurisdiction on specific requirements*.

2 Project Area (ft2):	41,180	3 Number of Dwelling Units:	N/A	4 SIC Code:	4214 - Local Trucking With Storage

5 Is Project going to be phased? Yes ☐ No ☒ *If yes, ensure that the WQMP evaluates each phase as a distinct DA, requiring LID BMPs to address runoff at time of completion.*

6 Does Project include roads? Yes ☐ No ☒ *If yes, ensure that applicable requirements for transportation projects are addressed (see Appendix A of TGD for WQMP)*

2.2 Property Ownership/Management

Describe the ownership/management of all portions of the project and site. State whether any infrastructure will transfer to public agencies (City, County, Caltrans, etc.) after project completion. State if a homeowners or property owners association will be formed and be responsible for the long-term maintenance of project stormwater facilities. Describe any lot-level stormwater features that will be the responsibility of individual property owners.

Form 2.2-1 Property Ownership/Management

Describe property ownership/management responsible for long-term maintenance of WQMP stormwater facilities:

All improvements will be on-site. Installation, operation, and long term maintenance of the WQMP facilities will be the responsibility of the Owner and/or Tenant:

Building Owner
BNSF
740 E Carnegie Dr
San Bernardino, CA 92408
909.386.4020
Contact: Jennifer Fitzgerald

Building Tenant
Tristar Companies FLC, Inc.
9600 Kaiser Way
Fontana, CA 92335
812.424.1239
Contact: Barry Love

2.3 Potential Stormwater Pollutants

Determine and describe expected stormwater pollutants of concern based on land uses and site activities (refer to Table 3-3 in the TGD for WQMP).

Form 2.3-1 Pollutants of Concern

Pollutant	Please check: E=Expected, N=Not Expected		Additional Information and Comments
Pathogens (Bacterial / Virus)	E ☒	N ☐	
Nutrients - Phosphorous	E ☐	N ☒	no landscaping
Nutrients - Nitrogen	E ☐	N ☒	no landscaping
Noxious Aquatic Plants	E ☐	N ☒	no landscaping
Sediment	E ☒	N ☐	gravel / CMB within disturbed area
Metals	E ☒	N ☐	
Oil and Grease	E ☒	N ☐	
Trash/Debris	E ☒	N ☐	
Pesticides / Herbicides	E ☒	N ☐	
Organic Compounds	E ☒	N ☐	including solvents
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	

2.4 Water Quality Credits

A water quality credit program is applicable for certain types of development projects if it is not feasible to meet the requirements for on-site LID. Proponents for eligible projects, as described below, can apply for water quality credits that would reduce project obligations for selecting and sizing other treatment BMP or participating in other alternative compliance programs. Refer to Section 6.2 in the TGD for WQMP to determine if water quality credits are applicable for the project.

<table>
<tr><th colspan="4">Form 2.4-1 Water Quality Credits</th></tr>
<tr><td colspan="4">1 Project Types that Qualify for Water Quality Credits: *Select all that apply*</td></tr>
<tr><td>☐ Redevelopment projects that reduce the overall impervious footprint of the project site. [Credit = % impervious reduced]</td><td>Higher density development projects
☐Vertical density [20%]
☐7 units/ acre [5%]</td><td>☐ Mixed use development, (combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that demonstrate environmental benefits not realized through single use projects) [20%]</td><td>☐Brownfield redevelopment (redevelop real property complicated by presence or potential of hazardous contaminants) [25%]</td></tr>
<tr><td>☐ Redevelopment projects in established historic district, historic preservation area, or similar significant core city center areas [10%]</td><td>☐ Transit-oriented developments (mixed use residential or commercial area designed to maximize access to public transportation) [20%]</td><td>☐ In-fill projects (conversion of empty lots & other underused spaces < 5 acres, substantially surrounded by urban land uses, into more beneficially used spaces, such as residential or commercial areas) [10%]</td><td>☐ Live-Work developments (variety of developments designed to support residential and vocational needs) [20%]</td></tr>
<tr><td colspan="4">2 Total Credit % 0 *(Total all credit percentages up to a maximum allowable credit of 50 percent)*</td></tr>
<tr><td>Description of Water Quality Credit Eligibility (if applicable)</td><td colspan="3">N/A</td></tr>
</table>

Section 3 Site and Watershed Description

Describe the project site conditions that will facilitate the selection of BMP through an analysis of the physical conditions and limitations of the site and its receiving waters. Identify distinct drainage areas (DA) that collect flow from a portion of the site and describe how runoff from each DA (and sub-watershed DMAs) is conveyed to the site outlet(s). Refer to Section 3.2 in the TGD for WQMP. The form below is provided as an example. Then complete Forms 3.2 and 3.3 for each DA on the project site. ***If the project has more than one drainage area for stormwater management, then complete additional versions of these forms for each DA / outlet.***

Form 3-1 Site Location and Hydrologic Features

Site coordinates *take GPS measurement at approximate center of site*	Latitude 34.1048 N	Longitude -117.4653 W	Thomas Bros Map page

[1] San Bernardino County climatic region: ☒ Valley ☐ Mountain

[2] Does the site have more than one drainage area (DA): Yes☐ No☒ *If no, proceed to Form 3-2. If yes, then use this form to show a conceptual schematic describing DMAs and hydrologic feature connecting DMAs to the site outlet(s). An example is provided below that can be modified for proposed project or a drawing clearly showing DMA and flow routing may be attached*

Conveyance	Briefly describe on-site drainage features to convey runoff that is not retained within a DMA
DA1 DMA A to Outlet 1	Runoff from impervious improvements retained in proposed pit, treated and pumped to site with an oil & water separator. Treated discharge flows to buried infiltration system (under separate permit)

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 1

For Drainage Area 1's sub-watershed DMA, provide the following characteristics	DMA A	DMA B	DMA C	DMA D
1 DMA drainage area (ft²)	41,180 sf			
2 Existing site impervious area (ft²)	0%			
3 Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	AMC II			
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*	A			
5 Longest flowpath length (ft)	580 ft			
6 Longest flowpath slope (ft/ft)	1.0%			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Gravel / CMB			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	poor			

Form 3-3 Watershed Description for Drainage Area

Receiving waters *Refer to Watershed Mapping Tool -* *http://permitrack.sbcounty.gov/wap/* *See 'Drainage Facilities" link at this website*	Etiwanda/San Sevaine Channel, Santa Ana River Reach 3, Prado Basin, Santa Ana River Reach 2, Santa Ana River Reach 1, Pacific Ocean
Applicable TMDLs *Refer to Local Implementation Plan*	Pathogens (SAR Reach 3)
303(d) listed impairments *Refer to Local Implementation Plan and Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/ and State Water Resources Control Board website – http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/index.shtml*	Copper, Lead, Pathogens (SAR Reach 3), Indicator Bacteria (SAR Reach 2)
Environmentally Sensitive Areas (ESA) *Refer to Watershed Mapping Tool –* *http://permitrack.sbcounty.gov/wap/*	None
Unlined Downstream Water Bodies *Refer to Watershed Mapping Tool –* *http://permitrack.sbcounty.gov/wap/*	None
Hydrologic Conditions of Concern	☐ Yes *Complete Hydrologic Conditions of Concern (HCOC) Assessment. Include Forms 4.2-2 through Form 4.2-5 and Hydromodification BMP Form 4.3-10 in submittal* ☒ No
Watershed–based BMP included in a RWQCB approved WAP	☐ Yes *Attach verification of regional BMP evaluation criteria in WAP* • *More Effective than On-site LID* • *Remaining Capacity for Project DCV* • *Upstream of any Water of the US* • *Operational at Project Completion* • *Long-Term Maintenance Plan* ☒ No

Section 4 Best Management Practices (BMP)

4.1 Source Control BMP

4.1.1 Pollution Prevention

Non-structural and structural source control BMP are required to be incorporated into all new development and significant redevelopment projects. Form 4.1-1 and 4.1-2 are used to describe specific source control BMPs used in the WQMP or to explain why a certain BMP is not applicable. Table 7-3 of the TGD for WQMP provides a list of applicable source control BMP for projects with specific types of potential pollutant sources or activities. The source control BMP in this table must be implemented for projects with these specific types of potential pollutant sources or activities.

The preparers of this WQMP have reviewed the source control BMP requirements for new development and significant redevelopment projects. The preparers have also reviewed the specific BMP required for project as specified in Forms 4.1-1 and 4.1-2. All applicable non-structural and structural source control BMP shall be implemented in the project.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N1	Education of Property Owners, Tenants and Occupants on Stormwater BMPs	☒	☐	General information will be provided to tenants on housekeeping practices that contribute to the protection of storm water.
N2	Activity Restrictions	☐	☒	Activity restrictions not required based on project scope and proposed BMPs.
N3	Landscape Management BMPs	☐	☒	No landscaping proposed
N4	BMP Maintenance	☒	☐	Building operator shall prepare and implement a BMP maintenance program in accordance with the recommendations of the approved WQMP.
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	Not Applicable, Title 22 is Medical Waste
N6	Local Water Quality Ordinances	☒	☐	Project will be in compliance of all local water quality ordinances through implementation of this WQMP
N7	Spill Contingency Plan	☒	☐	Building operator shall prepare a project specific spill contingency plan. Plan shall mandate stock piling of cleanup materials, notification of agencies, disposal, documentation, etc.
N8	Underground Storage Tank Compliance	☐	☒	No underground storage tanks.
N9	Hazardous Materials Disclosure Compliance	☒	☐	Project will be in compliance with San Bernardino County Fire Department Hazardous Materials Division requirements

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N10	Uniform Fire Code Implementation	☒	☐	Project reviewed and approved by SB County Fire Department.
N11	Litter/Debris Control Program	☒	☐	Building operator shall prepare and implement employee training program to include, but not limited to: instruction on spill clean-up, litter control, material storage, transfer, and disposal.
N12	Employee Training	☒	☐	Building operator shall prepare and implement employee training program to cover all tenant responsibilies covered in approved WQMP. Training shall occur within 3 months of new hires and annually thereafter.
N13	Housekeeping of Loading Docks	☐	☒	Project does not include loading docks.
N14	Catch Basin Inspection Program	☒	☐	Building operator shall inspect and clean the drop inlet catch basins annually prior to commencement of rainy season (October 1st).
N15	Vacuum Sweeping of Private Streets and Parking Lots	☐	☒	Project does not included private streets or parking lots.
N16	Other Non-structural Measures for Public Agency Projects	☐	☒	Project does not include Public Agency Project.
N17	Comply with all other applicable NPDES permits	☒	☐	Project limits within larger project with SWPPP filed with CASQA

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S1	Provide storm drain system stencilling and signage (CASQA New Development BMP Handbook SD-13)	☒	☐	Provide "NO DUMPING - DRAINS TO RIVER" stencil for each new inlet per CASQA SD-13 requirements. Stencil shall be inspected annually and re-applied as necessary to ensure legibility.
S2	Design and construct outdoor material storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-34)	☐	☒	No outdoor material storage areas proposed.
S3	Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	☐	☒	No new trash and waste storage (existing building has system in place)
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control (Statewide Model Landscape Ordinance; CASQA New Development BMP Handbook SD-12)	☐	☒	No new landscape or irrigation proposed.
S5	Finish grade of landscaped areas at a minimum of 1-2 inches below top of curb, sidewalk, or pavement	☐	☒	No landscaping proposed
S6	Protect slopes and channels and provide energy dissipation (CASQA New Development BMP Handbook SD-10)	☐	☒	No proposed landscape slopes or channels
S7	Covered dock areas (CASQA New Development BMP Handbook SD-31)	☐	☒	Runoff from surrounding areas outside of proposed improvements will be diverted to the natural drainge course via graded swales. Discharge from project WQMP BMP will spill to grade on energy dissapating rip-rap.
S8	Covered maintenance bays with spill containment plans (CASQA New Development BMP Handbook SD-31)	☐	☒	No proposed maintenance bays
S9	Vehicle wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	No proposed vehicle wash areas.

S10	Covered outdoor processing areas (CASQA New Development BMP Handbook SD-36)	☐	☒	No outdoor processing proposed as outlined in SD-36.

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S11	Equipment wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	No equipment wash area
S12	Fueling areas (CASQA New Development BMP Handbook SD-30)	☐	☒	No fueling areas as outlined in SD-30
S13	Hillside landscaping (CASQA New Development BMP Handbook SD-10)	☐	☒	No hillside landscaping.
S14	Wash water control for food preparation areas	☐	☒	No food preparation areas.
S15	Community car wash racks (CASQA New Development BMP Handbook SD-33)	☐	☒	No car wash.

4.1.2 Preventative LID Site Design Practices

Site design practices associated with new LID requirements in the MS4 Permit should be considered in the earliest phases of a project. Preventative site design practices can result in smaller DCV for LID BMP and hydromodification control BMP by reducing runoff generation. Describe site design and drainage plan including:

- A narrative of site design practices utilized or rationale for not using practices
- A narrative of how site plan incorporates preventive site design practices
- Include an attached Site Plan layout which shows how preventative site design practices are included in WQMP

Refer to Section 5.2 of the TGD for WQMP for more details.

Form 4.1-3 Preventative LID Site Design Practices Checklist

Site Design Practices
If yes, explain how preventative site design practice is addressed in project site plan. If no, other LID BMPs must be selected to meet targets

Minimize impervious areas: Yes ☐ No ☒
Explanation: Propsoed improvements are secondary containment for fuel transfer oprations. Improvements are 100% impervious by design.

Maximize natural infiltration capacity: Yes ☒ No ☐
Explanation: All runoff generated by proposed improvements will be captured and treated via Oil & Water Separator (OWS). The clarified runoff will be pumped out of the pit/enclosure to the site and discharge into buried infiltration system (under separate permit)

Preserve existing drainage patterns and time of concentration: Yes ☐ No ☒
Explanation: Overall site is being re-graded for railway design (under separate permit), drainage collected and conveyed to buried infiltration system.

Disconnect impervious areas: Yes ☐ No ☒
Explanation: Entire project is being paved.

Protect existing vegetation and sensitive areas: Yes ☐ No ☒
Explanation: No disturbed vegetation or sensitive areas.

Re-vegetate disturbed areas: Yes ☐ No ☒
Explanation: No disturbed vegetation.

Minimize unnecessary compaction in stormwater retention/infiltration basin/trench areas: Yes ☐ No ☒
Explanation: Project scope not adjacent to proposed buried infiltration system.

Utilize vegetated drainage swales in place of underground piping or imperviously lined swales: Yes ☐ No ☒
Explanation: Project scope does not impact existing drainage swale or underground piping.

Stake off areas that will be used for landscaping to minimize compaction during construction : Yes ☐ No ☒
Explanation: No proposed landscaping.

4.2 Project Performance Criteria

The purpose of this section of the Project WQMP is to establish targets for post-development hydrology based on performance criteria specified in the MS4 Permit. These targets include runoff volume for water quality control (referred to as LID design capture volume), and runoff volume, time of concentration, and peak runoff for protection of any downstream waterbody segments with a HCOC. ***If the project has more than one outlet for stormwater runoff, then complete additional versions of these forms for each DA / outlet.***

Methods applied in the following forms include:

- For LID BMP Design Capture Volume (DCV), the San Bernardino County Stormwater Program requires use of the P_6 method (MS4 Permit Section XI.D.6a.ii) – Form 4.2-1
- For HCOC pre- and post-development hydrologic calculation, the San Bernardino County Stormwater Program requires the use of the Rational Method (San Bernardino County Hydrology Manual Section D). Forms 4.2-2 through Form 4.2-5 calculate hydrologic variables including runoff volume, time of concentration, and peak runoff from the project site pre- and post-development using the Hydrology Manual Rational Method approach. For projects greater than 640 acres (1.0 mi^2), the Rational Method and these forms should not be used. For such projects, the Unit Hydrograph Method (San Bernardino County Hydrology Manual Section E) shall be applied for hydrologic calculations for HCOC performance criteria.

Refer to Section 4 in the TGD for WQMP for detailed guidance and instructions.

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 1)

1 Project area DA 1 (ft^2): 41,180	2 Imperviousness after applying preventative site design practices (Imp%): 100	3 Runoff Coefficient (Rc): _0.892 *$R_c = 0.858(Imp\%)^{\wedge 3}-0.78(Imp\%)^{\wedge 2}+0.774(Imp\%)+0.04$*

4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr-1hr}$ (in): 0.524 [*http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*](http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html)

5 Compute P_6, Mean 6-hr Precipitation (inches): 0.776

*P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*

6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*	24-hrs ☐ 48-hrs ☒

7 Compute design capture volume, DCV (ft^3): 4,662

*DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)*
Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2

Form 4.2-2 Summary of HCOC Assessment (DA 1)

Does project have the potential to cause or contribute to an HCOC in a downstream channel: Yes ☐ No ☒

Go to: *http://permitrack.sbcounty.gov/wap/*

If "Yes", then complete HCOC assessment of site hydrology for 2yr storm event using Forms 4.2-3 through 4.2-5 and insert results below *(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual)*

If "No," then proceed to Section 4.3 Project Conformance Analysis

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** *Form 4.2-3 Item 12*	**2** *Form 4.2-4 Item 13*	**3** *Form 4.2-5 Item 10*
Post-developed	**4** *Form 4.2-3 Item 13*	**5** *Form 4.2-4 Item 14*	**6** *Form 4.2-5 Item 14*
Difference	**7** *Item 4 – Item 1*	**8** *Item 2 – Item 5*	**9** *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** *%* *Item 7 / Item 1*	**11** *%* *Item 8 / Item 2*	**12** *%* *Item 9 / Item 3*

Form 4.2-3 HCOC Assessment for Runoff Volume (DA 1)

Weighted Curve Number Determination for: <u>Pre</u>-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type								
2a Hydrologic Soil Group (HSG)								
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*								
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*								
Weighted Curve Number Determination for: <u>Post</u>-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type								
2b Hydrologic Soil Group (HSG)								
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*								
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*								

5 Pre-Developed area-weighted CN:	**7** Pre-developed soil storage capacity, S (in): *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN:	**8** Post-developed soil storage capacity, S (in): *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): *I_a = 0.2 * Item 8*

11 Precipitation for 2 yr, 24 hr storm (in):
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3):
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3):
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet HCOC Requirement, (ft^3):
*V_{HCOC} = (Item 13 * 0.95) – Item 12*

Form 4.2-4 HCOC Assessment for Time of Concentration (DA 1)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*								
2 Change in elevation (ft)								
3 Slope (ft/ft), S_o *= Item 2 / Item 1*								
4 Land cover								
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*								
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*								
7 Cross-sectional area of channel (ft^2)								
8 Wetted perimeter of channel (ft)								
9 Manning's roughness of channel (n)								
10 Channel flow velocity (ft/sec) V_{fps} *= (1.49 / Item 9) * (Item 7/Item 8)*$^{\wedge 0.67}$ ** (Item 3)*$^{\wedge 0.5}$								
11 Travel time to outlet (min) T_t *= Item 6 / (Item 10 * 60)*								
12 Total time of concentration (min) T_c *= Item 5 + Item 11*								

13 Pre-developed time of concentration (min): *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet HCOC requirement (min): T_{C-HCOC} *= (Item 13 * 0.95) – Item 14*

Form 4.2-5 HCOC Assessment for Peak Runoff (DA 1)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.6 LOG Form 4.2-4 Item 5 /60)*							
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*							
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*							
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	9 Pre-developed Q_p at T_c for DMA B: *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	10 Pre-developed Q_p at T_c for DMA C: *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*
10 Peak runoff from pre-developed condition confluence analysis (cfs): *Maximum of Item 8, 9, and 10 (including additional forms as needed)*		
11 Post-developed Q_p at T_c for DMA A: *Same as Item 8 for post-developed values*	12 Post-developed Q_p at T_c for DMA B: *Same as Item 9 for post-developed values*	13 Post-developed Q_p at T_c for DMA C: *Same as Item 10 for post-developed values*
14 Peak runoff from post-developed condition confluence analysis (cfs): *Maximum of Item 11, 12, and 13 (including additional forms as needed)*		
15 Peak runoff reduction needed to meet HCOC Requirement (cfs): *Q_{p-HCOC} = (Item 14 * 0.95) – Item 10*		

4.3 Project Conformance Analysis

Complete the following forms for each project site DA to document that the proposed LID BMPs conform to the project DCV developed to meet performance criteria specified in the MS4 Permit (WQMP Template Section 4.2). For the LID DCV, the forms are ordered according to hierarchy of BMP selection as required by the MS4 Permit (see Section 5.3.1 in the TGD for WQMP). The forms compute the following for on-site LID BMP:

- Site Design and Hydrologic Source Controls (Form 4.3-2)
- Retention and Infiltration (Form 4.3-3)
- Harvested and Use (Form 4.3-4) or
- Biotreatment (Form 4.3-5).

At the end of each form, additional fields facilitate the determination of the extent of mitigation provided by the specific BMP category, allowing for use of the next category of BMP in the hierarchy, if necessary.

The first step in the analysis, using Section 5.3.2.1 of the TGD for WQMP, is to complete Forms 4.3-1 and 4.3-3) to determine if retention and infiltration BMPs are infeasible for the project. For each feasibility criterion in Form 4.3-1, if the answer is "Yes," provide all study findings that includes relevant calculations, maps, data sources, etc. used to make the determination of infeasibility.

Next, complete Forms 4.3-2 and 4.3-4 to determine the feasibility of applicable HSC and harvest and use BMPs, and, if their implementation is feasible, the extent of mitigation of the DCV.

If no site constraints exist that would limit the type of BMP to be implemented in a DA, evaluate the use of combinations of LID BMPs, including all applicable HSC BMPs to maximize on-site retention of the DCV. If no combination of BMP can mitigate the entire DCV, implement the single BMP type, or combination of BMP types, that maximizes on-site retention of the DCV within the minimum effective area.

If the combination of LID HSC, retention and infiltration, and harvest and use BMPs are unable to mitigate the entire DCV, then biotreatment BMPs may be implemented by the project proponent. If biotreatment BMPs are used, then they must be sized to provide sufficient capacity for effective treatment of the remainder of the volume-based performance criteria that cannot be achieved with LID BMPs (TGD for WQMP Section 5.4.4.2). **Under no circumstances shall any portion of the DCV be released from the site without effective mitigation and/or treatment**.

Form 4.3-1 Infiltration BMP Feasibility (DA 1)

Feasibility Criterion – Complete evaluation for each DA on the Project Site

[1] Would infiltration BMP pose significant risk for groundwater related concerns? Yes ☐ No ☒
Refer to Section 5.3.2.1 of the TGD for WQMP

If Yes, Provide basis: (attach)

[2] Would installation of infiltration BMP significantly increase the risk of geotechnical hazards? Yes ☐ No ☒
(Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert):

- The location is less than 50 feet away from slopes steeper than 15 percent
- The location is less than eight feet from building foundations or an alternative setback.
- A study certified by a geotechnical professional or an available watershed study determines that stormwater infiltration would result in significantly increased risks of geotechnical hazards.

If Yes, Provide basis: (attach)

[3] Would infiltration of runoff on a Project site violate downstream water rights? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[4] Is proposed infiltration facility located on hydrologic soil group (HSG) D soils or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[5] Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[6] Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WAP, or impair beneficial uses? Yes ☐ No ☒
See Section 3.5 of the TGD for WQMP and WAP

If Yes, Provide basis: (attach)

[7] Any answer from Item 1 through Item 3 is "Yes": Yes ☐ No ☒
If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Harvest and Use BMP. If no, then proceed to Item 8 below.

[8] Any answer from Item 4 through Item 6 is "Yes": Yes ☐ No ☒
If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Hydrologic Source Control BMP.
If no, then proceed to Item 9, below.

[9] All answers to Item 1 through Item 6 are "No":
Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP.
Proceed to Form 4.3-2, Hydrologic Source Control BMP.

4.3.1 Site Design Hydrologic Source Control BMP

Section XI.E. of the Permit emphasizes the use of LID preventative measures; and the use of LID HSC BMPs reduces the portion of the DCV that must be addressed in downstream BMPs. Therefore, all applicable HSC shall be provided except where they are mutually exclusive with each other, or with other BMPs. Mutual exclusivity may result from overlapping BMP footprints such that either would be potentially feasible by itself, but both could not be implemented. Please note that while there are no numeric standards regarding the use of HSC, if a project cannot feasibly meet BMP sizing requirements or cannot fully address HCOCs, feasibility of all applicable HSC must be part of demonstrating that the BMP system has been designed to retain the maximum feasible portion of the DCV. Complete Form 4.3-2 to identify and calculate estimated retention volume from implementing site design HSC BMP. Refer to Section 5.4.1 in the TGD for more detailed guidance.

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA 1)

1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☐ No ☒ _If yes, complete Items 2-5; If no, proceed to Item 6_	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type _(Use additional forms for more BMPs)_
2 Total impervious area draining to pervious area (ft^2)			
3 Ratio of pervious area receiving runoff to impervious area			
4 Retention volume achieved from impervious area dispersion (ft^3) _V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff_			
5 Sum of retention volume achieved from impervious area dispersion (ft^3):		$V_{retention}$ _=Sum of Item 4 for all BMPs_	
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): Yes ☐ No ☒ _If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14_	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type _(Use additional forms for more BMPs)_
7 Ponding surface area (ft^2)			
8 Ponding depth (ft)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft)			
11 Average porosity of amended soil/gravel			
12 Retention volume achieved from on-lot infiltration (ft^3) $V_{retention}$ _= (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)_			
13 Runoff volume retention from on-lot infiltration (ft^3): N/A	$V_{retention}$ _=Sum of Item 12 for all BMPs_		

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA 1)

Form 4.3-2 cont. Site Design Hydrologic Source Control BMPs (DA 1)

14 Implementation of evapotranspiration BMP (green, brown, or blue roofs): Yes ☐ No ☒ *If yes, complete Items 15-20. If no, proceed to Item 21*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
15 Rooftop area planned for ET BMP (ft^2)			
16 Average wet season ET demand (in/day) *Use local values, typical ~ 0.1*			
17 Daily ET demand (ft^3/day) *Item 15 * (Item 16 / 12)*			
18 Drawdown time (hrs) *Copy Item 6 in Form 4.2-1*			
19 Retention Volume (ft^3) $V_{retention}$ *= Item 17 * (Item 18 / 24)*			
20 Runoff volume retention from evapotranspiration BMPs (ft^3): $V_{retention}$ *=Sum of Item 19 for all BMPs*			
21 Implementation of Street Trees: Yes ☐ No ☒ *If yes, complete Items 22-25. If no, proceed to Item 26*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
22 Number of Street Trees			
23 Average canopy cover over impervious area (ft^2)			
24 Runoff volume retention from street trees (ft^3) $V_{retention}$ *= Item 22 * Item 23 * (0.05/12) assume runoff retention of 0.05 inches*			
25 Runoff volume retention from street tree BMPs (ft^3): $V_{retention}$ *= Sum of Item 24 for all BMPs*			
26 Implementation of residential rain barrel/cisterns: Yes ☐ No ☒ *If yes, complete Items 27-29; If no, proceed to Item 30*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
27 Number of rain barrels/cisterns			
28 Runoff volume retention from rain barrels/cisterns (ft^3) $V_{retention}$ *= Item 27 * 3*			
29 Runoff volume retention from residential rain barrels/Cisterns (ft3): $V_{retention}$ *=Sum of Item 28 for all BMPs*			
30 Total Retention Volume from Site Design Hydrologic Source Control BMPs: N/A *Sum of Items 5, 13, 20, 25 and 29*			

4.3.2 Infiltration BMPs

Use Form 4.3-3 to compute on-site retention of runoff from proposed retention and infiltration BMPs. Volume retention estimates are sensitive to the percolation rate used, which determines the amount of runoff that can be infiltrated within the specified drawdown time. The infiltration safety factor reduces field measured percolation to account for potential inaccuracy associated with field measurements, declining BMP performance over time, and compaction during construction. Appendix D of the TGD for WQMP provides guidance on estimating an appropriate safety factor to use in Form 4.3-3.

If site constraints limit the use of BMPs to a single type and implementation of retention and infiltration BMPs mitigate no more than 40% of the DCV, then they are considered infeasible and the Project Proponent may evaluate the effectiveness of BMPs lower in the LID hierarchy of use (Section 5.5.1 of the TGD for WQMP)

If implementation of infiltrations BMPs is feasible as determined using Form 4.3-1, then LID infiltration BMPs shall be implemented to the MEP (section 4.1 of the TGD for WQMP).

NOTE – The overall project runoff is being treated with a buried infiltration system. The runoff from this project is being clarified and pumped to the site and into the infiltration system.

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Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1)

1 Remaining LID DCV not met by site design HSC BMP (ft^3): 4,662 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*			
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*			
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*			
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*			
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*			
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*			
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*			
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*			
10 Amended soil porosity			
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*			
12 Gravel porosity			
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*			
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*			

16 Total Retention Volume from LID Infiltration BMPs: *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: % *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☐ No ☒

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

4.3.3 Harvest and Use BMP

Harvest and use BMP may be considered if the full LID DCV cannot be met by maximizing infiltration BMPs. Use Form 4.3-4 to compute on-site retention of runoff from proposed harvest and use BMPs.

Volume retention estimates for harvest and use BMPs are sensitive to the on-site demand for captured stormwater. Since irrigation water demand is low in the wet season, when most rainfall events occur in San Bernardino County, the volume of water that can be used within a specified drawdown period is relatively low. The bottom portion of Form 4.3-4 facilitates the necessary computations to show infeasibility if a minimum incremental benefit of 40 percent of the LID DCV would not be achievable with MEP implementation of on-site harvest and use of stormwater (Section 5.5.4 of the TGD for WQMP).

NOTE – Harvest and Use not feasible – no landscaping on site.

Form 4.3-4 Harvest and Use BMPs (DA 1)

1 Remaining LID DCV not met by site design HSC or infiltration BMP (ft^3): 4,662 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16*			
BMP Type(s) *Compute runoff volume retention from proposed harvest and use BMP (Select BMPs from Table 5-4 of the TGD for WQMP) - Use additional forms for more BMPs*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Describe cistern or runoff detention facility			
3 Storage volume for proposed detention type (ft^3) *Volume of cistern*			
4 Landscaped area planned for use of harvested stormwater (ft^2)			
5 Average wet season daily irrigation demand (in/day) Use local values, typical ~ 0.1 in/day			
6 Daily water demand (ft^3/day) *Item 4 * (Item 5 / 12)*			
7 Drawdown time (hrs) *Copy Item 6 from Form 4.2-1*			
8 Retention Volume (ft^3) *$V_{retention}$ = Minimum of (Item 3) or (Item 6 * (Item 7 / 24))*			
9 Total Retention Volume (ft^3) from Harvest and Use BMP *Sum of Item 8 for all harvest and use BMP included in plan*			
10 Is the full DCV retained with a combination of LID HSC, retention and infiltration, and harvest & use BMPs? Yes ☐ No ☒ *If yes, demonstrate conformance using Form 4.3-10. If no, then re-evaluate combinations of all LID BMP and optimize their implementation such that the maximum portion of the DCV is retained on-site (using a single BMP type or combination of BMP types). If the full DCV cannot be mitigated after this optimization process, proceed to Section 4.3.4.*			

4.3.4 Biotreatment BMP

Biotreatment BMPs may be considered if the full LID DCV cannot be met by maximizing retention and infiltration, and harvest and use BMPs. A key consideration when using biotreatment BMP is the effectiveness of the proposed BMP in addressing the pollutants of concern for the project (see Table 5-5 of the TGD for WQMP).

Use Form 4.3-5 to summarize the potential for volume based and/or flow based biotreatment options to biotreat the remaining unmet LID DCV w. Biotreatment computations are included as follows:

- Use Form 4.3-6 to compute biotreatment in small volume based biotreatment BMP (e.g. bioretention w/underdrains);
- Use Form 4.3-7 to compute biotreatment in large volume based biotreatment BMP (e.g. constructed wetlands);
- Use Form 4.3-8 to compute sizing criteria for flow-based biotreatment BMP (e.g. bioswales)

NOTE – Biotreatment BMPs not feasible based on current site conditions and programming.

Form 4.3-5 Selection and Evaluation of Biotreatment BMP (DA 1)

1 Remaining LID DCV not met by site design HSC, infiltration, or harvest and use BMP for potential biotreatment (ft³): 4,662 *Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16- Form 4.3-4 Item 9*	List pollutants of concern *Copy from Form 2.3-1.*

2 Biotreatment BMP Selected	Volume-based biotreatment *Use Forms 4.3-6 and 4.3-7 to compute treated volume*	Flow-based biotreatment *Use Form 4.3-8 to compute treated volume*
(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes, described in Table 5-5 of the TGD for WQMP)	☐ Bioretention with underdrain ☐ Planter box with underdrain ☐ Constructed wetlands ☐ Wet extended detention ☐ Dry extended detention	☐ Vegetated swale ☐ Vegetated filter strip ☐ Proprietary biotreatment

3 Volume biotreated in volume based biotreatment BMP (ft³): *Form 4.3-6 Item 15 + Form 4.3-7 Item 13*	4 Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft³): *Item 1 – Item 3*	5 Remaining fraction of LID DCV for sizing flow based biotreatment BMP: % *Item 4 / Item 1*

6 Flow-based biotreatment BMP capacity provided (cfs): *Use Figure 5-2 of the TGD for WQMP to determine flow capacity required to provide biotreatment of remaining percentage of unmet LID DCV (Item 5), for the project's precipitation zone (Form 3-1 Item 1)*

7 Metrics for MEP determination:

- Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds in Table 5-7 of the TGD for WQMP for the proposed category of development: ☐ *If maximized on-site retention BMPs is feasible for partial capture, then LID BMP implementation must be optimized to retain and infiltrate the maximum portion of the DCV possible within the prescribed minimum effective area. The remaining portion of the DCV shall then be mitigated using biotreatment BMP.*

Form 4.3-6 Volume Based Biotreatment (DA 1) – Bioretention and Planter Boxes with Underdrains

Biotreatment BMP Type *(Bioretention w/underdrain, planter box w/underdrain, other comparable BMP)*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*			
2 Amended soil infiltration rate *Typical ~ 5.0*			
3 Amended soil infiltration safety factor *Typical ~ 2.0*			
4 Amended soil design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*			
5 Ponded water drawdown time (hr) *Copy Item 6 from Form 4.2-1*			
6 Maximum ponding depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12 * Item 4 * Item 5) or Item 6*			
8 Amended soil surface area (ft^2)			
9 Amended soil depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Amended soil porosity, *n*			
11 Gravel depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
12 Gravel porosity, *n*			
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*			
14 Biotreated Volume (ft^3) *$V_{biotreated}$ = Item 8 * [(Item 7/2) + (Item 9 * Item 10) +(Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Total biotreated volume from bioretention and/or planter box with underdrains BMP: *Sum of Item 14 for all volume-based BMPs included in this form*			

Form 4.3-7 Volume Based Biotreatment (DA 1) –
Constructed Wetlands and Extended Detention

Biotreatment BMP Type *Constructed wetlands, extended wet detention, extended dry detention, or other comparable proprietary BMP. If BMP includes multiple modules (e.g. forebay and main basin), provide separate estimates for storage and pollutants treated in each module.*	DA DMA BMP Type		DA DMA BMP Type *(Use additional forms for more BMPs)*	
	Forebay	Basin	Forebay	Basin
1 Pollutants addressed with BMP forebay and basin *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*				
2 Bottom width (ft)				
3 Bottom length (ft)				
4 Bottom area (ft^2) A_{bottom} *= Item 2 * Item 3*				
5 Side slope (ft/ft)				
6 Depth of storage (ft)				
7 Water surface area (ft^2) $A_{surface}$ *=(Item 2 + (2 * Item 5 * Item 6)) * (Item 3 + (2 * Item 5 * Item 6))*				
8 Storage volume (ft^3) *For BMP with a forebay, ensure fraction of total storage is within ranges specified in BMP specific fact sheets, see Table 5-6 of the TGD for WQMP for reference to BMP design details* V *=Item 6 / 3 * [Item 4 + Item 7 + (Item 4 * Item 7)^0.5]*				
9 Drawdown Time (hrs) *Copy Item 6 from Form 2.1*				
10 Outflow rate (cfs) Q_{BMP} *= (Item* $8_{forebay}$ *+ Item* 8_{basin}*) / (Item 9 * 3600)*				
11 Duration of design storm event (hrs)				
12 Biotreated Volume (ft^3) $V_{biotreated}$ *= (Item* $8_{forebay}$ *+ Item* 8_{basin}*) +(Item 10 * Item 11 * 3600)*				
13 Total biotreated volume from constructed wetlands, extended dry detention, or extended wet detention : *(Sum of Item 12 for all BMP included in plan)*				

Form 4.3-8 Flow Based Biotreatment (DA 1)

Biotreatment BMP Type *Vegetated swale, vegetated filter strip, or other comparable proprietary BMP*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in TGD Table 5-5*			
2 Flow depth for water quality treatment (ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
3 Bed slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
4 Manning's roughness coefficient			
5 Bottom width (ft) b_w = *(Form 4.3-5 Item 6 * Item 4) / (1.49 * Item 2*$^{\wedge 1.67}$ ** Item 3*$^{\wedge 0.5}$*)*			
6 Side Slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Cross sectional area (ft^2) *A = (Item 5 * Item 2) + (Item 6 * Item 2*$^{\wedge 2}$*)*			
8 Water quality flow velocity (ft/sec) *V = Form 4.3-5 Item 6 / Item 7*			
9 Hydraulic residence time (min) *Pollutant specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Length of flow based BMP (ft) *L = Item 8 * Item 9 * 60*			
11 Water surface area at water quality flow depth (ft^2) SA_{top} *= (Item 5 + (2 * Item 2 * Item 6)) * Item 10*			

4.3.5 Conformance Summary

Complete Form 4.3-9 to demonstrate how on-site LID DCV is met with proposed site design hydrologic source control, infiltration, harvest and use, and/or biotreatment BMP. The bottom line of the form is used to describe the basis for infeasibility determination for on-site LID BMP to achieve full LID DCV, and provides methods for computing remaining volume to be addressed in an alternative compliance plan. If the project has more than one outlet, then complete additional versions of this form for each outlet.

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 1)

1 Total LID DCV for the Project DA-1 (ft^3): 4,662 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design hydrologic source control LID BMP (ft^3): 0 *Copy Item 30 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 0 *Copy Item 16 in Form 4.3-3*

4 On-site retention with LID harvest and use BMP (ft^3): 0 *Copy Item 9 in Form 4.3-4*

5 On-site biotreatment with volume based biotreatment BMP (ft^3): 0 *Copy Item 3 in Form 4.3-5*

6 Flow capacity provided by flow based biotreatment BMP (cfs): 0 *Copy Item 6 in Form 4.3-5*

7 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP: Yes ☐ No ☒
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

8 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture: ☒
  Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*
- An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility: ☐
  Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

4.3.6 Hydromodification Control BMP

Use Form 4.3-10 to compute the remaining runoff volume retention, after LID BMP are implemented, needed to address HCOC, and the increase in time of concentration and decrease in peak runoff necessary to meet targets for protection of waterbodies with a potential HCOC. Describe hydromodification control BMP that address HCOC, which may include off-site BMP and/or in-stream controls. Section 5.6 of the TGD for WQMP provides additional details on selection and evaluation of hydromodification control BMP.

Form 4.3-10 Hydromodification Control BMPs (DA 1)

1 Volume reduction needed for HCOC performance criteria (ft^3): N/A
*(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*

2 On-site retention with site design hydrologic source control, infiltration, and harvest and use LID BMP (ft^3): *Sum of Form 4.3-9 Items 2, 3, and 4 Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving HCOC volume reduction*

3 Remaining volume for HCOC volume capture (ft^3): *Item 1 – Item 2*

4 Volume capture provided by incorporating additional on-site or off-site retention BMPs (ft^3): *Existing downstream BMP may be used to demonstrate additional volume capture (if so, attach to this WQMP a hydrologic analysis showing how the additional volume would be retained during a 2-yr storm event for the regional watershed)*

5 If Item 4 is less than Item 3, incorporate in-stream controls on downstream waterbody segment to prevent impacts due to hydromodification ☐ *Attach in-stream control BMP selection and evaluation to this WQMP*

6 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site or off-site retention BMP ☐
  BMP upstream of a waterbody segment with a potential HCOC may be used to demonstrate increased time of concentration through hydrograph attenuation (if so, show that the hydraulic residence time provided in BMP for a 2-year storm event is equal or greater than the addition time of concentration requirement in Form 4.2-4 Item 15)
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

7 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site or off-site retention BMPs ☐
  BMPs upstream of a waterbody segment with a potential HCOC may be used to demonstrate additional peak runoff reduction through hydrograph attenuation (if so, attach to this WQMP, a hydrograph analysis showing how the peak runoff would be reduced during a 2-yr storm event)
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

4.4 Alternative Compliance Plan (if applicable)

Describe an alternative compliance plan (if applicable) for projects not fully able to infiltrate, harvest and use, or biotreat the DCV via on-site LID practices. A project proponent must develop an alternative compliance plan to address the remainder of the LID DCV. Depending on project type some projects may qualify for water quality credits that can be applied to reduce the DCV that must be treated prior to development of an alternative compliance plan (see Form 2.4-1, Water Quality Credits). Form 4.3-9 Item 8 includes instructions on how to apply water quality credits when computing the DCV that must be met through alternative compliance. Alternative compliance plans may include one or more of the following elements:

- On-site structural treatment control BMP - All treatment control BMP should be located as close to possible to the pollutant sources and should not be located within receiving waters;
- Off-site structural treatment control BMP - Pollutant removal should occur prior to discharge of runoff to receiving waters;
- Urban runoff fund or In-lieu program, if available

Depending upon the proposed alternative compliance plan, approval by the executive officer may or may not be required (see Section 6 of the TGD for WQMP).

Description of Alternate Compliance Plan

Total DCV from the transloading pad and containment pit will be contained in the pit with a ponding depth of 1.6" (DCV = 4,662 cf, tank enclosure area = 34,115 sf).

After a rainfall event, storm water will be pumped from pit to the site via above ground Oil & Water Separator (OWS) which will remove fuel and oil contaminants. Clarified storm water will discharge to the site onto riprap/cobble stone to dissipate energy, allowing water to sheet flow to the concrete gutter, area drain, and infiltration system (under separate permit).

The OWS pump will operate at approximately 28 gpm, discharging the DCV in approximately 21 hours. The low-flow discharge rate of the pump, which will occur after the rain event, will reduce erosion and promote natural infiltration as the discharge sheet flows over the existing pervious surface before being picked up in the existing gutter.

Section 5 Inspection and Maintenance Responsibility for Post Construction BMP

All BMP included as part of the project WQMP are required to be maintained through regular scheduled inspection and maintenance (refer to Section 8, Post Construction BMP Requirements, in the TGD for WQMP). Fully complete Form 5-1 summarizing all BMP included in the WQMP. Attach additional forms as needed. The WQMP shall also include a detailed Operation and Maintenance Plan for all BMP and may require a Maintenance Agreement (consult the jurisdiction's LIP). If a Maintenance Agreement is required, it must also be attached to the WQMP.

Form 5-1 BMP Inspection and Maintenance (use additional forms as necessary)

BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
Oil/Water Separator	Building Owner	Visual Inspection, Debris & Sediment Removal	3-months
Non-Structural BMPs	Building Owner	Annual Employee Training	1-year
Litter & Debris Control Program	Building Owner	Clear facilities of litter and debris	Weekly
Spill kit inspection & replacement	Building Owner	Inspect kit, replace when defective	3-months
Riprap Energy Dissipator	Building Owner	Visual Inspection, Debris removal, repair & replace when damaged.	1-year
Catch Basin Stenciling	Building Owner	Visual Inspection. Re-apply when no legible	1-year

Section 6 WQMP Attachments

6.1. Site Plan and Drainage Plan

Include a site plan and drainage plan sheet set containing the following minimum information:

- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural Source Control BMP locations
- Site Design Hydrologic Source Control BMP locations
- LID BMP details
- Drainage delineations and flow information
- Drainage connections

6.2 Electronic Data Submittal

Minimum requirements include submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open. If the local jurisdiction requires specialized electronic document formats (as described in their local Local Implementation Plan), this section will describe the contents (e.g., layering, nomenclature, geo-referencing, etc.) of these documents so that they may be interpreted efficiently and accurately.

6.3 Post Construction

Attach all O&M Plans and Maintenance Agreements for BMP to the WQMP.

6.4 Other Supporting Documentation

- BMP Educational Materials
- Activity Restriction – C, C&R's & Lease Agreements

APPENDIX A

CIVIL GRADING & DRAINAGE PLANS

SITE IMPROVEMENT PLANS
FOR
SITE TRANSLOADING AREA & CONTAINMENT PIT FOR BIOFUEL STORAGE
8377 SULTANA AVENUE
FONTANA, CA 92335
SAN BERNARDINO COUNTY

GRADING NOTES:

1. ALL GRADING SHALL CONFORM TO THE LATEST CALIFORNIA BUILDING CODE (CBC) CHAPTERS 17, 18, APPENDIX–J AND ALL APPLICABLE SECTIONS.
2. A GRADING PERMIT SHALL BE OBTAINED PRIOR TO COMMENCEMENT OF ANY WORK ON THE SITE.
3. ISSUANCE OF A GRADING PERMIT DOES NOT ELIMINATE THE NEED FOR PERMITS FROM OTHER REGULATORY AGENCIES WITH REGULATORY RESPONSIBILITIES FOR CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE WORK AUTHORIZED IN THIS PLAN.
4. ALL WORK UNDER THIS PERMIT SHALL BE LIMITED TO WORK WITHIN THE PROPERTY LINES. A SEPARATE CONSTRUCTION, EXCAVATION OR ENCROACHMENT PERMIT FROM THE DEPARTMENT OF PUBLIC WORKS MAY BE REQUIRED FOR ANY WORK WITHIN THE COUNTY RIGHT–OF–WAY.
5. APPROVAL OF THESE PLANS DOES NOT AUTHORIZE ANY WORK OR GRADING TO BE PERFORMED UNTIL THE EFFECTIVE PROPERTY OWNER'S PERMISSION HAS BEEN OBTAINED AND VALID GRADING PERMIT HAS BEEN ISSUED.
6. THIS PLAN IS FOR GRADING PURPOSES ONLY AND IS NOT TO BE USED FOR THE PURPOSE OF CONSTRUCTIN ONSITE OROFFSITE IMPROVEMENTS. ISSUANCE OF A PERMIT BASED ON THIS PLAN DOES NOT CONSTITUTE APPROVAL OFDRIVEWAY LOCATIONS OR SIZES, PARKING LOT STRUCTURAL SECTIONS OR LAYOUT, ADA–RELATED REQUIREMENTS,BUILDING LOCATIONS OR FOUNDATIONS, WALLS, CURBING, OFFSITE DRAINAGE FACILITIES OR OTHER ITEMS NOT RELATEDDIRECTLY TO THE BASIC GRADING OPERATION. ONSITE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE TOTHE APPROVED BUILDING PERMIT PLANS. OFFSITE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE TO PLANS APPROVED FOR THIS PURPOSE BY THE PUBLIC WORKS DEPARTMENT.
7. MAXIMUM CUT AND FILL SLOPE = 2:1 (HORIZONTAL TO VERTICAL) AND MAXIMUM VERTICAL HEIGHT = 30 FEET, UNLESS AN APPROVED GEOTECHNICAL REPORT CAN JUSTIFY A STEEPER AND TALLER SLOPE.
8. NO FILL SHALL BE PLACED ON EXISTING GROUND UNTIL THE GROUND HAS BEEN CLEARED OF WEEDS, DEBRIS, TOPSOILAND OTHER DELETERIOUS MATERIAL.
9. FILL SLOPES SHALL NOT HAVE LESS THAN 90% RELATIVE COMPACTION, OR AS RECOMMENDED ON THE APPROVED GEOTECHNICAL REPORT.
10. IT IS THE GRADING CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ADEQUATE COMPACTION HAS BEEN ATTAINED ON THE ENTIRE GRADING SITE, INCLUDING FILL AREAS OUTSIDE THE BUILDING PADS AND ON ALL FILL SLOPES.
11. UNLESS OTHERWISE RECOMMENDED IN AN APPROVED GEOTECHNICAL REPORT, OVER–EXCAVATION SHALL BE AT LEAST 24 INCHES MINIMUM BELOW THE BOTTOM OF FOOTINGS OR TO COMPETENT NATIVE SOIL OR BEDROCK MATERIALS, WHICHEVER IS DEEPER, AS APPROVED BY THE PROJECT'S GEOTECHNICAL ENGINEER OR GEOLOGIST.
12. EARTHWORK VOLUMES: CUT 1,000 CY, FILL 850 CY, TOTAL 150 CY (EXPORT), DISTURBED AREA 18,750 (SF)
13. EARTHWORK QUANTITIES ARE SHOWN FOR GRADING PERMIT PURPOSES ONLY, AND SAN BERNARDINO COUNTY IS NOT RESPONSIBLE FOR THEIR ACCURACY. LAND USE SERVICES DEPARTMENT LAND DEVELOPMENT 385 N. ARROWHEAD AVENUE, FIRST FLOOR, SAN BERNARDINO, CA 92415 | PHONE: 909.387.8311 FAX: 909.387.3223 PAGE 1 OF 2 REV. 01/2020
14. A COPY OF THE GRADING PERMIT AND APPROVED GRADING PLANS MUST BE IN THE POSSESSION OF A RESPONSIBLE PERSON AND AVAILABLE AT THE SITE AT ALL TIMES.
15. ANY ONSITE RETAINING WALLS SHOWN ON THE GRADING PLANS THAT ARE OVER 4'IN HEIGHT, MEASURED FROM TOP OF WALL TO BOTTOM OF FOOTING, ARE FOR REFERENCE ONLY. RETAINING WALLS OVER 4'IN HEIGHT ARE NOT CHECKED, PERMITTED, OR INSPECTED PER THE GRADING PERMIT. A SEPARATE RETAINING WALL PERMIT IS REQUIRED FOR ALL RETAINING WALLS OVER 4'IN HEIGHT.
16. ANY WALLS, FENCES, STRUCTURES AND/OR APPURTENANCES ADJACENT TO THIS PROJECT ARE TO BE PROTECTED IN PLACE. IF GRADING OPERATIONS DAMAGE OR ADVERSELY AFFECT SAID ITEMS IN ANY WAY, THE CONTRACTOR AND/OR DEVELOPER IS RESPONSIBLE FOR WORKING OUT AN ACCEPTABLE SOLUTION TO THE SATISFACTION OF THE AFFECTED PROPERTY OWNER(S).
17. FOR SITES WITH PROTECTED SPECIES OR TREES, THE PROPOSED GRADING MAY BE SUBJECT TO A SEPARATE PERMIT.
18. ADEQUATE FIRE ACCESS AROUND BUILDINGS (INCLUDING GARAGES) SHOULD BE PROVIDED AS APPROVED BY COUNTY FIRE.
19. EXISTING DRAINAGE COURSES SHALL NOT BE OBSTRUCTED, ALTERED, OR DIVERTED WITHOUT PRIOR APPROVAL FROM THE COUNTY OF SAN BERNARDINO, LAND DEVELOPMENT DIVISION. A STREAMBED ALTERATION AGREEMENT MAY ALSO BE REQUIRED FROM THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE.
20. DRAINAGE EASEMENTS SHALL NOT BE OBSTRUCTED, ALTERED OR DIVERTED WITHOUT PRIOR APPROVAL OF THE COUNTY OF SAN BERNARDINO, LAND DEVELOPMENT DIVISION.
21. SETBACKS AND BUILDING LOCATIONS SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY AND MUST BE REVIEWED AND APPROVED UNDER A SEPARATE BUILDING PERMIT.
22. UTILITY AND SEPTIC IMPROVEMENTS SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY AND MUST BE REVIEWED AND APPROVED UNDER A SEPARATE BUILDING PERMIT.
23. ON PROJECTS DISTURBING ONE ACRES OR MORE, THE FOLLOWING NOTE MUST BE ADDED: A NOTICE OF INTENT (NOI) HAS BEEN, OR WILL BE FILED WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) AND A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) HAS BEEN OR WILL BE PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF CALIFORNIA GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (PERMIT NO. CAS000002) FOR ALL OPERATIONS ASSOCIATED WITH THESE PLANS. THE PERMITTEE SHALL KEEP A COPY OF THE SWPPP ON SITE AND AVAILABLE FOR REVIEW BY COUNTY.
24. IN CONJUNCTION WITH THE CALIFORNIA GENERAL PERMIT FOR PROPOSED DISTURBANCE OVER ONE ACRE, AN ACTIVE WASTEWATER DISCHARGE ID # (WDID) MUST BE INCLUDED ON THE FINAL GRADING PLAN.
25. FOR ENGINEERED GRADING, A FINAL GRADING CERTIFICATION WILL BE COLLECTED BY THE BUILDING INSPECTOR AT THE FINAL BUILDING INSPECTION OR PRIOR A GRADING FINAL STATUS ON THE PERMIT. THE FINAL GRADING CERTIFICATION IS TO BE COMPLETED BY THE ENGINEER OF RECORD ON THE APPROVED GRADING PLANS.
26. ALL FLOOD ZONE REQUIREMENTS MUST BE REFLECTED OR ACCOUNTED FOR ON THE GRADING PLANS. ELEVATIONS OR CONSTRUCTION NOTES MUST BE INCLUDED IN THE PLANS TO ENSURE COMPLIANCE WITH ALL APPLICABLE FIRST FLOOR ELEVATION REQUIREMENTS PER FEMA AND SAN BERNARDINO COUNTY DEVELOPMENT CODE GUIDELINES. NOTE: ADDITIONAL REQUIREMENTS MAY BE APPLICABLE, AS DETERMINED BY THE BUILDING OFFICIAL.

GENERAL NOTES

1. ALL WORK SHALL BE COMPLETED PER LOCAL BUILDING CODES, STANDARD DETAILS, AND LATEST "GREENBOOK" STANDARDS.
2. ALL GRADING WORK SHALL BE PER PROJECT GEOTECH REPORT BY **NORCAL ENGINEERING DATED JUNE 12, 2020.**
3. PROJECT TOPOGRAPHY AND BOUNDARY LINES ARE BASED ON SURVEY BY ~~SURVEY COMPANY, INC. DATED XX/XX/202X.~~
4. FILES PROVIDED BY THE CLIENT. ELEVATION DATUM BASED ON STORM DRAIN MANHOLE RIM ELEVATION NEAR SOUTHEST CORNER OF BUILDING = 98.60'.
5. CONTRACTOR SHALL OBTAIN APPROVAL IN WRITING FROM ENGINEER OF RECORD PRIOR TO MAKING ANY CHANGES FROM APPROVED CIVIL DRAWINGS.
6. EXISTING UTILITY INFORMATION (SIZE, LOCATION, INVERTS) WERE OBTAINED FROM PROJECT SURVEY, PUBLIC UTILITY DRAWINGS, AND OTHER AVAILABLE RESOURCES. CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITY INFORMATION PRIOR TO NEW INSTALLATION AND NOTIFY CIVIL ENGINEER ANY VARIANCES.
7. CONTRACTOR SHALL NOTIFY PROJECT GEOTECHNICAL ENGINEER OF RECORD IF UNFAVORABLE GEOTECHNICAL CONDITIONS ARE DISCOVERED.
8. GRADES SHOWN ON PRECISE GRADING PLAN REPRESENT FINAL CONDITIONS. CONTRACTOR SHALL SUBTRACT PAVEMENT AND BASE THICKNESS PER DETAILS AND GEOTECHNICAL RECOMMENDATIONS TO SET ROUGH GRADE ELEVATIONS.
9. ALL WATER LINES SHALL BE INSTALLED MINIMUM 36" BELOW FINISHED GRADE, OR PER LOCAL STANDARDS, WHICHEVER IS GREATER.
10. SEWER CLEANOUTS ARE TO BE PLACED AT MAXIMUM 100 FEET SPACING AND FOR EACH AGGREGATE HORIZONTAL CHANGE IN DIRECTION EXCEEDING 135 DEGREES. PROVIDE MANHOLES AT 300 FEET MAXIMUM SPACING.
11. CONTRACTOR SHALL KEEP PERMIT APPROVED SET OF PLANS ON SITE AT ALL TIMES DURING CONSTRUCTION.
12. CONTRACTOR TO SCHEDULE ON SITE MEETING WITH CITY INSPECTOR PRIOR TO STARTING ANY WORK IN THE PUBLIC RIGHT–OF–WAY.
13. CONTRACTOR SHALL OBTAIN TRAFFIC CONTROL PERMIT AS REQUIRED BY CITY 48 HOURS PRIOR TO CONSTRUCTION WITHIN THE PUBLIC RIGHT–OF–WAY.
14. CONTRACTOR TO SCHEDULE ON SITE MEETING WITH CIVIL ENGINEER PRIOR TO INSTALLING APPROVED BMP (BEST MANAGEMENT PRACTICES) STORMWATER MITIGATION DEVICES.

NOTICE TO CONTRACTOR

1. THE ESTIMATES OF IMPROVEMENTS AND GRADING QUANTITIES AS SHOWN ON PERMIT DOCUMENTS ARE PROVIDED TO SATISFY PLAN CHECK INFORMATION REQUIREMENTS ONLY. THE CONTRACTOR SHALL PERFORM AN INDEPENDENT ESTIMATE OF ALL IMPROVEMENT QUANTITIES, INCLUDING GRADING VOLUMES, FOR BIDDING AND CONTRACT PURPOSES.

2. CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.

EROSION CONTROL NOTES

1. IN CASE OF EMERGENCY, CALL (RESPONSIBLE PERSON) AT (24–HOUR TELEPHONE).
2. POLLUTION AND EROSION PREVENTION MEASURES, ALSO KNOWN AS BEST MANAGEMENT PRACTICES (BMPS), MUST BE INSTALLED PRIOR TO GRADING. THESE MEASURES, INCLUDING THE PREVENTION OF SEDIMENTATION OR FLOOD DAMAGE, TO OFFSITE PROPERTY SHALL BE ADEQUATE WHETHER OR NOT AN EROSION CONTROL PERMIT IS REQUIRED.
3. ERODED SEDIMENTS AND OTHER POLLUTANTS MUST BE RETAINED ONSITE AND MAY NOT BE TRANSPORTED FROM THE SITE VIA SHEET FLOW, SWALES, AREA DRAINS, NATURAL DRAINAGE COURSES, OR WIND.
4. EROSION CONTROL DEVICES SHALL BE FUNCTIONING AT ALL TIMES. IN CASE OF FAILURE, RAPID CONSTRUCTION OF EMERGENCY DEVICES SHALL BE IMPLEMENTED.
5. STOCKPILES OF EARTH AND OTHER CONSTRUCTION–RELATED MATERIALS MUST BE PROTECTED FROM BEING TRANSPORTED FROM THE SITE BY THE FORCES OF WIND OR WATER.
6. FUELS, OILS, SOLVENTS, AND OTHER TOXIC MATERIALS MUST BE STORED IN ACCORDANCE WITH THEIR LISTING AND ARE NOT TO CONTAMINATE THE SOILS AND SURFACE WATERS. ALL APPROVED STORAGE CONTAINERS ARE TO BE PROTECTED FROM THE WEATHER. SPILLS MUST BE CLEANED UP IMMEDIATELY AND DISPOSED OF IN A PROPER MANNER. SPILLS MAY NOT BE WASHED INTO THE DRAINAGE SYSTEM.
7. EXCESS OR WASTE CONCRETE MUST BE CONTAINED ONSITE. PROVISIONS SHALL BE MADE TO RETAIN CONCRETE WASTES ONSITE UNTIL THEY CAN BE DISPOSED OF AS SOLID WASTE.
8. DEVELOPERS/CONTRACTORS ARE RESPONSIBLE TO ENSURE ALL EROSION CONTROL DEVICES AND BMPS ARE INSTALLED AND FUNCTIONING PROPERLY PER PLAN. PROPER PRECAUTION SHALL BE CONSIDERED WHEN 50% OR GREATER PROBABILITY OF PREDICTED PRECIPITATION, AND AFTER ACTUAL PRECIPITATION. A CONSTRUCTION SITE INSPECTION CHECKLIST AND INSPECTION LOG SHALL BE MAINTAINED AT THE PROJECT SITE AT ALL TIMES AND AVAILABLE FOR REVIEW BY THE BUILDING OFFICIAL.
9. TRASH AND CONSTRUCTION–RELATED SOLID WASTES MUST BE DEPOSITED INTO A COVERED RECEPTACLE TO PREVENT CONTAMINATION OF RAINWATER AND DISPERSAL BY WIND.
10. SEDIMENTS AND OTHER MATERIALS MAY NOT BE TRACKED FROM THE SITE BY VEHICLE TRAFFIC. THE CONSTRUCTION ENTRANCE ROADWAYS MUST BE STABILIZED SO AS TO INHIBIT SEDIMENTS FROM BEING DEPOSITED INTO THE PUBLIC WAY. ACCIDENTAL DEPOSITIONS MUST BE SWEPT UP IMMEDIATELY AND MAY NOT BE WASHED DOWN BY RAIN OR OTHER MEANS.
11. ANY SLOPES WITH DISTURBED SOILS OR DENUDED OF VEGETATION MUST BE STABILIZED SO AS TO INHIBIT EROSION BY WIND AND WATER.
12. ALL SILT AND DEBRIS SHALL BE REMOVED FROM ALL DEVICES WITHIN 24 HOURS AFTER EACH RAINSTORM AND BE DISPOSED OF PROPERLY.
13. ALL STORM WATER CAPTURE DEVICES SHALL BE PROTECTED AT ALL TIMES.

SOURCE: TOMTOM MAPS

VICINITY MAP
NOT TO SCALE

PROJECT INFORMATION

PROJECT ADDRESS
8377 SULTANA AVENUE
FONTANA, CA 92335

LEGAL DESCRIPTION
APN 0232–051–01

OWNER / DEVELOPER
BNSF
740 EAST CARNEGIE DRIVE
SAN BERNARDINO, CA 92408
(909) 386–4020
JENNIFER.FITZGERALD@BNSF.COM

BUILDING TENANT
TRISTAR COMPANIES FLC, INC.
9600 KAISER WAY
FONTANA, CA 92335
(909) 823–3000
BARRY@TRISTARPNW.COM

SURVEYOR
BY LAND OWNER

ARCHITECT
FUENTES DESIGN GROUP
15253 YOUNGWOOD DRIVE
WHITTIER, CALIFORNIA 90605
(562)464–6710
MANUEL@FUENTESDESIGNGROUP.COM

CIVIL ENGINEER
RUSSELL CONSULTING & ENGINEERING
1750 N. HARVARD BLVD #109
LOS ANGELES, CA 90027
PHONE: (310)614–4116
ROB@RUSSELLCE.COM

GEOTECHNICAL ENGINEER
TERRACON
1355 E. COOLEY DRIVE
COLTON, CA
(909)824–7311
CONTACT: KEITH ASKEW

STRUCTURAL ENGINEER
ROUNDTABLE ENGINEERING SOLUTIONS
2155 RELIABLE CIRCLE
COLORADO SPRINGS, CO 80906
(801)541–6685
CONTACT: BRIAN LEWIS

ABBREVIATIONS

AC	ASPHALT CONCRETE PAVEMENT	ECR	END OF CURB RETURN	POC	POINT OF CONNECTION
BC	BEGIN OF CURVE	EG	EDGE OF GUTTER OR EXISTING GRADE	PI	POINT INTERSECTION
BCR	BEGIN OF CURVE	EP	EDGE OF PAVEMENT	PP	POWER POLE
BOF	BOTTOM OF FOOTING	EX	EXISTING	PRC	POINT OF REVERSE CURVE
BFP	BACKFLOW PREVENTER	GB	GRADE BREAK	PROP	PROPOSED
BM	BENCHMARK	FD	FOOTING / FOUNDATION DRAIN	R&R	REMOVAL & RECOMPACTION
BMP	BEST MANAGEMENT PRACTICE	FDC	FIRE DEPARTMENT CONNECTION	RCB	REINFORCED CONCRETE BOX
BOS	BOTTOM OF STEP OR BUEAU OF SANITATION	FG	FINISHED GRADE	RCP	REINFORCED CONCRETE PIPE
BW	BACK OF WALK OR BOTTOM OF WALL	FH	FIRE HYDRANT	RB	RAIN BARREL
CB	CATCH BASIN	FF	FINISHED FLOOR	RD	ROOF DRAIN
CONC	CONCRETE PAVEMENT	FL	FLOW LINE	RG	ROUGH GRADE
CF	CURB FACE	FS	FINISHED SURFACE	RIM	MANHOLE RIM ELEVATION
CL	CENTERLINE	FW	FIRE WATER	ROW	RIGHT OF WAY
CI	CAST IRON	HPDE	HIGH DENSITY POLYETHYLENE	SD	STORM DRAIN
CMB	CRUSHED MISCELANEOUS BASE	HGL	HYDRAULIC GRADE LINE	SL	STREET LIGHT
CMP	CORRUGATED METAL PIPE	HP	HIGH POINT	SS	SANITARY SEWER
CO	CLEAN OUT	INV	INVERT	TG	TOP OF GRATE
DI	DUCTILE IRON OR DROP INLET	IRR	IRRIGATION	TOF	TOP OF FOOTING
DIA	DIAMETER	LID	MANHOLE LID OR LOW IMPACT DEVELOPMENT	TOS	TOP OF STEP
DS	DOWNSPOUT	LP	LOW POINT	TW	TOP OF WALL
DW	DOMESTIC WATER	MH	MANHOLE	TYP	TYPICAL
DWY	DRIVEWAY	OC	ON CENTER	W	WATER
EC	END OF CURB	PA	PLANTER AREA	WM	WATER METER

LEGEND

123.45 FS	PROPOSED SPOT ELEVATION
(123.45) FS	EXISTING SPOT ELEVATION
2.0%	PROPOSED SURFACE GRADE SLOPE
(2.0%)	EXISTING SURFACE GRADE SLOPE
S=2.0%	PROPOSED UTILITY INVERT SLOPE
S=(2.0%)	EXISTING UTILITY INVERT SLOPE
——123——	PROPOSED GRADE CONTOUR
——(123)——	EXISTING GRADE CONTOUR
▬ ▬ ▬ ▬	LIMIT OF WORK
—— — ——	CENTERLINE
—— – – —— – – ——	PROPERTY LINE / RIGHT–OF–WAY
→ · · — · · →	FLOW LINE
═ ═ ═ ═	SAWCUT & JOIN
■□■□■□■	RETAINING WALL
——SD——	PROPOSED UTILITY
——SD——	EXISTING UTILITY
▤	HARDSCAPE DRAIN INLET

ESTIMATE EARTHWORK QUANTITIES

CUT (INCLUDING REMOVAL & RECOMPACTION)	12,000 CY
FILL (TO ROUGH GRADE PAD ELEVATIONS)	0 CY
NET	12,000 CY (EXPORT)

NOTES:
1. QUANTITIES SHOWN ARE FOR PLAN CHECK PURPOSES ONLY. CONTRACTOR TO GENERATE THEIR OWN QUANTITIES FOR BIDDING PURPOSES.
2. VOLUMES CALCULATED COMPARING EXISTING SURFACE TO PROPOSED ROUGH GRADE ELEVATIONS. SEE PROJECT 21–400–009–00 BY WILSON & COMPANY.

CIVIL DRAWING SHEET INDEX

SHEET 1	C–0.1	TITLE SHEET
SHEET 2	C–1.0	OVERALL SITE PLAN
SHEET 3	C–1.1	TRANSLOADING AREA GRADING & DRAINAGE PLAN
SHEET 4	C–1.2	CONTAINMENT PIT GRADING & DRAINAGE
SHEET 5	C–2.1	TRANSLOADING AREA GRADING SECTIONS
SHEET 6	C–2.2	CONTAINMENT PIT GRADING SECTIONS
SHEET 7	C–3.0	WQMP DETAILS

Underground Service Alert
CALL BEFORE YOU DIG
Call: TOLL FREE
1–800–227–2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK:

PLANS PREPARED BY:
RCE
RUSSELL CONSULTING & ENGINEERING
1750 N. HARVARD BLVD #109
LOS ANGELES, CA 90027
(310) 614-4116
ROB@RUSSELLCE.COM

NOT FOR CONSTRUCTION
ROBERT T RUSSELL
Exp. 09–30–2021

MARK	REVISIONS	APPR	DATE

COUNTY OF SAN BERNARDINO
LAND USE SERVICES

DATE

RECOMMENDED BY:

APPROVED BY:
DATE

TITLE SHEET

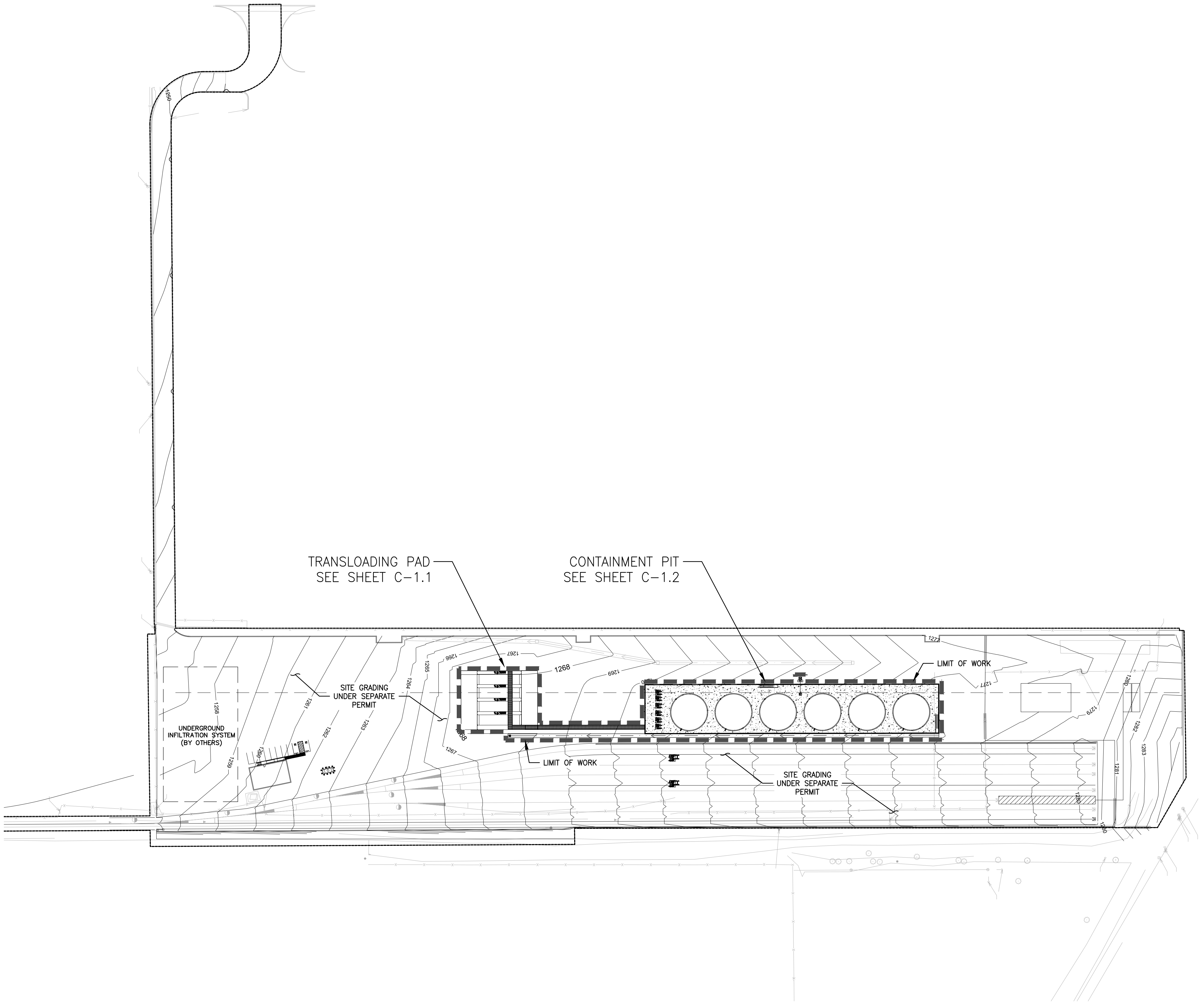
SITE TRANSLOADING AREA & CONTAINMENT PIT FOR BIOFUEL STORAGE

FONTANA, CA 92335

FILE NO.

C-0.1

SHEET 1 OF 7



WQMP CALCULATIONS

DRAINAGE AREA (DA)* = 41,180 SF (TRANSLOADING AND TANK ENCLOSURE)
% IMP = 100%
C = 0.892
$P_{2YR,1HR}$ = 0.524"
a_1 = 1.4807 (VALLEY)
a_2 = 1.963 (48–HR)
P_6 = 0.763
DCV = 4,662 CF
CONTAINMENT PIT AREA = 34,860 SF
DVC PONDING DEPTH = 1.6"
TREATMENT = PUMPED TO SITE THROUGH OIL WATER SEPARATOR.
DRAINS TO INFILTRATION SYSTEM PER PERMIT XXXXXXX.

GRAPHIC SCALE

40' 80' 160'

SCALE: 1" = 80'

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No. C-84132
Exp. 09-30-2021

MARK	REVISIONS	APPR	DATE

COUNTY OF SAN BERNARDINO
LAND USE SERVICES

DATE

RECOMMENDED BY:

APPROVED BY:

DATE

OVERALL SITE PLAN

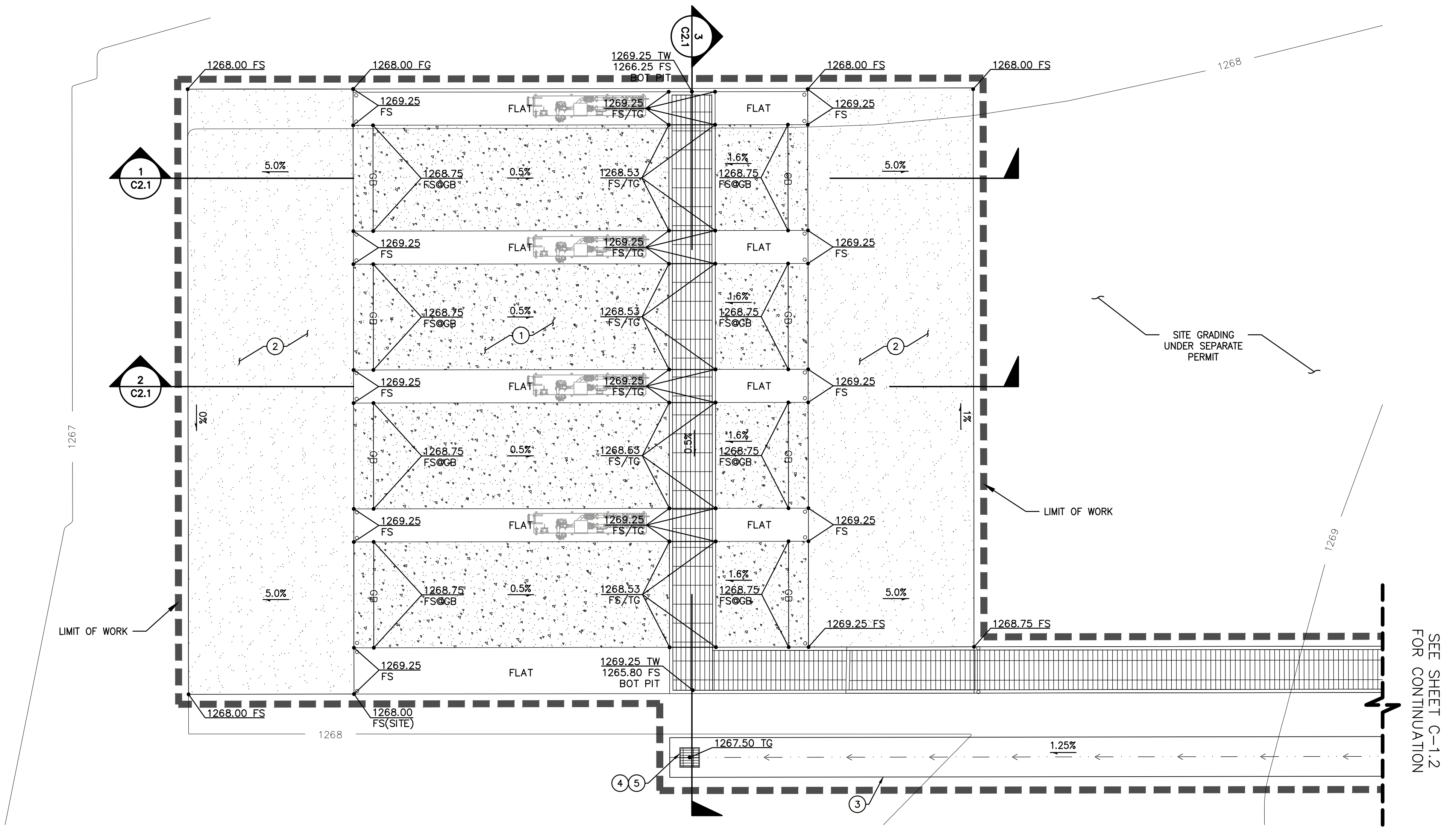
SITE TRANSLOADING AREA & CONTAINMENT
PIT FOR BIOFUEL STORAGE

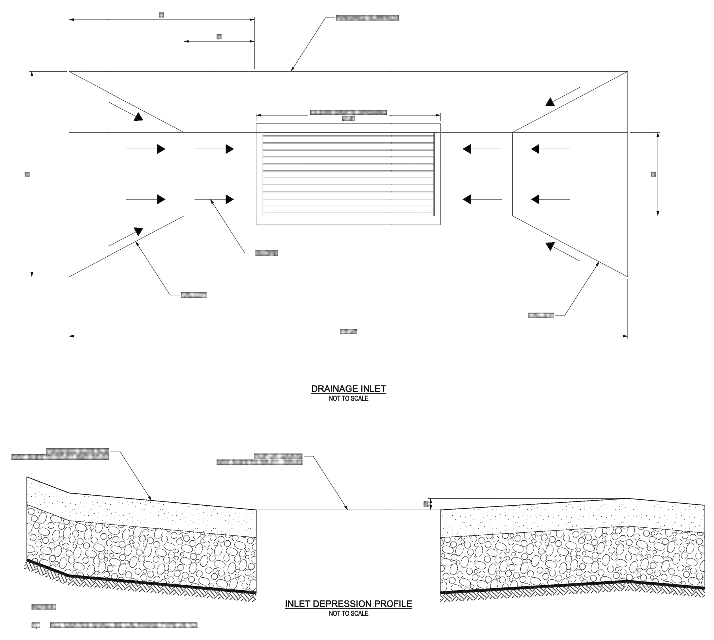
FONTANA, CA 92335

FILE NO.

C-1.0

SHEET 2 OF 7





DRAINAGE INLET DETAIL

N.T.S.

GRADING & DRAINAGE CONSTRUCTION NOTES

① TRUCK LOADING CONTAINMENT PAD & PIT. CONSTANT PERIMETER CONCRETE BERM ELEVATION = 1268.00'. BOTTOM OF PIT ELEVATION = 1266.25' (WEST), 1265.80' (EAST), 0.5% SLOPE TO PIT LOW POINT. SEE STRUCTURAL DRAWINGS FOR CONCRETE AND REINFORCEMENT DETAILS.

② CONCRETE RAMP

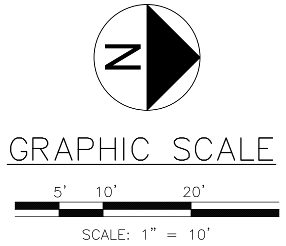
③ CONCRETE CROSS GUTTER PER SAN BERNARDINO COUNTY STANDARD PLAN 119.

④ PROPOSED CATCH BASIN PER CALTRANS STANDARD PLAN D72B, SEE DETAIL HEREON.

⑤ PROVIDE "NO DUMPING – DRAINS TO RIVER" STENCIL ADJACENT TO DRAIN INLET. PER WQMP REQUIREMENTS. SEE STENCIL DETAIL ON C–3.1.

LEGEND

▬ ▬ ▬	LIMIT OF WORK
—— · · ←—	DRAINAGE FLOW LINE
——GB——	GRADE BREAK



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MARK	REVISIONS	APPR	DATE

COUNTY OF SAN BERNARDINO
LAND USE SERVICES

DATE

RECOMMENDED BY:

APPROVED BY:

DATE

TRANSLOADING AREA GRADING & DRAINAGE PLAN

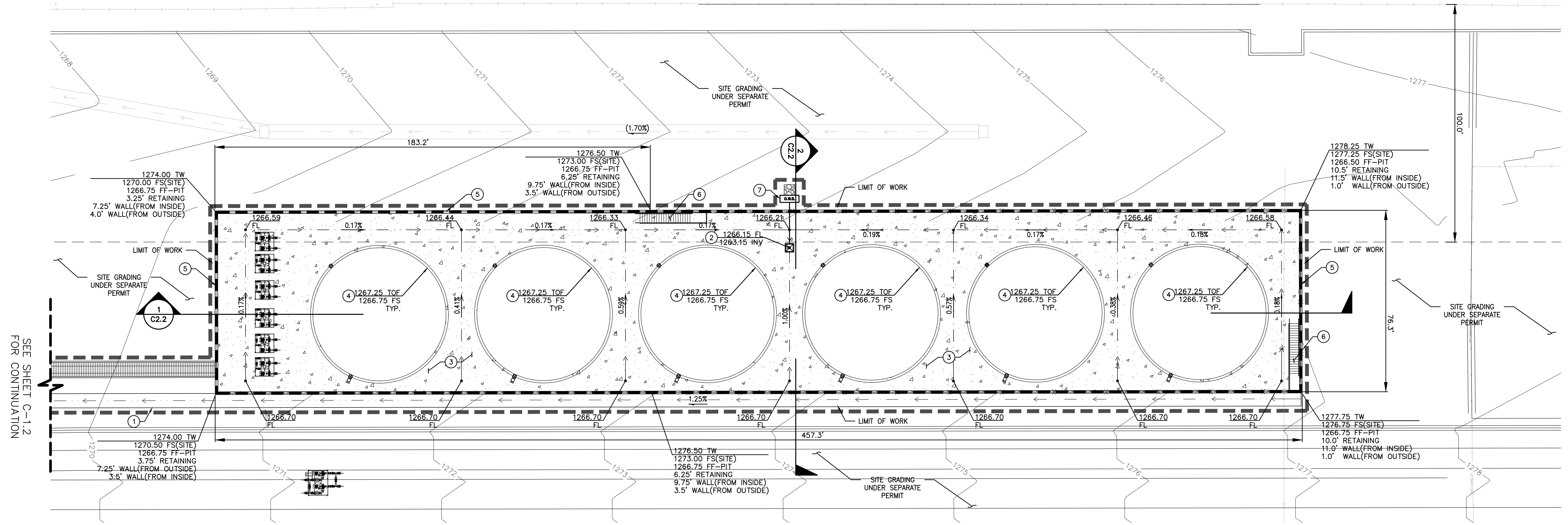
SITE TRANSLOADING AREA & CONTAINMENT PIT FOR BIOFUEL STORAGE

FONTANA, CA 92335

FILE NO.

C-1.1

SHEET 3 OF 7



GRADING & DRAINAGE CONSTRUCTION NOTES

① CONCRETE CROSS GUTTER PER SAN BERNARDINO COUNTY STANDARD PLAN 119.

② 36"X36" CONCRETE CATCH BASIN. HEAVY TRAFFIC RATED GRATE. SEE STRUCTURAL DRAWINGS. CONNECT TO OIL WATER SEPARATOR INTAKE PIPE.

③ PROPOSED 7" THICK CONCRETE SLAB OVER 6" CMB FOR BIO-FUEL STORAGE TANK ENCLOSURE. CONCRETE AND REINFORCEMENT DESIGN PER STRUCTURAL DRAWINGS.

④ PROPOSED BIO-FUEL STORAGE TANK. SEE ARCHITECTURAL PLANS FOR DETAILS. SEE STRUCTURAL PLANS FOR TANK FOOTING DETAILS. 6" MIN. REVEAL ON TANK FOOTINGS.

⑤ PROPOSED 14" THICK, WALL HEIGHT PER PLAN. SEE ARCHITECTURAL PLANS FOR FINISH. SEE STRUCTURAL PLANS FOR FOOTING AND REINFORCEMENT DETAILS.

⑥ PROPOSED STAIRS. SEE ARCHITECTURAL DRAWINGS.

⑦ ABOVE GROUND OIL/WATER SEPARATOR TO SATISFY WQMP STORMWATER TREATMENT REQUIREMENTS. SEE DETAILS ON C-3.0 AND WQMP REPORT. PUMPS AND CLARIFIES TRANSLOADING AND CONTAINMENT RUNOFF TO SITE. SEE PERMIT XXXXX DRAWINGS FOR CONTINUATION TO INFILTRATION SYSTEM.

LEGEND

▬ ▬ ▬	LIMIT OF WORK
— · — · ←	DRAINAGE FLOW LINE
▬▬▬	RETAINING WALL (SEE STRUCTURAL)
O.W.S.	OIL WATER SEPARATOR

GRAPHIC SCALE
10' 20' 40'
SCALE: 1" = 20'

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ROBERT T RUSSELL
No. C-84132
Exp. 09-30-2021
NOT FOR CONSTRUCTION

MARK	REVISIONS	APPR	DATE

COUNTY OF SAN BERNARDINO
LAND USE SERVICES

DATE

RECOMMENDED BY:

APPROVED BY:

DATE

CONTAINMENT PIT GRADING & DRAINAGE

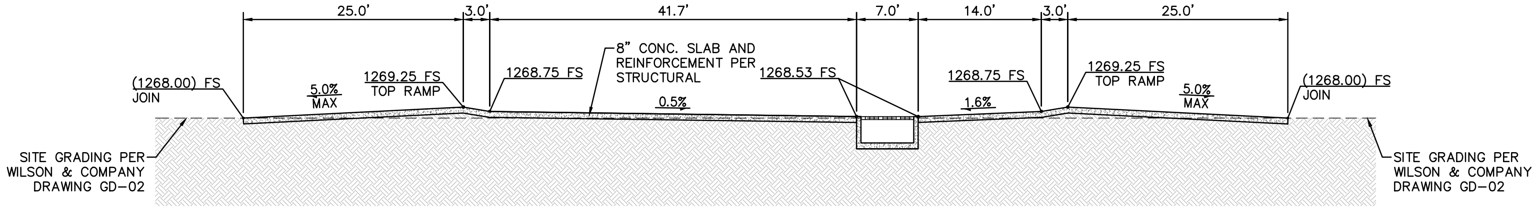
SITE TRANSLOADING AREA & CONTAINMENT PIT FOR BIOFUEL STORAGE

FONTANA, CA 92335

FILE NO.

C-1.2

SHEET 4 OF 7



SECTION 1

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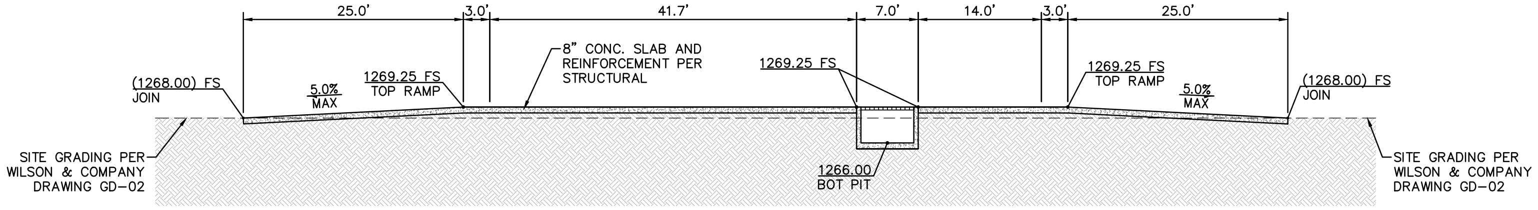

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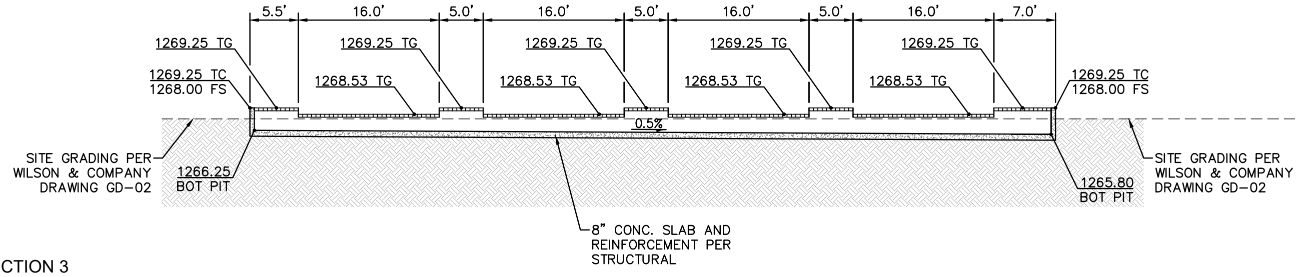

SECTION 3

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(WEST/EAST, LOOKING NORTH)

Underground Service Alert
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1-800-227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK:

PLANS PREPARED BY:
RCE
RUSSELL CONSULTING & ENGINEERING

1750 N. HARVARD BLVD #109
LOS ANGELES, CA 90027
(310) 614-4116
ROB@RUSSELLCE.COM

ROBERT T RUSSELL
No. C-84132
Exp. 09-30-2021
NOT FOR CONSTRUCTION

MARK	REVISIONS	APPR	DATE

COUNTY OF SAN BERNARDINO
LAND USE SERVICES

DATE

RECOMMENDED BY:

APPROVED BY:

DATE

TRANSLOADING AREA GRADING
SECTIONS

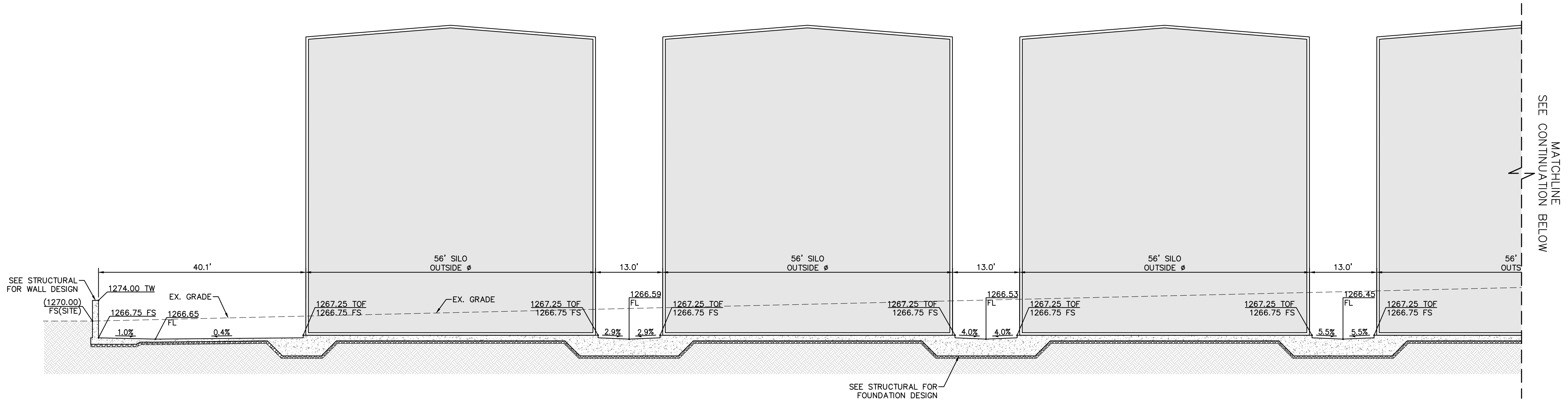
SITE TRANSLOADING AREA & CONTAINMENT
PIT FOR BIOFUEL STORAGE

FONTANA, CA 92335

FILE NO.

C-2.1

SHEET 5 OF 7



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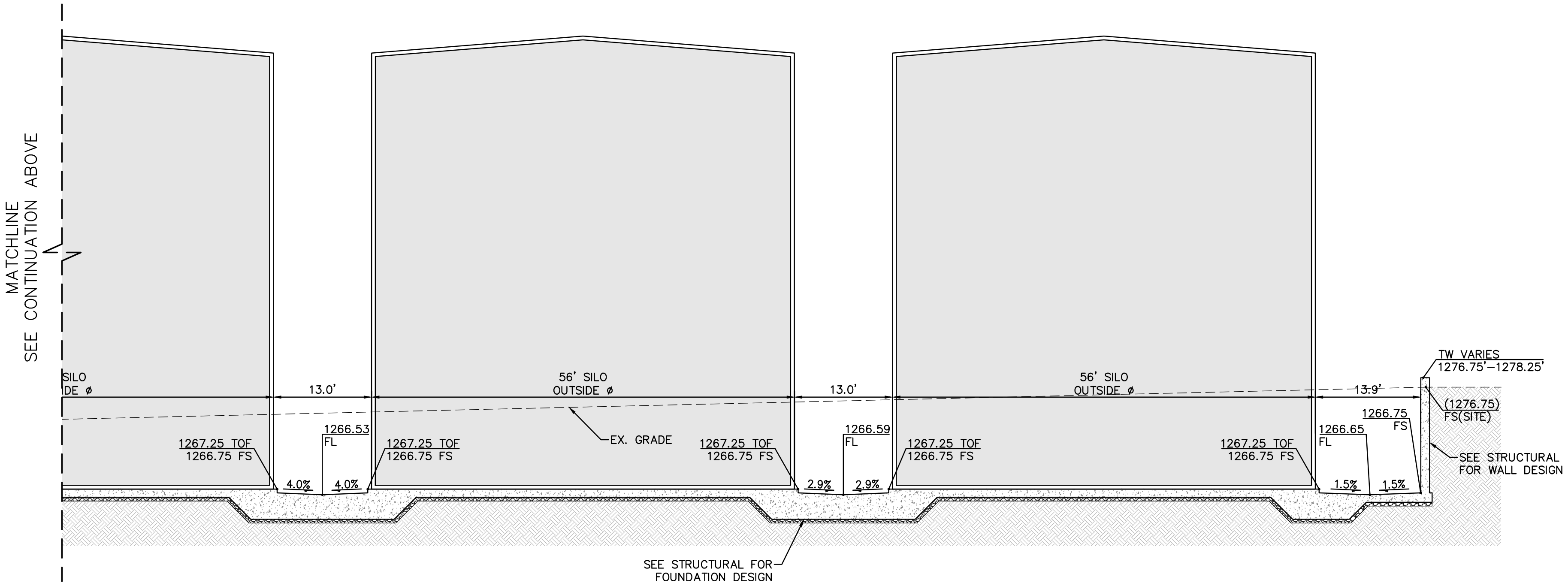

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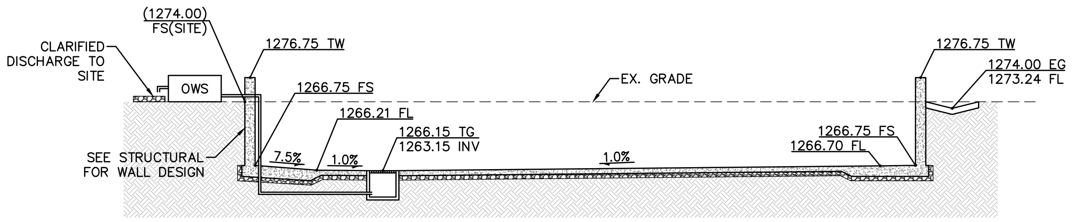

SECTION 1

SCALE: 1"=10'
(SOUTH/NORTH, LOOKING WEST)

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REGISTERED PROFESSIONAL ENGINEER
ROBERT T RUSSELL
No. C–84132
Exp. 09–30–2021
CIVIL
STATE OF CALIFORNIA
NOT FOR CONSTRUCTION

MARK	REVISIONS	APPR	DATE

COUNTY OF SAN BERNARDINO
LAND USE SERVICES

RECOMMENDED BY:

DATE

APPROVED BY:

DATE

CONTAINMENT PIT GRADING
SECTIONS

SITE TRANSLOADING AREA & CONTAINMENT
PIT FOR BIOFUEL STORAGE

FONTANA, CA 92335

FILE NO.

C-2.2

SHEET 6 OF 7

SEPARATION By Design

Aboveground Oil/ Water Separator

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Aboveground Oil/ Water Separator

Product Specifications

Cost Effective

Dramatically save over other disposal methods.

- Avoid EPA disposal fees.
- Portability lowers initial investment costs (over in-ground solutions), allows the unit to be used in various locations, and maintains its resale value.
- Unit can be rented out for additional income.

Application & Usage

SBD's Oil/Water Separator can be used anywhere where contained water can be contaminated with oil:

- Bulk Oil & Fuel Terminals
- Material Handling Facilities
- Refineries
- Utilities
- Petro Chemical Plants
- Military Installations
- Tank Farms
- Loading Dock Areas
- Elevator Shafts
- Flood & Other Disasters

Low Maintenance

Let the Oil/Water Separator do the work for you.

- Automatic start and stop.
- Controlled flow rate requires less monitoring.
- Visual alarm shows when oil containment area is full.
- Optional phone modem alerts remote location when containment area is full.
- Thermostatically controlled heater prevents freezing.
- Elevation is not of concern when discharging.

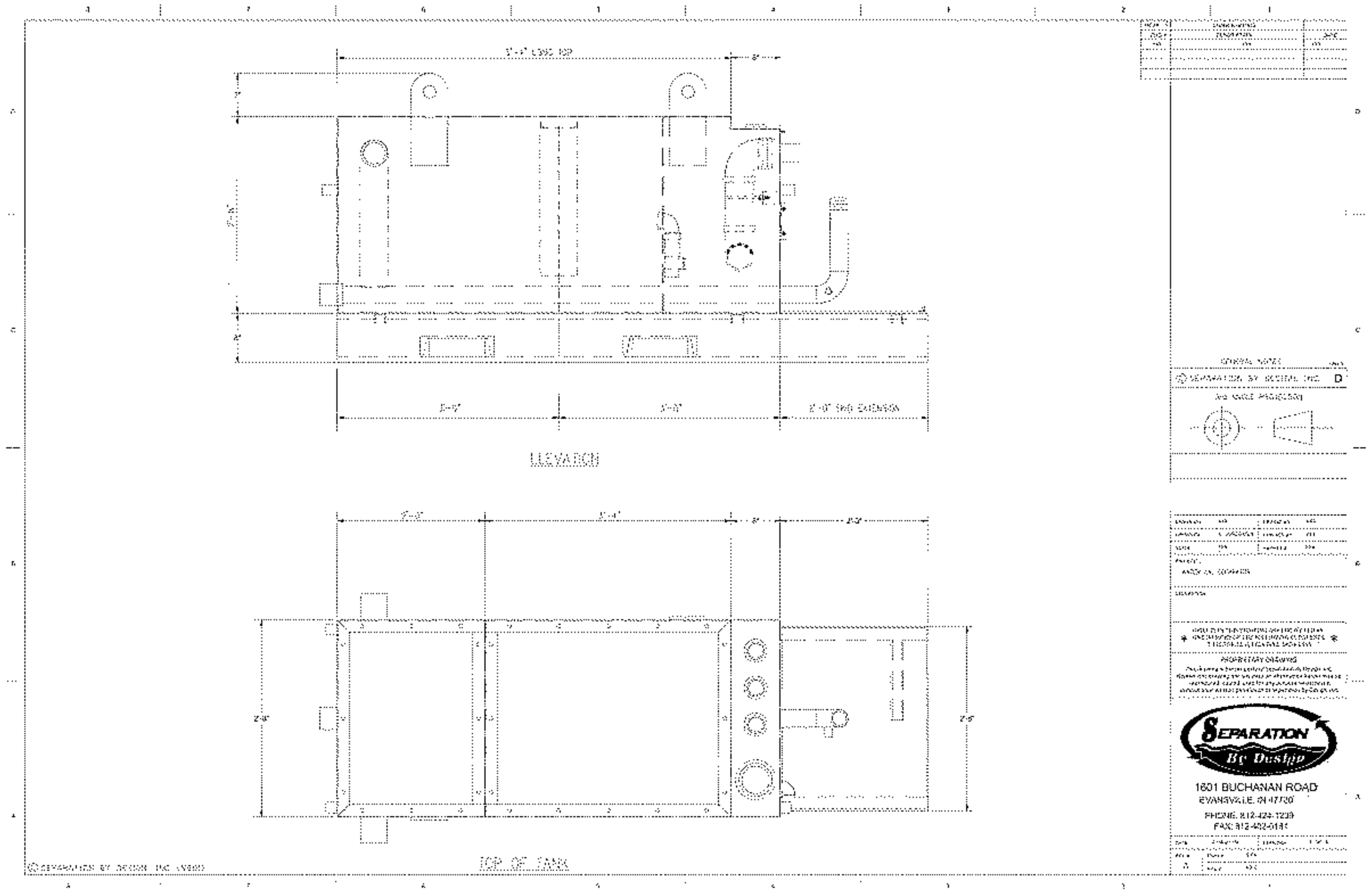
Safe to Use

Every detail was considered to ensure safe disposal.

- Explosion-proof diaphragm pump minimizes oil agitation.
- UL listed electronics are intrinsically safe for Class 1; Groups A, B, C & D and Class 2: Groups E, F & G.
- Other electronics are available for other applications.
- Lock out, tag out panel prevents tampering.
- Automatic shutdown to prevent overflows.

Contact us today to discuss how to satisfy your oil disposal needs in a way that's both smart and affordable.

SEPARATION By Design



Underground Service Alert

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PLANS PREPARED BY:

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(310) 614-4116
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ROBERT T RUSSELL
No. C-84132
Exp. 09-30-2021
NOT FOR CONSTRUCTION

MARK	REVISIONS	APPR	DATE

COUNTY OF SAN BERNARDINO
LAND USE SERVICES

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WQMP DETAILS

SITE TRANSLOADING AREA & CONTAINMENT PIT FOR BIOFUEL STORAGE

FONTANA, CA 92335

FILE NO.

C-3.0

SHEET 7 OF 7

APPENDIX B

SOILS REPORT

Proposed Biodiesel Project

Geotechnical Engineering Report

December 14, 2022 | Terracon Project No. CB225189

Prepared for:

BNSF Railway
740 E. Carnegie Drive
San Bernardino, California 92408

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December 14, 2022

BNSF Railway
740 E. Carnegie Drive
San Bernardino, California 92408

Attn: Jason Sanchez
P: 909-386-4470
E: Jason.Sanchez@bnsf.com

Re: Geotechnical Engineering Report
Proposed Biodiesel Project
Muscat Yard
Fontana, California
Terracon Project No. CB225189

Dear Mr. Sanchez:

We have completed the scope of Geotechnical Engineering services for the above referenced project in general accordance with Terracon Proposal No. PCB225189 dated October 28, 2022. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations and floor slabs for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon

Sean Paroski, EIT	Keith P. Askew, PE, GE
Staff Engineer	Department Manager

Table of Contents

Attachments

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed diesel storage tanks, pipeline, and pump house to be located at Muscat Yard in Fontana, California. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Seismic site classification per CBC
- Site preparation and earthwork
- Foundation design and construction
- Floor slab design and construction
- Lateral earth pressures
- Pavement sections

The geotechnical engineering Scope of Services for this project included the advancement of test borings, laboratory testing, engineering analysis, and preparation of this report.

Drawings showing the site and boring locations are shown on the Site Location and Exploration Plan, respectively. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs and/or as separate graphs in the Exploration Results section.

Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	A conceptual development plan prepared by Separation by Design was received via email on October 19, 2022. The conceptual plan was appended with requested boring locations. The scope was discussed with the project team during a teleconference on October 21, 2022, and a list of project design elements was received by email on October 21, 2022.

Item	Description
Project Description	The project consists of a biodiesel loading facility, including six reservoirs with a diameter of 55 feet, concrete loadout/containment pads, pipe bridges, and heavy-duty pavement capable of supporting heavy truck loading. The project is located within the Muscat Yard, an approximately 9.5-acre site.
Proposed Structure	Structures associated with the project includes six reservoirs, six concrete loadout/containment pads, pipe bridges and new pavement. The project also includes constructing six new industrial side-tracks. Design of the new tracks (subgrade preparation, subballast, ballast) was not requested and will be provided by others.
Construction Details	The design of the reservoirs was not provided. We assumed they will be of steel construction with concrete ringwall or concrete mat foundations. The capacity of each reservoir is approximately 1.1 million gallons. The pipe bridges will support 12-inch diameter pipes. The loadout/containment pads will be 8 inches thick with a double mat construction.
Finished Floor Elevation	Finished floor elevations were not provided. They are assumed to be at or near existing grade of approximately 1,266 feet (loadout/containment) and 1,270 to 1,274 for the reservoirs.
Maximum Loads	Anticipated structural loads were not provided. In the absence of information provided by the design team, we used the following loads in estimating settlement based on our experience with similar projects. ■ Fuel tanks: 2,650 psf ■ Bridge foundations: 50 kips
Grading/Slopes	The site is relatively planar and significant cuts and/or fills are not anticipated.
Below-Grade Structures	Except for buried utilities, below-grade structures are not anticipated.
Free-Standing Retaining Walls	None anticipated
Pavements	Paved driveway and parking will be constructed on approximately 8 ½ acres of the parcel. A preferred pavement surfacing has not been identified to us as part of the preliminary information. Asphalt/Concrete surfacing

Item	Description
	is common in the area for projects of this nature and is the assumed preference. Unless information is provided prior to the report, the anticipated ACI traffic categories and daily truck traffic will be assumed to consist of: ■ Category D: Heavy duty trucks, 25 trucks per day We assume that the traffic classification for asphalt concrete will consist of: ■ Class IV: Heavy trucks, up to 25 fully loaded 5-axle semi-trailers per day The pavement design period is 20 years.
Stormwater	Requirements for infiltration testing were not indicated. Infiltration testing is not included within our scope.
Design Criteria	CBC 2022 BNSF Standards and Specifications American Railway Engineering and Maintenance-of-Way Association (AREMA)

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located at Muscat Yard in Fontana, California, approximately 9½ acres located behind the Ferrellgas building located at 15559 Foothill Blvd, Fontana, CA 92335. Center of site: 34.1041° N / 117.4653° W (approximate) See Site Location
Existing Improvements	The site is a previously graded rail yard. One industrial side track traverses the yard. This track will be removed as part of site development. Another industrial lead track is located along the eastern site boundary.

Current Ground Cover	Surfaced with gravel and earth. Light vegetation is visible on portions of the site on Google Earth.
Existing Topography	Slopes gradually downward from Foothill Boulevard, from elevation 1,279 feet to elevation 1,258 feet per Google Earth.

Geotechnical Characterization

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project.

Subsurface soils encountered in our borings generally consisted of medium dense to very dense sands and gravels with varying amounts of silt extending to the maximum depth of the borings to 86 feet below existing ground surface (bgs). Fill soil consisting of silty sand was encountered in borings B-3 and B-4 to depths of approximately 3 to 5 feet bgs. A surface layer of highly weathered asphalt up to 3 inches thick was encountered in borings B-2, B-5, and B-6. Refusal was encountered on concrete immediately under the asphalt and aggregate base layer in boring B-5.

The individual logs can be found in the Exploration Results attachment of this report.

Groundwater

The borings were advanced using a hollow-stem auger drilling technique that allow short term groundwater observations to be made while drilling. Seepage was encountered at approximately 80 feet bgs in boring B-2. According to groundwater data collected from a nearby well with State Well No. 01S06W12P001S (approximately 0.7 miles south of the project site) historic high groundwater levels were recorded at greater than 300 feet bgs.[1] Groundwater conditions may change because of seasonal variations in rainfall, runoff, and other conditions not apparent at the time of drilling. Long-term groundwater monitoring was outside the scope of services for this project. Groundwater conditions may be different at the time of construction.

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[1] Data collected from the California State Groundwater Management Agency's Data Viewer website (https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#gwlevels)

Laboratory Results

Laboratory tests were conducted on selected soil samples and the test results are presented in the Exploration Results section and on the boring logs. To evaluate the potential deformation that may be caused by the addition of water to subsurface soils, hydroconsolidation testing was performed on selected, relatively undisturbed samples. The test results indicate a collapse potential of 0.8% (B-1 at 5 feet), and 1.1% (B-2 at 2.5 feet) when saturated under a confining pressure of 2,000 psf. A modified proctor test was conducted on a bulk soil sample collected from boring B-1 from 1 – 5 feet bgs (resulting in a maximum dry density of 131 pcf and an optimum water content of 7.2%) and boring B-3 from 1 – 5 feet bgs (resulting in a maximum dry density of 135 pcf and an optimum water content of 5.4%).

Seismic Design Considerations

Seismic Design Parameters

Based on the soil properties encountered at the site and as described on the exploration logs and results, it is our opinion that the Seismic Site Classification is C. The 2022 California Building Code (CBC) Seismic Design Parameters have been generated using the SEAOC/OSHPD Seismic Design Maps Tool. This web-based software application calculates seismic design parameters in accordance with ASCE 7-16 and 2022 CBC. The seismic design parameters for the tower and support structures are based on seismic design category and mapped acceleration parameters modified for soil profile. The seismic design parameters according to the 2022 CBC are provided in the following table.

Description	Value
2022 California Building Code Site Classification (CBC) [1]	C [2]
Site Latitude (°N)	34.1041
Site Longitude (°W)	117.4653
S_S Spectral Acceleration for a 0.2-Second Period	1.978
S_1 Spectral Acceleration for a 1-Second Period	0.746
F_a Site Coefficient for a 0.2-Second Period	1.2
F_v Site Coefficient for a 1-Second Period	1.4
PGA_M Site Modified Peak Ground Acceleration	1.019
De-aggregated Modal Magnitude [3]	7.9

1. Seismic site classification in general accordance with the *2019 California Building Code*.
2. The 2022 California Building Code (CBC) requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope does not include the 100-foot soil profile determination. Borings were extended to a maximum depth of 86 feet, and this seismic site class definition considers that similar or denser soils continue below the maximum depth of the subsurface exploration. Additional exploration to deeper depths would be required to confirm the conditions below the current depth of exploration.
3. These values were obtained using the on-line Unified Hazard Tool by the USGS (https://earthquake.usgs.gov/hazards/interactive/) for a return period of 2% in 50 years accessed.

A site-specific ground motion study may generate less conservative coefficients and acceleration values which may reduce construction costs. We recommend consulting with a structural engineer to evaluate the need for such study and its potential impact on construction costs. Terracon should be contacted if a site-specific ground motion study is desired.

Liquefaction

Liquefaction is a mode of ground failure that results from the generation of high pore-water pressures during earthquake ground shaking, causing loss of shear strength, and is typically a hazard where loose sandy soils exist below groundwater. San Bernardino County has designated certain areas as potential liquefaction hazard zones. These are areas considered at a risk of liquefaction-related ground failure during a seismic event, based upon mapped surficial deposits and the presence of a relatively shallow water table.

The subsurface materials generally consist of medium dense to very dense sands and gravels with varying amounts of silt extending to the maximum depth of the borings approximately 86 feet bgs. Groundwater was not encountered during the course of drilling and has historically been greater than 100 feet bgs.

According to the County of San Bernardino geologic hazard maps, the site is not located within an area having liquefaction potential. Based on the subsurface conditions encountered and the depth to groundwater, the potential for liquefaction at the site is low.

Geotechnical Overview

The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the test borings, provided that the recommendations provided in this report are implemented in the design and construction phases of this project.

We recommend that the proposed fuel tanks be supported by shallow foundation system (ring-foundation or mat slab) supported on engineered fill. The loadout/containment pads may be supported on a mat foundation system bearing on engineered fill. The pipe bridge may be supported by either shallow spread footings bearing on engineered fill or drilled piers.

The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the Exploration Results), engineering analyses, and our current understanding of the proposed project. The General Comments section provides an understanding of the report limitations.

Earthwork

Earthwork is anticipated to include demolition, clearing and grubbing, excavations, and engineered fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

Site Preparation

Strip and remove existing vegetation, debris, pavements, and other deleterious materials from proposed building areas. Exposed surfaces should be free of mounds and depressions which could prevent uniform compaction. The site should be initially graded to create a relatively level surface to receive fill, and provide for a relatively uniform thickness of fill beneath proposed building structures.

Fill materials were encountered in the areas around borings B-3 to and B-4 to depths of approximately 3 to 5 feet bgs. The fill soils consisted of silty sand and are likely associated with the previous development of the site.

Terracon does not have any documentation to show if the grading operations were monitored or the fill materials were compacted and tested when placed. If such documentation exists, Terracon should be notified and the recommendations in this report appropriately modified as needed. We recommend that undocumented fill soils be removed within the proposed building area.

In addition, concrete or cemented material was encountered near the surface in boring B-5 that prevented the advancement of a hollow-stem auger. Our field exploration was unable to determine the lateral extent of this material or its estimated depth. We recommend that this material be removed within the proposed building area.

Evidence of utilities such as manhole covers or utility markings were not observed onsite. Although no evidence underground facilities such as septic tanks, cesspools, or basements was observed during the site reconnaissance, such features could be encountered during construction. If unexpected fills, utilities, or underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Subgrade Preparation

We recommend that the soils within the footprint of the proposed structures be removed to a minimum depth of 1 foot below the bottom of foundations, or to 3 feet below existing grades, whichever is greater, and replaced with engineered fill. On-site soils are considered suitable to be used as structural fill materials. Structural fill placed beneath the entire footprint of the building should extend horizontally a minimum distance of 1 foot beyond the outside edge of footings.

Subgrade soils beneath exterior slabs and pavements should be removed to a depth of 1 foot beneath existing grade, or below bottom of slab or pavement section including any base materials. The exposed surface should then be scarified, moisture conditioned, and compacted to a minimum depth of 10 inches. In the event the demolition activities result in disturbance of deeper soils, the subgrade preparation and compaction should extend to the depth of undisturbed soils.

All exposed areas which will receive fill, once properly cleared and benched where necessary, should be scarified to a minimum depth of 10 inches, moisture conditioned, and compacted per the compaction requirements in this report. Fill soils should then be placed to the design grades in accordance with the compaction requirements outlined in this report. The moisture content and compaction of subgrade soils should be maintained until foundation, slab, or pavement construction.

Based upon the subsurface conditions determined from the geotechnical exploration, subgrade soils exposed during construction are anticipated to be relatively workable. However, the workability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors. If unworkable conditions develop, workability may be improved by scarifying and drying.

Excavation

Excavation penetrating the dense soils, gravels, cobbles, and concrete or cemented material may require the use of specialized heavy-duty equipment, to facilitate rock break-up and removal. Consideration should be given to obtaining a unit price for difficult excavation in the contract documents for the project.

Excavation

The bottom of excavations should be thoroughly cleaned of loose soils and disturbed materials prior to backfill placement and/or construction.

Onsite soils consist of cohesionless sandy soils. Such soils have the tendency to cave and slough during excavations. Therefore, formwork may be needed for foundation excavations.

Individual contractors are responsible for designing and constructing stable, temporary excavations. Excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current OSHA excavation and trench safety standards.

Fill Material Types

All fill materials should be inorganic soils free of vegetation, debris, and fragments larger than 6 inches in size. Pea gravel or other similar non-cementitious, poorly-graded materials should not be used as fill or backfill without the prior approval of the geotechnical engineer.

Clean on-site soils or approved imported materials may be used as fill material for the following:

- general site grading
- foundation areas
- pavement areas
- foundation backfill
- exterior slab areas

Imported Fill Materials: Imported fill materials should meet the following material property requirements. Regardless of its source, compacted fill should consist of approved materials that are free of organic matter and debris.

Gradation	Percent Finer by Weight (ASTM C 136)
3″	100
No. 4 Sieve	50-100
No. 200 Sieve	10-40

- Liquid Limit .... 30 (max)
- Plasticity Index .... 15 (max)
- Maximum expansion index* .... 20 (max)

*ASTM D 4829

The contractor shall notify the Geotechnical Engineer of import sources sufficiently ahead of their use so that the sources can be observed and approved as to the physical characteristic of the import material. For all import material, the contractor shall also submit current verified reports from a recognized analytical laboratory indicating that the import has a "not applicable" (Class S0) potential for sulfate attack based upon current ACI criteria and is "mildly corrosive" to ferrous metal and copper. The reports shall be accompanied by a written statement from the contractor that the laboratory test results are representative of all import material that will be brought to the job.

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Fill lifts should not exceed 10 inches loose thickness.

Fill Placement and Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Material Type and Location	Per the Modified Proctor Test (ASTM D 1557)		
	Minimum Compaction Requirement (%)	Range of Moisture Contents for Compaction Above Optimum	
		Minimum	Maximum
On-site granular soils and low volume change imported fill:			
Beneath foundations	90	0%	+3%
Beneath slabs	90	0%	+3%
Miscellaneous backfill	90	0%	+3%
Utility trenches [1]	90	0%	+3%
Bottom of excavation receiving fill	90	0%	+3%

1. Upper 12 inches should be compacted to 95% within pavement and structural areas. Low-volume change imported soils should be used in structural areas.

Utility Trench Backfill

Any soft or unsuitable materials encountered at the bottom of utility trench excavations should be removed and replaced with structural fill or bedding material in accordance with public works specifications for the utility being supported. This recommendation is particularly applicable to utility work requiring grade control and/or in areas where subsequent grade raising could cause settlement in the subgrade supporting the utility. Trench excavation should not be conducted below a downward 1:1 projection from existing foundations without engineering review of shoring requirements and geotechnical observation during construction.

On-site materials are considered suitable for backfill of utility and pipe trenches from 1 foot above the top of the pipe to the final ground surface, provided the material is free of organic matter and deleterious substances.

Trench backfill should be mechanically placed and compacted as discussed earlier in this report. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Where trenches are placed beneath slabs or footings, the backfill should satisfy the gradation and expansion index requirements of engineered fill discussed in this report. Flooding or jetting for placement and compaction of backfill is not recommended.

Grading and Drainage

Positive drainage should be provided during construction and maintained throughout the life of the development. Infiltration of water into utility trenches or foundation excavations should be prevented during construction. Planters and other surface features which could retain water in areas adjacent to the building or pavements should be sealed or eliminated. In areas where sidewalks or paving do not immediately adjoin the structure, we recommend that protective slopes be provided with a minimum grade of approximately 5 percent for at least 10 feet from perimeter walls. Backfill against footings, exterior walls, and in utility and sprinkler line trenches should be well compacted and free of all construction debris to reduce the possibility of moisture infiltration.

Roof drainage should discharge into splash blocks or extensions when the ground surface beneath such features is not protected by exterior slabs or paving. Sprinkler systems and landscaped irrigation should not be installed within 5 feet of foundation walls.

Exterior Slab Design and Construction

Exterior slabs-on-grade, exterior architectural features, and utilities founded on, or in backfill may experience some movement due to the volume change of the backfill. To reduce the potential for damage caused by movement, we recommend:

- minimizing moisture increases in the backfill;
- controlling moisture-density during placement of backfill;
- using designs which allow vertical movement between the exterior features and adjoining structural elements;
- placing effective control joints on relatively close centers.

Earthwork Construction Considerations

Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of grade-supported improvements such as floor slabs and pavements. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction.

We recommend that the earthwork portion of this project be completed during extended periods of dry weather if possible. If earthwork is completed during the wet season (typically November through April) it may be necessary to take extra precautionary measures to protect subgrade soils. Wet season earthwork operations may require additional mitigative measures beyond that which would be expected during the drier summer and fall months. This could include diversion of surface runoff around exposed soils and draining of ponded water on the site. Once subgrades are established, it may be necessary to protect the exposed subgrade soils from construction traffic.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred.

Excavations or other activities resulting in ground disturbance have the potential to affect adjoining properties and structures. Our scope of services does not include review of available final grading information or consider potential temporary grading performed by the contractor for potential effects such as ground movement beyond the project limits. A preconstruction/ precondition survey should be conducted to document nearby property/infrastructure prior to any site development activity. Excavation or ground disturbance activities adjacent or near property lines should be monitored or instrumented for potential ground movements that could negatively affect adjoining property and/or structures.

Construction Observation and Testing

The earthwork efforts should be observed by the Geotechnical Engineer (or others under their direction). Observation should include documentation of adequate removal of surficial materials (vegetation, topsoil, and pavements), evaluation and remediation of existing fill materials, as well as proofrolling and mitigation of unsuitable areas delineated by the proofroll.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, as recommended by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. Where not specified by local ordinance, one density and water content test should be performed for every 50 linear feet of compacted utility trench backfill and a minimum of one test performed for every 12 vertical inches of compacted backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated by the Geotechnical Engineer. If unanticipated conditions are observed, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

Shallow Foundations

If the site has been prepared in accordance with the requirements noted in Earthwork, the following design parameters are applicable for shallow foundations.

Ring Foundation – Design Recommendations

Item	Description
Foundation Type	Reinforced concrete ring-wall foundations
Maximum Net Allowable Bearing Pressure [1, 2]	3,000 psf
Required Bearing Stratum [3]	Engineered fill extending to a minimum depth of 1 foot below the bottom of foundations, or 3 feet below existing grades, whichever is greater.
Minimum Foundation Dimensions	24 inches
Minimum Embedment below Finished Grade [4]	24 inches
Estimated Total Settlement from Structural Loads [2]	Less than 1 inch
Estimated Differential Settlement [2, 5]	About 1/2 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation.
2. Values provided are for maximum loads noted in Project Description. Additional geotechnical consultation will be necessary if higher loads are anticipated.
3. Unsuitable, loose, or soft soils should be overexcavated and replaced per the recommendations presented in Earthwork.
4. Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.
5. Differential settlements are noted for equivalent-loaded foundations and bearing elevation as measured over a span of 50 feet.

Conventional Foundation – Design Recommendations

Item	Description
Foundation Type	Conventional Shallow Spread Footings
Maximum Net Allowable Bearing Pressure [1, 2]	3,000 psf
Required Bearing Stratum [3]	Engineered fill extending to a minimum depth of 1 foot below the bottom of foundations, 3 feet below existing grades, whichever is greater.
Minimum Foundation Dimensions	Columns: 24 inches wide
Minimum Embedment below Finished Grade [4]	24 inches
Ultimate Passive Resistance [5]	435 pcf
Ultimate Coefficient of Sliding Friction [6]	0.43
Estimated Total Settlement from Structural Loads [2]	Less than 1 inch
Estimated Differential Settlement [2, 7]	About 1/2 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation.
2. Values provided are for maximum loads noted in Project Description. Additional geotechnical consultation will be necessary if higher loads are anticipated.
3. Unsuitable or soft soils should be overexcavated and replaced per the recommendations presented in Earthwork.
4. Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.
5. Use of passive earth pressures requires the footing forms be removed and compacted structural fill be placed against the vertical footing face. A factor of safety of 2.0 is recommended.
6. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions. A factor of safety of 1.5 is recommended.
7. Differential settlements are noted for equivalent-loaded foundations and bearing elevation as measured over a span of 40 feet.

Mat Foundation Design Recommendations

Item	Description
Foundation Support	Engineered fill extending to a minimum depth of 1 foot below the bottom of foundations, or 3 feet below existing grades, whichever is greater.
Net Allowable Bearing pressure [1, 2] (On-site soils or structural fill)	3,000 psf (for widths 5 to 15 feet)
Minimum Embedment Depth	12 inches
Estimated Total Static Settlement from Structural Loads [2]	about 1 inch
"Estimated Differential Settlement [2, 5]	About 1/2 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied.
2. Values provided are for maximum loads noted in Project Description. The foundation settlement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footings, the thickness of compacted fill, and the quality of the earthwork operations.
3. Use of passive earth pressures requires the footing forms be removed and compacted structural fill be placed against the vertical footing face. A factor of safety of 2.0 is recommended.
4. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions. A factor of safety of 1.5 is recommended.
5. Differential settlements are as measured over a span of 40 feet.

A modulus of subgrade reaction (Kv_1) of 200 pounds per cubic inch (pci) should be used. Other details including treatment of loose foundation soils, superstructure reinforcement and observation of foundation excavations as outlined in this report are applicable for the design and construction of a mat foundation at the site.

The subgrade modulus (Kb) for the mat is affected by the size of the mat foundation and would vary according the following equation:

$$Kb = Kv_1 \times (B+1)^2 / 4B^2$$

Where: Kv_1 is the modulus of vertical subgrade reaction

B is the width of the mat foundation.

Thus for a footing width of B = 10 ft bearing on the onsite soils, the subgrade modulus would be:

$$Kb = 200 \times (10+1)^2 / (4 \times 10^2) = 60 \text{ pci}$$

Finished grade is defined as the lowest adjacent grade within five feet of the foundation. The allowable foundation bearing pressure applies to dead loads plus design live load conditions. The design bearing pressure may be increased by one-third when considering total loads that include wind or seismic conditions. The weight of the foundation concrete below grade may be neglected in dead load computations.

Foundations should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement. Foundation excavations should be observed by the geotechnical engineer. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

Foundation Construction Considerations

As noted in Earthwork, the footing excavations should be evaluated under the observation of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

Deep Foundations

Drilled pier recommendations are provided for the proposed diesel pipe bridge. We recommend drilled piers be designed and constructed as presented below.

Drilled Shaft Axial Loading

Axial compressive loads may be supported on straight-sided drilled piers. Allowable compressive side friction capacity is provided for different pile diameters (1.5 feet to 3.5 feet) in the Attachments of this report. The allowable uplift capacities should only be based on two-thirds of the allowable side friction of the shaft; however, the weight of the foundation should be added to these values to obtain the actual allowable uplift capacities for drilled shafts. The allowable skin friction and end bearing values are based on factors of safety of 2.5 and 3, respectively.

Drilled Shaft Lateral Loading

The following table lists input values for use in LPILE or GROUP analyses. Since deflection or a service limit criterion will most likely control lateral capacity design, no safety/resistance factor is included with the parameters. The table below also provides allowable passive lateral earth pressures for the lateral design of light pole foundations or other foundations.

L-Pile Design Input Parameters[1]

ique	Depth Below Finished Grade Surface (feet)		L-PILE Soil Type	Effective Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)	Allowable Passive Resistance (psf) [2]
	Top	Bottom					
1	2	5	Reese (Sand)	115	30	--	230
2	5	7.5	Reese (Sand)	116	34	--	270
3	7.5	20	Reese (Sand)	105	40	--	320

1. Default K values in LPILE may be utilized.
2. These values include a factor of safety of 1.5.

The axial and lateral capacities of the upper 2 feet should neglected. The load capacities provided herein are based on the stresses induced in the supporting soil strata. The structural capacity of the shafts/piles should be checked to assure they can safely accommodate the combined stresses induced by axial and lateral forces. Lateral deflections of shafts/piles should be evaluated using an appropriate analysis method, and will depend upon the pile's diameter, length, configuration, stiffness and "fixed head" or "free head" condition. We can provide additional analyses and estimates of lateral deflections for specific loading conditions upon request. The load-carrying capacity of shafts/piles may be increased by increasing the diameter and/or length.

Drilled Shaft Construction Considerations

Drilling for the proposed drilled shafts to design depths should be possible with conventional single flight power augers. For drilled shaft depths above the depth of groundwater, temporary steel casing will likely be required to properly drill and clean shafts prior to concrete placement.

We do not anticipate drilled shafts to extend below the depth of groundwater. However, if foundation concrete cannot be placed in dry conditions, a tremie should be used for concrete placement.

In the event drilled hole walls slough during drilling, we recommend the use of slurry drilling methods with polymers to keep the solids in suspension during the drilling. Drilled shaft foundation concrete should be placed within 6 inches of the shaft base of the slurry-filled excavation immediately after completion of drilling and cleaning. The tremie should remain inserted several feet into the fresh concrete as it displaces the slurry upward and until placement is complete. The slurry should have a sand content no greater than 1% at the time concrete placement commences. The maximum unit weight of the slurry should be established in consultation with Terracon. Due to potential sloughing and raveling, foundation concrete quantities may exceed calculated geometric volumes.

If casing is used for drilled shaft construction, it should be withdrawn in a slow continuous manner maintaining a sufficient head of concrete to prevent infiltration of water or the creation of voids in shaft concrete. Shaft concrete should have a relatively high fluidity when placed in cased shaft holes or through a tremie. Shaft concrete with slump in the range of 6 to 8 inches is recommended.

Formation of mushrooms or enlargements at the tops of shafts should be avoided during shaft drilling. If mushrooms develop at the tops of the shafts during drilling, sono-tubes should be placed at the shaft tops to help isolate the shafts.

Free-fall concrete placement in drilled shafts will only be acceptable if provisions are taken to avoid striking the concrete on the sides of the hole or reinforcing steel. The use of a bottom-dump hopper, or an elephant's trunk discharging near the bottom of the hole where concrete segregation will be minimized, is recommended.

The contractor should check for gas and/or oxygen deficiency prior to any workers entering the excavation for observation and manual cleanup. All necessary monitoring and safety precautions as required by OSHA, State or local codes should be strictly enforced.

We recommend that all drilled shaft installations be observed on a full-time basis by an experienced geotechnical engineer in order to evaluate that the soils encountered are consistent with the recommended design parameters. If the subsurface soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

Temporary steel casing may be required to properly drill and clean drilled piers prior to concrete placement. A water and polymer displacement method may also be considered as a means of maintaining pier integrity during construction. Foundation concrete should be placed immediately after completion of drilling and cleaning.

Drilled pier bearing surfaces must be thoroughly cleaned prior to concrete placement. A representative of the Geotechnical Engineer should inspect the bearing surface and foundation pier configuration. If the subsurface soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

The installation of drilled straight-shafts may likely require the use of the slurry displacement method and/or temporary steel casing with water pumps, if groundwater encountered. If drilled straight-shaft installation is attempted without utilizing slurry displacement method or temporary casing, zones of sloughing soils and/or groundwater inflow may occur during construction. Therefore, we recommend that provisions be incorporated into the plans and specifications to utilize slurry or casing to control sloughing and/or groundwater seepage during shaft construction.

Closely spaced piers should be drilled and filled alternately, allowing the concrete to set at least eight hours before drilling the adjacent pier. All excavations should be filled with concrete as soon after drilling as possible. In no event should pier holes be left open overnight. To prevent concrete from striking the walls of the pier and causing caving, the concrete should be placed with appropriate equipment so that the concrete is not allowed to fall freely more than 5 feet. All loose materials should be thoroughly cleaned from the bottom of the pier excavation.

Floor Slabs

Design parameters for floor slabs assume the requirements for Earthwork have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the subgrade beneath the floor slab.

Floor Slab Design Parameters

Item	Description
Floor Slab Support[1]	Engineered fill extending to a minimum depth of 1 foot below the bottom of foundations, or 3 feet below existing grades, whichever is greater.
Subbase	None
Estimated Modulus of Subgrade Reaction [2]	200 pounds per square inch per inch (psi/in) for point loads. (The modulus was obtained based on estimates obtained from NAVFAC 7.1 design charts). This value is for a small loaded area (1 Sq. ft or less) such as for forklift wheel loads or point loads and should be adjusted for larger loaded areas.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, when the project includes humidity-controlled areas, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut contraction joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations, refer to the ACI Design Manual. Joints or cracks should be sealed with a waterproof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Floor Slab Construction Considerations

Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed, and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should observe the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

Lateral Earth Pressures

For engineered fill comprised of on-site soils or imported low volume change materials above any free water surface, recommended equivalent fluid pressures for unrestrained foundation elements are:

ITEM	VALUE[1, 2]
Active Case	35 psf/ft
Passive Case	435 psf/ft
At-Rest Case	54 psf/ft
Coefficient of Friction	0.43

1. The values are based on engineered fill materials used as backfill.
2. Uniform, horizontal backfill, compacted to at least 90% of the ASTM D 1557 maximum dry density

The lateral earth pressures herein do not include any factor of safety and are not applicable for submerged soils/hydrostatic loading. Additional recommendations may be necessary if such conditions are to be included in the design.

Fill against foundation should be compacted to densities specified in the Earthwork section of this report.

Pavements

General Pavement Comments

Pavement designs are provided for the traffic conditions and pavement life conditions as noted in Project Description and in the following sections of this report. A critical aspect of pavement performance is site preparation. Pavement designs noted in this section must be applied to the site which has been prepared as recommended in the Earthwork section.

Pavement Design Parameters

Design of asphalt concrete (AC) pavements is based on the procedures outlined in the Caltrans "Highway Design Manual" (Caltrans, 2020). Design of Portland cement concrete (PCC) pavements are based upon American Concrete Institute (ACI) 330R-08; "Guide for Design and Construction of Concrete Parking Lots."

An estimated preliminary R-value of 50 was assumed for the subgrade soils supporting the pavement sections presented below. A modulus of subgrade reaction of 200 pci and a modulus of rupture of 600 psi were used for the PCC pavement designs.

The structural sections are predicated upon proper compaction of the utility trench backfills and the subgrade soils as prescribed by in Earthwork, with the upper 12 inches of subgrade soils and all aggregate base material brought to a minimum relative compaction of 95 percent in accordance with ASTM D 1557 prior to paving. The aggregate base should meet Caltrans requirements for Class 2 base.

The pavement designs were based upon the results of preliminary geotechnical testing and should be verified by additional sampling and R-value testing during construction when the actual subgrade soils are exposed.

Pavement Section Thicknesses

The table below provides options for AC and PCC Sections. Traffic Indices and truck traffic are assumed values and should be verified by the project Civil engineer.

Asphalt Concrete Design		
Usage	Assumed Traffic Class	Recommended Structural Section
Truck Lanes	IV[1]	6″ HMA[2]/9″ Class 2 AB[3]

1. Heavy trucks, up to 25 fully loaded 5-axle semi-trailers per day (ESAL = 2,959,968)
2. HMA = hot mix asphalt
3. AB = aggregate base

Portland Cement Concrete Design		
Layer	Assumed Traffic Category	Thickness (inches)
PCC	D[1]	7.0
Aggregate Base[2]	D	--

1. ADTT = 25 (Category D)
2. Aggregate base is not required. Compacted on-site material is considered competent.

Recommended structural sections were calculated based on assumed TIs and our preliminary sampling and testing.

Terracon does not practice traffic engineering. We recommend that the project civil engineer or traffic engineer verify that the ESALs and ADTT traffic indices used are appropriate for this project.

Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic maintenance should be anticipated. Therefore, preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Maintenance consists of both localized maintenance (e.g., crack and joint sealing and patching) and global maintenance (e.g., surface sealing). Preventive maintenance is usually the priority when implementing a pavement maintenance program. Additional engineering observation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Final grade adjacent to paved areas should slope down from the edges at a minimum 2 percent.
- Subgrade and pavement surfaces should have a minimum 2 percent slope to promote proper surface drainage.
- Install below-pavement drainage systems surrounding areas anticipated for frequent wetting.
- Install joint sealant and seal cracks immediately.
- Seal all landscaped areas in or adjacent to pavements to reduce moisture migration to subgrade soils.
- Place compacted, low permeability backfill against the exterior side of curb and gutter.
- Place curb, gutter and/or sidewalk directly on clay subgrade soils rather than on unbound granular base course materials.

Corrosivity

The results of laboratory sulfides, soluble sulfate, chlorides, electrical resistivity, redox potential, total salts, and pH testing are presented in our appendix within the

Exploration Results section. The values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Results of soluble sulfate testing indicate samples of the on-site soils tested possess negligible sulfate concentrations when classified in accordance with Table 19.3.1.1 of the ACI Design Manual. Concrete should be designed in accordance with the exposure class S0 provisions of the ACI Design Manual, Section 318, Chapter 19.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly effect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Attachments

Exploration and Testing Procedures

Field Exploration

Boring Designation	Approximate Boring Depth or Refusal (feet)	Location
B-1	50 ½	Biodiesel tanks
B-2	86	Biodiesel tanks
B-3	21 ¼	Pipe bridge
B-4	45	Biodiesel tanks
B-5A to B-5C	½	Containment pad
B-6	21	Containment pad
B-7	6 ½	Truck drive lanes

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal accuracy of about ±10 feet) and referencing existing site features. If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: We advanced the borings with a track-mounted drill rig using continuous flight hollow stem augers. Four samples were generally obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. A 3-inch O.D. split-barrel sampling spoon with 2.5-inch I.D. ring lined sampler was also used for sampling soils at the project site. Ring-lined, split-barrel sampling procedures are similar to standard split spoon sampling procedure. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with auger cuttings after their completion.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following types of tests:

- Moisture Content
- Dry Unit Weight
- Particle-size Distribution (Gradation) of Soils Using Sieve Analysis
- One-dimensional Consolidation
- Corrosion Suite

The laboratory testing program often included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in accordance with the Unified Soil Classification System.

Site Location and Exploration Plans

Contents:

Note: All attachments are one page unless noted above.

Site Location

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

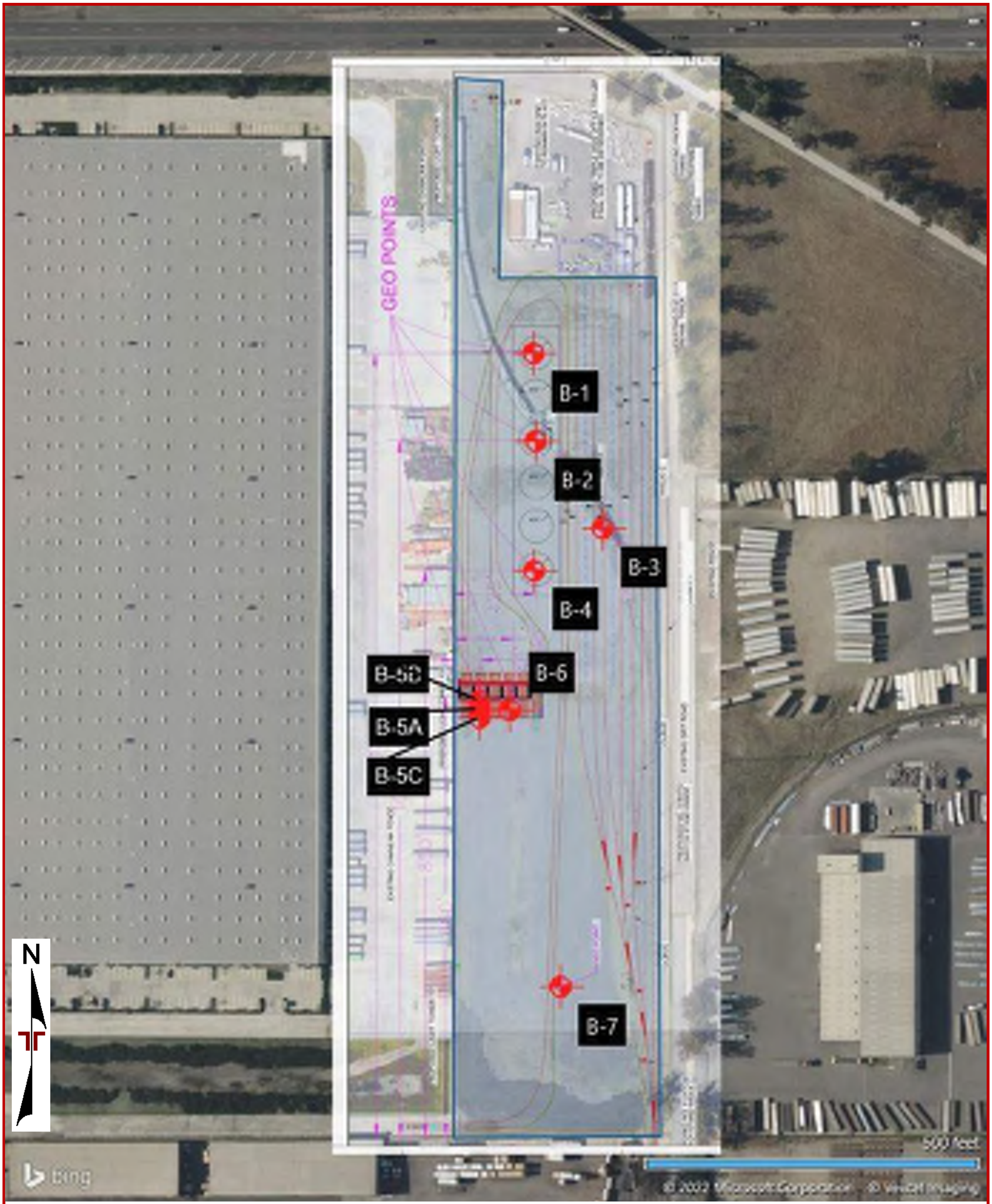


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Boring Logs (B-1 through B-7)
Grain Size Distribution
Consolidation/Swell
Modified Proctor
Corrosivity

Note: All attachments are one page unless noted above.

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 34.1052° Longitude: -117.4653°

Graphic Log Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	POORLY GRADED SAND WITH GRAVEL (SP), gravel up to 2.5", fine to coarse grained, olive brown, medium dense								
				⧗	27-26-27	0.8	111		4
5.0	**POORLY GRADED GRAVEL WITH SAND (GP)**, gravel up to 3", fine to coarse grained, olive brown, dense	5		⧗	28-31-30	1.6			
	very dense			⧗	21-50/5"				4
	medium dense	10		⧗	14-20-21	1.2	122		
	cobbles, medium to coarse grained, brown, very dense	15		☒	24-34-50/6"				4
		20		☒	7-50/2"				
		25		☒	46-50/3"				
		30							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

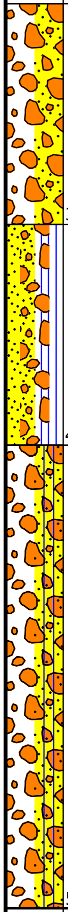
Boring Started
11-22-2022

Boring Completed
11-22-2022

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 34.1052° Longitude: -117.4653°



Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	POORLY GRADED GRAVEL WITH SAND (GP), gravel up to 3", fine to coarse grained, olive brown, dense *(continued)*			☒	36-50/2"				
35.0	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, gravel up to 3", fine to coarse grained, olive brown, very dense	35		☒	45-47-13 N=60				9
40.0	**POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, gravel up to 3", fine to coarse grained, olive brown, very dense	40			50/1"				
		45			50/1"				
		50		☒	50/6"				
50.5	***Boring Terminated at 50.5 Feet***								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

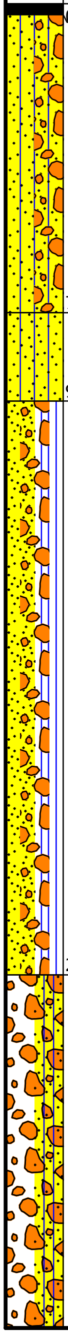
Boring Completed
11-22-2022

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 34.1048° Longitude: -117.4653°



Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
0.3	**ASPHALT**, 3 inches thick, highly weathered								
	SILTY SAND WITH GRAVEL (SM), light brown, medium dense			⧗	26-25-23	1.0	123		16
		5		⧗	16-22-28	1.2	121		
7.0	**SILTY SAND (SM)**, olive brown, medium dense			⧗	8-10-12	11.1	111	NP	45
9.0	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, olive brown, very dense	10		⧗	22-50/6"	2.5	97		
	dense	15		☒	24-34-29 N=63				7
	very dense	20		☒	31-23-50/2"				
22.0	**POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, bluish gray, very dense	25		☒	39-50/5"				6
		30							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
▽ While drilling
▽ At completion of drilling

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
11-21-2022

Boring Completed
11-21-2022

Notes

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-2

Graphic Log	Location: See Exploration Plan Latitude: 34.1048° Longitude: -117.4653° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
▨	**POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, bluish gray, very dense *(continued)*			☒	50/4"				
		35		☒	50/5"				
		40		☒	25-45-50/3"				
		45		☒	50/5"				
		50		☒	21-50/5"				
	dense	55		☒	15-35-49 N=84				6
		60							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
▽ While drilling
▽ At completion of drilling

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
11-21-2022

Boring Completed
11-21-2022

Notes

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 34.1048° Longitude: -117.4653°

Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), bluish gray, very dense *(continued)* very dense			☒	33-44-50/6"				
		65		☒	50/6"				
		70		☒	50/5"				
		75		☒	50/5"	6.7			
		80	▽ ▽	☒	50/4"	3.3			
		85		☒	50/4"	9.8			
86.0	***Auger Refusal on Boulder at 86 Feet***			☒	50/2"				

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
▽ While drilling
▽ At completion of drilling

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
GA

Boring Started
11-21-2022

Boring Completed
11-21-2022

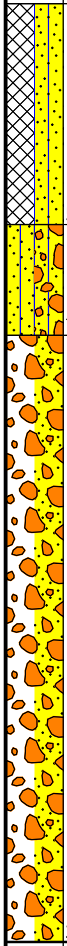
Proposed Biodiesel Project, BNSF Muscat Yard
15559 Foothill Blvd | Fontana, CA
Terracon Project No. CB225189

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-3

Location: See Exploration Plan

Latitude: 34.1045° Longitude: -117.4650°



Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	FILL - SILTY SAND (SM), fine to medium grained, olive brown with black, medium dense				6-8-15	8.1	106		
5.0	**SILTY SAND WITH GRAVEL (SM)**, gravel up to 3", fine to coarse grained, olive brown, medium dense	5			18-16-24	2.7	113		
7.5	**POORLY GRADED GRAVEL WITH SAND (GP)**, gravel up to 3", medium to coarse grained, olive brown, very dense				50/6"	0.8	104		
		10			30-50/2"				
		15			31-30-50/2"				
21.3		20			19-36-50/3"				
	Boring Terminated at 21.25 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

Boring Log No. B-4

Location: See Exploration Plan

Latitude: 34.1043° Longitude: -117.4653°

Graphic Log	Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	3.0	**FILL - SILTY SAND (SM)**, trace gravel up to 1", fine to medium grained, olive brown								
	5.0	**SILTY SAND WITH GRAVEL (SM)**, gravel up to 2", fine to coarse grained, olive brown, medium dense			⧗	15-13-17	1.7	117		
	10.0	**POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, gravel up to 3", fine to coarse grained, olive brown, medium dense	5		⧗	23-25-23	1.8	122		7
					⧗	22-23-23	2.1	121		
	20.0	**POORLY GRADED SAND (SP)**, trace gravel up to 1", medium to coarse grained, medium dense	10		⧗	23-24-24	1.5	109		4
		dense	15		☒	19-20-23 N=43				
		POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), gravel up to 2", medium to coarse grained, olive brown, very dense	20		☒	29-38-46 N=84				9
		gray	25		☒	34-34-50/2"				
			30							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

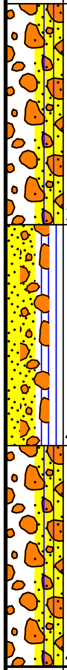
Boring Completed
11-22-2022

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-4

Location: See Exploration Plan

Latitude: 34.1043° Longitude: -117.4653°



Graphic Log	Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), gravel up to 2", medium to coarse grained, olive brown, very dense *(continued)*			☒	15-45-43 N=88				
	35.0 **POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, gravel up to 2", medium to coarse grained, olive brown, very dense	35		☒	22-23-50/4"				10
	40.0 **POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, gravel up to 2", medium to coarse grained, gray, very dense	40		☒	50/6"				8
	45.0 ***Auger Refusal on Cobbles at 45 Feet***	45			50/0"				

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

Proposed Biodiesel Project, BNSF Muscat Yard
15559 Foothill Blvd | Fontana, CA
Terracon Project No. CB225189

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-5A

Location: See Exploration Plan

Latitude: 34.1037° Longitude: -117.4656°

Graphic Log	Depth (Ft.)		Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	0.3	**ASPHALT**, 3 inches thick, highly weathered								
	0.5	**AGGREGATE BASE COURSE**, 3 inches thick								
		Auger Refusal on Concrete at 0.5 Foot								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

Boring Log No. B-5B

Graphic Log	Location: See Exploration Plan Latitude: 34.1038° Longitude: -117.4656° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	0.3 **ASPHALT**, 3 inches thick, highly weathered								
	0.5 **AGGREGATE BASE COURSE**, 3 inches thick								
	Auger Refusal on Concrete at 0.5 Foot								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

Boring Log No. B-5C

Graphic Log	Location: See Exploration Plan Latitude: 34.1037° Longitude: -117.4656° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	0.3 **ASPHALT**, 3 inches thick, highly weathered								
	0.5 **AGGREGATE BASE COURSE**, 3 inches thick								
	Auger Refusal on Concrete at 0.5 Foot								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

Proposed Biodiesel Project, BNSF Muscat Yard
15559 Foothill Blvd | Fontana, CA
Terracon Project No. CB225189

1355 E Cooley Dr, Ste C
Colton, CA

Boring Log No. B-6

Location: See Exploration Plan

Latitude: 34.1037° Longitude: -117.4654°

Graphic Log	Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	SILTY SAND WITH GRAVEL (SM), gravel up to 3", fine to coarse grained, olive brown, medium dense				10-9-18	7.2	112		
	5.0 **POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, gravel up to 3", fine to coarse grained, dense	5			20-27-43	1.8			
					19-25-44	2.2	124		
	very dense	10			18-50/3"				
		15			25-50/3"				
	21.0	20			21-50/4"				
	Boring Terminated at 21 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

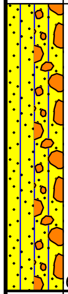
Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

Boring Completed
11-22-2022

Boring Log No. B-7

Graphic Log	Location: See Exploration Plan Latitude: 34.1026° Longitude: -117.4652° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	**SILTY SAND WITH GRAVEL (SM)**, gravel up to 3", fine to coarse grained, olive brown, dense								
					43-44-47	5.0	119		
		5			12-25-34	3.1	122		
	6.5								
	Boring Terminated at 6.5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations
Groundwater not encountered

Advancement Method
8 in. Hollow-stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME-75

Hammer Type
Automatic

Driller
2R Drilling

Logged by
SP

Boring Started
11-22-2022

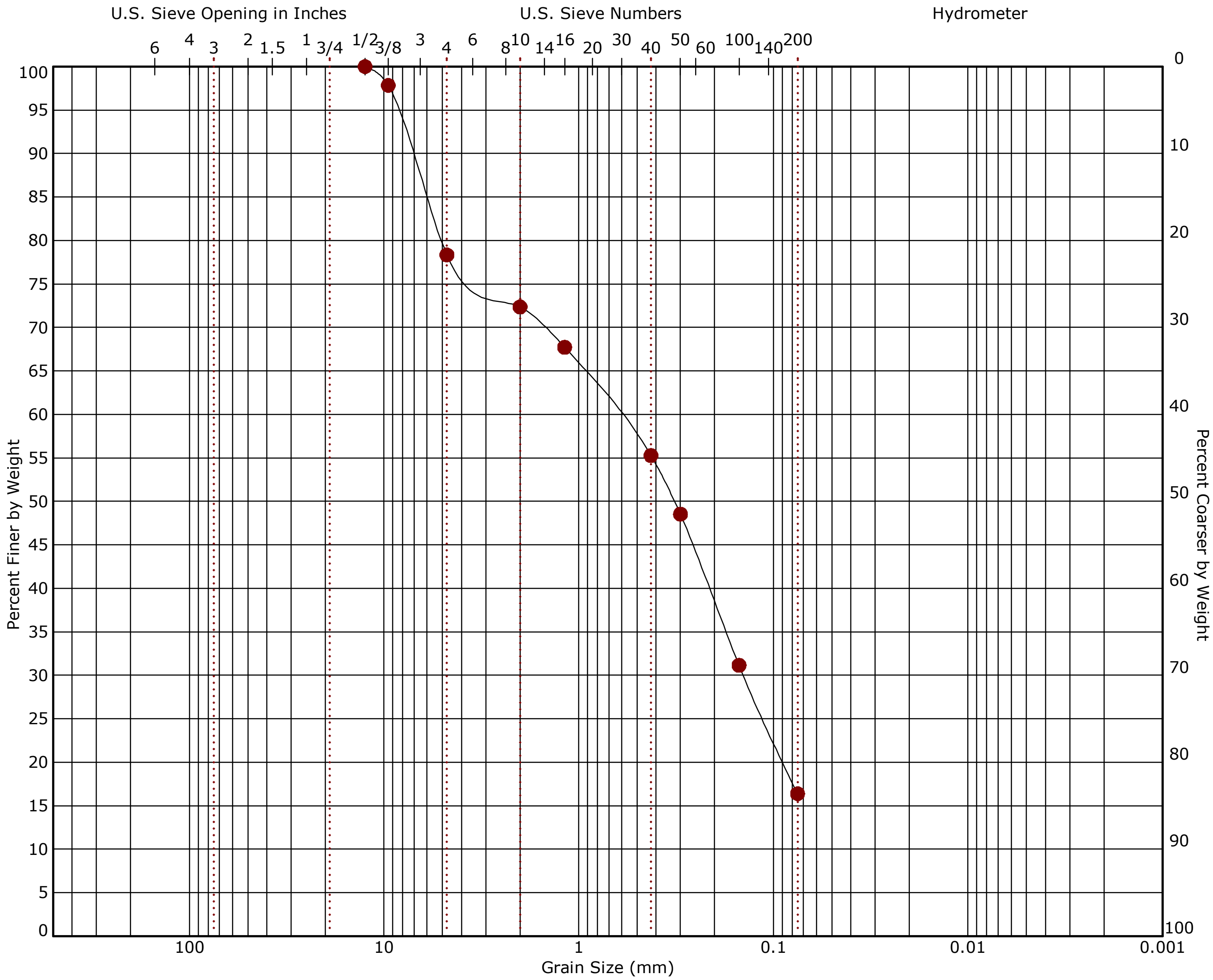
Boring Completed
11-22-2022

Proposed Biodiesel Project, BNSF Muscat Yard
15559 Foothill Blvd | Fontana, CA
Terracon Project No. CB225189

Terracon
1355 E Cooley Dr, Ste C
Colton, CA

Grain Size Distribution

ASTM D422 / ASTM C136



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

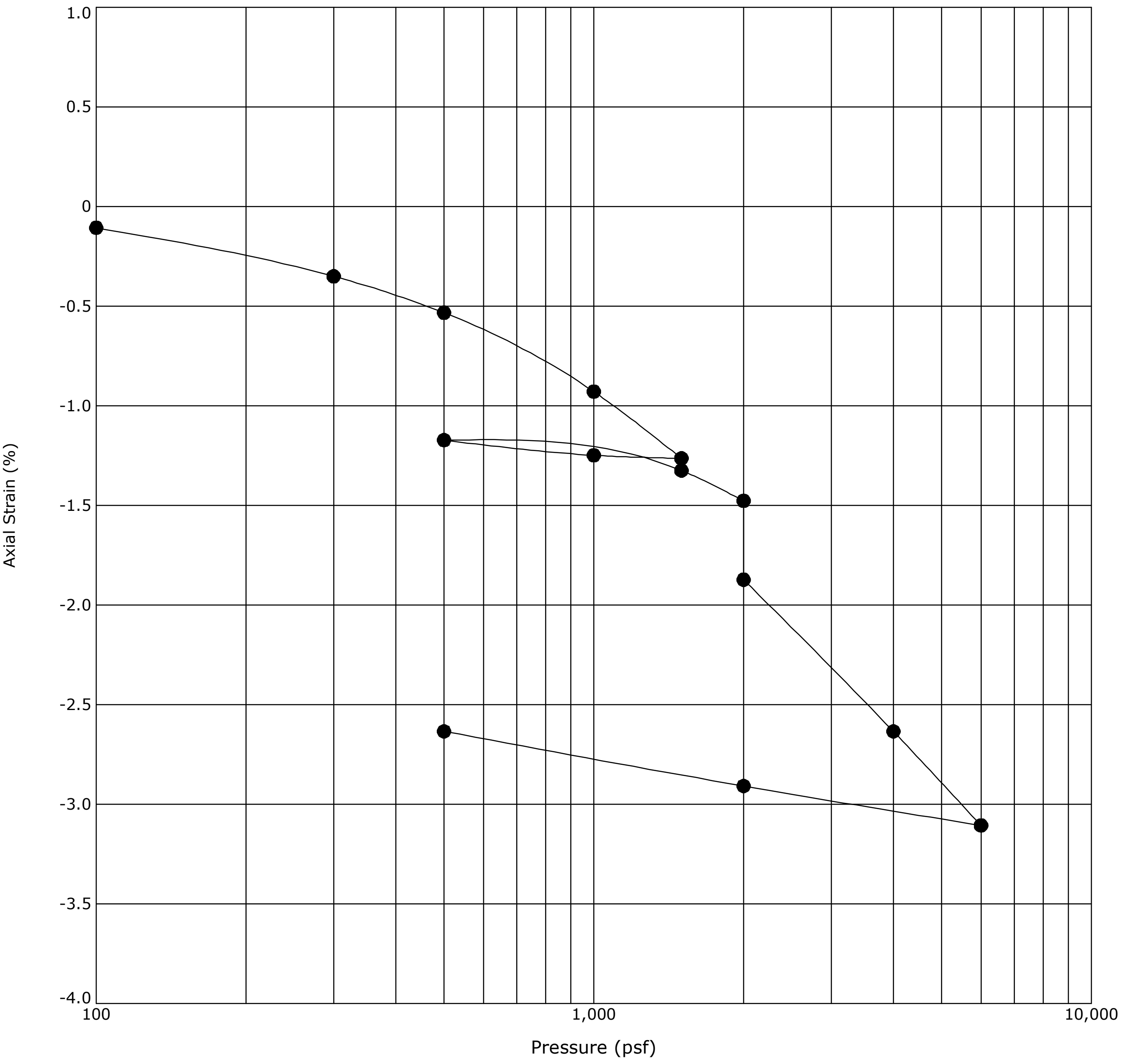
Boring ID	Depth (Ft)	Description	USCS	LL	PL	PI	Cc	Cu
● B-2	2 - 5	SILTY SAND with GRAVEL	SM					

Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● B-2	2 - 5	12.5	0.626	0.142		0.0	21.7	62.0	16.4		

1355 E Cooley Dr, Ste C
Colton, CA

Swell Consolidation Test

ASTM D2435



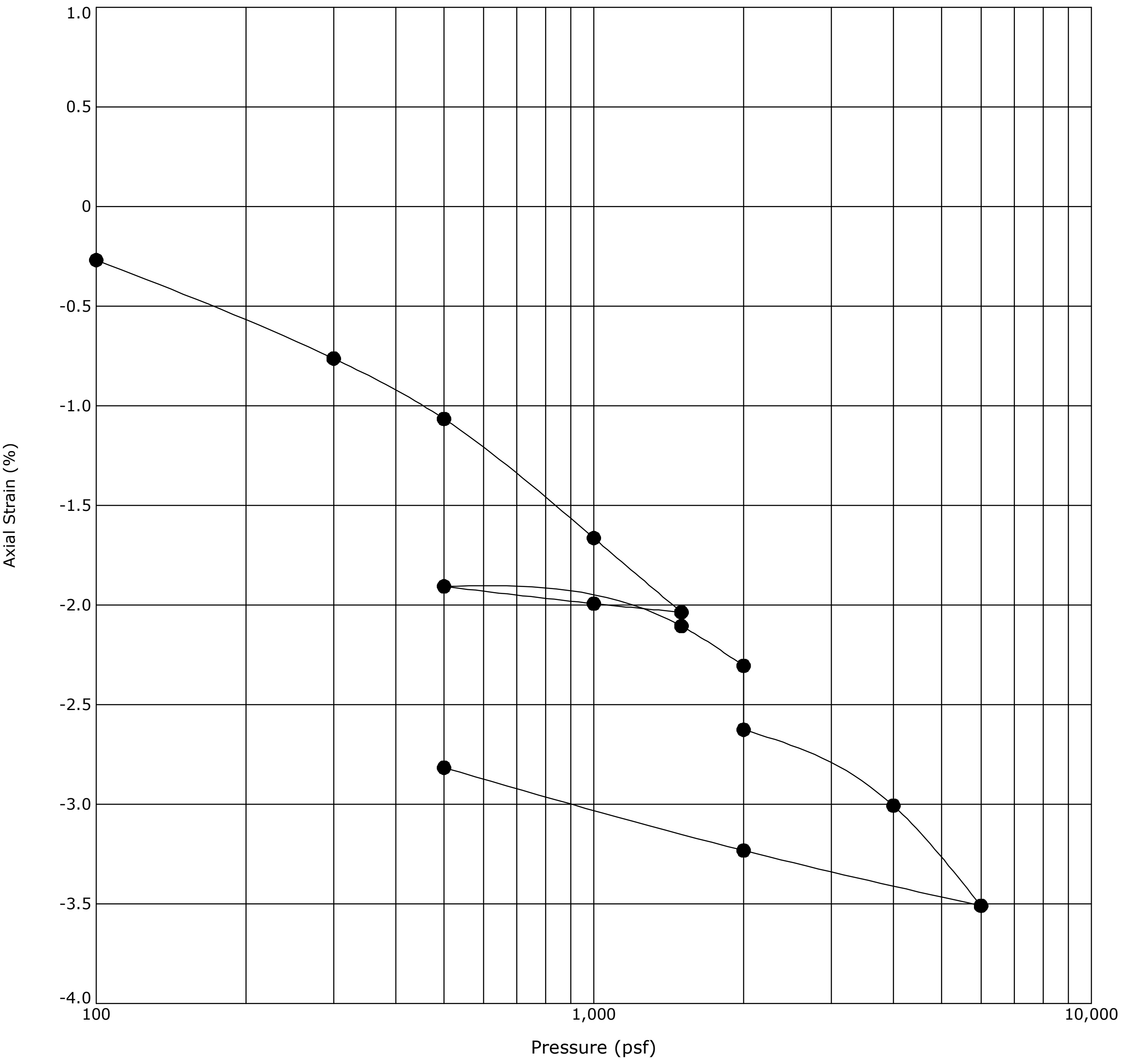
Boring ID		Depth (Ft)	Description	USCS	γ_d(pcf)	WC (%)
●	B-4	2.5 - 4	SILTY SAND with GRAVEL	SM	115	2.0

Notes: Sample saturated at 2,000 psf

1355 E Cooley Dr, Ste C
Colton, CA

Swell Consolidation Test

ASTM D2435



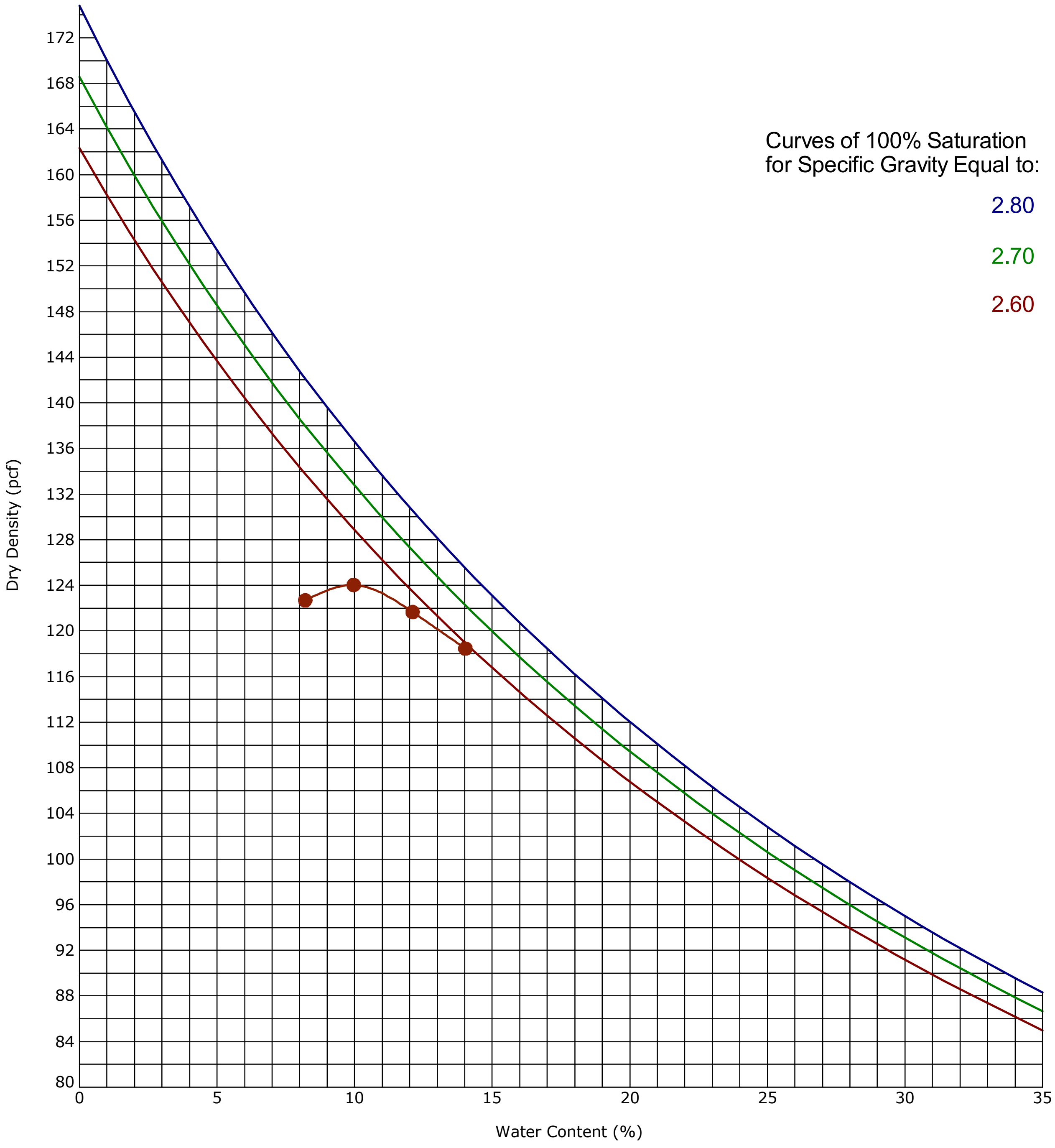
Boring ID		Depth (Ft)	Description	USCS	γ_d(pcf)	WC (%)
●	B-6	2.5 - 4	SILTY SAND with GRAVEL	SM	116	14.9

Notes: Sample saturated at 2,000 psf

1355 E Cooley Dr, Ste C
Colton, CA

Moisture-Density Relationship

ASTM D698/D1557



Boring ID	Depth (Ft)	Description of Materials
B-2	2 - 5	SILTY SAND with GRAVEL

Fines (%)		LL	PL	PI	Test Method	Maximum Dry Density (pcf)	Optimum Water Content (%)
16					ASTM D1557 Method B	124.0	9.9

750 Pilot Road, Suite F
Las Vegas, Nevada 89119
(702) 597-9393

Client	Project
BNSF Railway Company	Proposed Biodisel Project, BNSF Muscat Yard, Fontana

Sample Submitted By: Terracon (CB)   Date Received: 12/6/2022   Lab No.: 22-0815

Results of Corrosion Analysis

Sample Number	2-A
Sample Location	B-2
Sample Depth (ft.)	2.0-5.0
pH Analysis, ASTM G 51	8.03
Water Soluble Sulfate (SO4), ASTM C 1580 (mg/kg)	92
Sulfides, AWWA 4500-S D, (mg/kg)	Nil
Chlorides, ASTM D 512, (mg/kg)	72
Red-Ox, ASTM G 200, (mV)	+735
Total Salts, AWWA 2540, (mg/kg)	117
As-Received Resistivity, ASTM G 57, (ohm-cm)	59170
Resistivity, ASTM G 57, (ohm-cm)	5723

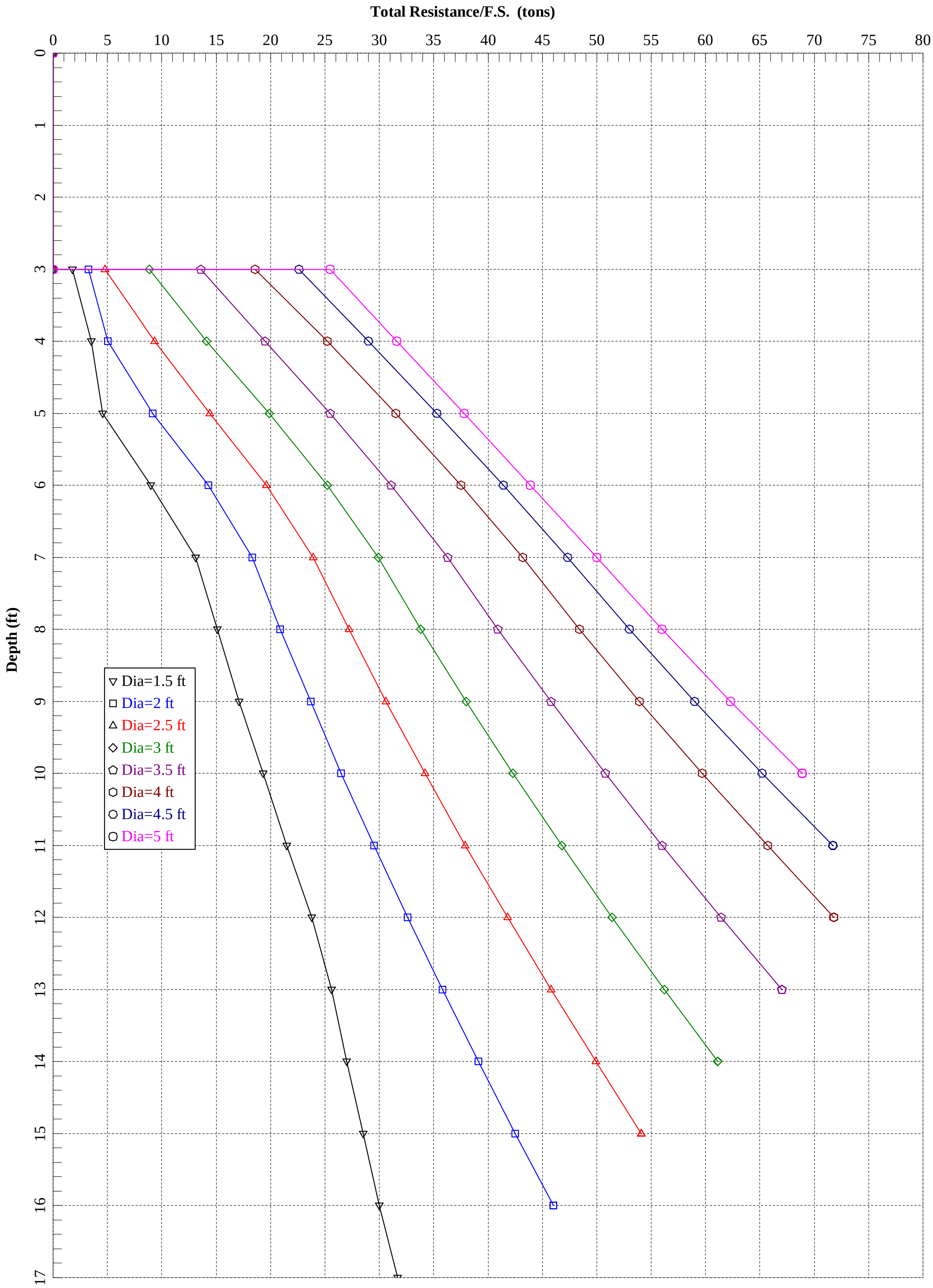
N. Campo

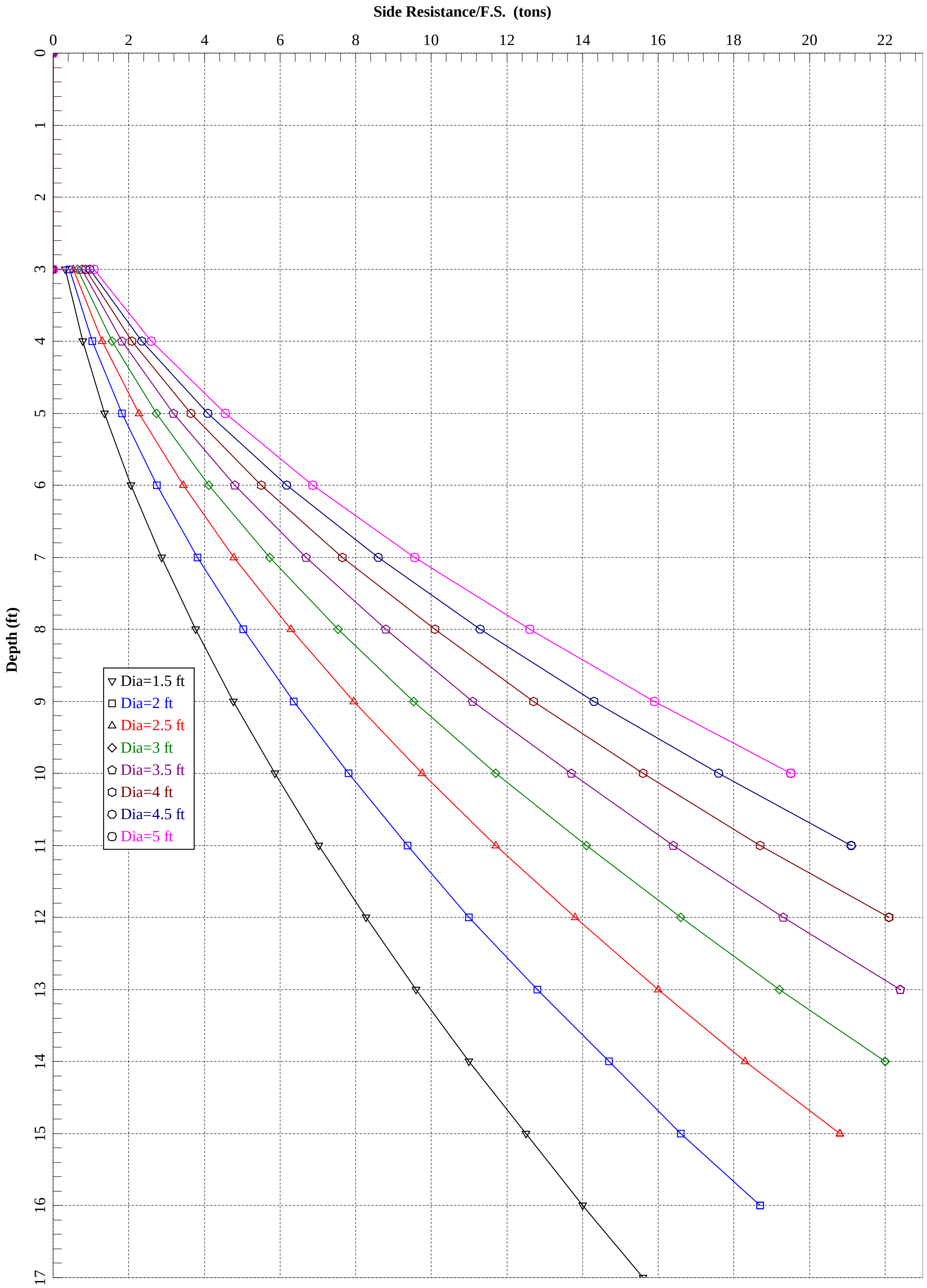
Analyzed By: ____________________
Nathan Campo
Engineering Technician II

Supporting Information

Contents:

Note: All attachments are one page unless noted above.


Total Resistance/F.S. (tons)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
▽ Dia=1.5 ft
□ Dia=2 ft
△ Dia=2.5 ft
◇ Dia=3 ft
⬠ Dia=3.5 ft
⬡ Dia=4 ft
○ Dia=4.5 ft
○ Dia=5 ft


Side Resistance/F.S. (tons)
0
2
4
6
8
10
12
14
16
18
20
22
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
▽ Dia=1.5 ft
□ Dia=2 ft
△ Dia=2.5 ft
◇ Dia=3 ft
⬠ Dia=3.5 ft
⬡ Dia=4 ft
○ Dia=4.5 ft
○ Dia=5 ft

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING

Auger	Shelby Tube	Split Spoon
Rock Core	Macro Core	Modified California Ring Sampler
Grab Sample	No Recovery	Modified Dames & Moore Ring Sampler

WATER LEVEL

▽	**Water Initially Encountered**
▽	**Water Level After a Specified Period of Time**
▼	**Water Level After a Specified Period of Time**

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	**Hand Penetrometer**
(T)	**Torvane**
(b/f)	**Standard Penetration Test (blows per foot)**
N	**N value**
(PID)	**Photo-Ionization Detector**
(OVA)	**Organic Vapor Analyzer**
(WOH)	Weight of Hammer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.			**CONSISTENCY OF FINE-GRAINED SOILS** (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance			
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength, Qu, psf**	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**
Very Loose	0 - 3	0 - 6	Very Soft	less than 500	0 - 1	< 3
Loose	4 - 9	7 - 18	Soft	500 to 1,000	2 - 4	3 - 4
Medium Dense	10 - 29	19 - 58	Medium-Stiff	1,000 to 2,000	4 - 8	5 - 9
Dense	30 - 50	59 - 98	Stiff	2,000 to 4,000	8 - 15	10 - 18
Very Dense	> 50	≥ 99	Very Stiff	4,000 to 8,000	15 - 30	19 - 42
			Hard	> 8,000	> 30	> 42

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N] Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P] Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

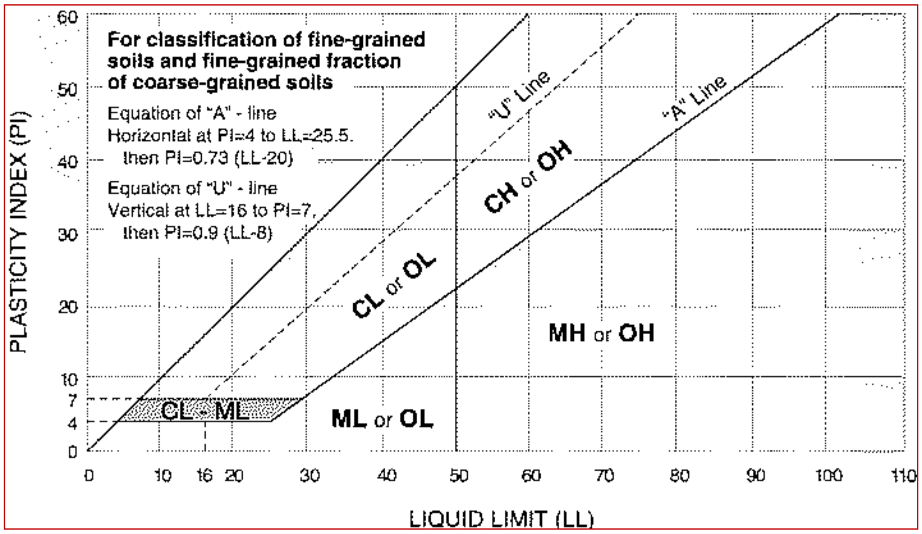
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



APPENDIX C

BMP DETAILS & SPECIFICATIONS

SEPARATION
By Design™

Aboveground Oil/ Water Separator

www.separationbydesign.com

Aboveground Oil/ Water Separator

A Cost Effective Way to Manage Oil Spills

Separation By Design, Inc.'s patented Aboveground Oil/ Water Separator began as way for petroleum bulk plants and terminals to safely and inexpensively dispose of rain water trapped within containment walls. Due to its success and versatility, the Oil/Water Separator's uses grew to include material handling facilities, refineries, utilities, petro chemical plants, military installations, tank farms, warehouses with loading docks, and more.

This unique product can be used as part of a spill control prevention plan. Or, where spills are known to occur, it can be used as a way to save significantly on disposal costs.

Efficiently Clean Up Spills

Use this proven method for clean-up of water contaminated by greases, oils, lubricants, or gasoline.

- 3rd party independently tested in laboratory.
- Controlled flow rate ensures oil particles aren't missed.
- 95% suspended solids retention.
- Average effluent less than 5 ppm.

(812) 424-1239
sales@separationbydesign.com

www.separationbydesign.com

Cost Effective

Dramatically save over other disposal methods.

- Avoid EPA disposal fees.
- Portability lowers initial investment costs (over in-ground solutions), allows the unit to be used in various locations, and maintains its resale value.
- Unit can be rented out for additional income.

Application & Usage

SBD's Oil/Water Separator can be used anywhere where contained water can be contaminated with oil:

- Bulk Oil & Fuel Terminals
- Material Handling Facilities
- Refineries
- Utilities
- Petro Chemical Plants
- Military Installations
- Tank Farms
- Loading Dock Areas
- Elevator Shafts
- Flood & Other Disasters

Low Maintenance

Let the Oil/Water Separator do the work for you.

- Automatic start and stop.
- Controlled flow rate requires less monitoring.
- Visual alarm shows when oil containment area is full.
- Optional phone modem alerts remote location when containment area is full.
- Thermostatically controlled heater prevents freezing.
- Elevation is not of concern when discharging.

Safe to Use

Every detail was considered to ensure safe disposal.

- Explosion-proof diaphragm pump minimizes oil agitation.
- UL listed electronics are intrinsically safe for Class 1: Groups A, B, C & D and Class 2: Groups E, F & G.
- Other electronics are available for other applications.
- Log out, tag out panel prevents tampering.
- Automatic shutdown to prevent overflows.

Contact us today to discuss how to satisfy your oil disposal needs in a way that's both smart and affordable.

Separation By Design™

Product Specifications

Standards & Approvals:
- Patent # US 7,445,704 B2
- Tank: UL 142 listed
- Electronic controls: UL 508/698-A listed
- Safe for: Class 1, Groups A, B, C, & D; Class 2, Groups E, F, & G
- Other electronic packages available for additional application areas

Operating Temperature:
- ???

Size & Dimensions:
- ?????

Tank Containment:
- Steel???
- Blue powder coated ???
- Internal lining????

Heating & Insulation:
- Insulation????
- Heater wattage???
- Automatic thermostat
- Ambient temperature probe

Electronics:
- Single or three phase power operation
- Explosion-proof control panel

Pump:
- Explosion-proof diaphragm pump
- ? - ? GPM
- Removable pump enclosure
- Float-activated for automatic operation and shutoff

Security/Accident Prevention:
- Internal high oil level sensor with automatic shutoff
- Visual alarm
- Optional phone modem for remote alarm notification
- Lockout tag out panel
- Explosion proof pump & electronic controls

Vents:
- Emergency Vent
- Normal Vent

Filters:
- Influent pickup tube with screen
- Trash receptor screen

Oil Removal:
- Patented internal coalescer
- 3rd party tested: 95% suspended solids retention and average effluent less than 5 ppm
- Effluent outlet
- Drain opening
- Oil removable opening

Installation:
- Turnkey: pre-wired and configured
- Forklift compatible

Separation By Design, Inc. has over 45 years of experience inventing creative solutions to challenges faced by businesses in the oil & gas industry. We are constantly designing and manufacturing new ways to improve the way oil, gas, diesel, DEF, and renewable fuels distributors manage their products. We are privately held and operated. This allows us to focus on our customers, not shareholders. Partner with us and find out why Separation By Design is the choice of small businesses and Fortune 100 companies alike.

Separation By Design, Inc.
1601 Buchanan Road, Evansville, IN 47720
(812) 424-1239
sales@separationbydesign.com

INSTALLATION AND OPERATION INSTRUCTIONS FOR SEPARATION BY DESIGN CONTROL AND ALARM PANEL FOR 230VAC SINGLE PHASE

INSTALLATION INSTRUCTIONS:

IMPORTANT: Completely read and thoroughly understand these instructions before proceeding to install and wire the control.

The maximum distance between the Alarm box and the location of the control floats is determined by the sensitivity of the 67 control(s). This information is supplied on Form 670-A.

INTRINSICALLY SAFE GENERAL INFORMATION

The following information should be used by experienced personnel as a guide to the installation of intrinsically safe alarm panels. Selection or installation of equipment should always be preformed by competent technical assistance. We encourage you to contact the factory or its local representative if further information is required.

The control panel contains a U.L. Listed interface relay with Intrinsically Safe Sensing Circuits. The interface relay is Associated Apparatus listed under Process Control equipment, with Intrinsically Safe Outputs for Interface into Class I, II, and III, Division 1 Groups C, D, E, and G Hazardous Locations. The Circuits are to be connected to any simple non-energy generating or storing device such as a pushbutton, limit, float switch, or any electrode and fitting assembly.

The enclosure and mounting plate are to be connected to a good earth ground. For additional guidance on "Hazardous Location Installation," and "Intrinsically Safe Devices," consult ANSI/ISA standard RP 12-6 or NEC ARTICLES 500 through 516.

CAUTION:
Intrinsically safe wiring must be kept separate from non-intrinsically safe wiring. Special procedures have been followed during the manufacturing of these control panels to insure proper spacing. Some models incorporate isolated barriers or covers for this purpose.

A separate rigid metallic conduit should be used to enclose the conductors of the intrinsically safe circuit. Multiple runs of intrinsically safe wiring may be run in the same conduit only where at least 0.25mm (0.010 inch) thick insulation, suitable for the maximum temperature, is used on each conductor. Refer to ANSI/ISA RP 12.6 for details. Conduit or cable, containing the intrinsically safe wiring, shall be sealed in accordance with the National Electrical Code, NFPA No. 70, (approved sealing fitting), where the conduit enters or exits the hazardous locations.

INDUCTANCE AND CAPACITANCE: For intrinsically safe wiring use 16 AWG or 14 QWG TYPE THHN/THHW/THWN or MTW. By using these types of wire in conjunction with a limitation on distance, you will not exceed the maximum capacitance or inductance for field wiring.

Use the following chart as a guide for maximum total length of all the intrinsically safe wiring (of each conductor), excluding any ground wiring.

INTERFACE RELAY MODEL NUMBER	HAZARDOUS LOCATIONS	MAXIMUM CABLE LENGTH SHALL NOT EXCEED

Model	Class I, Group C & D;	1200 ft. For a Float Sensor
67 Series	Class II, Group E, F & G	450 ft. For a Probe Sensor

Refer to Series 67 data information for distance recommendations so not to exceed the maximum capacitance or inductance limitations of the control.

Connect incoming 230 vac single phase supply power to L1 and L2 of the Main Panel Circuit Breaker.

Connect pump motor leads to terminals 1T1 and 1T2 of the terminal strip.

The exterior ‘High Oil” alarm light may be shipped separately. If this is the case the external light will be wired to terminals _ and _ . A Explosion conduit “Seal-Off” is required at the point the alarm light conduit exits the panel.

Connect “Pump Start” float switch to terminals A and terminal B.

Connect “Pump Stop” float switch to terminals A and terminal B.

The “High Oil Sensor” is pre-wired to terminals “E” and “F.

OPERATING INSTRUCTIONS

The Level control located in the sump will turn on the Sump Pump and power open a solenoid Valve when a liquid level rises to the “Start Float switch”.
The pump will continue in operation and the solenoid valve will remain open until the liquid level recedes below the Pump Stop” float switch.

The Separator Has a pre installed “High Oil” sensor. Should the oil level in the separator accumulate to maximum oil capacity the pump will be shut off and the solenoid valve closed and the “High Oil” alarm beacon will energize. The control / Alarm panel will remain in this state until the oil is removed and replaced with water to the appropriate level.

The control panel is equipped with a temperature sensor. Should the ambient temperature fall below the proscribed temperature setting on the temperature controller. The pump will be stopped from operating until ambient temperature rises to the set degrees on the temperature controller.

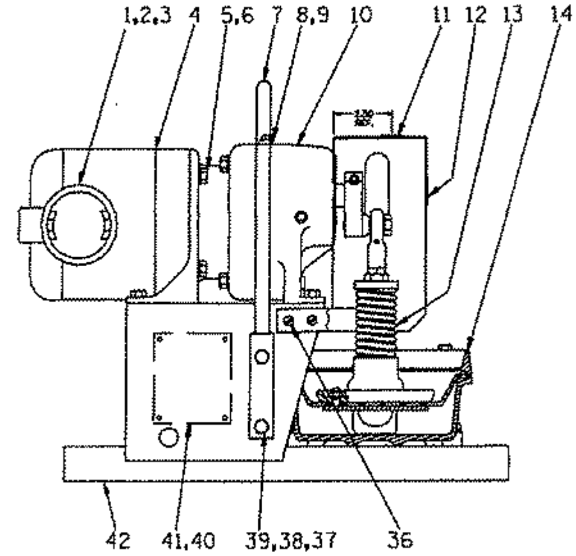
The Separator is equipped with a heating unit. This unit will keep the separator from freezing in cold weather. When the separator heater is operating, a “Heater On” indication light on the door will be energized.

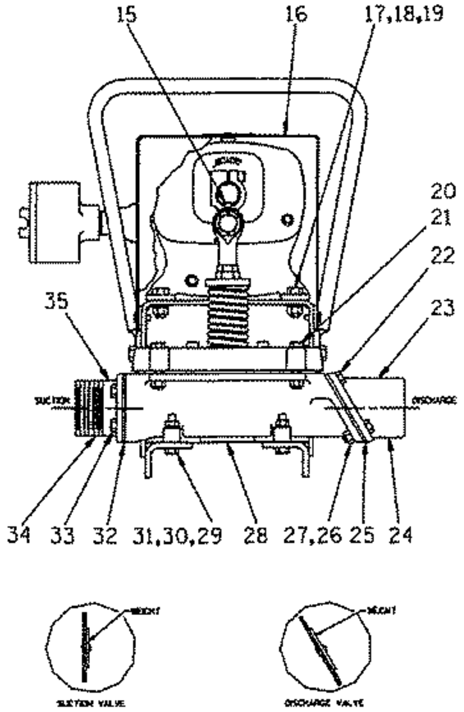
Separation by Design Components

- 225 Gallon Rectangular Aboveground Oil Separation Unit, UL-142 construction
- Removable Pump Enclosure
- Emergency Vent
- Normal Vent
- Lifting Lugs
- Channel Support Legs
- Patented Internal Oil Coalescer Media Bank
- Trash Receptor Screen
- Removable Covers for Ease of Maintenance
- 3” Effluent Outlet
- Threaded Oil Removal Opening
- Threaded Unit Drain Opening

- Explosion Proof Control Panel with Lock Out Tag Out Provisions
- Explosion Proof Diaphragm Pump, 25 gpm, nominal
- Electrical Conduits for All Wiring
- Float Activated Operation Control, Turns Pump On and Off, in Water Event
- 2” Influent Pickup Tube with Screen
- Internal High Oil Level Sensor
- Visual Alarm
- Bayonet Heating Element
- Heater Controls
- Atmospheric Temperature Probe
- Internal Lining
- Blue Exterior Paint

MAINTENANCE AND REPAIR





PARTS LIST

Pump Model 2D–X.75 1P

(From S/N 652300 up)

If your pump serial number is followed by an "N", your pump is NOT a standard production model. Contact the Gorman-Rupp Company to verify part numbers.

ITEM NO.	PART NAME	PART NUMBER	MATL CODE	QTY
1	CONDUIT BOX	27144–122	–––	1
2	HVY PIPE NIPPLE	THA1206	15079	1
3	RED CPLG 1 X .75	AE1612	15079	1
4	MOTOR .75 HP 1P XP	28272–340	–––	1
5	HEX HD CAPSCREW	B0604	15991	4
6	LOCKWASHER	J06	15991	4
7	CARRYING HANDLE	44724–007	24150	1
8	VENTED PLUG	4823	15079	1
9	SHIPPING PLUG	11495	15079	1
10	GEAR HEAD REDUCER	24572–003	–––	1
11	ROTATION DECAL	2613BM	–––	1
12	LUBE DECAL	38816–085	–––	1
13	PLUNGER ROD ASSY	46181–004	–––	1
14	RETAINER RING	26812–702	–––	1
15	KEY	N0403	15990	1
16	ECC GUARD ASSY	42381–024	24150	1
17	HEX HD CAPSCREW	B0605	15991	4
18	LOCKWASHER	J06	15991	4
19	HEX NUT	D06	15991	4
20	HEX HD CAPSCREW	B0508	15991	4
21	HEX NUT	D05	15991	4
22	HEX HD CAPSCREW	B0503	15991	2
23	HEX HD CAPSCREW	B0505	15991	2
24	DISCHARGE FLANGE	26812–707	–––	1
25 *	DISCH VALVE	26812–706	–––	1
26	HEX HD CAPSCREW	B0505	15991	2
27	HEX NUT	D05	15991	2
28	DIAPHRAGM POT	38254–006	10010	1
29	HEX HD CAPSCREW	B0506	15991	4
30	LOCKWASHER	J05	15991	4
31	HEX NUT	D05	15991	4
32 *	SUCTION VALVE ASSY	26812–705	–––	1
33	HEX HD CAPSCREW	B0503	15991	4
34	SUCTION FLNG	26812–704	–––	1
35	SUCTION STICKER	6588AG	–––	1
36	TAPSCREW 1/4 X 1/2	21281–472	–––	4
37	HEX HD CAPSCREW	B0604	15991	4
38	LOCKWASHER	J06	15991	4
39	HEX NUT	D06	15991	4
40	NAME PLATE	38818–004	13990	1
41	DRIVE SCREW	BM#04–03	17000	4
42	BASE ASSY	41547–017	24150	1
NOT SHOWN:				
	G-R DECAL	GR–03	–––	1
	WARNING DECAL	2613FF	–––	1
	INSTR TAG	38817–030	–––	1
	STRAINER	9026D	–––	1
	KEY	N0303	15990	1
OPTIONAL:				
	2–WHEEL KIT	GRP30–41	–––	1

* INDICATES PARTS RECOMMENDED FOR STOCK

Above Serial Numbers Do Not Apply To Pumps Made in Canada.

CANADIAN SERIAL NO. .... AND UP

* INDICATES PARTS RECOMMENDED FOR STOCK

SECTION DRAWING

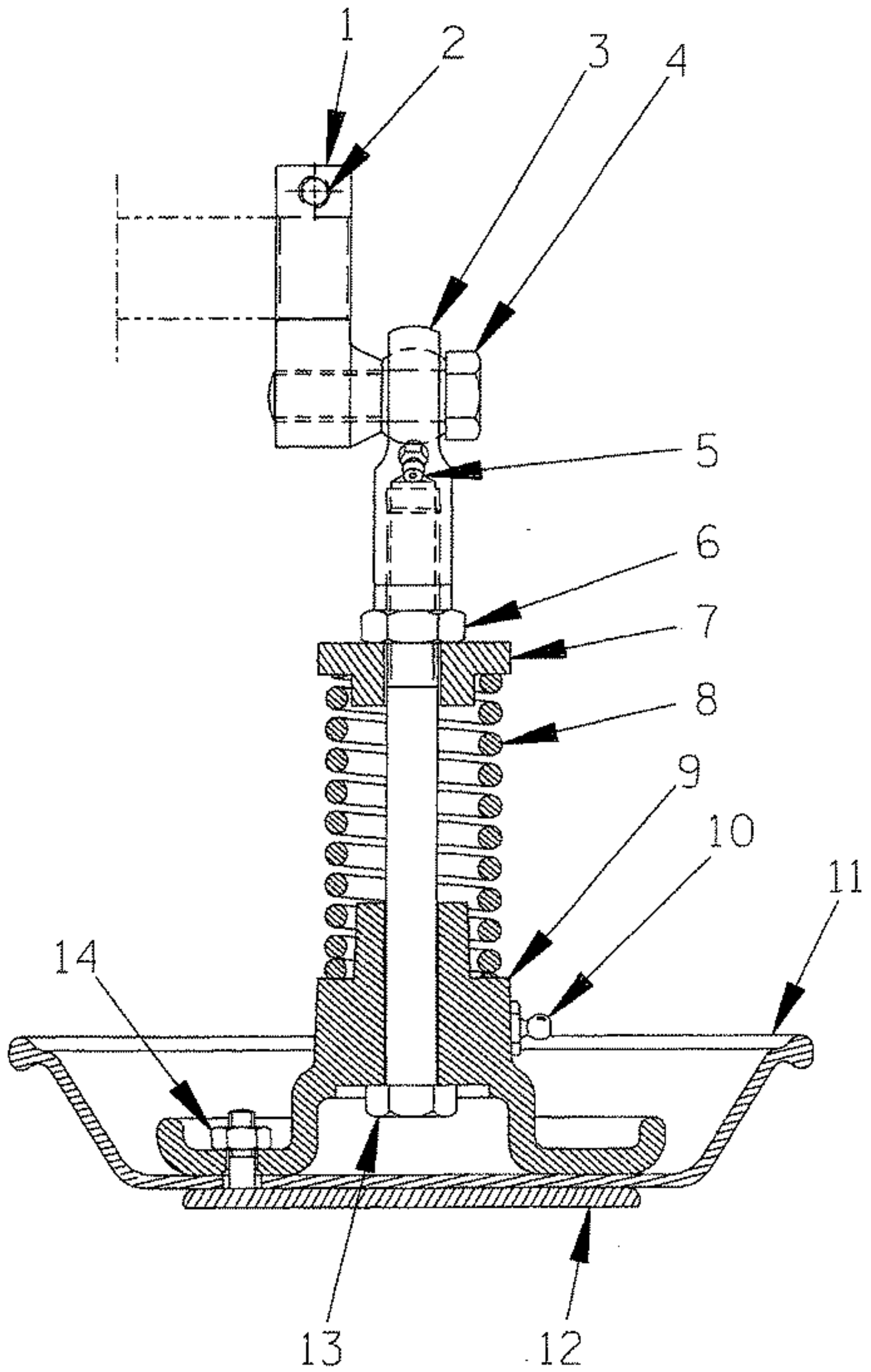


Figure 2. 46181-004 Plunger Rod Assembly

PARTS LIST

46181–004 PLUNGER ROD ASSEMBLY

ITEM NO.	PART NAME	PART NUMBER	MATL CODE	QTY
1	ECCENTRIC	38555–505	11060	1
2	SOCKET HEAD CAPSCREW	BD0504	15990	1
3	ROD END	23924–005	–––	1
4	HEX HEAD CAPSCREW	B0807	15991	1
5	CAP PLUG	25141–151	–––	1
6	JAM NUT	AT08S	15991	1
7	SPRING CENTERING WASHER	31513–001	15030	1
8	COMPRESSION SPRING	38571–603	17110	1
9	UPPER DIAPHRAGM PLATE	38583–003	10010	1
10	LUBE FITTING	S186	–––	1
11	DIAPHRAGM	26812–711	–––	1
12	LOWER DIAPHRAGM PLATE ASSY	42111–314	24150	1
13	PLUNGER ROD	46181–003	24150	1
14	HEX NUT	D04	15991	3
NOT SHOWN:				
	CAP PLUG	25141–151	–––	2

* INDICATES PARTS RECOMMENDED FOR STOCK
Above Serial Numbers Do Not Apply To Pumps Made In Canada.
CANADIAN SERIAL NO. .... AND UP

APPENDIX

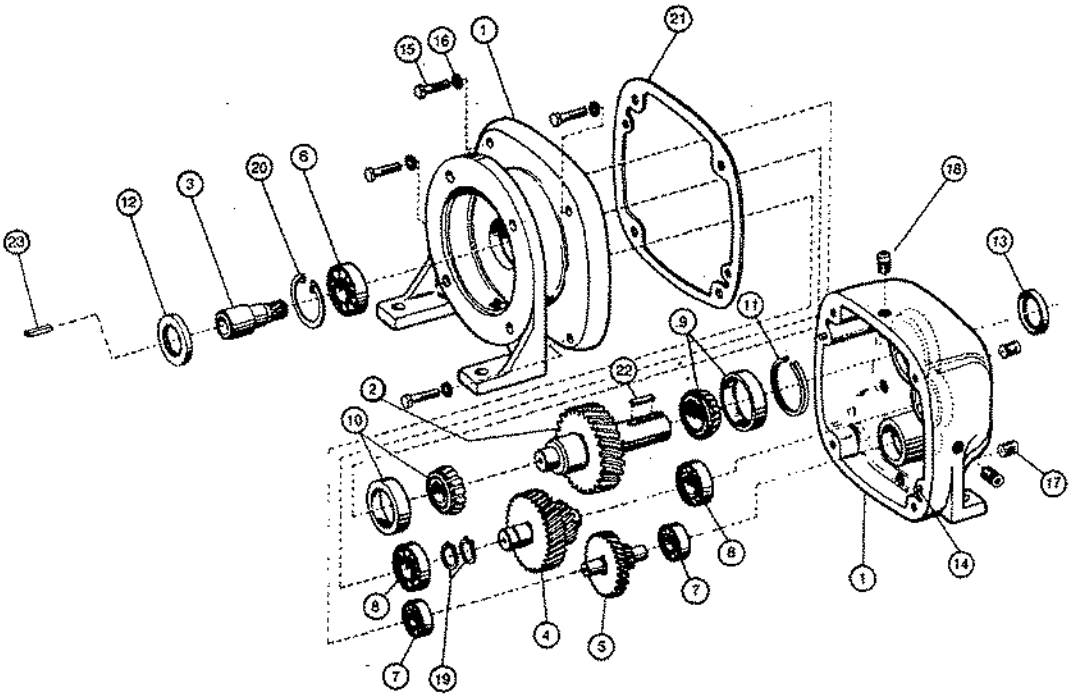


Figure 3. Exploded View, Model 2Z934-A Dayton Speed Reducer

PARTS LIST

MODEL 2Z934-A DAYTON SPEED REDUCER

ITEM NO.	DESCRIPTION	PART NUMBER	QTY
1	GEAR HOUSING AND GEAR HOUSING COVER SET	93A119346-000	1
2	*OUTPUT SHAFT ASSY	G-R PROPRIETARY ITEM	1
3	NPUT PINION	93A118178-001	1
4	OUTPUT PINION ASSY	93A119546-000	1
5	INTERMEDIATE PINION ASSY	93A119548-000	1
6	INPUT PINION BEARING	93A113859-006	1
7	INTERMEDIATE PINION BEARING	93A113859-005	1
8	OUTPUT PINION BEARING	93A113859-004	2
9	OUTPUT SHFT BRG - COVER END	04A12292-0300	1
10	OUTPUT SHFT BRG - HOUSING END	04A12292-0100	1
11	LOAD RING	24A12293-0200	1
12	INPUT SHAFT OIL SEAL	40A02187-3900	1
13	OUTPUT SHAFT OIL SEAL	40A02187-3800	1
14	DOWEL PIN	24A12295-0200	2
15	5/16-18 X 1/2 HEX HD CAPSCREW	STANDARD HARDWARE	4
16	5/16 LOCKWASHER	STANDARD HARDWARE	4
17	PIPE PLUG	93A113412-003	3
18	VENT PLUG	93A113535-001	1
19	SNAP RING	24A09285-1800	2
20	SNAP RING	24A09284-0300	1
21	GASKET	93A119348-004	1
22	OUTPUT KEY	23A02741-3700	1
23	INPUT KEY	23A02741-3600	1

* NOTE: If the output shaft requires replacement, the complete speed reducer (G-R P/N 24572-003) must be ordered from The Gorman-Rupp Company.

The Gorman-Rupp P/N 24572-003 speed reducer used in this pump is a proprietary item manufactured by Dayton Electric Manufacturing Co., as a special Model.

If replacement is necessary, the complete unit must be ordered exclusively from The Gorman-Rupp Company. Gorman-Rupp does not, however, stock or furnish any component parts for the unit.

All component parts, except the output shaft, are identical to those used in the Dayton Electric non-proprietary Model 2Z934-A Speed Reducer, and may be obtained from W. W. Grainger Inc., 5959 W. Howard St., Chicago, Illinois 60648, (312) 647-8900, or from any full-stock W. W. Granger distributor.

Separation by Design

Aboveground Oil Water Separation

Manufactured by: Modern Welding Company using Kleerwater™ Technology

Benefits of Aboveground Separation System

- No Elevation Concerns when Discharging
- No Cathodic Protection Needed
- No Flush Out in Heavy Rains
- No Confined Space Entry
- Shut Down Alarms
- Insurance Discount may Apply (Contact your insurance agent)
- Save Money on Standardized Unit.
- Unit is Portable
- Leasing Plan Available
- Retains Resale Value

- Solution for disposal of rain water discharge from diked petroleum bulk plants.
- Initiates operation automatically when water is detected in containment area and shuts down when water is removed.
- Easy installation inside or outside containment area.
- Patented Kleerwater coalescer efficiently separates oils and grease from water.
- In actual operation, unit takes oil and grease waste water concentrations from 44 ppm to <5 ppm, and 3,200 ppm of heavily mixed influent to 8.3 ppm. In a simulated spill test, separator is filled with oil to 10% beyond normal shutoff limit with an effluent not exceeding 5.31 ppm. In a test for total suspended solids, using State of Wisconsin test protocols, Separation By Design™ removes over 95% of 106 micron suspended solids at 25 GPM. Test results available.
- Heating element keeps pump and separation tank from freezing in cold climates.
- Unit comes equipped with high oil sensor to activate visual alarm and will shut down system to prevent oil overfill or discharge to ground water.
- The explosion proof diaphragm pump is designed to minimize agitation of oil and water and provide the required flow rate to accommodate operation parameters.
- Tanks are UL-142 listed and come with 1 year limited warranty.

Modern Welding Company of
Owensboro, Inc.
1450 East Parrish Ave
Owensboro, KY 42303

modern

Phone: 270-683-5323
Toll-Free: 800-633-0571
Fax: 270-684-5245
Website: www.modweldco.com
Email: modern1@modweldco.com

Separation by Design

Aboveground Oil Water Separation

- Electronic control panel constructed and listed to U.L. 508 / 698-A intrinsically safe, for areas: Class 1, Groups A, B, C, & D: Class II, Groups E, F, & G
- Other electronic packages available depending on application areas.
- Replacement parts available from local electrical supply houses.
- Units can be built for single or three phase power operation.
- Disconnect on panel closure allows for lockout when servicing.
- Phone modem is available for remote alarm notification.

Used at:

- Bulk Oil Terminals
- Refineries
- Utilities
- Military Installations
- Material Handling Facilities
- Loading Docks
- Petro Chemical Plants
- Tank Farms

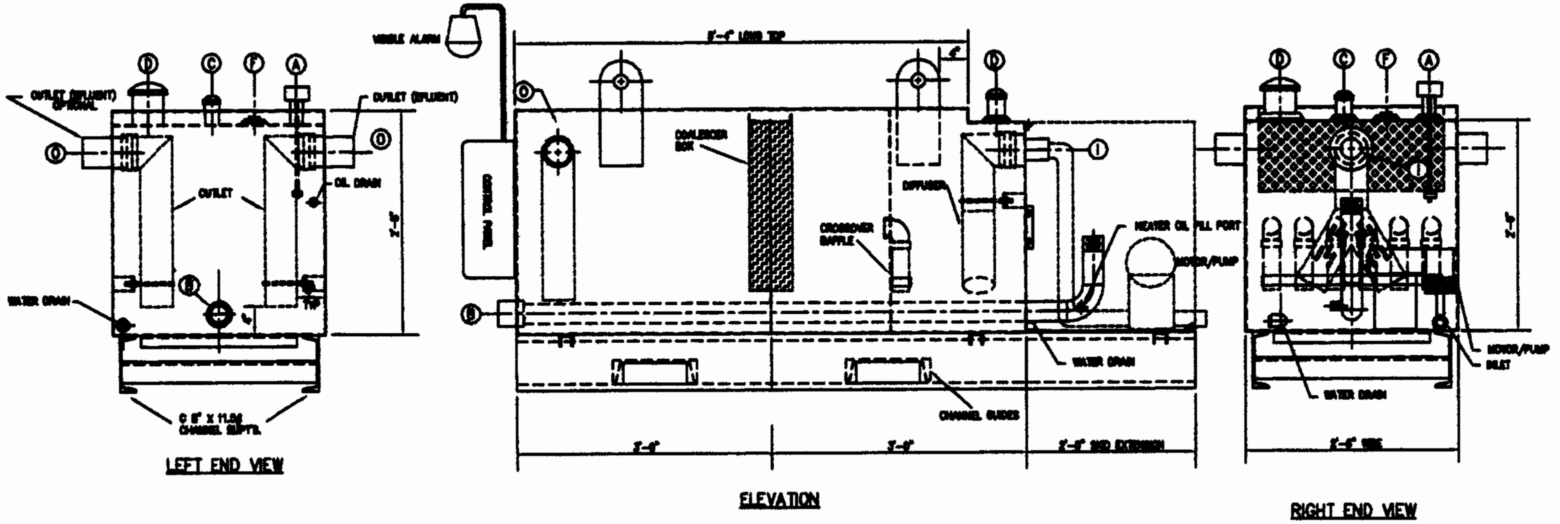
Separation By Design™ provides the ideal solution for managing liquid accumulations in petroleum containment areas.

The picture at left shows actual discharge of effluent after processing through Separation By Design.

SeparationbyDesign™ is Patent Pending

www.separationbydesign.com

Manufactured by:
Modern Welding Company, Inc.
using Kleerwater Technology
Subsidiaries Nationwide



LEFT END VIEW

ELEVATION

RIGHT END VIEW

NOZZLE MARK	QUANT. REQ'D.	SIZE	SERIES	DESCRIPTION		NOZZLE SERVICE
G	2	3"	FULL	COUPLING		OUTLETS
I	1	2"	FULL	COUPLING		INLET
F	1	2"	STD.	TANK FLNG.		FILL
D	1	4"	STD.	TANK FLNG.		EMERGENCY VENT
C	1	2"	STD.	TANK FLNG.		WORKING VENT
B	1	2½"	FULL	COUPLING		HEATER PIPE
A	1	2"	STD.	TANK FLNG.		LEVEL GAUGE
		FLANGE or COUPLING				

GENERAL INFORMATION

DESIGN CODE & CONDITIONS	FABRICATION PER	CUSTOMER SPECIFICATIONS
	UL-LABEL REQUIRED	UL-142
	DESIGN PRESSURE	ATMOSPHERIC
	DESIGN TEMPERATURE	AMBIENT
	SHOP TEST	FILL WITH WATER
	CORROSION ALLOWANCE	NONE
MATERIAL	SHELL	CARBON STEEL
	HEADS	CARBON STEEL
	BAFFLES	CARBON STEEL
	COVER PLATES	CARBON STEEL
	BOTTOM	
	BOLTING	–
	MISCELLANEOUS	–
	BAFFLES	–
	GASKETS	–
SURFACE FINISH	SANDBLAST INTERIOR	SSPC-SP-10
	SANDBLAST EXTERIOR	SSPC-SP-6
	PAINT INTERIOR	WATER RESISTANT PAINT
	PAINT EXTERIOR	MEDIUM BLUE
WEIGHTS	EST. EMPTY WEIGHT	2,500 LBS
	EST. WT. FULL OF WATER	N/A
	REFERENCE DRAWING	NONE

SHOP NOTES

1. COVER ALL OPENINGS PRIOR TO SHIPMENT

NO.	REVISION	DATE	BY
△			
△			
△			

Proprietary Drawing
This drawing is the property of Modern Welding Company of Owensboro, Inc. Neither this drawing nor any data or information herein may be reproduced, copied, used for any purpose whatsoever, without the prior written permission of Modern Welding Company of Owensboro, Inc.

NO. REQUIRED (1) ONE | ITEM NO. NONE

Modern Welding Company
of Owensboro, Inc.

P.O. Box [illegible] · [illegible] East Fourth Avenue · Owensboro, Kentucky [illegible] · [illegible]

30" wide x 30" tall x 72" long, 224 Gallon Aboveground
Oil-Water Separator w/90 gallon oil storage capacity

DRAWN BY: W.K.H.	SCALE: None	REV. NO. △
CHKD./APPRD. BY W.K.H.	DATE: June 13, 2005	SHT. 1 of 1
P.O. #	JOB # [illegible]	

Separation By Design™
Oil Water Separator
Start-up and Operating and Maintenance Instructions

1. The containment area being treated should be power washed clean prior to separator's installation to remove loose debris that may clog the separator system.
2. Electrical installation and hook ups shall be done by a licensed certified electrician. All conduits supplying power and/or telecom wiring to the unit shall be installed according to applicable electrical codes.
3. Make sure inlet pick up assembly with screened housing is properly positioned into the pick up area of the containment so waste water can be pumped into the separator uniformly.
4. After installation of the unit is complete, the separator shall be filled with clean water. Continue to fill separator until water starts to flow out the discharge (effluent) opening.
5. Turn on power to unit.
6. Supply water to the containment area and verify that level switch activates the pump. Allow pumping action to continue until pump cuts off. Cut off will occur when the original water level in the containment area is reached. If pump continues to run after the shut down point is reached, check float switch at inlet for proper installation.
7. Unit is now ready for operation.

Visible Alarm Activation

1. There are two alarm lights that indicate high level of separated material in the separator. One light extends off the top control panel, and another "redundant light" is mounted in the front of the control panel. (This light is a backup warning light.) When either of these lights is flashing, the unit has gone into "alarm" mode and needs immediate attention.

(Separated Material Removal)

CAUTION: Separated liquid oil and vapors are flammable and/or combustible.

1. Disconnect the electrical power to the unit. The electrical panel has a disconnect lock out / tag out device that should be utilized until the unit is ready for service.
2. Remove oil from unit by opening the oil removal valve and allowing oil to drain into the customer supplied catch bucket or drum. Re-close valve. Dispose of separated material properly.
3. Once separated material is removed, re-establish power and fill the separator with clean water until it flows out of the outlet opening.
4. Separator is now ready for use.

Periodic Maintenance of Separator Unit (Internal Catch Screen Cleaning)

CAUTION: Separated liquid oil and vapors are flammable and/or combustible.

1. Disconnect power to unit and perform safety lock out / tag out provisions.
2. Check the inlet pick up tube and screened housing to make sure leaves and debris are not clogging the inlet pickup tube of the separator.
3. Remove the metal covers to the separator by unscrewing bolts on the top cover and visually inspect internal catch screen for trash. Remove and dispose of any collected trash in a proper manner. Visually inspect separators internals.
4. Replace cover, secure bolts and re-establish power.

Maintenance of Separator Unit (Complete cleaning due to sediment build up)

1. Disconnect power to unit and perform safety lock out / tag out provisions.
2. Check the inlet pick up tube and screened housing to make sure leaves and debris are not clogging the inlet pickup tube of the separator.
3. Remove the metal covers to the separator by unscrewing bolts on the top cover and visually inspect internal catch screen for trash. Remove and dispose of any collected trash in a proper manner.
4. Remove any oil from unit by suction or by siphoning, allowing oil to drain into the customer supplied catch bucket or drum. Dispose of separated material properly.
5. Pump down or suction out the remaining waste water, sludge and particulate matter until the bottom of tank is visible. Dispose of all waste water properly by sending it to licensed waste disposal unit
6. Clean the internal parts of the separator as needed by using a power washer. Wash down grit chamber, coalescer media and separation chamber, suctioning out excess waste water until unit is clean. Dispose of waste water properly by sending it to licensed waste disposal unit.
7. Once cleaning is complete:
   a. Re-position coalescer media, replace weighted cover to keep media in position.
   b. Check to see that float sensor has freedom of movement.
   c. Re-fill the separator with clean water until the water starts to flow out the discharge (effluent) opening.
   d. Re-install collector screen.
8. Re-install separator covers.
9. Make sure pick up assembly with screened housing is properly positioned into the sump up of the containment so waste water can be pumped into the separator uniformly.
10. Re-establish power to the unit.
11. Supply water to the containment area and verify that level switch activates the pump. Allow pumping action to continue until pump cuts off. Cut off will occur when the original water level in the containment area is reached. If pump continues to run after the shut down point is reached, check float switch at inlet for proper installation.
12. Unit is now ready for operation.

INSTALLATION AND OPERATION INSTRUCTIONS FOR SEPARATION BY DESIGN CONTROL AND ALARM PANEL FOR 230VAC SINGLE PHASE

INSTALLATION INSTRUCTIONS:

IMPORTANT: Completely read and thoroughly understand these instructions before proceeding to install and wire the control.

The maximum distance between the Alarm box and the location of the control floats is determined by the sensitivity of the 67 control(s). This information is supplied on Form 670-A.

INTRINSICALLY SAFE GENERAL INFORMATION

The following information should be used by experienced personnel as a guide to the installation of intrinsically safe alarm panels. Selection or installation of equipment should always be preformed by competent technical assistance. We encourage you to contact the factory or its local representative if further information is required.

The control panel contains a U.L. Listed interface relay with Intrinsically Safe Sensing Circuits. The interface relay is Associated Apparatus listed under Process Control equipment, with Intrinsically Safe Outputs for Interface into Class I, II, and III, Division 1 Groups C, D, E, and G Hazardous Locations. The Circuits are to be connected to any simple non-energy generating or storing device such as a pushbutton, limit, float switch, or any electrode and fitting assembly.

The enclosure and mounting plate are to be connected to a good earth ground. For additional guidance on "Hazardous Location Installation," and "Intrinsically Safe Devices," consult ANSI/ISA standard RP 12-6 or NEC ARTICLES 500 through 516.

CAUTION:
Intrinsically safe wiring must be kept separate from non-intrinsically safe wiring. Special procedures have been followed during the manufacturing of these control panels to insure proper spacing. Some models incorporate isolated barriers or covers for this purpose.

A separate rigid metallic conduit should be used to enclose the conductors of the intrinsically safe circuit. Multiple runs of intrinsically safe wiring may be run in the same conduit only where at least 0.25mm (0.010 inch) thick insulation, suitable for the maximum temperature, is used on each conductor. Refer to ANSI/ISA RP 12.6 for details. Conduit or cable, containing the intrinsically safe wiring, shall be sealed in accordance with the National Electrical Code, NFPA No. 70, (approved sealing fitting), where the conduit enters or exits the hazardous locations.

INDUCTANCE AND CAPACITANCE: For intrinsically safe wiring use 16 AWG or 14 QWG TYPE THHN/THHW/THWN or MTW. By using these types of wire in conjunction with a limitation on distance, you will not exceed the maximum capacitance or inductance for field wiring.

Use the following chart as a guide for maximum total length of all the intrinsically safe wiring (of each conductor), excluding any ground wiring.

INTERFACE RELAY MODEL NUMBER	HAZARDOUS LOCATIONS	MAXIMUM CABLE LENGTH SHALL NOT EXCEED
Model 67 Series	Class I, Group C & D; Class II, Group E, F & G	1200 ft. For a Float Sensor 450 ft. For a Probe Sensor

Refer to Series 67 data information for distance recommendations so not to exceed the maximum capacitance or inductance limitations of the control.

Connect incoming 230 vac single phase supply power to L1 and L2 of the Main Panel Circuit Breaker.

Connect pump motor leads to terminals 1T1 and 1T2 of the terminal strip.

The exterior ‘High Oil” alarm light may be shipped separately. If this is the case the external light will be wired to terminals _ and _ . A Explosion conduit “Seal-Off” is required at the point the alarm light conduit exits the panel.

Connect “Pump Start” float switch to terminals A and terminal B.

Connect “Pump Stop” float switch to terminals A and terminal B.

The “High Oil Sensor” is pre-wired to terminals “E” and “F.

OPERATING INSTRUCTIONS

The Level control located in the sump will turn on the Sump Pump and power open a solenoid Valve when a liquid level rises to the “Start Float switch”.
The pump will continue in operation and the solenoid valve will remain open until the liquid level recedes below the Pump Stop” float switch.

The Separator Has a pre installed “High Oil” sensor. Should the oil level in the separator accumulate to maximum oil capacity the pump will be shut off and the solenoid valve closed and the “High Oil” alarm beacon will energize. The control / Alarm panel will remain in this state until the oil is removed and replaced with water to the appropriate level.

The control panel is equipped with a temperature sensor. Should the ambient temperature fall below the proscribed temperature setting on the temperature controller. The pump will be stopped from operating until ambient temperature rises to the set degrees on the temperature controller.

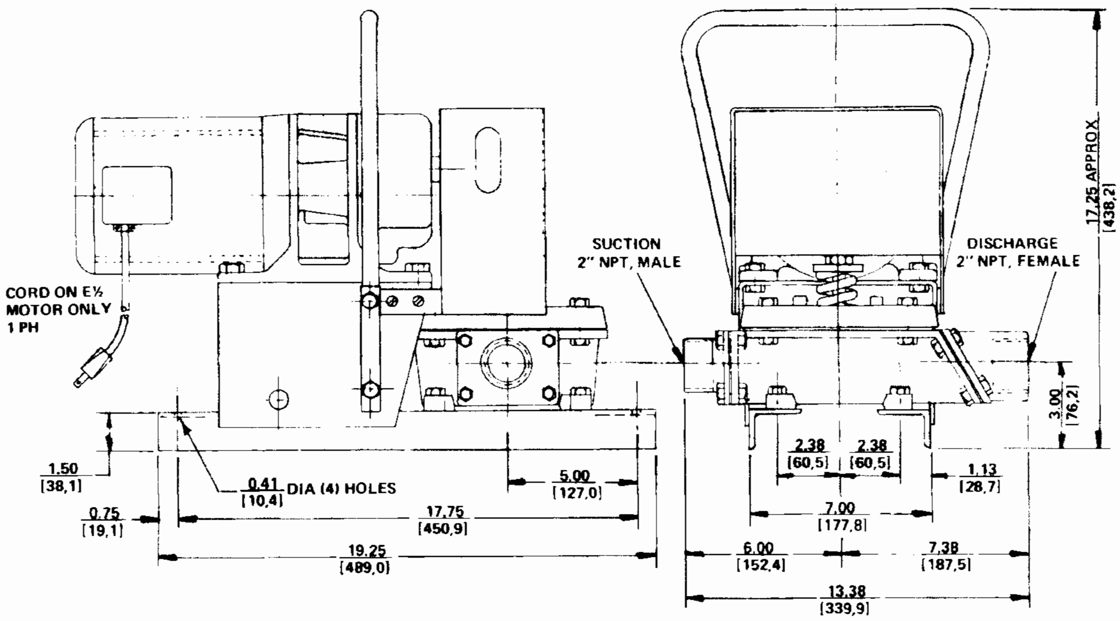
The Separator is equipped with a heating unit. This unit will keep the separator from freezing in cold weather. When the separator heater is operating, a “Heater On” indication light on the door will be energized.

Specification Data

SECTION 120, PAGE 80

OVERALL DIMENSIONS
and
WEIGHTS APPROXIMATE

	STATIONARY BASE	2-WHEEL
NET WEIGHT	105 LBS.	130 LBS.
SHIPPING WEIGHT	120 LBS.	145 LBS.
EXPORT CRATE SIZE	7.1 CU. FT.	8.5 CU. FT.



DIMENSIONS
INCHES
[MILLIMETERS]

POWERED BY X3/4 H.P., 1750 RPM, FR 56C, EXPLOSION PROOF MOTOR
E1/2 H.P., 1750 RPM, FR 56C ELECTRIC MOTOR

2D PUMP PERFORMANCE

IN GALLONS PER MINUTE
60 STROKES PER MINUTE

STATIC LIFT FEET	STATIC DISCHARGE HEAD IN FEET				
	0	5	10	15	20
5	27	26	24	22	20
10	25	24	21	20	19
15	22	21	20	19	18
20	21	20	19	18	17

IN LITERS PER MINUTE
60 STROKES PER MINUTE

STATIC LIFT METERS	STATIC DISCHARGE HEAD IN METERS				
	0	1.5	3.0	4.6	6.1
1.5	102.2	98.4	90.8	83.3	75.7
3.0	94.6	90.8	79.5	75.7	71.9
4.6	83.3	79.5	75.7	71.9	68.1
6.1	79.5	75.7	71.9	68.1	64.3

Test Performance –

Above Performance with 70° Clear Water at Sea Level using 2-inch (5.08 CM) Suction Hose and 2-inch (5.08 CM) Non-Collapsible Discharge Hose

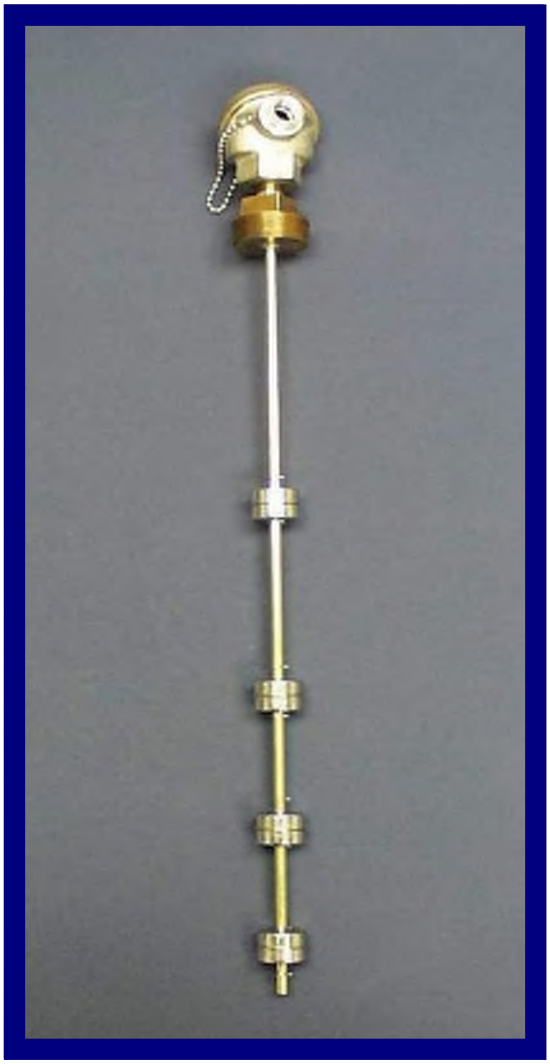
GORMAN-RUPP
THE GORMAN-RUPP COMPANY • MANSFIELD, OHIO
GORMAN-RUPP OF CANADA LIMITED • ST. THOMAS, ONTARIO, CANADA

AOE Selection Guide

AGGRESSIVE Systems, Inc.

FEATURES:

- Accurate and Reliable Level Control
- Custom Sensor Configuration for Unique Applications
- Fitting, Stem and Float available in Stainless Steel
- Rugged Cast Iron NEMA 4 Fitting Housing
- 50 Watt Switch Contacts at 120/240 VAC
- Temperature Rated to 200° F
- Pressure Rated to 100 P.S.I. Max



APPLICATIONS:

AOE can be ordered with standard floats with a specific gravity of 0.6 and Interface floats with a specific gravity of 0.95. The standard float will float on most all liquids, The Interface float, however, with a specific gravity of 0.95 will float on water but sink in oil.

When used in a potentially explosive application, the AOE must be interfaced with an intrinsically safe level control. The float stem and 2” NPT fitting can be ordered in a brass or stainless steel. The floats on the AOE are stainless steel as standard.

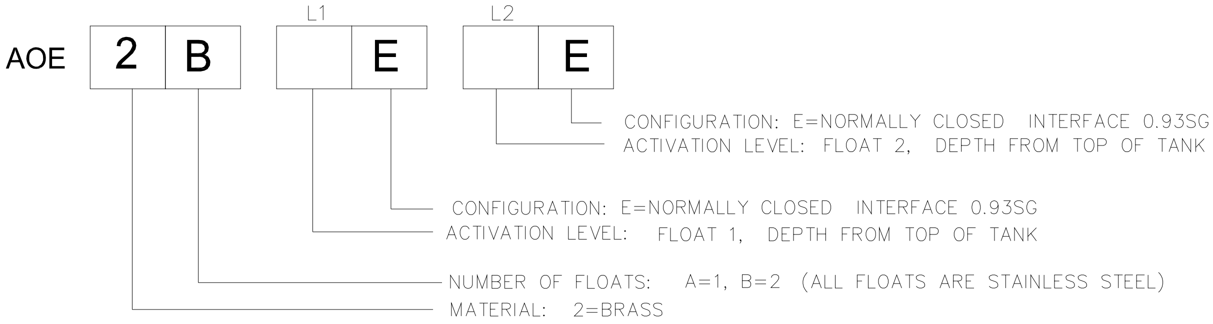
OPERATION:

The Float switch contains small magnets, as the float rises and falls in the liquid, the magnets cause SPST dry reed switch potted in the stem assembly to open or close depending on the orientation of the float switch. Float activation can be ordered in a normally open or a normally closed configuration.

INSTALLATION INSTRUCTIONS:

The AOE conduit head has a 3/4” NPT connection with a 1/2” NPT conduit adapter, for ease of electrical connection. When wiring to the Float switch wires, AWG 14 -16 Type MTW or THHN wire. Intrinsically safe wire must be used in “Hazardous Locations” applications and connected to intrinsically safe level controls. Consult NEC article 500 through 516 for additional guidance on Hazardous Locations. All splices, conduit and wiring conduit runs to the AOE, should be connected in such a way as to prevent moisture from entering the AOE conduit head. Water inside the conduit head could result in system failure. Liquid tight conduit is recommended.

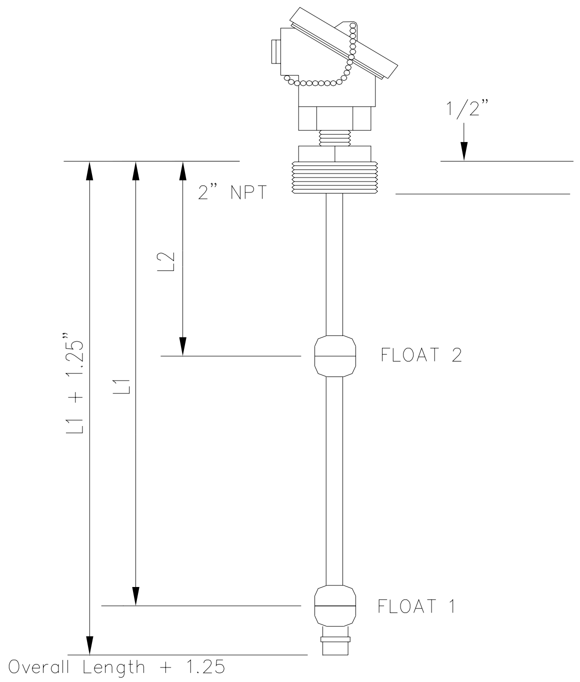
Form AOE-MWC
AUGUST, 2005



CONFIGURATION: E=NORMALLY CLOSED INTERFACE 0.93SG
ACTIVATION LEVEL: FLOAT 2, DEPTH FROM TOP OF TANK

CONFIGURATION: E=NORMALLY CLOSED INTERFACE 0.93SG
ACTIVATION LEVEL: FLOAT 1, DEPTH FROM TOP OF TANK

NUMBER OF FLOATS: A=1, B=2 (ALL FLOATS ARE STAINLESS STEEL)
MATERIAL: 2=BRASS



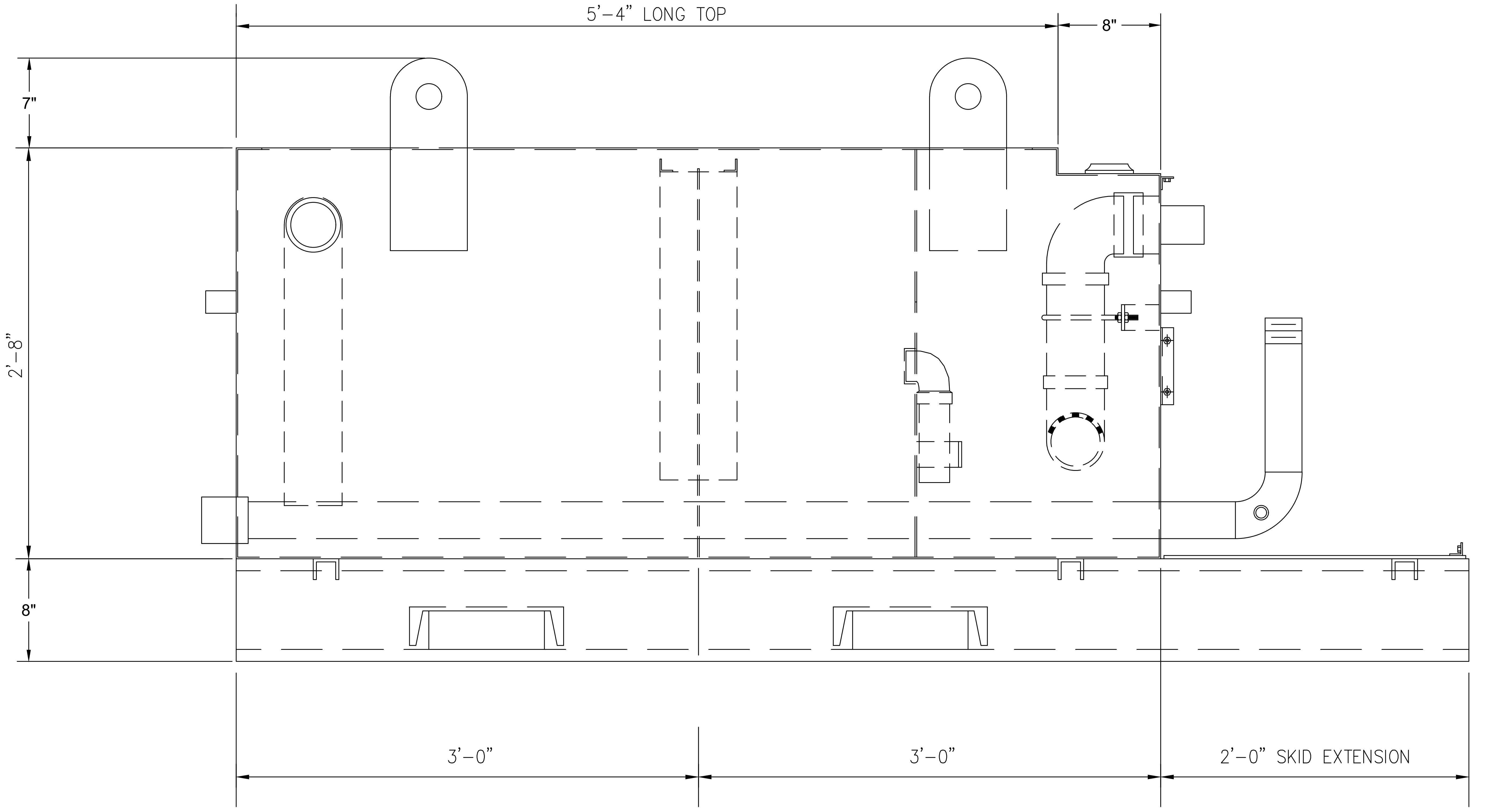
SPECIFICATIONS:

HOUSING:	CAST IRON/ALUMINUM NEMA 4
FITTING:	BRASS OR STAINLESS STEEL
THREAD SIZE* :	2" – 11 1/2 NPT
FLOAT SIZE:	1" WIDE 1/2" HIGH
CONTACT RATING:	50 WATT 120/240 VAC
STEM SIZE:	1/2"
TEMPERATURE:	200° F
PRESSURE:	100 P.S.I. MAX
SPECIFIC GRAVITY:	0.6 STANDARD 0.93 INTERFACE
WIRE COLOR CODE:	L1=RED L2=YELLOW L3=BLUE L4=BROWN L5=BLACK

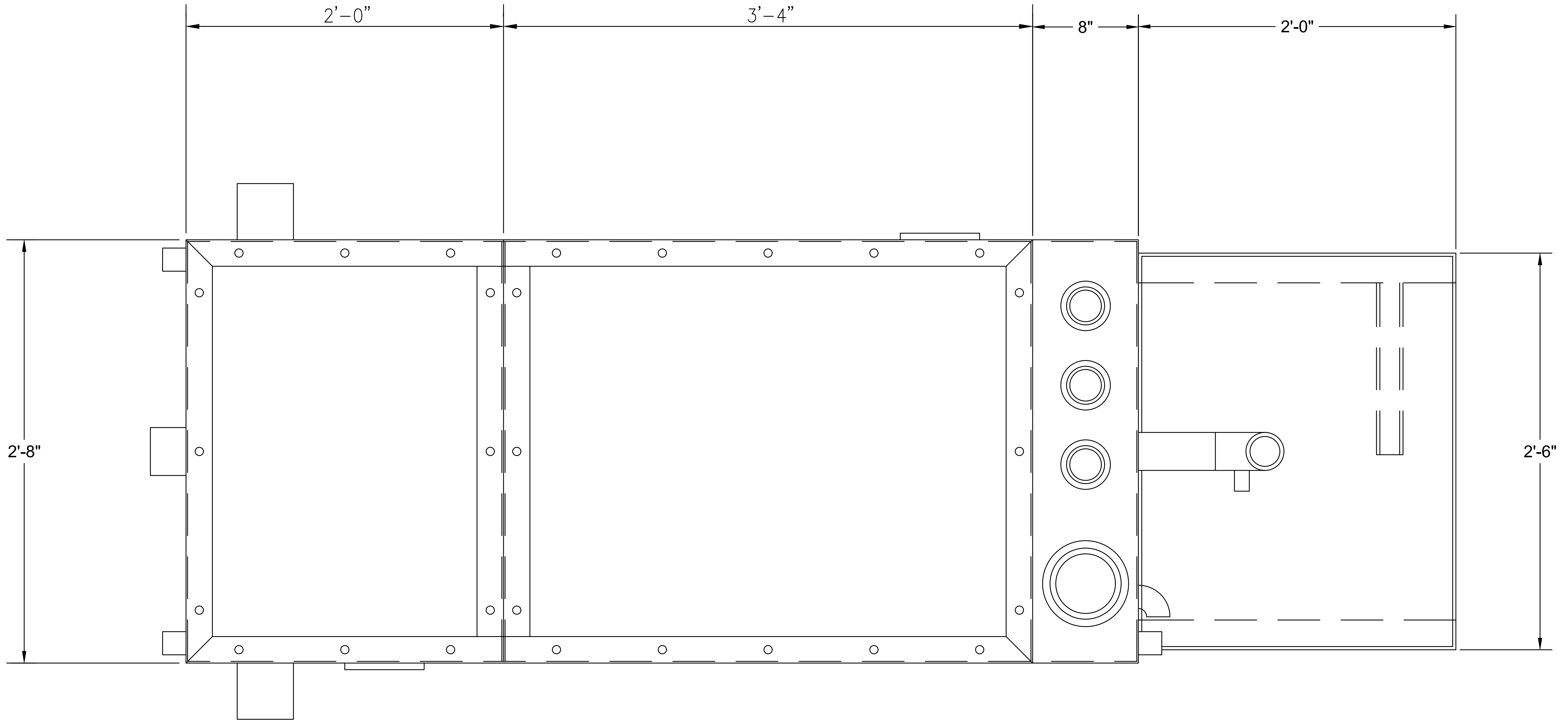
NOTES:
1) FOR TOTAL LENGTHS OVER 8 FEET, CONTACT FACTORY FOR SHIPPING AND CRATE ADDER.
2) ACTIVATION LEVEL TOLERANCE +/– .125"
3) OVERALL LENGTH OF STEM IS L1 ACTIVATION POINT +1.25

* NOTE:
CONSULT FACTORY FOR OPTIONAL MOUNTING APPLICATIONS

AOE
STYLE



ELEVATION



TOP OF TANK

REV# XX	CHANGE NOTICE	
CHG #	DESCRIPTION	DATE
XXX	XXX	XXX

GENERAL NOTES

SBD-D

D

3rd ANGLE PROJECTION

DRAWN BY:	XXX	REVISED BY:	XXX
APPROVED:	R. JORGENSEN	CHECKED BY:	XXX
SCALE:	XXX	KB PART #:	XXX

PROJECT:
WATER OIL SEPARATOR

DESCRIPTION:

* OBJECTS IN THIS DRAWING ARE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,445,704 B2; 8,302,639B2; D654,143S *

PROPRIETARY DRAWING

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1601 BUCHANAN ROAD
EVANSVILLE, IN 47720

PHONE: 812-424-1239
FAX: 812-402-0181

DATE:	2–May–19	DRAWING:	1 OF 3
REV. # A	PART #: XXX		
	FILE #: XXX		

Appendix 3 – Noise Analysis

Noise Assessment
For the Muscat Development Project

8377 Sultana Avenue
Fontana, CA

July 10, 2023

Client: TriStar FLC, LLC

Prepared By:

Rabe Consulting

Evan Foley, Environmental Consultant
Andréa Rabe, Senior Environmental Consultant
421 Commercial St.
Klamath Falls, OR 97601
andrea@rabeconsulting.com
541-891-2137

Introduction

The following report is a noise analysis for the Muscat Development Project too analyze the potential noise impacts associated with the proposed project.

Environmental Setting

Sound technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement is decibels (dB). The human ear is not equally sensitive to sound at all frequencies. The “A-weighted Scale” (dBA) reflects the normal range of human hearing, with the normal scale extends from 3-140 dBA.

Noise is generally defined an unwanted sound. The degree to which humans can be impacted by noise ranges from low levels (annoyance to nuisance) to high levels which can cause adverse health effects including hearing loss. Human response varies and can be subjective. Factors that influence the individual's response include intensity, frequency, and pat ern of noise; background noise level; and the nature of human activity (i.e., sleeping, working, studying) that is exposed to the noise. Land uses that are considered sensitive to noise impacts are called ”sensitive receptors”. Sensitive receptors include, but are not limited to, schools, residences, libraries, hospitals, and other medical facilities.

Noise level decreases as the distance from the noise to receptors increases. Noise generated by a stationary source will decrease by approximately six decibels over hard surfaces and nine decibels over soft surfaces for each doubling of the distance.

The noise analysis discusses sound levels in terms of Community Noise Equivalent Level (CNEL) and Equivalent Noise Level (L_{eq}). CNEL Is an average sound level during a 24-hour day. CNEL is a noise measurement scale, which accounts for noise source, distance, single event duration, single event occurrence, frequency, and time of day. Humans tolerate noises 5 dB higher during the day (7 am to 10 pm) as compared to nighttime (10 pm to 7 am).

L_{eq} is the average noise level over a specific period of time. L_{eq} can be thought of as the continuous noise which the same energy as the fluctuating noise level. The equivalent noise level is expressed in units of dBA.

Sensitive Receptors

The sensitive receptors that are in close proximity to project area in detailed in Table 1.

Table 1 Sensitive Receptors

Sensitive Receptor	Distance from Project (feet)	Direction from Project
Schools		
Tokay Elementary School	3000 ft	Northeast
Hemlock Elementary School	4568 ft	North
Oleander Elementary School	6179 ft	Southeast
Almeria Middle School	2393 ft	Northeast
Beech Avenue Elementary School	5783 ft	South
Sequoia Middle School	7758 ft	Southwest
Residences*		
Residence north of West Foothill Boulevard	645 ft	North
Residence west of Beech Avenue	1700 ft	West
Residence east of Catawba Avenue	2000 ft	East
Residence south of BNSF Railway	2886 ft	South
Hospitals/Medical Centers		
Cucamonga Valley Medical Group	12588 ft	North
Cucamonga Valley Medical Group	9306 ft	Northeast
Metropolitan Family Medical Clinic	9041 ft	Northeast
El Carmen Medical Clinic	9297 ft	Northeast
West Point Medical Center Urgent Care	7355 ft	Northwest
Unicare Community Health Center	3482 ft	East

*Measured to the closest residence in each direction.

Existing Noise Environment

The existing noise environment of the project area includes semitruck traffic, passenger vehicles, trains, and industrial facilities. The existing noise environment is 24 hours per day.

Thresholds of Significance

The proposed project would result in significant impact during the construction and operational phases if the project would cause the ambient noise level at the sensitive receptor to increase by 3 dB or more. The immediate area is zoned industrial, so an increase in truck and train noise in the project area is not a concern. The concern would be a noise increase on the sensitive receptors outlined above.

Table 2 Land Use Compatibility for Community Noise Environments

Land Use category	Normally Acceptable (dBA, CNEL)	Conditionally Acceptable (dBA, CNEL)	Normally Unacceptable (dBA, CNEL)	Clearly Unacceptable (dBA, CNEL)
Residential-Single Family	50-60	55-70	70-75	Above 70
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-70	60-70	70-80	Above 80
Industrial, Manufacturing, Utilities, Agriculture	50-75	70-80	Above 75	--

Source: California Office of Noise Control, Department of Health Services, City of Malibu General Plan Noise Element (1995).

Project Impacts

Construction and Operation Noise Impacts

Construction of the Proposed Project would result in temporary increases in ambient noise levels in the project area on an intermittent basis. The increase in noise would likely result in a temporary annoyance to nearby residents. Noise levels would fluctuate depending on the construction phase, the type of equipment and duration of use, the distance between the noise source and receptor, and the presence or absence of noise attenuation barriers.

Construction activities require the use of numerous noise-generating equipment, such as heavy equipment, pneumatic impact equipment, saws, and tractors. Typical noise levels from various types of equipment and activities that may be used during construction are listed in Table 3 and Table 4.

Table 3 Noise From Construction Equipment

Noise Source	Noise Level (dBA)[a]	
	50 Feet	100 Feet
Steamroller	83	77
Street Paver	80	74
Backhoe	83	77
Street Compressor	67	61
Front-end Loader	79	73
Idling Haul Truck	72	66
Cement Mixer	72	66

[a] *Assumes a six decibel drop-off rate for noise and traveling over hard surfaces. Measured noise levels of the equipment listed in this table were taken at distances of 10 and 30 feet from the noise source.*

Source: Cowan, James P., Handbook of Environmental Acoustics, 1994.

Table 4 Outdoor Construction Noise Levels

Construction Phase	**Noise Level (dBA, L_{eq})**	
	50 Feet	**50 Feet with Mufflers**
Ground Clearing	84	82
Grading/Excavation	89	86
Foundations	78	77
Structural	85	83
Finishing	89	86
Source: Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, PB 206717, 1971.		

Operation noise impacts would include existing train traffic and haul trucks for biofuel. Idling haul trucks would have noise impact levels of 72 dBA at 50 ft and 66 dBA at 100 ft from the noise source.

Noise Impacts on Sensitive Receptors

The noise impacts for the specific sensitive receptors are shown in the table below. The noise level at the specific sensitive receptor from this project is based on the noise level of the activity and the distance to the sensitive receptor. For example, idling hauling trucks (72 dBA) are reduced by 6 dBA over hard surfaces per each 50 ft to the residence 500 ft away. The sensitive receptor would hear this noise at 12 dBA, which is below the normally acceptable noise level for single family residences (50-60 dBA, CNEL). The table below shows the noise level heard at each specific receptor with the project serving as a noise source.

Table 5 Noise Level at the Sensitive Receptor

Sensitive Receptor	Distance from Receptor to Project (ft)	Activity Noise Level at Sensitive Receptor (dB)				
		Grading	Ground Clearing	Finishing	Idling Haul Truck	Backhoe
Tokay Elementary School	3000 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
Hemlock Elementary School	4568 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
Oleander Elementary School	6179 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
Almeria Middle School	2393 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
Beech Avenue Elementary School	5783 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB

Sensitive Receptor	Distance from Receptor to Project (ft)	Activity Noise Level at Sensitive Receptor (dB)				
		Grading	Ground Clearing	Finishing	Idling Haul Truck	Backhoe
Sequoia Middle School	7758 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
Residence north of West Foothill Boulevard	645 ft	23 dB	18 dB	23 dB	6 dB	17 dB
Residence west of Beech Avenue	1700 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
Residence east of Catawba Avenue	2000 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
Residence south of BNSF Railway	2886 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
Cucamonga Valley Medical Group	12588 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
Cucamonga Valley Medical Group	9306 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
Metropolitan Family Medical Clinic	9041 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
El Carmen Medical Clinic	9297 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
West Point Medical Center Urgent Care	7355 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB
Unicare Community Health Center	3482 ft	< 0 dB	< 0 dB	< 0 dB	< 0 dB	< 0 dB

Results from Impacts

Based on the types of activities within the project construction and operation phases and the distance to sensitive receptors, the noises are not going to exceed the normally acceptable noise levels. No mitigation measures are proposed during the project construction and operation phases. Given these results, there will be no impacts from noise on the sensitive receptors nearest the project area.

Appendix 4 –Air Quality Study

Air Quality and Greenhouse Gas Technical Report

Muscat Development Project

Fontana, California

August 7, 2023

Prepared for:
TriStar FLC, Inc,

By:
Rabe Consulting
421 Commercial Drive
Klamath Falls, Oregon 97601

Table of Contents

1.0 Introduction

TriStar FLC, Inc. (TriStar) is proposing to construct Muscat Development Project, a biofuel transload facility. The proposed project will include a high efficiency transload facility planned at the existing BNSF Railway yard. The planned facility will be used for the receipt, storage and distribution of biodiesel and renewable diesel. The facility will be fully contained adjacent to six inbound railroad tracks and include a truck loading rack and six one-million gallon above-ground tanks.

The project is located in the Mojave Desert Air Quality Management District area in Fontana (San Bernadino County), California. During both the construction and operation of the Muscat Development Project (Project), criteria pollutant and greenhouse gas (GHG) emissions would be generated due to equipment and vehicle use. The purpose of this technical study is to analyze the potential air quality and GHG impacts that could occur during construction and operation of the Project.

The emissions and impacts discussions in this report are divided into three sections, as follows:

- Project Overview
- Air Quality (Criteria Pollutants)
- Greenhouse Gases

This technical report concludes that impacts to air quality and climate change due to emissions from the Project will be insignificant, although the small incremental Project construction emissions could contribute to a potential cumulative air quality impact in this region when multiple other projects are also under construction.

2.0 Project Overview

The Project is proposed to be a biofuel transload facility. The planned facility will be used for the receipt, storage and distribution of biodiesel and renewable diesel. The facility will be fully contained adjacent to six inbound railroad tracks and include a truck loading rack and six one-million gallon above-ground tanks. Biofuel will be delivered to the project area via rail cars. The biofuel will be transferred to six one-million gallon above-ground tanks and then transferred to fuel delivery trucks.

Construction of the project will occur in an existing railway yard adjacent to six inbound railroad tracks. No demolition will need to occur as the project area does not have any existing structures or buildings. Construction will include grading of the site and surface preparation (gravel and pavement). The project will include a small building which will serve as an office and bathroom for the facility. Construction will result in approximately 20 days of 8 hours of grader and dump truck operations. The paving will include paving equipment for a 3-day period.

In order to provide a conservative assumption of air quality and GHG impacts, it is assumed that construction mobilization would commence in October 2023, with earthworks beginning as early as October 2023. Based on the construction schedule, the Project would be constructing and operation in early 2024. Construction will generally occur during daylight hours, Monday through Friday.

The proposed onsite building is expected to be staffed by one to two operations personnel during normal weekday working hours. An estimated 2 daily roundtrips would occur during operation of the Project. The project will result in an additional 25 truck trips per day, with an average trip length of 50 miles. The farthest delivery range is 150 miles. The project will result in 2 additional train trips per month (2 miles, locally car delivery within railyard).

3.0 Air Quality

The following section is an analysis of criteria air quality impacts associated with construction and operation of the proposed Project. Descriptions of TriStar-proposed mitigation measures that would reduce construction and operation generated air quality emissions are included in this section.

3.1 Project Construction

Construction of the Project would generate criteria pollutant emissions similar to those associated with any large industrial construction project. Onsite emissions would arise primarily from vehicles and equipment. Onsite fugitive dust emissions would also be generated during site earthwork and construction. Off-site emissions would occur from construction worker vehicles driving to and from the work site, as well as trucks delivering materials to the site. The construction related emissions are transient in nature.

Construction emissions were estimated using the Project-specific information provided by TriStar. The construction is divided into 3 phases: grading, surfacing, tank and building installation.

3.1.1 Methodology

The criteria pollutant for emissions from construction equipment comes from combustion of fuel to provide power for the operation of the equipment used for the construction activities. The result of the combustion generates criteria pollutant emissions—carbon monoxide (CO). volatile organic compounds (VOC), nitrogen oxides (NO_x), sulfur oxides (SO_x), respirable particulate matter (PM10) and fine particulate matter (PM2.5).

The fugitive dust emissions from construction activities are a result of earthmoving such as grading and vehicle travel during construction of the proposed Project. The emissions are PM10 and PM2.5. Wind entrainment of fugitive dust can occur when stockpiled soils or recently disturbed soils are not adequately treated or covered.

The criteria pollutant emission from motor vehicles results from the combustion of fuel in motor vehicle engines. The results are generation of CO, VOC, NO_x, SO_x, PM10, and PM2.5 emissions. Motor vehicle brake and tire wear results in the generation of PM10 and PM2.5 emissions.

Criteria pollutant emissions were estimated using the California Emissions Estimator Model (CalEEMod; 2023). CalEEMod is designed to model construction emissions for land use development projects and allows for the input of project-specific information. Emissions from equipment used during each phase of the project were modeled separately in the Construction module of CalEEMod. Exhaust emissions from the equipment were modeled using the modules building construction stage. For each phase of construction, the model defaults for the type of equipment, number of pieces of equipment, power rating and daily usage rate were adjusted by project specific information.

Annual fugitive dust emissions were estimated using the default level of detail in CalEEMod. The default worst-case emission factor for fugitive dust provided results.

Emissions from motor vehicles were calculated by multiplying the vehicle-miles-traveled for each type of vehicle used during the construction phase by emission factors in pounds. Emissions from worker trips and delivery vehicles were estimated in the Mojave Desert Air Basin.

Details of the calculations and model input and output are provided in Attachment 1.

3.1.2 Emissions estimates and Impacts

The results for the emissions during the construction phase are detailed in Attachment 1 and Table 1. The values listed in Table 1 are unmitigated values. The emissions are anticipated during the fall and winter, not in the summer months.

Table 1 Air Quality Emissions during Construction (pounds per day and tons per year for annual)

Time Period	VOC	NO_x	CO	SO_2	PM10	PM2.5
Average Daily Maximum Emissions	0.02	0.10	0.08	<0.005	<0.005	<0.005
Annual Emissions	0.17	2.92	4.62	0.01	0.73	0.12

Annual PM10 and PM2.5 would not exceed the applicable Mojave Desert Air Quality Management District (MDAQMD)thresholds. Nonetheless, TriStar would be required to implement standard dust control measures required by MDAQMD, including use of dust suppressants and control of vehicle speed on unpaved areas.

3.1.3 Construction Health Risk Impacts

The only toxic air pollutant emissions of potentially significant quantity would be those associated with the construction of the proposed Project from large, heavy-duty diesel-powered equipment exhaust. The Office of Environmental Health Hazard Assessment describes the health risk from diesel exhaust entirely in terms of the amount of particulate, or PM10, that is emitted. Currently, the health risk associated with diesel exhaust PM10 has a carcinogenic and chronic effect, but no short-term acute effect is recognized. The construction period of the Project lasts only a short period of time, relative to the length of time required for carcinogenic and chronic health impacts (i.e., 30 years). Therefore, the health risk associated with construction emissions would be less than significant.

3.2 Project Operation

Operation-related criteria pollutant emissions, including fugitive dust, would be generated from onsite and off-site vehicle use.

3.2.1 Methodology

Emissions from both onsite and off-site motor vehicles used during operation were modeled using CalEEMod, with default values for industrial uses. Off-site vehicles used during operation include vehicles used for delivering biofuel (trains) and dispersing biofuel (delivery trucks) and for employees. The combustion of fuel in off-site vehicles would generate VOC, NO_x, CO, SO_x, PM10, and PM2.5 emissions. Motor vehicle brake and tire wear and travel on paved roads with entrained road dust results in PM10 and PM2.5 emissions. The Project will result in a reduction of combustion fuels emissions from Project vehicles (delivery trucks) and other off-site vehicles, as biofuel will be more readily available for use in the region. It is anticipated that delivery trucks will be using biofuel, which is considered a non-emission fuel. Therefore, the emissions estimates and impact analysis for onsite and off-site vehicles should be considered to be conservative.

Fugitive dust emissions during operations from onsite and off-site vehicles are assumed to be traveling on paved surfaces. Note that although new fugitive dust emissions are predicted from the operation of the proposed Project according to calculation provided herein, the proposed Project may reduce overall fugitive dust emission in the region. This is because the project will add a distribution center for biofuels, resulting in shorter delivery distances to biofuel dispensing facilities. Therefore, the emissions estimates and impact analyses for PM10 and PM2.5 should be considered to be conservative.

For operations, the trip distance was estimated as the average round trip distance of the vehicle associated with the Project.

3.2.2 Emissions estimates and Impacts

Each heavy-duty truck and train provides emissions as detailed in Table 2 if using conventional fuels.

Table 2 Emissions for Vehicles

Number of Trucks per Day	**Number of Trains per Month**	**Total Number of Miles Per Day (based on average trip length)**	**Emissions/Day of CO_2 (kg)**	**Emissions/Day Of CH_2 (g)**	**Emissions/Day of N_2O (g)**
25 trucks		1250	1820	22.5	13.75
	2 trains	4			

The emission factors are 1.456 kg/mile for CO_2; 0.018 g/mile of CH_2; and 0.011 g/mile of N_2O.

The results for the emissions during the operation phase are detailed in Attachment 1. The values listed in Attachment 1 are unmitigated values for off-site vehicles. The emissions are anticipated year-round. Delivery trucks are expected to be using biofuel, instead of conventional fuels. Therefore, the delivery trucks are not considered to have air quality emissions. ‘

The annual emissions during operations of all pollutants are below their respective CEQA thresholds.

3.3 Impacts to Sensitive Receptors

One of the criteria identified by the CEQA Guidelines (Appendix G) to determine whether implementation of the Project would result in significant air quality impacts is the exposure of nearby sensitive receptors to substantial pollutant concentrations. As stated in Appendix G of the CEQA Guidelines, the significance thresholds established by the applicable air district may be relied upon to make this determination. Sensitive receptors are defined as land uses where sensitive population groups are likely to be located (e.g., children, the elderly, the acutely ill, and the chronically ill). These land uses include residences, schools, childcare centers, retirement homes, convalescent homes, medical care facilities, and recreational facilities. Sensitive receptors that may be adversely affected by the Project include surrounding residential land uses.

The sensitive receptors that are in close proximity to the Project are detailed in Table 3.

Table 3 Sensitive Receptors

Sensitive Receptor	Distance from Project (feet)	Direction from Project
Schools		
Tokay Elementary School	3000 ft	Northeast
Hemlock Elementary School	4568 ft	North
Oleander Elementary School	6179 ft	Southeast
Almeria Middle School	2393 ft	Northeast
Beech Avenue Elementary School	5783 ft	South
Sequoia Middle School	7758 ft	Southwest
Residences*		
Residence north of West Foothill Boulevard	645 ft	North
Residence west of Beech Avenue	1700 ft	West
Residence east of Catawba Avenue	2000 ft	East
Residence south of BNSF Railway	2886 ft	South
Hospitals/Medical Centers		
Cucamonga Valley Medical Group	12588 ft	North
Cucamonga Valley Medical Group	9306 ft	Northeast
Metropolitan Family Medical Clinic	9041 ft	Northeast
El Carmen Medical Clinic	9297 ft	Northeast
West Point Medical Center Urgent Care	7355 ft	Northwest
Unicare Community Health Center	3482 ft	East

*Measured to the closest residence in each direction.

With the exception of approximately 6 houses to the north, the sensitive receptors are all farther than 1000 ft from the project area. The project area is in an area zoned for “industrial” uses. The emissions are under thresholds for CEQA and more than 1000 ft (with the exception of a few residences).

Impacts on sensitive receptors, particularly from dust, would vary depending on the level and type of activity, the silt content of the soil, and prevailing weather. As discussed above, construction and operational emissions of criteria pollutants would be below the yearly thresholds and would not adversely affect nearby sensitive receptors. The proposed Project is found to have a less than significant impact related to exposure of sensitive receptors to substantial pollutant concentrations.

3.4 Carbon Monoxide

A carbon monoxide (CO) "hotspot" can occur when vehicles are idling at highly congested intersections. CO hotspots can adversely affect nearby sensitive receptors. CO hotspots are analyzed when a project increases traffic at an intersection or roadway which is already congested, a project involves adding signalization and/or channelization to an intersection, and sensitive receptors such as residences, schools, hospitals, etc. are located in the vicinity of the intersection or signalization. The Project does not involve signalization or channelization of an intersection. Therefore, no CO hotspots will be created. As a result, no adverse effects to nearby sensitive receptors would occur. For these reasons, no impact with respect to CO hotspots would occur and further analysis of CO hotspots is not warranted.

3.5 Project Site Cumulative Impacts

Cumulative impacts result from the proposed Project's incremental effect, together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Public Resource Code § 21083; California Code of Regulations, Title 14 §§ 15064(h), 15130, 15355). The following analysis of cumulative air quality impacts is based on assessment of cumulative air quality impacts by estimating via a three step process:

1. Evaluate localized impacts;
2. Evaluate consistency with existing air quality plans; and
3. Summarize air basin emissions.

3.5.1 Localized Impacts

The proposed Project would generate criteria pollutant emissions during construction and operation of the Project. However, emissions generated by the Project would not exceed thresholds established by MDAQMD. As such, the proposed Project would not result in any individual air quality impacts during construction or operation of the biofuel transload facility.

Significant cumulative impacts from the proposed Project, when considered with nearby, reasonably foreseeable planned solar projects, could occur only during Project construction since Project operation emissions are expected to be negligible. Most Project emissions would occur temporarily during the construction phase, which is conservatively assumed to commence in October 2023 and end in December 2023. After that, there would be minimal emissions and insignificant cumulative impacts during operation of the proposed Project.

3.5.2 Regional Impacts During Project Construction and Operation

There are no proposed/pending projects within the industrial area surrounding the Project. Rail replacement projects within the railyard were completed during the summer of 2023 and will not overlap with the construction of this project. No other biofuel transload facilities are proposed within a 5-mile radius of the project.

3.5.2 Consistency with Existing Air Quality Plans

Operation of the proposed Project would not exceed any established MDAQMD emissions thresholds. The Project is expected to be staffed by 1 to 2 operations personnel during normal weekday working hours. It is anticipated that these employees would be drawn from the existing San Bernadino County population. The proposed Project would not generate population, households or substantial employment within the general area. Therefore, the proposed Project would be consistent with the growth forecast for the general area. The Project would have no impact with respect to consistency with existing air quality plans.

4.0 Greenhouse Gases

This section provides an analysis of greenhouse gas (GHG) impacts associated with construction and operation of the proposed Project.

GHGs of concern include the following compounds:

- Carbon dioxide (CO_2)
- Nitrous oxide (N_2O)
- Methane (CH_4)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF_6)

Only the first three of these six GHGs are combustion source related and will be emitted by the equipment and vehicles used for the Project. The Project is not expected to have emissions of HFCs, PFCs, and SF_6. The primary GHG of concern for this Project is CO_2, as the emission rates of CH_4 and N_2O are orders of magnitude less than CO_2.

4.1 Project Construction

GHG emissions will be generated by the equipment used for construction activities and from both onsite and off-site motor vehicles.

4.1.2 Methodology

This section presents the methodology and assumptions used to estimate GHG emissions from construction of the Project.

The combustion of fuel to provide power for the operation of equipment results in the generation of GHGs. The CO_2, N_2O, and CH_4 emissions from off-road equipment use were estimated using the same methodology discussed above the criteria pollutants from construction equipment. GHGs emissions were estimated using CalEEMod (2023).

The combustion of fuel in motor vehicle engines would also generate GHG emissions. GHG emissions from motor vehicles were using CalEEMod as described above for criteria pollutants from construction vehicles.

4.1.3 Construction GHG Emissions and Impacts

Table 4 and Attachment 1 provide the average daily maximum emissions (summer and winter) and annual emissions for construction related GHG emissions. Values are shown for unmitigated emissions.

Table 4 GHG Emissions from Construction (lbs/day for daily; metric ton/year for annual)

Time Frame	CO_2	N_2O	CH_4
Daily Maximum (Summer)	15.1	<0.005	<0.005
Daily Maximum (Winter)	63.4	<0.005	<0.005
Annual Maximum	10.5	<0.005	<0.005

There is not a quantitative threshold over which construction GHG emissions are considered "significant" under CEQA. Best practices to reduce GHG emissions will be implemented during the construction of this project. Best practices to reduce GHG emissions include:

- Operational measures, such as limiting equipment and vehicle idling time and shutting down equipment when not in use;
- Regular preventive maintenance to prevent emission increases due to engine problems; and
- Use of newer, more fuel efficient or low-emitting diesel engines meeting federal/state emissions standards for construction equipment, whenever available.

The measures described above would directly and indirectly minimize the emissions of GHGs during the Project's construction and they are in accordance with the current best practices. Because these measures will be implemented for the Project, the GHG impacts from construction activities would not be significant.

4.2 Project Operation

Direct operation-related GHG emissions would be generated by vehicle use (delivery trucks and trains). Indirect GHG emissions would be generated due to electricity use.

4.2.1 Methodology

This section presents the methodology and assumptions used to estimate GHG emissions from the operation of the Project. The CO_2 emissions from motor vehicles used during operation were estimated using the same methodology described above for criteria pollutants from operation-related vehicles using the CalEEMod.

Other sources of GHG emissions during the Project's operation would include indirect emissions from electricity use. Electric power would be drawn from the grid for day-to-day operation of the transload facility including onsite operations and office building. GHG emissions from electricity use were estimated using CalEEMod.

4.2.2 Operation GHG Emissions and Impacts

GHG emissions during operation are shown in Table 5 and Attachment 1. The values shown are unmitigated.

Table 5 GHG Emissions during Operation

Time Frame	CO_2	N_2O	CH_4
Daily Maximum (Summer)	11.3	<0.005	0.62
Daily Maximum (Winter)	11.3	<0.005	0.62
Annual Maximum	8.7	<0.005	0.10

The Project has an estimated GHG emission rate below the standard threshold.

4.3 Total GHG Emissions

Combining the total construction and operation GHG emissions discussed above, the Project will emit the following:

10.5 tonnes CO_{2e} during construction + 261 (8.7 x 30 years) tonnes CO_{2e} during operation, for a Project total of 271.5 tonnes CO_{2e} of greenhouse gases.

As noted above, there is not a CEQA significance threshold for construction or operation-related GHG emissions. However, there is a threshold for industrial projects. Based on the calculations above, the Project total CO_{2e} of greenhouse gases is below the industrial project threshold. Therefore, the operation-related GHG emissions from the proposed Project would not have significant impacts on climate change.

4.4 Displacement of GHGs

Additionally, the Project will provide for biofuel to be more readily available in the region further reducing the GHG emissions in the region. The proposed transload facility for biofuels could displace fossil fuel combustion in vehicles, thereby providing a reduction in GHG emissions. Based on the assumption of this reduction, the Project would therefore result in a net reduction of GHG emissions annually.

5.0 References

California Air Pollution Control Officers Association. California Emissions Estimator Model. Accessed 2023. https://www.caleemod.com/

Mojave Desert Air Quality Management District (MDAQMD). Accessed 2023. https://www.mdaqmd.ca.gov/

The Climate Registry. Accessed 2023. https://theclimateregistry.org/

Attachment 1

Muscat Development Summary Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Muscat Development
Construction Start Date	10/1/2023
Operational Year	2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.80
Precipitation (days)	6.40
Location	34.103426262184726, -117.46515539978388
County	San Bernardino-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5307
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.17

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

Industrial Park	9.20	1000sqft	0.00	0.00	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-3	Use Local Construction Contractors
Construction	C-4*	Use Local and Sustainable Building Materials
Construction	C-5	Use Advanced Engine Tiers
Transportation	T-30*	Use Cleaner-Fuel Vehicles

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.02	0.01	0.10	0.08	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	—	15.1	15.1	< 0.005	< 0.005	0.00	15.2
Mit.	0.02	0.01	0.10	0.08	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	—	15.1	15.1	< 0.005	< 0.005	0.00	15.2
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.17	0.14	2.92	4.62	0.01	0.06	0.71	0.73	0.06	0.10	0.12	—	1,145	1,145	0.08	0.08	0.03	1,171
Mit.	0.17	0.14	2.92	4.62	0.01	0.06	0.71	0.73	0.06	0.10	0.12	—	1,145	1,145	0.08	0.08	0.03	1,171

% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.01	0.01	0.16	0.26	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	63.4	63.4	< 0.005	< 0.005	0.03	64.8
Mit.	0.01	0.01	0.16	0.26	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	63.4	63.4	< 0.005	< 0.005	0.03	64.8
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	< 0.005	< 0.005	0.03	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	10.5	10.5	< 0.005	< 0.005	< 0.005	10.7
Mit.	< 0.005	< 0.005	0.03	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	10.5	10.5	< 0.005	< 0.005	< 0.005	10.7
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6.16	5.14	11.3	0.62	< 0.005	0.00	26.7
Mit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6.16	5.14	11.3	0.62	< 0.005	0.00	26.7
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6.16	5.14	11.3	0.62	< 0.005	0.00	26.7
Mit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6.16	5.14	11.3	0.62	< 0.005	0.00	26.7

% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6.16	5.14	11.3	0.62	< 0.005	0.00	26.7
Mit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6.16	5.14	11.3	0.62	< 0.005	0.00	26.7
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	1.02	0.85	1.87	0.10	< 0.005	0.00	4.42
Mit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	1.02	0.85	1.87	0.10	< 0.005	0.00	4.42
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

6. Climate Risk Detailed Report

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	5	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	5	1	1	4

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

7. Health and Equity Details

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	81.0
Healthy Places Index Score for Project Location (b)	9.00
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

Appendix 5 –Biological Report

Biological Report
For the Muscat Development Project

8377 Sultana Avenue
Fontana, CA

July 10, 2023

Client: TriStar FLC, LLC

Prepared By:

Rabe Consulting

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Introduction

This report is to analyze the potential sensitive species including California State listed Threatened and Endangered species which may occur at the Muscat Development Project.

The project area for the Muscat Project is a portion of two tax lots in Fontana (San Bernardino County), California. The tax lots are described as: T1S R6W Section 12 Tax Lot 155 (APN 023205139) and T1S R6W Section 12 Tax Lot 166 (APN 023205139). The proposed project will develop a biofuel transload facility within a 9.24-acre project area.

The project area is a gravel railyard associated with the BNSF railway in Fontana, California. The project area is devoid of vegetation and does not exhibit wetland or natural soil features. The project area is entirely developed as a gravel yard adjacent to the railway.

State Authorities

California Endangered Species Act

The California Endangered Species Act (CESA) of 1984, in combination with the California Native Plant Protection Act of 1977, regulates the listing and take of plan and animal species designated as endangered, threatened, or rare within the State. The State of California also lists Species of Special Concern based on limited distribution, declining populations, diminishing habitat or unusual scientific, recreational, or educational value.

Site Visit

A site visit was conducted on March 6, 2023 to assess habitat conditions within the project area. During the site visit no reptiles, mammals or birds were observed within the project area.

Migratory Corridors and Linkages

Habitat linkages provide connections between larger habitat areas that are separated by development. Wildlife corridors are similar to linkages, but provide specific opportunities for animals to disperse or migrate between areas. A corridor can be defined as a linear landscape feature of sufficient width to allow animal movement between two comparatively undisturbed habitat fragments. Adequate cover is essential for a corridor to function as a wildlife movement area. It is possible for a habitat corridor to be adequate for one species yet still inadequate for others. Wildlife corridors are features that allow for the dispersal, seasonal migration, breeding, and foraging of a variety of wildlife species.

The project area is not located within any local or regional designated migratory corridors or linkages. The project area is separated from corridors by industrial development, railways and state highways.

Methods

As part of the habitat evaluation, a literature search was conducted to identify pertinent biological resources in the project area vicinity. Primary data sources reviewed to evaluate the occurrence potential of sensitive status species included: the California Natural Diversity Database (CNDDB); the California Native Plant Society (CNPS) inventory of rare and endangered plants. The search looked at the sensitive species which are known to potentially occur in the USGS 9 quadrangle map area around the project area for Muscat Development Project. The search results are attached in Appendix 1.

Results

Sensitive Status Plants

There are 55 sensitive status plant species that are known in the region. These plant species have the potential to occur in the project area. Of the 55 sensitive species, the species have different designations including Federally endangered; state endangered, threatened, and candidate threatened; and CNPS sensitive (list 1 or 2). List 1 and 2 are category designations for plants presumed extinct in California; plants rare and endangered in California and elsewhere; and plants rare and endangered in California, but more common elsewhere. Table 1 lists the number of species in each designation category.

Table 1 Sensitive Plant Designations

Designation Category	Number of Species in 9 Quad Area
Federally endangered/State endangered	5
Federally threatened/State endangered	1
Federally endangered/State threatened	1
Federally endangered	1
State candidate threatened	1
CNPS sensitive species (List 1 and 2)	46

Based on the habitat requirements for specific species and the developed nature of the project area, it was determined that the project area does not provide suitable habitat for sensitive status plant species known to occur in the general vicinity of the project area. This was confirmed during the site visit. All special status plants are absent from the project area.

Special Status Wildlife Species

There are 84 sensitive status wildlife species that are known in the region. These wildlife species have the potential to occur in the project area. Of the 84 sensitive species, the species have different designations including Federally endangered and threatened; state endangered, threatened, and candidate threatened; and California Department of Fish and Wildlife (CDFW) sensitive. CDFW sensitive category designations for wildlife include Species of Special Concern (SSC), California Fully Protected (FP) and Watch List (WL). Table 2 lists the number of species in each designation category.

Table 2 Sensitive Wildlife Designations

Designation Category	Number of Species in 9 Quad Area
Federally endangered/State endangered	3
Federally threatened/State endangered	1
Federally threatened/State threatened	1
Federally endangered/State candidate endangered	2
Federally delisted/State endangered	1
Federally threatened	2
Federally endangered	2
State threatened	5
State endangered	1

State candidate endangered	1
CDFW sensitive species (SSC/FP/WL)	64

Based on the habitat requirements for specific species and the developed nature of the project area, it was determined that the project area does not provide suitable habitat for sensitive status wildlife species known to occur in the general vicinity of the project area. This was confirmed during the site visit. All special status wildlife are absent from the project area.

Cumulative Effects

As there are no impacts to sensitive status wildlife and plant species, there will be no cumulative impacts to sensitive status wildlife and plant species.

Significant Unavoidable Impacts

Biological impacts associated with the project would be less than significant. No significant unavoidable impacts to biological resources would occur.

Table 3 Sensitive Wildlife Species by Animal Type

Animal Type	Number of Species in 9 Quad Area
Amphibians	4
Birds	46
Fish	3
Insects	2
Mammals	16
Reptiles	11

Based on the habitat requirements for specific species and the developed nature of the project area, it was determined that the project area does not provide suitable habitat for sensitive status wildlife species known to occur in the general vicinity of the project area. This was confirmed during the site visit. All special status wildlife are absent from the project area.

Appendix 1 CNDDB Search Results

Element_Type	Scientific_Name	Common_Name	Element_Code	Federal_Status	State_Status	CDFW_Status	CA_Rare_Plant_Rank	Quad_
Animals - Amphibians	Batrachoseps gabrieli	San Gabriel slender salamander	AAAAD02110	None	None	-	-	341172
Animals - Amphibians	Batrachoseps gabrieli	San Gabriel slender salamander	AAAAD02110	None	None	-	-	341172
Animals - Amphibians	Batrachoseps gabrieli	San Gabriel slender salamander	AAAAD02110	None	None	-	-	341172
Animals - Amphibians	Rana draytonii	California red-legged frog	AAABH01022	Threatened	None	SSC	-	331178
Animals - Amphibians	Rana draytonii	California red-legged frog	AAABH01022	Threatened	None	SSC	-	331178
Animals - Amphibians	Rana muscosa	southern mountain yellow-legged frog	AAABH01330	Endangered	Endangered	WL	-	341172
Animals - Amphibians	Rana muscosa	southern mountain yellow-legged frog	AAABH01330	Endangered	Endangered	WL	-	341172
Animals - Amphibians	Rana muscosa	southern mountain yellow-legged frog	AAABH01330	Endangered	Endangered	WL	-	341172
Animals - Amphibians	Taricha torosa	Coast Range newt	AAAAF02032	None	None	SSC	-	331178
Animals - Amphibians	Spea hammondii	western spadefoot	AAABF02020	None	None	SSC	-	331178
Animals - Amphibians	Spea hammondii	western spadefoot	AAABF02020	None	None	SSC	-	341172
Animals - Amphibians	Spea hammondii	western spadefoot	AAABF02020	None	None	SSC	-	341172
Animals - Amphibians	Spea hammondii	western spadefoot	AAABF02020	None	None	SSC	-	341171
Animals - Amphibians	Spea hammondii	western spadefoot	AAABF02020	None	None	SSC	-	331178
Animals - Amphibians	Spea hammondii	western spadefoot	AAABF02020	None	None	SSC	-	341171
Animals - Birds	Accipiter cooperii	Coopers hawk	ABNKC12040	None	None	WL	-	341171
Animals - Birds	Accipiter cooperii	Coopers hawk	ABNKC12040	None	None	WL	-	331178
Animals - Birds	Accipiter cooperii	Coopers hawk	ABNKC12040	None	None	WL	-	341171
Animals - Birds	Accipiter cooperii	Coopers hawk	ABNKC12040	None	None	WL	-	331178

Animals - Birds	Accipiter cooperii	Coopers hawk	ABNKC12040	None	None	WL	-	341172
Animals - Birds	Accipiter cooperii	Coopers hawk	ABNKC12040	None	None	WL	-	341171
Animals - Birds	Accipiter cooperii	Coopers hawk	ABNKC12040	None	None	WL	-	341172
Animals - Birds	Accipiter cooperii	Coopers hawk	ABNKC12040	None	None	WL	-	341172
Animals - Birds	Accipiter cooperii	Coopers hawk	ABNKC12040	None	None	WL	-	331178
Animals - Birds	Accipiter gentilis	northern goshawk	ABNKC12060	None	None	SSC	-	341171
Animals - Birds	Accipiter striatus	sharp-shinned hawk	ABNKC12020	None	None	WL	-	341171
Animals - Birds	Accipiter striatus	sharp-shinned hawk	ABNKC12020	None	None	WL	-	331178
Animals - Birds	Accipiter striatus	sharp-shinned hawk	ABNKC12020	None	None	WL	-	331178
Animals - Birds	Accipiter striatus	sharp-shinned hawk	ABNKC12020	None	None	WL	-	341171
Animals - Birds	Accipiter striatus	sharp-shinned hawk	ABNKC12020	None	None	WL	-	331178
Animals - Birds	Aquila chrysaetos	golden eagle	ABNKC22010	None	None	FP | WL	-	331178
Animals - Birds	Aquila chrysaetos	golden eagle	ABNKC22010	None	None	FP | WL	-	341171
Animals - Birds	Aquila chrysaetos	golden eagle	ABNKC22010	None	None	FP | WL	-	331178
Animals - Birds	Aquila chrysaetos	golden eagle	ABNKC22010	None	None	FP | WL	-	331178
Animals - Birds	Aquila chrysaetos	golden eagle	ABNKC22010	None	None	FP | WL	-	341171
Animals - Birds	Aquila chrysaetos	golden eagle	ABNKC22010	None	None	FP | WL	-	341172
Animals - Birds	Aquila chrysaetos	golden eagle	ABNKC22010	None	None	FP | WL	-	341172
Animals - Birds	Buteo regalis	ferruginous hawk	ABNKC19120	None	None	WL	-	341172
Animals - Birds	Buteo regalis	ferruginous hawk	ABNKC19120	None	None	WL	-	341172
Animals - Birds	Buteo regalis	ferruginous hawk	ABNKC19120	None	None	WL	-	331178
Animals - Birds	Buteo regalis	ferruginous hawk	ABNKC19120	None	None	WL	-	331178
Animals - Birds	Buteo swainsoni	Swainsons hawk	ABNKC19070	None	Threatened	-	-	331178
Animals - Birds	Buteo swainsoni	Swainsons hawk	ABNKC19070	None	Threatened	-	-	331178

Animals - Birds	Buteo swainsoni	Swainsons hawk	ABNKC19070	None	Threatened	-	-	331178
Animals - Birds	Buteo swainsoni	Swainsons hawk	ABNKC19070	None	Threatened	-	-	341171
Animals - Birds	Buteo swainsoni	Swainsons hawk	ABNKC19070	None	Threatened	-	-	341171
Animals - Birds	Circus hudsonius	northern harrier	ABNKC11011	None	None	SSC	-	341171
Animals - Birds	Circus hudsonius	northern harrier	ABNKC11011	None	None	SSC	-	341172
Animals - Birds	Circus hudsonius	northern harrier	ABNKC11011	None	None	SSC	-	341172
Animals - Birds	Circus hudsonius	northern harrier	ABNKC11011	None	None	SSC	-	341171
Animals - Birds	Circus hudsonius	northern harrier	ABNKC11011	None	None	SSC	-	331178
Animals - Birds	Circus hudsonius	northern harrier	ABNKC11011	None	None	SSC	-	341171
Animals - Birds	Circus hudsonius	northern harrier	ABNKC11011	None	None	SSC	-	331178
Animals - Birds	Circus hudsonius	northern harrier	ABNKC11011	None	None	SSC	-	331178
Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	331178
Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	331178
Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	341171
Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	331178
Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	341171
Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	341172
Animals - Birds	Haliaeetus leucocephalus	bald eagle	ABNKC10010	Delisted	Endangered	FP	-	331178
Animals - Birds	Eremophila alpestris actia	California horned lark	ABPAT02011	None	None	WL	-	331178
Animals - Birds	Eremophila alpestris actia	California horned lark	ABPAT02011	None	None	WL	-	341172
Animals - Birds	Eremophila alpestris actia	California horned lark	ABPAT02011	None	None	WL	-	341172
Animals - Birds	Eremophila alpestris actia	California horned lark	ABPAT02011	None	None	WL	-	341171
Animals - Birds	Eremophila alpestris actia	California horned lark	ABPAT02011	None	None	WL	-	341171

Animals - Birds	Eremophila alpestris actia	California horned lark	ABPAT02011	None	None	WL	-	331178
Animals - Birds	Eremophila alpestris actia	California horned lark	ABPAT02011	None	None	WL	-	331178
Animals - Birds	Chaetura vauxi	Vauxs swift	ABNUA03020	None	None	SSC	-	331178
Animals - Birds	Chaetura vauxi	Vauxs swift	ABNUA03020	None	None	SSC	-	331178
Animals - Birds	Chaetura vauxi	Vauxs swift	ABNUA03020	None	None	SSC	-	341171
Animals - Birds	Chaetura vauxi	Vauxs swift	ABNUA03020	None	None	SSC	-	331178
Animals - Birds	Ardea alba	great egret	ABNGA04040	None	None	-	-	331178
Animals - Birds	Ardea alba	great egret	ABNGA04040	None	None	-	-	341171
Animals - Birds	Ardea alba	great egret	ABNGA04040	None	None	-	-	341172
Animals - Birds	Ardea alba	great egret	ABNGA04040	None	None	-	-	341172
Animals - Birds	Ardea alba	great egret	ABNGA04040	None	None	-	-	331178
Animals - Birds	Ardea alba	great egret	ABNGA04040	None	None	-	-	341171
Animals - Birds	Ardea alba	great egret	ABNGA04040	None	None	-	-	331178
Animals - Birds	Ardea herodias	great blue heron	ABNGA04010	None	None	-	-	341171
Animals - Birds	Ardea herodias	great blue heron	ABNGA04010	None	None	-	-	341171
Animals - Birds	Ardea herodias	great blue heron	ABNGA04010	None	None	-	-	331178
Animals - Birds	Ardea herodias	great blue heron	ABNGA04010	None	None	-	-	341172
Animals - Birds	Ardea herodias	great blue heron	ABNGA04010	None	None	-	-	341172
Animals - Birds	Ardea herodias	great blue heron	ABNGA04010	None	None	-	-	341171
Animals - Birds	Ardea herodias	great blue heron	ABNGA04010	None	None	-	-	331178
Animals - Birds	Botaurus lentiginosus	American bittern	ABNGA01020	None	None	-	-	331178
Animals - Birds	Botaurus lentiginosus	American bittern	ABNGA01020	None	None	-	-	331178
Animals - Birds	Botaurus lentiginosus	American bittern	ABNGA01020	None	None	-	-	341171

Animals - Birds	Egretta thula	snowy egret	ABNGA06030	None	None	-	-	341171
Animals - Birds	Egretta thula	snowy egret	ABNGA06030	None	None	-	-	331178
Animals - Birds	Egretta thula	snowy egret	ABNGA06030	None	None	-	-	341171
Animals - Birds	Egretta thula	snowy egret	ABNGA06030	None	None	-	-	331178
Animals - Birds	Ixobrychus exilis	least bittern	ABNGA02010	None	None	SSC	-	331178
Animals - Birds	Nycticorax nycticorax	black-crowned night heron	ABNGA11010	None	None	-	-	331178
Animals - Birds	Nycticorax nycticorax	black-crowned night heron	ABNGA11010	None	None	-	-	341172
Animals - Birds	Nycticorax nycticorax	black-crowned night heron	ABNGA11010	None	None	-	-	331178
Animals - Birds	Nycticorax nycticorax	black-crowned night heron	ABNGA11010	None	None	-	-	341171
Animals - Birds	Nycticorax nycticorax	black-crowned night heron	ABNGA11010	None	None	-	-	331178
Animals - Birds	Gymnogyps californianus	California condor	ABNKA03010	Endangered	Endangered	FP	-	341172
Animals - Birds	Gymnogyps californianus	California condor	ABNKA03010	Endangered	Endangered	FP	-	341171
Animals - Birds	Charadrius montanus	mountain plover	ABNNB03100	None	None	SSC	-	331178
Animals - Birds	Mycteria americana	wood stork	ABNGF02010	None	None	SSC	-	331178
Animals - Birds	Coccyzus americanus occidentalis	western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	-	-	331178
Animals - Birds	Coccyzus americanus occidentalis	western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	-	-	341171
Animals - Birds	Coccyzus americanus occidentalis	western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	-	-	331178
Animals - Birds	Coccyzus americanus occidentalis	western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	-	-	331178
Animals - Birds	Falco columbarius	merlin	ABNKD06030	None	None	WL	-	331178
Animals - Birds	Falco columbarius	merlin	ABNKD06030	None	None	WL	-	331178

Animals - Birds	Falco columbarius	merlin	ABNKD06030	None	None	WL	-		341171
Animals - Birds	Falco columbarius	merlin	ABNKD06030	None	None	WL	-		341171
Animals - Birds	Falco columbarius	merlin	ABNKD06030	None	None	WL	-		341172
Animals - Birds	Falco columbarius	merlin	ABNKD06030	None	None	WL	-		331178
Animals - Birds	Falco mexicanus	prairie falcon	ABNKD06090	None	None	WL	-		331178
Animals - Birds	Falco mexicanus	prairie falcon	ABNKD06090	None	None	WL	-		341172
Animals - Birds	Falco mexicanus	prairie falcon	ABNKD06090	None	None	WL	-		341171
Animals - Birds	Falco mexicanus	prairie falcon	ABNKD06090	None	None	WL	-		331178
Animals - Birds	Falco peregrinus anatum	American peregrine falcon	ABNKD06071	Delisted	Delisted	FP	-		331178
Animals - Birds	Falco peregrinus anatum	American peregrine falcon	ABNKD06071	Delisted	Delisted	FP	-		331178
Animals - Birds	Falco peregrinus anatum	American peregrine falcon	ABNKD06071	Delisted	Delisted	FP	-		341172
Animals - Birds	Falco peregrinus anatum	American peregrine falcon	ABNKD06071	Delisted	Delisted	FP	-		341172
Animals - Birds	Falco peregrinus anatum	American peregrine falcon	ABNKD06071	Delisted	Delisted	FP	-		331178
Animals - Birds	Spinus lawrencei	Lawrences goldfinch	ABPBY06100	None	None	-	-		331178
Animals - Birds	Spinus lawrencei	Lawrences goldfinch	ABPBY06100	None	None	-	-		341172
Animals - Birds	Spinus lawrencei	Lawrences goldfinch	ABPBY06100	None	None	-	-		341172
Animals - Birds	Spinus lawrencei	Lawrences goldfinch	ABPBY06100	None	None	-	-		341171
Animals - Birds	Spinus lawrencei	Lawrences goldfinch	ABPBY06100	None	None	-	-		341172
Animals - Birds	Spinus lawrencei	Lawrences goldfinch	ABPBY06100	None	None	-	-		341171
Animals - Birds	Spinus lawrencei	Lawrences goldfinch	ABPBY06100	None	None	-	-		331178
Animals - Birds	Spinus lawrencei	Lawrences goldfinch	ABPBY06100	None	None	-	-		331178
Animals - Birds	Antigone canadensis canadensis	lesser sandhill crane	ABNMK01011	None	None	SSC	-		331178
Animals - Birds	Progne subis	purple martin	ABPAU01010	None	None	SSC	-		341171
Animals - Birds	Progne subis	purple martin	ABPAU01010	None	None	SSC	-		341172

Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Threatened	SSC	-	341171
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Threatened	SSC	-	331178
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Threatened	SSC	-	331178
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Threatened	SSC	-	341171
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Threatened	SSC	-	341171
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Threatened	SSC	-	331178
Animals - Birds	Xanthocephalus xanthocephalus	yellow-headed blackbird	ABPBXB3010	None	None	SSC	-	331178
Animals - Birds	Xanthocephalus xanthocephalus	yellow-headed blackbird	ABPBXB3010	None	None	SSC	-	341171
Animals - Birds	Xanthocephalus xanthocephalus	yellow-headed blackbird	ABPBXB3010	None	None	SSC	-	341172
Animals - Birds	Icteria virens	yellow-breasted chat	ABPBX24010	None	None	SSC	-	341171
Animals - Birds	Icteria virens	yellow-breasted chat	ABPBX24010	None	None	SSC	-	341172
Animals - Birds	Icteria virens	yellow-breasted chat	ABPBX24010	None	None	SSC	-	341172
Animals - Birds	Icteria virens	yellow-breasted chat	ABPBX24010	None	None	SSC	-	331178
Animals - Birds	Icteria virens	yellow-breasted chat	ABPBX24010	None	None	SSC	-	331178
Animals - Birds	Icteria virens	yellow-breasted chat	ABPBX24010	None	None	SSC	-	341171
Animals - Birds	Icteria virens	yellow-breasted chat	ABPBX24010	None	None	SSC	-	331178
Animals - Birds	Lanius ludovicianus	loggerhead shrike	ABPBR01030	None	None	SSC	-	331178
Animals - Birds	Lanius ludovicianus	loggerhead shrike	ABPBR01030	None	None	SSC	-	341171
Animals - Birds	Lanius ludovicianus	loggerhead shrike	ABPBR01030	None	None	SSC	-	341171
Animals - Birds	Lanius ludovicianus	loggerhead shrike	ABPBR01030	None	None	SSC	-	331178
Animals - Birds	Lanius ludovicianus	loggerhead shrike	ABPBR01030	None	None	SSC	-	331178
Animals - Birds	Lanius ludovicianus	loggerhead shrike	ABPBR01030	None	None	SSC	-	341172
Animals - Birds	Lanius ludovicianus	loggerhead shrike	ABPBR01030	None	None	SSC	-	341172
Animals - Birds	Lanius ludovicianus	loggerhead shrike	ABPBR01030	None	None	SSC	-	341171

Animals - Birds	Lanius ludovicianus	loggerhead shrike	ABPBR01030	None	None	SSC	-	341172
Animals - Birds	Hydroprogne caspia	Caspian tern	ABNNM08020	None	None	-	-	331178
Animals - Birds	Larus californicus	California gull	ABNNM03110	None	None	WL	-	331178
Animals - Birds	Larus californicus	California gull	ABNNM03110	None	None	WL	-	331178
Animals - Birds	Larus californicus	California gull	ABNNM03110	None	None	WL	-	331178
Animals - Birds	Larus californicus	California gull	ABNNM03110	None	None	WL	-	341171
Animals - Birds	Pandion haliaetus	osprey	ABNKC01010	None	None	WL	-	331178
Animals - Birds	Pandion haliaetus	osprey	ABNKC01010	None	None	WL	-	341171
Animals - Birds	Pandion haliaetus	osprey	ABNKC01010	None	None	WL	-	331178
Animals - Birds	Pandion haliaetus	osprey	ABNKC01010	None	None	WL	-	341172
Animals - Birds	Pandion haliaetus	osprey	ABNKC01010	None	None	WL	-	331178
Animals - Birds	Setophaga petechia	yellow warbler	ABPBX03010	None	None	SSC	-	331178
Animals - Birds	Setophaga petechia	yellow warbler	ABPBX03010	None	None	SSC	-	341172
Animals - Birds	Setophaga petechia	yellow warbler	ABPBX03010	None	None	SSC	-	341172
Animals - Birds	Setophaga petechia	yellow warbler	ABPBX03010	None	None	SSC	-	341172
Animals - Birds	Setophaga petechia	yellow warbler	ABPBX03010	None	None	SSC	-	341171
Animals - Birds	Setophaga petechia	yellow warbler	ABPBX03010	None	None	SSC	-	331178
Animals - Birds	Setophaga petechia	yellow warbler	ABPBX03010	None	None	SSC	-	331178
Animals - Birds	Setophaga petechia	yellow warbler	ABPBX03010	None	None	SSC	-	341171
Animals - Birds	Aimophila ruficeps canescens	southern California rufous-crowned sparrow	ABPBX91091	None	None	WL	-	341171
Animals - Birds	Aimophila ruficeps canescens	southern California rufous-crowned sparrow	ABPBX91091	None	None	WL	-	341171

Animals - Birds	Aimophila ruficeps canescens	southern California rufous-crowned sparrow	ABPBX91091	None	None	WL	-	331178
Animals - Birds	Aimophila ruficeps canescens	southern California rufous-crowned sparrow	ABPBX91091	None	None	WL	-	331178
Animals - Birds	Aimophila ruficeps canescens	southern California rufous-crowned sparrow	ABPBX91091	None	None	WL	-	341171
Animals - Birds	Aimophila ruficeps canescens	southern California rufous-crowned sparrow	ABPBX91091	None	None	WL	-	341172
Animals - Birds	Aimophila ruficeps canescens	southern California rufous-crowned sparrow	ABPBX91091	None	None	WL	-	341172
Animals - Birds	Aimophila ruficeps canescens	southern California rufous-crowned sparrow	ABPBX91091	None	None	WL	-	341172
Animals - Birds	Aimophila ruficeps canescens	southern California rufous-crowned sparrow	ABPBX91091	None	None	WL	-	331178
Animals - Birds	Ammodramus savannarum	grasshopper sparrow	ABPBXA0020	None	None	SSC	-	331178
Animals - Birds	Ammodramus savannarum	grasshopper sparrow	ABPBXA0020	None	None	SSC	-	331178
Animals - Birds	Artemisiospiza belli belli	Bells sparrow	ABPBX97021	None	None	WL	-	331178
Animals - Birds	Artemisiospiza belli belli	Bells sparrow	ABPBX97021	None	None	WL	-	331178
Animals - Birds	Artemisiospiza belli belli	Bells sparrow	ABPBX97021	None	None	WL	-	341171
Animals - Birds	Artemisiospiza belli belli	Bells sparrow	ABPBX97021	None	None	WL	-	341172
Animals - Birds	Artemisiospiza belli belli	Bells sparrow	ABPBX97021	None	None	WL	-	341172
Animals - Birds	Artemisiospiza belli belli	Bells sparrow	ABPBX97021	None	None	WL	-	341172
Animals - Birds	Artemisiospiza belli belli	Bells sparrow	ABPBX97021	None	None	WL	-	341171
Animals - Birds	Artemisiospiza belli belli	Bells sparrow	ABPBX97021	None	None	WL	-	331178
Animals - Birds	Spizella breweri	Brewers sparrow	ABPBX94040	None	None	-	-	341172
Animals - Birds	Spizella breweri	Brewers sparrow	ABPBX94040	None	None	-	-	341171
Animals - Birds	Spizella breweri	Brewers sparrow	ABPBX94040	None	None	-	-	331178

Animals - Birds	Pelecanus erythrorhynchos	American white pelican	ABNFC01010	None	None	SSC	-		331178
Animals - Birds	Nannopterum auritum	double-crested cormorant	ABNFD01020	None	None	WL	-		331178
Animals - Birds	Nannopterum auritum	double-crested cormorant	ABNFD01020	None	None	WL	-		331178
Animals - Birds	Nannopterum auritum	double-crested cormorant	ABNFD01020	None	None	WL	-		331178
Animals - Birds	Nannopterum auritum	double-crested cormorant	ABNFD01020	None	None	WL	-		341171
Animals - Birds	Nannopterum auritum	double-crested cormorant	ABNFD01020	None	None	WL	-		341172
Animals - Birds	Sphyrapicus ruber	red-breasted sapsucker	ABNYF05020	None	None	-	-		341171
Animals - Birds	Polioptila californica californica	coastal California gnatcatcher	ABPBJ08081	Threatened	None	SSC	-		341171
Animals - Birds	Polioptila californica californica	coastal California gnatcatcher	ABPBJ08081	Threatened	None	SSC	-		341172
Animals - Birds	Polioptila californica californica	coastal California gnatcatcher	ABPBJ08081	Threatened	None	SSC	-		341172
Animals - Birds	Polioptila californica californica	coastal California gnatcatcher	ABPBJ08081	Threatened	None	SSC	-		341172
Animals - Birds	Polioptila californica californica	coastal California gnatcatcher	ABPBJ08081	Threatened	None	SSC	-		341171
Animals - Birds	Polioptila californica californica	coastal California gnatcatcher	ABPBJ08081	Threatened	None	SSC	-		341171
Animals - Birds	Polioptila californica californica	coastal California gnatcatcher	ABPBJ08081	Threatened	None	SSC	-		331178
Animals - Birds	Polioptila californica californica	coastal California gnatcatcher	ABPBJ08081	Threatened	None	SSC	-		331178
Animals - Birds	Polioptila californica californica	coastal California gnatcatcher	ABPBJ08081	Threatened	None	SSC	-		331178
Animals - Birds	Coturnicops noveboracensis	yellow rail	ABNME01010	None	None	SSC	-		331178

Animals - Birds	Coturnicops noveboracensis	yellow rail	ABNME01010	None	None	SSC	-	331178
Animals - Birds	Laterallus jamaicensis coturniculus	California black rail	ABNME03041	None	Threatened	FP	-	331178
Animals - Birds	Laterallus jamaicensis coturniculus	California black rail	ABNME03041	None	Threatened	FP	-	331178
Animals - Birds	Laterallus jamaicensis coturniculus	California black rail	ABNME03041	None	Threatened	FP	-	341171
Animals - Birds	Laterallus jamaicensis coturniculus	California black rail	ABNME03041	None	Threatened	FP	-	341171
Animals - Birds	Laterallus jamaicensis coturniculus	California black rail	ABNME03041	None	Threatened	FP	-	331178
Animals - Birds	Asio flammeus	short-eared owl	ABNSB13040	None	None	SSC	-	331178
Animals - Birds	Asio flammeus	short-eared owl	ABNSB13040	None	None	SSC	-	331178
Animals - Birds	Asio otus	long-eared owl	ABNSB13010	None	None	SSC	-	331178
Animals - Birds	Asio otus	long-eared owl	ABNSB13010	None	None	SSC	-	341172
Animals - Birds	Asio otus	long-eared owl	ABNSB13010	None	None	SSC	-	341172
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	341172
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	341172
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	341171
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	331178
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	331178
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	341171
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	341171
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	331178
Animals - Birds	Strix occidentalis occidentalis	California Spotted Owl	ABNSB12013	None	None	SSC	-	341172

Animals - Birds	Strix occidentalis occidentalis	California Spotted Owl	ABNSB12013	None	None	SSC	-	341172
Animals - Birds	Strix occidentalis occidentalis	California Spotted Owl	ABNSB12013	None	None	SSC	-	341172
Animals - Birds	Plegadis chihi	white-faced ibis	ABNGE02020	None	None	WL	-	331178
Animals - Birds	Plegadis chihi	white-faced ibis	ABNGE02020	None	None	WL	-	331178
Animals - Birds	Calypte costae	Costas hummingbird	ABNUC47020	None	None	-	-	331178
Animals - Birds	Calypte costae	Costas hummingbird	ABNUC47020	None	None	-	-	331178
Animals - Birds	Calypte costae	Costas hummingbird	ABNUC47020	None	None	-	-	331178
Animals - Birds	Calypte costae	Costas hummingbird	ABNUC47020	None	None	-	-	341171
Animals - Birds	Calypte costae	Costas hummingbird	ABNUC47020	None	None	-	-	341171
Animals - Birds	Calypte costae	Costas hummingbird	ABNUC47020	None	None	-	-	341172
Animals - Birds	Calypte costae	Costas hummingbird	ABNUC47020	None	None	-	-	341172
Animals - Birds	Calypte costae	Costas hummingbird	ABNUC47020	None	None	-	-	341171
Animals - Birds	Calypte costae	Costas hummingbird	ABNUC47020	None	None	-	-	341172
Animals - Birds	Selasphorus rufus	rufous hummingbird	ABNUC51020	None	None	-	-	341172
Animals - Birds	Selasphorus rufus	rufous hummingbird	ABNUC51020	None	None	-	-	331178
Animals - Birds	Selasphorus rufus	rufous hummingbird	ABNUC51020	None	None	-	-	331178
Animals - Birds	Cistothorus palustris clarkae	Clarks marsh wren	ABPBG10021	None	None	SSC	-	331178
Animals - Birds	Contopus cooperi	olive-sided flycatcher	ABPAE32010	None	None	SSC	-	331178
Animals - Birds	Contopus cooperi	olive-sided flycatcher	ABPAE32010	None	None	SSC	-	331178
Animals - Birds	Contopus cooperi	olive-sided flycatcher	ABPAE32010	None	None	SSC	-	341171
Animals - Birds	Contopus cooperi	olive-sided flycatcher	ABPAE32010	None	None	SSC	-	341171
Animals - Birds	Contopus cooperi	olive-sided flycatcher	ABPAE32010	None	None	SSC	-	341172
Animals - Birds	Empidonax traillii	willow flycatcher	ABPAE33040	None	Endangered	-	-	341172
Animals - Birds	Empidonax traillii	willow flycatcher	ABPAE33040	None	Endangered	-	-	341171

Animals - Birds	Empidonax traillii	willow flycatcher	ABPAE33040	None	Endangered	-	-	341172
Animals - Birds	Empidonax traillii	willow flycatcher	ABPAE33040	None	Endangered	-	-	341171
Animals - Birds	Empidonax traillii	willow flycatcher	ABPAE33040	None	Endangered	-	-	331178
Animals - Birds	Empidonax traillii	willow flycatcher	ABPAE33040	None	Endangered	-	-	331178
Animals - Birds	Empidonax traillii	willow flycatcher	ABPAE33040	None	Endangered	-	-	331178
Animals - Birds	Empidonax traillii brewsteri	little willow flycatcher	ABPAE33041	None	Endangered	-	-	331178
Animals - Birds	Empidonax traillii extimus	southwestern willow flycatcher	ABPAE33043	Endangered	Endangered	-	-	331178
Animals - Birds	Empidonax traillii extimus	southwestern willow flycatcher	ABPAE33043	Endangered	Endangered	-	-	331178
Animals - Birds	Empidonax traillii extimus	southwestern willow flycatcher	ABPAE33043	Endangered	Endangered	-	-	331178
Animals - Birds	Empidonax traillii extimus	southwestern willow flycatcher	ABPAE33043	Endangered	Endangered	-	-	341172
Animals - Birds	Empidonax traillii extimus	southwestern willow flycatcher	ABPAE33043	Endangered	Endangered	-	-	341171
Animals - Birds	Empidonax traillii extimus	southwestern willow flycatcher	ABPAE33043	Endangered	Endangered	-	-	341172
Animals - Birds	Pyrocephalus rubinus	vermilion flycatcher	ABPAE36010	None	None	SSC	-	341172
Animals - Birds	Pyrocephalus rubinus	vermilion flycatcher	ABPAE36010	None	None	SSC	-	341171
Animals - Birds	Pyrocephalus rubinus	vermilion flycatcher	ABPAE36010	None	None	SSC	-	331178
Animals - Birds	Pyrocephalus rubinus	vermilion flycatcher	ABPAE36010	None	None	SSC	-	331178
Animals - Birds	Pyrocephalus rubinus	vermilion flycatcher	ABPAE36010	None	None	SSC	-	341171
Animals - Birds	Pyrocephalus rubinus	vermilion flycatcher	ABPAE36010	None	None	SSC	-	331178
Animals - Birds	Vireo bellii pusillus	least Bells vireo	ABPBW01114	Endangered	Endangered	-	-	331178
Animals - Birds	Vireo bellii pusillus	least Bells vireo	ABPBW01114	Endangered	Endangered	-	-	341171
Animals - Birds	Vireo bellii pusillus	least Bells vireo	ABPBW01114	Endangered	Endangered	-	-	341171

Animals - Birds	Vireo bellii pusillus	least Bells vireo	ABPBW01114	Endangered	Endangered	-	-	331178
Animals - Birds	Vireo bellii pusillus	least Bells vireo	ABPBW01114	Endangered	Endangered	-	-	331178
Animals - Birds	Vireo bellii pusillus	least Bells vireo	ABPBW01114	Endangered	Endangered	-	-	341171
Animals - Birds	Vireo bellii pusillus	least Bells vireo	ABPBW01114	Endangered	Endangered	-	-	341172
Animals - Birds	Vireo bellii pusillus	least Bells vireo	ABPBW01114	Endangered	Endangered	-	-	341172
Animals - Birds	Vireo bellii pusillus	least Bells vireo	ABPBW01114	Endangered	Endangered	-	-	341172
Animals - Crustaceans	Branchinecta sandiegonensis	San Diego fairy shrimp	ICBRA03060	Endangered	None	-	-	331178
Animals - Crustaceans	Streptocephalus woottoni	Riverside fairy shrimp	ICBRA07010	Endangered	None	-	-	331178
Animals - Fish	Catostomus santaanae	Santa Ana sucker	AFCJC02190	Threatened	None	-	-	331178
Animals - Fish	Catostomus santaanae	Santa Ana sucker	AFCJC02190	Threatened	None	-	-	341171
Animals - Fish	Catostomus santaanae	Santa Ana sucker	AFCJC02190	Threatened	None	-	-	341171
Animals - Fish	Catostomus santaanae	Santa Ana sucker	AFCJC02190	Threatened	None	-	-	331178
Animals - Fish	Gila orcuttii	arroyo chub	AFCJB13120	None	None	SSC	-	331178
Animals - Fish	Gila orcuttii	arroyo chub	AFCJB13120	None	None	SSC	-	341171
Animals - Fish	Gila orcuttii	arroyo chub	AFCJB13120	None	None	SSC	-	341171
Animals - Fish	Gila orcuttii	arroyo chub	AFCJB13120	None	None	SSC	-	331178
Animals - Fish	Gila orcuttii	arroyo chub	AFCJB13120	None	None	SSC	-	331178
Animals - Fish	Rhinichthys osculus ssp. 8	Santa Ana speckled dace	AFCJB3705K	None	None	SSC	-	331178
Animals - Fish	Rhinichthys osculus ssp. 8	Santa Ana speckled dace	AFCJB3705K	None	None	SSC	-	341172
Animals - Fish	Rhinichthys osculus ssp. 8	Santa Ana speckled dace	AFCJB3705K	None	None	SSC	-	341172
Animals - Fish	Oncorhynchus mykiss irideus pop. 10	steelhead - southern California DPS	AFCHA0209J	Endangered	Candidate Endangered	-	-	341172

Animals - Fish	Oncorhynchus mykiss irideus pop. 10	steelhead - southern California DPS	AFCHA0209J	Endangered	Candidate Endangered	-	-	341172
Animals - Fish	Oncorhynchus mykiss irideus pop. 10	steelhead - southern California DPS	AFCHA0209J	Endangered	Candidate Endangered	-	-	341171
Animals - Fish	Oncorhynchus mykiss irideus pop. 10	steelhead - southern California DPS	AFCHA0209J	Endangered	Candidate Endangered	-	-	341172
Animals - Fish	Oncorhynchus mykiss irideus pop. 10	steelhead - southern California DPS	AFCHA0209J	Endangered	Candidate Endangered	-	-	331178
Animals - Fish	Oncorhynchus mykiss irideus pop. 10	steelhead - southern California DPS	AFCHA0209J	Endangered	Candidate Endangered	-	-	341171
Animals - Fish	Oncorhynchus mykiss irideus pop. 10	steelhead - southern California DPS	AFCHA0209J	Endangered	Candidate Endangered	-	-	331178
Animals - Insects	Bombus crotchii	Crotch bumble bee	IIHYM24480	None	Candidate Endangered	-	-	331178
Animals - Insects	Bombus crotchii	Crotch bumble bee	IIHYM24480	None	Candidate Endangered	-	-	331178
Animals - Insects	Bombus crotchii	Crotch bumble bee	IIHYM24480	None	Candidate Endangered	-	-	341171
Animals - Insects	Bombus crotchii	Crotch bumble bee	IIHYM24480	None	Candidate Endangered	-	-	341171
Animals - Insects	Bombus crotchii	Crotch bumble bee	IIHYM24480	None	Candidate Endangered	-	-	341171
Animals - Insects	Bombus crotchii	Crotch bumble bee	IIHYM24480	None	Candidate Endangered	-	-	331178
Animals - Insects	Bombus crotchii	Crotch bumble bee	IIHYM24480	None	Candidate Endangered	-	-	341172
Animals - Insects	Bombus crotchii	Crotch bumble bee	IIHYM24480	None	Candidate Endangered	-	-	341172
Animals - Insects	Bombus crotchii	Crotch bumble bee	IIHYM24480	None	Candidate Endangered	-	-	341172
Animals - Insects	Bombus pensylvanicus	American bumble bee	IIHYM24260	None	None	-	-	341172
Animals - Insects	Bombus pensylvanicus	American bumble bee	IIHYM24260	None	None	-	-	341172
Animals - Insects	Bombus pensylvanicus	American bumble bee	IIHYM24260	None	None	-	-	331178
Animals - Insects	Bombus pensylvanicus	American bumble bee	IIHYM24260	None	None	-	-	341171
Animals - Insects	Bombus pensylvanicus	American bumble bee	IIHYM24260	None	None	-	-	331178

Animals - Insects	Neolarra alba	white cuckoo bee	IIHYM81010	None	None	-	-	341171
Animals - Insects	Neolarra alba	white cuckoo bee	IIHYM81010	None	None	-	-	331178
Animals - Insects	Neolarra alba	white cuckoo bee	IIHYM81010	None	None	-	-	341172
Animals - Insects	Neolarra alba	white cuckoo bee	IIHYM81010	None	None	-	-	341172
Animals - Insects	Cicindela tranquebarica viridissima	greenest tiger beetle	IICOL02201	None	None	-	-	341171
Animals - Insects	Ceratochrysis longimala	Desert cuckoo wasp	IIHYM71040	None	None	-	-	331178
Animals - Insects	Ceratochrysis longimala	Desert cuckoo wasp	IIHYM71040	None	None	-	-	331178
Animals - Insects	Eugnosta busckana	Buscks gallmoth	IILEM2X090	None	None	-	-	331178
Animals - Insects	Eugnosta busckana	Buscks gallmoth	IILEM2X090	None	None	-	-	331178
Animals - Insects	Eugnosta busckana	Buscks gallmoth	IILEM2X090	None	None	-	-	341171
Animals - Insects	Eugnosta busckana	Buscks gallmoth	IILEM2X090	None	None	-	-	341171
Animals - Insects	Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	IIDIP05021	Endangered	None	-	-	341171
Animals - Insects	Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	IIDIP05021	Endangered	None	-	-	341171
Animals - Insects	Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	IIDIP05021	Endangered	None	-	-	341171
Animals - Insects	Euphydryas editha quino	quino checkerspot butterfly	IILEPK405L	Endangered	None	-	-	341171
Animals - Insects	Euphydryas editha quino	quino checkerspot butterfly	IILEPK405L	Endangered	None	-	-	331178
Animals - Insects	Euphydryas editha quino	quino checkerspot butterfly	IILEPK405L	Endangered	None	-	-	341172
Animals - Insects	Euchloe hyantis andrewsi	Andrews marble butterfly	IILEPA5032	None	None	-	-	341172
Animals - Mammals	Ovis canadensis nelsoni	desert bighorn sheep	AMALE04013	None	None	FP	-	341172

Animals - Mammals	Microtus californicus mohavensis	Mohave river vole	AMAFF11031	None	None	SSC	-	341172
Animals - Mammals	Neotoma lepida intermedia	San Diego desert woodrat	AMAFF08041	None	None	SSC	-	341172
Animals - Mammals	Neotoma lepida intermedia	San Diego desert woodrat	AMAFF08041	None	None	SSC	-	341172
Animals - Mammals	Neotoma lepida intermedia	San Diego desert woodrat	AMAFF08041	None	None	SSC	-	341172
Animals - Mammals	Neotoma lepida intermedia	San Diego desert woodrat	AMAFF08041	None	None	SSC	-	341171
Animals - Mammals	Neotoma lepida intermedia	San Diego desert woodrat	AMAFF08041	None	None	SSC	-	331178
Animals - Mammals	Neotoma lepida intermedia	San Diego desert woodrat	AMAFF08041	None	None	SSC	-	331178
Animals - Mammals	Neotoma lepida intermedia	San Diego desert woodrat	AMAFF08041	None	None	SSC	-	341171
Animals - Mammals	Neotoma lepida intermedia	San Diego desert woodrat	AMAFF08041	None	None	SSC	-	331178
Animals - Mammals	Onychomys torridus ramona	southern grasshopper mouse	AMAFF06022	None	None	SSC	-	331178
Animals - Mammals	Onychomys torridus ramona	southern grasshopper mouse	AMAFF06022	None	None	SSC	-	341171
Animals - Mammals	Onychomys torridus ramona	southern grasshopper mouse	AMAFF06022	None	None	SSC	-	341172
Animals - Mammals	Lynx rufus pallescens	pallid bobcat	AMAJH03022	None	None	-	-	331178
Animals - Mammals	Lynx rufus pallescens	pallid bobcat	AMAJH03022	None	None	-	-	331178
Animals - Mammals	Lynx rufus pallescens	pallid bobcat	AMAJH03022	None	None	-	-	331178
Animals - Mammals	Chaetodipus fallax fallax	northwestern San Diego pocket mouse	AMAFD05031	None	None	SSC	-	331178

Animals - Mammals	Chaetodipus fallax fallax	northwestern San Diego pocket mouse	AMAFD05031	None	None	SSC	-	331178
Animals - Mammals	Chaetodipus fallax fallax	northwestern San Diego pocket mouse	AMAFD05031	None	None	SSC	-	331178
Animals - Mammals	Chaetodipus fallax fallax	northwestern San Diego pocket mouse	AMAFD05031	None	None	SSC	-	341171
Animals - Mammals	Chaetodipus fallax fallax	northwestern San Diego pocket mouse	AMAFD05031	None	None	SSC	-	341171
Animals - Mammals	Chaetodipus fallax fallax	northwestern San Diego pocket mouse	AMAFD05031	None	None	SSC	-	341172
Animals - Mammals	Chaetodipus fallax fallax	northwestern San Diego pocket mouse	AMAFD05031	None	None	SSC	-	341171
Animals - Mammals	Chaetodipus fallax fallax	northwestern San Diego pocket mouse	AMAFD05031	None	None	SSC	-	341172
Animals - Mammals	Chaetodipus fallax fallax	northwestern San Diego pocket mouse	AMAFD05031	None	None	SSC	-	341172
Animals - Mammals	Chaetodipus fallax pallidus	pallid San Diego pocket mouse	AMAFD05032	None	None	SSC	-	341172
Animals - Mammals	Chaetodipus fallax pallidus	pallid San Diego pocket mouse	AMAFD05032	None	None	SSC	-	341171
Animals - Mammals	Dipodomys merriami parvus	San Bernardino kangaroo rat	AMAFD03143	Endangered	Candidate Endangered	SSC	-	341171
Animals - Mammals	Dipodomys merriami parvus	San Bernardino kangaroo rat	AMAFD03143	Endangered	Candidate Endangered	SSC	-	341172
Animals - Mammals	Dipodomys merriami parvus	San Bernardino kangaroo rat	AMAFD03143	Endangered	Candidate Endangered	SSC	-	341172
Animals - Mammals	Dipodomys merriami parvus	San Bernardino kangaroo rat	AMAFD03143	Endangered	Candidate Endangered	SSC	-	341172
Animals - Mammals	Dipodomys merriami parvus	San Bernardino kangaroo rat	AMAFD03143	Endangered	Candidate Endangered	SSC	-	341171

Animals - Mammals	Dipodomys merriami parvus	San Bernardino kangaroo rat	AMAFD03143	Endangered	Candidate Endangered	SSC	-	341171
Animals - Mammals	Dipodomys merriami parvus	San Bernardino kangaroo rat	AMAFD03143	Endangered	Candidate Endangered	SSC	-	331178
Animals - Mammals	Dipodomys merriami parvus	San Bernardino kangaroo rat	AMAFD03143	Endangered	Candidate Endangered	SSC	-	331178
Animals - Mammals	Dipodomys simulans	Dulzura kangaroo rat	AMAFD03170	None	None	-	-	331178
Animals - Mammals	Dipodomys simulans	Dulzura kangaroo rat	AMAFD03170	None	None	-	-	341171
Animals - Mammals	Dipodomys simulans	Dulzura kangaroo rat	AMAFD03170	None	None	-	-	341171
Animals - Mammals	Dipodomys simulans	Dulzura kangaroo rat	AMAFD03170	None	None	-	-	341172
Animals - Mammals	Dipodomys simulans	Dulzura kangaroo rat	AMAFD03170	None	None	-	-	341172
Animals - Mammals	Dipodomys simulans	Dulzura kangaroo rat	AMAFD03170	None	None	-	-	341172
Animals - Mammals	Dipodomys simulans	Dulzura kangaroo rat	AMAFD03170	None	None	-	-	341171
Animals - Mammals	Dipodomys stephensi	Stephens kangaroo rat	AMAFD03100	Threatened	Threatened	-	-	341171
Animals - Mammals	Dipodomys stephensi	Stephens kangaroo rat	AMAFD03100	Threatened	Threatened	-	-	341171
Animals - Mammals	Dipodomys stephensi	Stephens kangaroo rat	AMAFD03100	Threatened	Threatened	-	-	331178
Animals - Mammals	Dipodomys stephensi	Stephens kangaroo rat	AMAFD03100	Threatened	Threatened	-	-	331178
Animals - Mammals	Dipodomys stephensi	Stephens kangaroo rat	AMAFD03100	Threatened	Threatened	-	-	331178
Animals - Mammals	Perognathus longimembris	Los Angeles pocket mouse	AMAFD01041	None	None	SSC	-	331178

	brevinasus							
Animals - Mammals	Perognathus longimembris brevinasus	Los Angeles pocket mouse	AMAFD01041	None	None	SSC	-	331178
Animals - Mammals	Perognathus longimembris brevinasus	Los Angeles pocket mouse	AMAFD01041	None	None	SSC	-	341171
Animals - Mammals	Perognathus longimembris brevinasus	Los Angeles pocket mouse	AMAFD01041	None	None	SSC	-	341171
Animals - Mammals	Perognathus longimembris brevinasus	Los Angeles pocket mouse	AMAFD01041	None	None	SSC	-	341172
Animals - Mammals	Perognathus longimembris brevinasus	Los Angeles pocket mouse	AMAFD01041	None	None	SSC	-	341172
Animals - Mammals	Perognathus longimembris brevinasus	Los Angeles pocket mouse	AMAFD01041	None	None	SSC	-	341172
Animals - Mammals	Lepus californicus bennettii	San Diego black-tailed jackrabbit	AMAEB03051	None	None	-	-	341172
Animals - Mammals	Lepus californicus bennettii	San Diego black-tailed jackrabbit	AMAEB03051	None	None	-	-	341172
Animals - Mammals	Lepus californicus bennettii	San Diego black-tailed jackrabbit	AMAEB03051	None	None	-	-	341172
Animals - Mammals	Lepus californicus bennettii	San Diego black-tailed jackrabbit	AMAEB03051	None	None	-	-	341171
Animals - Mammals	Lepus californicus bennettii	San Diego black-tailed jackrabbit	AMAEB03051	None	None	-	-	341171
Animals - Mammals	Lepus californicus bennettii	San Diego black-tailed jackrabbit	AMAEB03051	None	None	-	-	341171
Animals - Mammals	Lepus californicus bennettii	San Diego black-tailed jackrabbit	AMAEB03051	None	None	-	-	331178
Animals - Mammals	Lepus californicus bennettii	San Diego black-tailed	AMAEB03051	None	None	-	-	331178

		jackrabbit						
Animals - Mammals	Lepus californicus bennettii	San Diego black-tailed jackrabbit	AMAEB03051	None	None	-	-	331178
Animals - Mammals	Eumops perotis californicus	western mastiff bat	AMACD02011	None	None	SSC	-	331178
Animals - Mammals	Eumops perotis californicus	western mastiff bat	AMACD02011	None	None	SSC	-	331178
Animals - Mammals	Eumops perotis californicus	western mastiff bat	AMACD02011	None	None	SSC	-	341171
Animals - Mammals	Eumops perotis californicus	western mastiff bat	AMACD02011	None	None	SSC	-	341171
Animals - Mammals	Eumops perotis californicus	western mastiff bat	AMACD02011	None	None	SSC	-	341171
Animals - Mammals	Eumops perotis californicus	western mastiff bat	AMACD02011	None	None	SSC	-	341172
Animals - Mammals	Nyctinomops femorosaccus	pocketed free-tailed bat	AMACD04010	None	None	SSC	-	341171
Animals - Mammals	Nyctinomops femorosaccus	pocketed free-tailed bat	AMACD04010	None	None	SSC	-	341172
Animals - Mammals	Nyctinomops femorosaccus	pocketed free-tailed bat	AMACD04010	None	None	SSC	-	341172
Animals - Mammals	Nyctinomops femorosaccus	pocketed free-tailed bat	AMACD04010	None	None	SSC	-	341171
Animals - Mammals	Nyctinomops femorosaccus	pocketed free-tailed bat	AMACD04010	None	None	SSC	-	331178
Animals - Mammals	Nyctinomops femorosaccus	pocketed free-tailed bat	AMACD04010	None	None	SSC	-	331178
Animals - Mammals	Nyctinomops femorosaccus	pocketed free-tailed bat	AMACD04010	None	None	SSC	-	331178
Animals - Mammals	Taxidea taxus	American badger	AMAJF04010	None	None	SSC	-	331178

Animals - Mammals	Taxidea taxus	American badger	AMAJF04010	None	None	SSC	-	331178
Animals - Mammals	Taxidea taxus	American badger	AMAJF04010	None	None	SSC	-	331178
Animals - Mammals	Taxidea taxus	American badger	AMAJF04010	None	None	SSC	-	341171
Animals - Mammals	Taxidea taxus	American badger	AMAJF04010	None	None	SSC	-	341172
Animals - Mammals	Taxidea taxus	American badger	AMAJF04010	None	None	SSC	-	341172
Animals - Mammals	Taxidea taxus	American badger	AMAJF04010	None	None	SSC	-	341171
Animals - Mammals	Bassariscus astutus octavus	southern California ringtail	AMAJE01011	None	None	FP	-	341172
Animals - Mammals	Glaucomys oregonensis californicus	San Bernardino flying squirrel	AMAFB09021	None	None	SSC	-	341172
Animals - Mammals	Glaucomys oregonensis californicus	San Bernardino flying squirrel	AMAFB09021	None	None	SSC	-	341171
Animals - Mammals	Lasiurus cinereus	hoary bat	AMACC05032	None	None	-	-	331178
Animals - Mammals	Lasiurus frantzii	western red bat	AMACC05080	None	None	SSC	-	331178
Animals - Mammals	Lasiurus xanthinus	western yellow bat	AMACC05070	None	None	SSC	-	331178
Animals - Mammals	Lasiurus xanthinus	western yellow bat	AMACC05070	None	None	SSC	-	341171
Animals - Mammals	Lasiurus xanthinus	western yellow bat	AMACC05070	None	None	SSC	-	341172
Animals - Mammals	Lasiurus xanthinus	western yellow bat	AMACC05070	None	None	SSC	-	341172
Animals - Mammals	Lasiurus xanthinus	western yellow bat	AMACC05070	None	None	SSC	-	341171
Animals - Mammals	Lasiurus xanthinus	western yellow bat	AMACC05070	None	None	SSC	-	341171
Animals - Mammals	Lasiurus xanthinus	western yellow bat	AMACC05070	None	None	SSC	-	331178

Animals - Mammals	Lasiurus xanthinus	western yellow bat	AMACC05070	None	None	SSC	-	331178
Animals - Mammals	Myotis yumanensis	Yuma myotis	AMACC01020	None	None	-	-	341171
Animals - Mammals	Myotis yumanensis	Yuma myotis	AMACC01020	None	None	-	-	331178
Animals - Reptiles	Anniella stebbinsi	Southern California legless lizard	ARACC01060	None	None	SSC	-	331178
Animals - Reptiles	Anniella stebbinsi	Southern California legless lizard	ARACC01060	None	None	SSC	-	341171
Animals - Reptiles	Anniella stebbinsi	Southern California legless lizard	ARACC01060	None	None	SSC	-	341172
Animals - Reptiles	Anniella stebbinsi	Southern California legless lizard	ARACC01060	None	None	SSC	-	341172
Animals - Reptiles	Anniella stebbinsi	Southern California legless lizard	ARACC01060	None	None	SSC	-	341172
Animals - Reptiles	Anniella stebbinsi	Southern California legless lizard	ARACC01060	None	None	SSC	-	331178
Animals - Reptiles	Anniella stebbinsi	Southern California legless lizard	ARACC01060	None	None	SSC	-	331178
Animals - Reptiles	Anniella stebbinsi	Southern California legless lizard	ARACC01060	None	None	SSC	-	341171
Animals - Reptiles	Anniella stebbinsi	Southern California legless lizard	ARACC01060	None	None	SSC	-	341171
Animals - Reptiles	Charina umbratica	southern rubber boa	ARADA01011	None	Threatened	-	-	341172
Animals - Reptiles	Arizona elegans occidentalis	California glossy snake	ARADB01017	None	None	SSC	-	341172
Animals - Reptiles	Arizona elegans occidentalis	California glossy snake	ARADB01017	None	None	SSC	-	341172
Animals - Reptiles	Arizona elegans occidentalis	California glossy snake	ARADB01017	None	None	SSC	-	341172
Animals - Reptiles	Arizona elegans occidentalis	California glossy snake	ARADB01017	None	None	SSC	-	341171
Animals - Reptiles	Arizona elegans occidentalis	California glossy snake	ARADB01017	None	None	SSC	-	341171
Animals - Reptiles	Arizona elegans occidentalis	California glossy snake	ARADB01017	None	None	SSC	-	341171
Animals - Reptiles	Arizona elegans occidentalis	California glossy snake	ARADB01017	None	None	SSC	-	331178
Animals - Reptiles	Arizona elegans occidentalis	California glossy snake	ARADB01017	None	None	SSC	-	331178

Animals - Reptiles	Diadophis punctatus modestus	San Bernardino ringneck snake	ARADB10015	None	None	-	-		331178
Animals - Reptiles	Diadophis punctatus modestus	San Bernardino ringneck snake	ARADB10015	None	None	-	-		341171
Animals - Reptiles	Diadophis punctatus modestus	San Bernardino ringneck snake	ARADB10015	None	None	-	-		341171
Animals - Reptiles	Diadophis punctatus modestus	San Bernardino ringneck snake	ARADB10015	None	None	-	-		341172
Animals - Reptiles	Diadophis punctatus modestus	San Bernardino ringneck snake	ARADB10015	None	None	-	-		341172
Animals - Reptiles	Diadophis punctatus modestus	San Bernardino ringneck snake	ARADB10015	None	None	-	-		331178
Animals - Reptiles	Diadophis punctatus similis	San Diego ringneck snake	ARADB1001A	None	None	-	-		331178
Animals - Reptiles	Diadophis punctatus similis	San Diego ringneck snake	ARADB1001A	None	None	-	-		331178
Animals - Reptiles	Salvadora hexalepis virgultea	coast patch-nosed snake	ARADB30033	None	None	SSC	-		331178
Animals - Reptiles	Salvadora hexalepis virgultea	coast patch-nosed snake	ARADB30033	None	None	SSC	-		331178
Animals - Reptiles	Salvadora hexalepis virgultea	coast patch-nosed snake	ARADB30033	None	None	SSC	-		341172
Animals - Reptiles	Salvadora hexalepis virgultea	coast patch-nosed snake	ARADB30033	None	None	SSC	-		341172
Animals - Reptiles	Salvadora hexalepis virgultea	coast patch-nosed snake	ARADB30033	None	None	SSC	-		341172
Animals - Reptiles	Emys marmorata	western pond turtle	ARAAD02030	None	None	SSC	-		331178
Animals - Reptiles	Emys marmorata	western pond turtle	ARAAD02030	None	None	SSC	-		331178
Animals - Reptiles	Coleonyx variegatus abbotti	San Diego banded gecko	ARACD01031	None	None	SSC	-		331178
Animals - Reptiles	Coleonyx variegatus abbotti	San Diego banded gecko	ARACD01031	None	None	SSC	-		341172
Animals - Reptiles	Coleonyx variegatus abbotti	San Diego banded gecko	ARACD01031	None	None	SSC	-		341171

Animals - Reptiles	Coleonyx variegatus abbotti	San Diego banded gecko	ARACD01031	None	None	SSC	-	331178
Animals - Reptiles	Coleonyx variegatus abbotti	San Diego banded gecko	ARACD01031	None	None	SSC	-	331178
Animals - Reptiles	Coleonyx variegatus abbotti	San Diego banded gecko	ARACD01031	None	None	SSC	-	341171
Animals - Reptiles	Thamnophis hammondii	two-striped gartersnake	ARADB36160	None	None	SSC	-	341171
Animals - Reptiles	Thamnophis hammondii	two-striped gartersnake	ARADB36160	None	None	SSC	-	331178
Animals - Reptiles	Thamnophis hammondii	two-striped gartersnake	ARADB36160	None	None	SSC	-	331178
Animals - Reptiles	Thamnophis hammondii	two-striped gartersnake	ARADB36160	None	None	SSC	-	341172
Animals - Reptiles	Thamnophis hammondii	two-striped gartersnake	ARADB36160	None	None	SSC	-	341172
Animals - Reptiles	Thamnophis sirtalis pop. 1	south coast gartersnake	ARADB3613F	None	None	SSC	-	331178
Animals - Reptiles	Thamnophis sirtalis pop. 1	south coast gartersnake	ARADB3613F	None	None	SSC	-	341171
Animals - Reptiles	Thamnophis sirtalis pop. 1	south coast gartersnake	ARADB3613F	None	None	SSC	-	331178
Animals - Reptiles	Phrynosoma blainvillii	coast horned lizard	ARACF12100	None	None	SSC	-	331178
Animals - Reptiles	Phrynosoma blainvillii	coast horned lizard	ARACF12100	None	None	SSC	-	341171
Animals - Reptiles	Phrynosoma blainvillii	coast horned lizard	ARACF12100	None	None	SSC	-	341171
Animals - Reptiles	Phrynosoma blainvillii	coast horned lizard	ARACF12100	None	None	SSC	-	331178
Animals - Reptiles	Phrynosoma blainvillii	coast horned lizard	ARACF12100	None	None	SSC	-	331178
Animals - Reptiles	Phrynosoma blainvillii	coast horned lizard	ARACF12100	None	None	SSC	-	341172
Animals - Reptiles	Phrynosoma blainvillii	coast horned lizard	ARACF12100	None	None	SSC	-	341172
Animals - Reptiles	Phrynosoma blainvillii	coast horned lizard	ARACF12100	None	None	SSC	-	341172

Animals - Reptiles	Phrynosoma blainvillii	coast horned lizard	ARACF12100	None	None	SSC	-	341171
Animals - Reptiles	Aspidoscelis hyperythra	orange-throated whiptail	ARACJ02060	None	None	WL	-	341171
Animals - Reptiles	Aspidoscelis hyperythra	orange-throated whiptail	ARACJ02060	None	None	WL	-	341172
Animals - Reptiles	Aspidoscelis hyperythra	orange-throated whiptail	ARACJ02060	None	None	WL	-	341172
Animals - Reptiles	Aspidoscelis hyperythra	orange-throated whiptail	ARACJ02060	None	None	WL	-	331178
Animals - Reptiles	Aspidoscelis hyperythra	orange-throated whiptail	ARACJ02060	None	None	WL	-	331178
Animals - Reptiles	Aspidoscelis hyperythra	orange-throated whiptail	ARACJ02060	None	None	WL	-	341171
Animals - Reptiles	Aspidoscelis hyperythra	orange-throated whiptail	ARACJ02060	None	None	WL	-	331178
Animals - Reptiles	Aspidoscelis tigris stejnegeri	coastal whiptail	ARACJ02143	None	None	SSC	-	331178
Animals - Reptiles	Aspidoscelis tigris stejnegeri	coastal whiptail	ARACJ02143	None	None	SSC	-	341171
Animals - Reptiles	Aspidoscelis tigris stejnegeri	coastal whiptail	ARACJ02143	None	None	SSC	-	341171
Animals - Reptiles	Aspidoscelis tigris stejnegeri	coastal whiptail	ARACJ02143	None	None	SSC	-	331178
Animals - Reptiles	Aspidoscelis tigris stejnegeri	coastal whiptail	ARACJ02143	None	None	SSC	-	331178
Animals - Reptiles	Aspidoscelis tigris stejnegeri	coastal whiptail	ARACJ02143	None	None	SSC	-	341172
Animals - Reptiles	Aspidoscelis tigris stejnegeri	coastal whiptail	ARACJ02143	None	None	SSC	-	341172
Animals - Reptiles	Aspidoscelis tigris stejnegeri	coastal whiptail	ARACJ02143	None	None	SSC	-	341172
Animals - Reptiles	Aspidoscelis tigris stejnegeri	coastal whiptail	ARACJ02143	None	None	SSC	-	341171
Animals - Reptiles	Gopherus agassizii	desert tortoise	ARAAF01012	Threatened	Threatened	-	-	331178
Animals - Reptiles	Crotalus ruber	red-diamond rattlesnake	ARADE02090	None	None	SSC	-	331178

Animals - Reptiles	Crotalus ruber	red-diamond rattlesnake	ARADE02090	None	None	SSC	-	331178
Animals - Reptiles	Crotalus ruber	red-diamond rattlesnake	ARADE02090	None	None	SSC	-	331178
Animals - Reptiles	Crotalus ruber	red-diamond rattlesnake	ARADE02090	None	None	SSC	-	341171
Animals - Reptiles	Crotalus ruber	red-diamond rattlesnake	ARADE02090	None	None	SSC	-	341171
Community - Aquatic	Southern California Arroyo Chub/Santa Ana Sucker Stream	Southern California Arroyo Chub/Santa Ana Sucker Stream	CARE2330CA	None	None	-	-	331178
Community - Aquatic	Southern California Arroyo Chub/Santa Ana Sucker Stream	Southern California Arroyo Chub/Santa Ana Sucker Stream	CARE2330CA	None	None	-	-	331178
Community - Terrestrial	California Walnut Woodland	California Walnut Woodland	CTT71210CA	None	None	-	-	341172
Community - Terrestrial	Coastal and Valley Freshwater Marsh	Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	-	-	341172
Community - Terrestrial	Riversidian Alluvial Fan Sage Scrub	Riversidian Alluvial Fan Sage Scrub	CTT32720CA	None	None	-	-	341172
Community - Terrestrial	Riversidian Alluvial Fan Sage Scrub	Riversidian Alluvial Fan Sage Scrub	CTT32720CA	None	None	-	-	341172
Community - Terrestrial	Riversidian Alluvial Fan Sage Scrub	Riversidian Alluvial Fan Sage Scrub	CTT32720CA	None	None	-	-	341172
Community - Terrestrial	Riversidian Alluvial Fan Sage Scrub	Riversidian Alluvial Fan Sage Scrub	CTT32720CA	None	None	-	-	341171
Community - Terrestrial	Riversidian Alluvial Fan Sage Scrub	Riversidian Alluvial Fan Sage Scrub	CTT32720CA	None	None	-	-	341171
Community - Terrestrial	Southern Cottonwood Willow Riparian Forest	Southern Cottonwood Willow Riparian Forest	CTT61330CA	None	None	-	-	341171
Community - Terrestrial	Southern Cottonwood Willow Riparian Forest	Southern Cottonwood Willow Riparian Forest	CTT61330CA	None	None	-	-	331178
Community - Terrestrial	Southern Cottonwood Willow Riparian Forest	Southern Cottonwood Willow Riparian Forest	CTT61330CA	None	None	-	-	331178
Community - Terrestrial	Southern Riparian Forest	Southern Riparian Forest	CTT61300CA	None	None	-	-	341172
Community - Terrestrial	Southern Riparian Scrub	Southern Riparian Scrub	CTT63300CA	None	None	-	-	341171
Community - Terrestrial	Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder	CTT62400CA	None	None	-	-	331178

		Riparian Woodland						
Community - Terrestrial	Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	CTT62400CA	None	None	-	-	341172
Community - Terrestrial	Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	CTT62400CA	None	None	-	-	341172
Community - Terrestrial	Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	CTT62400CA	None	None	-	-	341172
Community - Terrestrial	Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	CTT62400CA	None	None	-	-	331178
Community - Terrestrial	Southern Willow Scrub	Southern Willow Scrub	CTT63320CA	None	None	-	-	331178
Plants - Vascular	Yucca brevifolia	western Joshua tree	PMAGA0B071	None	Candidate Threatened	-	CBR	341172
Plants - Vascular	Yucca brevifolia	western Joshua tree	PMAGA0B071	None	Candidate Threatened	-	CBR	331178
Plants - Vascular	Sagittaria sanfordii	Sanfords arrowhead	PMALI040Q0	None	None	-	1B.2	341172
Plants - Vascular	Oreonana vestita	woolly mountain-parsley	PDAPI1G030	None	None	-	1B.3	341172
Plants - Vascular	Asplenium vespertinum	western spleenwort	PPASP021P0	None	None	-	4.2	341172
Plants - Vascular	Asplenium vespertinum	western spleenwort	PPASP021P0	None	None	-	4.2	341171
Plants - Vascular	Ambrosia monogyra	singlewhorl burrobrush	PDAST50010	None	None	-	2B.2	341172
Plants - Vascular	Ambrosia pumila	San Diego ambrosia	PDAST0C0M0	Endangered	None	-	1B.1	331178
Plants - Vascular	Centromadia pungens ssp. laevis	smooth tarplant	PDAST4R0R4	None	None	-	1B.1	331178
Plants - Vascular	Centromadia pungens ssp. laevis	smooth tarplant	PDAST4R0R4	None	None	-	1B.1	341172
Plants - Vascular	Centromadia pungens ssp. laevis	smooth tarplant	PDAST4R0R4	None	None	-	1B.1	341171
Plants - Vascular	Centromadia pungens ssp. laevis	smooth tarplant	PDAST4R0R4	None	None	-	1B.1	331178
Plants - Vascular	Deinandra paniculata	paniculate tarplant	PDAST4R0N0	None	None	-	4.2	331178

Plants - Vascular	Deinandra paniculata	paniculate tarplant	PDAST4R0N0	None	None	-	4.2	331178
Plants - Vascular	Deinandra paniculata	paniculate tarplant	PDAST4R0N0	None	None	-	4.2	331178
Plants - Vascular	Deinandra paniculata	paniculate tarplant	PDAST4R0N0	None	None	-	4.2	341171
Plants - Vascular	Deinandra paniculata	paniculate tarplant	PDAST4R0N0	None	None	-	4.2	341171
Plants - Vascular	Eriophyllum lanatum var. obovatum	southern Sierra woolly sunflower	PDAST3N05D	None	None	-	4.3	341172
Plants - Vascular	Eriophyllum lanatum var. obovatum	southern Sierra woolly sunflower	PDAST3N05D	None	None	-	4.3	341172
Plants - Vascular	Helianthus nuttallii ssp. parishii	Los Angeles sunflower	PDAST4N102	None	None	-	1A	341171
Plants - Vascular	Lasthenia glabrata ssp. coulteri	Coulters goldfields	PDAST5L0A1	None	None	-	1B.1	331178
Plants - Vascular	Pseudognaphalium leucocephalum	white rabbit-tobacco	PDAST440C0	None	None	-	2B.2	341171
Plants - Vascular	Senecio aphanactis	chaparral ragwort	PDAST8H060	None	None	-	2B.2	341171
Plants - Vascular	Senecio aphanactis	chaparral ragwort	PDAST8H060	None	None	-	2B.2	331178
Plants - Vascular	Senecio aphanactis	chaparral ragwort	PDAST8H060	None	None	-	2B.2	341171
Plants - Vascular	Senecio astephanus	San Gabriel ragwort	PDAST8H090	None	None	-	4.3	341172
Plants - Vascular	Symphyotrichum defoliatum	San Bernardino aster	PDASTE80C0	None	None	-	1B.2	341172
Plants - Vascular	Symphyotrichum defoliatum	San Bernardino aster	PDASTE80C0	None	None	-	1B.2	341171
Plants - Vascular	Symphyotrichum defoliatum	San Bernardino aster	PDASTE80C0	None	None	-	1B.2	341171
Plants - Vascular	Symphyotrichum defoliatum	San Bernardino aster	PDASTE80C0	None	None	-	1B.2	341171
Plants - Vascular	Berberis nevinii	Nevins barberry	PDBER060A0	Endangered	Endangered	-	1B.1	331178

Plants - Vascular	Berberis nevinii	Nevins barberry	PDBER060A0	Endangered	Endangered	-	1B.1	341172
Plants - Vascular	Cryptantha incana	Tulare cryptantha	PDBOR0A1D0	None	None	-	1B.3	341172
Plants - Vascular	Lepidium virginicum var. robinsonii	Robinsons pepper-grass	PDBRA1M114	None	None	-	4.3	341171
Plants - Vascular	Lepidium virginicum var. robinsonii	Robinsons pepper-grass	PDBRA1M114	None	None	-	4.3	331178
Plants - Vascular	Lepidium virginicum var. robinsonii	Robinsons pepper-grass	PDBRA1M114	None	None	-	4.3	331178
Plants - Vascular	Lepidium virginicum var. robinsonii	Robinsons pepper-grass	PDBRA1M114	None	None	-	4.3	341171
Plants - Vascular	Lepidium virginicum var. robinsonii	Robinsons pepper-grass	PDBRA1M114	None	None	-	4.3	331178
Plants - Vascular	Nasturtium gambelii	Gambels water cress	PDBRA270V0	Endangered	Threatened	-	1B.1	341171
Plants - Vascular	Streptanthus bernardinus	Laguna Mountains jewelflower	PDBRA2G060	None	None	-	4.3	341172
Plants - Vascular	Streptanthus bernardinus	Laguna Mountains jewelflower	PDBRA2G060	None	None	-	4.3	341172
Plants - Vascular	Streptanthus bernardinus	Laguna Mountains jewelflower	PDBRA2G060	None	None	-	4.3	341172
Plants - Vascular	Streptanthus campestris	southern jewelflower	PDBRA2G0B0	None	None	-	1B.3	341172
Plants - Vascular	Opuntia basilaris var. brachyclada	short-joint beavertail	PDCAC0D053	None	None	-	1B.2	341172
Plants - Vascular	Arenaria paludicola	marsh sandwort	PDCAR040L0	Endangered	Endangered	-	1B.1	341172
Plants - Vascular	Arenaria paludicola	marsh sandwort	PDCAR040L0	Endangered	Endangered	-	1B.1	341171
Plants - Vascular	Arenaria paludicola	marsh sandwort	PDCAR040L0	Endangered	Endangered	-	1B.1	341171
Plants - Vascular	Arenaria paludicola	marsh sandwort	PDCAR040L0	Endangered	Endangered	-	1B.1	331178
Plants - Vascular	Cuscuta obtusiflora var. glandulosa	Peruvian dodder	PDCUS01111	None	None	-	2B.2	341171
Plants - Vascular	Dudleya multicaulis	many-stemmed dudleya	PDCRA040H0	None	None	-	1B.2	331178

Plants - Vascular	Carex comosa	bristly sedge	PMCYP032Y0	None	None	-	2B.1	341171
Plants - Vascular	Cladium californicum	California saw-grass	PMCYP04010	None	None	-	2B.2	341171
Plants - Vascular	Fimbristylis thermalis	hot springs fimbristylis	PMCYP0B0N0	None	None	-	2B.2	341172
Plants - Vascular	Schoenus nigricans	black bog-rush	PMCYP0P010	None	None	-	2B.2	341172
Plants - Vascular	Arctostaphylos glandulosa ssp. gabrielensis	San Gabriel manzanita	PDERI042P0	None	None	-	1B.2	341172
Plants - Vascular	Astragalus hornii var. hornii	Horns milk-vetch	PDFAB0F421	None	None	-	1B.1	341171
Plants - Vascular	Quercus durata var. gabrielensis	San Gabriel oak	PDFAG050G2	None	None	-	4.2	341172
Plants - Vascular	Frasera neglecta	pine green-gentian	PDGEN05080	None	None	-	4.3	341172
Plants - Vascular	Ribes divaricatum var. parishii	Parishs gooseberry	PDGRO020F3	None	None	-	1A	341171
Plants - Vascular	Phacelia mohavensis	Mojave phacelia	PDHYD0C310	None	None	-	4.3	341172
Plants - Vascular	Phacelia stellaris	Brands star phacelia	PDHYD0C510	None	None	-	1B.1	341171
Plants - Vascular	Phacelia stellaris	Brands star phacelia	PDHYD0C510	None	None	-	1B.1	331178
Plants - Vascular	Phacelia stellaris	Brands star phacelia	PDHYD0C510	None	None	-	1B.1	331178
Plants - Vascular	Juglans californica	southern California black walnut	PDJUG02020	None	None	-	4.2	331178
Plants - Vascular	Juglans californica	southern California black walnut	PDJUG02020	None	None	-	4.2	331178
Plants - Vascular	Juglans californica	southern California black walnut	PDJUG02020	None	None	-	4.2	341171
Plants - Vascular	Juglans californica	southern California black walnut	PDJUG02020	None	None	-	4.2	341171
Plants - Vascular	Juglans californica	southern California black walnut	PDJUG02020	None	None	-	4.2	341172
Plants - Vascular	Juglans californica	southern California black walnut	PDJUG02020	None	None	-	4.2	341171
Plants - Vascular	Juglans californica	southern California black walnut	PDJUG02020	None	None	-	4.2	341172
Plants - Vascular	Juglans californica	southern California black walnut	PDJUG02020	None	None	-	4.2	341172
Plants - Vascular	Juglans californica	southern California black walnut	PDJUG02020	None	None	-	4.2	331178

Plants - Vascular	Juncus duranii	Durans rush	PMJUN013T0	None	None	-	4.3	341172
Plants - Vascular	Juncus duranii	Durans rush	PMJUN013T0	None	None	-	4.3	341172
Plants - Vascular	Lepechinia fragrans	fragrant pitcher sage	PDLAM0V030	None	None	-	4.2	341172
Plants - Vascular	Monardella australis ssp. jokerstii	Jokersts monardella	PDLAM18112	None	None	-	1B.1	341172
Plants - Vascular	Monardella pringlei	Pringles monardella	PDLAM180J0	None	None	-	1A	341171
Plants - Vascular	Monardella pringlei	Pringles monardella	PDLAM180J0	None	None	-	1A	341171
Plants - Vascular	Monardella saxicola	rock monardella	PDLAM180Q1	None	None	-	4.2	341172
Plants - Vascular	Calochortus catalinae	Catalina mariposa-lily	PMLIL0D080	None	None	-	4.2	341172
Plants - Vascular	Calochortus catalinae	Catalina mariposa-lily	PMLIL0D080	None	None	-	4.2	341171
Plants - Vascular	Calochortus palmeri var. palmeri	Palmers mariposa-lily	PMLIL0D122	None	None	-	1B.2	341172
Plants - Vascular	Calochortus plummerae	Plummers mariposa-lily	PMLIL0D150	None	None	-	4.2	341172
Plants - Vascular	Calochortus plummerae	Plummers mariposa-lily	PMLIL0D150	None	None	-	4.2	341172
Plants - Vascular	Calochortus plummerae	Plummers mariposa-lily	PMLIL0D150	None	None	-	4.2	341172
Plants - Vascular	Calochortus plummerae	Plummers mariposa-lily	PMLIL0D150	None	None	-	4.2	341171
Plants - Vascular	Calochortus plummerae	Plummers mariposa-lily	PMLIL0D150	None	None	-	4.2	341171
Plants - Vascular	Calochortus plummerae	Plummers mariposa-lily	PMLIL0D150	None	None	-	4.2	331178
Plants - Vascular	Calochortus simulans	La Panza mariposa-lily	PMLIL0D170	None	None	-	1B.3	341172
Plants - Vascular	Calochortus weedii var. intermedius	intermediate mariposa-lily	PMLIL0D1J1	None	None	-	1B.2	341172
Plants - Vascular	Fritillaria pinetorum	pine fritillary	PMLIL0V0E0	None	None	-	4.3	341172
Plants - Vascular	Lilium humboldtii ssp. ocellatum	ocellated humboldt lily	PMLIL1A072	None	None	-	4.2	341172

Plants - Vascular	Lilium humboldtii ssp. ocellatum	ocellated humboldt lily	PMLIL1A072	None	None	-	4.2	341172
Plants - Vascular	Lilium humboldtii ssp. ocellatum	ocellated humboldt lily	PMLIL1A072	None	None	-	4.2	341172
Plants - Vascular	Lilium parryi	lemon lily	PMLIL1A0J0	None	None	-	1B.2	341172
Plants - Vascular	Lilium parryi	lemon lily	PMLIL1A0J0	None	None	-	1B.2	341172
Plants - Vascular	Malacothamnus parishii	Parishs bush-mallow	PDMAL0Q0C0	None	None	-	1A	341171
Plants - Vascular	Malacothamnus parishii	Parishs bush-mallow	PDMAL0Q0C0	None	None	-	1A	341172
Plants - Vascular	Malacothamnus parishii	Parishs bush-mallow	PDMAL0Q0C0	None	None	-	1A	341172
Plants - Vascular	Malacothamnus parishii	Parishs bush-mallow	PDMAL0Q0C0	None	None	-	1A	341171
Plants - Vascular	Sidalcea neomexicana	salt spring checkerbloom	PDMAL110J0	None	None	-	2B.2	341171
Plants - Vascular	Claytonia peirsonii ssp. peirsonii	Peirsons spring beauty	PDPOR03121	None	None	-	1B.2	341172
Plants - Vascular	Abronia villosa var. aurita	chaparral sand-verbena	PDNYC010P1	None	None	-	1B.1	331178
Plants - Vascular	Castilleja lasiorhyncha	San Bernardino Mountains owls-clover	PDSCR0D410	None	None	-	1B.2	341172
Plants - Vascular	Chloropyron maritimum ssp. maritimum	salt marsh birds-beak	PDSCR0J0C2	Endangered	Endangered	-	1B.2	341172
Plants - Vascular	Chloropyron maritimum ssp. maritimum	salt marsh birds-beak	PDSCR0J0C2	Endangered	Endangered	-	1B.2	341171
Plants - Vascular	Chloropyron maritimum ssp. maritimum	salt marsh birds-beak	PDSCR0J0C2	Endangered	Endangered	-	1B.2	341171
Plants - Vascular	Chloropyron maritimum ssp. maritimum	salt marsh birds-beak	PDSCR0J0C2	Endangered	Endangered	-	1B.2	331178
Plants - Vascular	Romneya coulteri	Coulters matilija poppy	PDPAP0L010	None	None	-	4.2	331178
Plants - Vascular	Diplacus johnstonii	Johnstons monkeyflower	PDSCR1B1H0	None	None	-	4.3	341172
Plants - Vascular	Hordeum intercedens	vernal barley	PMPOA380E0	None	None	-	3.2	331178

Plants - Vascular	Imperata brevifolia	California satintail	PMPOA3D020	None	None	-	2B.1	341172
Plants - Vascular	Muhlenbergia californica	California muhly	PMPOA480A0	None	None	-	4.3	341172
Plants - Vascular	Muhlenbergia californica	California muhly	PMPOA480A0	None	None	-	4.3	341172
Plants - Vascular	Muhlenbergia californica	California muhly	PMPOA480A0	None	None	-	4.3	341171
Plants - Vascular	Muhlenbergia utilis	aparejo grass	PMPOA481X0	None	None	-	2B.2	341171
Plants - Vascular	Sphenopholis obtusata	prairie wedge grass	PMPOA5T030	None	None	-	2B.2	341171
Plants - Vascular	Sphenopholis obtusata	prairie wedge grass	PMPOA5T030	None	None	-	2B.2	341171
Plants - Vascular	Eriastrum densifolium ssp. sanctorum	Santa Ana River woollystar	PDPLM03035	Endangered	Endangered	-	1B.1	341171
Plants - Vascular	Eriastrum densifolium ssp. sanctorum	Santa Ana River woollystar	PDPLM03035	Endangered	Endangered	-	1B.1	341171
Plants - Vascular	Eriastrum densifolium ssp. sanctorum	Santa Ana River woollystar	PDPLM03035	Endangered	Endangered	-	1B.1	331178
Plants - Vascular	Eriastrum densifolium ssp. sanctorum	Santa Ana River woollystar	PDPLM03035	Endangered	Endangered	-	1B.1	341172
Plants - Vascular	Eriastrum densifolium ssp. sanctorum	Santa Ana River woollystar	PDPLM03035	Endangered	Endangered	-	1B.1	341172
Plants - Vascular	Eriastrum densifolium ssp. sanctorum	Santa Ana River woollystar	PDPLM03035	Endangered	Endangered	-	1B.1	331178
Plants - Vascular	Linanthus concinnus	San Gabriel linanthus	PDPLM090D0	None	None	-	1B.2	341172
Plants - Vascular	Navarretia prostrata	prostrate vernal pool navarretia	PDPLM0C0Q0	None	None	-	1B.2	341171
Plants - Vascular	Chorizanthe leptotheca	Peninsular spineflower	PDPGN040D0	None	None	-	4.2	341171
Plants - Vascular	Chorizanthe parryi var. parryi	Parrys spineflower	PDPGN040J2	None	None	-	1B.1	341171
Plants - Vascular	Chorizanthe parryi var. parryi	Parrys spineflower	PDPGN040J2	None	None	-	1B.1	341172

Plants - Vascular	Chorizanthe parryi var. parryi	Parrys spineflower	PDPGN040J2	None	None	-	1B.1	341172
Plants - Vascular	Chorizanthe parryi var. parryi	Parrys spineflower	PDPGN040J2	None	None	-	1B.1	341172
Plants - Vascular	Chorizanthe parryi var. parryi	Parrys spineflower	PDPGN040J2	None	None	-	1B.1	341171
Plants - Vascular	Chorizanthe parryi var. parryi	Parrys spineflower	PDPGN040J2	None	None	-	1B.1	341171
Plants - Vascular	Chorizanthe parryi var. parryi	Parrys spineflower	PDPGN040J2	None	None	-	1B.1	331178
Plants - Vascular	Chorizanthe xanti var. leucotheca	white-bracted spineflower	PDPGN040Z1	None	None	-	1B.2	341172
Plants - Vascular	Dodecahema leptoceras	slender-horned spineflower	PDPGN0V010	Endangered	Endangered	-	1B.1	341172
Plants - Vascular	Dodecahema leptoceras	slender-horned spineflower	PDPGN0V010	Endangered	Endangered	-	1B.1	341172
Plants - Vascular	Dodecahema leptoceras	slender-horned spineflower	PDPGN0V010	Endangered	Endangered	-	1B.1	341171
Plants - Vascular	Eriogonum microthecum var. alpinum	alpine slender buckwheat	PDPGN083WA	None	None	-	4.3	341172
Plants - Vascular	Eriogonum microthecum var. johnstonii	Johnstons buckwheat	PDPGN083W5	None	None	-	1B.3	341172
Plants - Vascular	Eriogonum umbellatum var. minus	alpine sulphur-flowered buckwheat	PDPGN086U7	None	None	-	4.3	341172
Plants - Vascular	Horkelia cuneata var. puberula	mesa horkelia	PDROS0W045	None	None	-	1B.1	341172
Plants - Vascular	Horkelia cuneata var. puberula	mesa horkelia	PDROS0W045	None	None	-	1B.1	341172
Plants - Vascular	Horkelia cuneata var. puberula	mesa horkelia	PDROS0W045	None	None	-	1B.1	341171
Plants - Vascular	Horkelia cuneata var. puberula	mesa horkelia	PDROS0W045	None	None	-	1B.1	341171
Plants - Vascular	Horkelia cuneata var. puberula	mesa horkelia	PDROS0W045	None	None	-	1B.1	341171
Plants - Vascular	Galium angustifolium ssp. gabrielense	San Antonio Canyon bedstraw	PDRUB0N044	None	None	-	4.3	341172

Plants - Vascular	Galium californicum ssp. primum	Alvin Meadow bedstraw	PDRUB0N0E6	None	None	-	1B.2	341171
Plants - Vascular	Galium jepsonii	Jepsons bedstraw	PDRUB0N130	None	None	-	4.3	341172
Plants - Vascular	Galium jepsonii	Jepsons bedstraw	PDRUB0N130	None	None	-	4.3	341172
Plants - Vascular	Galium johnstonii	Johnstons bedstraw	PDRUB0N140	None	None	-	4.3	341172
Plants - Vascular	Galium johnstonii	Johnstons bedstraw	PDRUB0N140	None	None	-	4.3	341172
Plants - Vascular	Heuchera caespitosa	urn-flowered alumroot	PDSAX0E1C0	None	None	-	4.3	341172
Plants - Vascular	Lycium parishii	Parishs desert-thorn	PDSOL0G0D0	None	None	-	2B.3	341172
Plants - Vascular	Lycium parishii	Parishs desert-thorn	PDSOL0G0D0	None	None	-	2B.3	341172
Plants - Vascular	Lycium parishii	Parishs desert-thorn	PDSOL0G0D0	None	None	-	2B.3	341171
Plants - Vascular	Lycium parishii	Parishs desert-thorn	PDSOL0G0D0	None	None	-	2B.3	341171
Plants - Vascular	Brodiaea filifolia	thread-leaved brodiaea	PMLIL0C050	Threatened	Endangered	-	1B.1	341172
Plants - Vascular	Viola pinetorum ssp. grisea	grey-leaved violet	PDVIO04431	None	None	-	1B.2	341172

Appendix 6 Greenhouse Gas Study

Air Quality and Greenhouse Gas Technical Report

Muscat Development Project

Fontana, California

August 7, 2023

Prepared for:

TriStar FLC, Inc,

By:

Rabe Consulting
421 Commercial Drive
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Rabe Consulting

Table of Contents

1.0 Introduction

TriStar FLC, Inc. (TriStar) is proposing to construct Muscat Development Project, a biofuel transload facility. The proposed project will include a high efficiency transload facility planned at the existing BNSF Railway yard. The planned facility will be used for the receipt, storage and distribution of biodiesel and renewable diesel. The facility will be fully contained adjacent to six inbound railroad tracks and include a truck loading rack and six one-million gallon above-ground tanks.

The project is located in the Mojave Desert Air Quality Management District area in Fontana (San Bernadino County), California. During both the construction and operation of the Muscat Development Project (Project), criteria pollutant and greenhouse gas (GHG) emissions would be generated due to equipment and vehicle use. The purpose of this technical study is to analyze the potential air quality and GHG impacts that could occur during construction and operation of the Project.

The emissions and impacts discussions in this report are divided into three sections, as follows:

- Project Overview
- Air Quality (Criteria Pollutants)
- Greenhouse Gases

This technical report concludes that impacts to air quality and climate change due to emissions from the Project will be insignificant, although the small incremental Project construction emissions could contribute to a potential cumulative air quality impact in this region when multiple other projects are also under construction.

2.0 Project Overview

The Project is proposed to be a biofuel transload facility. The planned facility will be used for the receipt, storage and distribution of biodiesel and renewable diesel. The facility will be fully contained adjacent to six inbound railroad tracks and include a truck loading rack and six one-million gallon above-ground tanks. Biofuel will be delivered to the project area via rail cars. The biofuel will be transferred to six one-million gallon above-ground tanks and then transferred to fuel delivery trucks.

Construction of the project will occur in an existing railway yard adjacent to six inbound railroad tracks. No demolition will need to occur as the project area does not have any existing structures or buildings. Construction will include grading of the site and surface preparation (gravel and pavement). The project will include a small building which will serve as an office and bathroom for the facility. Construction will result in approximately 20 days of 8 hours of grader and dump truck operations. The paving will include paving equipment for a 3-day period.

In order to provide a conservative assumption of air quality and GHG impacts, it is assumed that construction mobilization would commence in October 2023, with earthworks beginning as early as October 2023. Based on the construction schedule, the Project would be constructing and operation in early 2024. Construction will generally occur during daylight hours, Monday through Friday.

The proposed onsite building is expected to be staffed by one to two operations personnel during normal weekday working hours. An estimated 2 daily roundtrips would occur during operation of the Project. The project will result in an additional 25 truck trips per day, with an average trip length of 50 miles. The farthest delivery range is 150 miles. The project will result in 2 additional train trips per month (2 miles, locally car delivery within railyard).

3.0 Air Quality

The following section is an analysis of criteria air quality impacts associated with construction and operation of the proposed Project. Descriptions of TriStar-proposed mitigation measures that would reduce construction and operation generated air quality emissions are included in this section.

3.1 Project Construction

Construction of the Project would generate criteria pollutant emissions similar to those associated with any large industrial construction project. Onsite emissions would arise primarily from vehicles and equipment. Onsite fugitive dust emissions would also be generated during site earthwork and construction. Off-site emissions would occur from construction worker vehicles driving to and from the work site, as well as trucks delivering materials to the site. The construction related emissions are transient in nature.

Construction emissions were estimated using the Project-specific information provided by TriStar. The construction is divided into 3 phases: grading, surfacing, tank and building installation.

3.1.1 Methodology

The criteria pollutant for emissions from construction equipment comes from combustion of fuel to provide power for the operation of the equipment used for the construction activities. The result of the combustion generates criteria pollutant emissions—carbon monoxide (CO). volatile organic compounds (VOC), nitrogen oxides (NO_x), sulfur oxides (SO_x), respirable particulate matter (PM10) and fine particulate matter (PM2.5).

The fugitive dust emissions from construction activities are a result of earthmoving such as grading and vehicle travel during construction of the proposed Project. The emissions are PM10 and PM2.5. Wind entrainment of fugitive dust can occur when stockpiled soils or recently disturbed soils are not adequately treated or covered.

The criteria pollutant emission from motor vehicles results from the combustion of fuel in motor vehicle engines. The results are generation of CO, VOC, NO_x, SO_x, PM10, and PM2.5 emissions. Motor vehicle brake and tire wear results in the generation of PM10 and PM2.5 emissions.

Criteria pollutant emissions were estimated using the California Emissions Estimator Model (CalEEMod; 2023). CalEEMod is designed to model construction emissions for land use development projects and allows for the input of project-specific information. Emissions from equipment used during each phase of the project were modeled separately in the Construction module of CalEEMod. Exhaust emissions from the equipment were modeled using the modules building construction stage. For each phase of construction, the model defaults for the type of equipment, number of pieces of equipment, power rating and daily usage rate were adjusted by project specific information.

Annual fugitive dust emissions were estimated using the default level of detail in CalEEMod. The default worst-case emission factor for fugitive dust provided results.

Emissions from motor vehicles were calculated by multiplying the vehicle-miles-traveled for each type of vehicle used during the construction phase by emission factors in pounds. Emissions from worker trips and delivery vehicles were estimated in the Mojave Desert Air Basin.

Details of the calculations and model input and output are provided in Attachment 1.

3.1.2 Emissions estimates and Impacts

The results for the emissions during the construction phase are detailed in Attachment 1 and Table 1. The values listed in Table 1 are unmitigated values. The emissions are anticipated during the fall and winter, not in the summer months.

Table 1 Air Quality Emissions during Construction (pounds per day and tons per year for annual)

Time Period	VOC	NO_x	CO	SO_2	PM10	PM2.5
Average Daily Maximum Emissions	0.02	0.10	0.08	<0.005	<0.005	<0.005
Annual Emissions	0.17	2.92	4.62	0.01	0.73	0.12

Annual PM10 and PM2.5 would not exceed the applicable Mojave Desert Air Quality Management District (MDAQMD)thresholds. Nonetheless, TriStar would be required to implement standard dust control measures required by MDAQMD, including use of dust suppressants and control of vehicle speed on unpaved areas.

3.1.3 Construction Health Risk Impacts

The only toxic air pollutant emissions of potentially significant quantity would be those associated with the construction of the proposed Project from large, heavy-duty diesel-powered equipment exhaust. The Office of Environmental Health Hazard Assessment describes the health risk from diesel exhaust entirely in terms of the amount of particulate, or PM10, that is emitted. Currently, the health risk associated with diesel exhaust PM10 has a carcinogenic and chronic effect, but no short-term acute effect is recognized. The construction period of the Project lasts only a short period of time, relative to the length of time required for carcinogenic and chronic health impacts (i.e., 30 years). Therefore, the health risk associated with construction emissions would be less than significant.

3.2 Project Operation

Operation-related criteria pollutant emissions, including fugitive dust, would be generated from onsite and off-site vehicle use.

3.2.1 Methodology

Emissions from both onsite and off-site motor vehicles used during operation were modeled using CalEEMod, with default values for industrial uses. Off-site vehicles used during operation include vehicles used for delivering biofuel (trains) and dispersing biofuel (delivery trucks) and for employees. The combustion of fuel in off-site vehicles would generate VOC, NO_x, CO, SO_x, PM10, and PM2.5 emissions. Motor vehicle brake and tire wear and travel on paved roads with entrained road dust results in PM10 and PM2.5 emissions. The Project will result in a reduction of combustion fuels emissions from Project vehicles (delivery trucks) and other off-site vehicles, as biofuel will be more readily available for use in the region. It is anticipated that delivery trucks will be using biofuel, which is considered a non-emission fuel. Therefore, the emissions estimates and impact analysis for onsite and off-site vehicles should be considered to be conservative.

Fugitive dust emissions during operations from onsite and off-site vehicles are assumed to be traveling on paved surfaces. Note that although new fugitive dust emissions are predicted from the operation of the proposed Project according to calculation provided herein, the proposed Project may reduce overall fugitive dust emission in the region. This is because the project will add a distribution center for biofuels, resulting in shorter delivery distances to biofuel dispensing facilities. Therefore, the emissions estimates and impact analyses for PM10 and PM2.5 should be considered to be conservative.

For operations, the trip distance was estimated as the average round trip distance of the vehicle associated with the Project.

3.2.2 Emissions estimates and Impacts

Each heavy-duty truck and train provides emissions as detailed in Table 2 if using conventional fuels.

Table 2 Emissions for Vehicles

Number of Trucks per Day	**Number of Trains per Month**	**Total Number of Miles Per Day (based on average trip length)**	**Emissions/Day of CO_2 (kg)**	**Emissions/Day Of CH_2 (g)**	**Emissions/Day of N_2O (g)**
25 trucks		1250	1820	22.5	13.75
	2 trains	4			

The emission factors are 1.456 kg/mile for CO_2; 0.018 g/mile of CH_2; and 0.011 g/mile of N_2O.

The results for the emissions during the operation phase are detailed in Attachment 1. The values listed in Attachment 1 are unmitigated values for off-site vehicles. The emissions are anticipated year-round. Delivery trucks are expected to be using biofuel, instead of conventional fuels. Therefore, the delivery trucks are not considered to have air quality emissions. ‘

The annual emissions during operations of all pollutants are below their respective CEQA thresholds.

3.3 Impacts to Sensitive Receptors

One of the criteria identified by the CEQA Guidelines (Appendix G) to determine whether implementation of the Project would result in significant air quality impacts is the exposure of nearby sensitive receptors to substantial pollutant concentrations. As stated in Appendix G of the CEQA Guidelines, the significance thresholds established by the applicable air district may be relied upon to make this determination. Sensitive receptors are defined as land uses where sensitive population groups are likely to be located (e.g., children, the elderly, the acutely ill, and the chronically ill). These land uses include residences, schools, childcare centers, retirement homes, convalescent homes, medical care facilities, and recreational facilities. Sensitive receptors that may be adversely affected by the Project include surrounding residential land uses.

The sensitive receptors that are in close proximity to the Project are detailed in Table 3.

Table 3 Sensitive Receptors

Sensitive Receptor	Distance from Project (feet)	Direction from Project
Schools		
Tokay Elementary School	3000 ft	Northeast
Hemlock Elementary School	4568 ft	North
Oleander Elementary School	6179 ft	Southeast
Almeria Middle School	2393 ft	Northeast
Beech Avenue Elementary School	5783 ft	South
Sequoia Middle School	7758 ft	Southwest
Residences*		
Residence north of West Foothill Boulevard	645 ft	North
Residence west of Beech Avenue	1700 ft	West
Residence east of Catawba Avenue	2000 ft	East
Residence south of BNSF Railway	2886 ft	South
Hospitals/Medical Centers		
Cucamonga Valley Medical Group	12588 ft	North
Cucamonga Valley Medical Group	9306 ft	Northeast
Metropolitan Family Medical Clinic	9041 ft	Northeast
El Carmen Medical Clinic	9297 ft	Northeast
West Point Medical Center Urgent Care	7355 ft	Northwest
Unicare Community Health Center	3482 ft	East

*Measured to the closest residence in each direction.

With the exception of approximately 6 houses to the north, the sensitive receptors are all farther than 1000 ft from the project area. The project area is in an area zoned for “industrial” uses. The emissions are under thresholds for CEQA and more than 1000 ft (with the exception of a few residences).

Impacts on sensitive receptors, particularly from dust, would vary depending on the level and type of activity, the silt content of the soil, and prevailing weather. As discussed above, construction and operational emissions of criteria pollutants would be below the yearly thresholds and would not adversely affect nearby sensitive receptors. The proposed Project is found to have a less than significant impact related to exposure of sensitive receptors to substantial pollutant concentrations.

3.4 Carbon Monoxide

A carbon monoxide (CO) “hotspot” can occur when vehicles are idling at highly congested intersections. CO hotspots can adversely affect nearby sensitive receptors. CO hotspots are analyzed when a project increases traffic at an intersection or roadway which is already congested, a project involves adding signalization and/or channelization to an intersection, and sensitive receptors such as residences, schools, hospitals, etc. are located in the vicinity of the intersection or signalization. The Project does not involve signalization or channelization of an intersection. Therefore, no CO hotspots will be created. As a result, no adverse effects to nearby sensitive receptors would occur. For these reasons, no impact with respect to CO hotspots would occur and further analysis of CO hotspots is not warranted.

3.5 Project Site Cumulative Impacts

Cumulative impacts result from the proposed Project’s incremental effect, together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Public Resource Code § 21083; California Code of Regulations, Title 14 §§ 15064(h), 15130, 15355). The following analysis of cumulative air quality impacts is based on assessment of cumulative air quality impacts by estimating via a three step process:

1. Evaluate localized impacts;
2. Evaluate consistency with existing air quality plans; and
3. Summarize air basin emissions.

3.5.1 Localized Impacts

The proposed Project would generate criteria pollutant emissions during construction and operation of the Project. However, emissions generated by the Project would not exceed thresholds established by MDAQMD. As such, the proposed Project would not result in any individual air quality impacts during construction or operation of the biofuel transload facility.

Significant cumulative impacts from the proposed Project, when considered with nearby, reasonably foreseeable planned solar projects, could occur only during Project construction since Project operation emissions are expected to be negligible. Most Project emissions would occur temporarily during the construction phase, which is conservatively assumed to commence in October 2023 and end in December 2023. After that, there would be minimal emissions and insignificant cumulative impacts during operation of the proposed Project.

3.5.2 Regional Impacts During Project Construction and Operation

There are no proposed/pending projects within the industrial area surrounding the Project. Rail replacement projects within the railyard were completed during the summer of 2023 and will not overlap with the construction of this project. No other biofuel transload facilities are proposed within a 5-mile radius of the project.

3.5.2 Consistency with Existing Air Quality Plans

Operation of the proposed Project would not exceed any established MDAQMD emissions thresholds. The Project is expected to be staffed by 1 to 2 operations personnel during normal weekday working hours. It is anticipated that these employees would be drawn from the existing San Bernadino County population. The proposed Project would not generate population, households or substantial employment within the general area. Therefore, the proposed Project would be consistent with the growth forecast for the general area. The Project would have no impact with respect to consistency with existing air quality plans.

4.0 Greenhouse Gases

This section provides an analysis of greenhouse gas (GHG) impacts associated with construction and operation of the proposed Project.

GHGs of concern include the following compounds:

- Carbon dioxide (CO_2)
- Nitrous oxide (N_2O)
- Methane (CH_4)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF_6)

Only the first three of these six GHGs are combustion source related and will be emitted by the equipment and vehicles used for the Project. The Project is not expected to have emissions of HFCs, PFCs, and SF_6. The primary GHG of concern for this Project is CO_2, as the emission rates of CH_4 and N_2O are orders of magnitude less than CO_2.

4.1 Project Construction

GHG emissions will be generated by the equipment used for construction activities and from both onsite and off-site motor vehicles.

4.1.2 Methodology

This section presents the methodology and assumptions used to estimate GHG emissions from construction of the Project.

The combustion of fuel to provide power for the operation of equipment results in the generation of GHGs. The CO_2, N_2O, and CH_4 emissions from off-road equipment use were estimated using the same methodology discussed above the criteria pollutants from construction equipment. GHGs emissions were estimated using CalEEMod (2023).

The combustion of fuel in motor vehicle engines would also generate GHG emissions. GHG emissions from motor vehicles were using CalEEMod as described above for criteria pollutants from construction vehicles.

4.1.3 Construction GHG Emissions and Impacts

Table 4 and Attachment 1 provide the average daily maximum emissions (summer and winter) and annual emissions for construction related GHG emissions. Values are shown for unmitigated emissions.

Table 4 GHG Emissions from Construction (lbs/day for daily; metric ton/year for annual)

Time Frame	CO_2	N_2O	CH_4
Daily Maximum (Summer)	15.1	<0.005	<0.005
Daily Maximum (Winter)	63.4	<0.005	<0.005
Annual Maximum	10.5	<0.005	<0.005

There is not a quantitative threshold over which construction GHG emissions are considered "significant" under CEQA. Best practices to reduce GHG emissions will be implemented during the construction of this project. Best practices to reduce GHG emissions include:

- Operational measures, such as limiting equipment and vehicle idling time and shutting down equipment when not in use;
- Regular preventive maintenance to prevent emission increases due to engine problems; and
- Use of newer, more fuel efficient or low-emitting diesel engines meeting federal/state emissions standards for construction equipment, whenever available.

The measures described above would directly and indirectly minimize the emissions of GHGs during the Project's construction and they are in accordance with the current best practices. Because these measures will be implemented for the Project, the GHG impacts from construction activities would not be significant.

4.2 Project Operation

Direct operation-related GHG emissions would be generated by vehicle use (delivery trucks and trains). Indirect GHG emissions would be generated due to electricity use.

4.2.1 Methodology

This section presents the methodology and assumptions used to estimate GHG emissions from the operation of the Project. The CO_2 emissions from motor vehicles used during operation were estimated using the same methodology described above for criteria pollutants from operation-related vehicles using the CalEEMod.

Other sources of GHG emissions during the Project's operation would include indirect emissions from electricity use. Electric power would be drawn from the grid for day-to-day operation of the transload facility including onsite operations and office building. GHG emissions from electricity use were estimated using CalEEMod.

4.2.2 Operation GHG Emissions and Impacts

GHG emissions during operation are shown in Table 5 and Attachment 1. The values shown are unmitigated.

Table 5 GHG Emissions during Operation

Time Frame	CO_2	N_2O	CH_4
Daily Maximum (Summer)	11.3	<0.005	0.62
Daily Maximum (Winter)	11.3	<0.005	0.62
Annual Maximum	8.7	<0.005	0.10

The Project has an estimated GHG emission rate below the standard threshold.

4.3 Total GHG Emissions

Combining the total construction and operation GHG emissions discussed above, the Project will emit the following:

10.5 tonnes CO_{2e} during construction + 261 (8.7 x 30 years) tonnes CO_{2e} during operation, for a Project total of 271.5 tonnes CO_{2e} of greenhouse gases.

As noted above, there is not a CEQA significance threshold for construction or operation-related GHG emissions. However, there is a threshold for industrial projects. Based on the calculations above, the Project total CO_{2e} of greenhouse gases is below the industrial project threshold. Therefore, the operation-related GHG emissions from the proposed Project would not have significant impacts on climate change.

4.4 Displacement of GHGs

Additionally, the Project will provide for biofuel to be more readily available in the region further reducing the GHG emissions in the region. The proposed transload facility for biofuels could displace fossil fuel combustion in vehicles, thereby providing a reduction in GHG emissions. Based on the assumption of this reduction, the Project would therefore result in a net reduction of GHG emissions annually.

5.0 References

California Air Pollution Control Officers Association. California Emissions Estimator Model. Accessed 2023. https://www.caleemod.com/

Mojave Desert Air Quality Management District (MDAQMD). Accessed 2023. https://www.mdaqmd.ca.gov/

The Climate Registry. Accessed 2023. https://theclimateregistry.org/

Attachment 1

Muscat Development Summary Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Muscat Development
Construction Start Date	10/1/2023
Operational Year	2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.80
Precipitation (days)	6.40
Location	34.103426262184726, -117.46515539978388
County	San Bernardino-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5307
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.17

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

Industrial Park	9.20	1000sqft	0.00	0.00	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-3	Use Local Construction Contractors
Construction	C-4*	Use Local and Sustainable Building Materials
Construction	C-5	Use Advanced Engine Tiers
Transportation	T-30*	Use Cleaner-Fuel Vehicles

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.02	0.01	0.10	0.08	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	—	15.1	15.1	< 0.005	< 0.005	0.00	15.2
Mit.	0.02	0.01	0.10	0.08	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	—	15.1	15.1	< 0.005	< 0.005	0.00	15.2
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.17	0.14	2.92	4.62	0.01	0.06	0.71	0.73	0.06	0.10	0.12	—	1,145	1,145	0.08	0.08	0.03	1,171
Mit.	0.17	0.14	2.92	4.62	0.01	0.06	0.71	0.73	0.06	0.10	0.12	—	1,145	1,145	0.08	0.08	0.03	1,171

% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.01	0.01	0.16	0.26	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	63.4	63.4	< 0.005	< 0.005	0.03	64.8
Mit.	0.01	0.01	0.16	0.26	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	63.4	63.4	< 0.005	< 0.005	0.03	64.8
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	< 0.005	< 0.005	0.03	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	10.5	10.5	< 0.005	< 0.005	< 0.005	10.7
Mit.	< 0.005	< 0.005	0.03	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	10.5	10.5	< 0.005	< 0.005	< 0.005	10.7
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6.16	5.14	11.3	0.62	< 0.005	0.00	26.7
Mit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6.16	5.14	11.3	0.62	< 0.005	0.00	26.7
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6.16	5.14	11.3	0.62	< 0.005	0.00	26.7
Mit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6.16	5.14	11.3	0.62	< 0.005	0.00	26.7

% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6.16	5.14	11.3	0.62	< 0.005	0.00	26.7
Mit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6.16	5.14	11.3	0.62	< 0.005	0.00	26.7
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	1.02	0.85	1.87	0.10	< 0.005	0.00	4.42
Mit.	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	1.02	0.85	1.87	0.10	< 0.005	0.00	4.42
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

6. Climate Risk Detailed Report

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	5	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	5	1	1	4

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

7. Health and Equity Details

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	81.0
Healthy Places Index Score for Project Location (b)	9.00
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.