Administrative Draft

CITY OF HOLLISTER MUNICIPAL AIRPORT STORM WATER MASTER PLAN

Initial Study

Prepared for

City of Hollister

May 2011

1.0 **Environmental Initial Study**

1.1 **Introduction**

The California Environmental Quality Act (CEQA) requires that public agencies consider and disclose the environmental effects of their decisions to the public and governmental decision-makers. It also mandates the implementation of feasible mitigation measures or alternatives that would mitigate significant adverse effects to the environment. In 2010, the City of Hollister (the City) completed a Storm Water Master Plan (SWMP) for the Hollister Municipal Airport (CVH). The City now plans to formally adopt the SWMP and construct the proposed drainage improvements at CVH. Implementation of the proposed project requires discretionary approval from the City, and therefore constitutes a "project" under CEQA guidelines.

This environmental document is an Initial Study/Mitigated Negative Declaration (IS/MND) for the proposed Hollister Municipal Airport SWMP. CEQA defines a mitigated negative declaration (MND) as a "negative declaration prepared for a project when the initial study (IS) has identified potentially significant effects on the environment but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed IS/MND are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment[1]."

The City of Hollister is the applicant and lead agency for the proposed project as the public agency with the greatest responsibility for supervising or approving a project or the first public agency to make a discretionary decision to proceed with a project.

"Trustee Agencies" under CEQA are state agencies having jurisdiction by law over natural resources affected by the project that are held in trust for the people of the state such as the California Department of Fish and Game's (CDFG) responsibility for fish and wildlife[2]. The following have been determined to be 'Trustee Agencies" for the proposed project:

1. California Department of Fish and Game
2. State Water Resource Control Board (SWRCB)

This document has been prepared in accordance with CEQA and the CEQA Guidelines; with Title 14 of the California Administrative Code, as revised; and with ordinance and policies set forth by the City of Hollister.

1.2 **Project Title**

Hollister Municipal Airport Storm Water Master Plan

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[1] California Code of Regulations, Title 14, Division 6, Section 15368.5.

[2] California Public Resources Code. Section 21000 et seq. California Environmental Quality Act. *CEQA Guidelines*. Section 15836.

1.3 Lead Agency

City of Hollister

1.4 CEQA Contact Person

Bill Avera
Development Services Director
City of Hollister Development Services
375 Fifth Street
Hollister, California 95023
(831) 636-4360
Bill.Avera@Hollister.CA.Gov

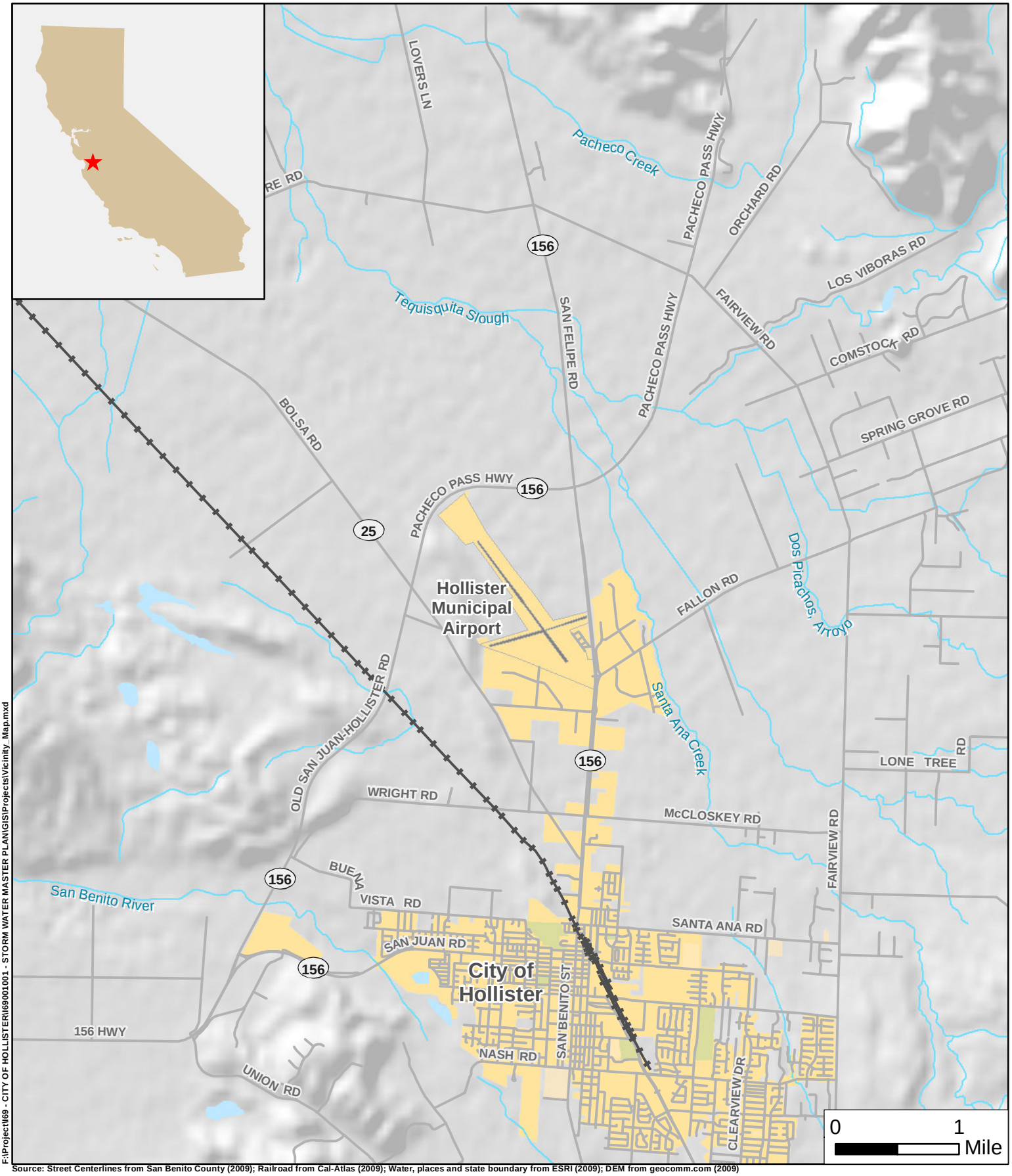
1.5 Project Location

The Hollister Municipal Airport is located in the north central region of San Benito County, in the northern limits of the City of Hollister. San Benito County is bordered to the north by Santa Clara County and to the west by Monterey County. The City of Hollister is approximately 40 miles east of Monterey, 93 miles southeast of San Francisco, 151 miles south of Sacramento, and 304 miles north of Los Angeles. The airport is located between State Highways 25 and 156, which converge in the City of Hollister and provide primary highway access for the area. Highway 25 (Bolsa Road) is located west of the airport and Highway 156 (San Felipe Road) is located east of the airport (see **Figure 1, Airport Vicinity Map**). The four-lane access road, San Felipe Road, leads to the landside facilities providing access for based aircraft owners. The existing airport property covers approximately 336 acres.

The proposed project will take place almost entirely within the airport's existing property line or directly adjacent to it. The topography within the proposed project site is mostly flat terrain as agricultural land uses dominate the region, but does include channels and swales that are part of the existing drainage system. Habitats within the proposed project site are composed almost exclusively of regularly mowed annual grasses, with some areas directly bordering paved airport surfaces maintained at a shorter height than other areas. The airport business park east of the proposed project site contains mature pine (*Pinus* sp.), eucalyptus (*Eucalyptus* sp.), and tulip trees (*Liriodendron tulipifera*), with smaller landscape trees present along streets and adjacent to buildings. Lands directly surrounding the airport are primarily agricultural fields. An aggregate quarry (primarily made up of sand) is present northwest of the proposed project site and urban areas of the City of Hollister are located south of the proposed project site.

1.6 Project Background

Hollister Municipal Airport is owned and operated by the City of Hollister and primarily supports general aviation (GA) activities within the central California coastal region. An Airport Master Plan (AMP) report and associated Airport Layout Plan (ALP) were prepared for CVH in 2003. The purpose of the AMP was to evaluate the airport's existing conditions, forecast future aviation demand for the region, and determine the need for future aviation support facilities and



F:\Project\69 - CITY OF HOLLISTER\69001001 - STORM WATER MASTER PLAN\GIS\Projects\Vicinity_Map.mxd

Source: Street Centerlines from San Benito County (2009); Railroad from Cal-Atlas (2009); Water, places and state boundary from ESRI (2009); DEM from geocomm.com (2009)

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Hollister Municipal Airport
Airport Vicinity Map
Figure 1

N

associated infrastructure at CVH. Possible future airport development projects were identified on the ALP for both existing and future conditions. As required by the Federal Aviation Administration (FAA) the ALP was updated in 2009 to display completed improvements and additional ones that were not already included on the 2003 ALP. In support of the 2003 AMP and 2009 ALP update, a SWMP was developed by C&S Engineers, Inc., in 2010 to identify necessary drainage infrastructure improvements that are necessary to support both existing and future conditions at CVH. As a result of the recommendations made in the SWMP, the ALP was subsequently updated to display those improvements. This proposed project does not implement identified projects that would upgrade or expand the operations of CVH.

1.7 Project Purpose and Need

An SWMP was prepared for the Hollister Municipal Airport. It identifies the following:

- The existing drainage infrastructure;
- The flow rates for the existing, interim, and ultimate conditions;
- The adequacy of the existing drainage facilities for each condition;
- Recommended facilities needed to convey the flows; and
- Water quality treatment measures.

This IS/MND is being undertaken to assess the environmental impacts of constructing those recommended facilities that have been identified as necessary in order to bring the airport into compliance with FAA design standards and reduce projected soil erosion.

1.8 Land Use Designation and Zoning

According to the 2009 City of Hollister General Plan, the proposed project site includes land designated as 'Airport', 'Airport Support' and 'Industrial' (see **Figure 2, Land Use Map**). The zoning classifications for the proposed project site shown on the City of Hollister Zoning Map, amended 2010, are 'Airport', for the current airport property and 'Airport Support', for the proposed location of a detention basin east of the airport (see **Figure 3, Zoning Map**). The proposed project site also includes land west and northeast of the existing airport property that is currently unincorporated. The county zoning designation for this land is Agricultural Productive. The allowed uses for this zoning definition include Aircraft Landing Field under Additional Uses.

1.9 Existing Conditions (Existing Site and Surrounding Area)

The proposed project site encompasses the approximately 336-acre Hollister Municipal Airport. Airport facilities can be classified into both airside and landside categories. The airside facilities include two intersecting runways (Runway 13-31 is approximately 6,350 feet long by 100 feet wide, and Runway 6-24 is approximately 3,150 feet long by 100 feet wide), full-length parallel taxiways, airfield lighting, and navigational aids. The landside facilities include ground-based services that support the aircraft and pilot/passenger needs. The landside facilities include the aircraft storage/maintenance hangars, aircraft parking aprons, and support features such as fuel

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HOLLISTER
Hometown, California
Est. 1877

Legend

- Existing Airport Property Line
- Ultimate Airport Property Line
- Airfield
- Proposed Bio-Filter Swale
- Proposed Storm Drain or Catch Basin
- Proposed Storm Drain Regrade
- Potential Infiltration Basin
- Proposed Regrading
- CA Dep. of Forestry (Not part of project)

Land Use

- Agriculture
- Airport
- Airport Support
- Industrial
- Public

0 1,000 Feet

1" = 1000'
When printed at 11"x17"

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Hollister Municipal Airport

Land Use Map

Figure 2

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HOLLISTER
Hometown, California
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Legend

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- Potential Infiltration Basin
- Proposed Regrading
- CA Dep. of Forestry (Not part of project)

Zoning

- Agricultural Productive
- Airport
- Airport Support
- Industrial Business Park
- Light Industrial
- Public Facilities

0 1,000 Feet

1" = 1000'
When printed at 11"x17"

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Hollister Municipal Airport

Zoning Map

Figure 3

storage, automobile parking, and roadways. Additional facilities on airport property include buildings used by various aviation and non-aviation related businesses such as Gavilan College, an Elks Lodge, and a cafe. Additionally, the California Department of Forestry (CDF) operates an Air Attack Base near the southeast portion of the site. Off-airport areas in which the proposed project could potentially impact are either currently vacant or used for agricultural uses.

Regarding the existing conditions of the airport drainage system, the property and surrounding area currently slope toward the north and northwest. Off-site surface runoff from the south is brought north towards the airport via three sources:

1. Sheet flow that is dispersed across the southern boundary of the airport is currently captured by a storm drain pipe and several catch basins located along the northern edge of the Airpark Business Center subdivision, at the southern edge of the airport property. The drain pipe carries the runoff to a retention pond at the northwest corner of the subdivision. The business park built this drainage system and pond in order to capture and store surface runoff, thus preventing it from reaching the airport property.
2. An earth-lined channel flows north along the eastern edge of the airport property, west of San Filipe Road. The channel captures runoff from a portion of the airport and carries it north, beyond the airport.
3. Overland flow approaches the southwest region of the airport property and then flows into the site.

The airport's current drainage infrastructure, (including swales, culverts and pipes), directs on-site runoff to two locations. Runoff from the southeasterly portion of the airport enters the drainage channel along the eastern edge of the airport property. This drainage area is generally southeast of the intersection of the two runways. The remaining airport runoff flows towards the northerly edge of Runway 13-31 and then continues off-site in the northern direction[3].

1.10 **Project Description**

As noted, the City of Hollister has proposed the adoption of the recently completed Airport SWMP. This SWMP is a planning study that identifies capital improvements and best management practices for the existing and future conditions at the airport as outlined on the ultimate ALP (see **Ultimate ALP)**. The following improvements are broken down into those that address FAA design standards and those needed for existing and future soil erosion control at CVH:

[3] City of Hollister. 2010. *City of Hollister Airport Storm Water Master Plan*.

AIRPORT DATA

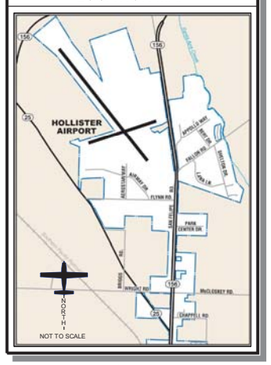
OWNER: City of Hollister		AIRPORT NPIAS CODE: General Aviation	
CITY: Hollister, California		COUNTY: San Benito, California	
HOLLISTER MUNICIPAL AIRPORT (307)		EXISTING	ULTIMATE
AIRPORT SERVICE LEVEL		GENERAL AVIATION	SAME
AIRPORT REFERENCE CODE		B-II	C-II
DESIGN AIRCRAFT		Cessna Citation III	Canadair Cl-600
AIRPORT ELEVATION (NGVD-29 to NAVD-88 add 2.82')		229.6 MSL(NGVD-29)	229.0 MSL(NGVD-29)
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		83.2 ° September	83.2 ° September
AIRPORT REFERENCE POINT (NAD 83)	Latitude	36° 53' 36.04" N	36° 53' 39.472" N
	Longitude	121° 24' 36.97" W	121° 24' 40.807" W
AIRPORT INSTRUMENT APPROACH GPS APPROACH		GPS (31) VOR or GPS-A LORAN-C	GPS ILS (31) LORAN-C
AIRPORT and TERMINAL NAVIGATIONAL AIDS		Rotating Beacon PAPI, VASI REIL	Rotating Beacon PAPI, VASI REIL
GPS AT AIRPORT		YES	YES

VICINITY MAP

RUNWAY END COORDINATES (NAD 83)

(NGVD-29 to NAVD-88 add 2.82')		EXISTING	ULTIMATE
Ext. Runway 6—EL. 223.7	Latitude	36° 53' 23.000" N	36° 53' 22.363" N
Ult. Runway 6—EL. 223.7	Longitude	121° 24' 48.29" W	121° 24' 50.712" W
Ext. Runway 24—EL. 222.5	Latitude	36° 53' 32.69" N	36° 53' 32.690" N
Ult. Runway 24—EL. 222.5	Longitude	121° 24' 11.44" W	121° 24' 11.440" W
Ext. Runway 13—EL. 202.5	Latitude	36° 54' 04.80" N	36° 54' 12.423" N
Ult. Runway 13—EL. 196.0	Longitude	121° 25' 04.63" W	121° 25' 12.078" W
Ext. Runway 31—EL. 229.6	Latitude	36° 53' 15.41" N	36° 53' 17.976" N
Ult. Runway 31—EL. 229.0	Longitude	121° 24' 16.37" W	121° 24' 18.875" W

LOCATION MAP



RUNWAY DATA

Convert Elevations NGVD-29 to NAVD-88 Elevations add 2.82 Feet.

	RUNWAY 13-31				RUNWAY 6-24			
	EXISTING / INTERIM		ULTIMATE		EXISTING / INTERIM		ULTIMATE	
	13	31	13	31	6	24	6	24
AIRCRAFT APPROACH CATEGORY-DESIGN GROUP	B-II		C-II		B-II		B-II	
MAX. CERTIFIED TAKEOFF WEIGHT (LB) OF DESIGN A/C	22,000		41,250		12,500		Same	
DESIGN CRITICAL AIRCRAFT	Cessna Citation III		Canadair CL 600		Beech King Air 350		Same	
APPROACH SPEED OF DESIGN A/C	114 Knots		125 Knots		103 Knots		Same	
WINGSPAN OF DESIGN A/C	51.7'		61.8'		57.9		Same	
LINE OF SIGHT REQUIREMENT MET	YES		YES		YES		YES	
FAR PART 77 CATEGORY	Visual-B	Nonprecision-C	Nonprecision	Precision	Visual-B	Visual-B	Visual	Visual
APPROACH VISIBILITY MINIMUMS	1 Mile	1 Mile	1 Mile	1/2 Mile	1 Mile	1 Mile	1 Mile	1 Mile
RUNWAY INSTRUMENTATION	Visual	Nonprecision	Nonprecision	Precision	Visual	Visual	Visual	Visual
RUNWAY WIND COVERAGE (ALL WEATHER MPH)	95.96%-12/86.48%-15/96.76%-18/99.50%-23		95.96%-12/86.48%-15/96.76%-18/99.50%-23		99.50%-12/96.60%-15/98.96%-18/99.71%-23		99.50%-12/96.60%-15/98.96%-18/99.71%-23	
RUNWAY APPROACH SLOPE	20:1	34:1	34:1	50:1	20:1	20:1	20:1	20:1
OBSTRUCTION CLEARANCE SLOPE	50:1	50:1	50:1	50:1	23:1	20:1	23:1	20:1
RUNWAY END ELEVATION (NGVD-29)	202.5	229.6	196.0	229.0	223.7	222.5	223.7	222.5
MAXIMUM RUNWAY ELEVATION ABOVE MSL (NGVD-29)	229.6'		229.0'		223.7'		222.8'	
RUNWAY DIMENSIONS	6,350 x 100'		7,000 x 100'		3,150' x 100'		3,357' x 100'	
RUNWAY AZIMUTH	141.87°	321.88°	141.87°	321.88°	71.86°	251.87°	71.86°	251.87°
RUNWAY BEARING (TRUE)	N 141° 52' 12" W		N 141° 52' 12" W		N 71° 51' 36" W		N 71° 51' 36" W	
RUNWAY SAFETY AREA (Length x Width Beyond Runway Ends)	300' x 150'	300' x 150'	1000' x 500'	1000' x 500'	300' x 150'	300' x 150'	300' x 150'	300' x 150'
RUNWAY OBSTACLE FREE ZONE (Length x Width Beyond Runway Ends)	200' x 400'	200' x 400'	200' x 400'	200' x 400'	200' x 400'	200' x 400'	200' x 400'	200' x 400'
RUNWAY OBJECT FREE AREA (Length x Width Beyond Runway Ends)	300' x 500'	300' x 500'	1000' x 800'	1000' x 800'	300' x 500'	300' x 500'	300' x 500'	300' x 500'
PRECISION OBJECT FREE AREA (POFA 200' x 800')	N/A	N/A	N/A	RW 31	N/A	N/A	N/A	N/A
RUNWAY SURFACE MATERIAL and PAVEMENT SURFACE TREATMENT	Asphalt / Grooved		Asphalt / Grooved		Asphalt		Asphalt	
RUNWAY PAVEMENT STRENGTH (in thousand lbs.)[1]	30(S), 45(D)		30(S), 60(D)		30(S), 45(D)		30(S), 60(D)	
RUNWAY EFFECTIVE GRADIENT/ RUNWAY MAXIMUM GRADIENT	0.42% / (max 0.46%)		0.47% / (max 0.66%)		0.04% / (max 0.13%)		.04% / (max 0.13%)	
RUNWAY TOUCHDOWN ZONE ELEVATION (in MSL, NGVD-29)	214.6	229.6	209.0	229.0	223.7	223.5	223.7	223.5
RUNWAY MARKING	NP	NP	NP	P	B	B	B	B
RUNWAY LIGHTING	MIRL		MIRL		MIRL		MIRL	
RUNWAY APPROACH LIGHTING	NONE		MALSR (31)		NONE		NONE	
RUNWAY/TAXIWAY HOLDING POSITION MARKING	200'		250'		200'		200'	
TAXIWAY SURFACE MATERIAL	Asphalt		Asphalt		Asphalt		Asphalt	
TAXIWAY WIDTH	50'		50' / 35'		50'		50' / 35'	
TAXIWAY SAFETY AREA WIDTH	79'		79'		79'		79'	
TAXIWAY OBJECT FREE AREA WIDTH	131'		131'		131'		131'	
TAXIWAY MARKING	Centerline		Centerline		Centerline		Centerline	
TAXIWAY LIGHTING	NONE		MITL		NONE		MITL	
RUNWAY ELECTRONIC NAVIGATIONAL AIDS	GPS (31)		GPS (13-31) ILS (31)		NONE		NONE	
RUNWAY VISUAL NAVIGATIONAL AIDS	Rotating Beacon PAPI-2 (13, 31) REIL (13, 31)		Rotating Beacon PAPI-4 (13, 31) REIL (13)		Rotating Beacon, VASI-4 (24) REIL (24)		Rotating Beacon, PAPI-2 (6, 24) REIL (6, 24)	

[1]Pavement strengths are expressed in Single(S) and Dual(D) wheel loading capacities.

AIRPORT FACILITIES LIST

NO.	EXISTING	ULTIMATE
1	GAVILAN COLLEGE	
2	GAVILAN COLLEGE	
3	GAVILAN COLLEGE	
4	GAVILAN COLLEGE	
5	ELECT. VAULT & ROTATING BEACON	
6	AIRCRAFT MAINTENANCE	
7	AIRCRAFT STORAGE/MAINTENANCE	
8	AIRCRAFT STORAGE/MAINTENANCE	
9	AIRCRAFT STORAGE	
10	OFFICE/STORAGE	
11	OFFICE/STORAGE	
12	RESTAURANT	
13	STORAGE BUILDINGS	
14	AIRCRAFT MAINTENANCE	
15	OFFICE/STORAGE	
16	OFFICE/STORAGE	
17	T-HANGARS	
18	T-HANGARS	
19	T-HANGARS	
20	T-HANGARS	
21	T-HANGARS	
22	T-HANGARS	
23	CALIF. DEPARTMENT OF FORESTRY	
24	FORMER NATIONAL GUARD FACILITY	
25	HOLLISTER ELKS LODGE	
26	EXECUTIVE HANGARS	
27	T-HANGARS	
28	T-HANGARS	
29	CALIFORNIA SHOCK TRAUMA AIR RESCUE	
30		CALIF. DEPARTMENT OF FORESTRY
31		CALIF. DEPARTMENT OF FORESTRY
32		CALIF. DEPARTMENT OF FORESTRY
33		CALIF. DEPARTMENT OF FORESTRY
34-41		T-HANGARS
42-47		HANGARS (Off-Airport)
48-51		HANGARS (Off-Airport)
52		HANGAR (Off-Airport)
53		OFFICE (Off-Airport)
54		TERMINAL/MUSEUM (Off-Airport)
55		HOTEL/RESTAURANT (Off-Airport)
56		COMMERCIAL/GA HANGARS (Off-Airport)
57		COMMERCIAL/GA HANGARS (Off-Airport)
67-69		CORPORATE-HANGARS
71-80		CORPORATE HANGAR PARCELS
81-82		FBO PARCELS
83-89		INDIVIDUAL HANGAR PARCELS
90-101		CORPORATE PARCELS
102		AIRPORT MAINTENANCE
103		FUEL STORAGE
104		HELICOPTER HARDSTAND

ABBREVIATIONS

(E) – Existing
(U) – Ultimate
(R) – Relocated
(CA) – Critical Area
(TBR) – TO BE REMOVED

FOR APPROVAL BY:

Mr. Clint Quilter
City Manager

DATE:

FAA APPROVAL STAMP

GENERAL NOTES

1. Existing site facilities digitized from aerial photograph, provided by HJW GeoSpatial, Inc., dated September 9, 2002.
2. All Elevations NGVD 29, Topography, and U.S.G.S. Maps. To convert NGVD-29 Elevations to NAVD-88 add 2.82 feet.
3. There are no Existing OFZ penetrations.
4. Fence line extends around Airport Property Line except where shown.
5. The Hollister USGS Map and San Felipe USGS Map do not show Section Corner in the vicinity of the airport site shown this drawing.
6. The Future Building Restriction Line (BRL), where shown, is based upon a 35' building height. The BRL parallel to runway 13-31 will be based upon a future primary surface width of 1,000' required for approach minimums less than 1 mile but > 3/4 mile.
7. All taxiways are 50' wide unless otherwise noted.
8. Runway shoulders are 50' wide typ.
9. Through the Fence Access Pursuant to Chapter 13.28 of the Hollister Municipal Code and the Hollister Airport Security Procedure.

LEGEND

EXISTING	INTERIM	ULTIMATE	DESCRIPTION
N/A	N/A		ABANDONED PAVEMENT
			AIRPORT PROPERTY LINE
			FUTURE PROPERTY ACQUISITION
	N/A		AIRPORT REFERENCE POINT (ARP)
	N/A	N/A	AIRPORT ROTATING BEACON
			AVIGATION EASEMENT
N/A			ABANDONED BUILDING
			BUILDING
	BRL(INT)		BUILDING RESTRICTION LINE (BRL)
N/A			AIRFIELD GLIDER AREA
			AIRFIELD PAVEMENT
			ROAD
			HOLD SIGN/MARKING
PAPI-4	PAPI-4	PAPI-4	NAVIGATIONAL AID
			RUNWAY END IDENTIFICATION LIGHTS (REIL)
			SEGMENTED CIRCLE/WIND INDICATOR
	N/A	N/A	SURVEY MONUMENTS
			TOPOGRAPHY
			TREE
			WIND INDICATOR (Lighted)
			UNDERGROUND IRRIGATION SYSTEM WITH POP-UPS
			RUNWAY VISIBILITY ZONE
ROFA		ROFA	RUNWAY SAFETY AREA
OFZ		OFZ	OBSTACLE FREE ZONE
ROFA		ROFA	RUNWAY OBJECT FREE AREA
x x	xx	xx	FENCE LINE
			PROPOSED STORM DRAIN REQUIRED FOR GRADING
			PROPOSED CATCH BASIN REQUIRED FOR GRADING
			PROPOSED STORM DRAIN FOR INTERIM AND ULTIMATE AIRPORT LAYOUTS
			NON FAA ELIGIBLE DEVELOPMENT
			POTENTIAL INFILTRATION BASINS

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 6-24	99.50%	96.60%	98.99%	99.71%
Runway 13-31	95.98%	98.48%	99.76%	99.50%
Combined	99.85%	99.95%	99.97%	99.80%

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Salinas Municipal Airport
Salinas, California

OBSERVATIONS:
81,482 All Weather Observations
10,074 IFR Observations
1993-2002

No.	REVISIONS	DATE	BY	APP'D.
2	Updated by C&S Engineers, Inc.	Nov '10	JCT	E.S.
1	Updated by CH2M Hill –	Jan '08	RPE	M.C.

*"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

HOLLISTER MUNICIPAL AIRPORT

ULTIMATE AIRPORT LAYOUT

Hollister, California

PLANNED BY: Christopher M. Kuguniin
APPROVED BY: Christopher M. Kuguniin
Updated by: Robert Endres of CH2M HILL

January 22, 2009

SHEET 1B OF 12

Coffman Associates
Airport Consultants
www.coffmanassociates.com

1. Regrading of land to remove exiting drainage ditches and depressions on the airport property to reduce safety hazards to aircraft and comply with FAA design standards for Runway Safety Areas (RSAs). The improvement will include:

    - Regrading of a total of 46 acres of disturbed land located parallel and between runways and taxiways, 200 feet east of Runway 3-31 and 100 feet south of Runway 6-24.

2. Replacement of the existing drainage ditches with subsurface storm water facilities with additional capacity. The improvement will include:

    - Replacement of existing storm water drainage pipes with 1,700 linear feet (LF) of 18-inch reinforced concrete pipe (RCP), 800 LF of 24 inch RCP, 800 LF of 36 inch RCP, and 300 LF of 42 inch RCP; and
    - Construction of up to five new infiltration basins, four of which will be outside of the current airport boundary.

3. Replacement of existing storm water facilities with infrastructure to eliminate ponding or storage of water that could become a wildlife attractant. The improvement will include:

    - Construction of up to eight new storm water catch basins within areas of regarding;
    - Construction of up to 14 new drainage headwalls;
    - Construction of 1,000 LF of new bio-filter swales; and
    - Importation of 40,000 square yards (SY) of topsoil, seeds, and mulch.

The proposed project will take place primarily within the airport property line. There will be up to four infiltration basins located off current airport property. The construction period for the proposed improvements is estimated to take five to seven months. See **Figure 5, Proposed Airport Improvements.**

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Legend

- Existing Airport Property Line
- Ultimate Airport Property Line
- Airfield
- Proposed Bio-Filter Swale
- Proposed Storm Drain or Catch Basin
- Proposed Storm Drain Regrade
- Potential Infiltration Basin
- Proposed Regrading
- CA Dep. of Forestry (Not part of project)

0 1,000 Feet

1" = 1000'
When printed at 11"x17"

C&S COMPANIES®

Hollister Municipal Airport

Proposed Airport Improvements

Figure 5

DETERMINATION

On the basis of this initial study:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

I find that although the proposed project could have a significant effect on the environment, there will 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 will be prepared.

I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

_____ _____

Signature Date

Name of Preparer:

Hollister Municipal Airport
Storm Water Master Plan
Initial Study/Mitigated Negative Declaration
TABLE OF CONTENTS

I. AESTHETICS - Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect on a scenic vista?				X
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?				X
d) Create a new source of substantial light or glare which would adversely affect day or night time views in the area?				X

REGULATORY SETTING

State Regulations

CEQA established that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of aesthetic, natural, scenic and healthful environmental qualities"[4].

California's Scenic Highway Program

California's Scenic Highway Program was created in 1963 to preserve and protect scenic highway corridors from alterations that would diminish the aesthetic value of lands adjacent to highways[5].

Local Regulations

Hollister Municipal Code, Title 17 Zoning, Chapter 17.16 – *Performance Standards*

Chapter 17.16.090 – *Lighting (Outdoors)* of the Hollister Municipal Code establishes general guidelines and requirements for outdoor lighting. It encourages lighting practices that minimize

[4] California Public Resources Code. Section 21002(b). California Environmental Quality Act.

[5] California Department of Transportation. 2010. California Scenic Highway Mapping System. <http://www.dot.ca.gov/hq/LandArch/scenic_highways /index.htm>.

glare and light pollution, conserve energy while maintaining security and productivity, and curtail degradation of the nighttime visual environment[6].

City of Hollister General Plan, Implementation Measure LU.J.

In order to minimize light trespass and greater overall light levels in the City, new development and projects making significant parking lot improvements or proposing new lighting shall be required to prepare a lighting plan for review by city planning staff[7].

FINDINGS

The City of Hollister lies near the southern end of the broad alluvial plain formed by the San Benito River and is surrounded on three sides by mountainous terrain. The City is situated at the focal point of a basin formed by the Gabilan Mountains to the south and west, and by the Diablo Range to the east. These mountain ranges provide a rugged, natural backdrop to the highly modified landscape along the plain that is a patchwork of agricultural activity and suburban development. Along with the distant rim of the Coastal Mountains, the City is ringed by gentle foothills to the east, south, and west.

There are no scenic corridors listed in the 2005 City of Hollister General Plan[8]. The proposed project area is located almost entirely within the airport boundaries and is generally flat with few distinguishing physical features such as rock outcroppings or historic buildings. Areas located outside of the airport boundaries that could be potentially impacted by the proposed project have comparable physical features. State Highways 25 and 156 are situated west and north of the airport. Due to the surrounding topography, there is not a clear view of the airport from Highway 25. The northern end of Runway 13 can be viewed from Highway 156. Although both highways are listed as Eligible State Scenic Highways by the California Department of Transportation (Caltrans)[9] neither has been officially designated as such at this time[10].

The proposed project does not require any lighting improvements or alterations. All construction will be completed during daytime hours so there will be no need for nighttime lighting.

DISCUSSION

I. a, b, c)

Improvements associated with the SWMP would require the replacement of drainage ditches and depressions with underground drainage facilities for safety improvements. The changes would have a negligible visual impact from the public roads and within the airport.

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[6] City of Hollister. 2010. Municipal Code Chapter 17.16.090 : Lighting (outdoors). <http://qcode.us/codes/hollister/>.

[7] City of Hollister. 2005. City of Hollister General Plan. Adopted December 5, 2005. Amended June 18, 2007.

[8] Ibid.

[9] California Department of Transportation. 2010. California Scenic Highway Mapping System. <http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm>.

[10] Lewis I. Rosenberg, Relative Liquefaction Susceptibility Map of the Hollister Area, San Benito County, California, 1998.

I. d)

Existing nighttime sources of lighting and glare within the airport consists of runway lights, public street lighting, and building lights. The proposed project does not require any lighting improvements or alterations. All construction will be completed during daytime hours so there will be no need for nighttime lighting. If additional lighting does become necessary during daytime construction activities, there will be no impact because the area surrounding the airport is used for agriculture and industrial land uses. There is no impact.

MITIGATION MEASURES

No mitigation measures are required. All of the necessary permits will be obtained to ensure cooperation with public agencies.

II. AGRICULTURAL 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. Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
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?			X	
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?			X	
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))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
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?				X

REGULATORY SETTING

Federal Regulations

Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA)[11] regulates federal actions with the potential to convert protected farmland to non-agricultural uses. If a proposed action will convert farmland to non-agriculture use, it must be determined whether the land is protected by the FPPA. To be protected, it must be either "prime farmland" that is not committed to urban development or water storage, or unique farmland, or farmland that is of state or local importance.

State Regulations

California Land Conservation Act

The Williamson Act[12] seeks to preserve agricultural land and encourages open space protection. Williamson Act contracts provide willing land owners with an opportunity to receive tax reductions if they agree to not convert agricultural or open space to other uses throughout the duration of the contract.

CEQA and the *CEQA Guidelines* provide significance criteria for potential project impacts to existing farmland. According to the *Guidelines,* a project will incur a significant impact if it conflicts with existing zoning for agricultural use or a Williamson Act Contract.

FINDINGS

The proposed project consists of four infiltration basins that will be constructed off airport property. There are two proposed infiltration basins on the northeast side of the airport, the first approximately 400 feet outside of the existing property line and the second approximately 650 feet outside of the existing property line. There are two proposed infiltration basins on the west side of the airport, one located approximately 150 feet outside of the existing property line and the other at approximately 80 feet from the existing property line (see **Figure 5, Proposed Airport Improvements**).

According to the City of Hollister Zoning Map[13] the proposed project site is zoned as 'Airport', for the current airport property and 'Airport Support', for the proposed location of a detention basin east of the airport. The proposed project site also includes land west of the existing airport property that is currently unincorporated. The county zoning designation for this land is Agricultural Productive (see **Figure 3, Zoning Map**). The allowed uses for this zoning

[11] Natural Resources Conservation Service. 2006. Farmland Protection Program. Farmland Protection Act. 7 United States Code 4201-4209. <http://www.nrcs.usda.gov/programs/fppa/>.

[12] California Land Conservation Act. 1965. Section 51200.

[13] City of Hollister. Zoning Map. <http://www.hollister.ca.gov/site/Documents/COHZONINGMAPDECEMBER2010 ORDAMENDED104310621.pdf >.

designation include Aircraft Landing Field under Additional Uses. In addition, the areas of the proposed project have been designated by the City of Hollister General Plan[14], Land Use Plan, as 'Airport,' 'Airport Support' and 'Industrial' land uses (see **Figure 2, Land Use Map**).

A search for soils classified as Farmland of Statewide Importance was conducted for the proposed project area using the Soil Survey Geographic (SSURGO) Database administered by the Natural Resources Conservation Service (NRCS)[15]. According to the survey, elements of the proposed project are located on several soil types, two of which, Willows clay & Clear Lake clay are classified as "soils of importance" and located within the proposed project area (see **Figure 6, Soils Map**).

DISCUSSION

II. a)

Elements of the proposed project are located on soil types, Willows clay & Clear Lake clay, that have been classified as Farmland of Statewide Importance. However, areas of the proposed project where the above-mentioned soils are located have been designated by the City of Hollister Land Use Plan as Airport, Airport Support and Industrial[16] (see **Figure 2, Land Use Map**). Thus, there will be less than significant impacts as those areas are already used for non-agricultural land uses and would require no conversion.

II. b)

The proposed project site would occur almost entirely on the airport property or immediately adjacent to it. The proposed project area is zoned as Light Industrial by the City of Hollister. None of the proposed improvements would conflict with existing zoning or conflict with a Williamson contract. However, there may be minor impacts considering the county's zoning designation of Agricultural Productive. There will be less than significant impacts.

II. c)

No areas of the proposed project are currently zoned as forestland or timberland. No impacts are anticipated.

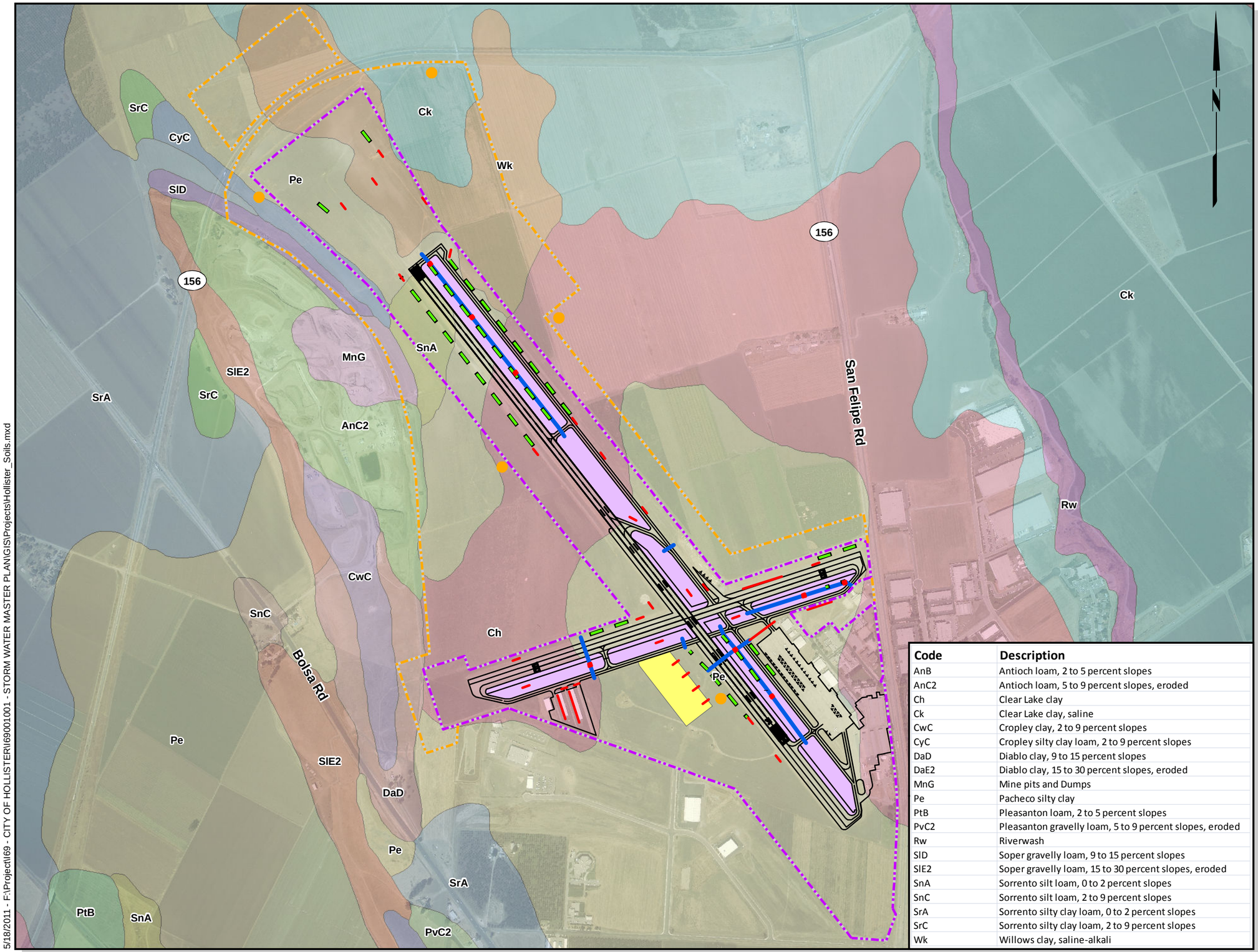
II. d)

The proposed project will not result in the lost of forest land or conversion of forest land to non-forest use. No impacts are anticipated.

[14] City of Hollister. 2005. City of Hollister General Plan. Land Use Plan. Amended 2009.

[15] Natural Resources Conservation Service. 2011. Soil Survey Staff, United States Department of Agriculture Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.

[16] City of Hollister. 2005. City of Hollister General Plan. Land Use Plan. Amended 2009.



Code	Description
AnB	Antioch loam, 2 to 5 percent slopes
AnC2	Antioch loam, 5 to 9 percent slopes, eroded
Ch	Clear Lake clay
Ck	Clear Lake clay, saline
CwC	Cropley clay, 2 to 9 percent slopes
CyC	Cropley silty clay loam, 2 to 9 percent slopes
DaD	Diablo clay, 9 to 15 percent slopes
DaE2	Diablo clay, 15 to 30 percent slopes, eroded
MnG	Mine pits and Dumps
Pe	Pacheco silty clay
PtB	Pleasanton loam, 2 to 5 percent slopes
PvC2	Pleasanton gravelly loam, 5 to 9 percent slopes, eroded
Rw	Riverwash
SlD	Soper gravelly loam, 9 to 15 percent slopes
SlE2	Soper gravelly loam, 15 to 30 percent slopes, eroded
SnA	Sorrento silt loam, 0 to 2 percent slopes
SnC	Sorrento silt loam, 2 to 9 percent slopes
SrA	Sorrento silty clay loam, 0 to 2 percent slopes
SrC	Sorrento silty clay loam, 2 to 9 percent slopes
Wk	Willows clay, saline-alkali

Legend

- Existing Airport Property Line
- Ultimate Airport Property Line
- Airfield
- Proposed Bio-Filter Swale
- Proposed Storm Drain or Catch Basin
- Proposed Storm Drain Regrade
- Potential Infiltration Basin
- Proposed Regrading
- CA Dep. of Forestry (Not part of project)

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1" = 1000'
When printed at 11"x17"

Hollister Municipal Airport

Soils Map

Figure 6

5/18/2011 - F:\Project\69 - CITY OF HOLLISTER\69001001 - STORM WATER MASTER PLAN\GIS\Projects\Hollister_Soils.mxd

II. e)

The proposed project will not involve any other changes to the existing environment which could result in conversion of Farmland to non-agricultural use. According to the Important Farmlands Mapping classification, the project site is located on urban – built-up. The only proposed project elements that would occur off airport property are four proposed infiltration basins. The basins on the east side of the airport property line would be located on land designated as 'Airport Support,' and the basins on the west side of the property line would be located on land designated as 'City Industrial Land.' No impacts are anticipated.

MITIGATION MEASURES

No mitigation measures are required. All of the necessary permits will be obtained to ensure cooperation with public agencies.

III. AIR QUALITY - Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Conflict with or obstruct implementation of the applicable air quality plan?				X
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?				X
c) 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 (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?				X
d) Expose sensitive receptors to substantial pollutant concentrations?				X
e) Create objectionable odors affecting a substantial number of people?				X

REGULATORY SETTING

The proposed project site is located within the North Central Coast Air Basin (NCCAB) and is subject to the air quality standards of significance established by the Monterey Bay Unified Air Pollution Control District (MBUAPCD). According to the 2008 Air Quality Management Plan (AQMP), the air basin is non-attainment (i.e. currently exceeds) for state air quality standards for criteria pollutants Ozone (O_3) and inhalable particulates of ten microns or less in diameter (PM_{10}). Information supplied by the MBUAPCD CEQA Air Quality Guidelines indicates that the MBUAPCD is also concerned with the criteria pollutant carbon monoxide (CO)[17].

[17] Monterey Bay Unified Air Pollution Control District. 2008. CEQA Air Quality Guidelines. <http://www.mbuapcd.org/ mbuapcd /pdf/mbuapcd/pdf/CEQA_full.pdf>.

FINDINGS

The MBUAPCD maintains monitoring stations within San Benito County to monitor air quality and compliance with applicable ambient air quality standards. The station closest to the proposed project site is located in Hollister at 1979 Fairview Rd. The station is located approximately 5.0 miles southeast of the proposed project site. This station analyzes only ozone and PM_{10}. **Table III-A** includes the ambient pollutant levels monitored at these stations for the past five years, 2006 through 2010. During the 2006 to 2010 air quality monitoring period the Hollister area monitoring station reported that only the Ozone standard of 0.070 parts per million (ppm) was exceeded.

Table III-A
Project Area Air Pollutant Summary, 2006-2010
Hollister Air Station

Pollutant	Standard	2006	2007	2008	2009	2010
O_3						
Highest 1-hr average, ppm	0.09	0.099	0.087	0.090	0.090	0.087
No. of days above standard	-	1	0	0	0	0
Highest 8-hr average, ppm	0.07	0.088	0.074	0.073	0.074	0.078
No. of days above standard	-	5	2	2	2	4
PM_{10}						
Highest 24-hr average, µg/m3	50	46	40	40	38	34
No. of days above standard	-	0	0	0	0	0
Annual Arithmetic Mean, µg/m3	20	16.10	17.30	19.67	14.62	13.94
Violation	-	No	No	No	No	No

Source: CARB AQMIS2 2006-2009

DISCUSSION

III. a)

The MBUAPCD develops and administers the AQMP for the NCCAB. A project would be considered to be in conflict with or obstruct implementation of the AQMP if the project would be inconsistent with air pollution emission inventories within the plan. Emission inventories are projected based on the population growth estimates prepared by the Association of Monterey Bay Area Governments (AMBAG) and the projected vehicle miles traveled within the region[18].

Section 1.10 – *Project Description* of this IS explains the proposed project is necessary to improve existing airport drainage and will not induce population growth. For this reason, a

[18] Association of Monterey Bay Area Governments. June 2008. *Monterey Bay Area 2008 Regional Forecast Population, Housing Unit, and Employment Projections for Monterey, San Benito, and Santa Cruz Counties to the Year 2035*. <http://www.ambag.org/programs/blueprint/forecast/index.html>.

consistency determination is not required by AMBAG for project consistency with the Monterey Bay Area 2008 Regional Forecasts. The proposed project, therefore, would not conflict with or obstruct the implementation of the AQMP. No impact is anticipated.

III. b, c)

Development of the proposed storm water drainage improvements would result in temporary impacts to air quality from the use of construction equipment needed for grading of drainage ditches/swales and construction of associated storm water infrastructure. The potential air quality impacts of the proposed project are analyzed in this section.

Construction Impacts: It is expected that construction activities would occur incrementally over a period of up to seven months when funding for the capital improvements is available. Incremental constructions projects include the regrading of areas within the RSA, construction of bio-filter swales, and construction of storm drains and catch basins. The MBUAPCD has established the following thresholds of significance for project construction-generated PM_{10}[19]:

Daily construction emission limit:	82 lbs/day
Area under construction disturbance	
Minimal earthmoving:	8.1 acres/day
Extensive earthmoving:	2.2 acres/day

Based on preliminary construction estimates a maximum of 1.7 acres of earthmoving would be performed per day. However, an emissions analysis was performed for the use of construction activities needed to complete the proposed project. The analysis is based on information developed using the California Air Resource Board (CARB) recommended URBEMIS 2007 v 9.24-air pollutant emissions model, prepared February 7, 2011, which is hereby incorporated by reference into this IS. As shown by the emissions estimates included in **Table III-B** the daily construction emissions limit of 82 lbs/day is not exceeded.

[19] Monterey Bay Unified Air Pollution Control District. 2008. CEQA Air Quality Guidelines. <http://www.mbuapcd.org/mbuapcd/pdf/mbuapcd/pdf/CEQA_full.pdf>.

Table III-B
Proposed Project Construction Emissions Analysis

	Estimated Emissions (pound/day)		
Construction Year	**NO_x**	**CO**	**PM_{10}**
2011	158.51	87.86	69.94
2012	10.84	9.19	0.93
MBUAPCD Significant Threshold	-	-	82 lbs/day
Significant Impact	No[1/]	No[1/]	No
1/ Accommodated in the emissions inventories of State and federally required air quality plans			

Source: C&S and MBUAPCD, 2011

Construction projects using typical construction equipment that temporarily emit ozone precursors are accommodated in the emission inventories of state and federally required air plans and would not have a significant impact on attainment and maintenance of ozone ambient air quality standards (AAQS). Construction of the proposed project will include the following pieces of construction equipment:

- Front Loader
- Grader
- Scrapper
- Crawler Tractor
- Surfacing Equipment
- Dumper
- Sweeper/Scrubbers
- Off-Highway Trucks
- Watering Truck
- Paver
- Skid Steer Loader
- Rollers
- Signal Boards
- Cement and Mortar Mixers
- Concrete Saws

None of those pieces are considered non-typical. No significant impacts are anticipated.

III. d)

The MBUAPCD CEQA Guidelines generally define a sensitive receptor as a location where it can be reasonably assumed that human populations, especially children, seniors, and sick persons, would be continuously exposed to pollutants concentrations. Sensitive receptors typically include residences, hospitals, and schools[20]. The closest sensitive receptor in the proposed project area is an existing park (Hollister Airport Park) which is located southeast of Runway end 31, between the existing CDF facility and San Felipe Road. There are no anticipated impacts to patrons of the park as the closest construction activities would take place

[20] Monterey Bay Unified Air Pollution Control District. 2008. CEQA Air Quality Guidelines. <http://www.mbuapcd.org /mbuapcd /pdf/mbuapcd/pdf/CEQA_full.pdf>.

over 500 feet away from the park and be temporary in nature. The anticipated construction schedule for the closest area to be graded is two weeks. No significant impacts are anticipated.

III. e)

The majority of construction activities will take place within or adjacent to the airport property line. The anticipated construction schedule for the proposed project is approximately 4 months. The proposed project is not anticipated to create or expose a substantial number of people to objectionable odors as construction equipment activities will not be located in proximity to areas where people congregate.

MITIGATION MEASURES

The project sponsor shall implement and follow the MBUAPCD-recommended Best Construction Practices (BCPs) during all phases of construction, as determined necessary by the City of Hollister Planning Division and Building Division to minimize dust generation. These BCPs include the following:

- Water all active construction areas at least twice daily. Frequency shall be based on the type of operation, soil and wind exposure.
- Prohibit all grading activities during periods of high wind (over 15 mph).
- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations.
- Haul trucks shall maintain at least 2'0" of freeboard.
- Cover all trucks hauling dirt, sand or loose materials.
- Cover inactive storage piles.
- Install wheel washers at the entrance to construction sites for all exiting trucks.
- Sweep streets if visible soil material is carried out from the construction site.
- Post a publicly visible sign, which includes the telephone number and person to contact regarding dust complaints. This person shall respond to complaints and take corrective action within two hours. The phone number of the MBUAPCD shall be included on the sign to ensure compliance with MBUAPCD Rule Book, Rule 402[21].

It should also be noted that Chapter 15.24.131 of the Hollister Municipal Code also requires use of BMPs during grading for control of wind erosion and dust[22]. Section 17.16.040 of the Zoning Code requires construction activities to minimize dust or dirt emissions beyond the project boundary, through implementation of the following measures:

[21] Monterey Bay Unified Air Pollution Control District. 2008. CEQA Air Quality Guidelines. <http://www.mbuapcd.org /mbuapcd/pdf/mbuapcd/pdf/CEQA_full.pdf>.

[22] City of Hollister. 2010. Municipal Code Chapter 15.24.131 : Grading and Best Management Practices Control. <http://qcode. us/codes/hollister/>.

- Implementation of an erosion and control plan per City Engineering Standards;
- Water graded areas as often as necessary or hydro seed and install a temporary irrigation system, subject to approval of the Director; and
- Revegetate graded areas as soon as possible to minimize dust and erosion[23].

All of the necessary permits will be obtained to ensure cooperation with public agencies.

[23] City of Hollister. 2010. Municipal Code Chapter 17.16.040 : Zoning – Performance Standards. <http://qcode.us/codes/hollister/>.

IV. BIOLOGICAL RESOURCES - Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?		X		
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal, pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		X		
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?			X	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
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?				X

REGULATORY SETTING

Federal Regulations

Federal Endangered Species Act

According to the Endangered Species Act (ESA), the United States Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) have regulatory authority over federally listed species. Under ESA, a permit is required to "take" a listed species for any action that may harm a member of that species. The term "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" under Section 9 of ESA. Under federal regulation, "take" further encompasses habitat modification or deprivation where it would be anticipated to result in death or injury to listed wildlife by significantly inhibiting critical behavioral patterns, including breeding, feeding, or sheltering. If a project would result in the take of a federally listed species, the project proponent must obtain either an incidental-take permit, under Section 10(a) of ESA, or a federal interagency consultation, under Section 7 of ESA prior to the take[24].

Clean Water Act, Section 404

Section 404 of the Clean Water Act (CWA) requires that a permit be obtained by the United States Army Corps of Engineers (USACE) for any project that involves the discharge of dredged or fill material into "waters of the United States." These waters include navigable waters of the United States, tributaries to navigable waters, interstate wetlands, wetlands which could affect interstate or foreign commerce, and wetlands adjacent to other waters in the United States. The USACE and the United States Environmental Protection Agency (EPA) defines wetlands as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions"[25]. In order to qualify as a jurisdictional wetland, the following delineation criteria must be met: hydrophytic vegetation, hydric soil types, and wetland hydrology.

Clean Water Act, Section 401

Section 401 of the CWA requires that project proponents applying for a Section 404 permit must first obtain a certificate from the appropriate state agency confirming that the projected dredging or filling activity complies with the state's water quality standards and criteria[26]. In the State of California, water quality certification is granted by the State Water Resource Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCB).

[24] United States Code. 1973. Endangered Species Act. 16 U.S.C. 1531-1544.

[25] United States Environmental Protection Agency. Clean Water Act. Section 404.

[26] United States Environmental Protection Agency. Clean Water Act. Section 404.

State Regulations

California Endangered Species Act

According to the California Endangered Species Act (CESA) of the California Fish and Game Code, a permit from the CDFG is required when a project could result in the take of a species state listed as threatened or endangered[27]. The exception is plants that may be taken without a permit pursuant to the terms of the California Native Plant Protection Act (CNPPA)[28]. Section 2080 of the Fish and Game Code prohibits take of a listed species without an incidental take permit. Under CESA, take is defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" a member of a state listed endangered or threatened species. The terms "harm" and "harass" are included in the federal act but are noticeably missing from the CESA definition. Therefore, the threshold for take under CESA is considered higher than under ESA.

California Fish and Game Code, Section 1602 – *Notification of Lake or Streambed Alteration*

DFG is responsible for the conservation, protection and management of the state's fish, wildlife, and native plant resources. In order to fulfill this responsibility, Section 1602 of the Fish and Game Code requires that DFG be notified if any proposed activity may substantially modify a river, stream or lake. Specifically, notification must be given if an activity will: substantially divert or obstruct the natural flow of any river, stream or lake; substantially change or use any material from the bed, channel, or bank of, any river, stream or lake; or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake[29].

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act grants jurisdiction of "waters of the state" to the appropriate RWQCB, which then must prepare and periodically update water quality control plans, also known as basin plans. Each plan should provide water quality standards for surface and ground water, as well as measures to control point and non-point pollution sources to achieve and maintain these standards[30]. Projects that discharge waste to wetlands or waters of the state must meet the RWQCB waste discharge requirements, which may be issued in addition to water quality certification or waiver under Section 401 of CWA.

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[27] California Department of Fish and Game. California Endangered Species Act. <http://www.dfg.ca.gov/habcon/cesa/>.

[28] California Department of Fish and Game. Section 1900 et seq. California Native Plant Protection Act.

[29] California Department of Fish and Game. Fish and Game Code. Section 1602 – Notification of Lake or Streambed Alteration.

[30] United States Department of Energy. Summary of the Porter-Cologne Water Quality Control Act. Energy Technology Engineering Center, Regulators and Regulations. <http://www.etec.energy.gov/Regulation/Porter-Cologne-Water-Quality-Control-Act.html>. Last updated August 6, 2008.

Local Regulations

City of Hollister General Plan

The City of Hollister General Plan provides guidance for natural resource conservation. The Natural Resources and Conservation Element guarantees protection for threatened or endangered species and enhanced habitat for native plants and animals. The following policies were adopted to achieve this goal:

> Policy NRC 1.1: Protection of Environmental Resources – Protect or enhance environmental resources, such as wetlands, creeks and drainageways, and habitat for threatened and endangered species.
>
> Policy NRC 1.2: Protection of Endangered Species Habitat – Identify and protect the habitats of endangered species which may found within the Hollister Planning Area, in cooperation with the U.S. Fish and Wildlife Service and the California Department of Fish and Game, through the review all development proposals for compliance with regulations established by the U.S. Fish and Wildlife Service and the California Department of Fish and Game as they apply to the protection of endangered species and their habitats.
>
> Policy NRC 1.3: Compensatory Habitat, Habitat Enhancement or Habitat Protection – Require developers to assure the provision of compensatory habitat, habitat enhancement or habitat protection if impacts to sensitive species that could result from proposed development cannot be avoided.
>
> Policy NRC 1.4: Other Habitat Planning Measures – Utilize regional planning and the use of concepts such as mitigation banking to offset the cumulative effects of piecemeal development on the habitat of special status species.
>
> Policy NRC 1.5: Wetlands Preservation – Maintain existing riparian areas in their natural state to provide for wildlife habitat, groundwater percolation, water quality, aesthetic relief and recreational uses that are environmentally compatible with wetland preservation. Require appropriate public and private wetlands preservation, restoration and/or rehabilitation through compensatory mitigation in the development process for unavoidable impacts. Support and promote acquisition from willing property owners, and require those development projects, which may result in the disturbance of delineated seasonal wetlands to be redesigned to avoid such disturbance.
>
> Policy NRC 1.6: Enhancement of Creeks and Drainage Ways – Explore enhancement of, and support continuous upgrades to, drainageways to serve as wildlife habitat corridors for wildlife movement and to serve as flood control facilities to accommodate storm drainage and groundwater recharge. Require setbacks, creek enhancement and associated riparian habitat restoration/creation for projects adjacent to creeks to maintain storm flows, reduce erosion and maintenance and improve habitat values, where feasible.

Generally, all new structures and paved surfaces should be set back 100 feet from wetlands and creeks.

Policy NRC 1.7: Specialized Surveys for Special-Status Species – Require specialized surveys for special status species for those projects that have been proposed in areas that contain suitable habitat for such species. All surveys should take place during appropriate seasons to determine nesting or breeding occurrences.[31]

FINDINGS

Vegetation and Wildlife

Environmental Science Associates (ESA) conducted a reconnaissance-level field survey of the proposed project site on January 13, 2011 to verify existing biological conditions, assess vegetation and wildlife habitats, and identify potential for special-status[32] wildlife species to occur onsite[33]. Wildlife observed at the proposed project site included red-winged blackbird (*Agelaius phoeniceus*), burrowing owl (*Athene cunicularia*), red-tailed hawk (*Buteo jamaicensis*), killdeer (*Charadrius vociferus*), common raven (*Corvus corax*), white-tailed kite (*Elanus leucurus*), American kestrel (*Falco sparverius*), loggerhead shrike (*Lanius ludovicianus*), western meadowlark (*Sturnella neglecta*), mourning dove (*Zenadia macroura*), California ground squirrel (*Spermophilus beecheyi*), pocket gopher (*Thomomys* sp.), and black-tailed jackrabbit (*Lepus californicus*) (See **Appendix C**).

The California Natural Diversity Database (CNDDB) documents 52 special-status plant and wildlife species within the Gilroy, Gilroy Hot Springs, Pacheco Peak, Chittenden, San Felipe, Three Sisters, San Juan Bautista, Hollister, and Tres Pinos United States Geological Survey (USGS) quadrangles that include the proposed project area and adjacent areas with similar habitats[34]. Species recorded in the CNDDB within 5 miles of the proposed project area are shown on **Figure 7, Biological Resource Findings**. Potential for the proposed project area to support special-status species was assessed using the CNDDB[35], the California Native Plant Society's (CNPS) Rare Plant Inventory[36], and an endangered species list from the Sacramento

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[31] City of Hollister. 2005. *City of Hollister General Plan*. Chapter 7 – Natural Resources and Conservation Element. Adopted December 5, 2005. Amended June 18, 2007.

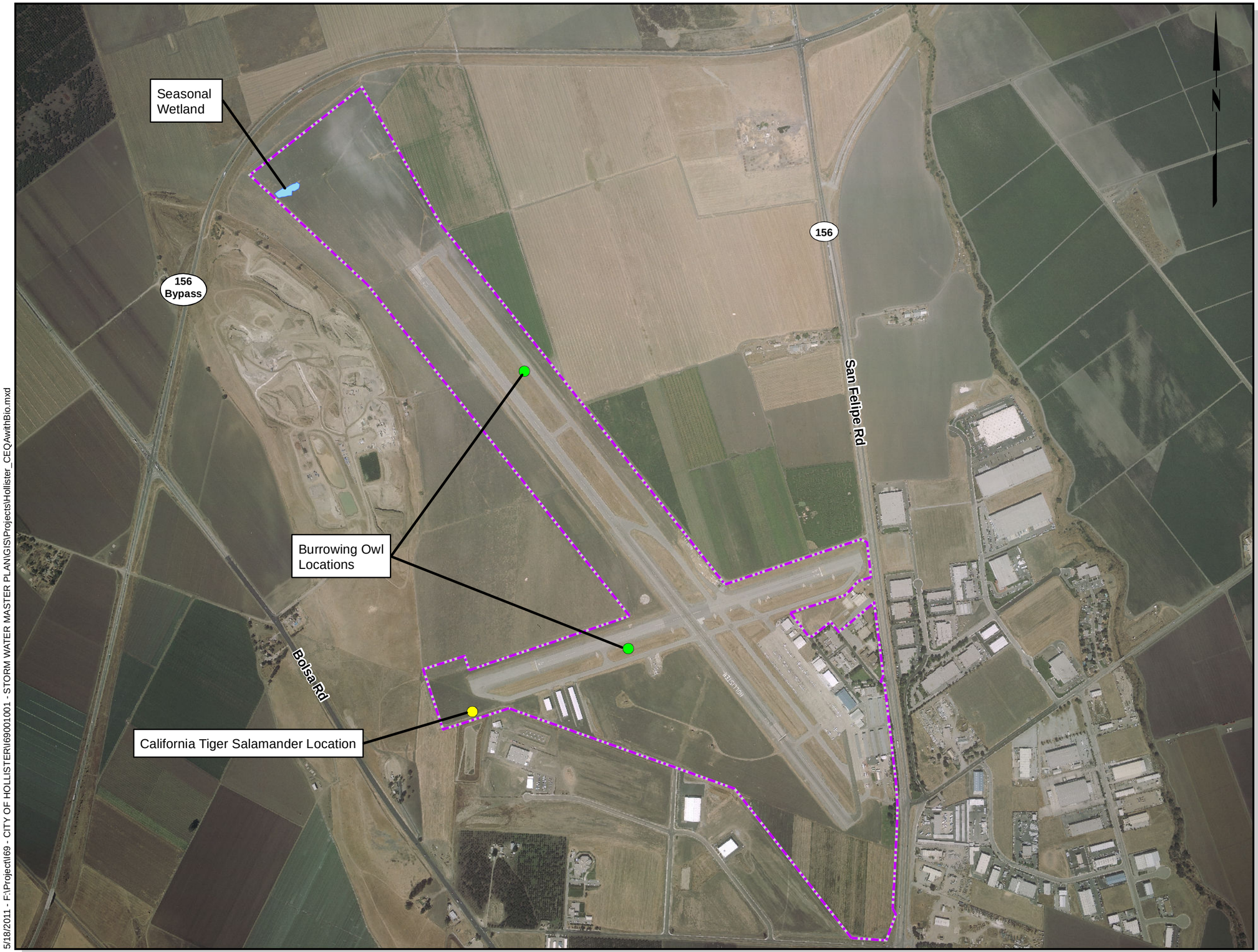
[32] The term "special-status" species includes those species that are listed and receive specific protection defined in federal or state endangered species legislation, as well as species not formally listed as Threatened or Endangered, but designated as "Rare" or "Sensitive" on the basis of adopted policies and expertise of state resource agencies or organizations, or local agencies such as counties, cities, and special districts. A principle source for this designation is the California "Special Animals List" (CDFG, 2009).

[33] Environmental Science Associates. Site Reconnaissance Survey. December 13, 2011.

[34] California Department of Fish and Game (CDFG), California Natural Diversity Database for 7.5 minute topographic quadrangles of Gilroy, Gilroy Hot Springs, Pacheco Peak, Chittenden, San Felipe, Three Sisters, San Juan Bautista, Hollister, and Tres Pinos, Commercial Version, accessed January 2011.

[35] Ibid.

[36] California Native Plant Society (CNPS), 2010, CNPS Electronic Inventory for 7.5-minute topographic quadrangles: Clayton, Walnut Creek, Tassajara, Diablo, Antioch North, Antioch South, Honker Bay, Las Trampas Ridge, Vine Hill, information dated 2010.



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HOLLISTER
Hometown, California
Est. 1877

Legend

- Burrowing Owl Location
- California Tiger Salamander
- Seasonal Wetland
- Existing Airport Property Line

0 1,000 Feet

1" = 1000'
When printed at 11"x17"

C&S COMPANIES®

Hollister Municipal Airport

Biological Resource Findings

Figure 7

office of the USFWS[37]. As a result dense growth of non-native grass species, constant mowing of vegetation, and agricultural development, no suitable habitat for special-status plant species is present on or directly adjacent to the proposed project site.

The San Joaquin kit fox (*Vulpes macrotis mutica*) was not considered in this assessment, despite CNDDB records in the vicinity of the proposed project area recorded between 1970 and 1997[38]. Habitat elements on site potentially suitable for kit fox include a small mammal prey base and areas of low-growing annual grasses. However, agricultural fields almost entirely surround the airport, which would make movement from suitable habitats in the Hollister area to the proposed project site difficult for kit fox. The most recent recovery plan for San Joaquin kit fox did not designate the Hollister area as a core area, a satellite area, or a linkage area for recovery[39]. While kit foxes are known to inhabit urban environments and can habituate to human disturbance, aircraft noise and human presence in and around the airport likely deter kit fox from using habitat in the proposed project site[40].

Special-status wildlife species that could potentially be impacted by the proposed project include burrowing owl, California tiger salamander (*Ambystoma californiense*), and nesting birds. These species are described in more detail below.

Burrowing Owl

The burrowing owl is a California species of special concern typically found in open grassland areas with low-growing vegetation, and less commonly in areas highly disturbed by agriculture or urban development[41]. It is not a federally or state listed species. Burrowing owls require some form of protected burrow for nesting, which can include ground squirrel or badger burrows, culverts, debris piles, or openings underneath concrete or asphalt. Burrowing owls feed on a variety of prey, including small mammals, large arthropods, and small reptiles and amphibians[42]. While burrowing owls are considered year-round residents in much of California, owls are also known to migrate from higher elevations to lowland areas in during the winter[43]. DeSante et. al., 2007, described burrowing owl populations in California as "highly fragmented, extremely non-uniform, generally declining, and locally vanishing" after a comprehensive survey over the

[37] United States Fish and Wildlife Service (USFWS), *Federally Listed Threatened and Endangered Species* [Unofficial Species List], available online at http://www.fws.gov/sacramento/es/spp_lists/auto_list_form.cfm, information accessed January 2011.

[38]CDFG, California Natural Diversity Database. Special Animals (901 Taxa), <www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf>. January 2011.

[39] United States Fish and Wildlife Service (USFWS), *Federally Listed Threatened and Endangered Species* [Unofficial Species List], <http://www.fws.gov/sacramento/es/spp_lists/auto_list_form.cfm>. January 2011.

[40] United States Fish and Wildlife Service. San Joaquin Kit Fox (*Vulpes macrotis mutica*) 5-Year Review Summary and Evaluation, U.S. Fish and Wildlife Service Sacramento Fish and Wildlife Office, Sacramento, CA, 2010.

[41] Shuford, W. D., and Gardali, T., editors, California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California, Studies of Western Birds 1, Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento, 2008.

[42] California Department of Fish and Game (CDFG), Staff Report on Burrowing Owl Mitigation. CDFG Environmental Services Division and Wildlife Management Division CDFG, 1995, *<sdip.water.ca.gov/documents/asip/doc/AppF.pdf>. January 2011.*

[43] Shuford, W. D., and Gardali, T., editors, California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California, Studies of Western Birds 1, Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento, 2008.

species' entire breeding range[44]. While some populations can persist in disturbed areas and drainage canals associated with agriculture in the inland valleys are capable of supporting high owl densities[45], state-wide distribution of this species has changed significantly as a result of urban development[46].

The current breeding range of the burrowing owl extends to the southern end of the Santa Clara Valley, just south of the City of Hollister, which includes the Hollister Municipal Airport[47]. During a reconnaissance site visit, ESA biologist B. Olney observed two separate burrowing owls in mowed grass areas adjacent to both of the airport's runways (see **Figure 7, Biological Resource Findings**). While aircraft traffic is a constant source of disturbance at the proposed project site, it is likely that owls present at Hollister Municipal Airport have habituated to this disturbance, much like owls have done at the Norman Y. Mineta San Jose International Airport[48]. Three CNDDB occurrences for burrowing owl are present within five miles of the proposed project site in agricultural fields or annual grassland habitats, and burrowing owls have been recorded in the vicinity of the proposed project area in both the non-breeding and breeding seasons[49]. Based on these data and observations, burrowing owls winter and could potentially breed at the proposed project site, and these owls may be part of a larger population present in the Santa Clara Valley.

California Tiger Salamander

According to the CDFG and USFWS, the California tiger salamander is a state and federally threatened species that most commonly breeds in vernal pools, as well as the quiet waters of ponds, reservoirs, lakes, roadside ditches and occasionally streams. California tiger salamanders participate in nocturnal migrations to and from breeding pools that may cover distances of more than one kilometer (0.6 mile)[50]. Adult California tiger salamanders spend most of the year in subterranean refugia, especially burrows of California ground squirrels and pocket gophers, debris piles, and man-made structures. The species is restricted to grasslands and low foothill regions of Central and Northern California, which is where the longest-lasting rain pools tend to form[51].

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[44] DeSante, D.F., D.E. Ruhlen, R. Scalf, The Distribution and Relative Abundance of Burrowing Owls in California During 1991-1993: Evidence for a Declining Population and Thoughts on its Conservation, The Institute for Bird Populations, Proceedings of the California Burrowing Owl Symposium, pp. 1-41, 2007.

[45] DeSante, D.F., D.E. Ruhlen, R. Scalf, The Distribution and Relative Abundance of Burrowing Owls in California During 1991-1993: Evidence for a Declining Population and Thoughts on its Conservation, The Institute for Bird Populations, Proceedings of the California Burrowing Owl Symposium, pp. 1-41, 2007.

[46] Shuford, W. D., and Gardali, T., editors, California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California, Studies of Western Birds 1, Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento, 2008.

[47] Ibid.

[48] Barclay, J.H., Burrowing Owl Management at Mineta San Jose International Airport, The Institute for Bird Populations, Proceedings of the California Burrowing Owl Symposium, pp. 146-154, 2007.

[49]California Department of Fish and Game. California Natural Diversity Database. Special Animals (901 Taxa), <www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf>. January 2011.

[50]Jennings, M. R. and M. P. Hayes, 1994, "Amphibian and Reptile Species of Special Concern in California," Final Report submitted to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California, 1994.

[51] Ibid.

While the proposed project site is surrounded by unsuitable dispersal movement areas for California tiger salamander with active agricultural fields to the east, transportation to the north, and industrial development to the south, one dead adult salamander was found outside of a burrow near the southwestern edge of the proposed project site during a survey in 2007[52] (see **Figure 7, Biological Resource Findings**). The surveyor who recorded this occurrence noted that suitable breeding habitats were not present in areas directly surrounding the specimen, and current CNDDB records show the nearest known California tiger salamander breeding pond is more than 3.5 miles west of the location where the adult specimen was found[53]. Several marginal aquatic habitats that could potentially support California tiger salamander breeding are within 0.6 mile of the proposed project site, and include a detention basin directly south of the proposed project site and several quarry ponds approximately 0.5 mile north of the proposed project site. The detention basin holds water for at least part of the year, and could support California tiger salamander breeding efforts.

Nesting Birds

Most native, breeding birds are protected under Section 3503 of the CDFG Code, and raptors are protected under Section 3503.5 of the Code[54]. In addition, both Section 3513 of the CDFG Code[55] and the Federal Migratory Bird Treaty Act[56] (16 U.S. Code, Sec. 703 Supp. I, 1989) prohibit the killing, possession, or trading of migratory birds. The CDFG Code (Sections 3511 – *Birds*, 4700 – *Mammals*, 5050 – *Reptiles and Amphibians*, and 5515 – *Fish*) also allows the designation of a species as Fully Protected. This designation provides a greater level of protection than is afforded by the CESA, since it means the designated species cannot be taken at any time. Finally, Section 3800 of the Code prohibits the taking of non-game birds, which are defined as birds occurring naturally in California that are neither game birds nor fully protected species. Typical avoidance buffers for nesting birds recommended by CDFG are 250 feet for perching bird species (passerines) and 500 feet for birds of prey (raptors) and owls[57].

The California horned lark (*Eremophila alpestris actia*) and killdeer, both species protected by the Federal Migratory Bird Treaty Act[58] and CDFG Code[59], are the only sensitive bird species that could nest in habitat within the proposed project site. The California horned lark (*Eremophila alpestris actia*) is one of eight horned lark subspecies that breed in California. The California horned lark is a common to abundant resident in a variety of open habitats where large trees and shrubs are absent. The California horned lark forages on open ground, often forming large, gregarious flocks that roost together. Nesting occurs on the ground as well, in a grass-lined depression often in the open[60]. The killdeer is a fairly common, year-round resident of

[52] California Department of Fish and Game. California Natural Diversity Database. Special Animals (901 Taxa), <www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf>. January 2011.
[53] Ibid.
[54] California Department of Fish and Game. Fish and Game Code. Sections 3503 and 3503.5.
[55] California Department of Fish and Game. Fish and Game Code. Section 3513.
[56] United States Code. 1989. Federal Migratory Bird Treaty Act. 16 U.S.C. Sec. 703 Supp. I.
[57] California Department of Fish and Game. Fish and Game Code.
[58] United States Code. 1989. Federal Migratory Bird Treaty Act. 16 U.S.C. Sec. 703 Supp. I.
[59] California Department of Fish and Game. Fish and Game Code.
[60] Zeiner, D.C., Laudenslayer, W.F., Mayer, W.E., and White, M., ed., *California's Wildlife, Volume II, Birds*, California Department of Fish and Game, Sacramento, CA, 1990.

California. Killdeer forage in open fields, lawns, on mudflats or muddy shores, or in bare ground areas disturbed by human activity. Like the Californ**n**ia horned lark, killdeer nest on the ground, but are capable of nesting in bare ground areas such as gravel pits, roadsides, plowed fields, golf courses, airports, suburban lawns, and sometimes flat graveled rooftops[61].

At the proposed project site, no large trees capable of supporting nesting raptors are present within 500 feet of proposed construction areas. Several landscape pine trees near the corner of Skylane Drive and Armory Drive are approximately 400 feet from the proposed project site, but are likely too small to support nesting raptors, and no stick nests were observed in these trees at the time of the reconnaissance site visit[62]. However, bare ground and low grass areas within the proposed project site could support California horned lark and killdeer nests. CNDDB records of foraging and breeding California horned larks are located less than four miles southwest of the proposed project site, and foraging killdeer were observed during the reconnaissance site visit[63]. See **Appendix C**.

Wetlands

Analytical Environmental Services (AES) conducted a wetland delineation of the Hollister Municipal Airport on April 5, 2011. This delineation report describes any potentially jurisdictional waters of the United States (including wetlands) identified within the study area that may be subject to regulation by the USACE pursuant to Section 404 of the CWA.

Wetlands and/or waters of the U.S. locations within the study area were determined based on the following three parameter criteria:

- The majority of dominant plant species are wetland-associated species;
- Hydric soils are present; and
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season.

Two aquatic feature types identified within the study area included a seasonal wetland and manmade drainage ditch.

Seasonal Wetland

An isolated seasonal wetland occurs on the northwest corner of the study area (see **Figure 7, Biological Resource Findings**). Located at a low point within the study area, the seasonal wetland is composed of Pacheco silty clay (Pe) soil. This soil is not included on the NRCS' Hydric Soil List for San Benito County. However, a sample of the soil taken from within the seasonal wetland exhibited hydric characteristics. The primary hydric soil indicator was Redox Dark Surface (F6)[64]. There were very few oxidized rhizospheres present (<1 percent) along

[61] Zeiner, D.C., Laudenslayer, W.F., Mayer, W.E., and White, M., ed., *California's Wildlife, Volume II, Birds*, California Department of Fish and Game, Sacramento, CA, 1990.

[62] Environmental Science Associates, Site reconnaissance survey, December 13, 2011.

[63] Ibid.

[64] U.S. Army Corps of Engineers (USACE), 2008. *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. December 2008.

living roots in the soil sample. The vegetation was not considered hydrophytic since the dominant plant species included upland, grain crop species such as ripgut brome (*Bromus diandrus*), slender wild oat (*Avena barbata*), and barley (*Hordeum murinum*). The seasonal wetland contained ponded water and saturated soils during the April 5, 2011, site visit, which constituted the primary indicators for wetland hydrology.

This isolated, seasonal wetland is located in a field in the northern limits of the study area, significantly far from the airport runways and airport operations/activities. The field is irrigated with reclaimed water and routinely mowed. A well head is located to the east of the wetland, which is used in the irrigation of the field. At the time of the survey, the well was in good condition and did not have any known leaks[65]. There had been heavy rainfall in recent weeks prior to the site visit, which was the source of the ponded water in the wetland observed during the survey. Once the seasonal wetland dries out, it is planned to be mowed along with the remainder of the northern field in compliance with FAA standards[66].

This seasonal wetland was observed to provide a temporary water source for wildlife. At the time of the April 5, 2011, field survey, a few waterfowl were observed along the edges of the seasonal wetland. These species included: black-necked stilt (*Himantopus mexicanus*), mallard (*Anas platyrhynchos*), and an immature green heron (*Butorides virescens*).

Manmade Drainage Ditch

Several engineered and routinely maintained drainage ditches were observed within the study area. The majority of these drainages are located adjacent to airport runways to aid in the conveyance of stormwater runoff away from the runways consistent with FAA standards. These ditches did not contain water during the April 5, 2011, site visit. Vegetation observed within the ditches included grain crop species (i.e. alfalfa (*Medicago* sp.) and barley) and non-native invasive species (i.e. yellow star thistle (*Centaurea solstitialis*)). Riparian vegetation was not observed near or within the ditches. At the time of the site visit, none of the onsite manmade drainage ditches were observed to support aquatic wildlife species but they may provide a temporary water source for terrestrial wildlife during heavy rain events[67]. See **Appendix D**.

CDFG and RWQCB requirements are not applicable to the seasonal wetland and manmade drainage ditches. The CDFG has jurisdiction over activities that result in "the modification of the bed, bank, or channel of a stream, river, or lake," (all activities in which a Section 1602 Streambed Alternation Agreement (SAA) is required per CDFG Code)[68]. However, the manmade drainage ditches and seasonal wetland onsite do not fit this CDFG definition. These ditches drain only uplands and are not connected to any other waters or wetlands; the main engineered drainage terminates north of the project site on San Felipe Road. Therefore, both the manmade drainage ditches and the seasonal wetland would not require a SAA and do not fit under CDFG jurisdiction.

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[65] Chambless, Mike, 2011. Personal Communication via telephone. April 28, 2011.

[66] Ibid.

[67] Analytical Environmental Services. Wetland Delineation, City of Hollister, Hollister Municipal Airport. May 2011.

[68] California Department of Fish and Game. Fish and Game Code. Sections 1602.

The RWQCB has jurisdiction over activities that would "dredge" or "fill" waters of the state (including isolated wetlands) under Section 401 of the Clean Water Act[69]. The isolated seasonal wetland onsite would not be filled, dredged, drained, etc. from the project. Therefore, the seasonal wetland would not be included under this definition of RWQCB-jurisdiction.

DISCUSSION

IV. a)

Burrowing Owls

While burrowing owls present at Hollister Municipal Airport are accustomed to a high level of disturbance from aircraft noise and regular mowing, wintering or nesting pairs could be impacted from construction and grading of proposed drainage features. Potential impacts on burrowing owls, according to the CDFG *Staff Report on Burrowing Owl Mitigation*, could include:

- Construction equipment or personnel working within 160 feet of occupied burrows, which could result of harassment of breeding or non-breeding owls;
- Destruction of natural or artificial occupied burrows;
- Destruction and/or degradation of foraging habitat within 330 feet of occupied burrows[70].

Any of these impacts on wintering or breeding burrowing owls would be considered significant. Mitigation Measures IV-1a and IV-1b will reduce these impacts to less-than-significant levels.

California Tiger Salamander

Habitats located in close proximity to the proposed project site containing low-growing vegetation and ground squirrel burrows are suitable for adult California tiger salamander dispersal, and salamanders inside burrows within ground disturbance areas could be injured or harassed by proposed project activities. This would be considered a significant impact. Mitigation Measure IV-2 would mitigate this potential impact to less-than-significant levels.

Nesting Birds

Destruction of any nests within the proposed project site by construction equipment, or indirect harassment of nesting adults or young through construction noise would be considered a significant impact. In the event construction or vegetation removal must be performed during the nesting season, potential impacts to breeding or nesting birds could be significant. Potential impacts would be minimized to less-than-significant levels with the implementation of Mitigation Measure IV-3.

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[69] United States Environmental Protection Agency. Clean Water Act. Section 401.

[70] California Department of Fish and Game. Staff Report on Burrowing Owl Mitigation. CDFG Environmental Services Division and Wildlife Management Division CDF*G*, 1995, <sdip.water.ca.gov/documents/asip/doc/AppF.pdf>. January 2011.

IV. b)

No Impact. No communities designated as sensitive by CDFG are present in the vicinity of the proposed project area. No mitigation measures are required.

IV. c)

In accordance with USACE guidelines and relevant court decisions, the results of the field survey concluded that there were no features within the study area identified as potentially jurisdictional under the CWA. A brief discussion on why the aquatic features within the study area are likely to be considered non-jurisdictional is presented below.

Seasonal Wetland

As noted, the isolated, seasonal wetland located in the northwestern corner of the study area occurs outside of the airport runways and operations/activities. This seasonal wetland is located at a low point in a field that is regularly irrigated and mowed according to FAA standards. The primary indicators for wetland hydrology within the wetland were saturated soils and the presence of ponded water. The likely source of this water is direct rainfall and stormwater runoff from the surrounding hillsides to the west of the study area.

The dominant vegetation observed in the wetland did not include any facultative wetland or obligate plant species; instead, the dominant vegetation included upland plant species. The presence of hydric soils with low permeability in combination with a lack of hydrophytic vegetation suggests that this area commonly collects rainwater but the area does not remain saturated for prolonged periods.

This wetland appears to be an isolated wetland feature per the Solid Waste Agency of Northern Cook County (SWANCC) decision. According to the SWANCC decision, wetlands that are non-navigable, isolated, and intrastate may fall outside of USACE jurisdiction. "Wetlands with no apparent surface water connection to perennial rivers and streams, estuaries, or the ocean" are considered to be geographically isolated[71].

This seasonal wetland lacks an apparent surface connection to any other waters of the U.S. (e.g., stream or drainage ditch). However, the determination of the jurisdictional status of this feature within the study area is at the discretion of the USACE. The USACE evaluates jurisdictional determinations for isolated wetlands on a case-by case basis.

Manmade Drainage Ditch

The manmade drainage ditches within the study area are located in the grassy, marginal areas surrounding the airport runways. These drainage ditches have been engineered to convey stormwater runoff away from airport runways. Several onsite ditches are connected via onsite

[71] U.S. Department of Energy (DOE), 2003. The Supreme Court's SWANCC Decision. Office Air, Water, and Radiation Protection Policy and Guidance. U.S. DOE Clean Water Act Information Brief. DOE/EH-412/0016r (August 2003). Available online at: http://homer.ornl.gov/nuclearsafety/env/guidance/cwa/swancc_info_brf.pdf. Accessed on April 28, 2010.

culverts while others show evidence of the drainage ditch dissipating within the grassy areas. According to the delineation report (see **Appendix D**) the collective drainage ditch on the eastern edge of the study area flows north along San Felipe Road before terminating at the edge of an agricultural field. This drainage ditch is not connected to any other wetland or drainage feature. Similar to the isolated, seasonal wetland above, the onsite manmade drainage ditches would not be considered jurisdictional due to a lack of a significant nexus to traditional navigable waters (TNW) or other water of the U.S. As noted above, the USACE evaluates jurisdictional determinations for isolated drainages on a case-by-case basis[72].

Coordination with the USACE is ongoing, if the USACE determines that jurisdictional wetlands do exist within the study area, Mitigation Measures IV-4a through IV-4c would reduce the potential impacts from direct removal, sediment pollution or hazardous material pollution to these areas to less-than-significant levels.

IV. d)

Areas around the Hollister Municipal Airport are primarily active agricultural fields, and many historically present terrestrial wildlife corridors have already been disrupted by human activities. However, agricultural fields as well as annual grasslands surrounding the airport are foraging habitat for large flocks of migrating birds as well as stopover foraging sites for migrating raptors. Impacts associated with the proposed project are temporary, and while construction noise and ground disturbance may temporarily disrupt some species, any temporary impacts on migratory corridors would be considered less than significant. No mitigation measures are required.

IV. e)

The proposed project is not anticipated to conflict with any local policies or ordinances. No mitigation measures are required.

IV. f)

The proposed project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Mitigation Measures IV-1 through IV-3 are designed to reduce cumulative impacts to special-status species and wetlands, and avoid conflicts with any other local plans or ordinances.

MITIGATION MEASURES

Mitigation Measure IV-1a

The project proponent shall implement the following measures:

[72] Analytical Environmental Services. Wetland Delineation, City of Hollister, Hollister Municipal Airport. May 2011.

- A qualified biologist[73] shall conduct a pre-construction survey for burrowing owl if construction occurs during the breeding season (February 1 through August 31). Surveyors shall walk transects no more than 100 feet apart to attain 100 percent visual coverage of all grassland habitats within the proposed project site. Where possible, agricultural or grassland habitats within 300 feet of the proposed project site shall also be surveyed. If owls are not detected during this survey, proposed project work can move forward as proposed.

    - If owls are detected during this survey, no proposed project activities shall occur within 160 to 250 feet of occupied burrows until the breeding season is over, unless it can be determined that the owls have not begun laying eggs or juveniles are capable of independent survival.

- If proposed project activities will occur during the non-breeding season (September 1 through January 31), a second pre-construction survey shall be conducted for burrowing owl to document wintering owls that have migrated to the proposed project site, as well as breeding owls that may have left the proposed project site. If owls are not detected during this survey, proposed project work can move forward as proposed.

    - If occupied burrows are detected during this survey and can be avoided, proposed project activities shall not occur within 160 feet of occupied burrows.
    - If occupied burrows cannot be avoided, one-way doors shall be installed to passively relocate burrowing owls away from active work areas. Two natural burrows or one artificial burrow shall be provided in adjacent grassland habitat for each one-way door installed in an active burrow. One-way doors shall remain in place for 48 hours. The proposed project site shall be monitored daily for up to one week to ensure owls have moved to replacement burrows.
    - Once unoccupied, burrows shall be excavated by hand and backfilled to prevent owl occupation. When feasible, other unoccupied burrows in ground disturbance area should also be excavated by hand and backfilled. Burrows in some areas of the proposed project site will require a pre-construction survey for California tiger salamander before they can be collapsed (see Mitigation Measure IV-2).

Mitigation Measure IV-1b

Any grassland habitats disturbed by proposed project construction shall be restored to pre-project conditions to avoid inadvertently creating a wildlife hazard (birds) issue. To enable re-establishment of vegetation in ground disturbance areas, topsoil shall be salvaged for future replacement. Salvaged topsoil shall be covered and labeled with signage, and once grading and construction are complete, topsoil shall be evenly distributed on the surface of ground disturbance areas. No rodent control shall be implemented as part of the proposed project.

Mitigation Measure IV-1a will ensure that breeding owls will not be disturbed, and owls will be re-located during the non-breeding season using the least invasive methods feasible. Mitigation Measure IV-1b will ensure that disturbed areas will be restored to pre-project conditions, and no

[73] A qualified biologist shall have at least a bachelor's degree in a field related to wildlife ecology and shall be familiar with life history and habitats of target species for any pre-construction surveys.

permanent removal of burrowing owl habitat will occur after ground squirrels have re-colonized ground disturbance areas. Successful implementation of this measure will prevent the need for off-site habitat mitigation for burrowing owl. These mitigation measures will reduce burrowing owl impacts to less-than-significant levels.

Mitigation Measure IV-2

A pre-construction survey shall be conducted by a qualified biologist for adult California tiger salamanders in grassland areas within one kilometer (0.63 mile) of the detention pond adjacent to the western edge of the proposed project site. The survey will consist of inspection of all burrows within this 0.63 mile radius of the detention pond using a wildlife endoscope[74]. The survey shall occur no more than 14 days before construction is scheduled to begin, and no more than 14 days before burrows are to render habitat unsuitable for burrowing owl (see Mitigation Measure IV-1a). The survey must occur close to groundbreaking to ensure that individuals do not move into the work area between the time of the survey and the beginning of construction. This survey could potentially be conducted during the same field visit as breeding or non-breeding season burrowing owl surveys recommended in Mitigation Measure IV-1a. Once it is confirmed that adult salamanders are not present in burrows within ground disturbance areas, exclusion fence shall be installed around ground disturbance areas to prevent adult tiger salamanders from entering the work area. If any adult California tiger salamanders are found within burrows in ground disturbance areas, the project proponent shall contact CDFG and develop an avoidance and relocation plan.

Mitigation Measure IV-3

If construction must be performed in the bird nesting season (February 1 through August 31), a qualified biologist shall be retained to survey the proposed project area for nesting California horned larks and killdeer no more than 14 days prior to construction activities. These surveys can be planned in conjunction with pre-construction burrowing owl surveys, and potentially conducted simultaneously. If active nests are observed, no-construction buffer zones shall be established around nests, with a buffer size established by the qualified biologist through consultation with CDFG. Buffer zones shall be avoided during construction activities until young have fledged or the nest is otherwise abandoned.

Mitigation Measure IV-4a

If jurisdictional "waters of the United States" are found within the proposed project area, ground disturbance will avoid or minimize adverse effects on them to the full extent feasible. Specifically:

- Any jurisdictional areas to be avoided shall be delineated and protected using a visual barrier (orange fencing, stakes and flagging, caution tape, etc.).
- Areas that are avoided will be further protected during construction by BMPs, as described in Mitigation Measure IV-4b below. Such measures include the installation of silt fencing,

[74] A flexible viewing instrument with a camera, light, and monitor, which enables inspection of burrows without excavation.

straw wattles or other appropriate erosion and sediment control methods or devices along roads and at the 100 foot setback limits.

Mitigation Measure IV-4b

Standard BMPs shall be employed to avoid degradation of aquatic habitat by maintaining water quality and controlling erosion and sedimentation during construction as required by compliance with the General National Pollution Discharge Elimination System (NPDES) Permit for Construction Activities.

BMPs would include, but would not be limited to, installing silt fencing between jurisdictional waters and proposed project-related activities, locating fueling stations away from potentially jurisdictional features, and otherwise isolating construction work areas from any identified jurisdictional features.

Mitigation Measure IV-4c

If wetlands must be impacted by proposed project activities, the project applicant shall provide compensation as required by permits issued by the USACE and the RWQCB. Mitigation shall be designed in compliance with FAA setbacks for hazardous wildlife attractants described in Advisory Circular 150/5200-33B[75]. Potential options for wetland compensation would also include, but not be limited to, the following:

1. Additional wetland creation or enhancement or offsite mitigation: If permanent and temporary impacts to jurisdictional waters cannot be compensated for onsite through the restoration or enhancement of wetland features incorporated within proposed open space areas, the project sponsor shall negotiate additional compensatory mitigation for these losses with the applicable regulatory agencies. Potential options include the creation of additional wetland acreage onsite or the purchase of offsite mitigation.

Mitigation Measure IV-5

All of the necessary permits will be obtained to ensure cooperation with public agencies.

[75] Federal Aviation Administration. Advisory Circular 150/5200-33B: Hazardous Wildlife Attractants on or Near Airports. 2007.

V. CULTURAL RESOURCES - Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?				X
b) Cause a substantial adverse change in the significance of an archeological resource pursuant to §15064.5?				X
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		
d) Disturb any human remains, including those interred outside of formal cemeteries?		X		

REGULATORY SETTING

State Regulations

California Environmental Quality Act

CEQA, as codified in Public Resources Code (PRC) Sections 21000 et seq.[76], is the principal statute governing the environmental review of projects in the state. CEQA requires lead agencies to determine if a proposed project would have a significant effect on historical resources, including archaeological resources. The CEQA Guidelines define a historical resource as: (1) a resource in the California Register of Historical Resources (CRHR); (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 and CEQA Guidelines, Section 15064.5, would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site may meet the threshold of PRC Section 21083 regard unique archaeological resources. A unique archaeological resource is "an archaeological artifact, object, or site about which it can be clearly

[76] California Public Resources Code. Section 21000 et seq. California Environmental Quality Act.

demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person"[77].

The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment[78].

California Register of Historical Resources

CRHR is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change"[79]. The criteria for eligibility to the CRHR are based on NRHP criteria[80]. Certain resources are determined by the statute to be automatically included in the CRHR, including California properties formally determined eligible for or listed in the NRHP.

To be eligible for the CRHR a historical resource must be significant at the local, state, and/or federal level under one or more of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or,
4. Has yielded, or may be likely to yield, information important in prehistory or history[81].

For a resource to be eligible for the CRHR, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. A resource that does not retain sufficient integrity to meet the NRHP criteria may still be eligible for listing in the CRHR.

[77] California Public Resources Code. Section 21083.2(g).

[78] California Public Resources Code. Section 21000 et seq. California Environmental Quality Act. *CEQA Guidelines.* Section 15064(c)(4).

[79] California Public Resources Code. Section 5024.1(a).

[80] California Public Resources Code. Section 5024.1(b).

[81] California Public Resources Code. Section 5024.1(c).

Local Regulations

City of Hollister General Plan

The City of Hollister General Plan was adopted in December of 2005, and provides a comprehensive land use plan through the year 2023. The Land Use and Community Design Element of the General Plan includes the following goals and policies relevant to cultural resources:

> Goal LU 1: Maintain and enhance Hollister's small town agricultural valley culture and identity. Organize and design the City with an attractive and positive image.
>
> > Policy LU1.2: Historical Preservation Ordinance – Supplement the existing Historical Preservation Ordinance with an inventory and designation of potential sites and structures of architectural, historic, archeological and cultural significance. (Effective November 1, 2010, the City of Hollister adopted Ordinance No. 1067 to repeal and replace Title 15.16 of the Municipal Code, now known as the Historic Resources Ordinance.
> >
> > Policy LU1.3: Design Review – Require proposals for residential and non-residential development projects adjacent to designated landmarks to undergo design review.
> >
> > Policy LU1.4: Historical Building Code – Adopt a Historical Building Code that exceeds state standards.
>
> Goal LU 8: Maintain the stability of existing neighborhoods.
>
> > Policy LU8.2: Historic Neighborhoods – Ensure that existing historical neighborhoods remain intact by prohibiting incompatible uses and development types[82].

Historic Resources Ordinance

According to the City of Hollister Historic Resources Ordinance[83], an improvement, building, structure, sign, feature, site, scenic area, view or vista, place, area or other object can be designated a historic resource if it meets the criteria for listing on the National Register of Historic Places, state register, or one or more of the following:

1. It exemplifies or reflects special elements of the City's cultural, social, economic, political, aesthetic, engineering, architectural or natural history;
2. It is identified with persons or events significant in local, state or national history;

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[82] City of Hollister. 2005. City of Hollister General Plan. <http://www.hollister.ca.gov/Site/html/about/Genplan2005.asp>. January 21, 2011.

[83] City of Hollister. 2010. Municipal Code Title 15.16: Historic Resources Ordinance. Adopted November 1, 2010. <http://qcode .us/codes/hollister/>. January 21, 2010.

3. It embodies distinctive characteristics of a style, type, period or method of construction or is a valuable example of the use of indigenous materials or craftsmanship;
4. It is representative of the work of a notable builder, designer or architect;
5. It contributes to the significance of a historic area, being a geographically definable area possessing a concentration of historic or scenic properties or thematically related grouping of properties which contribute to each other and are unified aesthetically by plan or physical development;
6. It has a unique location or singular physical characteristic or is a view or vista representing an established and familiar visual feature of a neighborhood, community or the City:
7. It embodies elements of architectural design, detail, materials or craftsmanship that represent a significant structural or architectural achievement or innovation;
8. It is similar to other distinctive properties, sites, areas or objects based on a historic, cultural or architectural motif;
9. It reflects significant geographical patterns, including those associated with different eras of settlement and growth, particular transportation modes or distinctive examples of park or community planning; or
10. It is one of the few remaining examples in the City, region, state or nation possessing distinguishing characteristics of an architectural or historical type of specimen.

The ordinance also provides criteria and procedures for designating historic districts; the composition, powers and duties of the Historic Resources Commission (HRC); and permitting requirements for alteration, demolition, or adaptive re-use of historic resources[84].

FINDINGS

On January 14, 2011, ESA Archaeologist Candace Ehringer, RPA, conducted an intensive pedestrian survey of all unpaved surfaces within the proposed project's CEQA Area of Potential Effects (C-APE). The C-APE for the proposed project includes all areas of proposed ground-disturbing activity for installation of drainage facilities and infrastructure. The horizontal extent of the C-APE totals approximately 30 acres. The C-APE also includes a vertical component, as grading and culvert/pipe installation would occur below the ground surface to a depth of as much as six feet. Parallel transects, spaced 15-20 meters apart, were walked across all open ground. No cultural materials were observed within the proposed project C-APE (see **Appendix E**).

The proposed project would have no significant impacts on known cultural resources that qualify as historical resources or unique archaeological resources pursuant to CEQA Guidelines, Section 15064.5. However, surface visibility during the survey was low in some areas, making complete surface examination difficult and survey results inconclusive. In addition, buried archaeological resources do not always manifest themselves on the surface. Consequently, archaeological materials can be revealed unexpectedly during earth-moving activities. Mitigation measures are included to reduce the impacts of such an inadvertent discovery to a less than significant level.

[84] City of Hollister. 2010. Municipal Code Title 15.16: Historic Resources Ordinance. Adopted November 1, 2010. <http://qcode.us/codes/hollister/>. January 21, 2010.

DISCUSSION

Since there are no historical, archeological or paleontological resources on the proposed project site, no impact is anticipated. No human remains will be disturbed.

MITIGATION MEASURES

Mitigation Measure V-1: Cease Work if Subsurface Cultural Resources are Discovered During Ground-Disturbing Activities

If cultural materials are encountered during ground-disturbing activities within the proposed project C-APE, all activity in the vicinity of the find shall cease until it can be evaluated by a professional archaeologist. If the archaeologist determines that the resource(s) may be significant, the City of Hollister's HRC shall be notified and will develop an appropriate treatment plan for the resource(s). The HRC shall consult with the Native American representatives identified by the Native American Heritage Commission (NAHC) in determining appropriate treatment for unearthed cultural resources if the materials are associated with Native American cultural traditions.

In considering any suggested measures proposed by the archaeologist in order to mitigate impacts to cultural resources, the HRC will determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) will be instituted. Work may proceed on other parts of the proposed project C-APE while treatment plans for cultural resources are being developed and implemented.

Mitigation Measure V-2: Halt Work if Human Remains are Identified During Construction

If human remains are uncovered during ground-disturbing activities within the proposed project C-APE, work in the vicinity of the find will immediately halt. An appropriate project representative will contact the San Benito County Coroner to evaluate the remains. If the County Coroner determines that the remains are Native American in origin, the project representative will contact the NAHC, in accordance with Health and Safety Code, Section 7050.5, subdivision (c), and PRC 5097.98 (as amended by AB 2641). The NAHC will assign a Most Likely Descendant (MLD). Per PRC 5097.98, the project representative and airport officials shall ensure that the immediate vicinity of the find is not damaged or disturbed by further development activities until the project representative has discussed and conferred with the MLD regarding their recommendations, taking into account the possibility of multiple human remains.

Mitigation Measure V-3: Agency Coordination

All of the necessary permits will be obtained to ensure cooperation with public agencies.

VI. GEOLOGY AND SOILS - Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:		X		
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?		X		
ii) Strong seismic ground shaking?		X		
iii) Seismic-related ground failure, including liquefaction?		X		
iv) Landslides?				X
b) Result in substantial soil erosion or the loss of topsoil?			X	
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?		X		
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?		X		
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?				X

REGULATORY SETTING

State Regulations

California Building Standards Code

The California Building Code (CBC) has been codified in the California Code of Regulations (CCR) as Title 24, Part 2[85]. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. The CBC is based on the International Building Code. The 2007 CBC[86] is based on the 2006 International Building Code (IBC) published by the International Code Conference. In addition, the CBC contains necessary California amendments which are based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05[87]. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion into building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients that are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC.

County Regulations

San Benito County Existing General Plan Seismic and Safety Element (1980)

> Policy #4 - It is the county's policy that where there is a coincidence of high agricultural productivity and high geologic hazards the land should be retained in agricultural use to serve dual open space functions (the production of food and fiber and the protection of health and safety) wherever reasonable in relation to parcel size and established use patterns. It is the county's policy to adopt zoning categories and scenic easements for the protection of environmentally hazardous or aesthetically valuable resources.

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[85] California Code of Regulations. Title 24. Part 2. California Building Code. <http://publicecodes.citation.com/st/ca/st/CA-P-2007-999999.htm>.

[86] Ibid.

[87] American Society of Civil Engineers (ASCE), SEI 7-05, *Minimum Design Loads for Buildings and Other Structures,* 2006.

Policy #5 - It will be the county's policy to identify and abate existing structures which will be hazardous during an earthquake. Included would be those of high occupancy, public structures or any structures, the dangers of which affect the general public[88].

Local Regulations

City of Hollister Zoning Code, Section 17.16.040

All land use activities (i.e., construction, grading, gardening and operation) shall be conducted so as to create as little dust or dirt emission beyond any boundary line of the parcel as possible. To ensure that this occurs, appropriate grading procedures shall include, but are not limited to, the following:

1. Erosion and control plan per city engineering standards;
2. Disturb as little native vegetation that has been determined to be significant to prevent erosion;
3. Water graded areas as often as necessary or hydro seed and install a temporary irrigation system, subject to the approval of the director; and
4. Revegetate graded areas as soon as possible to minimize dust and erosion[89].

City of Hollister 2005 General Plan, Health and Safety Element

Goal HS1: Protect community health and safety from natural and man-made hazards

HS1.4: Seismic Hazards – Assure existing and new structures are designed to protect people and property from seismic hazards. Review all development proposals for compliance with the Alquist-Priolo Earthquake Fault Zoning Act and the Uniform Building Code as a way to reduce the risk of exposure to seismic hazards for those who will be living and working within the Hollister Planning Area.

HS1.5: Geotechnical and Geologic Review – Require all geologic hazards be adequately addressed and mitigated through project development. Development proposed within areas of potential geological hazards shall not be endangered by, nor contribute to, the hazardous conditions on the site or on adjoining properties.

HS1.6: Engineering Tests for Geologic Conditions – Require engineering tests for those development projects which may be exposed to impacts associated with expansive soils, so that building foundation footings, utility lines, roadways and sidewalks can be designed to accept the estimated degree of soil contraction, expansion and settlement, according to the standards of the Uniform Building Code.

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88 San Benito County General Plan. Seismic Safety/Safety Element. 1980. <http://www.sanbenitogpu.com/pdf/1980GP/SBC-ExistingGP-Seismic.pdf>.

89 Hollister Municipal Code. 2005. Title 17 Zoning Code. Chapter 17.16 Performance Standards. <http://qcode.us/codes /hollister/>.

FINDINGS

The City of Hollister is located within a seismically active region, and has experienced severe damage caused by ground shaking within the last 35 years. The closest active fault system to the proposed project site is the Calaveras Fault, which runs north and south through the City of Hollister. The Calaveras Fault has the capacity for a quake of 7+ on the Richter scale. The existing airport property line of Hollister Municipal Airport is within 150 feet of the main branch of the Calaveras Fault Zone. The main branch is at the surface in some parts of Hollister and is actively creeping[90].

Additional fault systems are located within San Benito County. The San Andreas Fault system crosses San Benito County in a southeasterly direction along the Gavilan Range two and a half miles west of the City of Hollister, and is capable of generating an earthquake of up to 8.3 magnitude on the Richter Scale. The Quien Sabe Fault, within three miles to the east of the proposed project site and trending southeast, registered an earthquake of at least 5.5 on the Richter scale in 1986[91].

DISCUSSION

VI. a)

The potential impact from strong seismic ground shaking or seismic-related ground failure within the proposed project area, including liquefaction and landslides, is significant. Consequently, Mitigation Measure VI-1 has been identified to address the impacts to below less than significant.

i. Fault Rupture: The City of Hollister is located within a highly seismic area. The closest active fault system to the proposed project site is the Calaveras Fault, which runs north and south through the City of Hollister. The existing airport property line of Hollister Municipal Airport is within 150 feet of the main branch of the Calaveras Fault Zone. The main branch is at the surface in some parts of Hollister and is actively creeping. The property is located within the Alquist-Priolo Earthquake Fault Hazard Zone[92]. When combined with the soil types of the area, there remains the potential for subsidence, lateral swelling and liquidation.

ii. Ground shaking: There is a potential for persons and structures on the proposed project site to be subject to groundshaking from an earthquake within the proposed project area. The San Andreas Fault system crosses San Benito County in a southeasterly direction along the Gavilan Range two and a half miles west of the City, and is capable of generating an earthquake of up to 8.3 magnitude on the Richter Scale. The Calaveras fault has the capacity for a quake of 7+ on the Richter scale. The Quien Sabe Fault,

[90] City of Hollister 2005. General Plan. Section 8 – Health and Safety Element.

[91] San Benito County General Plan. Seismic Safety/Safety Element. 1980. <http://www.sanbenitogpu.com/pdf/1980GP/SBC-ExistingGP-Seismic.pdf>.

[92] California Geological Survey - Alquist-Priolo Earthquake Fault Zones. <http://www.consrv.ca.gov/cgs/rghm/ap/Pages/Index.aspx>.

within three miles to the east of the proposed project site and trending southeast, registered an earthquake of at least 5.5 on the Richter scale in 1986.

iii. Ground Failure: The ground shaking associated with seismic events can cause loose sand and silt that is saturated with water to lose strength and behave like a liquid. This occurs when earthquake waves cause an increase in pore water pressure, forcing apart the sand grains and weakening the sediment. Soil liquefaction can have disastrous consequences in developed areas due to the resulting inability to support structures, eruption of "sand boils" in the ground, and the potential to flow down gradual slopes. According to the City of Hollister General Plan (adopted December 2005)[93], the proposed project site is located in an area designated as having a medium to high susceptibility to liquefaction.

iv. Landslides: There is a minimal potential for landslide hazard because the soil is relatively flat. There will be no impact.

VI. b)

Concentrated water erosion, if not managed or controlled, can eventually result in significant soil loss and/or discharging of sediment into installed utilities and/or adjacent lots. Sediment from proposed project-induced on-site erosion can also accumulate in downstream drainage facilities, interfere with flow, and aggravate downstream flooding conditions. Construction-related soil erosion would be kept to a minimum and controlled through standard grading practices. As discussed under Section IX – *Hydrology and Water Quality*, the City of Hollister would be required to complete a Storm Water Pollution Prevention Plan (SWPPP) for construction of the proposed project for compliance with required NPDES construction permitting and to reduce the intensity of potential water quality impacts. The SWPPP would require the implementation of BMPs to reduce the potential for erosion and sedimentation during construction.

VI. c)

As described above, the proposed project site's topography is relatively flat and consequently the potential for a landslide is very low. According to the City of Hollister General Plan, the proposed project site is listed in an area that is least susceptible to landslides[94]. It is very unlikely that landslides or other features related to slope instability will occur in this area. Without any radical modifications to the topography, the land here should remain relatively stable.

VI. d)

The San Benito County Existing General Plan Seismic and Safety Element (1980) includes expansive soils among geologic hazards in the area[95]. Consequently, Mitigation Measure VI-2 has been identified to address the impacts to below less than significant.

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[93] City of Hollister 2005. General Plan. Section 8 – Health and Safety Element. <http://hollister.ca.gov/Site/html/about /documents/Chapter8_000.pdf>.

[94] Ibid.

[95] San Benito County General Plan. Seismic Safety/Safety Element. 1980. <http://www.sanbenitogpu.com/pdf/1980GP/SBC-ExistingGP-Seismic.pdf>.

VI. e)

The proposed project does not involve the use of septic tanks or alternative wastewater disposal systems. No impact.

MITIGATION MEASURES

Mitigation Measure VI-1

The proposed project will require a geotechnical investigation and Geotechnical Soils Report to identify geologic hazards and provide engineering recommendations for appropriate mitigation measures to minimize risks of fault rupture, ground shaking, ground failure, liquefaction, soil erosion and expansion.

Mitigation Measure VI-2

The project applicant will have to submit an erosion control plan and comply with City Zoning Code, Section 17.16.040[96] – *Dust and Dirt*, in order to minimize soil erosion.

Mitigation Measure VI-3

The proposed project would be required to comply with the natural Resources and Conservation Element of the 2009 City of Hollister General Plan: 'Require construction techniques that minimize wind erosion: Require appropriate measures to be taken to reduce wind erosion during construction, such as watering of soil, replanting and repaving, and cleanup of mud and dust carried onto street surfaces by construction vehicles'[97].

Mitigation Measure VI-4

All of the necessary permits will be obtained to ensure cooperation with public agencies.

[96] Hollister Municipal Code. 2005. Title 17 Zoning Code. Chapter 17.16 Performance Standards. <http://qcode.us/codes/hollister/>.

[97] City of Hollister 2005. General Plan. Section 7 – Natural Resources and Conservation Element.

VII. GREENHOUSE GAS EMISSIONS - Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing emissions of greenhouse gases?			X	

REGULATORY SETTING

State Regulations

California Global Warming Solutions Act of 2006 (AB32)

California Global Warming Solutions Act of 2006 (AB32)[98] - Executive Order S-3-05 was issued by the State of California on June 1, 2005. In recognition of the state's vulnerability to the impacts of climate change, the order mandates that overall state greenhouse gas (GHG) emissions meet the following targets:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

In accordance with Part 4 of AB32, CARB has made public a number of early action measures that can be implemented prior to adopting formal limitations on GHG emissions in 2012. Most of these measures are not directly related to construction activities, however, one of the measures is applicable to the proposed project, and can be addressed by appropriate mitigation measures. This measure includes:

CARB Measure 2: Transportation: Diesel-Off-Road Equipment (Non-Agricultural)

The goal of this measure is to reduce emissions of construction equipment through all feasible measures[99].

[98] California Health and Safety Code Division 25.5, Sections 38500 et seq. 2006. California Global Warming Solutions Act.
[99] California Air Resources Board (ARB). 1994. Measure 2: Transportation.

Mandatory GHG reporting requirements defined under 17 CCR 95100 apply to only various California entities[100]. Because the proposed project is not anticipated to generate a substantial increase in overall vehicle trips the 25,000 annual metric ton threshold for reporting requirements would not be met. The proposed project is therefore not subject to the CARB's mandatory reporting requirements.

Regional and Local Regulations

No air district in California, including the MBUAPCD, has identified a significance threshold for GHG emissions or a methodology for analyzing air quality impacts related to them. San Benito County is in the process of developing a General Plan update, and the County will develop a Climate Change Element as part of the General Plan update. The adoption of the General Plan is not expected until January 2012.

Although the MBUAPCD does not yet recommend any method or threshold for determining significance of climate change impacts or GHG emissions from a proposed project any project subject to CEQA must be described in order for a lead agency to determine the significance of impacts. The 2010 State CEQA Guidelines provide the following direction for the assessment and mitigation of GHG emissions:

- A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting.
- A lead agency should consider the extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting.
- A lead agency should consider the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions[101].

FINDINGS

The proposed project would contribute to a cumulative increase in GHG emissions. Estimated GHG emissions resulting from implementation of the proposed project would be completely associated with increases of carbon dioxide (CO_2) from mobile sources (construction equipment and personal vehicles) as proposed project construction would involve on-site activities and mobilization of numerous equipment types and personnel. This activity would cause minor short-term, unavoidable increases in GHG emissions from vehicle and equipment activity.

Estimated emissions of GHGes associated with the proposed project were calculated using the URBEMIS2007 (v.9.2.4) computer program. To account for individual pollutants contribution to global warming, predicted emissions of GHG are presented in CO_2 equivalent units of measure (CO_2e), expressed in metric tons/year. Based on the analysis the proposed project would result in a cumulative net increase of approximately 1,435 metric tons/year of CO_{2e} during the grading for

[100] California Code of Regulations. 17 CCR 95100.

[101] California Code of Regulations. Title 14. Section 15064.5. *CEQA Guidelines*.

the drainage improvements included in the SWMP. Predicted increases in GHG emissions would constitute approximately less than 0.001 percent of the total statewide emissions inventory estimated buy CARB.

DISCUSSION

VII. a)

A proposed project's incremental contribution to global climate change would be considered significant if it would result in substantial net increases in GHG emissions. A substantial net increase occurs if the proposed project exceeds any threshold of significance for regulated pollutants set by the MBUAPCD. Because no significance criteria have been established for GHG emissions by the air district, a quantitative comparison to a standard cannot be performed. Since the proposed project's incremental additional contribution to the total GHG emissions of the City and region is negligible, it may be reasonably argued the increase is not substantial.

VII. b)

The proposed project does not result in a reduction of GHG emissions, however, since the proposed project's incremental additional contribution to the total GHG emissions of the City and region is negligible; it may reasonably be argued that the proposed project will not substantially conflict with or obstruct implementation of the goals or strategies of Executive Order S-3-05. Implementation of the proposed project would not result in a significant contribution to statewide emission inventory or interfere with statewide goals and objectives for reducing GHG emissions. Therefore, proposed project impacts would be considered less than significant.

MITIGATION MEASURES

Mitigation Measure VII-1

The proposed project shall be required to implement Best-Available Mitigation Measures for the control of emissions generated by off-road construction equipment, as recommended by the MBUAPCD at the time construction is conducted. Measures could include the use of low emission construction vehicles and use of emission reduction devices and alternative fuels or other means. Idling of construction equipment for periods greater than five minutes when not in use would be prohibited and enforced by the construction contractor.

Mitigation Measure VII-2

All of the necessary permits will be obtained to ensure cooperation with public agencies.

VIII. HAZARDS AND HAZARDOUS MATERIALS - Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				X
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?		X		
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
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?				X
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 for people residing or working in the project area?		X		
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?		X		
h) Expose people or structures to a significant risk of loss, injury or				X

death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands?				

REGULATORY SETTING

California regulations pertaining to hazardous waste are equal to or more stringent than federal regulations. The EPA has consequently granted the State of California oversight responsibility to manage and enforce hazardous waste management programs. Below is a list of several significant state regulations pertaining to hazardous waste.

State Regulations

Hazardous Materials Release Response Plans and Inventory Act of 1985

The Hazardous Materials Release Response Plans and Inventory Act of 1985, also known as the Business Plan Act, requires businesses using hazardous materials to prepare a Hazardous Materials Business Plan and disclose a hazardous materials inventory. The Plan should include a list of all hazardous materials handled, a floor plan of the facility that pinpoints where the hazardous materials are stored, an emergency response plan, and provisions for employee training in safety and emergency response procedures[102].

Hazardous Waste Control Act

The Hazardous Waste Control Act was passed in 1972 and established the California Hazardous Waste Control Program. The act would become the model for the federal Resource Conservation and Recovery Act (RCRA). California's program, however, was much more stringent than its national counterpart. It was responsible for regulating the generation, treatment, storage and disposal of hazardous wastes[103].

Emergency Services Act

The Emergency Services Act allowed California to develop an emergency response plan that coordinated emergency services provided by federal, state and local agencies[104].

[102] California Health and Safety Code. Division 20, Chapter 6.95, Article 1. <http://www.cdcr.ca.gov/Reports_Research/Environmental/EIR/4.7-HazardsandHazardousMaterials.pdf>. Page 4.7-4

[103] California Environmental Protection Agency. Department of Toxic Substances Control. 1972. Hazardous Waste Control Act. <http://www.calepa.ca.gov/about/history01/dtsc.htm>.

[104] California Office of Emergency Services. Emergency Services Act. <http://www.oes.ca.gov/Operational/OESHome.nsf/PDF/California%20Emergency%20Services%20Act/$file/ESA-all8-06-final.pdf>.

FINDINGS

Proposed project-related construction and maintenance activities would involve the use of potentially hazardous materials, such as fuels, oils and lubricants, and cleaners. However, the use of the new drainage facilities would not require any of these materials. Therefore, all increases will be temporary and should not cause a net increase in hazardous materials.

According to information supplied by the California Department of Toxic Substances no existing cleanup sites or hazardous waste sites are located within two miles of the airport. In 1941, the United States Navy acquired the airport property as an air training facility for fighter squadrons. In 1943 the Navy installed nine 300- to 500- gallon heating fuel underground storage tanks (USTs) and five 10,000-gallon fuel USTs. In 1960, the City of Hollister removed and disposed of nine USTs (heating oil storage). Three USTs (fuel) were drained, filled with water, and abandoned in place. Two USTs were located by the Hollister Fire Department and were removed and replaced with triple-wall tanks. A third tank and related pipelines and a pump island have been located on the property. These were also removed by the City of Hollister.

DISCUSSION

VIII. a)

The proposed project will not cause an increase in the transport, use or disposal of hazardous materials and therefore will not cause a significant hazard to the public or the environment. There is no impact.

VIII. b)

Given the location and temporary nature of construction activities there is the minimal potential for the public and/or the environment to temporarily come into contact with hazardous materials through upset and accident conditions. The proposed project will comply with applicable regulations to reduce the potential for accidental release of hazardous materials during their transport and during construction activities. Therefore, Mitigation Measure VIII-1 will help to ensure that any found unknown hazardous materials are identified and stored or disposed of in an appropriated manner. There is less than a significant impact with mitigation.

VIII. c)

The proposed project is not located within one-quarter mile of an existing school. There is no impact.

VIII. d)

The proposed project site is not listed as a hazardous materials site, pursuant to Government Code Section 65962.5. There is no impact.

VIII. e)

Construction near airports can pose safety hazards to passengers, pilots, and people working in or residing near a public or private airstrip. A construction management plan will be created prior to the proposed project's start date to avoid conflicts with air traffic. There will be less than a significant impact with mitigation.

VIII. f)

The proposed project is not located within the vicinity of a private airstrip. There will be no impact.

VIII. g)

Construction of the proposed project could temporarily increase traffic on local roadways associated with construction trips. There will be a less than significant impact with mitigation.

VIII. h)

The City of Hollister, contractors, and others would be required to use, store, and transport hazardous materials in compliance with federal, state, and local regulations during proposed project construction. There is no wild land within the vicinity of the proposed project site. Therefore, the proposed project will not expose people or structures to a significant risk of loss, injury or death involving wild land fires. There will be no impact.

MITIGATION MEASURES

The proposed project must comply with any and all applicable regulations in order to reduce any significant impacts to the proposed project area or the people residing or working on or near the proposed project area. To avoid conflict with air traffic, a construction management plan should be created prior to the proposed project's start date. All of the necessary permits will be obtained to ensure cooperation with public agencies.

Mitigation Measure VIII-1: Hazards Remediation

If contaminated soil and/or groundwater are encountered or suspected contamination is encountered during proposed project construction activities, work shall be halted in the area, and the type and extent of the contamination shall be identified in accordance with coordination of the overseeing agency. A qualified professional, in consultation with regulatory agencies shall then develop an appropriate method to remediate the contamination, and determine the appropriate disposal method of any contaminated soil and/or groundwater. If required by an overseeing agency, a remediation plan shall be implemented either before or in conjunction with continued proposed project construction.

IX. HYDROLOGY AND WATER QUALITY - Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Violate any water quality standards or waste discharge requirements?		X		
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			X	
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site?		X		
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?		X		
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?		X		
f) Otherwise substantially degrade water quality?			X	
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or				X

Flood Insurance Rate Map or other flood hazard delineation map?				
h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?				X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Inundation of seiche, tsunami, or mudflow?				X

REGULATORY SETTING

Federal Regulations

Clean Water Act

The objective of the federal CWA is to reduce or eliminate water pollution in the nation's rivers, streams, lakes, and coastal waters. The CWA prescribes the basic federal laws for regulating discharges of pollutants into waters of the United States; these laws include setting water quality standards for contaminants in surface waters, establishing wastewater and effluent discharge limits from various industry categories, and imposing requirements for controlling nonpoint-source pollution. At the federal level, the CWA is administered by United States EPA[105]. At the state and regional levels, the act is administered and enforced by the SWRCB and the RWQCB.

State Regulations

Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Control Act is the primary statute covering the quality of waters in California. The act sets out specific water quality provisions and discharge requirements regulating the discharge of waste within any region that could affect the quality of state waters. Under the act, the SWRCB has ultimate authority over state water rights and water quality policy. The RWQCB is responsible for the oversight of water quality on a day-to-day basis at the local/regional level, including the preparation and periodic updating of basin plans that identify existing and potential beneficial uses for specific water bodies[106].

[105] United States Environmental Protection Agency. Clean Water Act.

[106] United States Department of Energy. Summary of the Porter-Cologne Water Quality Control Act. Energy Technology Engineering Center, Regulators and Regulations. <http://www.etec.energy.gov/Regulation/Porter-Cologne-Water-Quality-Control-Act.html>. Last updated August 6, 2008.

NPDES General Construction Permit

The SWRCB adopted a new General Construction Permit for Discharges of Storm Water Associated with Construction Activities, to become effective on July 1, 2010. The new permit requires a risk-based permitting approach, dependent upon the likely level of risk imparted by a project and contains several additional compliance items. Under the revised permit, BMPs will be incorporated into the compliance action and monitoring requirements for each development site, as compared to the existing permit, where specific BMPs are implemented via a SWPPP.

The proposed project site is located within the jurisdiction of the Central Coast Regional Water Quality Control Board (CCRWQCB). As a condition of construction, the City of Hollister and all applicable contractors would be required to obtain coverage under the NPDES General Construction Permit for Discharges of Storm Water Associated with Construction Activities. Adherence to associated BMPs would be required as a condition of the permit, and would substantially reduce or prevent waterborne pollutants from entering natural waters, per CCRWQCB standards. The specific set of BMPs would be determined prior to initiation of construction activities in the project area, and a schedule for implementation, as well as a series of monitoring and compliance measures would be developed in coordination with the permitting agency, to meet state and federal water quality standards.

Under the updated permit a SWPPP would be reviewed by the CCRWQCB.

Local Regulations

City of Hollister Municipal Code

The City of Hollister's Ordinance 1053 Grading and Best Management Practices[107] and Section 17.16.140(C)(3)[108] require the project applicants to prepare a SWPPP for approval by the City. The SWPPP is required to list BMPs, which specify how the applicant will protect water quality during the course of construction. BMPs typically include, but are not limited to, scheduling earthwork to occur during the dry season to prevent runoff erosion, protecting drainages and storm drain inlets from sedimentation with berms or filtration barriers, and the installation of gravel entrances to reduce tracking of sediment onto adjoining streets.

FINDINGS

The closest river, the San Benito River, is approximately 2.5 miles from the proposed project site and the Santa Ana Creek runs a half mile east of the airport. The site is located approximately 16 miles southwest from the San Luis Reservoir, with mostly mountainous terrain in between[109].

[107] City of Hollister. 2010. Municipal Code Chapter 15.24.131 : Grading and Best Management Practices Control. <http://qcode.us/codes/hollister/>.

[108] City of Hollister. 2010. Municipal Code Chapter 17.16.140(C)(3) : Zoning – Performance Standards. <http://qcode.us/codes/hollister/>.

[109] City of Hollister. 2005. City of Hollister General Plan. Adopted December 5, 2005. Amended June 18, 2007.

According to the Federal Emergency Management Agency (FEMA) flood insurance rate maps, (FIRM) Hollister Municipal Airport is not located within a 100-year flood plain[110].

As noted under Section 1.10 – *Project Description*, an Airport SWMP was developed for the airport to address soil erosion and safety concerns. Although the CCRWQCB and local agencies are currently updating their requirements, BMPs were still developed as part of the plan with input from the CCRWQCB. The BMPs were developed to help treat the water quality generated by the proposed project. These include low impact development (LID) and hydromodification components that involve storm water planning and management techniques for protecting, preserving, and treating water quality (see **Appendix F**).

The airport is located in the middle of a California Coastal Basin Aquifer[111]. The proposed project is expected to increase groundwater supplies and promote groundwater recharge. This will be done by incorporating LID methods (see Mitigation Measure IX-2).

The proposed project includes grading, trenching, paving, and other construction activities that would result in the disturbance of surface soils and facilitate erosion on site. Additionally, the use of construction equipment could result in the release of greases, oils, coolants, hydraulic fluid, fuels, cement washout, and other construction-related contaminants into the environment. As a result, storm water could become contaminated by elevated sediment levels, or by elevated levels of other construction-related pollutants. Sediment from proposed project-induced on-site erosion can also accumulate in downstream drainage facilities, interfere with flow, and aggravate downstream flooding conditions. The implementation of Mitigation Measure IX-1 would reduce potential impacts to less-than-significant levels.

DISCUSSION

IX. a)

The proposed project includes grading, trenching, paving, and other construction activities that would result in the disturbance of surface soils and facilitate erosion on site. Additionally, the use of construction equipment could result in the release of greases, oils, coolants, hydraulic fluid, fuels, cement washout, and other construction-related contaminants into the environment. As a result, storm water could become contaminated by elevated sediment levels, or by elevated levels of other construction-related pollutants. Sediment from proposed project-induced on-site erosion can also accumulate in downstream drainage facilities, interfere with flow, and aggravate downstream flooding conditions. The implementation of Mitigation Measure IX-1 would reduce potential impacts to less-than-significant levels.

IX. b)

The proposed project site is within City of Hollister service area for water supply. According to the 2005 Hollister Area Urban Water Management Plan, adequate water supplies exist for

[110] Federal Emergency Management Agency. Flood Insurance Rate Map. < http://www.fema.gov/>.
[111] NationalAtlas.gov. <http://nationalatlas.gov/mapmaker>.

planned development through the 20-year timeframe of the plan, or 2025[112]. Water demand in the Hollister area estimated within the plan is based on population growth projections by AMBAG[113], which in turn rely in part on allowable population density based on general plan land use densities. Because the proposed project will not induce population growth for the area, it is therefore consistent with AMBAG population projections, and therefore accounted for within the Urban Water Management Plan. The proposed project will not create an increase in the demand for water and therefore would not deplete water supplies. The proposed project is expected to increase groundwater supplies and promote groundwater recharge. Less than significant impacts to the Hollister area water supply are therefore anticipated.

IX. c)

Incorporation of Mitigation Measure IX-2 into the proposed project is expected to have a positive net impact on the area's drainage pattern. The use of BMPs such as LID and hydromodification will help the site achieve its pre-development hydrology.

The closest river, the San Benito River, is approximately 2.5 miles from the proposed project site. Upon project completion, there will be no resulting substantial erosion or siltation on- or off-site because of Mitigation Measure IX-2. Less than significant impacts are anticipated as a result of the proposed project.

IX. d)

Incorporation of Mitigation Measure IX-2 into the proposed project is expected to have a positive net impact on the area's drainage pattern. The closest river, the San Benito River, is approximately 2.5 miles from the proposed project site. According to FEMA, Hollister Municipal Airport is not located within a 100-year flood plain[114]. The drainage improvements that are included in the Airport SWMP were designed to help eliminate ponding or storage of water on the airport and surrounding area. The proposed project will not result in significant impacts as a result of the proposed project drainage improvements.

IX. e)

The proposed project has been designed to have an overall positive impact on the capacity of the storm water drainage system and storm water quality. During the course of construction, storm water from the site will be treated by incorporating the BMPs required as part of the NPDES General Construction Permit and associated SWPPP. The proposed project will not result in significant impacts as a result of the proposed project drainage improvements.

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[112] City of Hollister. 2005. Hollister Area Urban Water Management Plan.

[113] Association of Monterey Bay Area Governments. *Monterey Bay Area 2008 Regional Forecast Population, Housing Unit, and Employment Projections for Monterey, San Benito, and Santa Cruz Counties to the Year 2035*. <http://www.ambag.org/programs/blueprint/forecast/index.html>.

[114] Federal Emergency Management Agency. Flood Insurance Rate Map for Hollister Municipal Airport. <http://www.fema.gov/>.

IX. f)

The proposed project is not anticipated to degrade water quality. The storm water infrastructure has been designed to have an overall positive impact on water quality by incorporating BMPs. The proposed project will not result in significant impacts as a result of the proposed project drainage improvements.

IX. g)

The proposed project does not include the development of any housing and according to the FEMA, Hollister Municipal Airport is not located within a 100-year flood plain[115]. No impacts are anticipated.

IX. h)

According to the FEMA, Hollister Municipal Airport is not located within a 100-year flood plain[116]. No impacts are anticipated.

IX. i)

According to FEMA, Hollister Municipal Airport is not located within a 100-year flood plain[117]. The drainage improvements that are included in the Airport SWMP were designed to help eliminate ponding or storage of water on the airport and surrounding area. The proposed project will not result in significant impacts as a result of the proposed drainage improvements.

IX. j)

Seiches are standing waves set up on rivers, reservoirs, ponds, and lakes when seismic waves from an earthquake pass through the area. Tsunamis are giant sea waves created by the sudden uplift of the sea floor. The proposed project will not involve any rivers, reservoirs, ponds, or lakes, so therefore, no inundation of seiches or tsunamis will occur. The slope of the proposed project site is not significant enough to cause mudslides.

MITIGATION MEASURES

Mitigation Measure IX-1

The City of Hollister's Ordinance 1053 Grading and Best Management Practices[118] and Section 17.16.140(C)(3)[119] of the City of Hollister Municipal Code require the project applicant to

[115] Federal Emergency Management Agency. Flood Insurance Rate Map for Hollister Municipal Airport. <http://www.fema.gov/>.
[116] Ibid.
[117] Federal Emergency Management Agency. Flood Insurance Rate Map for Hollister Municipal Airport. <http://www.fema.gov/>.
[118] City of Hollister. 2010. Municipal Code Chapter 15.24.131 : Grading and Best Management Practices Control. <http://qcode.us/codes/hollister/>.

prepare a SWPPP for construction to be approved by the City. The SWPPP is required to list BMPs, which specify how the applicant will protect water quality during the course of construction. BMPs typically include, but are not limited to, scheduling earthwork to occur during the dry season to prevent runoff erosion, protecting drainages and storm drain inlets from sedimentation with berms or filtration barriers, and the installation of gravel entrances to reduce tracking of sediment onto adjoining streets.

Mitigation Measure IX-2

BMPs were developed as part of the Airport SWMP[120]. These include LID and hydromodification components.

LID is a storm water management approach with the basic principle that is modeled after nature: manage rainfall runoff at the source using uniformly distributed, decentralized micro-scale controls. LID involves storm water planning and management techniques for protecting, preserving, and treating water quality. LID's goal is to mimic a site's pre-development hydrology by using design practices and techniques that effectively capture, filter, store, evaporate, detain, and infiltrate runoff close to its source. This can be accomplished by creating site design features that direct runoff to vegetated areas containing permeable/amended soils, protect native vegetation and open space, and reduce the amount of hard surfaces and compaction of soil. Examples of engineering solutions include infiltration and filtration of runoff into and through vegetated swales and landscape areas, permeable surfaces and soils, evapotranspiration by vegetation, and infiltration for groundwater recharge.

Hydromodification requires post-development peak flow rates, volumes, and durations to mimic pre-development levels. The hydromodification criteria is under development by the local agencies in the Central Coast area, but will likely include allowable thresholds for given storm frequencies and simulation events. Hydromodification is typically satisfied by including infiltration and retention (similar to LID) as part of development[121].

Mitigation Measure IX-3

A grading permit will be required from the Public Works Department of San Benito County for off-site swales. All of the necessary permits will be obtained to ensure cooperation with public agencies.

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[119] City of Hollister. 2010. Municipal Code Chapter 17.16.040(C)(3) : Zoning – Performance Standards. <http://qcode.us/codes/hollister/>.

[120] City of Hollister. 2010. *City of Hollister Airport Storm Water Master Plan*.

[121] City of Hollister. *City of Hollister Airport Storm Water Master Plan*. Page 14.

X. LAND USE AND PLANNING - Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Physically divide an established community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

REGULATORY SETTING

County Regulations

San Benito County General Plan

According to San Benito County, the project site is zoned as Agricultural Productive. The allowed uses for this zoning definition include Aircraft Landing Field under Additional Uses.

Local Regulations

City of Hollister Land Use Plan/Zoning

According to the City of Hollister Zoning Map[122], amended 2010, the proposed project site is zoned as 'Airport', for the current airport property and 'Airport Support', for the proposed location of a detention basin east of the airport (see **Figure 3, Zoning Map**). The proposed project site also includes land west and northeast of the existing airport property that is currently unincorporated. The county zoning designation for this land is Agricultural Productive. The allowed uses for this zoning designation includes Aircraft Landing Field under Additional Uses. The closest area zoned for residential land use is over one-half mile from the proposed project work. According to the City of Hollister 2005 General Plan, the proposed project site and entire airport property is designated as 'Airport,' 'Airport Support' and 'Industrial.' The closest area designated as residential land use in the Land Use Plan is over a mile away from the proposed

[122] City of Hollister. Zoning Map. <http://www.hollister.ca.gov/site/Documents/COHZONINGMAPDECEMBER2010ORDAMENDED104310621.pdf>.

project work[123] (see **Figure 2, Land Use Map**). The land surrounding the airport has land use designations, from the above mentioned Land Use Plan, of Industrial, Airport Support, Airport and Agricultural (north of Highway 156 Bypass).

FINDINGS

The proposed project site is located approximately three miles north of the center of the City of Hollister. All improvements will be made on airport property except for four proposed infiltration basins that will be placed adjacent to the airport; within 650 of the existing property line in an area designated as Industrial land use (see **Figure 2, Land Use Map**).

DISCUSSION

X. a)

The proposed drainage improvements will not divide an established community. The proposed project site (Hollister Municipal Airport) is located approximately 3 miles north of the center of the City of Hollister. The closest area zoned for residential land use is over one-half mile from the proposed project work, according to the City of Hollister Zoning Map[124] (see **Figure 3, Zoning Map**). The closest area designated as residential land use in the Land Use Plan (Amended 2009) from the City of Hollister 2005 General Plan is over a mile away from the proposed project work[125]. The land surrounding the airport has land use designations, from the above mentioned Land Use Plan, of 'Industrial', 'Airport Support', 'Airport' and 'Agricultural' (north of Highway 156 Bypass) (see **Figure 2, Land Use Map**). All improvements will be made on airport property except for four proposed infiltration basins that will be placed adjacent to the airport, within 650 feet of the existing property. The basins on the east side of the airport property line would be located on land designated as either 'Airport Support' or 'Industrial' and the basins on the west side of the property line would be located on land designated as 'Industrial.'

X. b)

According to the Land Use Plan from the City of Hollister 2005 General Plan, amended 2009, the land use of the proposed project site is prescribed for 'Airport', 'Airport Support' and 'Industrial' uses[126] (see **Figure 2, Land Use Map**). The proposed project will not conflict with any of these land uses. The most recent Hollister Municipal Airport Master Plan incorporated the land use designations of the City of Hollister General Plan from 1995[127]. The land use of the proposed project site from the Airport Master Plan is made up of 'Public', 'Public & Industrial' and 'Industrial' land use designations. The proposed project will not conflict with any of these

[123] City of Hollister. 2005. City of Hollister General Plan. Land Use Plan. Amended 2009.

[124] City of Hollister. Zoning Map. < http://www.hollister.ca.gov/site/Documents/COHZONINGMAPDECEMBER 2010ORDAMENDED 104310621.pdf >.

[125] City of Hollister. 2005. City of Hollister General Plan. Land Use Plan. Amended 2009.

[126] Ibid.

[127] City of Hollister. 1995. City of Hollister General Plan.

land uses. According to San Benito County, the project site is zoned as 'Agricultural Productive'. The 'Allowed Uses' of this zoning definition includes Aircraft Landing Field under 'Additional Uses' (Section 164, Additional Uses). The proposed project will support, rather than conflict, with this use. According to the City of Hollister Zoning Map[1], the portion of the proposed project site located on the airport is zoned as 'Airport', while one proposed detention basin to be outside of existing airport property, to the east, would be on land zoned as 'Airport Support' (see **Figure 3, Zoning Map**). The proposed drainage improvements will support, rather than conflict, with these uses. According to San Benito County, the portion of the proposed project site located off the airport, to the west and northeast of existing airport property, on land that is unincorporated, is zoned as 'Agricultural Productive'. The 'Allowed Uses' of this zoning definition includes Aircraft Landing Field under 'Additional Uses'[2]. The proposed project will support, rather than conflict, with this use.

X. c)

There is currently no established habitat conservation plan or natural community conservation plan for the City of Hollister.

MITIGATION MEASURES

No mitigation measures are required. All of the necessary permits will be obtained to ensure cooperation with public agencies.

[1] City of Hollister. Zoning Map. < http://www.hollister.ca.gov/site/Documents/COHZONINGMAPDECEMBER 2010ORDAMENDED104310621.pdf >.

[2] San Benito County General Plan Housing Element Update. Section 164. Additional Uses. <http://www.sanbenito.ca. us/departments/planning/documents/AgriculturalProductive.pdf>.

XI. MINERAL RESOURCES - Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
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?				X

REGULATORY SETTING

State Regulations

Surface Mining and Reclamation Act (SMARA)

SMARA was signed into law in 1975 and went into effect in 1976, and has since been amended. The intent of the act is to: 1) assure reclamation of mined lands, 2) encourage production and conservation of minerals, and 3) create and maintain surface mining and reclamation policy. SMARA has established a mineral land classification system to help identify and protect mineral resources in areas that are subject to urban expansion or other irreversible land uses that would preclude mineral extraction. Protected mineral resources include construction materials, industrial and chemical mineral materials, metallic and rare minerals, and nonfluid mineral fuels. The act directs the state geologist to classify (identify and map) the nonfuel mineral resources of the state to show where economically significant mineral deposits occur and where they are likely to occur based on the best available scientific data. Nonfuel mineral resources include: metals such as gold, silver, iron, and copper; industrial minerals such as boron compounds, rare earth elements, clays, limestone, gypsum, salt, and dimension stone; and construction aggregate, which includes sand, gravel, and crushed stone.

FINDINGS

The proposed project will take place almost entirely within the airport property and the only proposed improvement outside of the property line will not include any significant disturbance of land. The proposed project site is not currently used for quarry operations so there will be no impact.

DISCUSSION

XI. a, b)

The proposed project will have no impact on the quarry and will not include any significant disturbance of land.

MITIGATION MEASURES

No mitigation measures are required. All of the necessary permits will be obtained to ensure cooperation with public agencies.

XII. NOISE - Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?				X
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?		X		
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 expose people residing or working in the project area to excessive noise levels?			X	
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

REGULATORY SETTING

Local Regulations

According to the City of Hollister General Plan noise issues are most closely associated with the Land Use and Circulation portions of the Hollister General Plan. Specific concerns addressed are: (1) establishment of noise compatible land uses; (2) regulation of new development to limit noise impacts on noise-sensitive uses; (3) minimization of traffic noise; (4) enforcement of noise

standards to protect the existing quality of life; and (5) insulation of residences posed to excessive levels of noise. Construction noise impacts are directly addressed through the Health and Safety Element Goals and Policies of the General Plan. These include the following:

> Goal HS3: Achieve noise levels consistent with acceptable standards and reduce or eliminate objectionable noise sources.
>
> Goal HS3.3: Regulate construction activity to reduce noise between 7:00 pm and 7:00 am by adopting a truck route plan in cooperation with the County of San Benito and Caltrans, and provide enforcement mechanisms to ensure compliance[130]. The City and County are in the process with the San Benito Council of Governments (COG) in establishing truck routes that will meet the Surface Transportation Assistance Act (STAA) designation. The roadways within the airport area are accessible to California standard truck traffic.

Under the City of Hollister Municipal Code, Title 8 – *Health and Safety*, a noise level in residential districts exceeding fifty-five (55) dBA during daylight hours, and fifty (50) dBA after sunset, measured at the property line of the complaining party or inside an affected multiple-dwelling unit is prohibited[131]. The proposed project will not take place within noted distance to a residential area.

FINDINGS

Construction noise in any one particular area would be temporary and would include noise from activities such as site grading, concrete paving, truck hauling of material, pouring of concrete, and use of power hand tools. Construction would occur in phases on distinct portions of the proposed project area (see **Figure 5, Proposed Airport Improvements**). Dependent upon the actual construction activity each phase would last approximately one to two months for an overall duration of approximately five to seven months. Construction workers are planned to be on-site eight hours a day, five days a week, until the construction is complete. Construction noise typically occurs intermittently and varies depending on the nature of the construction activities being performed. Noise generated by construction equipment, including grading and paving equipment can reach high levels for brief periods.

There are anticipated to be a maximum of eight pieces of construction equipment on-site during the construction period. Typical pieces of equipment that will be on-site are detailed in **Table XII-A** (Construction Vehicles and Equipment). **Table XII-A** provides the estimated noise levels of construction equipment, similar to what may be required to construct the proposed project based on the Federal Highway Administration (FHWA) Roadway Construction Noise Model[132]. Equipment and operation noise levels in this inventory are expressed in terms of Lmax noise levels and a usage factor for the intermittent nature of construction. The acoustical usage factor estimates the fraction of time each piece of construction equipment is operating at full power

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[130] San Benito County General Plan. <http://www.sanbenito.ca.us/departments/planning/documents/AgriculturalProductive.pdf>.

[131] City of Hollister. 2010. Municipal Code Title 8 : Health and Safety. Ordinance 882, Section 1 (part), 1996: prior code Section 3B-2. <http://qcode.us/codes/hollister/>.

[132] Federal Highway Administration. 2006 (January). *FHWA Roadway Construction Noise User's Guide*. Washington, D.C.

(i.e., its loudest condition) during a construction operation. Noise levels would range from 101 dBA Lmax for a pile driver (this assumes operation at full load) and between 74 to 85 dBA Lmax (this assumes operation at full load) at 50 feet from other equipment.

Table XII-A
Construction Equipment Noise Levels

Equipment	Typical Noise Level (dBA) 50 feet from Source
Backhoe	80
Compactor	82
Dozer / Grader / Loader / Concrete Mixer	85
Truck	88
Air Compressor	81
Concrete Pump	82
Generator	81
Impact Wrench / Pneumatic Tool	85
Jack Hammer	88
Paver	89
Pump	76
Roller	74
Saw	76

Source: Federal Transit Administration, 2006

During development of the proposed project, construction activities occurring during the more noise-sensitive late evening and nighttime hours (i.e., 7 pm to 7 am) could result in increased levels of annoyance and potential sleep disruption. The closest noise-sensitive land uses to CVH are located over a mile from the proposed construction area. As a result, noise-generating construction activities are not anticipated to have a significant short-term impact.

DISCUSSION

XII. a)

The proposed project will take place within land uses designated as aviation or industrial use and will not cause an exceedance of allowable noise levels within a residential district according to the City of Hollister Municipal Code. There is a jail facility located approximately 1,100 feet away from the airport property. Due to the distance away from construction, no impact is

anticipated. Construction noise represents a less-than-significant impact.

XII. b)

The proposed improvements to the airport drainage system are not of a nature that would be likely to expose persons to excessive ground borne vibration or ground borne noise levels. No impact will result.

XII. c)

Construction activities associated with the proposed improvements to the airport drainage system are temporary in nature and there would be no impact to permanent noise levels. No impact will result.

XII. d)

Temporary increases in noise can be expected as a result of construction activities. Mitigation Measure XII-1 will be implemented to be consistent with the City's General Plan standards that restrict construction hours on a project site from 7 pm to 7 am. Construction noise represents a less-than-significant impact.

XII. e)

The proposed project would take place within or directly adjacent to the airport itself and would not expose people living or working in the proposed project area to excessive noise levels. Construction noise represents a less-than-significant impact.

XII. f)

The proposed project is not within the vicinity of a private airstrip. No impact will result.

MITIGATION MEASURES

Mitigation Measure XII-1

During all phases of construction, the project applicant shall adhere to the following requirements for construction activities with respect to hours of operation and idling and muffling of internal combustion engines:

1. Noise-generating construction activities shall be limited to the hours between 7 a.m. to 7 p.m., and shall be prohibited on Sundays and federally-recognized holidays.
2. Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.

3. Construction vehicles and equipment shall not be left idling for longer than five minutes when not in use.

Mitigation Measure XII-2

All of the necessary permits will be obtained to ensure cooperation with public agencies.

XIII. POPULATION AND HOUSING - Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Induce substantial 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)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

REGULATORY SETTING

The development of the proposed project at Hollister Municipal Airport would occur on City of Hollister property, in a location that is zoned for aviation operations. There are no relevant local regulations for assessment of population and housing.

FINDINGS

The proposed project will not cause changes to the housing stock or increase population.

DISCUSSION

XIII. a, b, c)

The proposed project will not have any impact on population and housing.

MITIGATION MEASURES

No mitigation measures are required. All of the necessary permits will be obtained to ensure cooperation with public agencies.

XIV. PUBLIC SERVICES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
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 of any of the public services:				
i. Fire protection?				X
ii. Police protection?				X
iii. Schools?				X
iv. Parks?				X
v. Other Public Facilities?				X
b) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
c) 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?				X

REGULATORY SETTING

The following regional and local plans, policies, and regulations must be considered:

Local Regulations

City of Hollister General Plan

The Community Services and Facilities Element of the City of Hollister General Plan outlines goals, policies, and implementation measures to "provide for an adequate level of community services and facilities to ensure the continued health, education, welfare and safety of all residents and businesses. The proposed project must comply with the following policies, among others:

> Policy CSF1.1: Adequate Capabilities and Capacity of Local Public Services. Ensure that future growth does not exceed the capabilities and capacity of local public services such as wastewater collection and treatment, local water supply systems, fire and police protection, maintenance of streets and roads, local school systems, parks and recreational facilities, and landfill capacity, and ensure that public services meet Federal and state standards and are available in a timely fashion[133].

Measure U (City of Hollister Municipal Code Title 16, Chapter 16.64, Section 16.64.010)

In 2002, voters approved the Measure U Growth Management initiative. The relevant goal of Measure U is to (City of Hollister 2009: 3158):

> Encourage a rate of residential growth within the City that will not exceed the City's ability to provide adequate and efficient public services, including sewer, water, police, fire, streets, parks, general administration, and maintenance of public facilities, or the ability of the local economy, including the City's financial capacity, to support such growth, maintain and improve the quality of the environment considering the City's natural setting, including water courses, viable agricultural/open lands, and recreational, historic, and scenic areas[134].

FINDINGS

The City of Hollister is not located within a State Responsibility Area for Fire Protection or an Extremely High Fire Hazard Area. Although the proposed project is a public improvement, it would not cause significant shifts in patterns of population movement or growth so there will be no increases in the need for public services.

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[133] City of Hollister. 2005. City of Hollister General Plan. Community Services and Facilities Element.

[134] City of Hollister. 2010. Municipal Code Title 16, Chapter 16.64, Section 16.64.010 : Measure U Growth Management. <http://q.us/codes/hollister/>.

DISCUSSION

XIV. a)

- **i.** Fire Protection: The Hollister Fire Department currently operates one engine company and one truck company from Station 1, located at 110 5th Street and one engine company from Station 2 located at 1000 Union Road. The proposed project would not cause an increase in capacity of the airport and therefore would not increase the need for emergency services. There will be no impact.
- **ii.** Police Protection: The Hollister Police Department provides police protection for the City and is headquartered at 395 Apollo Court, approximately three miles northeast of the proposed project site. The proposed project would not cause an increase in capacity of the airport and therefore would not increase the need for emergency services. There will be no impact.
- **iii.** Schools: There are no schools within a quarter mile radius of the proposed project. There will be no impact, as the new drainage facilities will not generate new or additional students or affect school operations.
- **iv.** Parks: The proposed project would not cause significant shifts in patterns of population movement or growth so there will be no increase in the use of existing neighborhood and regional parks or other recreational facilities. There will be no impact.
- **v.** Other Public Facilities: No other public facilities have been identified that would require construction or expansion as a result of the proposed project. Therefore, no impacts are anticipated.

XIV. b, c)

Please refer to Section XV – *Recreation*.

MITIGATION MEASURES

No mitigation measures are required. All of the necessary permits will be obtained to ensure cooperation with public agencies.

XV. RECREATION	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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 would occur or be accelerated?				X
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?				X

REGULATORY SETTING

No federal or state regulations related to recreational resources apply to the proposed project. The following regional and local plans, policies, and regulations must be considered:

Local Regulations

City of Hollister General Plan

The Community Services and Facilities Element of the City of Hollister General Plan outlines goals, policies, and implementation measures to "provide for an adequate level of community services and facilities to ensure the continued health, education, welfare and safety of all residents and businesses. The proposed project must comply with the following policies, among others:

> Policy CSF4.4 Parks and Recreation Standards – Provide for high-quality neighborhood and community parks to meet the recreational, open space, leisure, and play needs and desire of existing and future residents. Coordinate efforts with the County of San Benito to provide an average of 4 acres of developed parks and recreational facilities for every 1,000 residents within the Hollister Planning Area.
>
> Policy CSF4.5 Park and Recreation Master Plan – Ensure an equitable distribution of parks and recreational facilities throughout the City. The City will strive to improve, operate, maintain, and rehabilitate existing parks, facilities, and other public amenities, and will design all new parks to meet the quality standards established in the Parks and Recreation Master Plan.

Policy CSF4.6 Recreation Programs – Provide high-quality facilities and recreation programs to meet the recreational and cultural needs and desires of existing and future residents of all groups, ethnicities, and income levels[135].

FINDINGS

The City of Hollister's Parks and Recreation Master Plan[136] has established that there should be four acres of parks and recreational facilities per 1,000 residents. The Plan indicates that Hollister currently provides approximately 4.1 acres of parks and recreational facilities per 1,000 residents, thereby fulfilling the standard. The proposed project will not cause an increase in the population of the City of Hollister and therefore would not increase the use of parks or other recreational facilities in the area. There would be no additional deterioration of facilities, nor would the proposed project involve or require the construction or expansion of recreational facilities.

DISCUSSION

XV. a, b)

There is one park in close proximity to the airport, Hollister Airport Park. The proposed project will not include new residential units and therefore will not cause an increase in population. The proposed project will not increase use of existing neighborhood and regional parks or other recreational facilities. The proposed project does not include recreational facilities, nor does it require the construction or expansion of recreational facilities. There is no impact.

MITIGATION MEASURES

No mitigation measures are required. All of the necessary permits will be obtained to ensure cooperation with public agencies.

[135] City of Hollister. 2005. General Plan. Chapter 5 – Community Services and Facilities Element. <http://www.hollister.ca.gov Site/html/about/documents/Chapter5_000.pdf>.

[136] City of Hollister. 2001. *Parks and Recreation Master Plan*. Adopted 2001 <http://www.hollister.ca.gov/Site/html/about /parkMsPlan.asp>.

XVI. TRANSPORTATION / TRAFFIC Would the project :	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths and mass transit?				X
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?			X	
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e) Result in inadequate emergency access?				X
f) Result in inadequate parking capacity?			X	
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X

REGULATORY SETTING

State Regulations

California Department of Transportation

Caltrans regulates any encroachment within the right-of-way of a state highway or route. These encroachments must be issued permits and follow the provisions of temporary traffic control systems. Authority for Caltrans to control encroachments within state highway right-of-way is found in Chapter 3, Division 1, Articles 1, 2, 2.5 and 3 of the Streets and Highways Code. The term "encroachment" is defined in Section 660 of this Code as "any tower, pole, pole line, pipe, pipe line, fence, billboard, stand, or building, any structure or object of any kind or character not particularly mentioned…or special event, which is placed in, under, or over any portion of the highway"[137].

Local Regulations

City of Hollister General Plan

The City of Hollister General Plan, Chapter 4 – *Circulation Element*, provides goals, policies, and implementation measures to "facilitate the orderly, efficient, and context sensitive expansion and development of Hollister's circulation systems." There are no specific goals related to temporary effects of construction traffic on existing circulation patterns[138].

FINDINGS

Proposed project operations are not expected to result in impacts to traffic or transportation because all drainage improvements will be underground. However, the construction of some proposed project elements could adversely affect nearby traffic patterns on a temporary short-term basis. A traffic control plan should be created and implemented to ensure minimal disruptions. There is a less than significant impact with mitigation.

DISCUSSION

XVI. a)

There are no plans, ordinances, or policies that establish measures of effectiveness for the performance of the circulation system. There is no impact.

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[137] California Department of Transportation. *Streets and Highways Code.* Chapter 3, Division 1, Articles 1, 2, 2.5 and 3.

[138] City of Hollister. 2005. City of Hollister General Plan. Chapter 4 – Circulation Element. <http://www.hollister.ca.gov/Site/html/about/documents/04_Circulation_001.pdf>.

XVI. b)

There is not a congestion management program that applies to the proposed project. There is no impact.

XVI. c)

All phases and operations of the proposed project will take place on land during daytime hours and will have minimal effects on air traffic. There will be no increase in air traffic levels, nor will there be added safety risks. Drainage improvements will improve airport safety by eliminating ditches near runways, thus having a positive effect on airport safety. Due to on-airport construction, there may be temporary closures to the runway impacting aircraft operations. This impact will be temporary in nature and will have a minimal effect on air traffic. There will be a less than significant impact.

XVI. d)

The proposed project does not contain any design features that would affect traffic or increase hazards because all drainage improvements will be underground. There will be no changes to the existing right-of-way. There is no impact.

XVI. e)

Emergency access will not be affected by the proposed project because all drainage improvements will be underground. There is no impact.

XVI. f)

A construction staging area will be identified prior to construction with input from the City. Parking capacity at the airport may be affected during the construction phase of the proposed project. Any effects to parking capacity will be temporary. There is less than a significant impact.

XVI. g)

The proposed project will have no impact on alternative means of transportation because there are no bus routes, bicycle racks, etc. on the airport property. Therefore, it will not conflict with adopted policies, plans or programs supporting alternative transportation. There is no impact.

MITIGATION MEASURES

The project proponent shall prepare a traffic control plan for each proposed project element that would involve partial road closures for more than 1 one week. The traffic control plan shall be prepared in accordance with professional traffic engineering standards and in compliance with the requirements of the affected jurisdiction's encroachment permit requirements. The traffic control plan may include, but not be limited to, the following measures:

- Identify specific construction methods to maintain traffic flows on affected streets.
- Maintain the maximum amount of travel land capacity during non-construction periods and provide flagger control at sensitive sites to manage traffic control and flows.
- Limit the construction work zones to widths that, at a minimum, shall maintain alternate one-way traffic flow past the construction zones.
- Coordinate construction activities (time of year and duration) to minimize traffic disturbances adjacent to schools and commercial areas.
- Post advanced warning of construction activities to allow motorists to select alternative routes in advance.
- Prepare appropriate warning signage and lighting for construction zones.
- Identify appropriate and safe detour routes if closure of a roadway is required, and install signage that warns of road closures and detour routes.
- Maintain steel trench plates at construction sites to restore access across open trenches to minimize disruption of access to driveway and adjacent land uses. Construction trenches in street shall not be left open after work hours.
- The traffic control plan shall be reviewed for appropriateness and approved by the governing public works department.

All of the necessary permits will be obtained to ensure cooperation with public agencies.

XVII. UTILITIES AND SERVICE SYSTEMS - Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?			X	
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			X	
e) 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?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X	
g) Comply with federal, state and local statutes and regulations related to solid waste?			X	

REGULATORY SETTING

No federal regulations related to utilities and public services apply to the proposed project. The proposed project must comply with the following state, regional, and local plans, policies, and regulations.

State Regulations

California Integrated Waste Management Act of 1989

The California Integrated Waste Management Act (CIWMA) of 1989 (AB 939) requires all cities and counties in California to divert 25% of its solid waste from landfill facilities by 1995 and 50% by 2000[139]. Each city must develop solid waste plans demonstrating its compliance with CIWMA. The plans should promote source reduction, recycling and composting, and environmentally safe transformation and land disposal.

Local Regulations

City of Hollister General Plan

The following policies of the City of Hollister General Plan, Chapter 5 – *Community Services and Facilities Element,* are relevant to the proposed project:

> GOAL CSF1: Coordinate with other agencies and plan for the provision of adequate infrastructure, facilities, and services.
>
> > Policy CSF1.1: Adequate Capabilities and Capacity of Local Facilities – Ensure that future growth does not exceed the capabilities and capacity of local public services such as wastewater collection and treatment, local water supply systems, fire and police protection, maintenance of streets and roads, local school systems, parks and recreational facilities, and landfill capacity, and ensure that public services meet federal and state standards and are available in a timely fashion.
>
> GOAL CSF2: Plan for adequate sewer and water facilities.
>
> > Policy CSF2.1: Sewer and Water Facilities – Coordinate with responsible districts and agencies to assure that sewer and water facility expansion and/or improvements meet federal and state standards and occur in a timely manner.
> >
> > Policy CSF2.2: Provision of Sanitary Sewerage Capacity for Commercial and Industrial Uses – Reserve sanitary sewerage capacity for future commercial and industrial uses[140].

[139] California Environmental Protection Agency. Assembly Bill 939. California Integrated Waste Management Act.
[140] City of Hollister. 2005. City of Hollister General Plan. Chapter 5 – Community Services and Facilities Element.

FINDINGS

There will be construction-related increases in the need for and use of utilities. However, any increases will be temporary and should not have an overall effect on utilities. Water is supplied to the airport by the City of Hollister. The 2005 Hollister Area Urban Water Management Plan states that adequate water supplies exist for planned development through 2025.

DISCUSSION

XVII. a)

There will be an insignificant increase in wastewater during the construction phase. The overall proposed project will not result in an increase in wastewater and, therefore, will not exceed wastewater requirements of the RWQCB. There has already been coordination with the Central Coast RWQCB as part of the SWMP.

XVII. b)

Neither the construction or use of the proposed project would require construction of new water or wastewater treatment facilities, or the expansion of existing facilities; therefore, there would be no impact to facilities of these types resulting from the construction or use of the proposed project.

XVII. c)

The proposed project involves the construction of a new storm water drainage facility. There will be a positive impact to the environment.

XVII. d)

The Hollister Area Urban Water Management Plan bases water demand in the area on population growth projections by AMBAG. These projections partially rely on allowable population density based on general plan land use densities. Since the proposed project is consistent with the general plan, it is therefore consistent with AMBAG projections and is accounted for within the Urban Water Management Plan[141]. There will be less than a significant impact.

XVII. e)

Sanitary sewer service is provided to the airport by the City of Hollister. Since the proposed project will not require any additional sewer service, there will be no impact.

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[141] Association of Monterey Bay Area Governments. 2008 (June). *Monterey Bay Area 2008 Regional Forecast Population, Housing Unit, and Employment Projections for Monterey, San Benito, and Santa Cruz Counties to the Year 2035*. <http://www.ambag.org/programs/blueprint/forecast/index.html>.

XVII. f)

There is no anticipated increase in solid waste generated by the airport during the construction phase as the majority of materials will be reused on-site. Any unforeseen increases are not expected to place an undue burden on the existing landfill that accepts airport waste. There will be less than a significant impact.

XVII. g)

There are no applicable federal regulations. The proposed project will comply with state, local and regional regulations. There will be less than a significant impact.

MITIGATION MEASURES

During all phases of construction, the project applicant should coordinate with the County of San Benito in addressing solid waste management needs. Solid waste disposal is currently provided by the Hollister Disposal Company. Solid waste is disposed of at the John Smith landfill, which is the only permitted landfill serving the Hollister area. It is owned by the County of San Benito and is operated by Hollister Disposal Company, under contract with the County. Currently, only half of the landfill is being utilized and it is estimated that the full utilization of the site would provide a life span of between 40 and 45 years[142]. The project proponent should coordinate with the County to ensure that this estimate will cover any additional wastes created by the proposed project.

All of the necessary permits will be obtained to ensure cooperation with public agencies.

[142] City of Hollister. 2005. City of Hollister General Plan. Chapter 5 – Community Services and Facilities Element. <http://www.hollister.ca.gov/Site/html/about/documents/Chapter5_000.pdf>.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Does the project have the potential to 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 plan or animal community, 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 of prehistory?		X		
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)?			X	
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?				X

FINDINGS

XVIII. a)

Please see Section IV – *Biological Resources*

XVIII. b)

The proposed project could contribute to cumulative GHG emissions. This issue is previously discussed in Section VII – *Greenhouse Gases* of this IS. Mitigation Measures for cumulative

GHG emissions will reduce the cumulative impact of the proposed project to an insignificant level.

XVIII. c)

Please refer to Section IV – *Biological Resources.*

GHG emissions will reduce the cumulative impact of the proposed project to an insignificant level.

XVIII. c)

Please refer to Section IV – *Biological Resources.*

APPENDIX A

Acronyms

Hollister Acronyms

AAQS : Ambient Air Quality Standards

AB32 : California Global Warming Solutions Act of 2006

AES : Analytical Environmental Services

ALP : Airport Layout Plan

AMBAG : Association of Monterey Bay Area Governments

AMP : Airport Master Plan

AQMP : Air Quality Management Plan

ASCE : American Society of Civil Engineers

BCPs : Best Construction Practices

C-APE : California Environmental Quality Act Area of Potential Effects

Caltrans : California Department of Transportation

CARB : California Air Resource Board

CBC : California Building Code

CCR : Code of Regulations

CDF : California Department of Forestry

CDFG : California Department of Fish and Game

CEQA : California Environmental Quality Act

CESA : California Endangered Species Act

CFR : Code of Federal Regulations

CIWMA : California Integrated Waste Management Act

CNDDB : California Natural Diversity Database

CNPPA : California Native Plant Protection Act

CNPS : California Native Plant Society

CO : Carbon Monoxide

CO_2 : Carbon Dioxide

CO_2e : CO_2 Equivalent Units of Measure

CRHR : California Register of Historical Resources

CVH : Hollister Municipal Airport

CWA : Clean Water Act

EPA : Environmental Protection Agency

ESA : Endangered Species Act

FAA : Federal Aviation Administration

FEMA : Federal Emergency Management Agency

FHWA : Federal Highway Administration

FIRM : Flood Insurance Rate Maps

FPPA : Farmland Protection Policy Act

GA : General Aviation

GHG : Greenhouse Gas

HRC : Historic Resources Commission

IBC : International Building Code

IS : Initial Study

IS/MND : Initial Study/Mitigated Negative Declaration

LF : Linear Feet

LID : Low Impact Development

MBUAPCD : Monterey Bay Unified Air Pollution Control District

MLD : Most Likely Descendent

MND : Mitigated Negative Declaration

NAHC : Native American Heritage Commission

NCCAB : North Central Coast Air Basin

NMFS : National Marine Fisheries Service

NOAA : National Oceanic and Atmospheric Administration

NPDES : National Pollution Discharge Elimination System

NRCS : Natural Resources Conservation Service

O_3 : Ozone

PM_{10} : Inhalable Particulates of Ten Microns or Less in Diameter

PPM : parts per million

PRC : Public Resources Code

RCP : Reinforced Concrete Pipe

RCRA : Resource Conservation and Recovery Act

RSA : Runway Safety Areas

RWQCB : Regional Water Quality Control Boards

SDC : Seismic Design Category

SSURGO : Soil Survey Geographic

SWANCC : Solid Waste Agency of Northern Cook County

SWMP : Storm Water Master Plan

SWPPP : Storm Water Pollution Prevention Plan

SY : Square Yards

TNW : Traditional Navigable Waters

USACE : United States Army Corps of Engineers

USFWS : United States Fish and Wildlife Service

USGS : United States Geological Survey

UST : Underground Storage Tank

APPENDIX B

References

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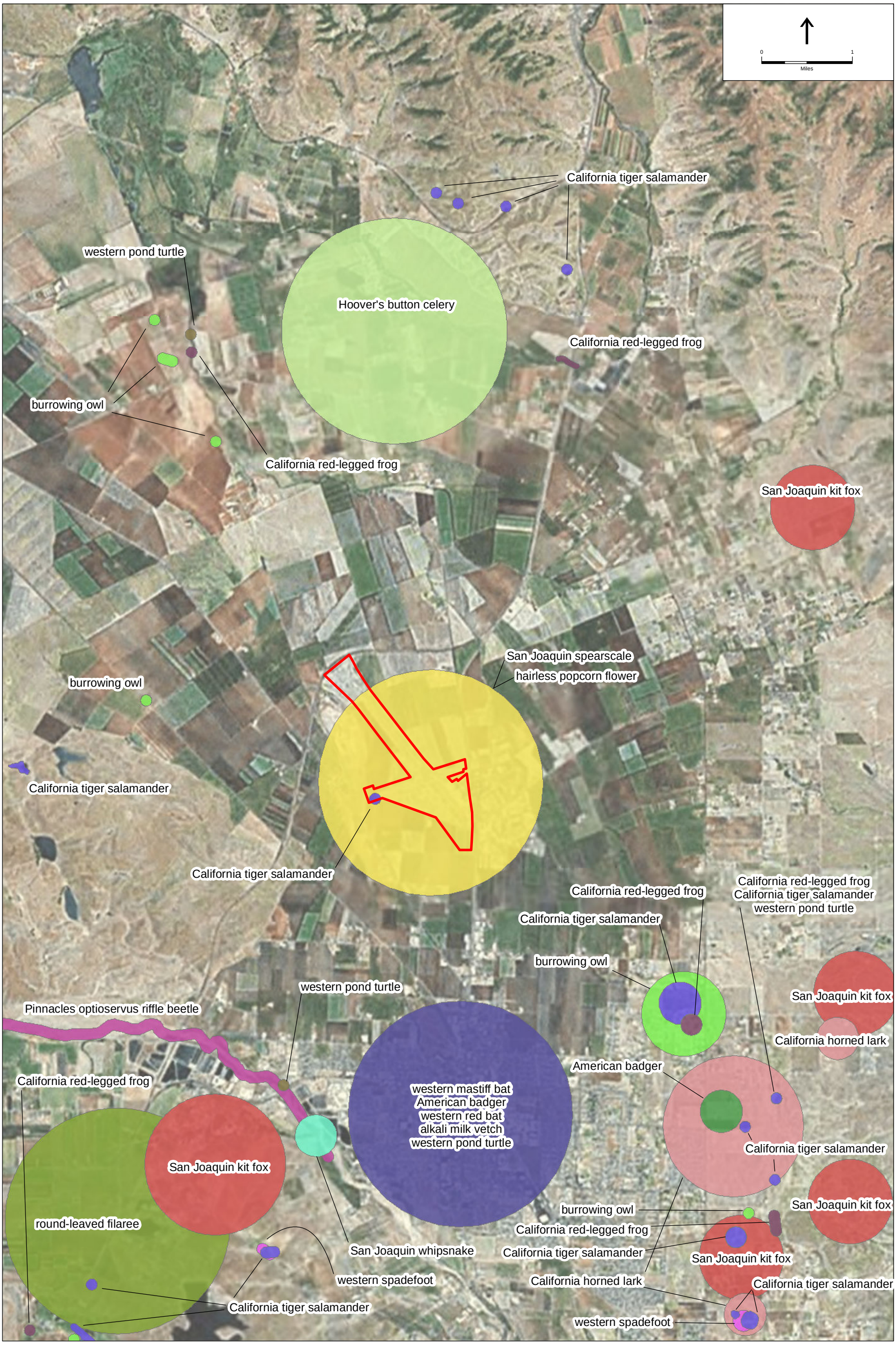
APPENDIX C

Biological Resources Survey Report



SOURCE: ESRI, 2010; CDFG, 2011

Figure 1

CNDDB Occurrences Within Five Miles of the Project Site

SOURCE: ESRI, 2010; ESA, 2011

Figure 2

Location of Burrowing Owls Observed During ESA Site Visit

SOURCE: ESRI, 2010; ESA, 2011

Figure 3

Potential Wetlands within the Project Site

APPENDIX D

Wetland Delineation

WETLAND DELINEATION

CITY OF HOLLISTER

HOLLISTER MUNICIPAL AIRPORT

MAY 2011

PREPARED FOR:

C&S Engineers, Inc.
2020 Camino del Rio North
Suite 100
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PREPARED BY:

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APPENDICES

1.0 INTRODUCTION

Analytical Environmental Services (AES) conducted a wetland delineation of the Hollister Municipal Airport (study area) in San Benito County, California. This delineation report (report) describes any potentially jurisdictional waters of the United States (U.S.) (including wetlands) identified within the study area that may be subject to regulation by the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act (CWA). Any waters of the U.S. boundaries depicted in this report represent a calculated estimate of the potentially jurisdictional features within the study area and are subject to modification following the USACE verification process. All results contained herein are considered preliminary until the USACE verifies the findings.

1.1 PROJECT LOCATION

The study area is located within San Benito County, California approximately three miles north of the City of Hollister (City). The regional location is shown in **Figure 1** and the site and vicinity is shown in **Figure 2**. The airport property (study area) is located in Sections 9 and 15, of Township (T) 12 South (S), Range (R) 5 East (E), on the "San Felipe, CA" U.S. Geological Survey (USGS) 7.5–minute topographic quadrangle.

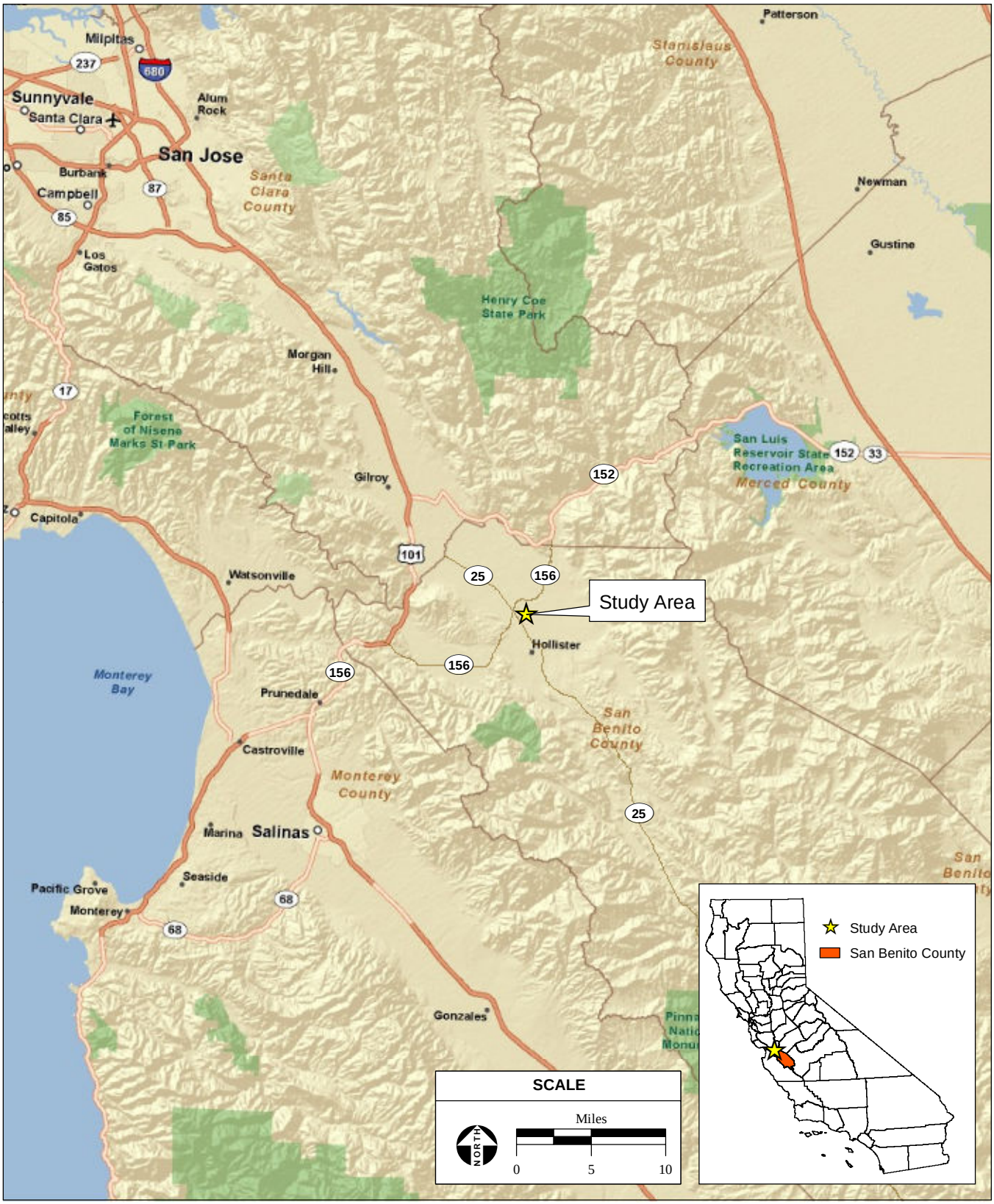
1.2 PROJECT DESCRIPTION

The City has proposed to make improvements to the stormwater drainage system at Hollister Municipal Airport (airport). The improvements include: re-grading of shoulders and storm drains adjacent to airport runways to meet Federal Aviation Administration (FAA) standards, the installation and/or modification of storm drains and catch basins, and the installation of bio-filter swales in selected areas adjacent to airport runways. These improvements are proposed to occur primarily within the grassy margins of the existing airport runways and onsite roads, entirely within the airport property boundaries (refer to **Figure 2**). **Table 1** displays the San Benito County assessor's parcel numbers (APNs) for the parcels within the study area.

TABLE 1
PARCELS WITHIN THE STUDY AREA

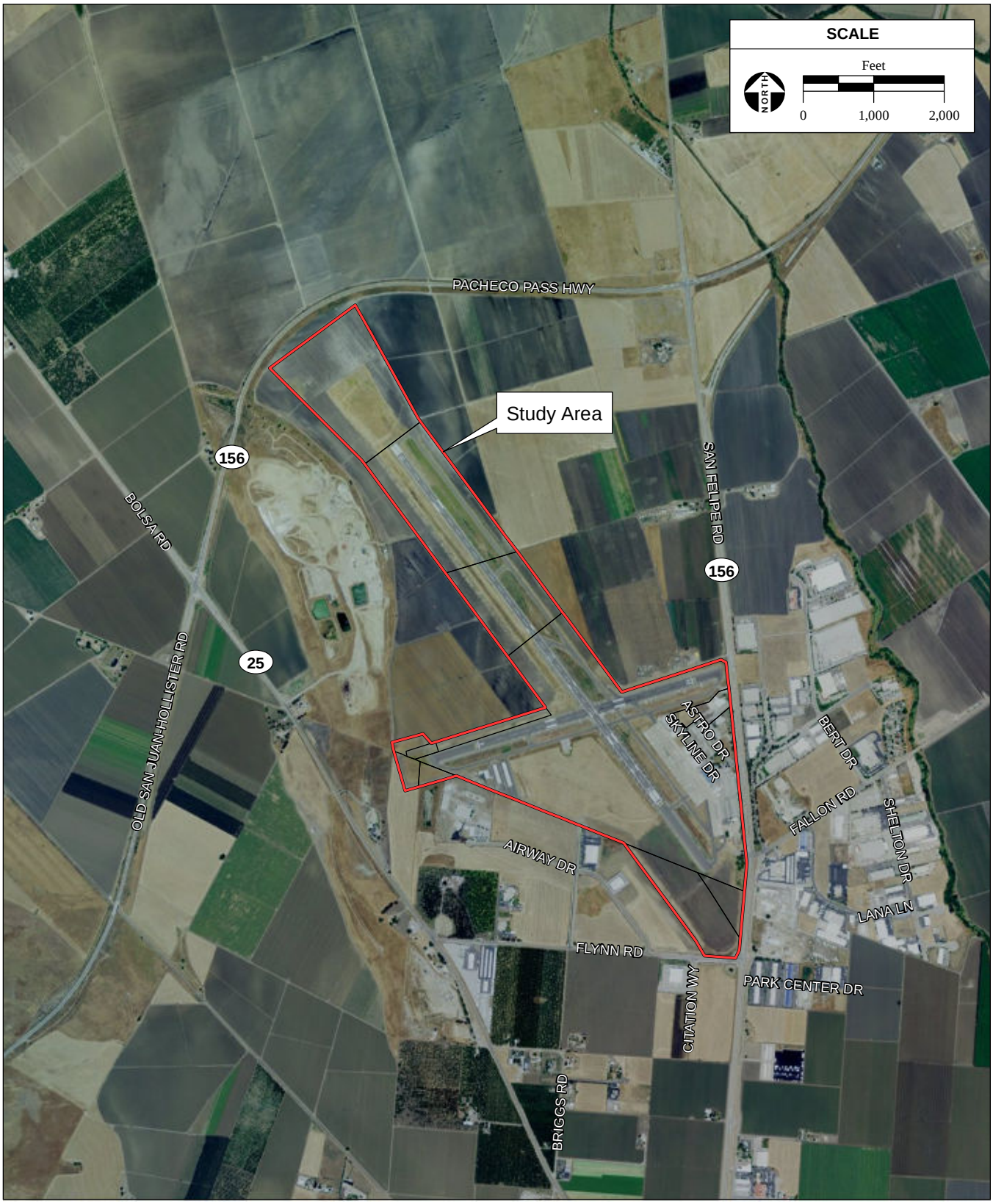
Parcel #	Size (acres)	Assessor's Parcel #
1	29.2	050-020-002
2	5.2	053-360-021
3	21.9	053-360-028
4	2.9	019-010-009
5	2.2	053-360-022
6	1.4	050-010-002
7	4.8	014-110-999
8	197.2	050-010-001
9	48.4	050-020-004
10	53.7	050-020-003
Total Acreage	**366.9**	

Source: San Benito County Assessor, 2011; AES, 2011



SOURCE: ESRI Server Data, 2011; AES, 2011

Figure 1
Regional Location



SOURCE: NAIP Aerial Photograph, 6/8/2009; AES, 2011

Figure 2
Aerial Site and Vicinity

1.3 DRIVING DIRECTIONS

From the San Francisco Bay Area, take interstate US-101 south for approximately 40 miles. Take exit 353 for State Route (SR)-25 toward Hollister. Turn left onto SR-156 and head east for approximately two miles. Turn right onto San Felipe Road for about one mile. Turn right onto Airport Drive and then right onto Skylane Drive. The APNs within the study area are located to the north and west of the airport entrance (**Table 1**).

2.0 REGULATORY SETTING

The U.S. Army Corps of Engineers (USACE) has primary federal responsibility for administering regulations that concern waters of the U.S., including wetlands, under Section 404 of the Clean Water Act (CWA). Section 404 regulates the discharge of dredged and fill material into waters of the U.S. The USACE requires that a permit be obtained if a project proposes placing structures within, over, or under navigable waters and/or discharging dredged or fill material into waters below the ordinary high water mark (OHWM). Wetlands and other water features that lack a hydrologic connection to navigable waters of the U.S. and that lack a nexus to interstate and foreign commerce are not regulated by the CWA and do not fall under the jurisdiction of the USACE. Such features are called "isolated" (DOE, 2003).

Waters of the U.S. are defined as *"All waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters"* [Section 404 of the CWA; 33 Code of Federal Regulations (CFR) Part 328]. The limit of USACE jurisdiction for non-tidal waters (including non-tidal perennial and intermittent watercourses and tributaries to such watercourses) in the absence of adjacent wetlands is defined by the OHWM. The OHWM is defined as "*The line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas"* (Section 404 of the CWA; 33 CFR Part 328).

Wetlands are defined as "*Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions*" (Section 404 of the CWA; 33 CFR Part 328).

The USACE and EPA issued the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (hereafter, "USACE JD Guidelines") on May 30, 2007 to provide guidance based on the Supreme Court's decision regarding *Rapanos v. United States* and *Carabell v. United States*

(Rapanos decision) [Rapanos vs. U.S., No. 04-1034 (June 19, 2006) and *Carabell v. U.S.*, No. 04-1384 (September 27, 2004)] (USACE, 2007). The Rapanos decision provides standards that distinguish between traditional navigable waters (TNWs), relatively permanent waters (RPWs) with perennial or seasonal flows, and non-relatively permanent waters (non-RPWs). Wetlands and non-TNWs adjacent to TNWs are subject to CWA jurisdiction if: the water body is relatively permanent, or if a water body abuts or is tributary to a RPW, or if a water body, in combination with all wetlands adjacent to that water body, has a significant nexus with TNWs. The significant nexus standard will be based on evidence applicable to ecology, hydrology, and the influence of the water on the "chemical, physical, and biological integrity of downstream traditional navigable waters" (USACE, 2007). Isolated wetlands are not subject to CWA jurisdiction based on the Supreme Court's decision regarding the Solid Waste Agency of Northern Cook County (SWANCC decision) (*Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, No. 99-1178, January 9, 2001) (DOE, 2003).

In addition, ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water are generally not defined as waters of the U.S. because they are not tributaries or they do not have a significant nexus to downstream TNWs (45, 48, and 51 CFR subsections 62732, 62747, 21466, 21474, 41206, and 41217).

3.0 METHODOLOGY

The information presented in this report was prepared in accordance with the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987); the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Region Supplement) (USACE, 2008); *Minimum Standards for Acceptance of Preliminary Wetland Delineations* (USACE, 2001); the USACE JD Guidelines (USACE, 2007); and the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). The boundaries of potential Waters of the U.S. were delineated through aerial photograph interpretation and standard field methodologies (i.e., paired data set analyses), and all wetland data were recorded on Wetland Determination Data Forms - Arid West Region Version 2.0 (USACE, 2008). The *Munsell Soil Color Charts* (Kollmorgen Instruments Co., 1990) was used in the field to identify hydric soils. Plant identification and nomenclature followed *The Jepson Manual: Higher Plants of California* (Hickman, 1993). The USACE Arid West Version 2.0 Wetland Delineation Data Forms completed with field data from the site visit are included as **Appendix A** (USACE, 2008). A list of plant species observed within the study area is included as **Appendix B**. Site photos of the study area are included as **Appendix C**.

3.1 DELINEATION

AES biologists Jessica Griggs and Kelly Bayne, M.S. conducted a delineation of the study area on April 5, 2011. The team walked meandering transects throughout the marginal grassy areas and fields surrounding the airport runways and facilities. Focus areas examined during the field assessment

included the areas proposed for improvements near and in between the airport runways, including the areas previously identified as "potential wetland areas" in previous City documents.

The wetland delineation was conducted in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987). The field survey included the mapping of paired data point sets to evaluate whether the three parameter criteria (vegetation, soil, and hydrology) supported a wetland or upland determination. At wetland locations, one point was situated outside the limits of the estimated wetland area and the other point was situated within the estimated wetland area. Data sheets that document the basis for determining whether an area qualifies as a jurisdictional water of the U.S. were prepared for representative locations and are included as **Appendix A**.

Plant nomenclature follows *The Jepson Manual: Higher Plants of California* (Hickman, 1993). The 1988 *National List of Vascular Plant Species that Occur in Wetlands, California Region 0* (Reed, 1988), was used to determine the status of observed plants as wetland indicator species. A standard *Munsell* soil color chart was used to determine soil matrix and mottle colors. Wetlands were classified according to the Cowardin system of classification of wetlands and deepwater habitats of the U.S. (Cowardin et al., 1979). Potential jurisdictional features were mapped using a Trimble GeoExplorer XT Global Positioning System (GPS) handheld unit. In areas where on the ground GPS mapping of drainages was infeasible due to steepness of terrain, density of vegetation, or were otherwise inaccessible, the dimensions of the unmapped portion of the drainage were estimated in the field and hand drawn onto an aerial and/or topographic map. This data was then used to produce a waters of the U.S. delineation map.

3.2 ROUTINE DETERMINATIONS

Wetlands and/or waters of the U.S. locations within the study area were determined based on the following three parameter criteria:

- The majority of dominant plant species are wetland-associated species;
- Hydric soils are present; and
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season.

3.3 VEGETATION

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory, 1987). Prevalent vegetation is characterized by the dominant plant species comprising the plant community. The dominance test is the basic hydrophytic vegetation indicator and was utilized at each data point location. The "50/20 rule" was used to select the dominant plant species from each stratum of the vegetation community. This rule states that for each stratum in the community, dominant

plant species are the most abundant species (when ranked in descending order of coverage and cumulatively totaled) that immediately exceed 50 percent of the total coverage for the stratum, plus any additional plant species that individually comprise 20 percent or more of the total stratum (USACE, 2008).

Dominant plant species observed at each data point were then classified according to their indicator status (i.e., probability of occurring in a wetland), according to the USFWS National List of Vascular Plant Species That Occur in Wetlands: California Region 0 (Reed, 1988; **Table 2**). If the majority (greater than 50 percent) of the dominant vegetation on-site are classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC), then the site is considered to be dominated by hydrophytic vegetation. Pursuant to the Arid West Supplement, plus (+) and minus (-) modifiers were not used (i.e., FAC- and FAC+ plant species are all considered FAC) and plant species not listed in Reed (1988) were assumed to be upland (UPL) species (USACE, 2008).

TABLE 2
CLASSIFICATION OF WETLAND-ASSOCIATED PLANT SPECIES

Plant Species Classification	Abbreviation	Probability of Occurring in Wetland
Obligate	OBL	>99%
Facultative Wetland	FACW	66-99%
Facultative	FAC	33-66%
Facultative Upland	FACU	1-33%
Upland	UPL	1%

Source: Reed, 1988

In instances where indicators of hydric soil and wetland hydrology were present but the plant community failed the dominance test, the vegetation was re-evaluated using the prevalence index. The prevalence index is a weighted-average wetland indicator status of all plant species in the sample area, where each indicator status is assigned a numeric code (OBL=1, FACW=2, FAC=3, FACU=4, and UPL=5) and weighted by percent cover. If the plant community failed the prevalence index, the morphological adaptations of the plants were evaluated (USACE, 2008).

3.4 SOILS

Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil (NRCS, 2003). Frequently observed indicators of hydric soils include (but are not limited to) histosols, histic epipedon, hydrogen sulfide, stratified layers, depleted below dark surface, depleted matrix, redox dark surface, depleted dark surface, and redox depressions (USACE, 2008). Soil pits were excavated to the depth necessary to observe and document hydric soils indicators at data point locations, to confirm the absence of indicators, or until further excavation was inhibited by a physical barrier. The soils at each data point location were examined for the presence or absence of these indicators. The colors of the

examined soil samples were determined while the soils were moist using the *Munsell Soil Color Charts* (Kollmorgen Instruments Co., 1990).

3.5 HYDROLOGY

Wetlands are generally depressions in the landscape that are seasonally or perennially inundated or saturated at or near (within 12 inches of) the soil surface. Primary indicators of wetland hydrology include (but are not limited to): visual observation of surface water, high water table, saturation, water marks (nonriverine), sediment deposits (nonriverine), drift deposits (nonriverine), surface soil cracks, inundation visible on aerial imagery, water stained leaves, salt crust, biotic crust, aquatic invertebrates, hydrogen sulfide odor, and oxidized rhizospheres along living roots. Secondary indicators of wetland hydrology include: water marks (riverine), sediment deposits (riverine), drainage patterns, dry-season water table, crayfish burrows, etc. (USACE, 2008). Observation of at least one primary indicator or two secondary indicators is required to confirm the presence of wetland hydrology at each data point location.

4.0 ENVIRONMENTAL SETTING

The Jepson Manual (Hickman, 1993) divides California into 21 regions based on weather patterns, topography, and vegetative communities. The study area is located within the Inner South Coast Range region, which is in the Coast Ranges immediately west of the San Joaquin Valley (Hickman, 1993). This region has an annual precipitation of 14.05 inches (WRCC, 2007). The climate is relatively mild, with an average low temperature of 38.8 degrees Fahrenheit in the winter and an average high temperature of 80.1 degrees Fahrenheit in the summer (WRCC, 2007). The dominant habitat types in this region include blue oak woodland and chaparral (Hickman, 1993). Agricultural fields dominate most of the areas surrounding the City of Hollister. The study area ranges in elevation from 200 feet to 245 feet above mean sea level.

Much of the region has been developed for agriculture and ranching, however some commercial and residential uses exist in the cities of Hollister and San Juan Bautista. The majority of the remaining natural habitat within the region includes the following plant communities: non-native grassland, central coast willow riparian scrub, oak woodland, chaparral, coastal scrub, freshwater marsh, and alkali marsh. Several sensitive habitats exist within Hollister and adjacent areas, including: central coast willow scrub, freshwater marsh, and alkali marsh. In addition, highly modified habitats, including sewage ponds, pastures, agricultural fields, and golf courses are found within and near Hollister.

4.1 HABITAT TYPES

The study area contains non-native annual grassland and ruderal/developed habitats. These terrestrial habitat types are described below as adapted from *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland, 1986). The two aquatic habitat types observed within the study area

include seasonal wetland and manmade drainage ditch, which are described in detail in **Section 5.2**. A map that illustrates the various habitat types within the study area is presented as **Figure 3**.

NON-NATIVE ANNUAL GRASSLAND

Non-native annual grassland habitat occurs throughout the study area near to and in between airport runways (**Figure 3**). This non-native grassland is highly disturbed by routine mowing in accordance with FAA guidelines. This habitat type is dominated by non-native annual grass species including barley (*Hordeum murinum*), wild oat (*Avena species*), ripgut brome (*Bromus diandrus*), Italian ryegrass (*Lolium multiflorum*), little quaking grass (*Briza minor*), and wheat (*Triticum aestivum*). It also contains other herbaceous species including, black mustard (*Brassica nigra*), shepherd's purse (*Capsella bursa-pastoris*), common skullcap (*Scutellaria tuberosa*), common groundsel (*Senecio vulgaris*), and prickly lettuce (*Lactuca serriola*). AES biologists observed several ground squirrel (*Spermophilus beldingi*) colonies in this habitat, along with mammal burrows up to six inches in diameter. These larger borrows may be indicative of larger species, such as foxes (*Vulpes* sp.) and burrowing owls (*Athene cunicularia*). This community corresponds to the Non-Native Grassland (42200) in the Holland system (Holland, 1986).

RUDERAL/DEVELOPED

Ruderal/developed habitat is defined as paved areas and buildings (**Figure 3**). Paved areas within the study area include all airport runways and access roads. Airport buildings, aircraft hangers, and facilities are all included within this category. This habitat type is equivalent to the Urban or Built-Up Land (11100) in the Holland system (Holland, 1986).

4.2 SOIL TYPES

The study area is located in the Hollister and San Juan Valleys, which are part of the Coast Range geomorphic province of California. The valleys are bordered by the Diablo Range to the east and the Gabilan Range to the west. The elevation of the local region ranges from approximately 140 to 1,540 feet above mean sea level. The valley floors are nearly flat and comprised of unconsolidated to poorly consolidated alluvial and lake deposits. Younger terrace deposits are prevalent along the east side of Hollister Valley, and channel deposits exist along the San Benito River, which cuts through the valleys. The floor gives way to low foothills in the east and west, where deposits are older and have been locally modified by renewed surface erosion, and are underlain by sedimentary rocks. Hillside areas located to the south and east of the San Juan Valley are underlain by continental mudstone. The higher and steeper mountain areas of the Diablo and Gabilan mountain ranges are underlain by a variety of semi-consolidated bedrock materials (SBCWD, 2008).

The soil types within the study area include: Clear Lake clay (Ch), and Clear Lake clay, saline (Ck), Pacheco silty clay (Pe), Sorrento silt loam, 0 to 2 percent slopes (SnA), and Willows clay, saline-alkali

SOURCE: NAIP Aerial Photograph, 6/8/2009; AES, 2011

Figure 3
Habitat Types

(Wk). A map of these soil types is provided as **Figure 4**. Characteristics of each soil type are described below.

CLEAR LAKE CLAY SERIES

Two types of soils from the Clear Lake clay soil series occur within the study area. The first, Clear Lake clay (Ch) (0 to 2 percent slopes) exhibits hydric soil characteristics as listed on the San Benito County Hydric Soils List (USDA, 2011). This soil is primarily composed of clay and is classified as poorly drained. The depth to restrictive feature is greater than 80 inches and the parent material is composed of alluvium derived from sedimentary rock. This soil is found in basin floors and concave landscapes. The capacity of the most limiting layer to transmit water (Ksat) is classified as moderately low to moderately high (0.06 to 0.20 inches/hour (in/hr)). The available water capacity of the soil is moderate at approximately 9 inches (NRCS, 2009).

In comparison, the Clear Lake clay, saline (Ck) (0 to 2 percent slopes) also exhibits hydric soil characteristics as listed on the San Benito County Hydric Soils List (USDA, 2011). This soil is similar in composition, with similar poor drainage characteristics, parent material, and Ksat value to Clear Lake clay (Ch). This soil possesses slightly saline to moderately saline content whereas the Clear Lake clay discussed above is typically nonsaline (NRCS, 2009).

PACHECO CLAY SERIES

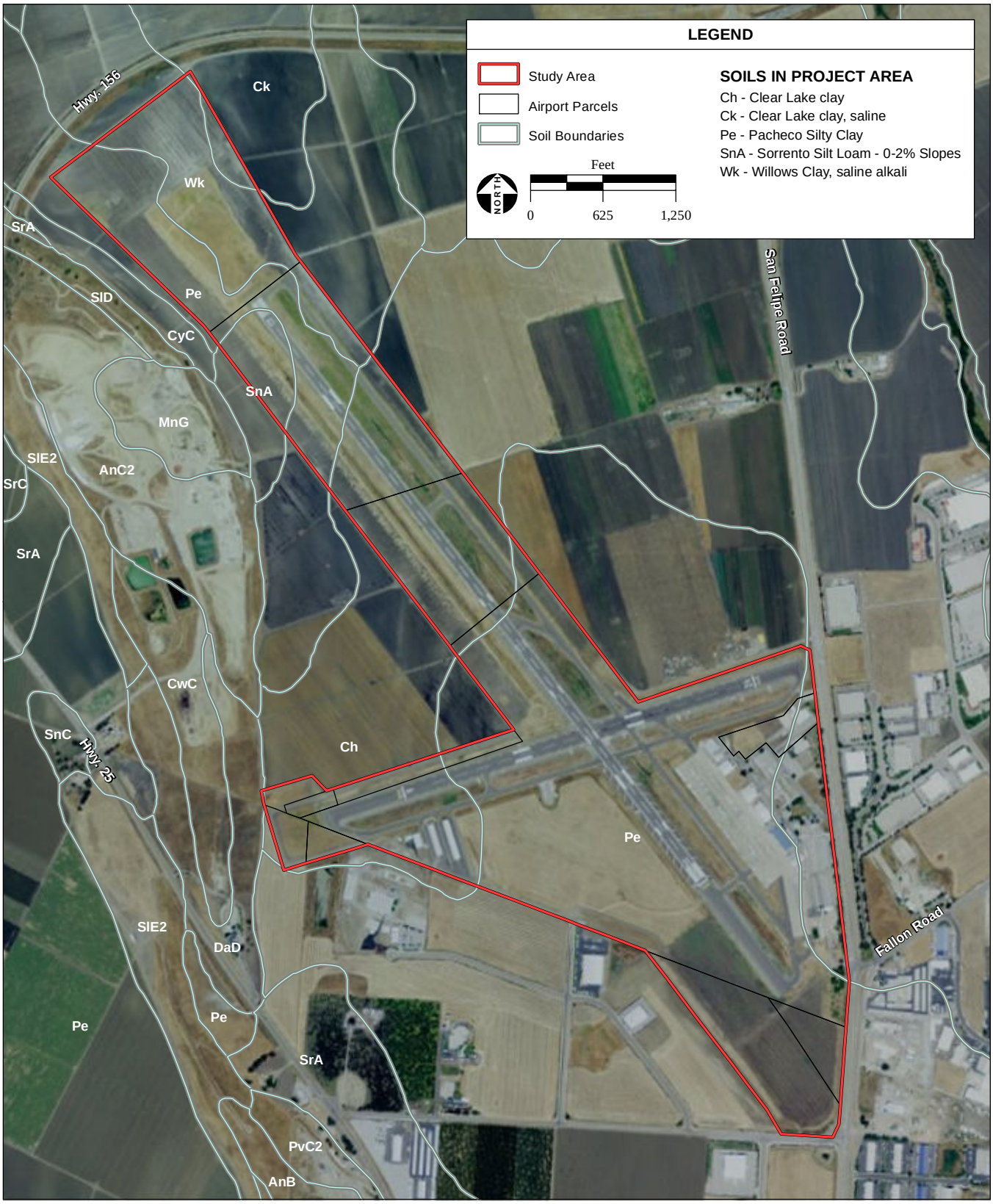
Pacheco silty clay (Pe) (0 to 2 percent) is commonly found in floodplains and is classified as somewhat poorly drained. The depth to the restrictive feature is greater than 80 inches. The parent material is alluvium derived from sedimentary rocks. Similar to the Clear Lake clay series, this soil has a moderately low to moderately high Ksat, which is the ability of the most limiting layer to transmit water. This soil typically has a nonsaline to slightly saline content. This soil is classified as having a high available water capacity of about 0.16 inches (NRCS, 2009).

SORRENTO SILT LOAM SERIES

Similar to both the Clear Lake clay and Pacheco series discussed above, Sorrento silt loam (SnA) (0 to 2 percent slopes) is found in floodplains and fans. However, unlike the other soil series, this soil is classified as well drained. This soil has a depth to restrictive feature of greater than 80 inches. The Ksat for this soil type is listed as moderately high to high. The available water capacity of this soil is classified as high at approximately 11.4 inches (NRCS, 2009).

WILLOWS CLAY SERIES

The Willows clay, saline alkali (Wk) (0 to 2 percent slopes) occurs within basin floors and concave landforms. This soil exhibits hydric soil characteristics as listed on the San Benito County Hydric Soils List (USDA, 2011). The parent material is alluvium derived from sandstone and shale. Similar to the Clear Lake clay and Pacheco series discussed above, this soil is classified as poorly drained. The depth



SOURCE: USDA NRCS Soil Survey Geographic (SSURGO) database for San Benito County, California, 2004-2009; NAIP Aerial Photograph, 6/8/2009; AES, 2011

Figure 4
Soils Map

to a restrictive feature is greater than 80 inches. The Ksat value is described as very low to moderately low. As a result, the available water capacity for this soil is classified as moderate (at approximately 9 inches) (NRCS, 2009).

4.3 HYDROLOGY

The San Benito River flows from the southeast to the northwest through the southern portion of the City of Hollister limits. The San Benito River is the largest tributary of the greater Pajaro River watershed, wherein lies the study area. The Pajaro River watershed has a drainage area of approximately 661 square miles (AES, 2006). The San Benito River begins near the peak of the San Benito Mountains and flows northerly into the Pajaro River. Flow within the San Benito River is generally seasonal.

There are several drainage ditches onsite that carry stormwater runoff away from airport runways into a main engineered drainage ditch near the eastern edge of the study area. From here, stormwater runoff is carried off-site in a roadside drainage ditch that flows outside of the study area to the north along San Felipe Road. This drainage ditch conveys stormwater north until the ditch eventually dissipates at the edge of an agricultural field near the juncture of a dirt farm road.

4.4 NATIONAL WETLANDS INVENTORY

The USFWS National Wetlands Inventory (NWI) online mapper was reviewed to determine if there are any wetlands or other waters of the U.S. previously mapped by the NWI within the study area (USFWS, 2011). There was one wetland feature identified by NWI that occurs within the study area (**Figure 5**). This feature is classified as PUSAx: Palustrine, Unconsolidated shore, Temporarily Flooded, Excavated. **Figure 5** shows this NWI feature near the eastern boundary of the study area, to the east of an airport access road. This area was surveyed during the field visit and it was determined that no wetlands were present. This area contains a low spot located next to a culvert, which indicates that this area likely ponds temporarily due to heavy rainfall events before it drains through the culvert. During the field survey, the soil sampled at this location exhibited hydric characteristics; however, the other primary wetland indicators for vegetation and hydrology were not met. Therefore, this this area was determined to not be a wetland.

5.0 RESULTS

5.1 EXISTING CONDITIONS

The wetland delineation field survey was conducted by AES biologists on April 5, 2011. Along with the majority of northern California, Hollister received above average rainfall during the months of February and March, 2011. Prior to the site visit, there had been steady rainfall the week before. At the time of the site visit, the weather was sunny and clear with a temperature of approximately 55 degrees Fahrenheit (F).

SOURCE: USFWS National Wetlands Inventory, NWIC, NWI-GX, 8/1981;
NAIP Aerial Photograph, 6/8/2009; AES, 2011

Figure 5
National Wetland Inventory

5.2 WETLANDS AND OTHER WATERS OF THE U.S.

The two aquatic feature types identified within the study area include: seasonal wetland and manmade drainage ditch. The wetland delineation data forms completed for the study area are included as **Appendix A.** A list of plant species observed within the project site is included as **Appendix C**. A detailed description of the aquatic habitat types identified within the study area is presented on the following pages. All aquatic features mapped within the study area during the field surveys are shown in the wetland delineation map in **Figure 6**. Features that occur outside of, but adjacent to, the proposed development areas are discussed below and shown on the delineation map for the purpose of documenting avoidance.

SEASONAL WETLAND

An isolated seasonal wetland occurs on the northwest corner of the study area (**Figure 6**). Located at a low point within the study area, the seasonal wetland is composed of Pacheco silty clay (Pe) soil. As discussed under **Section 4.2**, this soil is not included on the NRCS' Hydric Soil List for San Benito County. However, a sample of the soil taken from within the seasonal wetland exhibited hydric characteristics. The primary hydric soil indicator was Redox Dark Surface (F6) (USACE, 2008). There were very few oxidized rhizospheres present (<1 percent) along living roots in the soil sample. The vegetation was not considered hydrophytic since the dominant plant species included upland, grain crop species such as ripgut brome (*Bromus diandrus*), slender wild oat (*Avena barbata*), and barley (*Hordeum murinum*). The seasonal wetland contained ponded water and saturated soils during the April 5, 2011 site visit, which constituted the primary indicators for wetland hydrology.

This isolated, seasonal wetland is located in a field in the northern limits of the study area, significantly far from the airport runways and airport operations/activities. The field is irrigated with reclaimed water and routinely mowed. A well head is located to the east of the wetland, which is used in the irrigation of the field. At the time of the survey, the well was in good condition and did not have any known leaks (Chambless pers.comm., 2011). There had been heavy rainfall in recent weeks prior to the site visit, which was the source of the ponded water in the wetland observed during the survey. Once the seasonal wetland dries out, it is planned to be mowed along with the remainder of the northern field in compliance with FAA standards (Chambless pers. comm.., 2011).

This seasonal wetland was observed to provide a temporary water source for wildlife. At the time of the April 5, 2011 field survey, a few waterfowl were observed along the edges of the seasonal wetland. These species included: black-necked stilt (*Himantopus mexicanus*), mallard (*Anas platyrhynchos*), and an immature green heron (*Butorides virescens*).

MANMADE DRAINAGE DITCH

Several engineered and routinely maintained drainage ditches were observed within the study area (**Figure 6**). The majority of these drainages are located adjacent to airport runways to aid in the

SOURCE: NAIP Aerial Photograph, 6/8/2009; AES, 2011

Figure 6
Wetland Delineation

conveyance of stormwater runoff away from the runways consistent with FAA standards. These ditches did not contain water during the April 5, 2011 site visit. Vegetation observed within the ditches included grain crop species (i.e. alfalfa (*Medicago* sp.) and barley) and non-native invasive species (i.e. yellow star thistle (*Centaurea solstitialis*)). Riparian vegetation was not observed near or within the ditches. As noted in **Section 4.3**, several of the onsite ditches empty into a main engineered drainage ditch located near the eastern edge of the study area that flows outside of the study area to the north along San Felipe Road (**Figure 6**). This drainage ditch conveys stormwater to the north where the ditch eventually dissipates at the edge of an agricultural field near the juncture of a dirt farm road. For purposes of documentation and avoidance, this ditch is shown in **Figure 6** although it occurs outside of the study area. At the time of the site visit, none of the onsite manmade drainage ditches were observed to support aquatic wildlife species but they may provide a temporary water source for terrestrial wildlife during heavy rain events.

6.0 DISCUSSION AND ANALYSIS

6.1 POTENTIALLY JURISDICTIONAL AND NON-JURISDICTIONAL FEATURES

As described in **Section 2.0**, the Rapanos and SWANCC decisions establish limitations on federal jurisdiction over wetlands and other waters. In accordance with USACE guidelines and relevant court decisions, the results of the field survey concluded that there were no features within the study area identified as potentially jurisdictional under the CWA. A brief discussion on why the aquatic features within the study area are likely to be considered non-jurisdictional is presented below.

SEASONAL WETLAND

As noted above, the isolated, seasonal wetland located in the northwestern corner of the study area occurs outside of the airport runways and operations/activities. This seasonal wetland is located at a low point in a field that is regularly irrigated and mowed according to FAA standards. The primary indicators for wetland hydrology within the wetland were saturated soils and the presence of ponded water (**Appendix A**). The likely source of this water is direct rainfall and stormwater runoff from the surrounding hillsides to the west of the study area.

The dominant vegetation observed in the wetland did not include any facultative wetland or obligate plant species; instead, the dominant vegetation included upland plant species. The presence of hydric soils with low permeability in combination with a lack of hydrophytic vegetation suggests that this area commonly collects rainwater but the area does not remain saturated for prolonged periods.

This wetland appears to be an isolated wetland feature per the SWANCC decision. According to the SWANCC decision, wetlands that are non-navigable, isolated, and intrastate may fall outside of USACE jurisdiction. "Wetlands with no apparent surface water connection to perennial rivers and streams, estuaries, or the ocean" are considered to be geographically isolated (Tiner et al., 2002; DOE, 2003).

This seasonal wetland lacks an apparent surface connection to any other waters of the U.S. (e.g., stream or drainage ditch). However, the determination of the jurisdictional status of this feature within the study area is at the discretion of the USACE. The USACE evaluates jurisdictional determinations for isolated wetlands on a case-by case basis.

MANMADE DRAINAGE DITCH

The manmade drainage ditches within the study area are located in the grassy, marginal areas surrounding the airport runways. As noted above, these drainage ditches have been engineered to convey stormwater runoff away from airport runways. Several onsite ditches are connected via onsite culverts while others show evidence of the drainage ditch dissipating within the grassy areas. As stated above, the collective drainage ditch on the eastern edge of the study area flows north along San Felipe Road before terminating at the edge of an agricultural field. This drainage ditch is not connected to any other wetland or drainage feature. Similar to the isolated, seasonal wetland above, the onsite manmade drainage ditches would not be considered jurisdictional due to a lack of a significant nexus to a TNW or other water of the U.S. As noted above, the USACE evaluates jurisdictional determinations for isolated drainages on a case-by-case basis.

6.2 INTERSTATE COMMERCE CONNECTION

As previously mentioned, the seasonal wetland within the study area would likely be classified as an isolated feature according to the SWANCC decision (**Section 6.1**). This feature does not appear to be connected to any TNWs or tributaries of TNWs. It is functionally isolated and is therefore considered non-jurisdictional (upon final approval by the USACE).

The manmade drainage ditches onsite serve to convey stormwater runoff away from the airport runways. These engineered drainage ditches are routinely mowed and their associated culverts are regularly maintained. Several of the drainage ditches within the study area are connected to a single, collective drainage ditch that flows to the north, outside of the study area (**Figure 6**). There is no evidence of connectivity of this drainage ditch to a TNW or other waters of the U.S. or wetlands since the drainage ditch terminates near the end of an agricultural field adjacent to a dirt farm road. For this reason, this feature would not be considered jurisdictional under the CWA (upon final approval by the USACE). The USACE evaluates jurisdictional determinations for the significant nexus standard, as pursuant to the Rapanos decision, on a site-specific basis.

7.0 CONCLUSION

AES biologists conducted a formal delineation of potential waters of the U.S. within the 366± acre study on April 5, 2011. The results of the field survey indicate that there are no jurisdictional features are located within the study area. Field observations and analysis of local hydrology determined that the isolated seasonal wetland and manmade drainage ditches within the study area do not possess a significant nexus to a TNW or other water of the U.S (USACE, 2007). However, note that the

determination of the non-jurisdictional status of these features is at the discretion of the USACE. The USACE evaluates jurisdictional determinations for the significant nexus standard, as pursuant to the Rapanos and SWANCC decisions, on a site-specific basis.

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APPENDICES

APPENDIX A

WETLAND DELINEATION DATA SHEETS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Hollister Airport WD City/County: San Benito Co Sampling Date: 4/5/2011
Applicant/Owner: City of Hollister State: CA Sampling Point: 1
Investigator(s): J. Griggs, K. Bayne Section, Township, Range: S9, 15, T12S, R5E
Landform (hillslope, terrace, etc.): depression / low point Local relief (concave, convex, none): Concave Slope (%): 0-2
Subregion (LRR): LRR-C Lat: — Long: — Datum: —
Soil Map Unit Name: (Pe) Pacheco silty clay NWI classification: ϕ
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation YES, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:
Point taken on eastern edge of study area, adjacent to the east-west oriented runway. Point taken in depression near fence perimeter. This area is not indicative of a wetland.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ϕ)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ϕ)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 1m²)			
1. Avena barbata	10	—	NL
2. Vulpia bromoides	30	DOM	FACU
3. Geranium dissectum	1	—	NL
4. Avena fatua	60	DOM	UPL
5.			
6.			
7.			
8.			
	110 = Total Cover		
Woody Vine Stratum (Plot size: ϕ)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ϕ % Cover of Biotic Crust ϕ

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)
Total Number of Dominant Species Across All Strata: ____ (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:
This area is highly disturbed by regular mowing.

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
5-8	2.5 3/1	100	—	—	—	—	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ϕ

Depth (inches): ϕ

Hydric Soil Present? Yes ____ No X

Remarks:

Soils have clay texture, dark (blackish) color.
This area is disturbed due to the past construction of the jetway.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ **High** Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

point taken in depression along jetway. This area is significantly disturbed as it is mowed regularly.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Hollister Airport WD City/County: San Benito Co. Sampling Date: 4/5/11

Applicant/Owner: City of Hollister State: CA Sampling Point: 2

Investigator(s): J. Griggs, K. Bayne Section, Township, Range: S9, 15, T12N, R5E

Landform (hillslope, terrace, etc.): — Local relief (concave, convex, none): flat Slope (%): 0-2

Subregion (LRR): LRR-C Lat: — Long: — Datum: —

Soil Map Unit Name: (Pe) Pacheco silty clay NWI classification: ϕ

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation Yes, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

pt Next to drainage/culvert on NE side above the two runway crossings.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ϕ)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ϕ)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 1m²)			
1. Lolium multiflorum	50	DOM	NL
2. Avena barbata	50	DOM	NL
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ϕ)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ϕ % Cover of Biotic Crust ϕ

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

The grass was very high at the time of the survey even though this area is regularly mowed.

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5 3/2	98	2.5Y 2.5/1	40	C	M	clay	
0-10	GLEY1 2.5/N	2						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ϕ

Depth (inches): ϕ

Hydric Soil Present? Yes ✓ No ___

Remarks:

(see notes below)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

point taken adjacent to culvert within a low spot. Stormwater runoff likely ponds here temporarily before it drains through the culvert.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Hollister WD City/County: San Benito Co. Sampling Date: 4/5/11

Applicant/Owner: City of Hollister State: CA Sampling Point: 3

Investigator(s): J. Griggs, K. Bayne Section, Township, Range: S9, 15 T12N, R5E

Landform (hillslope, terrace, etc.): — Local relief (concave, convex, none): flat Slope (%): 0-2

Subregion (LRR): LRR-C Lat: — Long: — Datum: —

Soil Map Unit Name: (Pe) Pacheco silty clay NWI classification: ϕ

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation yes, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X

Hydric Soil Present? Yes ____ No X

Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
Not a wetland, probably ponds during large rain events. nearby culvert drains most of the water. Little to No topsoil present. Highly disturbed area between jetway, regularly mowed.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ϕ)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ϕ)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 1m 2)			
1. Eleocharis macrostachya	30	DOM	OBL
2. Geranium dissectum	30	DOM	NL
3. Trifolium fragiferum	5	—	FACU
4. Bromus hordeaceus	20	—	UPL
5.			
6.			
7.			
8.			
	85	= Total Cover	
Woody Vine Stratum (Plot size: ϕ)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust ϕ

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	1	x 4 =	4
UPL species	2	x 5 =	10
Column Totals:	4 (A)		15 (B)

Prevalence Index = B/A = 3.75

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR3/1	100	—	—	—	—	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Compacted fill material

Depth (inches): 2

Hydric Soil Present? Yes ____ No X

Remarks:

Very compacted soil. Difficult to dig soil pit. Fill material comprises the soil. The hard, compacted soil may be why this area ponds during rain events before draining via nearby culvert.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

point taken in between two north-south oriented runways

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Hollister Airport WD City/County: San Benito Co. Sampling Date: 4/5/2011

Applicant/Owner: City of Hollister State: CA Sampling Point: 4

Investigator(s): J. Griggs, K. Bayne Section, Township, Range: S9, 15, T12N, R5E

Landform (hillslope, terrace, etc.): — Local relief (concave, convex, none): flat Slope (%): 0-2

Subregion (LRR): LRR-C Lat: — Long: — Datum: —

Soil Map Unit Name: (Pe) Pacheco silty clay NWI classification: ϕ

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Point taken to southwest of ponded "wetland" area. The ponded area is supplied by an adjacent pipe. Point taken outside of wetland.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ϕ)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ϕ)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 1 m2)			
1. Hordium murinum	35	Dom	NL
2. Bromus diandrus	25	Dom	NL
3. Senecio vulgaris	8	—	NI
4. Cirsium vulgare	1	—	FACU
5. Avena barbata	10	—	NL
6. Sonchus asper	1	—	FAC
7.			
8.			
	76 = Total Cover		
Woody Vine Stratum (Plot size: ϕ)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 24 % Cover of Biotic Crust ϕ

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

Located in margins of airport property. The upland grasses dominated the area and were very tall. This area probably doesn't get mowed as often.

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y 2.5/1		—	—	—	—	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (**A11**)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ϕ

Depth (inches): ϕ

Hydric Soil Present? Yes ____ No ✓

Remarks:

Saturated clay soil. very dark in color. Point located to the southwest of ponded "wetland" area. Pt taken outside wetland.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 8 in

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Lolium multiflorum dominant, likely a recently made wetland. Water source appears to be supplied by a pipe on the east side of the ponded "wetland" area.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Hollister Airport WD City/County: San Benito Co. Sampling Date: 4/5/2011
Applicant/Owner: City of Hollister State: CA Sampling Point: 5
Investigator(s): J. Griggs, K. Bayne Section, Township, Range: S9, 15, T12N, R5E
Landform (hillslope, terrace, etc.): — Local relief (concave, convex, none): flat Slope (%): 0-2
Subregion (LRR): LRR-C Lat: — Long: — Datum: —
Soil Map Unit Name: (Pe) Pacheco silty clay NWI classification: ϕ
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:
point taken inside ponded "wetland" area. The entire field is irrigated with reclaimed water. This ponded area is located near a well head.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ϕ)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ϕ)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1 m²)			
1. Hordeum murinum	30	Dom	UPL
2. Avena barbata	20	Dom	UPL
3. Bromus diandrus	20	Dom	UPL
4.			
5.			
6.			
7.			
8.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: ϕ)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust ϕ

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:
Upland grasses dominant. No wetland indicator species present. This ponded area was likely created recently.

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	5Y 2.5/1	99	5YR 4/6	1	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ϕ

Depth (inches): ϕ

Hydric Soil Present? Yes ✓ No ___

Remarks:

very few oxidized rhizospheres present, only two identified in sample. Sample taken in the upper 5 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 0

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

This wetland is located in a low point on the property. There is a lot of ponded water due to recent rains. This wetland "-ponded area is located near a well head in the north field past the runways.

APPENDIX B

PLANT SPECIES OBSERVED WITHIN THE STUDY AREA

PLANT SPECIES OBSERVED ON SITE

April 5, 2011

Scientific Name	Common Name
AMARANTHACEAE	**AMARANTH FAMILY**
*Amaranthus albus**	Tumbleweed
Amaranthus blitoides	Prostrate amaranth
ANACARDIACEAE	**SUMAC FAMILY**
*Schinus terebinthifolius**	Brazilian pepper tree
*Schinus molle**	Peruvian pepper tree
Toxicodendron diversilobum	Poison oak
APIACEAE	**CARROT FAMILY**
*Anthriscus caucalis**	Bur chervil
Berula erecta	Water parsnip
*Conium maculatum**	Poison-hemlock
*Daucus carota**	Wild carrot
Daucus pusillus	American wild carrot
*Foeniculum vulgare**	Sweet fennel
Sanicula crassicaoulis	Pacific sanicle
*Torilis arvensis**	Torilis (hedge parsley)
ASCLEPIADACEAE	**MILKWEED FAMILY**
Asclepias fascicularis	Narrow-leaf milkweed
Asclepias californica	California milkweed
ASTERACEAE	**SUNFLOWER FAMILY**
Achillea millefolium	Common yarrow
Achyrachaena mollis	Blow wives
Ambrosia acanthicarpa	Annual turweed
Ambrosia psilostachya	Naked-spike ragweed
Anaphallis margaritaceae	Pearly everlasing
*Anthemis cotula**	Mayweed
Arnica species	Arnica
Artemisia tridentata	Big sagebrush
Baccharis pilularis	Coyote Brush
Baccharis salicifolia	Sticky false-willow
*Carduus pycnocephalus**	Italian thistle
*Centaurea iberica**	Iberian knapweed
*Centaurea solstitialis**	Yellow star-thistle
*Chamomilla suaveolens**	Pineapple weed
*Cichorium intybus**	Chicory
Cirsium occidentale	Cobweb thistle
*Cirsium vulgare**	Bull thistle

PLANT SPECIES OBSERVED ON SITE

April 5, 2011

*Conyza bonariensis**	Horseweed
Conyza canadensis	Canada horseweed
*Cotula cornopifolia**	Brass buttons
Crepis species	Hawksbeard
*Gnaphalium luteo-album**	Weedy cudweed
Heliotropium curassavicum	Seaside heliotrope
Hemizonia congesta ssp. *luzulifolia*	Hayfield tarweed
Hemizonia corymbosa ssp. *corymbosa*	Coastal tarweed
Hemizonia pungens ssp. *pungens*	Common tarweed
Heterotheca grandiflora	Telegraph weed
*Hypochaeris glabra**	Smooth cat's-ear
Isocoma aracadenia var. *bracteosa*	Alkali goldenbush
*Lactuca serriola**	Prickly lettuce
Lagophylla species	Lagophylla
Lasthenia glabberrima	Rayless goldfields
Lasthenia species	Goldfields
Microseris douglasii	Douglas' microseris
*Picris echioides**	Bristly oxtongue
*Senecio vulgaris**	Common groundsel
*Silybum marianum**	Milk thistle
*Sonchus asper**	Prickly sowthistle
*Sonchus oleraceus**	Common sowthistle
*Taraxacum officinale**	Common dandelion
Tragopogon species*	Goat's beard
Xanthium spinosum	Spiny cockle-bur
Xanthium strumarium	Rough cockle-bur

BORAGINACEAE	**BORAGE FAMILY**
Amsinckia menziesii	Rancher's fireweed
Cryptantha species	Cryptantha
Heliotropium curassavicum	Seaside heliotrope
Plagiobothyrs undulatus	Coast popcorn-flower

BRASSICACEAE	**MUSTARD FAMILY**
Arabis species	Rock cress
*Brassica rapa**	Field mustard
*Brassica nigra**	Black mustard
*Capsella bursa-pastoris**	Shepherd common purse
*Hirschfeldia incana**	Shortpod mustard
*Lepidium latifolium**	Broad-leaf pepper grass
Lepidium species	Pepper grass
*Raphanus raphanistrum**	Yellow wild radish
*Raphanus sativus**	Purple wild radish
Rorippa curvisiliqua	Yellow cress
Rorippa nasturtium-aquaticum	Water cress

PLANT SPECIES OBSERVED ON SITE

April 5, 2011

Thysanocarpus radians	Fringepod
CAPRIFOLIACEAE	**HONEYSUCKEL FAMILY**
Sambucus mexicana	Blue elderberry
CARYOPHYLLACEAE	**PINK FAMILY**
*Cerastium glomeratum**	Mouse-ear chickweed
*Spergula arvensis**	Spurrey
CHENOPODIACEAE	**GOOSEFOOT FAMILY**
Atriplex lentiformis ssp. *lentiformis*	Big saltbush
*Atriplex semibaccata**	Australian saltbush
Atriplex serenana var. *serenana*	Bractscale
*Beta vulgaris**	Common beet
Chenopodium berlandieri	Pit-seed goosefoot
*Salsola tragus**	Russian thistle
CONVOLVULACEAE	**MORNING-GLORY FAMILY**
*Convolvulus arvensis**	Morning glory
CUCURBITACEAE	**GOURD FAMILY**
Marah fabaceus	Wild cucumber
CYPERACEAE	**SEDGE FAMILY**
Carex species	Sedge
Eleocharis acicularis	Least spikerush
Eleocharis macrostachya	Creeping spikerush
Scirpus pungens	Three square
Scirpus species	Bulrush
EUPHORBIACEAE	**SPURGE FAMILY**
*Chamaesyce maculatum**	Spotted spurge
Eremocarpus setigerus	Turkey mullein
Glycyrrhiza lepidota	Wild licorice
FABACEAE	**LEGUME FAMILY**
Astragalus gambelianus	Dwarf milkvetch
*Lotus corniculatus**	Birdsfoot trefoil
Lupinus microcarpus	Chick lupine
*Medicago polymorpha**	Bur clover
*Melilotus alba**	White sweetclover
*Melilotus indica**	Sweetclover
*Robinia pseudoacacia**	Black locust
Trifolium depauperatum var. *amplectens*	Pale sack clover
*Trifolium fragiferum**	Strawberry clover

PLANT SPECIES OBSERVED ON SITE

April 5, 2011

*Vicia sativa**	Spring vetch
*Vicia villosa**	Winter vetch
FAGACEAE	**OAK FAMILY**
Quercus agrifolia	Coast live oak
Quercus garryana	Oregon white oak
Quercus wislizenii	Interior live oak
FRANKENIACEAE	**FRANKENIA FAMILY**
Frankenia salina	Alkali heath
GERANIACEAE	**GERANIUM FAMILY**
*Erodium botrys**	Filaree
*Erodium cicutarium**	Filaree
*Erodium moschatum**	White-stem filaree
*Geranium dissectum**	Cut-leaf geranium
*Geranium molle**	Hairy geranium
HAMEMELIDACEAE	**WITCH-HAZEL FAMILY**
*Liquidambar styraciflua**	Sweetgum
HIPPOCASTANACEAE	**BUCKEYE FAMILY**
Aesculus californica	California buckeye
HYDROPHYLLACEAE	**WATERLEAF FAMILY**
Nemophila species	Baby blue eyes
Phacelia species	Phacelia
ISOETACEAE	**QUILLWORT FAMILY**
Isoetes species	Quillwort
JUGLANDACEAE	**WALNUT FAMILY**
Juglans californica	California black walnut
*Juglans regia**	English walnut
JUNCACEAE	**RUSH FAMILY**
Juncus bufonius	Toad rush
*Juncus capitatus**	Capped rush
Juncus species	Rush
LAMIACEAE	**MINT FAMILY**
*Marrubium vulgare**	Common horehound
Pogogyne species	Mesamint
Scutellaria tuberosa	Common skullcap
Stachys ajugoides	Hedge-nettle

PLANT SPECIES OBSERVED ON SITE

April 5, 2011

Trichostema lanceolatum	Vinegar weed
LEMNACEAE	**DUCKWEED FAMILY**
Lemna species	Duckweed
LILIACEAE	**LILY FAMILY**
Brodiaea species	Brodiaea
Triteleia hyacinthina	White brodiaea
Triteleia laxa	Ithurial's spear
LYTHRACEAE	**LOOSESTRIFE FAMILY**
*Lythrum hyssopifolia**	Hyssop loosestrife
*Lythrum tribracteatum**	Three-bracted loosestrife
MALVACEAE	**MALLOW FAMILY**
*Malva neglecta**	Common mallow
*Malva parviflora**	Cheeseweed
Malvella leprosa	Alkali-mallow
MORACEAE	**MULBERRY FAMILY**
*Ficus carica**	Fig
MYRTACEAE	**MYRTLE FAMILY**
Eucalyptus species	Eucalyptus
ONAGRACEAE	**EVENING PRIMROSE FAMILY**
Camissonia ovata	Sun cup
Epilobium brachycarpum	Panicled willow-herb
Epilobium ciliatum	Slender willow-herb
Ludwigia peploides ssp. peploides	Water primrose
PAPAVERACEAE	**POPPY FAMILY**
Eschscholzia californica	California poppy
PINACEAE	**PINE FAMILY**
Pinus sabiniana	Gray pine
PLANTAGINACEAE	**PLANTAIN FAMILY**
*Plantago coronopus**	Cut-leaf plantain
Plantago erecta	Plantain
*Plantago lanceolata**	English plantain
*Plantago major**	Broad-leaf plantain
POACEAE	**GRASS FAMILY**
*Aira caryophyllea**	Hairgrass

PLANT SPECIES OBSERVED ON SITE

April 5, 2011

Alopecurus saccatus	Pacific foxtail
*Avena barbata**	Slender wild oat
*Avena fatua**	Wild oat
*Briza minor**	Little quaking grass
Bromus carinatus	California brome
*Bromus diandrus**	Ripgut brome
*Bromus hordeaceus**	Soft brome
*Bromus trinii**	Chilean chess
*Crypsis schoenoides**	Swamp grass
*Cynodon dactylon**	Bermuda grass
Deschampsia danthonioides	Annual hairgrass
Distichlis spicata	Inland saltgrass
Elymus glaucus	Blue wild-rye
*Gastridium ventricosum**	Nit grass
Hordeum brachyantherum	Meadow barley
*Hordeum marinum**	Mediterranean barley
*Hordeum murinum**	Barley
Leymus triticoides	Creeping wildrye
*Lolium multiflorum**	Ryegrass
Nassella pulchra	Purple needle grass
*Phalaris aquatica**	Harding grass
*Phalaris canariensis**	Common canary grass
Phalaris lemmonii	Lemon's canary grass
*Phalaris minor**	Littleseed canary grass
*Poa annua**	Annual bluegrass
*Polypogon interruptus**	Beard grass
*Polypogon monspeliensis**	Annual rabbit-foot grass
*Taeniatherum caput-medusae**	Medusa-head grass
*Triticum aestivum**	Cultivated wheat
*Vulpia bromoides**	Brome fescue
*Vulpia myuros**	Rat-tail vulpia
POLYGONACEAE	**BUCKWHEAT FAMILY**
Eriogonum fasciculatum var. *polifolium*	California buckwheat
*Polygonum arenastrum**	Prostrate knotweed
*Rumex acetosella**	Sheep sorrel
*Rumex crispus**	Curly dock
*Rumex pulcher**	Fiddle dock
PORTULACACEAE	**PURSLANE FAMILY**
*Portulaca oleraceae**	Common purslane
Claytonia perfoliata ssp. *mexicana*	Miner's lettuce
PRIMULACEAE	**PRIMROSE FAMILY**
*Anagallis arvensis**	Scarlet pimpernel

PLANT SPECIES OBSERVED ON SITE

April 5, 2011

ROSACEAE	**ROSE FAMILY**
Heteromeles arbutifolia	Toyon
Rosa californica	California rose
RUBIACEAE	**MADDER FAMILY**
Galium species	Bedstraw
SALICACEAE	**WILLOW FAMILY**
Populus fremontii	Fremont cottonwood
Salix exigua	Sandbar willow
Salix hindsiana	Sandbar willow
Salix laevigata	Red willow
Salix lasiolepis	Arroyo willow
SCROPHULARIACEAE	**FIGWORT FAMILY**
*Bellardia trixago**	Mediterranean Lineseed
Castilleja exserta	Purple owl's clover
Castilleja species	Paintbrush
Mimulus guttatus	Common large monkey-flower
Triphysaria eriantha	Butter and eggs
Veronica americana	American brooklime
SOLANACEAE	**NIGHTSHADE FAMILY**
*Nicotiana glauca**	Tree tobacco
Petunia parviflora	Wild petunia
Solanum umbelliferum	Blue witch
TYPHACEAE	**CATTAIL FAMILY**
Typha domingensis	Southern cattail
URTICACEAE	**NETTLE FAMILY**
Urtica dioica	Stinging nettle
VERBENACEAE	**VERVAIN FAMILY**
Phyla nodiflora	Common frog-fruit
ZYGOPHYLLACEAE	**CALTROP FAMILY**
*Tribulus terrestris**	Puncture vine

APPENDIX C

SITE PHOTOS TAKEN ON APRIL 5, 2011

PHOTO 1: View south of manmade drainage ditch that runs off-site to the north along San Felipe Road.

PHOTO 2: View north of isolated, seasonal wetland located on the northern limits of the project site.

PHOTO 3: View east of isolated, seasonal wetland.

PHOTO 4: View west of isolated, seasonal wetland. A well head used for irrigation is shown in the foreground.

PHOTO 5: View north of a depression adjacent to a culvert in a highly disturbed area near runway D. There were no primary wetland indicators identified at this location.

PHOTO 6: View north of a depression between the two north-south orriented runways. This is a manmade depression with culverts at both the north and south end. There were no primary wetland indicators identified at this location.

SOURCE: AES, 2011

APPENDIX E

Cultural Resources Survey Report

Confidential

HOLLISTER MUNICIPAL AIRPORT MASTER DRAINAGE PLAN PROJECT

Cultural Resources Survey Report

Prepared for
C&S Companies
2020 Camino Del Rio North, Suite 100
San Diego, CA 92108

June 2011

Confidential

HOLLISTER MUNICIPAL AIRPORT MASTER DRAINAGE PLAN PROJECT

Cultural Resources Survey Report

Prepared for
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2020 Camino Del Rio North, Suite 100
San Diego, CA 92108

June 2011

Prepared by
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Tampa

Woodland Hills

Project No. D210758.00

STATEMENT OF CONFIDENTIALITY

This report contains confidential cultural resources location information; report distribution should be restricted to those with a need to know. Cultural resources are nonrenewable, and their scientific, cultural, and aesthetic values can be significantly impaired by disturbance. To deter vandalism, artifact hunting, and other activities that can damage cultural resources, the locations of cultural resources should be kept confidential. The legal authority to restrict cultural resources information is in California Government Code Section 6254.10 and the National Historic Preservation Act of 1966, as amended, Section 304.

SUMMARY OF FINDINGS

This Cultural Resources Survey Report (CRSR) has been prepared at the request of C&S Companies in support of an Initial Study/Mitigated Negative Declaration for the City of Hollister. The CRSR documents the methods and findings of the cultural resources background research and survey conducted for the Hollister Municipal Airport Master Drainage Plan Project (Project).

This study has been conducted in accordance with professional research and reporting standards established in compliance with the California Environmental Quality Act (CEQA).

The proposed Project is a Master Drainage Plan to provide the Airport with improvements which meet Federal Aviation Administration (FAA) design standard criteria and to enhance the operating safety conditions at the Airport. The Project is needed to upgrade the conditions of the existing airport drainage system to comply with FAA design standards for Runway Safety Areas (RSA) based on FAA Advisory Circular (AC) 150/5300-13 *Airport Design* for grading and slope requirements. The CEQA Area of Potential Effects (C-APE) for the Project includes all areas of proposed ground-disturbing activity for installation of drainage facilities and infrastructure. The horizontal extent of the C-APE totals approximately 30 acres. The C-APE also includes a vertical component, as grading and culvert/pipe installation would occur below the ground surface to a depth of as much as six feet.

Background research was conducted for the Project, including a search of the records kept at the Northwest Information Center of the California Historical Resources Information System, and a search of the Sacred Lands File maintained by the Native American Heritage Commission (NAHC). Although no previously recorded resources were identified within the C-APE, the background research suggested the possibility of both prehistoric and historic-era archaeological resources.

On January 14, 2011, ESA Archaeologist Candace Ehringer, RPA, conducted an intensive pedestrian survey of all unpaved surfaces within the entire Project C-APE. Parallel transects, spaced 15-20 meters apart, were walked across all open ground. No cultural materials were observed within the Project C-APE.

The proposed Project would have no significant impacts on known cultural resources that qualify as historical resources or unique archaeological resources pursuant to CEQA Guidelines Section 15064.5. However, surface visibility during the survey was low in some areas, making complete surface examination difficult and survey results inconclusive. In addition, buried archaeological resources do not always manifest themselves on the surface. Consequently, archaeological materials can be revealed unexpectedly during earth-moving activities. Mitigation measures are included in this report to reduce the impacts of such an inadvertent discovery to a less than significant level.

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Hollister Municipal Airport Master Drainage Plan Project Cultural Resources Survey Report

Introduction

This Cultural Resources Survey Report (CRSR) was prepared at the request of C&S Companies in support of an Initial Study/Mitigated Negative Declaration for the City of Hollister. The CRSR documents the methods and findings of the cultural resources background research and survey conducted for the Hollister Municipal Airport Master Drainage Plan Project (Project). The proposed Project is a Master Drainage Plan (MDP) to provide the Airport with improvements which meet Federal Aviation Administration (FAA) design standard criteria and to enhance the operating safety conditions at the Airport.

This study has been conducted in accordance with professional research and reporting standards established in compliance with the California Environmental Quality Act (CEQA). The purpose of this study was to:

- identify cultural resources, including prehistoric and historic-period archaeological resources, buildings, structures, and places of importance to Native Americans located within the project area;
- preliminarily evaluate cultural resources according to the criteria set forth by the California Register of Historical Resources (CRHR);
- determine whether the proposed project would have an impact on potentially-significant cultural resources; and
- recommend procedures for avoidance or mitigation of impacts to potentially-significant cultural resources.

This report was completed by ESA archaeologists Jennifer Bowden, B.A. and Heidi Koenig, Registered Professional Archaeologist (RPA). ESA archaeologist Candace Ehringer, M.A. conducted the field survey, and W. Brad Brewster, M.A. served as Project Manager. All archaeologists have at least 12 years of experience and meet the Secretary of the Interior's Professional Qualification Standards for archaeology. Mr. Brewster meets the Standards for architectural history.

Project Location and Setting

The Project is located on Hollister Municipal Airport property, on the north side of the City of Hollister, in San Benito County, California. Hollister Municipal Airport is located within the incorporated limits of the City of Hollister, and is shown on the San Felipe 7.5-minute USGS topographic quadrangle, Township 12 South, Range 15 East, in an unsectioned portion of the Bolsa de San Felipe land grant (**Figures 1 and 2**).

The City of Hollister is located within the Hollister Valley, defined by the alluvial floodplain of Santa Ana Creek and the San Benito River. The overall topography of the region is flat, with a gradual slope to the north and northwest. The average elevation of the Project area is approximately 225 feet above mean sea level. Santa Ana Creek is located approximately 0.5

miles east of the Hollister Municipal Airport, and the Flint Hills begin to slope up about one mile to the west of the Airport.

Project Purpose and Description

The purpose of the proposed Project at Hollister Municipal Airport is to provide the Airport with improvements which meet FAA design standard criteria and to enhance the operating safety conditions at the Airport. The Project is needed to upgrade the conditions of the existing Airport drainage system to comply with FAA design standards for Runway Safety Areas (RSA) based on FAA Advisory Circular (AC) 150/5300-13 *Airport Design* for grading and slope requirements. The MDP was designed to accommodate run-off from a 15-year storm event, thereby providing a more conservative development criteria than the 5-year event drainage mandated by the FAA.

The MDP includes drainage facilities and suggested Best Management Practices (BMPs) for conveying the storm water flows across the post-Project property. The required drainage facilities were designed for the flow rates anticipated under ultimate development of the Airport property.

Drainage facilities for the MDP would include swales, culverts, and pipes to convey flows to the north and northwest away from critical airport facilities, and infiltration basins to allow flows to recharge the underlying aquifer. Areas adjacent to both runways would be re-graded and equipped with storm drains and/or catch basins to direct flows. Vegetated bio-filter swales would be installed within re-graded areas and in other areas of overland storm water flows to slow the velocity of sheet flow and allow filtering of potential pollutants, including sediment. BMPs would include measures during all phases of development to protect surface and ground water quality by minimizing potential pollutants (including sediment) in storm water runoff. In addition, a total of six, small infiltration basins would be constructed immediately outside the airport property boundaries.

CEQA-Area of Potential Effects

The definition of the Project area [also called the CEQA Area of Potential Effects (C-APE)] is modeled after that of the federal Area of Potential Effects defined in 36 CFR 800.16(d):

> The [C-] APE is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historical resources (i.e., CRHR - eligible resources), if any such properties exist. The [C-] APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

The C-APE for the Project includes all areas of proposed ground-disturbing activity for installation of drainage facilities and infrastructure. Because the locations of individual elements of the MDP are not currently staked or otherwise indicated on the ground, all unpaved areas adjacent to both sides of both runways were considered the C-APE for the purposes of field survey, as shown on **Figure 3**. The horizontal extent of the C-APE totals approximately 30 acres. The C-APE also includes a vertical component, as grading and culvert/pipe installation would occur below the ground surface to a depth of as much as six feet.

Because the Project would result in no direct or indirect changes to any buildings or structures within or adjacent to the Hollister Municipal Airport property, recordation and evaluation of built-environment historic-period resources are considered to be beyond the scope of the field survey and this report, and are not included within the C-APE. If Project plans change to include modifications to any existing building or structure, a separate architectural survey and evaluation may be required.

Regulatory Context

The State of California implements the National Historic Preservation Act (NHPA) of 1966, as amended, through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation (DPR), implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historical Resources Inventory. The State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the state's jurisdictions.

California Environmental Quality Act

CEQA, as codified in Public Resources Code (PRC) Sections 21000 et seq., is the principal statute governing the environmental review of projects in the state. CEQA requires lead agencies to determine if a proposed project would have a significant effect on historical resources, including archaeological resources. The CEQA Guidelines define a historical resource as: (1) a resource in the California Register of Historical Resources (CRHR); (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 and CEQA Guidelines Section 15064.5 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site may meet the threshold of PRC Section 21083 regarding unique archaeological resources. A unique archaeological resource is "an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3) Is directly associated with a scientifically recognized important prehistoric or historic event or person" (PRC Section 21083.2 [g]).

The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064[c][4]).

California Register of Historical Resources

The CRHR is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility to the CRHR are based on National Register of Historic Places (NRHP) criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the CRHR, including California properties formally determined eligible for or listed in the NRHP.

To be eligible for the CRHR a historical resource must be significant at the local, state, and/or federal level under one or more of the following criteria:

1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

2) Is associated with the lives of persons important in our past;

3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or,

4) Has yielded, or may be likely to yield, information important in prehistory or history (PRC Section 5024.1[c]).

For a resource to be eligible for the CRHR, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. A resource that does not retain sufficient integrity to meet the NRHP criteria may still be eligible for listing in the CRHR.

Local Regulations

City of Hollister General Plan

The City of Hollister General Plan was adopted in December of 2005, and provides a comprehensive land use plan through the year 2023. The Land Use and Community Design Element of the General Plan includes the following goals and policies relevant to cultural resources:

Goal LU 1: Maintain and enhance Hollister's small town agricultural valley culture and identity. Organize and design the City with an attractive and positive image.

Policy LU1.2: Historical Preservation Ordinance. Supplement the existing Historical Preservation Ordinance with an inventory and designation of potential sites and structures of architectural, historic, archeological and cultural significance.*

Policy LU1.3: Design Review. Require proposals for residential and non-residential development projects adjacent to designated landmarks to undergo design review.

Policy LU1.4: Historical Building Code. Adopt a Historical Building Code that exceeds state standards.

Goal LU8: Maintain the stability of existing neighborhoods.

Policy LU8.2: Historic Neighborhoods. Ensure that existing historical neighborhoods remain intact by prohibiting incompatible uses and development types.

* Effective November 1, 2010, the City of Hollister adopted Ordinance No. 1067 to repeal and replace Title 15.16 of the Municipal Code, now known as the Historic Resources Ordinance.

Historic Resources Ordinance

According to the City of Hollister Historic Resources Ordinance (Title 15.16 of the Municipal Code, adopted November 1, 2010), an improvement, building, structure, sign, feature, site, scenic area, view or vista, place, area or other object can be designated a historic resource if it meets the criteria for listing on the National Register of Historic Places, state register, or one or more of the following:

> A. It exemplifies or reflects special elements of the city's cultural, social, economic, political, aesthetic, engineering, architectural or natural history;
>
> B. It is identified with persons or events significant in local, state or national history;
>
> C. It embodies distinctive characteristics of a style, type, period or method of construction or is a valuable example of the use of indigenous materials or craftsmanship;
>
> D. It is representative of the work of a notable builder, designer or architect;
>
> E. It contributes to the significance of a historic area, being a geographically definable area possessing a concentration of historic or scenic properties or thematically related grouping of properties which contribute to each other and are unified aesthetically by plan or physical development;
>
> F. It has a unique location or singular physical characteristic or is a view or vista representing an established and familiar visual feature of a neighborhood, community or the city:
>
> G. It embodies elements of architectural design, detail, materials or craftsmanship that represent a significant structural or architectural achievement or innovation;

H. It is similar to other distinctive properties, sites, areas or objects based on a historic, cultural or architectural motif;

I. It reflects significant geographical patterns, including those associated with different eras of settlement and growth, particular transportation modes or distinctive examples of park or community planning;

J. It is one of the few remaining examples in the city, region, state or nation possessing distinguishing characteristics of an architectural or historical type of specimen.

The Ordinance also provides criteria and procedures for designating historic districts; the composition, powers and duties of the Historic Resources Commission; and permitting requirements for alteration, demolition, or adaptive re-use of historic resources (City of Hollister 2010).

Study Methods

Records Search and Literature Review

Research Methods

A records search was conducted for the Project at the Northwest Information Center (NWIC) of the California Historical Resources Information System on January 3, 2011 by Heidi Koenig, M.A., RPA with ESA. The purpose of the records search was to (1) determine whether known cultural resources have been recorded within or adjacent to the C-APE; (2) assess the likelihood for unrecorded cultural resources to be present based on historical references and the distribution of nearby sites; and (3) develop a context for the identification and preliminary evaluation of cultural resources. The records search consisted of an examination of the following documents:

- **NWIC base maps:** (USGS San Felipe 7.5-minute topographic maps), to identify recorded cultural resources within a 0.5-mile radius of the C-APE.

- **NWIC base maps:** (USGS San Felipe 7.5-minute topographic maps), to identify reports from studies conducted within a 0.5-mile radius of the C-APE.

- **Resource Inventories:** *California Inventory of Historical Resources, California Historical Landmarks, Historic Properties Directory Listing by City* (through October 5, 2010)

- **Prehistoric Archaeology:** T.L. Jones and K.A. Klar (2007) *Prehistoric California: Colonization, Culture, and Complexity.* AltaMira Press.

- **Ethnographic Sources:** Richard Levy (1978) *Costanoan*. In Handbook of North American Indians, Vol. 8, California. Robert F. Heizer, ed. Smithsonian Institution, Washington, D.C.; Randall Milliken (1995*) A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769-1810*. Ballena Press, Menlo Park, CA.

- **Historic Maps:** An extensive on-line historic map collection with over 300 maps and views of California and San Benito County is available online at http://davidrumsey.com; 1923 Hollister 15-minute USGS topographic quadrangle

Records Search Results

The records search indicated that eight cultural resources studies have been completed within the 0.5-mile records search radius around the Project C-APE (**Table 2**). These previous investigations resulted in survey coverage of less than five percent of the Project area for a linear investigation of sewer line improvements (PAR Environmental Services 1992). The entire 0.5-mile records search study area has been surveyed with approximately 20 percent coverage.

TABLE 2.
CULTURAL RESOURCES STUDIES WITHIN OR ADJACENT TO THE PROJECT AREA

Study No.	Title	Author	Year
S-005222	Archaeological Impact Evaluation: San Felipe Division, Central Valley Project, Part 1. The Southern Santa Clara Valley, California: A General Plan for Archaeology	Thomas F. King and Patricia P. Hickman	1973
S-005228	Preliminary Archaeological Reconnaissance and Historical Overview of the Proposed Hollister Sewer Project, Hollister, San Benito County, California	Gary S. Breschini, Trudy Haversat, and Glory Anne Laffey	1980
S-014418	Cultural Resources Investigation of the Proposed Area-Wide Sanitary Sewer Project, City of Hollister, San Benito County, California	PAR Environmental Services, Inc.	1992
S-020089	Archaeological Field Inspection of the Proposed Hollister Industrial Park, Hollister, San Benito County, California (letter report)	Miley Paul Holman, Holman & Associates	1998
S-022424	Preliminary Archaeological Reconnaissance of Assessor's Parcel Number 051-012-019, Hollister, San Benito County, California	Mary Doane and Trudy Haversat, Archaeological Consulting	1999
S-022425	Preliminary Archaeological Reconnaissance of Assessor's Parcel Number 019-030-015, Hollister, San Benito County, California	Mary Doane and Trudy Haversat, Archaeological Consulting	1999
S-022728	Cultural Resources Inventory for the California Department of Forestry and Fire Protection, Hollister Air Attack Base Relocation Project, San Benito County, California	PAR Environmental Services, Inc.	2000
S-030235	A Reply to Your Concerns on the Hollister to Gilroy 4-Lane Project (letter report addressed to Ms. Jacquelin Jensen Kehl)	Caltrans District 5	2000

One cultural resource has been recorded within the 0.5-mile records search radius, although a cluster of four additional resources was noted not far outside the search radius boundary. These resources were included in the background analysis in order to form a more thorough overview of the range of potential cultural resources within the Project C-APE. The five previously recorded resources that were identified in the Project vicinity include two historic-period sites and three prehistoric isolated artifacts (**Table 3**).

TABLE 3
CULTURAL RESOURCES WITHIN 0.5-MILE RADIUS OF THE PROJECT AREA

Primary	Trinomial	Age	Description	Location
P-35-000297**	(none)	Unknown Prehistoric	Isolated stone mortar	~1 mile northwest of C-APE
P-35-000339	(none)	1942-1946	Foundation and structures associated with Naval Auxiliary Air Station, Hollister	South side of airport property, adjacent to but outside of C-APE
P-35-000361**	(none)	Unknown Prehistoric	Isolated fragment of sandstone pestle	~0.7 miles west-northwest of C-APE
P-35-000394**	(none)	Early to Mid-20th Century	Trash scatter from single dumping incident	~1 mile northwest of C-APE
P-35-000395**	(none)	Unknown Prehistoric	Isolated fragment of granitic pestle	~0.9 miles northwest of C-APE

*These resources are located just outside the 0.5-mile records search radius, but were included in the background analysis.

The 1923 Hollister topographic quadrangle map shows no buildings or structures in the C-APE. Hollister Airport Hangar #6 is listed in the Historic Properties Directory for San Benito County. This building, located on the southeast side of the runway intersection (more than 100 feet outside of the C-APE), was built in 1940. It has been determined ineligible for listing in the NRHP through an evaluation in accordance with Section 106 of the NHPA; however, it has not been evaluated for state or local significance (OHP, 2010).

Based on the known resources in the area, the historic-period Naval Auxiliary Air Station structures (P-35-000339) and Hangar #6 are likely to be visible from the C-APE; however, no prehistoric or historic-period resources have been recorded within the Project C-APE.

The background research performed for the Project suggests that both prehistoric and historic-period cultural resources may be encountered within the C-APE. Prehistoric camp sites or other use areas could be identified by the presence of culturally darkened soils ("midden"), concentrations of shell or faunal bone, and flaked or ground stone artifacts. Isolated stone artifacts could also be identified. Historic-period resources, including trash scatters and structural foundations or remains, would likely be related to early activities at the airport property.

Organizational Contacts

A sacred lands search request was submitted to the Native American Heritage Commission (NAHC) on January 28, 2011. As of the date of this report, no response has yet been received from the NAHC.

Context

Natural Environment

The Project is located within the Santa Ana Creek floodplain, part of Hollister Valley. The average elevation of the Project area is approximately 225 feet above mean sea level. Santa Ana Creek is located approximately 0.5 miles east of the Hollister Municipal Airport, and the Flint

Hills begin to slope up about one mile to the west of the Airport. The entire ground surface within the Project C-APE has been disturbed by previous agricultural activities and grading associated with the Airport.

The Project area is situated within an annual grassland vegetative community. The dominant grass species are non-native, including wild oats, soft chess, broam, and fescue. Russian thistle (tumbleweed) and several broad-leafed herbaceous species were also noted. Agricultural parcels are located adjacent to the Project C-APE, with strawberries and other row crops under cultivation. Areas currently graded for drainage or water retention support hydrophytic vegetation typical of small seasonal wetlands. Wildlife species observed or expected in the Project vicinity include ground squirrels, rabbits, burrowing owls, and other bird species adapted to human-influenced habitats such as rock doves and crows.

Geoarchaeological Context

Soils within the Project area primarily consist of Clear Lake clay and Pacheco silty clay, both derived from alluvial weathering of sedimentary rocks (NRCS, 2011). The alluvial sediments on the floor of the Hollister Valley are estimated to be between seven and nine feet thick, and have been deposited over the Mesozoic-age sedimentary bedrock during the past 9,000 or so years (National Atlas, 2011). Previous archaeological investigations in the general Project vicinity have noted that prehistoric archaeological sites have been found buried under two to three feet of alluvial sediment, with no surface manifestations (Breschini, Haversat and Laffey 1980).

Prehistory

Archaeologists have developed individual cultural chronological sequences tailored to the archaeology and material culture of each subregion of California. Each of these sequences is based principally on the presence of distinctive cultural traits and stratigraphic separation of deposits. A framework for the interpretation of the San Francisco Bay Area is provided by Milliken et al. (2007), who have divided human history in California into three broad periods: the Early Period, the Middle Period, and the Late Period. Economic patterns, stylistic aspects, and regional phases further subdivide cultural patterns into shorter phases. This scheme uses economic and technological types, socio-politics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

The *Paleoindian Period* (13,500 to 10,000 before present [B.P.]) was characterized by big-game hunters occupying broad geographic areas. Evidence of human habitation during the *Paleoindian Period* has not yet been discovered in the San Francisco Bay Area. During the *Lower Archaic* of the *Early Period* (10,000 to 5500 B.P.), geographic mobility continued and is characterized by the millingslab and handstone as well as large wide-stemmed and leaf-shaped projectile points. The first cut shell beads and the mortar and pestle are documented in burials during the *Middle Archaic* of the *Early Period* (5500 to 2500 B.P.), indicating the beginning of a shift to sedentism. During the *Middle Period*, which includes the *Lower Middle Period* (*Initial Upper Archaic*; 2500 to 1570 B.P.), and *Upper Middle Period* (*Late Upper Archaic*; 1570 to 950 B.P.), geographic mobility may have continued, although groups began to establish longer-term base camps in localities from which a more diverse range of resources could be exploited. The first

rich black middens are recorded from this period. The addition of milling tools, obsidian and chert concave-base projectile points, and the occurrence of sites in a wider range of environments suggest that the economic base was more diverse. By the *Upper Middle Period*, mobility was being replaced by the development of numerous small villages. Around 1570 B.P. a "dramatic cultural disruption" occurred evidenced by the sudden collapse of the *Olivella* saucer bead trade network. During the *Initial Late Period* (*Lower Emergent*; 950 to 450 B.P.), social complexity developed toward lifeways of large, central villages with resident political leaders and specialized activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched projectile points, and a diversity of beads and ornaments.

Archaeological Research in the Vicinity

Relatively little archaeological excavation has been conducted in the Hollister Valley compared to other areas of California. A general archaeological overview of the south Santa Clara Valley was completed by King and Hickman (1973), resulting in an early archaeological sensitivity map of the region. Subsequent survey and overview work along the Monterey Coast, including the Project area, suggested refinements to King and Hickman's sensitivity map based on the excavation of CA-SBN-14, a prehistoric occupation and burial site with no surface manifestation (Breschini and Haversat 1978a, 1978b, and 1979). Discovered in the 1940s, CA-SBN-14 was buried beneath approximately 75 cm of alluvial floodplain sediment, leading Breschini and Haversat to conclude that sites may be present in areas shown as "low probability" on King and Hickman's sensitivity map.

Ethnography

At the time of Euroamerican contact, the Project area and vicinity were inhabited by speakers of Mutsun, one of eight Utian-family languages spoken by the Ohlone people. Ohlone territory included a region from San Francisco Bay south to the Salinas River, including coastal and inland areas (Levy, 1978). Each linguistic branch of the Ohlone occupied a discrete territory of several villages with an average population of about 200.

Fresh and saltwater fish and shellfish, as well as local plants, provided food sources for the Mutsun (Kroeber, 1925). Acorns were a primary plant food source, with oak groves in Mutsun territory visited on a seasonal basis for acorn collecting and processing.

Mutsun-speaking villages were generally situated along rivers and creeks, especially at confluences. The Mutsun-speaking villages of Ausayma and Mutsun were located in the vicinity of Mission San Juan Bautista, about seven miles to the west of the City of Hollister (Milliken, 1995).

History

The following historical overview is condensed from previous research by Glory Anne Laffey in Breschini, Haversat, and Laffey (1980), and PAR Environmental Services (2000).

Several Spanish expeditions crossed the San Benito Valley in the late 18th century. The Project area and surrounding vicinity were part of the lands claimed by the Mission San Juan Bautista,

established in 1797 near a location known to the local Mutsun inhabitants as *Popeloutchom*. In addition to planting orchards and field crops, the Mission brought herds of cattle and sheep to graze the rich valley bottomlands of the San Benito River and Santa Ana Creek floodplains. By 1810 the herds had grown to the extent that the Mission began to engage in the trade of hides and tallow with ships that arrived at port in Monterey. The Mutsun and other Ohlone groups who were brought to labor on the Mission lands suffered from previously unknown diseases to which they had no natural immunity and death rates at the Mission were high.

The Missions were secularized by the Mexican government in 1933 and the lands entrusted to prominent citizens. The Mission San Juan Bautista lands were administered and divided by Jose Tiburcio Castro into several grants, including the Rancho Bolsa de San Felipe. This Rancho, which contains the Project area, was given in 1840 to Francisco Perez Pacheco. Pacheco continued to run cattle on much of the land until selling it in 1857 to a group of four local businessmen, including his son-in-law. The land was further subdivided in 1871, with the land that would eventually become the Hollister Airport contained in "Lot R."

The economy of the region remained focused on cattle and sheep ranching, with increasing experimentation in wheat and other grain crops, orchards, and vegetable row crops during the late 1800s and early 1900s. The City of Hollister was established in 1868, when prosperous local sheep rancher Colonel William Welles Hollister sold his 21,000 acres of the Rancho San Justo to the San Justo Homestead Association. This group, formed by 50 local farmers and investors, parceled the land into 172-acre lots, with 100 acres left over for the town of Hollister.

By 1870, the Southern Pacific Railroad had begun a branch line from Gilroy to Hollister. The arrival of the railroad made transportation of crops much faster, although high freight costs led many Hollister-area farmers to switch from long-storage, low-profit grain to fruit orchards and row crops with a shorter storage life and a higher profit margin. Portions of the former Bolsa de San Felipe land grant were less well suited to horticulture, due to alkaline soils and poor drainage, and the Project area remained as cattle grazing land until it was sold to the Chamber of Commerce in 1928 for the purpose of creating an airfield.

The Project area may have been used as a landing strip as early as 1925; however, formal airport buildings and paved runways are not plotted on historic maps until approximately 1940. Between 1942 and 1946, the airport served as a Naval Auxiliary Air Station (NAAS) for fleet air training and munitions storage during WWII. Upon decommissioning of the NAAS in 1946, the grounds surrounding the airport returned to agricultural use. The airport itself has remained in operation for civil aviation purposes since this time.

Field Methods

On January 14, 2011, ESA Archaeologist Candace Ehringer, RPA, conducted an intensive pedestrian survey of all unpaved surfaces within the entire Project C-APE. Parallel transects, spaced 15-20 meters apart, were walked across all open ground. Runways and taxiways were not examined due to safety constraints and because pavement prevented observations of any surfaces that might contain cultural materials. Surface visibility on unpaved surfaces ranged from poor to

fair, with extensive grass coverage at the north end of the Project area restricting ground surface visibility to zero percent. Animal burrows and other areas of high visibility were intensively examined for cultural remains. Soils observed throughout the Project area were brown-gray loam with small pebbles. Due to previous agricultural uses and modifications for the Airport, it is estimated that soils within the C-APE have been previously disturbed to a depth of at least 10 inches. The six proposed off-site infiltration basins were not surveyed as they were located on private properties that were not accessible to the surveyor. In addition, because these areas were in active agricultural cultivation at the time of the on-airport survey, ground visibility would have been restricted to zero percent.

Study Findings

Field Survey Summary

No cultural materials were observed within the Project C-APE. One of the buildings recorded as part of P-35-000339 was observed in a field outside the C-APE; however, the scope of the Project does not warrant inclusion of built-environment resources.

Conclusions and Recommendations

Neither the archival search nor the field reconnaissance resulted in the identification of prehistoric or historic-era archaeological resources within the C-APE. The proposed Project would have no significant impacts on known archaeological resources that qualify as historical resources or unique archaeological resources pursuant to CEQA Guidelines Section 15064.5.

However, surface visibility during the survey was low in some areas, making complete surface examination difficult and survey results inconclusive. In addition, buried archaeological resources do not always manifest themselves on the surface, as much of the archaeological record for the region has likely been buried beneath alluvial deposits by erosion and depositional processes typical of this area, especially over the past 9,000 years. Consequently, archaeological materials can be revealed unexpectedly during earth-moving activities.

Therefore, the possibility still exists for the discovery of such resources as a result of proposed Project activities. Potential features or artifacts indicative of prehistoric or ethnohistoric occupation could include, but are not limited to: hearths or scatters of fire-affected rock, midden soils or shell deposits, lithic reduction flakes and cores, projectile points or other flaked-stone tools, and bedrock or portable milling stations and handstones. Unreported historic-era archaeological remains could also occur, especially buried features such as building foundations, privies, root cellars, or trash dumps. Damage or destruction of a potentially CRHR-eligible cultural resource would be a significant impact. The following measure is provided in the event that an inadvertent discovery occurs during construction.

> **Mitigation Measure 1: Cease Work if Subsurface Cultural Resources are Discovered During Ground-Disturbing Activities.** If cultural materials are encountered during ground-disturbing activities within the Project C-APE, all activity in the vicinity of the find shall cease until it can be evaluated by a professional archaeologist. If the archaeologist

determines that the resource(s) may be significant, the City of Hollister's Historic Resources Commission (HRC) shall be notified and will develop an appropriate treatment plan for the resource(s). The HRC shall consult with the Native American representatives identified by the NAHC in determining appropriate treatment for unearthed cultural resources if the materials are associated with Native American cultural traditions.

In considering any suggested measures proposed by the archaeologist in order to mitigate impacts to cultural resources, the HRC will determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) will be instituted. Work may proceed on other parts of the Project C-APE while treatment plans for cultural resources are being developed and implemented.

Effects to Human Remains

There is no indication, either from the archival research results or the pedestrian field survey, that any particular location in the C-APE has been used for human burial purposes in the recent or distant past. Therefore, it is unlikely that human remains would be encountered during construction of the proposed Project. However, the possibility of inadvertent discovery cannot be completely discounted, and would result in a potentially significant impact. The following measure is provided in the event that an inadvertent discovery occurs during construction.

Mitigation Measure 2: Halt Work if Human Remains are Identified During Construction. If human remains are uncovered during ground-disturbing activities within the Project C-APE, work in the vicinity of the find will immediately halt. An appropriate Project representative will contact the San Benito County Coroner to evaluate the remains. If the County Coroner determines that the remains are Native American in origin, the Project representative will contact the NAHC, in accordance with Health and Safety Code Section 7050.5, subdivision (c), and Public Resources Code 5097.98 (as amended by AB 2641). The NAHC will assign a Most Likely Descendant (MLD). Per Public Resources Code 5097.98, the Project representative and Airport officials shall ensure that the immediate vicinity of the find is not damaged or disturbed by further development activities until the Project representative has discussed and conferred with the MLD regarding their recommendations, taking into account the possibility of multiple human remains.

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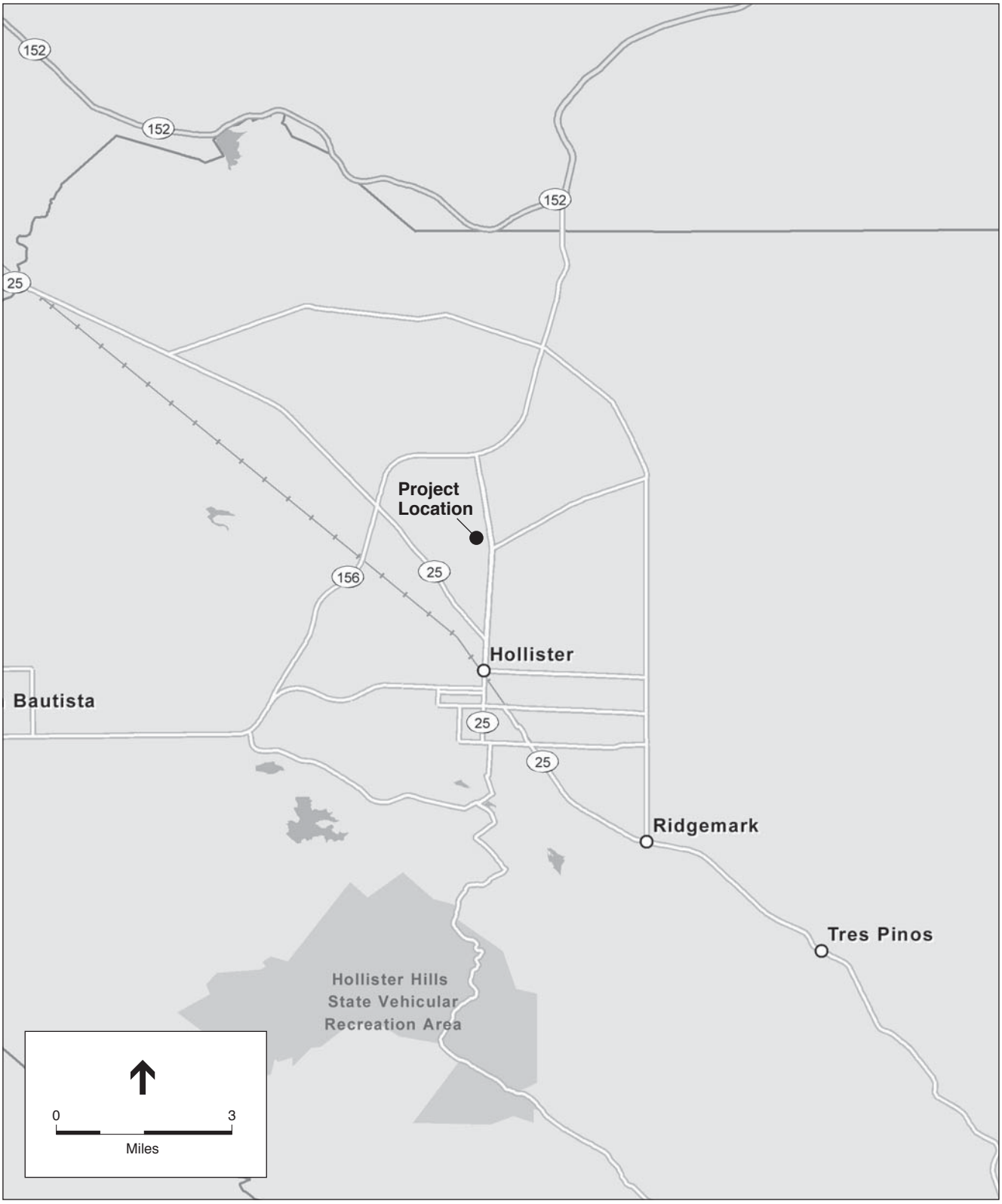
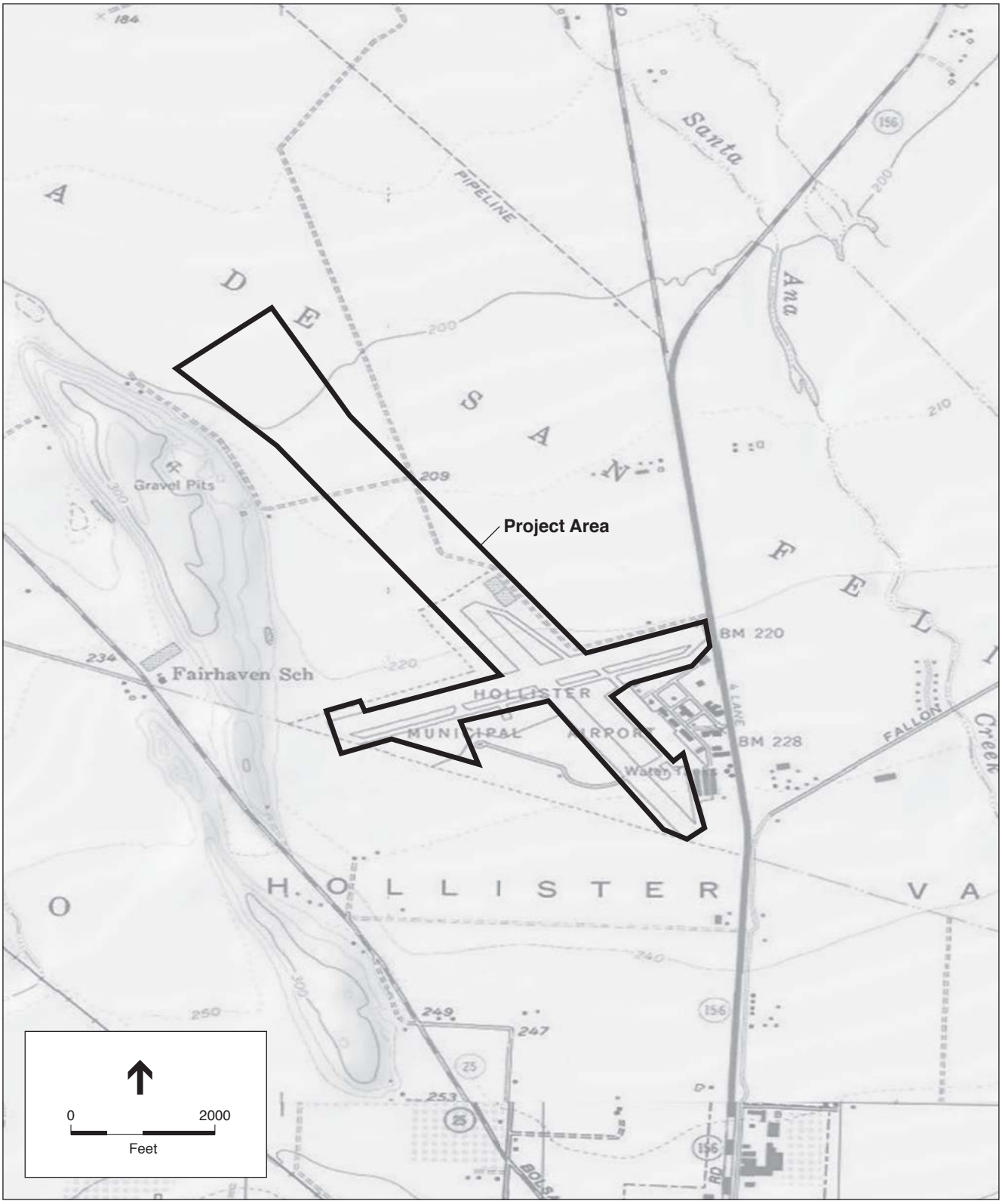
FIGURES



Hollister Municipal Airport Master Drainage Plan Project . 210758

SOURCE: ESRI, 2011

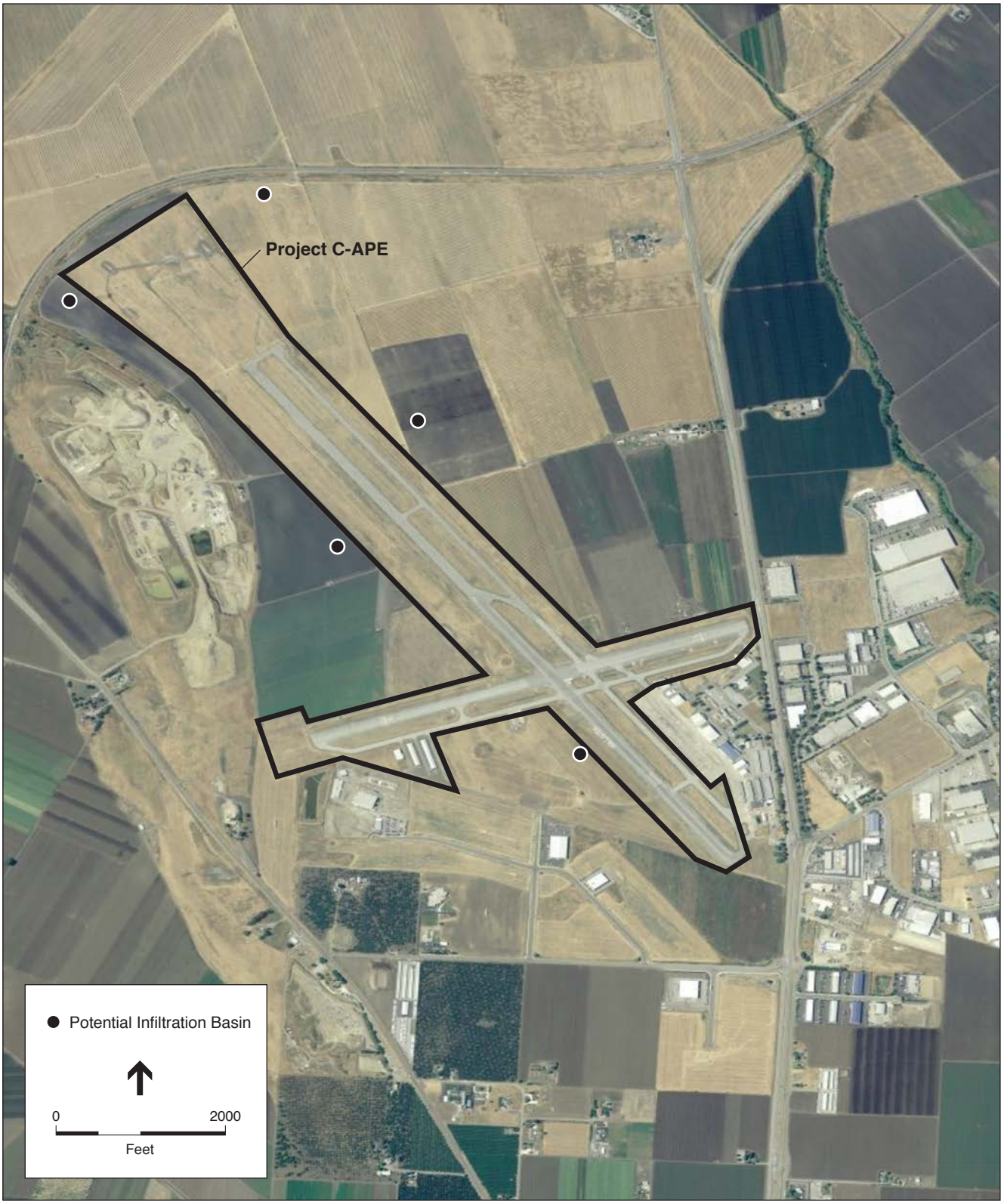
Figure 1
Project Vicinity Map



SOURCE: USGS; ESRI, 2011

Hollister Municipal Airport Master Drainage Plan Project . 210758

Figure 2
Project Location Map



SOURCE: ESRI, 2011

Hollister Municipal Airport Master Drainage Plan Project . 210758

Figure 3
C-APE Map

CORRESPONDENCE

Additional Information

California Native Americans
Cultural Resources
Strategic Plan
Commissioners
Federal Laws and Codes
State Laws and Codes
Local Ordinances and Codes
Additional Information
Return to CNAHC Home Page

Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION
915 Capitol Mall, RM 364
Sacramento, CA 95814
(916) 653-4082
(916) 657-5390 – Fax
nahc@pacbell.net

Information Below is Required for a Sacred Lands File Search

Project: Hollister Municipal Airport MDP

County San Benito

USGS Quadrangle

Name San Felipe

Township 12S Range 15E Section(s) unsectioned - Bolsa de San Felipe

Company/Firm/Agency: ESA

Contact Person: Jennifer Bowden

Street Address: 225 Bush St., Suite 1700

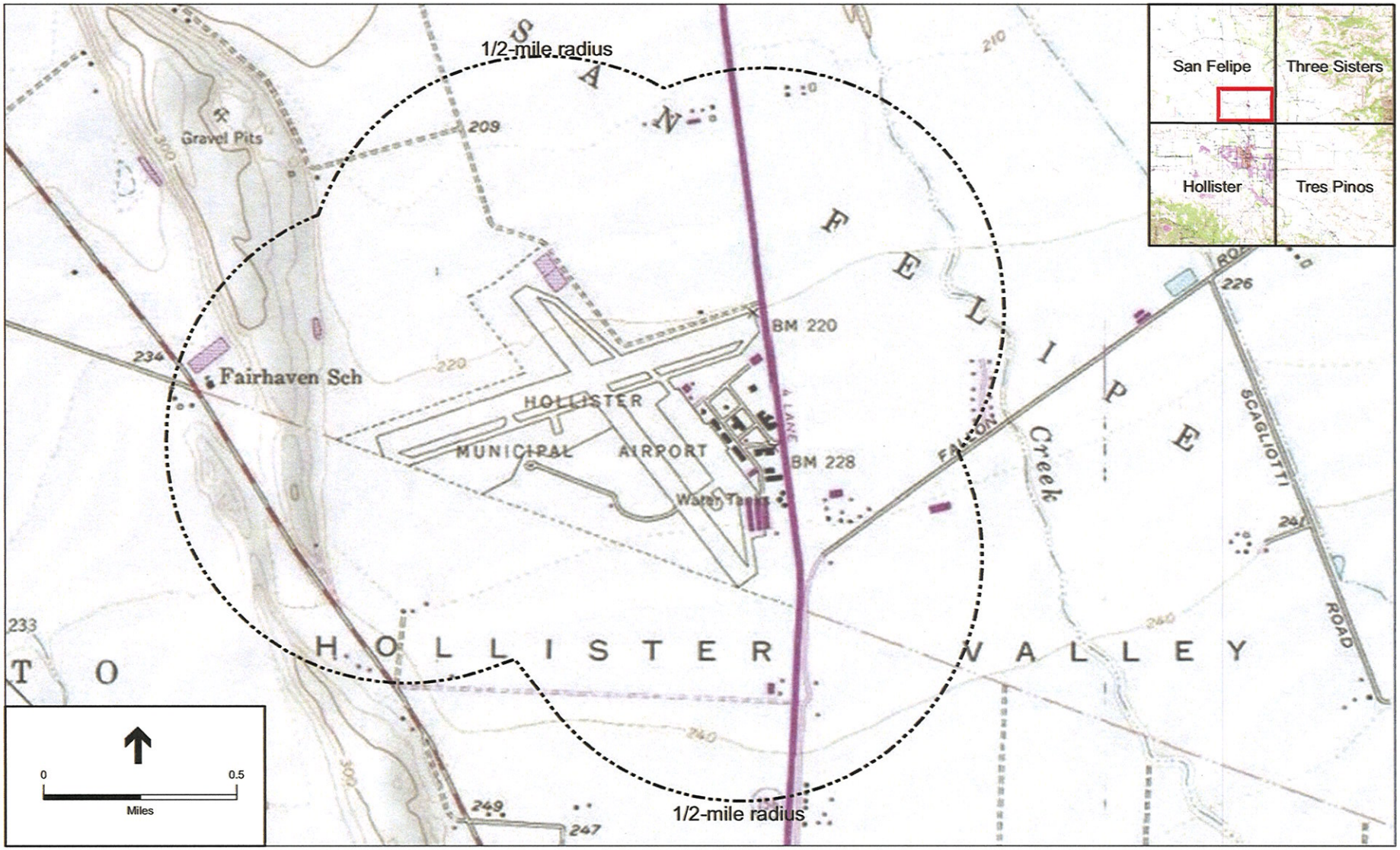
City: San Francisco, CA Zip: 94104

Phone: (415) 896-5900

Fax: (415) 896-0332

Email: jbowden@esassoc.com

Project Description: Master Drainage Plan (MDP) for Hollister Airport - grading & installation of culverts, pipes, swales for drainage improvements.



SOURCE: USGS San Felipe, California 7.5-minute quadrangle

Hollister Airport . 210758

Figure 1

Project Location

APPENDIX F

BMP Data Sheets

Pervious Pavements SD-20

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Pervious paving is used for light vehicle loading in parking areas. The term describes a system comprising a load-bearing, durable surface together with an underlying layered structure that temporarily stores water prior to infiltration or drainage to a controlled outlet. The surface can itself be porous such that water infiltrates across the entire surface of the material (e.g., grass and gravel surfaces, porous concrete and porous asphalt), or can be built up of impermeable blocks separated by spaces and joints, through which the water can drain. This latter system is termed 'permeable' paving. Advantages of pervious pavements is that they reduce runoff volume while providing treatment, and are unobtrusive resulting in a high level of acceptability.

Approach

Attenuation of flow is provided by the storage within the underlying structure or sub base, together with appropriate flow controls. An underlying geotextile may permit groundwater recharge, thus contributing to the restoration of the natural water cycle. Alternatively, where infiltration is inappropriate (e.g., if the groundwater vulnerability is high, or the soil type is unsuitable), the surface can be constructed above an impermeable membrane. The system offers a valuable solution for drainage of spatially constrained urban areas.

Significant attenuation and improvement in water quality can be achieved by permeable pavements, whichever method is used. The surface and subsurface infrastructure can remove both the soluble and fine particulate pollutants that occur within urban runoff. Roof water can be piped into the storage area directly, adding areas from which the flow can be attenuated. Also, within lined systems, there is the opportunity for stored runoff to be piped out for reuse.

Suitable Applications

Residential, commercial and industrial applications are possible. The use of permeable pavement may be restricted in cold regions, arid regions or regions with high wind erosion. There are some specific disadvantages associated with permeable pavement, which are as follows:

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- Permeable pavement can become clogged if improperly installed or maintained. However, this is countered by the ease with which small areas of paving can be cleaned or replaced when blocked or damaged.

- Their application should be limited to highways with low traffic volumes, axle loads and speeds (less than 30 mph limit), car parking areas and other lightly trafficked or non-trafficked areas. Permeable surfaces are currently not considered suitable for adoptable roads due to the risks associated with failure on high speed roads, the safety implications of ponding, and disruption arising from reconstruction.

- When using un-lined, infiltration systems, there is some risk of contaminating groundwater, depending on soil conditions and aquifer susceptibility. However, this risk is likely to be small because the areas drained tend to have inherently low pollutant loadings.

- The use of permeable pavement is restricted to gentle slopes.

- Porous block paving has a higher risk of abrasion and damage than solid blocks.

Design Considerations

Designing New Installations

If the grades, subsoils, drainage characteristics, and groundwater conditions are suitable, permeable paving may be substituted for conventional pavement on parking areas, cul de sacs and other areas with light traffic. Slopes should be flat or very gentle. Scottish experience has shown that permeable paving systems can be installed in a wide range of ground conditions, and the flow attenuation performance is excellent even when the systems are lined.

The suitability of a pervious system at a particular pavement site will, however, depend on the loading criteria required of the pavement.

Where the system is to be used for infiltrating drainage waters into the ground, the vulnerability of local groundwater sources to pollution from the site should be low, and the seasonal high water table should be at least 4 feet below the surface.

Ideally, the pervious surface should be horizontal in order to intercept local rainfall at source. On sloping sites, pervious surfaces may be terraced to accommodate differences in levels.

Design Guidelines

The design of each layer of the pavement must be determined by the likely traffic loadings and their required operational life. To provide satisfactory performance, the following criteria should be considered:

- The subgrade should be able to sustain traffic loading without excessive deformation.

- The granular capping and sub-base layers should give sufficient load-bearing to provide an adequate construction platform and base for the overlying pavement layers.

- The pavement materials should not crack of suffer excessive rutting under the influence of traffic. This is controlled by the horizontal tensile stress at the base of these layers.

There is no current structural design method specifically for pervious pavements. Allowances should be considered the following factors in the design and specification of materials:

- Pervious pavements use materials with high permeability and void space. All the current UK pavement design methods are based on the use of conventional materials that are dense and relatively impermeable. The stiffness of the materials must therefore be assessed.
- Water is present within the construction and can soften and weaken materials, and this must be allowed for.
- Existing design methods assume full friction between layers. Any geotextiles or geomembranes must be carefully specified to minimize loss of friction between layers.
- Porous asphalt loses adhesion and becomes brittle as air passes through the voids. Its durability is therefore lower than conventional materials.

The single sized grading of materials used means that care should be taken to ensure that loss of finer particles between unbound layers does not occur.

Positioning a geotextile near the surface of the pervious construction should enable pollutants to be trapped and retained close to the surface of the construction. This has both advantages and disadvantages. The main disadvantage is that the filtering of sediments and their associated pollutants at this level may hamper percolation of waters and can eventually lead to surface ponding. One advantage is that even if eventual maintenance is required to reinstate infiltration, only a limited amount of the construction needs to be disturbed, since the sub-base below the geotextile is protected. In addition, the pollutant concentration at a high level in the structure allows for its release over time. It is slowly transported in the stormwater to lower levels where chemical and biological processes may be operating to retain or degrade pollutants.

The design should ensure that sufficient void space exists for the storage of sediments to limit the period between remedial works.

- Pervious pavements require a single size grading to give open voids. The choice of materials is therefore a compromise between stiffness, permeability and storage capacity.
- Because the sub-base and capping will be in contact with water for a large part of the time, the strength and durability of the aggregate particles when saturated and subjected to wetting and drying should be assessed.
- A uniformly graded single size material cannot be compacted and is liable to move when construction traffic passes over it. This effect can be reduced by the use of angular crushed rock material with a high surface friction.

In pollution control terms, these layers represent the site of long term chemical and biological pollutant retention and degradation processes. The construction materials should be selected, in addition to their structural strength properties, for their ability to sustain such processes. In general, this means that materials should create neutral or slightly alkaline conditions and they should provide favorable sites for colonization by microbial populations.

Construction/Inspection Considerations

- Permeable surfaces can be laid without cross-falls or longitudinal gradients.
- The blocks should be lain level
- They should not be used for storage of site materials, unless the surface is well protected from deposition of silt and other spillages.
- The pavement should be constructed in a single operation, as one of the last items to be built, on a development site. Landscape development should be completed before pavement construction to avoid contamination by silt or soil from this source.
- Surfaces draining to the pavement should be stabilized before construction of the pavement.
- Inappropriate construction equipment should be kept away from the pavement to prevent damage to the surface, sub-base or sub-grade.

Maintenance Requirements

The maintenance requirements of a pervious surface should be reviewed at the time of design and should be clearly specified. Maintenance is required to prevent clogging of the pervious surface. The factors to be considered when defining maintenance requirements must include:

- Type of use
- Ownership
- Level of trafficking
- The local environment and any contributing catchments

Studies in the UK have shown satisfactory operation of porous pavement systems without maintenance for over 10 years and recent work by Imbe et al. at 9th ICUD, Portland, 2002 describes systems operating for over 20 years without maintenance. However, performance under such regimes could not be guaranteed, Table 1 shows typical recommended maintenance regimes:

Table 1 Typical Recommended Maintenance Regimes	
Activity	**Schedule**
■ Minimize use of salt or grit for de-icing ■ Keep landscaped areas well maintained ■ Prevent soil being washed onto pavement	Ongoing
■ Vacuum clean surface using commercially available sweeping machines at the following times: - End of winter (April) - Mid-summer (July / August) - After Autumn leaf-fall (November)	2/3 x per year
■ Inspect outlets	Annual
■ If routine cleaning does not restore infiltration rates, then reconstruction of part of the whole of a pervious surface may be required. ■ The surface area affected by hydraulic failure should be lifted for inspection of the internal materials to identify the location and extent of the blockage. ■ Surface materials should be lifted and replaced after brush cleaning. Geotextiles may need complete replacement. ■ Sub-surface layers may need cleaning and replacing. ■ Removed silts may need to be disposed of as controlled waste.	As needed (infrequent) Maximum 15-20 years

Permeable pavements are up to 25 % cheaper (or at least no more expensive than the traditional forms of pavement construction), when all construction and drainage costs are taken into account. (Accepting that the porous asphalt itself is a more expensive surfacing, the extra cost of which is offset by the savings in underground pipework etc.) (Niemczynowicz, et al., 1987)

Table 1 gives US cost estimates for capital and maintenance costs of porous pavements (Landphair et al., 2000)

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Cost Considerations

Permeable pavements are up to 25 % cheaper (or at least no more expensive than the traditional forms of pavement construction), when all construction and drainage costs are taken into account. (Accepting that the porous asphalt itself is a more expensive surfacing, the extra cost of which is offset by the savings in underground pipework etc.) (Niemczynowicz, et al., 1987)

Table 2 gives US cost estimates for capital and maintenance costs of porous pavements (Landphair et al., 2000)

Table 2 Engineer's Estimate for Porous Pavement

Porous Pavement													
Item	Units	Price	Cycles/ Year	Quant. 1 Acre WS	Total	Quant. 2 Acre WS	Total	Quant. 3 Acre WS	Total	Quant. 4 Acre WS	Total	Quant. 5 Acre WS	Total
Grading	SY	$2.00		604	$1,208	1209	$2,418	1812	$3,624	2419	$4,838	3020	$6,040
Paving	SY	$19.00		212	$4,028	424	$8,056	636	$12,084	848	$16,112	1060	$20,140
Excavation	CY	$3.60		201	$724	403	$1,451	604	$2,174	806	$2,902	1008	$3,629
Filter Fabric	SY	$1.15		700	$805	1400	$1,610	2000	$2,300	2800	$3,220	3600	$4,140
Stone Fill	CY	$16.00		201	$3,216	403	$6,448	604	$9,664	806	$12,896	1008	$16,128
Sand	CY	$7.00		100	$700	200	$1,400	300	$2,100	400	$2,800	500	$3,500
Sight Well	EA	$300.00		2	$600	3	$900	4	$1,200	7	$2,100	7	$2,100
Seeding	LF	$0.05		644	$32	1288	$64	1932	$97	2576	$129	3220	$161
Check Dam	CY	$35.00		0	$0	0	$0	0	$0	0	$0	0	$0
Total Construction Costs					**$10,105**		**$19,929**		**$29,619**		**$40,158**		**$49,798**
Construction Costs Amortized for 20 Years					**$505**		**$996**		**$1,481**		**$2,008**		**$2,490**
Annual Maintenance Expense													
Item	Units	Price	Cycles/ Year	Quant. 1 Acre WS	Total	Quant. 2 Acre WS	Total	Quant. 3 Acre WS	Total	Quant. 4 Acre WS	Total	Quant. 5 Acre WS	Total
Sweeping	AC	$250.00	6	1	$1,500	2	$3,000	3	$4,500	4	$6,000	5	$7,500
Washing	AC	$250.00	6	1	$1,500	2	$3,000	3	$4,500	4	$6,000	5	$7,500
Inspection	MH	$20.00	5	5	$100	5	$100	5	$100	5	$100	5	$100
Deep Clean	AC	$450.00	0.5	1	$225	2	$450	3	$675	3.9	$878	5	$1,125
Total Annual Maintenance Expense					**$3,960**		**$7,792**		**$11,651**		**$15,483**		**$19,370**

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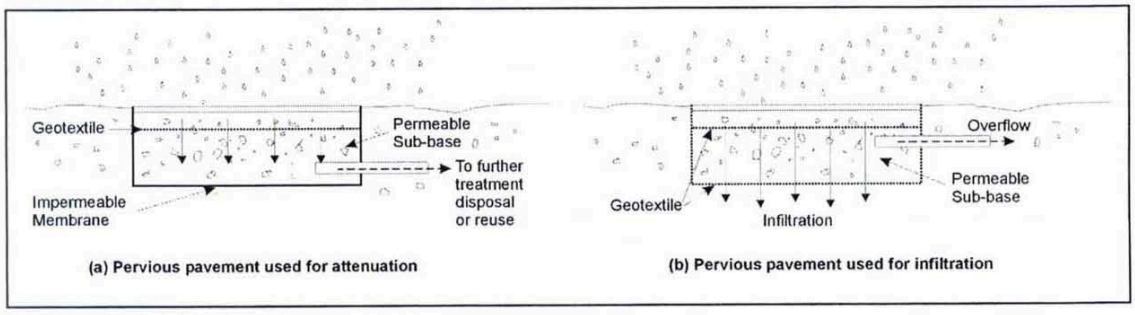

Schematics of a Pervious Pavement System

Infiltration Basin TC-11

Design Considerations

- Soil for Infiltration
- Slope
- Aesthetics

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■

Legend *(Removal Effectiveness)*

● Low ■ High

▲ Medium

Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins use the natural filtering ability of the soil to remove pollutants in stormwater runoff. Infiltration facilities store runoff until it gradually exfiltrates through the soil and eventually into the water table. This practice has high pollutant removal efficiency and can also help recharge groundwater, thus helping to maintain low flows in stream systems. Infiltration basins can be challenging to apply on many sites, however, because of soils requirements. In addition, some studies have shown relatively high failure rates compared with other management practices.

California Experience

Infiltration basins have a long history of use in California, especially in the Central Valley. Basins located in Fresno were among those initially evaluated in the National Urban Runoff Program and were found to be effective at reducing the volume of runoff, while posing little long-term threat to groundwater quality (EPA, 1983; Schroeder, 1995). Proper siting of these devices is crucial as underscored by the experience of Caltrans in siting two basins in Southern California. The basin with marginal separation from groundwater and soil permeability failed immediately and could never be rehabilitated.

Advantages

- Provides 100% reduction in the load discharged to surface waters.
- The principal benefit of infiltration basins is the approximation of pre-development hydrology during which a

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significant portion of the average annual rainfall runoff is infiltrated and evaporated rather than flushed directly to creeks.

- If the water quality volume is adequately sized, infiltration basins can be useful for providing control of channel forming (erosion) and high frequency (generally less than the 2-year) flood events.

Limitations

- May not be appropriate for industrial sites or locations where spills may occur.
- Infiltration basins require a minimum soil infiltration rate of 0.5 inches/hour, not appropriate at sites with Hydrologic Soil Types C and D.
- If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated prior to infiltration to protect groundwater quality.
- Not suitable on fill sites or steep slopes.
- Risk of groundwater contamination in very coarse soils.
- Upstream drainage area must be completely stabilized before construction.
- Difficult to restore functioning of infiltration basins once clogged.

Design and Sizing Guidelines

- Water quality volume determined by local requirements or sized so that 85% of the annual runoff volume is captured.
- Basin sized so that the entire water quality volume is infiltrated within 48 hours.
- Vegetation establishment on the basin floor may help reduce the clogging rate.

Construction/Inspection Considerations

- Before construction begins, stabilize the entire area draining to the facility. If impossible, place a diversion berm around the perimeter of the infiltration site to prevent sediment entrance during construction or remove the top 2 inches of soil after the site is stabililized. Stabilize the entire contributing drainage area, including the side slopes, before allowing any runoff to enter once construction is complete.
- Place excavated material such that it can not be washed back into the basin if a storm occurs during construction of the facility.
- Build the basin without driving heavy equipment over the infiltration surface. Any equipment driven on the surface should have extra-wide ("low pressure") tires. Prior to any construction, rope off the infiltration area to stop entrance by unwanted equipment.
- After final grading, till the infiltration surface deeply.
- Use appropriate erosion control seed mix for the specific project and location.

Performance

As water migrates through porous soil and rock, pollutant attenuation mechanisms include precipitation, sorption, physical filtration, and bacterial degradation. If functioning properly, this approach is presumed to have high removal efficiencies for particulate pollutants and moderate removal of soluble pollutants. Actual pollutant removal in the subsurface would be expected to vary depending upon site-specific soil types. This technology eliminates discharge to surface waters except for the very largest storms; consequently, complete removal of all stormwater constituents can be assumed.

There remain some concerns about the potential for groundwater contamination despite the findings of the NURP and Nightingale (1975; 1987a,b,c; 1989). For instance, a report by Pitt et al. (1994) highlighted the potential for groundwater contamination from intentional and unintentional stormwater infiltration. That report recommends that infiltration facilities not be sited in areas where high concentrations are present or where there is a potential for spills of toxic material. Conversely, Schroeder (1995) reported that there was no evidence of groundwater impacts from an infiltration basin serving a large industrial catchment in Fresno, CA.

Siting Criteria

The key element in siting infiltration basins is identifying sites with appropriate soil and hydrogeologic properties, which is critical for long term performance. In one study conducted in Prince George's County, Maryland (Galli, 1992), all of the infiltration basins investigated clogged within 2 years. It is believed that these failures were for the most part due to allowing infiltration at sites with rates of less than 0.5 in/hr, basing siting on soil type rather than field infiltration tests, and poor construction practices that resulted in soil compaction of the basin invert.

A study of 23 infiltration basins in the Pacific Northwest showed better long-term performance in an area with highly permeable soils (Hilding, 1996). In this study, few of the infiltration basins had failed after 10 years. Consequently, the following guidelines for identifying appropriate soil and subsurface conditions should be rigorously adhered to.

- Determine soil type (consider RCS soil type 'A, B or C' only) from mapping and consult USDA soil survey tables to review other parameters such as the amount of silt and clay, presence of a restrictive layer or seasonal high water table, and estimated permeability. The soil should not have more than 30% clay or more than 40% of clay and silt combined. Eliminate sites that are clearly unsuitable for infiltration.

- Groundwater separation should be at least 3 m from the basin invert to the measured ground water elevation. There is concern at the state and regional levels of the impact on groundwater quality from infiltrated runoff, especially when the separation between groundwater and the surface is small.

- Location away from buildings, slopes and highway pavement (greater than 6 m) and wells and bridge structures (greater than 30 m). Sites constructed of fill, having a base flow or with a slope greater than 15% should not be considered.

- Ensure that adequate head is available to operate flow splitter structures (to allow the basin to be offline) without ponding in the splitter structure or creating backwater upstream of the splitter.

- Base flow should not be present in the tributary watershed.

Secondary Screening Based on Site Geotechnical Investigation

- At least three in-hole conductivity tests shall be performed using USBR 7300-89 or Bouwer-Rice procedures (the latter if groundwater is encountered within the boring), two tests at different locations within the proposed basin and the third down gradient by no more than approximately 10 m. The tests shall measure permeability in the side slopes and the bed within a depth of 3 m of the invert.

- The minimum acceptable hydraulic conductivity as measured in any of the three required test holes is 13 mm/hr. If any test hole shows less than the minimum value, the site should be disqualified from further consideration.

- Exclude from consideration sites constructed in fill or partially in fill unless no silts or clays are present in the soil boring. Fill tends to be compacted, with clays in a dispersed rather than flocculated state, greatly reducing permeability.

- The geotechnical investigation should be such that a good understanding is gained as to how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water.

Additional Design Guidelines

(1) Basin Sizing - The required water quality volume is determined by local regulations or sufficient to capture 85% of the annual runoff.

(2) Provide pretreatment if sediment loading is a maintenance concern for the basin.

(3) Include energy dissipation in the inlet design for the basins. Avoid designs that include a permanent pool to reduce opportunity for standing water and associated vector problems.

(4) Basin invert area should be determined by the equation:

$$A = \frac{WQV}{kt}$$

where A = Basin invert area (m^2)

WQV = water quality volume (m^3)

k = 0.5 times the lowest field-measured hydraulic conductivity (m/hr)

t = drawdown time (48 hr)

(5) The use of vertical piping, either for distribution or infiltration enhancement shall not be allowed to avoid device classification as a Class V injection well per 40 CFR146.5(e)(4).

Maintenance

Regular maintenance is critical to the successful operation of infiltration basins. Recommended operation and maintenance guidelines include:

- Inspections and maintenance to ensure that water infiltrates into the subsurface completely (recommended infiltration rate of 72 hours or less) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats.
- Observe drain time for the design storm after completion or modification of the facility to confirm that the desired drain time has been obtained.
- Schedule semiannual inspections for beginning and end of the wet season to identify potential problems such as erosion of the basin side slopes and invert, standing water, trash and debris, and sediment accumulation.
- Remove accumulated trash and debris in the basin at the start and end of the wet season.
- Inspect for standing water at the end of the wet season.
- Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons.
- Remove accumulated sediment and regrade when the accumulated sediment volume exceeds 10% of the basin.
- If erosion is occurring within the basin, revegetate immediately and stabilize with an erosion control mulch or mat until vegetation cover is established.
- To avoid reversing soil development, scarification or other disturbance should only be performed when there are actual signs of clogging, rather than on a routine basis. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller, if possible, or a disc harrow pulled by a very light tractor.

Cost

Infiltration basins are relatively cost-effective practices because little infrastructure is needed when constructing them. One study estimated the total construction cost at about $2 per ft (adjusted for inflation) of storage for a 0.25-acre basin (SWRPC, 1991). As with other BMPs, these published cost estimates may deviate greatly from what might be incurred at a specific site. For instance, Caltrans spent about $18/ft^3 for the two infiltration basins constructed in southern California, each of which had a water quality volume of about 0.34 ac.-ft. Much of the higher cost can be attributed to changes in the storm drain system necessary to route the runoff to the basin locations.

Infiltration basins typically consume about 2 to 3% of the site draining to them, which is relatively small. Additional space may be required for buffer, landscaping, access road, and fencing. Maintenance costs are estimated at 5 to 10% of construction costs.

One cost concern associated with infiltration practices is the maintenance burden and longevity. If improperly maintained, infiltration basins have a high failure rate. Thus, it may be necessary to replace the basin with a different technology after a relatively short period of time.

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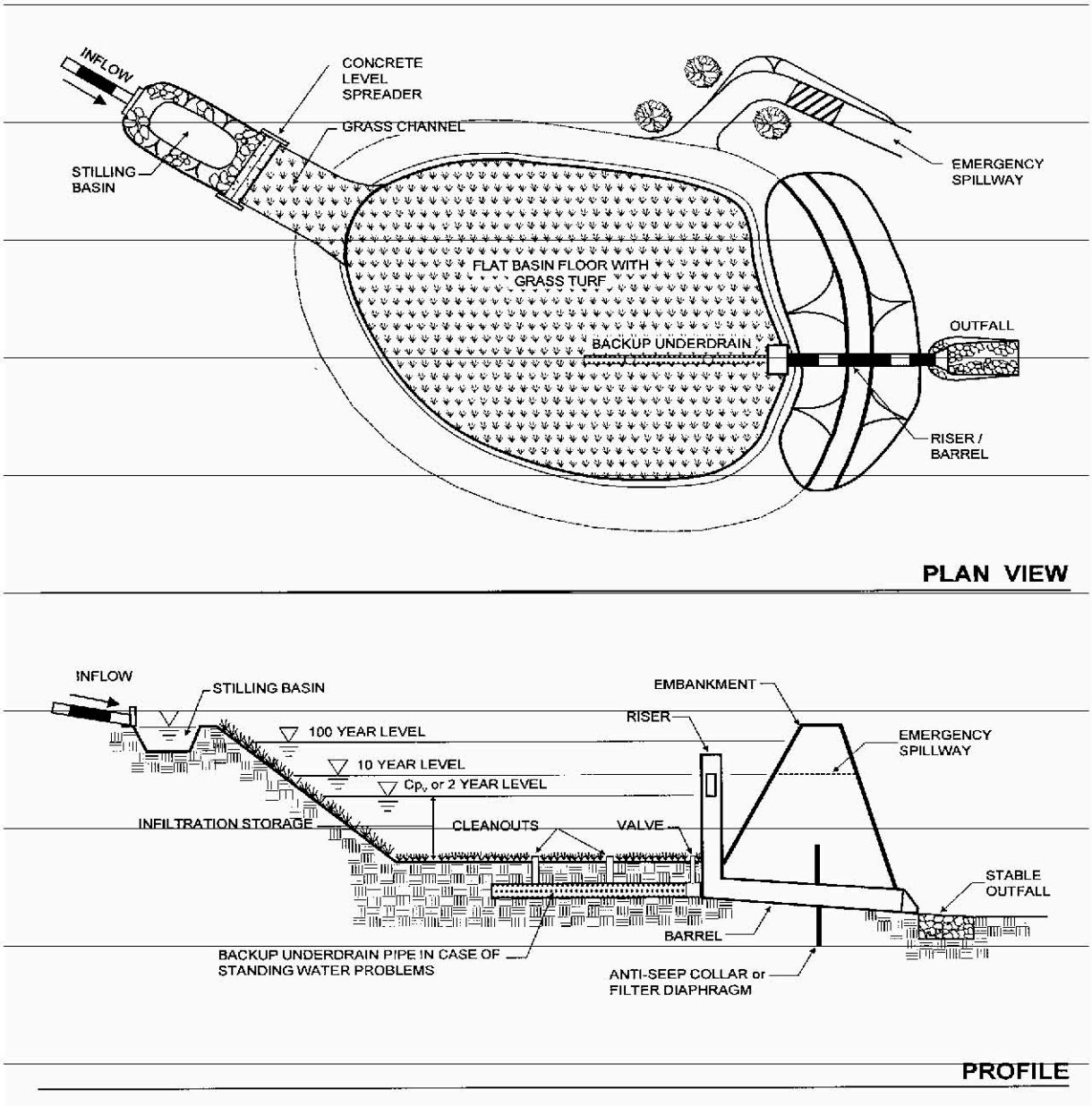
INFLOW
CONCRETE LEVEL SPREADER
GRASS CHANNEL
STILLING BASIN
EMERGENCY SPILLWAY
FLAT BASIN FLOOR WITH GRASS TURF
OUTFALL
BACKUP UNDERDRAIN
RISER / BARREL
PLAN VIEW
INFLOW
STILLING BASIN
EMBANKMENT
RISER
100 YEAR LEVEL
10 YEAR LEVEL
Cp_v or 2 YEAR LEVEL
EMERGENCY SPILLWAY
INFILTRATION STORAGE
CLEANOUTS
VALVE
STABLE OUTFALL
BARREL
BACKUP UNDERDRAIN PIPE IN CASE OF STANDING WATER PROBLEMS
ANTI-SEEP COLLAR or FILTER DIAPHRAGM
PROFILE

Vegetated Swale TC-30

Design Considerations

- Tributary Area
- Area Required
- Slope
- Water Availability

Description

Vegetated swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, and reduce the flow velocity of stormwater runoff. Vegetated swales can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems.

Targeted Constituents

☑	Sediment	▲
☑	Nutrients	●
☑	Trash	●
☑	Metals	▲
☑	Bacteria	●
☑	Oil and Grease	▲
☑	Organics	▲

Legend *(Removal Effectiveness)*

● Low ■ High

▲ Medium

California Experience

Caltrans constructed and monitored six vegetated swales in southern California. These swales were generally effective in reducing the volume and mass of pollutants in runoff. Even in the areas where the annual rainfall was only about 10 inches/yr, the vegetation did not require additional irrigation. One factor that strongly affected performance was the presence of large numbers of gophers at most of the sites. The gophers created earthen mounds, destroyed vegetation, and generally reduced the effectiveness of the controls for TSS reduction.

Advantages

- If properly designed, vegetated, and operated, swales can serve as an aesthetic, potentially inexpensive urban development or roadway drainage conveyance measure with significant collateral water quality benefits.

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- Roadside ditches should be regarded as significant potential swale/buffer strip sites and should be utilized for this purpose whenever possible.

Limitations

- Can be difficult to avoid channelization.
- May not be appropriate for industrial sites or locations where spills may occur
- Grassed swales cannot treat a very large drainage area. Large areas may be divided and treated using multiple swales.
- A thick vegetative cover is needed for these practices to function properly.
- They are impractical in areas with steep topography.
- They are not effective and may even erode when flow velocities are high, if the grass cover is not properly maintained.
- In some places, their use is restricted by law: many local municipalities require curb and gutter systems in residential areas.
- Swales are mores susceptible to failure if not properly maintained than other treatment BMPs.

Design and Sizing Guidelines

- Flow rate based design determined by local requirements or sized so that 85% of the annual runoff volume is discharged at less than the design rainfall intensity.
- Swale should be designed so that the water level does not exceed 2/3rds the height of the grass or 4 inches, which ever is less, at the design treatment rate.
- Longitudinal slopes should not exceed 2.5%
- Trapezoidal channels are normally recommended but other configurations, such as parabolic, can also provide substantial water quality improvement and may be easier to mow than designs with sharp breaks in slope.
- Swales constructed in cut are preferred, or in fill areas that are far enough from an adjacent slope to minimize the potential for gopher damage. Do not use side slopes constructed of fill, which are prone to structural damage by gophers and other burrowing animals.
- A diverse selection of low growing, plants that thrive under the specific site, climatic, and watering conditions should be specified. Vegetation whose growing season corresponds to the wet season are preferred. Drought tolerant vegetation should be considered especially for swales that are not part of a regularly irrigated landscaped area.
- The width of the swale should be determined using Manning's Equation using a value of 0.25 for Manning's n.

Construction/Inspection Considerations

- Include directions in the specifications for use of appropriate fertilizer and soil amendments based on soil properties determined through testing and compared to the needs of the vegetation requirements.
- Install swales at the time of the year when there is a reasonable chance of successful establishment without irrigation; however, it is recognized that rainfall in a given year may not be sufficient and temporary irrigation may be used.
- If sod tiles must be used, they should be placed so that there are no gaps between the tiles; stagger the ends of the tiles to prevent the formation of channels along the swale or strip.
- Use a roller on the sod to ensure that no air pockets form between the sod and the soil.
- Where seeds are used, erosion controls will be necessary to protect seeds for at least 75 days after the first rainfall of the season.

Performance

The literature suggests that vegetated swales represent a practical and potentially effective technique for controlling urban runoff quality. While limited quantitative performance data exists for vegetated swales, it is known that check dams, slight slopes, permeable soils, dense grass cover, increased contact time, and small storm events all contribute to successful pollutant removal by the swale system. Factors decreasing the effectiveness of swales include compacted soils, short runoff contact time, large storm events, frozen ground, short grass heights, steep slopes, and high runoff velocities and discharge rates.

Conventional vegetated swale designs have achieved mixed results in removing particulate pollutants. A study performed by the Nationwide Urban Runoff Program (NURP) monitored three grass swales in the Washington, D.C., area and found no significant improvement in urban runoff quality for the pollutants analyzed. However, the weak performance of these swales was attributed to the high flow velocities in the swales, soil compaction, steep slopes, and short grass height.

Another project in Durham, NC, monitored the performance of a carefully designed artificial swale that received runoff from a commercial parking lot. The project tracked 11 storms and concluded that particulate concentrations of heavy metals (Cu, Pb, Zn, and Cd) were reduced by approximately 50 percent. However, the swale proved largely ineffective for removing soluble nutrients.

The effectiveness of vegetated swales can be enhanced by adding check dams at approximately 17 meter (50 foot) increments along their length (See Figure 1). These dams maximize the retention time within the swale, decrease flow velocities, and promote particulate settling. Finally, the incorporation of vegetated filter strips parallel to the top of the channel banks can help to treat sheet flows entering the swale.

Only 9 studies have been conducted on all grassed channels designed for water quality (Table 1). The data suggest relatively high removal rates for some pollutants, but negative removals for some bacteria, and fair performance for phosphorus.

Table 1 Grassed swale pollutant removal efficiency data							
	Removal Efficiencies (% Removal)						
Study	TSS	TP	TN	NO_3	Metals	Bacteria	Type
Caltrans 2002	77	8	67	66	83-90	-33	dry swales
Goldberg 1993	67.8	4.5	-	31.4	42–62	-100	grassed channel
Seattle Metro and Washington Department of Ecology 1992	60	45	-	-25	2–16	-25	grassed channel
Seattle Metro and Washington Department of Ecology, 1992	83	29	-	-25	46–73	-25	grassed channel
Wang et al., 1981	80	-	-	-	70–80	-	dry swale
Dorman et al., 1989	98	18	-	45	37–81	-	dry swale
Harper, 1988	87	83	84	80	88–90	-	dry swale
Kercher et al., 1983	99	99	99	99	99	-	dry swale
Harper, 1988.	81	17	40	52	37–69	-	wet swale
Koon, 1995	67	39	-	9	-35 to 6	-	wet swale

While it is difficult to distinguish between different designs based on the small amount of available data, grassed channels generally have poorer removal rates than wet and dry swales, although some swales appear to export soluble phosphorus (Harper, 1988; Koon, 1995). It is not clear why swales export bacteria. One explanation is that bacteria thrive in the warm swale soils.

Siting Criteria

The suitability of a swale at a site will depend on land use, size of the area serviced, soil type, slope, imperviousness of the contributing watershed, and dimensions and slope of the swale system (Schueler et al., 1992). In general, swales can be used to serve areas of less than 10 acres, with slopes no greater than 5 %. Use of natural topographic lows is encouraged and natural drainage courses should be regarded as significant local resources to be kept in use (Young et al., 1996).

Selection Criteria (NCTCOG, 1993)

- Comparable performance to wet basins
- Limited to treating a few acres
- Availability of water during dry periods to maintain vegetation
- Sufficient available land area

Research in the Austin area indicates that vegetated controls are effective at removing pollutants even when dormant. Therefore, irrigation is not required to maintain growth during dry periods, but may be necessary only to prevent the vegetation from dying.

The topography of the site should permit the design of a channel with appropriate slope and cross-sectional area. Site topography may also dictate a need for additional structural controls. Recommendations for longitudinal slopes range between 2 and 6 percent. Flatter slopes can be used, if sufficient to provide adequate conveyance. Steep slopes increase flow velocity, decrease detention time, and may require energy dissipating and grade check. Steep slopes also can be managed using a series of check dams to terrace the swale and reduce the slope to within acceptable limits. The use of check dams with swales also promotes infiltration.

Additional Design Guidelines

Most of the design guidelines adopted for swale design specify a minimum hydraulic residence time of 9 minutes. This criterion is based on the results of a single study conducted in Seattle, Washington (Seattle Metro and Washington Department of Ecology, 1992), and is not well supported. Analysis of the data collected in that study indicates that pollutant removal at a residence time of 5 minutes was not significantly different, although there is more variability in that data. Therefore, additional research in the design criteria for swales is needed. Substantial pollutant removal has also been observed for vegetated controls designed solely for conveyance (Barrett et al, 1998); consequently, some flexibility in the design is warranted.

Many design guidelines recommend that grass be frequently mowed to maintain dense coverage near the ground surface. Recent research (Colwell et al., 2000) has shown mowing frequency or grass height has little or no effect on pollutant removal.

Summary of Design Recommendations

1) The swale should have a length that provides a minimum hydraulic residence time of at least 10 minutes. The maximum bottom width should not exceed 10 feet unless a dividing berm is provided. The depth of flow should not exceed 2/3rds the height of the grass at the peak of the water quality design storm intensity. The channel slope should not exceed 2.5%.

2) A design grass height of 6 inches is recommended.

3) Regardless of the recommended detention time, the swale should be not less than 100 feet in length.

4) The width of the swale should be determined using Manning's Equation, at the peak of the design storm, using a Manning's n of 0.25.

5) The swale can be sized as both a treatment facility for the design storm and as a conveyance system to pass the peak hydraulic flows of the 100-year storm if it is located "on-line." The side slopes should be no steeper than 3:1 (H:V).

6) Roadside ditches should be regarded as significant potential swale/buffer strip sites and should be utilized for this purpose whenever possible. If flow is to be introduced through curb cuts, place pavement slightly above the elevation of the vegetated areas. Curb cuts should be at least 12 inches wide to prevent clogging.

7) Swales must be vegetated in order to provide adequate treatment of runoff. It is important to maximize water contact with vegetation and the soil surface. For general purposes, select fine, close-growing, water-resistant grasses. If possible, divert runoff (other than necessary irrigation) during the period of vegetation

establishment. Where runoff diversion is not possible, cover graded and seeded areas with suitable erosion control materials.

Maintenance

The useful life of a vegetated swale system is directly proportional to its maintenance frequency. If properly designed and regularly maintained, vegetated swales can last indefinitely. The maintenance objectives for vegetated swale systems include keeping up the hydraulic and removal efficiency of the channel and maintaining a dense, healthy grass cover.

Maintenance activities should include periodic mowing (with grass never cut shorter than the design flow depth), weed control, watering during drought conditions, reseeding of bare areas, and clearing of debris and blockages. Cuttings should be removed from the channel and disposed in a local composting facility. Accumulated sediment should also be removed manually to avoid concentrated flows in the swale. The application of fertilizers and pesticides should be minimal.

Another aspect of a good maintenance plan is repairing damaged areas within a channel. For example, if the channel develops ruts or holes, it should be repaired utilizing a suitable soil that is properly tamped and seeded. The grass cover should be thick; if it is not, reseed as necessary. Any standing water removed during the maintenance operation must be disposed to a sanitary sewer at an approved discharge location. Residuals (e.g., silt, grass cuttings) must be disposed in accordance with local or State requirements. Maintenance of grassed swales mostly involves maintenance of the grass or wetland plant cover. Typical maintenance activities are summarized below:

- Inspect swales at least twice annually for erosion, damage to vegetation, and sediment and debris accumulation preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the swale is ready for winter. However, additional inspection after periods of heavy runoff is desirable. The swale should be checked for debris and litter, and areas of sediment accumulation.

- Grass height and mowing frequency may not have a large impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

- Trash tends to accumulate in swale areas, particularly along highways. The need for litter removal is determined through periodic inspection, but litter should always be removed prior to mowing.

- Sediment accumulating near culverts and in channels should be removed when it builds up to 75 mm (3 in.) at any spot, or covers vegetation.

- Regularly inspect swales for pools of standing water. Swales can become a nuisance due to mosquito breeding in standing water if obstructions develop (e.g. debris accumulation, invasive vegetation) and/or if proper drainage slopes are not implemented and maintained.

Cost

Construction Cost

Little data is available to estimate the difference in cost between various swale designs. One study (SWRPC, 1991) estimated the construction cost of grassed channels at approximately $0.25 per ft^2. This price does not include design costs or contingencies. Brown and Schueler (1997) estimate these costs at approximately 32 percent of construction costs for most stormwater management practices. For swales, however, these costs would probably be significantly higher since the construction costs are so low compared with other practices. A more realistic estimate would be a total cost of approximately $0.50 per ft^2, which compares favorably with other stormwater management practices.

Table 2 Swale Cost Estimate (SEWRPC, 1991)

Component	Unit	Extent	Unit Cost			Total Cost		
			Low	Moderate	High	Low	Moderate	High
Mobilization / Demobilization-Light	Swale	1	$107	$274	$441	$107	$274	$441
Site Preparation								
Clearing[b]	Acre	0.5	$2,200	$3,800	$5,400	$1,100	$1,900	$2,700
Grubbing[c]	Acre	0.25	$3,800	$5,200	$6,600	$950	$1,300	$1,650
General Excavation[d]	Yd^3	372	$2.10	$3.70	$5.30	$781	$1,376	$1,972
Level and Till[e]	Yd^2	1,210	$0.20	$0.35	$0.50	$242	$424	$605
Sites Development								
Salvaged Topsoil Seed, and Mulch[f]	Yd^2	1,210	$0.40	$1.00	$1.60	$484	$1,210	$1,936
Sod[g]	Yd^2	1,210	$1.20	$2.40	$3.60	$1,452	$2,904	$4,356
Subtotal	--	–	--	–	--	$5,116	$9,388	$13,660
Contingencies	Swale	1	25%	25%	25%	$1,279	$2,347	$3,415
Total	--	–	--	–	--	$6,395	$11,735	$17,075

Source: (SEWRPC, 1991)

Note: Mobilization/demobilization refers to the organization and planning involved in establishing a vegetative swale.

[a] Swale has a bottom width of 1.0 foot, a top width of 10 feet with 1:3 side slopes, and a 1,000-foot length.

[b] Area cleared = (top width + 10 feet) x swale length.

[c] Area grubbed = (top width x swale length).

[d] Volume excavated = (0.67 x top width x swale depth) x swale length (parabolic cross-section).

[e] Area tilled = $\left(\text{top width} + \frac{8(\text{swale depth}^2)}{3(\text{top width})}\right) \times$ swale length (parabolic cross-section).

[f] Area seeded = area cleared x 0.5.

[g] Area sodded = area cleared x 0.5.

Table 3 Estimated Maintenance Costs (SEWRPC, 1991)

Component	Unit Cost	Swale Size (Depth and Top Width)		Comment
		1.5 Foot Depth, One-Foot Bottom Width, 10-Foot Top Width	3-Foot Depth, 3-Foot Bottom Width, 21-Foot Top Width	
Lawn Mowing	$0.85 / 1,000 ft^2/ mowing	$0.14 / linear foot	$0.21 / linear foot	Lawn maintenance area=(top width + 10 feet) x length. Mow eight times per year
General Lawn Care	$9.00 / 1,000 ft^2/ year	$0.18 / linear foot	$0.28 / linear foot	Lawn maintenance area = (top width + 10 feet) x length
Swale Debris and Litter Removal	$0.10 / linear foot / year	$0.10 / linear foot	$0.10 / linear foot	–
Grass Reseeding with Mulch and Fertilizer	$0.30 / yd^2	$0.01 / linear foot	$0.01 / linear foot	Area revegetated equals 1% of lawn maintenance area per year
Program Administration and Swale Inspection	$0.15 / linear foot / year, plus $25 / inspection	$0.15 / linear foot	$0.15 / linear foot	Inspect four times per year
Total	--	**$0.58 / linear foot**	**$ 0.75 / linear foot**	--

Maintenance Cost

Caltrans (2002) estimated the expected annual maintenance cost for a swale with a tributary area of approximately 2 ha at approximately $2,700. Since almost all maintenance consists of mowing, the cost is fundamentally a function of the mowing frequency. Unit costs developed by SEWRPC are shown in Table 3. In many cases vegetated channels would be used to convey runoff and would require periodic mowing as well, so there may be little additional cost for the water quality component. Since essentially all the activities are related to vegetation management, no special training is required for maintenance personnel.

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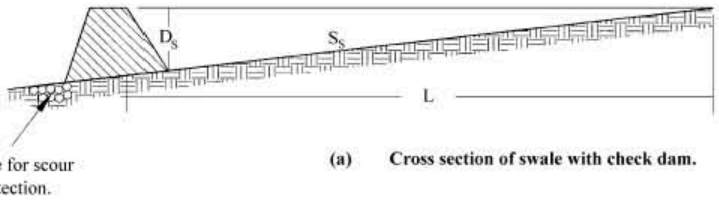
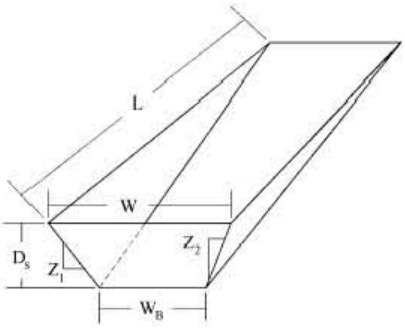


(a) Cross section of swale with check dam.



(b) Dimensional view of swale impoundment area.

Notation:

L = Length of swale impoundment area per check dam (ft)
D_S = Depth of check dam (ft)
S_S = Bottom slpe of swale (ft/ft)
W = Top width of check dam (ft)
W_B = Bottom width of check dam (ft)
$Z_{1\&2}$ = Ratio of horizontal to vertical change in swale side slope (ft/ft)