


Mendocino Solid Waste Management Authority

Central Coast Transfer Station

Draft Environmental Impact Report

SCH # 2014012058

February 2015

Draft Environmental Impact Report for the

Central Coast Transfer Station

SCH # 2014012058

Prepared for:

Mendocino Solid Waste Management Authority
3200 Taylor Drive
Ukiah, CA 95482

Attention: Mike Sweeney
General Manager
(707) 468-9710

Prepared by:

GHD Inc.
718 Third Street
Eureka, CA 95501

Contact: Misha Schwarz
Project Manager
(707) 443-8326

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Acronyms and Abbreviations

AAI	all appropriate inquiries
AB	Assembly Bill
ADT	average daily traffic
ASC	Anthropological Studies Center
bgs	below ground surface
BLM	Bureau of Land Management
BMP	best management practices
CalEEMod	California Emissions Estimator Model
Cal/EPA	California Environmental Protection Agency
CalFire	California Department of Forestry and Fire Protection
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CalEPA	Clifornia Environmental Protection Agency
CAP	climate action plan
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CDPR	California Department of Parks and Recreation
CERCLA	Comprehensive Environmental Response, Compensation and Liability
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CGS	California Geological Survey
CH4	methane
CHP	California Highway Patrol
CHSC	California Health and Safety Code
CNEL	Community Noise Equivalent Level
CNPPA	California Native Plant Protection Act
CO	carbon monoxide
CO2	carbon dioxide
CO2e	carbon-dioxide-equivalent
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dB	decibel
dBA	A-weighted sound level
DHS	California Department of Health Services
DOC	California Department of Conservation
DOT	U.S. Department of Transportation
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EDR	Environmental Data Resources
EIR	Environmental Impact Report
EOC	County Emergency Operations Center
EOP	Mendocino County Emergency Operations Plan

EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
Fed/OSHA	Federal Occupational Safety and Health Administration
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FMMP	Farmland Mapping and Monitoring Program
FTE	full-time equivalent
GHG	greenhouse gas
H2O	water vapor
HAZWOPER	Hazardous Waste Operations and Emergency Response
HHW	household hazardous waste
HI	Hazard Index
JDSF	Jackson Demonstration State Forest
JPA	Joint Powers Agreement
Ldn	Day/Night Average Sound Level
Leq	equivalent noise level
LIM	Land Inventory and Monitoring
Lmax	maximum A-weighted noise level
Lmin	minimum A-weighted noise level
LOS	Level of Service
MBTA	Migratory Bird Treaty Act
MCAQMD	Mendocino County Air Quality Management District
MCLs	maximum contaminant levels
MEI	Maximally Exposed Individual
mg/m3	milligrams per cubic meter
MOEs	Measures of Effectiveness
MHMP	Mendocino County Multi-Hazard Mitigation Plan
MMT	million metric tons
msl	mean sea level
MSW	Municipal Solid Waste
MSWMA	Mendocino Solid Waste Management Authority
MTA	Mendocino Transit Authority
N2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
NOAA	National Oceanic Atmospheric Administration
NOP	Notice of Preparation
NOX	nitrogen oxides
NO_2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
O3	ozone
OES	Office of Emergency Services
pga	peak ground acceleration
PM	particulate matter
ppm	parts per million
PPV	Peak Particle Velocity
PRC	Public Resources Code
REL	reference exposure level
RMS	Root Mean Square
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendment and Reauthorization Act
SRA	State Responsibility Areas

SR	State Route
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	Toxic Air Contaminants
TCP	Timberland Conversion Permit
THP	Timber Harvesting Plan
TPZ	Timberland Production Zone
UBC	Uniform Building Code
µg/m3	micrograms per cubic meter
USACE	U.S. Army Corps of Engineers
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VMT	vehicle miles travelled
WBWG	Western Bat Working Group

1. Introduction and Summary

1.1 California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires that discretionary decisions by public agencies be subject to environmental review. The purpose of an environmental impact report (EIR) is to identify the potentially significant effects of the project on the environment, to identify and evaluate alternatives to the project, and to indicate the manner in which those potentially significant effects can be mitigated or avoided (Section 21002.1[a]). Each public agency is required to mitigate or avoid the significant effects on the environment of projects it approves or carries out whenever it is feasible.

This Draft EIR has been prepared by the Mendocino Solid Waste Management Authority (MSWMA), acting on behalf of the Caspar Joint Powers Agreement (Caspar JPA) of the County of Mendocino and City of Fort Bragg, for the proposed Central Coast Transfer Station (project) pursuant to the CEQA of 1970 (Public Resources Code Section 21000 et seq.) and the CEQA Guidelines (California Code of Regulations Section 15000 et seq.).

The Caspar Joint Powers Agreement was originally formulated by the City and County in 1967 to authorize the joint ownership and operation of the Caspar Landfill. The basic method of governance is mutual agreement between the County Board of Supervisors and the City Council. The JPA was amended several times, most recently in 2011, and includes the following provision:

“Replacement or expansion of the Caspar Transfer Station is necessary to accommodate commercial solid waste collection trucks and allow long-haul direct transfer to a destination landfill. County and City shall cooperate in a siting and development project to provide such an expanded facility, either at the Caspar property or another site, and shall amend this Agreement as necessary to implement the expansion.”

Environmental effects of the project that must be addressed include the significant effects of the project, growth-inducing effects of the project, and significant cumulative effects of past, present, and reasonably anticipated future projects. The purpose of an EIR is not to recommend either approval or denial of a project. CEQA requires decision-makers to balance the benefits of a project against its unavoidable environmental effects in deciding whether to carry out a project. The lead agency will consider the Draft EIR, comments received on the Draft EIR, and responses to those comments before making a final decision. If significant environmental effects are identified, the lead agency must adopt “Findings” indicating whether feasible mitigation measures or alternatives exist that can avoid or reduce those effects. If significant environmental impacts are identified as unavoidable after proposed mitigation, the lead agency may still approve the project if it determines that the social, economic, or other benefits outweigh the unavoidable impacts. The lead agency would then be required to prepare a “Statement of Overriding Considerations” that discusses the specific reasons for approving the project, based on information in the EIR and other information in the administrative record.

1.2 Type of Environmental Impact Report

The Central Coast Transfer Station EIR is a project EIR, pursuant to CEQA Guidelines Section 15161. A project EIR examines the environmental impacts of a specific development and focuses on the changes in the environment that would result from the construction, development, and ultimate operation of the project.

1.3 Intended Uses of the EIR

The purpose of an EIR is to provide a clear understanding of the environmental impacts associated with the construction and operation of a project and the EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the Notice of Preparation (NOP) is published, from both a local and regional perspective. This environmental setting normally constitutes the baseline physical conditions by which the lead agency determines whether an impact is significant.

The lead agency is the decision-making body that will ultimately certify the adequacy of the EIR and decide whether to approve the implementation of a project. In accordance with CEQA Guidelines Section 15051 (d), “where the provisions of subdivisions (a), (b), and (c) leave two or more public agencies with a substantial claim to be the lead agency, the public agencies may by agreement designate an agency as the lead agency.” The lead agency for the proposed project is the Caspar JPA of the County of Mendocino and City of Fort Bragg, as equal partners.

In addition to the lead agency, other responsible and trustee agencies may need to use this EIR in approving permits or providing recommendations for the project. These agencies include:

- Board of Supervisors of the County of Mendocino (Major Use Permit)
- Mendocino County Health Department (Well Construction Permit, Septic System Construction Permit)
- California Department of Resource Recovery & Recycling (Solid Waste Facilities Permit)
- California Department of Transportation (Encroachment Permit)
- California Department of Forestry & Fire Protection (Timberland Conversion Plan, Timberland Conversion Permit, Timber Harvest Plan
- Regional Water Quality Control Board (General Construction Permit)

1.3.1 Background

The Caspar JPA plans to develop a commercial transfer station facility to serve the central coast area. A commercial transfer station is a facility that allows all vehicles, including franchise collection trucks, to consolidate solid waste, which can then be loaded for direct haul to a destination landfill. The facility will serve self-haul and commercial customers in the wasteshed which consists of the City of Fort Bragg and the surrounding unincorporated area delineated as the coastal zone of Mendocino County Solid Waste Refuse Collection Area #2. The wasteshed includes the coast from the southern edge of the town of Westport south to the mouth of the Navarro River, extending inland approximately half the distance to the Highway 101 corridor.

Solid waste disposal in the central coast region of Mendocino County has been a joint responsibility of the County of Mendocino and City of Fort Bragg for more than 40 years. When the jointly–owned Caspar Landfill closed in 1992, the site was converted to a self-haul transfer station.

Empire Waste Management, the franchised collector for the City of Fort Bragg and the surrounding unincorporated area, introduced its “WMS” or “pod” system for medium-distance waste transfer, which uses specialized collection trucks with detachable pod bodies for compacted waste. The pods are removed from the collection trucks at Empire’s Fort Bragg yard and loaded three-at-time on a flatbed semi-trailer to be hauled 37 miles to the Willits Transfer Station, where they are dumped and reloaded for transfer to the Potrero Hills Landfill in Suisun, California.

The inefficiency and expense of this disposal system led to a decision by the Caspar JPA in 2006 to identify a site for construction of a commercial transfer station that would receive the entire wastestream and ship it directly to a destination landfill. A 2007 study evaluated 25 sites. In 2011, six semi-final sites were evaluated by Caspar JPA staff, and these were then narrowed down to two finalist sites, the Jackson Demonstration State Forest (JDSF) property on State Route 20 (project site) and the existing Caspar Landfill property. In June, 2013, the Caspar JPA designated the JDSF property SR 20 as the preferred site.

Based on the current wastestream, the solid waste throughput would average 35 tons per day. To accommodate potential peak periods, future growth and technological changes, the facility would be designed to handle up to 50 tons per day by more intensive operation with the same infrastructure.

1.4 Public Scoping Process

On January 27, 2014, the NOP for the Central Coast Transfer Station EIR was distributed (included in Appendix A). The NOP was mailed to property owners within the project area and was distributed by the State Clearinghouse to the reviewing State agencies, as well as local and regional agencies, triggering the start of a 30-day scoping period. On February 19, 2014 a Public Scoping Meeting was held at Fort Bragg Town Hall at 363 North Main Street, to solicit input regarding the issues that should be addressed in the EIR. The scoping period ended on February 25, 2014. Approximately 18 letters/emails were received during the scoping period, as summarized below in Section 1.8, and included in Appendix A.

1.5 Effects Found Not to be Significant

To provide more meaningful public disclosure, reduce the time and cost required to prepare an EIR, and focus on potentially significant effects on the environment of a proposed project, lead agencies may limit discussion of other effects to a brief explanation as to why those effects are not potentially significant (Public Resources Code Section 21002.1 (e); State CEQA Guidelines Sections 15128 and 15143). Information used to determine which impacts would be potentially significant was derived from a review of the project, field work, feedback from agency consultation and input, and comments received on the NOP (Appendix A). As a result of this review, the following resource categories were found not to be significant, and therefore, are not included in the detailed analysis of potential impacts in the Central Coast Transfer Station EIR:

1.5.1 Population and Housing

The proposed project relocates existing solid waste services. It does not provide new housing nor does it remove any existing housing, or create a substantial population increase. Therefore, the proposed project would not affect the location, density, distribution, or growth rate of the human population in the project area and surrounding region.

1.5.2 Public Services and Utilities

The construction and operation of the proposed project would not induce growth that would result in a substantial increase in the demand for utility systems such as electricity, water, sewer, drainage, or wastewater treatment capacity, or protective services from fire departments or local law enforcement. Sewer and water would be provided onsite. Reference Section 3.9 (Hydrology) for an analysis of potential impacts to hydrology and water resources. The proposed project is consistent with the land use and zoning designations for the project sites. Construction and operation of the facility would not increase the demand for police or fire protection or emergency medical services above the level anticipated for the project site within the Mendocino County General Plan. In addition, the proposed project would be required to comply with state regulatory requirements for the proposed facility, as specified in the CCR Titles 14, 22, and 27 as well as fire department requirements. The project would not have a significant adverse effect on public services or utilities.

1.5.3 Recreation

The project site does not include any recreational facilities and the proposed project would not generate additional demand for recreational facilities or services because it would not increase the number of residents or visitors within the project area and surrounding region.

1.6 Availability of the Draft EIR and Public Comment Period

The Draft EIR will be circulated for 45 days, from February 9, 2015 to March 26, 2015 to allow interested individuals and public agencies to review and comment on the document. Written comments on the Draft EIR will be accepted by MSWMA until 5:00 pm on March 26, 2015. Public agencies, interested organizations and individuals are encouraged to submit comments on the Draft EIR to:

Mike Sweeney, General Manager
Mendocino Solid Waste Management Authority
3200 Taylor Drive
Ukiah, CA 95482
Email: sweeney@pacific.net

To facilitate understanding of and orderly responses to the comments, please provide a separate sentence or paragraph for each comment, and note the page and chapter/section of the Draft EIR to which the comment is directed.

The Draft EIR is available for review at the address above, and at Fort Bragg City Hall, 416 N. Franklin St., Fort Bragg, and the Fort Bragg Library, 499 E. Laurel St., Fort Bragg. It is also available in downloadable Adobe Acrobat format on the MSWMA's website at http://mendorecycle.org/.

At the end of the public review period, written responses will be prepared for comments received on the Draft EIR. The comments and responses will be included in the Final EIR and will be considered by the Caspar JPA prior to consideration of the adequacy of the EIR. Prior to approval of the project, the Caspar JPA must certify that the EIR has been completed in compliance with CEQA.

1.7 Organization of this Environmental Impact Report

This Draft EIR is organized into chapters, as identified and briefly described below. Chapters are further divided into sections (e.g., Section 3.1, Aesthetics).

- **Chapter 1, Introduction and Summary.** Chapter 1 describes the purpose and organization of the Draft EIR, context, and terminology used in the Draft EIR. This chapter also summarizes the project description, alternatives to the project, significant environmental impacts, and mitigation measures to reduce or eliminate those impacts.
- **Chapter 2, Project Description.** Chapter 2 describes the project objectives, project location, background, project characteristics, and project operation.

- **Chapter 3, Environmental Setting, Impacts and Mitigation Measures.** For each environmental resource area, this chapter describes the existing environmental and regulatory setting, identifies applicable thresholds of significance, discusses the potential environmental impacts associated with the proposed project, identifies feasible mitigation measures to reduce or eliminate those impacts, and provides conclusions on the significance of each potentially significant adverse impact both before and after proposed mitigation.
- **Chapter 4, Alternatives.** This chapter describes and evaluates the alternatives to the proposed project that are being considered to avoid or mitigate the project's environmental impacts.
- **Chapter 5, Other CEQA Related Impacts.** This chapter describes any unavoidable significant impacts, growth-inducing, and irreversible impacts.
- **Chapter 6, Report Preparation.** This chapter identifies the Draft EIR authors and consultants who provided analysis in support of the Draft EIR's conclusions.
- **Chapter 7, References.** This chapter sets forth a comprehensive list of all sources of information used in the preparation of the Draft EIR, including agencies or individuals consulted during preparation of the Draft EIR.
- **Appendices.** The appendices contain various technical reports and publications that have been summarized or otherwise used for preparation of the Draft EIR.

1.8 Areas of Controversy and Key Issues to be Resolved

Section 15123 of the CEQA Guidelines requires an EIR to identify areas of controversy known to the lead agency, including issues raised by agencies and the public. The following provides a brief summary of the comments/issues raised in comment letters and emails received on the NOP and during the public scoping meeting. The comment letters received on the NOP are included in Appendix A of this document.

- Why can't waste be hauled out of the County on the Skunk Train.
- Why not burn trash so it doesn't have to be shipped out of the area.
- Why wasn't the Pudding Creek Road site selected instead of the SR 20 site.
- Will the SR 20 transfer station cause groundwater contamination that will threaten the City's Newman Gulch water source.
- SR 20 should not be subjected to additional large semi-truck traffic.
- No pygmy forest or bishop pine forest vegetation should be removed.
- Will the stench of garbage be eliminated by fully enclosed buildings and sweetened with perfume.
- How will groundwater be affected by the project.
- Bicyclists' safety may be at risk with increased truck trips on SR 20.
- Road-side trash and debris along SR 20 will increase.
- How will the Noyo River Watershed not be compromised by this project.
- Conversion from Timber Production is unwarranted when the Pudding Creek Recycling Center and Caspar Landfill sites are already converted and industrialized.

- The Draft EIR should include a detailed mitigation plan which outlines measures for avoidance, minimization, mitigation, and monitoring for habitats including Mendocino Pygmy Woodland Forest, Northern Bishop Pine, wetlands, and special-status species.
- The Draft EIR should include alternative locations that avoid sensitive species or habitats.
- The project's water consumption should be analyzed.
- The Draft EIR should include an erosion control plan and LID strategy that details site-specific measures for reducing erosion, maintaining water quality, and encouraging on-site retention of stormwater.

All of the substantive environmental issues raised in the NOP comment letters and emails have been addressed in this Draft EIR.

1.9 Summary of Significant Impacts and Proposed Mitigation Measures

Table 1-1 identifies, by resource category, the significant project impacts and proposed mitigation measures. Additional information about the impacts and mitigation measures can be found in Chapter 3 of this EIR, as referenced for each resource category.

Table 1-1 Summary of Impacts and Mitigation Measures

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Aesthetics			
Impact AES-1: Impacts on Scenic Vistas.	Less than Significant	n/a	
Impact AES-2: Changes in Visual Character.	Less than Significant	n/a	
Impact AES-3: Impacts from Nighttime Lighting and Glare.	Less than Significant	n/a	
Impact AES-C-1: Cumulative Impacts to Aesthetic Resources.	Less than Significant	n/a	
Agriculture and Forest Resources			
Impact AG-1: Conflict with Zoning for Timberland and Conversion to Non-Forest Use.	Less than Significant	n/a	
Impact AG-C-1: Cumulative Impacts to Forest Land.	Less than Significant	n/a	

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Air Quality and Odor			
Impact AQ-1: Violate Any Air Quality Standard or Result in Cumulatively Considerable Net Increase of Any Criteria Pollutant for which the Project Region is in Non-attainment.	Potentially Significant	Mitigation Measure AQ-1: Air Quality Control Measures during Construction.	Less than Significant
Impact AQ-2: Expose Sensitive Receptors to Substantial Pollutant Concentrations.	Potentially Significant	Mitigation Measure AQ-2: Select Equipment during Construction to Minimize Emissions.	Less than Significant
Impact AQ-3: Create Objectionable Odors Affecting a Substantial Number of People.	Potentially Significant	Mitigation Measure AQ-3: Implement Odor Reduction Measures.	Less than Significant
Impact AQ-C-1: Project plus Cumulative Projects Result in a Cumulatively Considerable Contribution to Cumulative Impacts Related to Air Quality.	Potentially Significant	Mitigation Measures: AQ-1 Air Quality Control Measures during Construction and AQ-2 Select Equipment during Construction to Minimize Emissions.	Less than Significant
Biological Resources			
Impact BIO-1: Substantial Adverse Effect on Special-Status Species.	Potentially Significant	Mitigation Measure BIO-1a: Mitigate Impacts to Coast Lily. Mitigation Measure BIO-1b: Mitigate Impact to Mendocino Cypress and Bolander's Pine. Mitigation Measure BIO-1c: Minimize and Avoid Impacts to Sonoma Tree Vole. Mitigation Measures BIO-1d: Conduct Pre-construction Avian Surveys for Nesting Passerine Birds and Avian Species of Special Concern. Mitigation Measures BIO-1e: Avoid Impacts to Special-Status Bat Species	Less than Significant
Impact BIO-2: Substantial Adverse Effect on Sensitive Natural Community.	Potentially Significant	Mitigation Measure BIO-2: Mitigate Impacts to Sensitive Listed Habitats with State Rank S2 Status (Cypress forest-tall and Cypress forest – intermediate).	Less than Significant

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact BIO-3: Substantial Adverse Effect on Federally Protected Wetlands.	No Impact	n/a	
Impact BIO-4: Interfere Substantially with the Movement of Any Native Resident or Migratory Fish or Wildlife Species or Impede Use of Native Wildlife Nursery.	Less than Significant	n/a	
Impact BIO-5: Conflict with Local Policies or Ordinances Protecting Biological Resources.	Less than Significant	n/a	
Impact BIO-C-1: Project Result in a Cumulatively Considerable Contribution to Cumulative Impacts Related to Biological Resources.	Less than Significant	n/a	
Cultural Resources			
Impact CR-1: Change in the Significance of an Archaeological or Historical Resource.	Potentially Significant	Mitigation Measure CR-1: Potential Disturbance of Undiscovered Cultural Resources.	Less than Significant
Impact CR-2: Potential Impacts to Unknown Paleontological Resources.	Potentially Significant	Mitigation Measure CR-2: Potential Disturbance of Undiscovered Paleontological Resources.	Less than Significant
Impact CR-3: Potential Disturbance of Human Remains.	Potentially Significant	Mitigation Measure CR-3: Potential to Uncover Human Remains.	Less than Significant
Impact CR-C-1: Cumulative Impacts to Cultural Resources.	Less than Significant	n/a	
Geology and Soils			
Impact GEO-1: Expose People or Structures to Potential Substantial Adverse Effects Involving Strong Seismic Ground Shaking or Seismic-related Ground Failure, including Liquefaction.	Potentially Significant	Mitigation Measure GEO-1: Conduct a Geotechnical Study and Implement Recommendations	Less than Significant
Impact GEO-2: Result in Substantial Soil Erosion or Loss of Topsoil.	Potentially Significant	Mitigation Measure HYD-1: NDPES and Storm Water Pollution Prevention Plan	Less than Significant

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact GEO-3: Be Located on Geologic Unit or Soil that is Unstable, or would become Unstable as a Result of the Project, and Potentially Result in Liquefaction, Lateral Spreading, Subsidence, or Collapse.	Potentially Significant	Mitigation Measure GEO-1: Conduct a Geotechnical Study and Implement Recommendations	Less than Significant
Impact GEO-4: Be Located on Expansive Soil, as Defined in Table 18-1-B of Uniform Building Code (1994), Creating Substantial Risks to Life or Property.	Potentially Significant	Mitigation Measure GEO-1: Conduct a Geotechnical Study and Implement Recommendations	Less than Significant
Impact GEO-5: Have Soils Incapable of Adequately Supporting Use of Septic Tanks or Alternative Waste Water Disposal Systems.	Less than significant	n/a	
Impact GEO-C-1: Project Plus Cumulative Projects Result in a Cumulatively Considerable Contribution to Cumulative Impacts Related to Geology and Soils.	No impact	n/a	
Greenhouse Gas Emissions			
Impact: GG-1: Generate Greenhouse Gas Emissions that may have Significant Impact on Environment.	Beneficial	n/a	
Impact: GG-2: Conflict with Applicable Plan, Policy, or Regulation Adopted for Purpose of Reducing Emissions of Greenhouse Gases.	No impact	n/a	
Impact GG-C-1: Would the Project plus cumulative projects cause a cumulatively considerable contribution to a significant cumulative impact relative to greenhouse gas emissions.	Beneficial	n/a	
Hazards and Hazardous Materials			
Impact HAZ-1: Exposure to Known and Unknown Hazardous Materials.	Less than Significant	n/a	

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact HAZ-2: Exposure to Hazardous Materials during Project Construction and Operation.	Less than Significant	n/a	
Impact HAZ-3: Emergency Response Plans and Wildland Fire Risk.	Less than Significant	n/a	
Impact HAZ-C-1: The Project, in Combination with Other Cumulative Projects, Would Not Increase the Exposure of Hazardous Substances to the Public or Environment.	Less than Significant	n/a	
Hydrology and Water Quality			
Impact HWQ-1: Violate any Water Quality Standards or Waste Discharge Requirements.	Potentially Significant	Mitigation Measure HWQ-1a: Manage Construction Storm Water. Mitigation Measure HWQ-1b: Industrial Storm Water General Permit Mitigation Measures HWQ-1c: Well Development According to Mendocino County and California State Standards.	Less than Significant
Impact HWQ-2: Substantially Deplete Groundwater Supplies or Interfere Substantially with Groundwater Recharge	Less than Significant	n/a	
Impact HWQ-3: Substantial Additional Sources of Polluted Runoff or Otherwise Substantially Degrade Water Quality.	Potentially Significant	Mitigation Measure HWQ-1a: NDPES and Storm Water Pollution Prevention Plan. Mitigation Measures HWQ-1b: Well Construction according to California State well drilling standards. Mitigation Measures HWQ-1c: Well Development according to Mendocino County and California State well development standards.	Less than Significant

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact HWQ-4: Substantially Alter Existing Drainage Pattern, or Substantially Increase Rate or Amount of runnoff in a Manner which would Result in Flooding On- or Off-site.	Potentially Significant	Mitigation Measures HWQ-4: Reduce Potential for Offsite Runoff.	Less than Significant
Impact HWQ-C-1: Project Result in a Cumulatively Considerable Contribution to Cumulative Impacts Related to Hydrology and Water Quality.	Less than Significant	n/a	
Land Use and Planning			
Impact LU-1: Conflict with Any Applicable Land Use Plan, Policy, or Regulation.	Less than Significant	n/a	
Impact LU-C-1: The Project Combined with Other Cumulative Projects, Conflict with Applicable Land Use Plans, Policies, or Regulations.	Less than Significant	n/a	
Noise			
Impact NO-1: Exposure of Persons to or Generation of Noise Levels in Excess of Standards.	Less than Significant	n/a	
Impact NO-2: Result in Exposure of Persons to or Generation of Excessive Groundborne Vibration or Groundborne Noise Levels.	Less than Significant	n/a	
Impact NO-3: Substantial Permanent Increase in Ambient Noise Levels in the Project Vicinity.	Less than Significant	n/a	
Impact NO-4: Substantial Temporary or Periodic Increase in Ambient Noise Levels in the Project Vicinity.	Less than Significant	n/a	
Impact NO-C-1: Cumulative Impacts from Noise.	Less than Significant	n/a	

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Transportation			
Impact TR-1: Conflict with an Applicable Plan, Ordinance, or Policy Establishing Measures of Effectiveness for the Performance of the Circulation System.	Potentially Significant	Mitigation Measure TR-1: Traffic Control Plan.	Less than Significant
Impact TR-2: Substantially Increase Hazards Due to Design Feature or Incompatible Use.	Less than Significant	n/a	
Impact TR-3: Result in Inadequate Emergency Access.	Less than Significant	n/a	
Impact TR-4: Conflict with Adopted Policies, Plans, or Programs Regarding Public Transit, Bicycle, or Pedestrian Facilities.	Less than Significant	n/a	
Impact TR-C-1: Cumulatively Considerable Contribution to Cumulative Impacts Related to Transportation.	Less than Significant	n/a	

2.0 Project Description

2.1 Project Overview

The Central Coast Transfer Station project would replace the existing solid waste transfer and disposal system (owned by the County of Mendocino and City of Fort Bragg, and operated by Solid Waste of Willits and Empire Waste Management) for the Central Coast region of Mendocino County with a new transfer station facility on SR 20. The new transfer station would be publicly owned and operated by a private contractor, and would allow direct haul of all solid waste to a destination landfill. The Central Coast region extends from the mouth of the Navarro River north to the southern edge of the town of Westport, and inland from the Pacific Ocean to a point approximately half-way to the inland valleys. It corresponds to the Coastal Zone of Mendocino County Solid Waste Refuse Collection Area No. 2, together with the incorporated City of Fort Bragg. In 2013, this wasteshed generated 11,882 tons of solid waste which is transferred by Empire Waste Management in truck haul pods and debris boxes.

The City of Fort Bragg and County of Mendocino would hold title to the Central Coast Transfer Station site but would not design, build, or operate the facility. A private solid waste management company would be retained under a long-term contract to carry out these functions. The contract would embody the mitigation measures set forth in this EIR. Some details of design and operation would be left to the discretion of the private operator. Any changes to the design would be analyzed for consistency with the project as described and analyzed in this EIR before approval of the contract with a private solid waste management company.

2.2 Project Location

The proposed project site for the new transfer station is located in unincorporated Mendocino County approximately 3.5 miles southeast of downtown Fort Bragg. The 17-acre site will be removed from Jackson Demonstration State Forest (JDSF) at 30075 State Route 20 (Figure 2-1 - Vicinity Map), and includes a portion of Assessor's Parcel Number (APN) 019-150-05 (Figure 2-2 - Site Plan). The removal of the site from JDSF was mandated by AB 384 (2011), the text of which is included as Appendix I.

2.3 Project Objectives

The proposed project has the following objectives:

- To provide cost-effective and environmentally-sound waste management services to the citizens of Fort Bragg and Mendocino County.
- To construct and operate a commercial transfer station able to accommodate waste from the wasteshed, peak periods and technological changes.
- To allow the Central Coast region's solid waste to be loaded for direct haul to a destination landfill, rather than being dumped and reloaded at the Willits Transfer Station.
- To increase the efficiency of solid waste transfer from the Central Coast region in order to minimize energy use, greenhouse gas emissions, truck trips, and costs.
- To achieve public ownership of the transfer station facility to ensure long-term protection of the public interest, while accommodating private operation by a qualified solid waste entity

under a contract that ensures compliance with all federal, state and local regulations and requirements

- To isolate the transfer station, as much as possible, from potentially conflicting land uses
- To control the rising costs of managing solid waste and recyclables for the City of Fort Bragg and Mendocino County.

2.4 Existing Solid Waste Collection/Disposal System

Currently, the region's solid waste stream is handled in different pieces. The curbside solid waste is collected by Empire Waste Management, a franchisee under separate contracts with both the County of Mendocino and the City of Fort Bragg. The curbside collection vehicles have detachable bodies (commonly referred to as "pods") which are removed and stored at Empire Waste Management's truck depot at 219 Pudding Creek Road, Fort Bragg. The pods are then loaded three-at-a-time on a flatbed semi-trailer and hauled approximately 35 miles east on SR 20 to the Willits Transfer Station, where they are emptied out and the solid waste is reloaded for long-haul to Potrero Hills Landfill in Suisun City, California. Empire Waste Management also collects solid waste in roll-off boxes (also known as debris boxes) which are hauled two-at-a-time to Willits Transfer Station. Solid waste from private vehicles is received at the Caspar self-haul transfer station at 14000 Prairie Way, Caspar, the site of a closed landfill. The waste is received in debris boxes and pods, which are hauled by Empire Waste Management to the Willits Transfer Station.

The Central Coast region also has a second, smaller self-haul transfer station located at 30180 Albion Ridge Road, Albion. The waste is received in debris boxes which are hauled by Solid Wastes of Willits to the Willits Transfer Station.

2.5 Project Description

The project includes several related components:

2.5.1 Site Acquisition and Land Swap

Following a decision by the City and County to approve the project and a contract for design, construction and operation of the facility, the next step would be for the City and County to exercise their option to take ownership of the site pursuant to AB 384 (2011).

At the request of the County of Mendocino and City of Fort Bragg, AB 384 was enacted in 2011 and added new Section 4659 to the Public Resources Code, which included provisions authorizing a multi-party/multi-property land swap whereby the state would transfer ownership of the 17-acre JDSF site (project site) to the County/City in exchange for either ownership of 35 acres at the Caspar Landfill site or control over its future uses.

Under AB 384, the 60-acre Caspar site (Figure 3 - Project Land Exchange Parcels), including the footprint of the closed landfill, would be the subject of a conservation easement granted to the California Department of Parks & Recreation (DPR). DPR would have the option of taking ownership of the 35 westernmost acres of the site (Figure 3). The interest of DPR in the property results from the site's adjacent proximity to Russian Gulch State Park. DPR has stated in the past that operations of the Caspar self-haul transfer station (and prior to 1992, the Caspar Landfill) cause a conflict with the State Park. DPR has not indicated any plans for the 35-acre Caspar property except to keep it vacant.

Further, under the land swap authorized by AB 384, twelve acres of redwood forest at the northeastern corner of Russian Gulch State Park (Figure 3), comprising the entire Park northeast of County Road 409, would be transferred to Jackson Demonstration State Forest (JDSF). The purpose of this transfer would be to offset the loss of forest resources caused to JDSF at the Central Coast Transfer Station site. These 12 acres would become part of JDSF's Caspar Creek Experimental Watershed Study area. The Caspar Creek Experimental Watershed Study area serves as a research area for evaluating the effects of timber management on streamflow, sedimentation, and erosion. The study area was established in 1961 as a cooperative effort between the CalFire and the United States Forest Service Pacific Southwest Research Station (PSW). PSW and CalFire have a 100-year Memorandum of Understanding to continue research at the site at least through 2099. Caspar Creek is one of 11 USFS Experimental Forests and Ranges selected in 2007 to complement the national network of Long Term Ecological Research sites.

2.5.2 Facility Construction

After obtaining the required permits, the company that was awarded the design-construction-operations contract would build the facility within the parameters set forth in the adopted EIR. As described in this EIR, the construction would entail land clearing, road improvements to SR 20, building and paving, and on-site utilities.

Site preparation would take approximately two weeks, followed by grading/excavation which would take approximately one month. Trenching would take approximately three weeks. Construction of the buildings would take approximately four months, and paving approximately two weeks. Construction equipment for site preparation and grading/excavation would include: excavator, rubber tired dozer, backhoe, dump truck, water truck, and vibratory roller. Building construction and paving would include the following additional equipment: crane, forklift, generator sets, welders, flatbed truck, mini bobcat, and cement and mortar mixers.

Soil hauling volume is estimated at 5,000 cubic yards of export and 6,000 cubic yards of import, for a net import of 1,000 cubic yards. Asphalt has been estimated at approximately 1,200 cubic yards.

2.5.3 Facility operation

The transfer station would commence operations as described elsewhere in this section and receive the entire solid waste disposal stream from the Central Coast wasteshed, for transfer to a destination landfill.

1.1.1 2.5.4 Closure of existing facilities

With the opening of the new transfer station, the existing Caspar self-haul transfer station would cease operations and Empire Waste Management would cease its direct-haul transfer to Willits Transfer Station and instead use the new transfer station. The Albion self-haul transfer station would continue to operate but its solid waste would be redirected to the new Central Coast Transfer Station.

2.5.5 New Facility Description

The Central Coast Transfer Station facility would include a solid waste transfer building (with loading bay and unloading and waste areas), an outdoor recycling drop-off area, two scales and office (scalehouse), paved driveways, parking areas for the public and transfer trailers, two stormwater detention areas, a groundwater well, a septic tank and leachfield, and perimeter fencing immediately outside the developed project footprint. The site plan is shown in Figure 2-2. A single gate on SR 20 would accommodate all vehicle entry and exit. Vehicles would pull up at the scalehouse for inspection, weighing or volume measurement, and to pay applicable charges. The Transfer Building would be approximately 30,000 square feet and enclosed. Enclosure would reduce or prevent off-site noise, odors, and dust. In addition, the design would be compatible with installation of control measures such as negative-pressure ventilation with biofiltered exhaust, automated roll-up doors, and/or doorway air curtains, should they be necessary to prevent off-site transmission of odor.

Some vehicles would operate outdoors in the recycling area, most likely a single loader and occasional roll-off trucks to change-out debris boxes as necessary. These vehicles would use “white-sound” OSHA-approved backup alarms such as the Brigade which replaces the typical loud “ping” with a directional buzzing sound with much less range.


Typical possum-belly transfer trailer used for solid waste hauling

All solid and green waste (leaves, brush, landscape trimmings, and unfinished wood) would be deposited inside the transfer building. These materials would be loaded into transfer trailers using a method to be determined by the operator, such as a grapple crane. When a transfer trailer is fully loaded, it would be driven directly to a destination landfill to be specified under the operator’s contract. The facility may utilize high-volume possum belly trailers to transport solid waste (the image on prevous page is an example of a possum belly trailer, length may vary). These high-volume trailers can legally haul up to 10 percent more waste than a standard waste hauling trailer. More tons per load equates to less trips. Solid waste would typically be removed within 24 hours; however, it is possible that in some situations, such as weekends/holidays, waste could remain for up to 48 hours. Among the fully-permitted regional landfills that might receive the solid waste are Potrero Hills in Suisun City, Redwood in Novato, Sonoma Central in Petaluma, Anderson in Anderson, Ostrum Road in Wheatland, Lake County in Clearlake, Recology Hay Road in Vacaville, and Keller Canyon in Pittsburg. Green waste would be hauled to Cold Creek Compost in Potter Valley or another fully-permitted compost facility. Transfer vehicles leaving the facility would proceed east on SR 20.

The recycling drop-off area would duplicate the drop-off services presently provided at the Caspar self-haul transfer station. Cans, bottles, cardboard, paper and mixed plastics would be collected together in debris boxes (see outdoor recycling area in Figure 2-2). Scrap metal, appliances and concrete rubble would be received in paved bunkers or debris boxes. Used motor oil and used antifreeze would be collected in secure tanks with secondary containment (see outdoor recycling area in Figure 2-2). Other recyclable household hazardous waste items, including electronics, fluorescent lights, and batteries, would be collected in secure containment areas. All other hazardous wastes would be prohibited at the facility and customers would be referred to the periodic HazMobile household and small business hazardous waste mobile collection system.

For the purposes of evaluation and analysis in this EIR, a total of 4.72 acres is assumed to be disturbed by the project-- approximately 3.76 acres within the project footprint, and 0.96 acre for a 10-foot buffer (construction/temporary).

The site is heavily forested and as much of the original vegetation as possible would be preserved. No new landscaping is planned.

2.5.6 Hours of Operation

The transfer station would operate five days per week for self-haul customers and the franchised hauler, and two additional days per week for the self-haul customers only. The exact hours of operation would be determined by the operations contracts; however, it is anticipated to be between 8:00 a.m. and 5:00 p.m. There would be approximately four employees on site.

2.5.7 Capacity

Based on the current wastestream, documented by transfer station records, the solid waste throughput would average 35 tons per day year-round, with a peak day of 50 tons per day. The facility could handle a larger wastestream by more intensive utilization of the same infrastructure. The future size of the wastestream is speculative. There has been no growth (an actual decrease has occurred) in the region's disposal wastestream over the last six years as shown by Table 2-1, and City and County annual population growth projections are less than one percent. According to the Fort Bragg General Plan Land Use Element, "it is expected that growth will continue to occur at a slow but regular pace (i.e., less than 0.5 percent per year) as experienced in the last decade (Fort Bragg 2012)." The Mendocino County General Plan "projects the County's total population will increase to 93,166 persons by the year 2010, and then increase an average of 9.5 percent every 10 years to a population of 134,358 in 2050" (California Department of Finance 2007).

The region has a highly-developed waste diversion system and strong public support for waste diversion. One possible source of substantial future growth might be development of the 315-acre former Georgia-Pacific Mill Site in the City of Fort Bragg. While it is unknown if or when this development might occur, the possible mix of residential, commercial and industrial zoning for the Mill Site has been set forth in a draft specific plan. The proposed transfer station could accommodate the waste generation of the Mill Site development without the need for expansion of the original infrastructure. Based on the draft specific plan, the land uses would be of types that would utilize the curbside collection of the franchised hauler, meaning that the solid waste would be transported to the transfer station in relatively few trips by the hauler's compactor trucks.

Table 2-1 Solid Waste Disposal in the Region

Year	Solid Waste Disposal of Region (tons)
2008	14,300
2009	12,334
2010	11,691
2011	11,078
2012	11,060
2013	11,882

Source: Disposal Reports, Willits Transfer Station

2.5.8 Facility Access and State Route Improvements

Access to the project site would be controlled by gate with security fencing surrounding the perimeter of the facility. The site will include two queuing lanes for ingress and one queuing lane for egress. Vehicles would enter and exit the facility directly from SR 20, which would be improved with deceleration and acceleration lanes as illustrated in Figure 2-2. SR 20 improvements would include acceleration and deceleration lanes per California Department of Transportation (Caltrans) standards. SR 20 would be widened from the roadway centerline north to accommodate the acceleration and deceleration lanes, and for the new eastbound left-turn pocket and westbound right-turn pockets at the proposed project access point.

All vehicles carrying solid waste and other materials that may have a fee charged for their disposal would enter and leave the site across the scales. Customers with mixed loads including items that can be dropped off for free or that are paid for on a per item basis may be routed through the outdoor recycling area.

2.5.9 Utilities and Public Services

Potable water for the facility would be provided by a new on-site well. Sewer for the single restroom would be handled via an on-site septic tank and leachfield, or a holding-tank system. Three-phase electrical power is available on the SR 20 frontage.

2.5.10 Energy Usage

Operation of the solid waste transfer station would require electricity for general operation of the facility, lighting for the scalehouse and restroom, interior lighting for the unloading area, and security lighting. Except in unusual or emergency circumstances, all operations would take place during daylight hours so there would be no need for exterior lighting except for minimal security lighting which would be shielded and downcast. The transfer building would incorporate translucent panels in the ceiling and/or walls to provide interior illumination, thereby minimizing the need for interior lights.

Trucks and self-haul vehicles would use gasoline/diesel to deliver solid waste and recycling materials to the facility. Trucks would use diesel for delivery of the transfer trailers to a destination landfill. The amount of diesel used annually for the delivery of transfer trailers to the Willits Transfer Station under existing conditions is approximately 54,630 gallons per year. The amount of diesel used annually for the delivery of transfer trailers to a destination landfill under project conditions is unknown at this time.

Currently, the franchised hauler collection trucks make an average of 63 trips per week or 3,276 trips annually for its curbside collection routes throughout Fort Bragg and the unincorporated area. The trucks are based at 219 Pudding Creek Road, Fort Bragg, and return there to unload their pods. These trucks would be diverted to unload at the proposed transfer station, causing an average of eight additional miles of travel for each truck. The additional miles per year would be approximately 26,208 miles per year and approximately 8,293 gallons of diesel annually.

Self-haul vehicles currently drop off at the Caspar Transfer Station. The population centroid of the service area has been determined by the Mendocino County GPS Coordinator to be a point approximately one mile northeast of the intersection of SR 20 and SR 1. Since the entire service area has non-mandatory trash collection at similar prices for identical terms of service, the centroid for self-haul trip generation is assumed to be the same as the population centroid. From the SR 20 and SR 1 intersection, the Caspar Transfer Station is 6.8 miles away and the project site is 3.0

miles away, which would equate to approximately 7.6 miles saved per visit, or 162,032 miles per year. Using an estimate of 17 miles per gallon for self-haul vehicles, the amount of fuel saved would be approximately 9,531 gallons.

2.5.11 Stormwater Detention Facilities

Two stormwater detention facilities have been planned for the proposed project (Figure 2-2). The detention basins would be designed to be an impoundment lined with vegetated soil. Stormwater runoff would be conveyed from the site to these basins through bioswales and from surface runoff. Stormwater collects in the basins and the outlet would allow water to drain slowly, while sediment and other particulate forms of pollutants settle out. At full capacity, the basins are designed to drain in at most 72 hours and at least 24 hours to prevent mosquito production and allow for capture of subsequent storms. These basins would be designed to remain dry except during a runoff event and the detention period afterward. When maintenance is required, accumulated sediment would be removed, characterized, and disposed of appropriately.

2.5.12 On-site Well

An on-site potable water well would be constructed to supply water for operations and for drinking water. The well would be located east of the facility (Figure 2-2) and would supply water to a holding tank, with sufficient capacity for the facility's needs including fire protection as required by CalFire. The well would be constructed according to the California Department of Public Health (CDPH) standards, which consider 100-foot offsets from the transfer station building and proper well construction including a sanitary seal, with adequate materials for the casing and screen. The pump used in the well would be a submersible pump logically tied with telemetry to the storage tank. An approximately 10-foot wide by 55-foot long road would be constructed leading to the pumphouse for the well. The road would be top dressed with gravel and the pumphouse would be approximately four feet by four feet. To protect groundwater quality, transfer trailers will be prohibited from parking on the eastern side of the facility through barriers and signage.

2.5.13 Holding Tank Sewer System

As an alternative to a septic tank and leachfield, a sewage holding tank could be provided subject to regulatory approval. The tank would be located in close proximity to the restrooms. The holding tank would be designed with sufficient capacity to accommodate five employees and several visitors per day. Construction of the holding tank would be in accordance with Mendocino County Division of Environmental Health's Minimum Standards for On-site Sewage Systems standards, including appropriate materials, access ports, and an over flow alarm. The tank would be emptied as necessary by a permitted septic tank service.

2.5.14 Caspar Transfer Station Closure

Closure of the Caspar self-haul transfer station would involve shutting the gate and ceasing acceptance of solid waste. This would occur within one week of the opening of the new transfer station. It is anticipated that removal of small and portableexisting structures, including the gate house, lockers and stationary compactors, would occur at some point after the Caspar transfer station closes. At this time there is no requirement or intention to demolish any of the existing structures at the Caspar facility. Any future demolition would depend on funding and future use of the site by DPR.

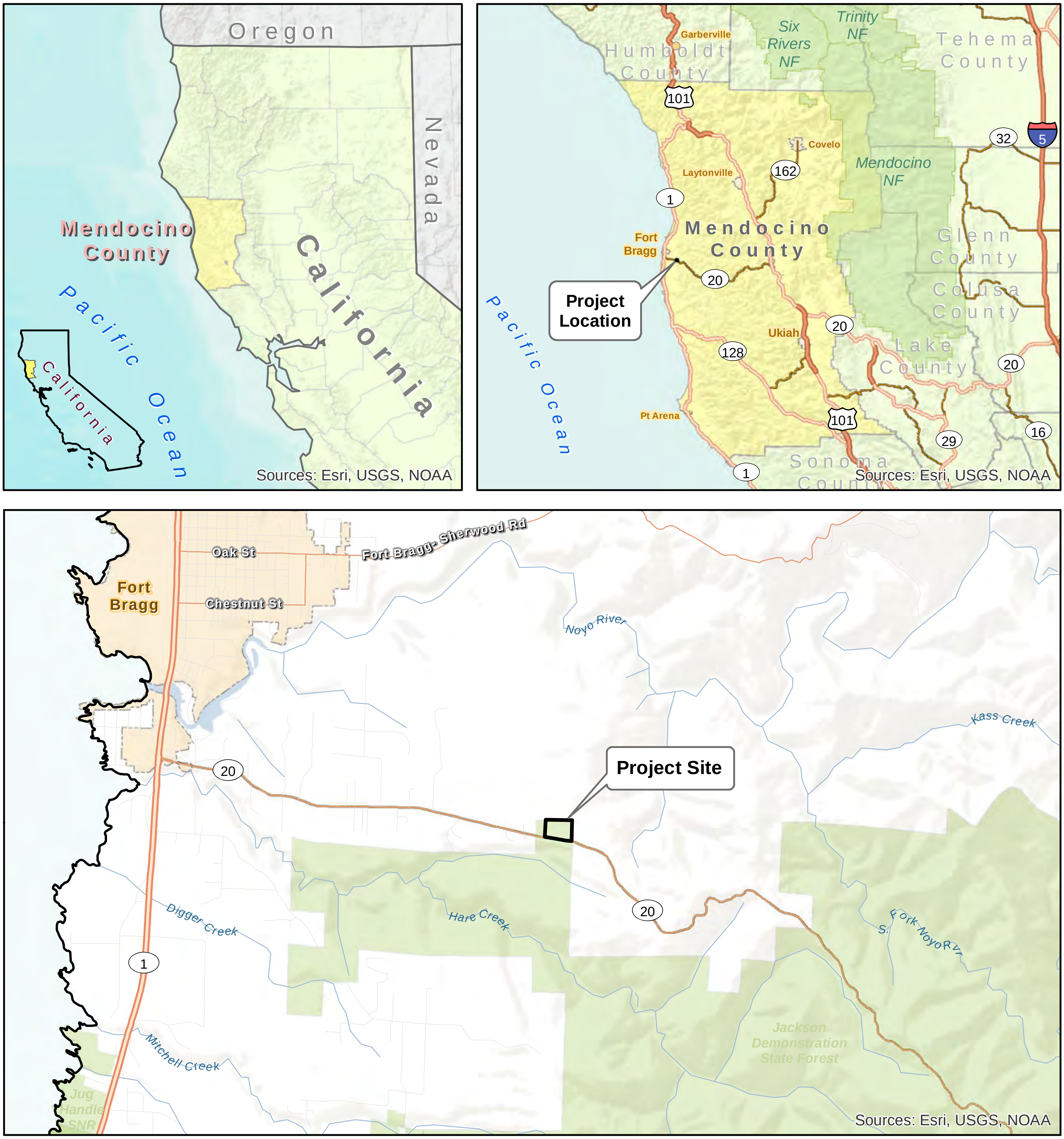
2.5.15 Construction Schedule and Duration

The timeline for construction is dependent on a number of factors. It is estimated that construction would commence within 24 months from certification of the EIR, followed by up to six months of construction depending on weather. Hours of construction would be between the hours of 8:00 AM and 6:00 PM.

2.6 Required Permits and Approvals

As anticipated by the existing provisions of the Caspar JPA agreement, the JPA will be amended to specify the roles of the City and County in transfer station contract administration, land title, and site supervision. The project would require the following permits/approvals:

- Acquisition of the project site by the County of Mendocino and the City of Fort Bragg
- Major use permit by the County of Mendocino as a Civic Type Use – Major Impact Services & Utilities
- Approval by California Department of Forestry & Fire Protection of a Timberland Conversion Plan, Timberland Conversion Permit, and Timber Harvest Plan
- Encroachment permit and related approvals by the California Department of Transportation for improvements to SR 20
- Solid waste facilities permit from the California Department of Resource Recovery & Recycling
- Stormwater discharge permit (National Pollutant Discharge Elimination System) from the Water Quality Control Board
- Well construction permit from the Mendocino County Health Department
- Permit for the construction of a septic system from the Mendocino County Health Department.



Project Site	Major Highways
City Limits	Highways
Parks/Open Space	Major Roads
	Rivers/Streams

Paper Size 8.5" x 11" (ANSI A)

0 0.25 0.5 0.75 1

Miles

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

Mendocino Solid Waste Management Authority
Central Coast Transfer Station EIR

Job Number 8411065
Revision A
Date 03 Nov 2014

Vicinity Map and Project Location

Figure 2-1

718 Third Street Eureka CA 95501 USA T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

G:\0016201 MendoSolidWasteMgmtAuthority\8411065 MSWMA TransferStationEIR\08-GIS\Maps\Figures\EIR\F2-1_Vicinity.mxd

Data source: USDA NAIP Imagery, 2010; USA Base Map, 2013; GHD data, 2013. Created by:jrousseau

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California II FIPS 0402 Feet

N

17 Acre Portion of APN 019-150-05

Parcels

Bio-swale

Direction of Travel

GHD

Mendocino Solid Waste Management Authority
Central Coast Transfer Station EIR

Job Number	8411065
Revision	A
Date	20 Jan 2015

Site Plan

Figure 2-2

718 Third Street Eureka CA 95501 USA T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

G:\0016201 MendoSolidWasteMgmtAuthority\8411065 MSWMA TransferStationEIR\08-GIS\Maps\Figures\EIR\F2-2_SitePlan.mxd

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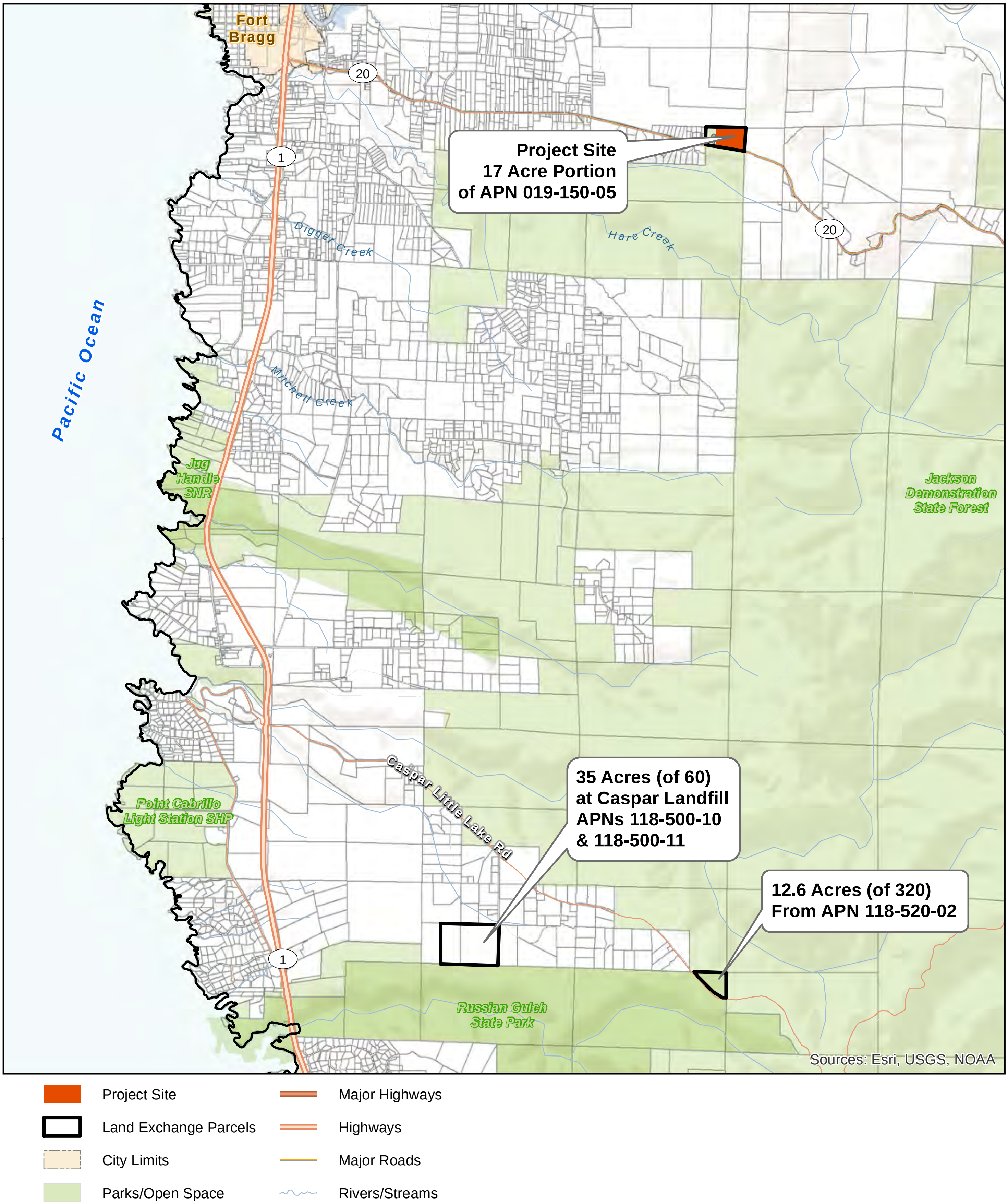

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Miles
Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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Mendocino Solid Waste Management Authority
Central Coast Transfer Station EIR

Job Number 8411065
Revision A
Date 03 Nov 2014

Project Land Exchange Parcels

Figure 2-3

718 Third Street Eureka CA 95501 USA **T** 707 443 8326 **F** 707 444 8330 **E** eureka@ghd.com **W** www.ghd.com

G:\0016201 MendoSolidWasteMgmtAuthority\8411065 MSWMA TransferStationEIR\08-GIS\Maps\Figures\EIR\F2-3_ProjectLandExchange_new.mxd

Data source: USDA NAIP Imagery, 2010; USA Base Map, 2013; GHD data, 2013. Created by:jrousseau

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3.0 Environmental Setting, Impacts and Mitigation Measures

Scope of Analysis

This Draft EIR analyzes the potential effects of the proposed project on the environment under the applicable environmental resource topics listed in the CEQA Initial Study Checklist.

Each environmental resource area potentially impacted by the project is addressed in the following sections numbered as follows:

- 3.1 Aesthetics
- 3.2 Agriculture and Forest Resources
- 3.3 Air Quality and Odor
- 3.4 Biological Resources
- 3.5 Cultural Resources
- 3.6 Geology, Soils and Seismicity
- 3.7 Greenhouse Gas Emissions and Energy
- 3.8 Hazards and Hazardous Materials
- 3.9 Hydrology and Water Quality
- 3.10 Land Use and Planning
- 3.11 Noise
- 3.12 Transportation

Section 1.5 identifies the resource categories found not to be significant and thus are not included for further discussion and analysis in this Draft EIR (Population and Housing, Public Services and Utilities, and Recreation).

Each section of Chapter 3 contains the following elements:

Existing Setting. This subsection presents a description of the existing physical environmental conditions in the project area with respect to each resource area at an appropriate level of detail to understand the impact analysis. It describes existing conditions and provides a baseline by which to compare the potential impacts of the proposed project.

Regulatory Framework. This subsection provides a brief discussion of federal, State, and local regulations and policies that are relevant to the resource.

Significance Thresholds. This subsection provides the significance thresholds for evaluation of environmental impacts. The significance thresholds are based on State CEQA Guidelines Appendix G.

Methodology. The methodology subsection discusses the approach to the analysis.

Impacts and Mitigation Measures. This subsection evaluates the potential for the project to significantly affect the physical environment described in the setting. Potential impacts are identified and characterized, and where feasible, mitigation measures are identified to avoid or reduce significant impacts to a less-than-significant level.

Cumulative Impacts and Mitigation Measures. Cumulative impacts are discussed in each environmental resource section following the description of the project-level impacts and mitigation measures. The cumulative impact analysis is based on the same setting, regulatory framework, and significance thresholds presented in each resource topic section. Additional mitigation measures are identified if the analysis determines that the project’s contribution to an adverse cumulative impact would be cumulatively considerable and, therefore, significant.

Significance Determinations

The significance thresholds for each environmental resource topic are presented in each section of Chapter 3. For the impact analyses, the following categories are used to identify impact significance:

No Impact. This determination is made if a resource is absent or if a resource exists within the project area, but there is no potential that the project could affect the resource.

Less-than-Significant Impact. This determination applies if there is a potential for some limited impact on a resource, but the impact is not significant under the significance threshold.

Less-than-Significant Impact after Mitigation Incorporated. This determination applies if there is the potential for a substantial adverse effect in accordance with the significance threshold, but mitigation is available to reduce the impact to a less-than-significant level.

Significant and Unavoidable Impact. This determination applies to impacts that are significant, and mitigation has been incorporated, but the mitigation does not reduce the impact to less-than-significant and there appears to be no additional feasible mitigation available to reduce the impact to a less-than-significant level.

Environmental impacts are numbered throughout this EIR, using the section number followed by sequentially numbered impacts. Mitigation measures are numbered to correspond to the impact numbers; for example, Mitigation Measure 3.1-1 would address Aesthetics Impact 3.1-1. Where more than one mitigation measure is included to mitigate one impact the sequence of “a”, “b,” etc. is added (for example: Mitigation Measure 3.1-1a and Mitigation Measure 3.1-1b both apply to Impact 3.1-1).

Cumulative Impacts

Cumulative impacts are defined as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts” (CEQA Guidelines Section 15355). Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

The cumulative impact analysis for each environmental resource topic is described in the appropriate subsections of this Chapter, following the description of direct project impacts and identified mitigation measures.

Approach to Cumulative Impact Analysis

Two approaches to the definition of the cumulative project scenario are discussed in CEQA Guidelines Section 15130(b). The first approach is a list of past, present, and probable future projects producing related or cumulative impacts. The second approach is a summary of projections contained in an adopted local, regional or statewide plan, such as a general plan or related planning document, or in an adopted or certified environmental document, which describes or evaluates conditions contributing to cumulative effects.

For this EIR, the cumulative project scenario has been evaluated using the list approach. Table 3.0-1 lists relevant projects used in the cumulative impacts analysis for each environmental resource topic.

List of Relevant Projects

Table 3.0-1 (Projects Considered for Cumulative Impacts) provides a list of the past, present, and reasonably foreseeable future projects within and near the project area, including a brief description of the projects and their anticipated construction schedules (if known). Single family homes and other similar scale uses were not included because of their negligible cumulative effects.

Table 3.0-1 Projects Considered for Cumulative Impacts

Project Name	Project Description	Estimated Construction Schedule	Project Location
Mill Site	Rezone to allow 520 residential units, 450 hotel rooms, 700,000 square feet of commercial/industrial development, and open space (315 total acres).	Specific Plan is incomplete, EIR needs to be prepared.	West side of the City of Fort Bragg. 90 West Redwood Avenue. Approximately 3.6 miles (air) northwest of project site.
Fort Bragg Coastal Trail	The project includes a 4.5 mile multiuse trail and 82 acre park, two parking lots, and three restrooms.	Construction underway, to be completed in 2015.	Coast within City of Fort Bragg. Noyo Point Road to Elm Street. Approximately 3.2 miles (air) west of project site.
Hare Creek Shopping Mall	Development of a 29,500 square foot retail shopping center.	Planning application submitted and under review.	Corner of SR 1 and SR 20 in Fort Bragg. Approximately 2.9 miles west of project site.
Avalon Hotel	Development of 20-40 hotel rooms.	Planning application under review.	SR 1 and Airport Road in Fort Bragg. Approximately 4.3 miles (air) northwest of project site.

Source: City of Fort Bragg and Mendocino County. 2014

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3.1 Aesthetics

This section evaluates the potential impacts related to aesthetics and visual resources during construction and operation of the project. To provide the basis for this evaluation, the Setting section describes the existing scenic resources and visual character for the project area and the Regulatory Framework section describes the regulatory background that applies to the project.

3.1.1 Setting

The descriptions of existing conditions are accompanied by photographs of representative views taken during a site visit on May 7, 2014. The locations and viewpoints of each image are shown in Figure 3.1-1.

Visual Character of the Project Site

The project site consists of approximately 17 acres of relatively flat, coniferous forest, with dense underbrush. (see Images 1 through 4). The site has no built structures or roadways. SR 20 is adjacent to and directly south of the project site and the CalFire helipad is adjacent to and directly west of the project site.

Visual Character of the Surrounding Area

The dominant visual character in the immediate project area consists of forest land to the north, east, and south, and low density single family residential to the west. Between the single family homes and the project site is the CalFire emergency helipad. SR 20 provides access to the project site and runs in a predominantly east-west direction connecting the communities of Fort Bragg to the west and Willits to the east. SR 20 has one lane in each direction in the project vicinity with a minimal shoulder. Utility lines run along the south side of SR 20 in the project area.

The views for both eastbound and westbound travellers on SR 20 as they approach the project site include coniferous forest on both sides of the highway with utility lines along the south side of the highway (similar to Images 2 and 4).

3.1.2 Regulatory Framework

Federal

There are no federal regulations that apply to the proposed project related to visual resources in Mendocino County.

State

California Scenic Highway Program

The California Department of Transportation (Caltrans) manages the California Scenic Highway Programto preserve and protect scenic highway corridors from change which would diminish the aesthetic value of lands adjacent to highways. According to the California Scenic Highway Program website, no State-designated scenic highways are located in the project vicinity (Caltrans 201). SR 20 is an Eligible State Scenic Highway though not officially designated.

Site Photographs

Image 1: Looking east at the project site from the west side of the helipad.

Image 2: Looking northeast at the project site from the south side of SR 20 across from the helipad entrance.

Image 3: Looking north at the approximate location of the project entry from the south side of SR 20.

Image 4: Looking northwest at the project site from the southeast corner of the project on the south side of SR 20.

Regional and Local

County of Mendocino General Plan Goals and Policies

The following are the goals and policies from the *Mendocino County General Plan* that are applicable to the project.

Goal RM-14 (Visual Character): Protection of the visual quality of the County's natural and rural landscapes, scenic resources, and areas of significant natural beauty.

Goal RM-15 (Dark Sky): Protection of the qualities of the County's night-time sky and reduced energy use.

Policy RM-80: Vegetation removal should be reviewed when involving five (5) or more acres, assessing the following impacts:

- Grading and landform modifications including effects on site stability, soil erosion and hydrology.
- Effects on the natural vegetative cover and ecology in the project area.
- Degradation to sensitive resources, habitat and fisheries resources.
- Compatibility with surrounding uses.
- Visual impacts from public vantage points.

Policy RM-126: New development should incorporate open space and resource conservation measures, coordinated with the surrounding area.

Policy RM-128: Protect the scenic values of the County's natural and rural landscapes, scenic resources, and areas of significant natural beauty.

Policy RM-132: Maintain and enhance scenic values through development design principles and guidelines, including the following:

- Development scale and design should be subordinate to and compatible with the setting.
- Reduce the visual impacts of improvements and infrastructure.
- Minimize disturbance to natural features and vegetation, but allow selective clearing to maintain or reveal significant views.

Policy RM-134: The County shall seek to protect the qualities of the night-time sky and reduce energy use by requiring that outdoor night-time lighting is directed downward, kept within property boundaries, and reduced both in intensity and direction to the level necessary for safety and convenience.

3.1.3 Evaluation Criteria and Significance Thresholds

The project would cause a significant impact related to aesthetic resources, as defined by the CEQA Guidelines (Appendix G), if it would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or

- Create a new source of substantial light or glare which would adversely affect day or night-time views in the area.

Areas of No Project Impact

As explained below, construction and operation of the project would not result in impacts related to one of the significance criteria identified in Appendix G of the current CEQA Guidelines as mentioned above. The following significance criterion is not discussed further in the impact analysis, for the following reasons:

- **Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings within a State scenic highway**. There are no officially designated state scenic highways within Mendocino County (Caltrans 2011). SR 20 within Mendocino County is eligible, but not officially designated. Therefore, the significance criterion related to substantially damaging scenic resources within a State scenic highway is not applicable to the proposed project.

3.1.4 Methodology

The visual impact analysis below evaluates the physical changes that would occur at the project site using the CEQA Guidelines significance thresholds described above. The potential for changes to views from visually sensitive land uses also is evaluated. The visual impacts are compared against the thresholds of significance discussed above.

The projects impacts from light and glare is measured for consistency with the Mendocino County General Plan Goal RM-15 and Policy RM-134.

There would be no physical changes to the Caspar self-haul transfer station except removal of some small structures, which could be considered a beneficial aesthetic impact to the site. Therefore, the Caspar site is not considered further in this analysis. Likewise, the transfer of 12.6 acres from Russian Gulch State Park to JDSF involves no physical changes and therefore no aesthetic impacts.

3.1.5 Impacts and Mitigation Measures

Impact AES-1: Substantial Adverse Effect on Scenic Vistas.

A scenic vista is generally defined (dictionary) as a view that has remarkable scenery or a broad or outstanding view of the natural landscape. These conditions do not exist at the project site or in the surrounding area. The site does have scenic qualities; however, they are not remarkable or outstanding. The project site and surrounding area includes forest land consisting of a variety of species, including pygmy forest; however, the proposed project would be situated within the central portion of the site, behind a screen provided by existing tall trees and undergrowth, as shown in Images 2 and 3, which would remain, so that views of the buildings and ancillary facilities would be shielded from off-site view. Consistent with Policies RM-126, RM-128, and RM-132, site construction would leave much of the surrounding natural vegetation, approximately 12 acres, as undisturbed open space on all sides with the exception of the entry point on SR 20. The visual impact to residences to the west is expected to be minimal because of the intervening trees, vegetation, and helipad that would shield views of the project site. The helipad was created with fill which has increased its elevation to approximately 433 feet (above sea level), thus creating a visual barrier between the neighboring properties and the project site which are at an elevation of approximately 397 feet. The distance from the center of the helipad and closest property line to the west is approximately 250 feet. Therefore, development of the project site would not have a substantial adverse effect on a scenic vista. The impact to scenic vistas would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: **Less than significant.**

Impact AES-2: Substantially Degrade Existing Visual Character of Site and Surroundings.

The project site is surrounded by forest land to the north, east and south, and a helipad and single family residences to the west. The conversion of this site to a transfer station facility would alter the site's visual character by introducing buildings, paved areas, fencing, and automobile and truck traffic when in operation. However, as noted above under Impact AES-1, the proposed project facilities would be situated within the central portion of the site, behind a screen provided by existing vegetation, so that views of the buildings and ancillary facilities would be shielded by trees, vegetation, and topography, from off-site views.

The proposed transfer station building would have a peak height of approximately 50 feet, while other buildings on the site would generally be one story with typical heights of 20 feet or less. The main transfer station building would be approximately 275 feet from the edge of pavement on SR 20, and approximately 600 feet east of the nearest residential home to the west (Figure 2-2). Although travelers along SR 20 would have views of the facilities at the entryway, they would be fleeting and minimized by the existing trees which would be maintained as part of the project. Therefore, because of the distance of the main transfer station building from SR 20 and residences to the west, and the height of the existing trees and vegetation, as well as topography, views of the transfer station building and ancillary facilities would be minimal to non-existent in most instances. The impact to the visual character of the site and surroundings would not be substantial and therefore would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: **Less than significant.**

Impact AES-3: Impacts from Nighttime Lighting and Glare.

Under current conditions, the proposed project site does not generate any light or glare. Although the proposed transfer station would normally operate only during daylight hours, there would be outdoor lighting available for buildings, parking areas and other facilities in case unusual or emergency circumstances caused nighttime operation. The facilities are not expected to produce any perceived glare because operations would normally occur only in daylight hours and any exterior lighting would be shielded and downcast. Light poles would not be taller than necessary to provide appropriate lighting for security and safety. As noted previously, because of the distance of the transfer station building from SR 20 and residences to the west, and the density of the existing trees and vegetation, the facility's lighting would not be expected to adversely affect adjacent land uses. Additionally, because facility lighting would be focused downward and not up into the sky, the project will be consistent with the County's "dark sky" goal and policy (Goal RM-15 and Policy RM-134) of seeking to protect the qualities of the nighttime sky by requiring that outdoor nighttime lighting is directed downward and kept within property boundaries. The impact from nighttime lighting and glare would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: **Less than significant.**

3.1.6 Cumulative Impacts

Impact AES-C-1: Result in Cumulatively Considerable Contribution to a Cumulative Impact Related to Aesthetic Resources.

The impacts to scenic vistas, visual character, and light/glare are not cumulatively considerable, because there are no cumulative projects located in the same viewshed as the project site. As shown in Table 3.0-1, the cumulative projects are all more than 2.9 miles from the project site. Additionally, impacts to a scenic vista or visual character would be dependent upon project- and site-specific variables, including proximity to visually sensitive receptors, the visual sensitivity of the respective development sites, and the operational characteristics of each development site. The potential impacts of other projects on a scenic vista or visual character of a development site and its surroundings would be evaluated on a project-by-project basis. It is assumed that cumulative development would progress in accordance with the Zoning/Development Code of the respective jurisdictions. Each project would be analyzed in order to ensure the construction-related Zoning/Development Code restrictions are consistently upheld. Cumulative impacts to a scenic vista or visual character would not be cumulatively considerable.

Mitigation Measures: No mitigation is necessary.

Level of Significance: **Less than significant.**

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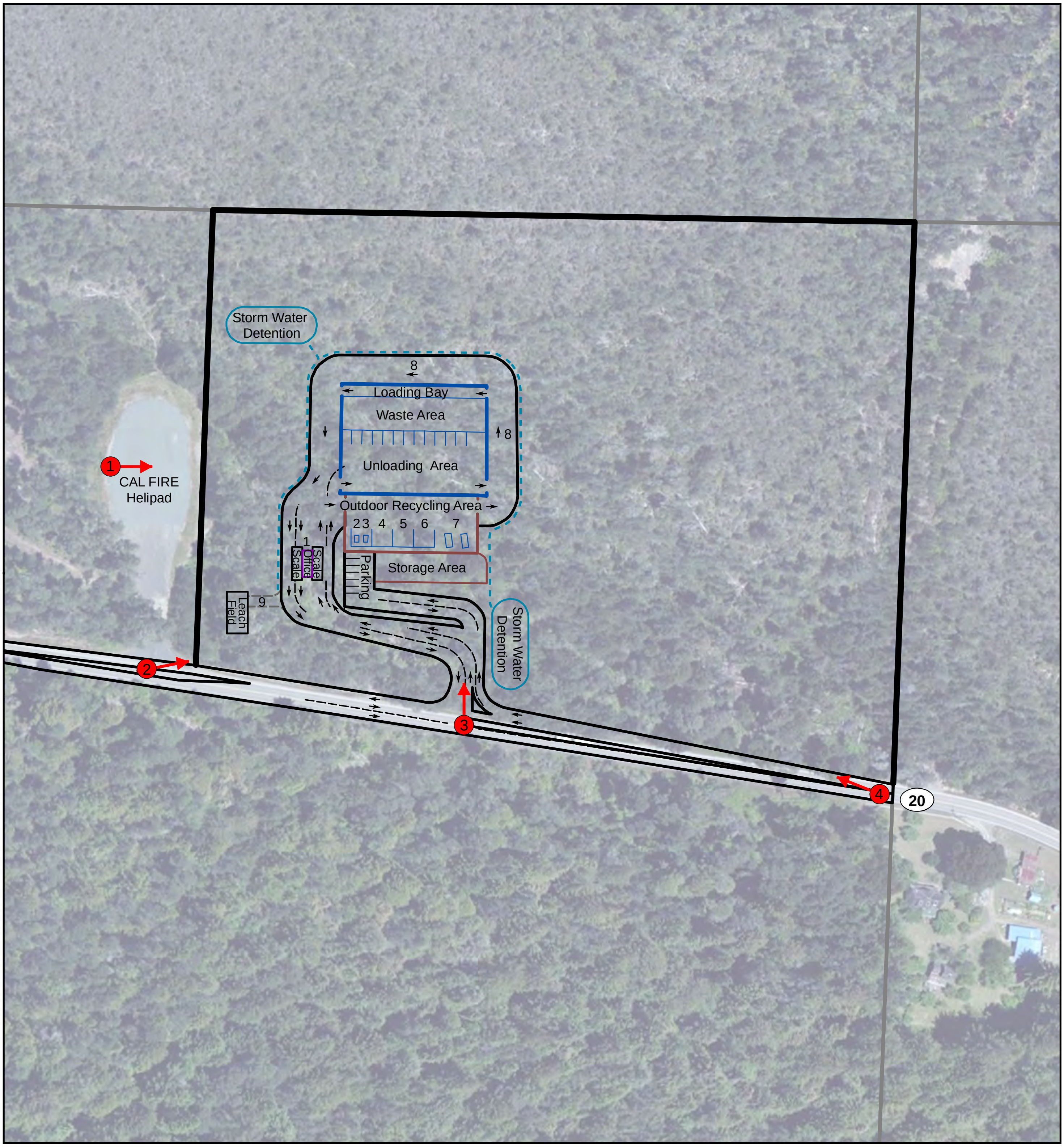

1. Office and restroom
2. Antifreeze drop-off tank
3. Used oil drop-off tank
4. Metal recycling bay
5. Appliance recycling bay
6. Electronics recycling bay
7. Mixed recyclables boxes
8. Transfer trailer parking
9. Unpaved driveway to leachfield

Image Viewpoint Location

Paper Size ANSI A
0 50 100 150 200
Feet
Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California II FIPS 0402 Feet

N

GHD

Mendocino Solid Waste Management Authority
Central Coast Transfer Station EIR

Job Number	8411065
Revision	A
Date	30 Jul 2014

Viewpoint Locations

Figure 3.1-1

180 Lonsdale Street Melbourne VIC 3000 Australia **T** 61 3 8687 8000 **F** 61 3 8687 8111 **E** melmail@ghd.com **W** www.ghd.com

N:\US\Eureka\Projects\0016201 MendoSolidWasteMgmtAuthority\8411065 MSWMA TransferStationEIR\08-GIS\Maps\Figures\F3.1-1_Viewpoints.mxd

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3.2 Agriculture and Forest Resources

This section evaluates the potential impacts related to agriculture and forest resources with implementation of the project. The Setting section describes the existing environmental setting as it relates to agricultural and forest resources. The Regulatory Framework section describes the applicable regulations at the federal, state and local level. The Impacts and Mitigation Measures section establishes the thresholds of significance, evaluates potential impacts to agriculture and forest resources, and identifies the significance of impacts. Where appropriate, mitigation is presented to reduce impacts to less-than-significant levels.

3.2.1 Setting

Agriculture Resources

The project site and the Caspar site are not in agricultural production nor are they under Williamson Act contract. According to the California Department of Conservation's (DOC's) Farmland Mapping and Monitoring Program (FMMP), the project site is located within an area designated as "Grazing Land" (DOC 2010). Grazing Land is defined as land on which the existing vegetation is suited to the grazing of livestock.

Forest Resources

Historically, Mendocino County was one of California's leading counties in timber production. However, harvest volumes in the County have been decreasing since the mid-1950s, reflecting the conversion of old-growth forests to younger stands of timber and reliance on smaller trees (PMC 2009).

Timber represents the second highest value commodity in the County, with a gross "at mill" value of $71,587,951 in 2012. Mendocino County ranked 4th in the state in timber volumes and produced roughly nine percent of the state's total timber harvest in 2012. Timber values increased 21 percent from 2011 to 2012 (Mendocino County 2012).

The project site is currently part of the Jackson Demonstration State Forest (JDSF) and is managed by the California Department of Forestry and Fire Protection (CalFire). The site is in a relatively undisturbed extensive closed-cone coniferous forest and consists of Bishop pine (*Pinus muricata*), pygmy cypress (Hesperocyparis pygmaea), and lesser amounts of Bolander's pine (*Pinus contorta* ssp. *bolanderi*).

On March 8, 2010, Forester Jere Melo conducted a forest inventory (see Appendix J) on the 17-acre portion of APN 019-150-05 (Melo 2010) that consists of the project site. Melo concluded that the project site has approximately 419 trees and calculated the "thousands of board feet" (MBF) as 66 net MBF with 20 percent having defects. Net MBF estimates net board feet after allowance for defects such as fire scars, rot, broken pieces, etc. Gross MBF was calculated at 82 MBF. The number of trees includes trees 12 inches or larger in diameter, as measured at 4.5 feet above ground level.

Melo described the tree cover as being composed of primarily Bishop pine and cypress. Under the trees is a dense cover of brush from two to eight feet tall, and composed of huckleberry (*P. muricata-Vaccinium ovatum* Association), salal (*Gaultheria shallon*), rhododendron (*Rhododendron macrophyllum*), and manzanita (*Arctostaphylos columbiana*).

The Mendocino County General Plan land use designation for the project site is Public Land. The site is zoned Timber Production and is in a Timberland Production Zone (TPZ) which allows public service facilities. According to the JDSF Management Plan the project site is designated Site Class IV, the lowest quality timberland. JDSF does not consider the project site as valuable for timber production. JDSF converted the land immediately to the west into a helipad, and considered the project site itself as a possible site to relocate the JDSF headquarters office (email correspondence, CalFire 2014). The land surrounding the project site to the north, east and south consists of timber production and recreational uses. Land to the west is residential.

3.2.2 Regulatory Framework

Federal

There are no federal regulations associated with agriculture and forest resources that are applicable to the proposed project or project site.

State

Forest Land

Forest land is land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits (Public Resources Code Section 12220(g)).

California Timberland Productivity Act of 1982

Under the Timberland Productivity Act, "timberland" means privately owned land, or land acquired for state forest purposes, which is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses, and which is capable of growing an average annual volume of wood fiber of at least 15 cubic feet per acre.

"Timberland production zone" or "TPZ" means an area that has been zoned pursuant to Government Code section 51112 or 51113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses. With respect to the general plans of cities and counties, "timberland preserve zone" means "timberland production zone."

Z'berg-Nejedly Forest Practice Act of 1973

Under the Forest Practice Act, "timberland" means land, other than land owned by the federal government or land designated as experimental forest land, which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the board on a district basis after consultation with the district committees and others. Commercial species are determined by the Board of Forestry on a district basis after consultation with the district committees and others.

The timberland conversion process is initiated by “any person, firm, corporation, company, partnership or government agency owning timberland for which the timberland owner proposes conversion…” The timberland owner must apply to the Director of CalFire on a form prescribed for the issuance of a Timberland Conversion Permit (TCP). No timber operations or other conversion activities may commence until a conversion permit and a Timber Harvest Plan (THP) are approved and issued to the landowner.

Jackson Demonstration State Forest

Jackson Demonstration State Forest is the largest of CalFire's eight demonstration state forests at 48,652 acres. A Demonstration Forest is timberland that is managed for forestry education, research, and recreation. It demonstrates innovations in forest management, watershed protection and restoration, and environmentally sensitive timber harvesting techniques. Demonstration Forest timberlands are publicly owned by the State of California, managed by CalFire, and open to the public.

Regional and Local

Mendocino County General Plan Goals and Policies

Following are Mendocino County General Plan goals and policies most applicable to agricultural and forest resources.

Goal RM-11(Forestry): To protect and enhance the County's diverse forest resources for all uses including timber harvest.

Policy RM-24: Protect the County's natural landscapes by restricting conversion and fragmentation of timberlands, oak woodlands, stream corridors, farmlands, and other natural environments.

Policy RM-111: The County considers timber growing and harvesting to be the highest and best use of lands zoned Timberland Production.

Policy RM-113: Protect the County's timber resources by discouraging the conversion or fragmentation of lands zoned "TPZ" to housing or some other use that permanently precludes its use for timber production, or timber growing.

Policy RM-122: Prohibit rezoning and development of prime timberland (Site Classes I, II and III) classified for resource uses, including proposed resort uses, unless:

- The project is determined to be in the public interest, and
- State timber conversion permits are approved, and
- The project is consistent with land use, resource management, and other applicable General Plan goals and policies.
- Managing the property for timber production is no longer sustainable.

Policy RM-123: Discretionary projects and parcels created by new land divisions shall be designed and sized to be compatible with contiguous lands zoned Forestlands or Timberland Production.

Policy RM-125: The following guidelines shall apply to all projects (including land divisions) contiguous to lands designated as Forest Lands on the Land Use Map of this General Plan:

- The number of ownerships and land use intensities on adjacent parcels shall be minimized.
- Building envelopes, clustered development, and commercial, industrial, civic, and sensitive uses on non-resource lands shall be designed with buffers or setbacks. Buffers shall generally be defined as a physical separation of 200 feet with the potential for a reduced separation when a topographic feature,

substantial tree-stand, landscaped berm, watercourse or similar existing or constructed feature is provided and maintained.

- Projects shall be designed to reduce growth-inducing impacts and maintain a stable limit to urban development.
- Potential conflicts related to noise, dust, chemicals, spraying, burning, vandalism and trespass, and other issues associated with forest management or timber operations shall be mitigated by the new discretionary project.

3.2.3 Evaluation Criteria and Significance Thresholds

The project would cause a significant impact related to agricultural and forest resources, as defined by the CEQA Guidelines (Appendix G), if it would:

- Convert prime farmland, unique farmland, or farmland of statewide importance, as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use or a Williamson Act contract;
- 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);
- Result in the loss of forest land or conversion of forest land to non-forest use; or
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

Areas of No Project Impact

Construction and operation of the project would not result in impacts related to some of the significance criteria identified in Appendix G of the current CEQA Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- **Convert prime farmland, unique farmland, or farmland of statewide importance, as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use**. The proposed project site and Caspar site are not located on prime farmland, unique farmland, or farmland of statewide importance (DOC 2010). The proposed project site and Caspar site are both located within forest land. Therefore, the significance criterion related to converting Important Farmland pursuant to the FMMP is not applicable to the proposed project and is not discussed further.
- **Conflict with existing zoning for agricultural use or a Williamson Act contract.** The proposed project site and Caspar site are not located on land zoned for agricultural use (Mendocino County 1991) or under Williamson Act contract (Mendocino County Assessor’s Office 2011). Therefore, the significance criterion related to conflicting with existing zoning for agricultural use or a Williamson Act contract is not applicable to the proposed project and is not discussed further.

3.2.4 Methodology

Potential impacts related to agricultural and forest resources are based on an examination of the proposed project's consistency with the policies of Mendocino County's General Plan, land use and zoning, and the conversion of agricultural or forest land to non-agricultural or non-forest use. The loss of pygmy cypress (*Hesperocyparis pygmaea*) and Bishop pine (*Pinus muricata*) forest are discussed under Biological Resources (Section 3.4).

3.2.5 Impacts and Mitigation Measures

Impact AG-1: Conflict with Existing Zoning, or Cause Rezoning of, Forest Land, Timberland, or Timberland Zoned Timberland Production, or Result in Conversion of Forest Land to Non-Forest Use.

The project site is zoned Timberland Production and the Caspar site is zoned PF-PD (Public Facilities) [Mendocino County Zoning Code Section 20.068.010(B)]. Permitted uses in the Timberland Production Zone include civic uses that provide essential services. The project provides the essential civil service of waste management. In addition, project design would be consistent with the setbacks and building limits identified for this zoning district. Therefore, the project would not conflict with the existing zoning.

On April 7, 2010, the State of California Board of Forestry and Fire Protection approved a resolution, which states that "the Board of Forestry and Fire Protection supports the efforts of the Department of Forestry and Fire Protection to facilitate the transfer of not more than 17 acres of JDSF land (a portion of Assessor's Parcel Number 019-15-005) to the MSWMA for the transfer station and to receive approximately 12.7 acres of forest land from California Department of Parks and Recreation…" The resolution further stated that transfer of the JDSF land would not result in any significant adverse programmatic impacts to the mission and management of JDSF. The JDSF is 48,652 acres of which 17 acres would be transferred to the Caspar JPA for the transfer station. This would equate to 0.00035 percent of the total JDSF site.

AB 384 would transfer ownership of the 17-acre JDSF site (project site) to the County/City in exchange for either ownership of 35 acres at the Caspar Landfill site or control over its future uses. The 60-acre Caspar site (Figure 2-3), including the footprint of the closed landfill, would be the subject of a conservation easement granted to the DPR. DPR would have the option of taking ownership of the 35 westernmost acres of the site (Figure 2-3). This land swap would not result in the conversion of forest land to non-forest use.

The project would convert approximately 4.72 acres of forest land to non-forest use. The site has been designed to be as compact as feasible to reduce forest resource impacts to the maximum extent possible; however, there would still be a need to remove forest land and vegetation to accommodate the facilities. In the context of the 48,652-acre JDSF and the 33 million acres of forest land in California, the 4.72 acres of forest land that would be converted with implementation of the project is small and would be a less-than-significant impact on forest land.

Mendocino County General Plan Policy RM-122 prohibits development of prime timberland (Site Classes I, II and III) classified for resource uses, unless: (1) the project is determined to be in the public interest; (2) State timber conversion permits are approved; (3) the project is consistent with land use, resource management, and other applicable General Plan goals and policies; and managing the property for timber production is no longer sustainable. The proposed project is consistent with this policy in that the project site is designated Site Class IV timberland (not prime timberland, low timberland production), is in the public interest, the project would be issued a TCP and prepare a Timber Harvest Plan, the proposed project is consistent with General Plan Policy RM-122.

Policy RM-111 considers timber growing and harvesting to be the highest and best use of lands zoned Timberland Production. Policy RM-113 protects the County's timber resources by discouraging the conversion or fragmentation of lands zoned "TPZ" to some other use. The project site, however, is designated Site Class IV which is not prime timberland, and is low timberland production.

Policy RM-123 calls for discretionary projects to be designed and sized to be compatible with contiguous lands zoned Forestlands or Timberland Production and Policy RM-125 includes design guidelines for projects contiguous to lands designated as forest lands. Consistent with these policies, the project has been designed to minimized visual effects by placement of the main transfer station building approximately 275 feet from the edge of pavement on SR 20, and approximately 600 feet east of the nearest residential home to the west. The main transfer station building would be approximately 30,000 square feet and enclosed, which would reduce or prevent off-site noise, odors, and dust. In addition, the design would be compatible with installation of control measures such as negative-pressure ventilation with biofiltered exhaust, automated roll-up doors, and/or doorway air curtains.

Mitigation Measures: No mitigation is necessary.

Level of Significance: **Less than significant.**

3.2.6 Cumulative Impacts

Impact AG-C-1: Result in Cumulatively Considerable Contribution to a Significant Cumulative Impact Related to Forest Resources.

The proposed project would result in the permanent loss of approximately 4.72 acres of forest land of the 17-acre project site. The loss and conversion of approximately 4.72 acres of forest land compared to the annual production of timber in Mendocino County, approximately 121,850,000 board feet (Mendocino County 2012), is not considered to be a considerable contribution to the cumulative impact on forest and timber resources.

Mitigation Measures: No mitigation is necessary.

Level of Significance: **Less than significant.**

3.3 Air Quality and Odor

This section includes a summary of applicable regulations, existing air quality and odor conditions and an analysis of potential impacts related to air quality and odor during construction and operation of the project. The impacts and mitigation measures section establishes the thresholds of significance, evaluates potential air quality and odor impacts, and identifies the significance of impacts. Where appropriate, mitigation is presented to reduce impacts to less-than-significant levels.

3.3.1 Setting

The proposed project would be located in Mendocino County in the North Coast Air Basin. The county covers 3,510 square miles and is bounded on the west by the Pacific Ocean and on the east by mountains that separate the North Coast and Sacramento River Air Basins. The county's east-west width varies from 35 to 60 miles, and its north-south length is approximately 80 miles. Within 20 miles of the ocean, the county landscape rises to 3,000 feet in a series of ridges parallel to the coast and separated by narrow valleys. The alluvial valleys that run parallel to the coast and mountain ranges are 1,000 to 1,500 feet above sea level in the central part of the county; and drop to 500 feet above sea level at the points where the Eel and Russian Rivers leave the County. The project site is located about 3 miles east of Fort Bragg.

The climate of Fort Bragg is maritime, with high humidity throughout the year. There are distinct wet and dry seasons. The rainy season lasts from October through April, accounting for about 90 percent of annual precipitation. The dry season, lasting from May through September, is characterized by regular intrusions of low clouds and fog that usually clear by late morning. Early afternoon generally is mostly sunny with low clouds moving in by evening. Temperatures are moderate, and the annual range is one of the smallest in the lower 48 states. During a typical year, the low temperatures are in the mid-30s (degrees Fahrenheit) and the high temperatures reach the mid-70s. The reason for the small temperature range is the proximity to the Pacific Ocean. The prevailing northwest wind blows across the cold, upwelling water that is almost always present along the Mendocino County coast.

Wind data for Fort Bragg are reported in the California Surface Wind Climatology (CARB 1984). The predominant wind flow is from the northwest. A secondary predominant flow is from the southeast, occurring primarily in fall and winter. The mean wind speed is 7.6 miles per hour (mph), with spring having the highest mean wind speed out of the northwest.

Existing Air Quality – Criteria Air Pollutants

California and the federal government (i.e., U.S. Environmental Protection Agency [EPA]) have established ambient air quality standards for several different pollutants. Most standards have been set to protect public health, but standards for some pollutants have other purposes, such as to protect crops, protect materials, or avoid nuisance conditions. Table 3.3-1 summarizes state and federal ambient air quality standards.

Among the pollutants that may be generated by the proposed project, those of greatest concern are emitted by motor vehicles. These pollutants include fine particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and particulate matter less than 10 microns in diameter (PM_{10}). Other pollutants that are less problematic to the region include ozone precursors NOX and reactive organic gases [ROG]) and carbon monoxide. The specifics of each of these pollutants are discussed below.

Particulate Matter

Particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Particles 10 microns or less in diameter are defined as "respirable particulate matter" or "PM10." Fine particles are 2.5 microns or less in diameter ($PM_{2.5}$) and, while also respirable, can contribute significantly to regional haze and reduction of visibility. Inhalable particulates come from smoke, dust, aerosols, and metallic oxides. Although particulates are found naturally in the air, most particulate matter found in the vicinity of the project site is emitted either directly or indirectly by motor vehicles, industry, construction, agricultural activities, and wind erosion of disturbed areas. Most $PM_{2.5}$ is comprised of combustion products such as smoke. Extended exposure to PM can increase the risk of chronic respiratory disease (BAAQMD 2011a). PM exposure is also associated with increased risk of premature deaths, especially in the elderly and people with pre-existing cardiopulmonary disease. In June 2002, the California Air Resources Board (CARB) adopted new ambient air quality standards for PM_{10} and $PM_{2.5}$, resulting from an extensive review of the health-based scientific literature. The U.S. EPA adopted a more stringent 24-hour $PM_{2.5}$ standard of 35 micrograms per cubic meter (µg/m3) in September 2006, replacing the older standard of 65 µg/m3 (BAAQMD 2012).

Ozone

Ground-level ozone is the principal component of smog. Ozone is not directly emitted into the atmosphere, but instead forms through a photochemical reaction of ROG and nitrogen oxides, which are known as ozone precursors. Ozone levels are highest from late spring through autumn when precursor emissions are high and meteorological conditions are warm and stagnant. Motor vehicles create the majority of ROG and NOX emissions in California. Exposure to levels of ozone above current ambient air quality standards can lead to human health effects such as lung inflammation and tissue damage and impaired lung functioning. Ozone exposure is also associated with symptoms such as coughing, chest tightness, shortness of breath, and the worsening of asthma symptoms (BAAQMD 2011). The greatest risk for harmful health effects belongs to outdoor workers, athletes, children, and others who spend greater amounts of time outdoors during periods of high ozone levels.

Carbon Monoxide

Carbon monoxide, known as CO, is a public health concern because it combines readily with hemoglobin in the bloodstream, reducing the amount of oxygen transported by blood. State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 parts per million (ppm) by volume, and the federal 1-hour standard is 35 ppm. Both the state and federal standards are 9 ppm for the 8-hour averaging period. Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter, when light winds combine with ground-level temperature inversions (typically between evening and early morning). These conditions result in reduced dispersion of vehicle emissions. Also, motor vehicles emit CO at higher rates when air temperatures are low.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is an essential ingredient in the formation of ground-level ozone pollution. NO_2 is one of the NOX emitted from high-temperature combustion processes, such as those occurring in trucks, cars, and power plants. Home heaters and gas stoves also produce NO_2 in indoor settings. Besides causing adverse health effects, NO_2 is responsible for the visibility reducing reddish-brown tinge seen in smoggy air in California. NO_2 is a reactive, oxidizing gas capable of damaging cells lining the respiratory tract. Studies suggest that NO_2 exposure can increase the risk of acute and chronic respiratory disease (BAAQMD 2011). Due to potential health effects at or near the current air quality standard, the CARB recently revised the State ambient air quality standard for NO_2. The U.S. EPA recently adopted a new 1-hour NO_2 standard of 0.10 ppm.

Sulfur Dioxide

Sulfur dioxide is a colorless gas with a strong odor. It can damage materials through acid deposition. It is produced by the combustion of sulfur-containing fuels, such as oil and coal. Refineries, chemical plants, and pulp mills are the primary industrial sources of sulfur dioxide emissions. Sulfur dioxide concentrations in the Bay Area are well below the ambient standards. Adverse health effects associated with exposure to high levels of sulfur dioxide include irritation of lung tissue, as well as increased risk of acute and chronic respiratory illness (BAAQMD 2011).

Lead

Lead occurs in the atmosphere as particulate matter. It was primarily emitted by gasoline-powered motor vehicles, although the use of lead in fuel has been virtually eliminated. As a result, levels throughout the State have dropped dramatically.

Ambient Air Quality – Monitoring Station Data and Attainment Designations

Table 3.3-2 summarizes air quality data for monitoring stations in Mendocino County. Data from 2013 are the most recent available. The data reported in Table 3.3-2 show that ambient air quality standards were not exceeded over the 2010-2013 period at this monitoring station. Carbon monoxide, nitrogen dioxide, sulphur dioxide, and lead are not measured in the county due to the lack of emission sources. These pollutants have been measured at very low levels in the past.

Attainment Status

Areas that do not violate ambient air quality standards are considered to have attained the standard. Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant, using the most recent three years of monitoring data. The North Coast Air Basin as a whole does not meet State standards for $PM_{10,}$ as designated by CARB. The air basin is considered attainment or unclassified for all other air pollutants. Unclassified typically means the region does not have concentrations of that pollutant that exceed ambient air quality standards.

Toxic Air Contaminants

Toxic Air Contaminants (TACs) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer or serious illness) and include, but are not limited to, the criteria air pollutants listed above. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and federal level. The identification, regulation, and monitoring of TACs is relatively new compared to that for criteria air pollutants that have established ambient air quality standards. TACs are regulated or evaluated on the basis of risk to human health rather than comparison to an ambient air quality standard or emission-based threshold.

Table 3.3-1 Relevant California and National Ambient Air Quality Standards and Attainment Status

Pollutant	Averaging Time	California Standards	California Attainment Status	National Standards	National Attainment Status
Ozone	8-hour	0.070 ppm (137 μg/m^3)	Attainment	0.075 ppm (147μg/m^3)	Unclassified/ Attainment
	1-hour	0.09 ppm (180 μg/m^3)	Attainment	None	NA
Carbon Monoxide	1-hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Unclassified/ Attainment
	8-hour	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	
Nitrogen Dioxide	1-hour	0.18 ppm (339 μg/m^3)	Attainment	0.100 ppm (188 μg/m^3)	Unclassified/ Attainment
	Annual	0.030 ppm (57 μg/m^3)	Status not reported	0.053 ppm (100 μg/m^3)	
Sulfur Dioxide	1-hour	0.25 ppm (655 μg/m^3)	Attainment	0.075 ppm (196 μg/m^3)	Unclassified
	24-hour	0.04 ppm (105 μg/m^3)	Attainment	0.14 ppm (365 μg/m^3)	
	Annual	None	NA	0.03 ppm (56 μg/m^3)	
Respirable Particulate Matter (PM_{10})	24-hour	50 μg/m^3	Nonattainment	150 μg/m^3	Unclassified
	Annual	20 μg/m^3	Nonattainment	None	
Fine Particulate Matter ($PM_{2.5}$)	24-hour	None	NA	35 μg/m^3	Unclassified/ Attainment
	Annual	12 μg/m3	Attainment	12 μg/m3	

Source: CARB (2014a and 2014b)

Notes:
ppm = parts per million
mg/m3 = milligrams per cubic meter
μg/m3 = micrograms per cubic meter

Table 3.3-2 Highest Measured Air Pollutant Concentrations in Mendocino County

Pollutant	Average Time	Measured Concentration 2011	2012	2013
Ozone Ukiah	8-Hour	0.047 ppm	0.061 ppm	0.049 ppm
	1-Hour	0.066 ppm	0.066 ppm	0.059 ppm
Respirable Particulate Matter (PM_{10}) Fort Bragg	24-Hour	35 μg/m^3	40 μg/m^3	47 μg/m^3
	Annual	16 μg/m^3	13 μg/m^3	14 μg/m^3
Fine Particulate Matter ($PM_{2.5}$) Willits	24-Hour	26 μg/m^3	24 μg/m^3	26 μg/m^3
	Annual	10 μg/m^3	7 μg/m^3	NA

Source: CARB 2014c

Diesel exhaust is the predominant TAC in urban air with the potential to cause cancer. It is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide average). According to the CARB, diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the federal Hazardous Air Pollutants programs. California has adopted a comprehensive diesel risk reduction program. The U.S. EPA and the CARB adopted low-sulfur diesel fuel standards in 2006 that reduce diesel particulate matter substantially. The CARB recently adopted new regulations requiring the retrofit and/or replacement of construction equipment, on-highway diesel trucks, and diesel buses in order to lower PM2.5 emissions and reduce statewide cancer risk from diesel exhaust.

Sensitive Receptors

Sensitive receptors are people who are particularly susceptible to the adverse effects of air pollution. The CARB has identified the following people who are most likely to be affected by air pollution: children, the elderly, the acutely ill, and the chronically ill, especially those with cardio-respiratory diseases. Residential areas are also considered sensitive receptors to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. The closest sensitive receptors include single-family residences 500 feet west or further and 1,000 feet east-southeast from the active parts of the facility.

3.3.2 Regulatory Framework

Federal

The federal Clean Air Act of 1977 (CAA) governs air quality in the United States. In addition to being subject to federal requirements, air quality in California is also governed by more stringent regulations under the California Clean Air Act. At the federal level, the U.S. EPA administers the Clean Air Act. The California Clean Air Act is administered by the CARB and by the Air Quality Management Districts at the regional and local levels.

The U.S. EPA is responsible for enforcing the federal CAA. The U.S. EPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS). The NAAQS are required under the CAA and subsequent amendments. The U.S. EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships and certain types of locomotives. The U.S. EPA has jurisdiction over emission sources outside State waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by the CARB.

State

In California, the CARB, which is part of the California Environmental Protection Agency, is responsible for meeting the State requirements of the federal Clean Air Act, administering the California Clean Air Act, and establishing the California Ambient Air Quality Standards (CAAQS). The California Clean Air Act, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain the CAAQS. The CARB regulates mobile air pollution sources, such as motor vehicles. It is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. The CARB established passenger vehicle fuel specifications, which became effective in March 1996. It oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level.

Regional and Local

Mendocino County Air Quality Management District

The Mendocino County Air Quality Management District (MCAQMD) is one of 35 local air districts in California. The mission of the MCAQMD is to protect and manage air quality. The MCAQMD has permit authority over most types of stationary emission sources and can require stationary sources to obtain permits, impose emission limits, set fuel or material specifications, or establish operational limits to reduce air emissions. The MCAQMD regulates new or expanding stationary sources of toxic air contaminants. The District is managed by a five member Board of locally elected officials which currently consists of all five members of the Mendocino County Board of Supervisors.

In January 2005 the MCAQMD adopted the Particulate Matter Attainment Plan. The District is in attainment for all Federal criteria air pollutants and is also in attainment for all State standards except PM10. Districts designated non-attainment for all pollutants except PM10 are required to prepare an attainment plan. While the District is not required to prepare a PM10 attainment plan the District is required to prevent significant deterioration of local air quality and make reasonable efforts toward achieving attainment status for all pollutants. In general, 'reasonable progress' is defined as a 5% reduction in emissions per year, until the standard is attained. SB 656 requires the District to list particulate matter control measures it considers cost-effective and develop a schedule for their implementation. The Particulate Matter Attainment Plan is designed to serve as a summary of the District's current status, a long range planning tool, and a roadmap for future District policy.

Mendocino County General Plan Goals and Policies

The Mendocino County General Plan contains goals, policies, standards, and implementation programs pertinent to air quality. The following general plan policies regarding air quality are considered relevant to the proposed project:

Policy RM-37: Public and private development shall not exceed Mendocino County Air Quality Management District emissions standards.

Policy RM-38: The County shall work to reduce or mitigate particulate matter emissions resulting from development, including emissions from wood-burning devices.

Policy RM-43: Reduce the effects of earth-moving, grading, clearing and construction activities on air quality.

Policy RM-44: New development should be focused within and around community areas to reduce vehicle travel.

Policy RM-45: Encourage the use of alternative fuels, energy sources and advanced technologies that result in fewer airborne pollutants.

Policy RM-46: Reduce or eliminate exposure of persons, especially sensitive populations, to air toxics.

Policy RM-47: Minimize the exposure of sensitive uses, such as residences, schools, day care, group homes or medical facilities to industrial uses, transportation facilities, or other sources of air toxics.

1.1.1 3.3.3 Evaluation Criteria and Significance Thresholds

The project would cause a significant impact related to odor and air quality, as defined by the CEQA Guidelines (Appendix G), if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- 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);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

MCAQMD recommends that agencies use the Bay Area Air Quality Management District's (BAAQMD) Air Quality CEQA Guideline thresholds adopted in 2010 for projects in Mendocino County (MCAQMD 2010). One difference is that MCAQMD recommends that the Indirect Source Rule [Regulation 1, Rule 1-130(i)(1)] definition of an "Indirect Source" be used to set emission thresholds for ROG and NOX. Significance thresholds used to evaluate air quality and odor impacts from this project are described in Table 3.3-3.

Areas of No Project Impact

Conflict with or obstruct implementation of the applicable air quality plan. As discussed previously, the MCAQMD has published the Particulate Matter Attainment Plan in 2005, representing the most current applicable air quality plan for the County. This plan is designed to meet the requirements of Senate Bill 656 (2003), which required the District to list particulate matter control measures it considers cost-effective and develop a schedule for their implementation. This document is designed to serve as a summary of the District's current status, a long range planning tool and a roadmap for future District policy. Consistency with this plan is the basis for determining whether the proposed project would conflict with or obstruct implementation of an applicable air quality plan. The plan includes measures dealing with such topics as wood burning stoves, campfires, dust from unpaved roads, construction grading activities, and open burning. The plan does not include measures or policies that would apply directly to operation of the project. As for the control measure regarding grading activities during construction, the measure never went through the rule-making process and consequently was not adopted. Construction and operation of the project would not result in impacts related to conflicts with an applicable air quality plan.

Table 3.3-3 Air Quality Significance Thresholds

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)
Criteria Air Pollutants			
ROG	180	180	None
NO_x	42	42	None
PM_{10}	80	80	None
$PM_{2.5}$	54	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	None	
Health Risks and Hazards for New Sources			
Excess Cancer Risk	10 per one million	10 per one million	
Chronic or Acute Hazard Index	1.0	1.0	
Incremental annual average $PM_{2.5}$	0.3 µg/m^3	0.3 µg/m^3	
Health Risks and Hazards for Sensitive Receptors (Cumulative from all sources within 1,000 foot zone of influence) and Cumulative Thresholds for New Sources			
Excess Cancer Risk	100 per one million		
Chronic Hazard Index	10.0		
Annual Average $PM_{2.5}$	0.8 µg/m^3		
Odors	5 confirmed complaints per year averaged over 3 years		

Sources: BAAQMD 2011; BAAQMD 2009; and MCAQMD 2003 (see http://www.co.mendocino.ca.us/aqmd/pdf_files/ISR_Policy.pdf)

1.1.2 3.3.4 Methodology

Project Emissions

The air quality impact analysis considers construction and operational impacts associated with the proposed project. Construction and operation period air pollutants were modeled using the latest version of the California Emissions Estimator Model, CalEEMod (Version 2013.2.2).

The on-site construction modeling was based on the construction equipment inventories and schedule provided for the project (included in Appendix C). Modeled construction phases include Site Preparation, Grading, Trenching, Exterior Building, Interior Building, and Paving. The mobile emissions during construction, which include haul truck trips, vendor or delivery truck trips, and worker trips, were included in the CalEEMod model. The modelling assumed that construction would occur in 2016. The project was entered as a 30,000 square foot light-industrial use on five acres. The provided equipment list and schedule were used to model construction equipment emissions. Localized construction period impacts associated with fugitive dust are evaluated through the appropriate application of best management practices recommended by BAAQMD to reduce PM_{10} emissions.

Project operation was assumed to produce emissions from traffic and use of off-road equipment to process material. CalEEMod was used to compute emissions from the off-road equipment that was assumed to include a large front-end loader, forklift and grapple crane. Although not quantified for this analysis, there is a small amount of diesel used at the existing Caspar facility from the intermittent use of a loader. Under the project, this loader would no longer be used as operations at the Caspar facility would cease. Implementation of the project also would reduce, by approximately half, the amount of waste handled at the Willits Transfer Station. Thus the equipment used to move and load materials there would not be used as frequently, resulting in reduced diesel usage at the Willits facility. Therefore, the modelling results presented in this analysis are conservative, looking only at the new on-site emissions from operations and not deducting emissions that would cease with the implementation of the new transfer facility.

Net traffic emissions associated with operation of the new facility, decommissioning of the Caspar facility, and discontinued use of the Willits Transfer Station by central coast, were computed using the EMFAC2011 model developed by the CARB. This included modelling of self-haul vehicles, franchise hauling trucks, and use of large trucks to transfer material to Willits. Self-haul vehicles were assumed to be a mix of light-duty trucks, medium-duty trucks, and light heavy duty trucks, consistent with the vehicle miles travelled distribution computed by EMFAC2011. Current haul trucks were assumed to consist of diesel-powered T6 heavy heavy duty trucks. New project haul trips were assumed to be made by larger T7 heavy heavy duty trucks. The franchise haul trucks were assumed to be Solid Waste Collection Trucks. Refer to Appendix C for additional detail on the assumptions and outputs.

The traffic emissions are based on the projected change in vehicle miles travelled (VMT) combined with the emissions rates computed using EMFAC2011. Changes to VMT are based on different vehicle travel characteristics for the existing scenario and the project scenario where all self-haul materials and collected solid waste are brought to the project site, then transferred to Willits in larger trucks (only mileage to Willits was calculated as miles between Willits and the destination landfill would remain the same with implementation of the project). Table 3.7-1, in Section 3.7 Greenhouse Gas Emissions and Energy, describes the distribution of VMT for existing conditions and the project conditions. The emission rates from EMFAC2011 are based on Mendocino County default annual conditions, aggregate year of 2016 and an average travel speed of 30 miles per hour.

Appendix C includes the CalEEMod model output and emissions computations that were made using EMFAC2011.

Impacts to Sensitive Receptors

A risk assessment of construction emissions was performed to assess cancer risk and PM2.5 exposure. Construction emissions were computed using CalEEMod, as described above. The truck and worker trip lengths were calculated as 0.3 miles to reflect on- or near-site travel.

Air quality modeling of annual average diesel particulate matter (DPM) and fugitive $PM_{2.5}$ concentrations was conducted using the EPA's ISCST3 dispersion model in a screening mode. The ISCST3 model is a steady-state, multiple-source, dispersion model designed to calculate pollutant concentrations from single or multiple sources. The model is recommended by BAAQMD for predicting air pollutant/contaminant concentrations associated with various emissions sources. The ISCST3 model predicts pollutant concentrations at receptors located in areas of flat or complex terrain from a variety of emission source types including point, area, volume and line sources.

The U.S. EPA ISCST3 dispersion model was used in screening mode to calculate concentrations of DPM and $PM_{2.5}$ concentrations at existing sensitive receptors (residences) in the vicinity of the project construction area. The ISCST3 dispersion model is a BAAQMD-recommended model for use in modeling analysis of these types of emission activities for CEQA projects. The ISCST3 modeling utilized a single area source to represent the on-site construction emissions from the project site, one for DPM exhaust emissions and the other for fugitive $PM_{2.5}$ dust emissions. To represent the construction equipment exhaust emissions, an emission release height of six meters was used for the area source. The elevated source height reflects the height of the equipment exhaust stacks and the rise of the exhaust plume. For modeling fugitive $PM_{2.5}$ emissions, a near ground level release height of two meters was used for modeling the area source. Emissions from vehicle travel on-site and off-site within about 1,000 feet of the construction site were distributed throughout the modeled area sources. Construction emissions were modeled as occurring daily between 8 a.m. - 5 p.m. when a majority of the construction activity involving equipment usage would occur.

The model used a synthetic screening level meteorological data set to determine the annual concentrations in the air quality assessment. Screening modeling encompasses a number of conservative analytical modeling techniques for estimating extreme upper bound concentrations. These "worst-case" estimates are based on simplified, but conservative assumptions of dispersion meteorology. The primary purpose of screening modeling is to assess new potential sources whose impacts may be low enough that they will not pose a threat to ambient air quality standards or health risks, thus avoiding the need for further analysis. The screening meteorological data set was obtained from the BAAQMD and used a matrix of daytime dispersion parameters for each five (5) degrees of wind direction. From this, the ISCST3 model calculates a 1-hour average. Using the BAAQMD and CARB persistence factors, the 1-hour average was converted to an annual average by applying the recommended factor of 0.1 (BAAQMD 2012). DPM and fugitive $PM_{2.5}$ concentrations were calculated at nearby sensitive receptors at heights of 1.5 meters (4.9 feet) representative of the ground level exposures for the nearby residential structures.

Increased cancer risks were calculated using the modeled concentrations and BAAQMD recommended risk assessment methods for infant exposure (3rd trimester through two years of age), child exposure, and for an adult exposure (BAAQMD 2010). The cancer risk calculations were based on applying the BAAQMD recommended age sensitivity factors to the DPM exposure parameters. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing TACs. Infant, child, and adult exposures were assumed to occur at all residences during the entire construction period. Appendix B also includes the cancer risk calculations.

Odors

The handling and storage of solid waste can produce odors. Odors are generally considered an annoyance rather than a health hazard. The ability to detect and respond to odors varies considerably among the population and is quite subjective. The receptors nearest the site are residences to the west and southeast. Odors are analysed qualitatively, based on the potential for the site to generate odors and wind patterns in the area.

3.3.5 Impacts and Mitigation Measures

Impact AQ-1: Violate Any Air Quality Standard or Result in Cumulatively Considerable Net Increase of Any Criteria Pollutant for which the Project Region is in Non-attainment.

By its very nature, air pollution is largely a cumulative impact, in that individual projects are rarely sufficient in size to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions (BAAQMD 2011). Mendocino County is considered non-attainment for PM_{10}.

Most of the construction would occur over a 6-month period, or about 132 days. Table 3.3-4 presents the project's construction period emissions, based on the CalEEMod model results. Construction period emissions would not exceed significance thresholds. During grading and construction activities, dust would be generated. The amount of dust generated would be highly variable and is dependent on the size of the area disturbed at any given time, amount of activity, soil conditions, and meteorological conditions. Unless controlled, fugitive dust emissions during construction of the proposed project would be a significant impact. In addition to measuring the construction-related emissions against specified thresholds, the BAAQMD recommends that all proposed projects implement "basic construction mitigation measures" whether or not construction-related emissions exceed applicable thresholds. Incorporation of these measures also meets the construction-related threshold for fugitive dust identified in Table 3.3-3, which is to use best management practices during construction of a project. Therefore, without inclusion of the basic construction mitigation measures as defined by the BAAQMD, the impact during construction would be significant.

Table 3.3-4 Construction Criteria Air Pollutant Emissions

Facility Site	ROG	NO_x	PM_{10}	$PM_{2.5}$
Emissions in tons per year	0.43	1.29	0.05	0.04
Average Daily Emissions (pounds per day)[1]	6.5	19.5	0.8	0.6
Threshold (pounds per day)	180	42	80	54
Exceed Threshold?	No	No	No	No

Notes: [1]Assuming 132 days of construction

Project operational emissions are presented in Table 3.3-5. These include on-site emissions based on CalEEMod modelling and mobile emissions based on the traffic analysis and EMFAC2011 emission factors. The combination of the increase in emissions from the facility and the decrease of mobile emissions would result in emission well below the significance thresholds (Note, even if the reduction in mobile emissions was not included, the project emissions would still be below the thresholds). Operation of the project would have less-than-significant impacts on air quality.

Table 3.3-5 Operational Criteria Air Pollutant Emissions

Facility Site	ROG	NO_x	PM_{10}	$PM_{2.5}$
On-Site Emissions in tons per year	0.27	1.42	1.36	0.18
Mobile Emissions in tons per year	(0.14)	(1.30)	(0.10)	(0.07)
Average Daily Emissions (pounds per day)[1]	0.7	0.9	7.2	0.6
Threshold (pounds per day)	180	42	80	54
Exceed Threshold?	No	No	No	No

Notes:
[1]Assuming 350 days of operation per year

Mitigation Measure AQ-1: Air Quality Control Measures during Construction.

The contractor shall implement the following Best Management Practices:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible and feasible. Building pads shall be laid as soon as possible and feasible, as well, after grading unless seeding or soil binders are used.
6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure AQ-1 complies with the best management practices recommended by the BAAQMD to reduce construction related air emissions, including dust, to a less-than-significant level. Therefore, Impact AQ-1 would be reduced to less than significant with implementation of the Mitigation Measure AQ-1.

Impact AQ-2: Expose Sensitive Receptors to Substantial Pollutant Concentrations.

Construction of the project would result in emissions of diesel particulate matter, a TAC that causes cancer. The MCAQMD does not have community risk assessment guidelines for evaluating these impacts. Therefore, the BAAQMD guidance for evaluating community risk impacts was used. Emissions of diesel particulate matter and fugitive $PM_{2.5}$ were predicted. These emissions were input to a dispersion model to predict the exposure at sensitive receptors near the project. Cancer risk computations were performed (refer to Appendix B for the outputs).

The location of the maximum modeled DPM and $PM_{2.5}$ concentration is shown on Figure 3.3-1.Increased cancer risks were calculated using the modeled concentrations and BAAQMD recommended risk assessment methods for both a child exposure (3rd trimester through two years of age) and adult exposure (BAAQMD 2010). Since the modeling was conducted under the conservative assumption that emissions occurred daily for a full year during the construction year, the default BAAQMD exposure period of 350 days per year was used.

Results of this assessment indicate that for project construction the incremental child cancer risk at the maximally exposed individual (MEI) receptor would be 11.6 in one million and the adult incremental cancer risk would be 0.6 in one million. This would be over the threshold of 10 in one million and would be a significant impact.

The maximum annual $PM_{2.5}$ concentration was 0.285 $\mu g/m^3$ occurring at the same location where maximum cancer risk would occur. This $PM_{2.5}$ concentration is below the BAAQMD threshold of 0.3 $\mu g/m^3$ used to judge the significance of health impacts from $PM_{2.5}$.

Potential non-cancer health effects due to chronic exposure to DPM were also evaluated. The chronic inhalation reference exposure level (REL) for DPM is 5 $\mu g/m^3$ (BAAQMD 2011). The maximum predicted annual DPM concentration for project construction was 0.133 $\mu g/m^3$ (see Appendix B), which is much lower than the REL. The Hazard Index (HI), which is the ratio of the annual DPM concentration to the REL, is 0.027. This HI is much lower than the BAAQMD significance criterion of a HI greater than 1.0.

Operation of the project would generate some truck traffic and localized on-site emissions. The project would introduce about 10 to 15 daily truck trips. These would be considered minor and would not increase the overall cancer risk significantly. Impacts from pollutants emitted during operation would be less than significant.

Mitigation Measure AQ-2: Select Equipment during Construction to Minimize Emissions.

The Contractor shall follow the following standard: All diesel-powered off-road equipment larger than 50 horsepower and operating at the site for more than two days continuously shall meet U.S. EPA particulate matter emissions standards for Tier 2 engines or equivalent.

Level of Significance: Less than significant with mitigation.

Based on the significant result for child exposure to construction emissions, mitigation was applied to the sources of DPM in order to reduce the impacts to a less significant. Incorporating Mitigation Measure AQ-2, the modeling results with this mitigation in place would have a child cancer risk of 5.87 in a million with the adult incremental cancer risk of 0.3 in million, which is below the significance threshold of 10 in one million. Therefore, implementation of Mitigation Measure AQ-2 would reduce the impact to less than significant.

Impact AQ-3: Create Objectionable Odors Affecting a Substantial Number of People.

The handling of waste material has the potential to cause odors. Potential odor issues would be a function of the strength of the odors emanating from the project, combined with the distance to the receptors (i.e., residences) and meteorological conditions. The handling and transfer of solid waste would occur inside of a fully enclosed building. The nearest residence is about 600 feet west of the project facility building where material transfer would occur. Wind data for Fort Bragg indicate a predominant wind from the northwest, with a secondary predominant wind from the east-southeast.

Odor problems from solid waste transfer stations are well understood because of the experience of thousands of such facilities throughout the United States. Municipal solid waste creates significant amounts of objectionable odor only when it degrades over time. Therefore, the primary means of odor avoidance is to transfer waste out of the facility quickly, with regular cleaning to ensure that residual waste doesn't build up. If transfer cannot be carried out rapidly enough to control odor, a variety of measures are available. The most important measure is to fully enclose the transfer building, with minimal door openings, so that spread of odor by dispersion or wind is reduced. Additional measures, in approximate order of cost and impact, include:

- Roll-up doors which can be automated to open only when a vehicle approaches.
- Air curtains on doorways. These help confine odors to the inside of the transfer station building.
- Deodorizing misting spray. Overhead sprays can neutralize odorous material.

  Several types of misting sprays are commercially available, including Odor X, NONOX, and Biomagic.
- Negative pressure ventilation with biofiltered exhaust.

  Biofilters are typically a large container filled with wood chips or compost that will scrub noxious odors out of exhaust air. An example is CR&R's Perris Transfer Station in Perris, California, which receives up to 3,000 tons per day and has reportedly eliminated odor problems after installation of a biofilter.

For the Central Coast Transfer Station, all handling of solid waste would occur inside of the building. The enclosed building would reduce the potential for odors. Typically, solid waste would be removed from the facility within 24 hours and would not remain at the site for more than 48 hours. The project is anticipated to include features to reduce odors; however, project design details are not available at this time. Since these control features have not been specified at this time, there is a potential for odors to be emitted from the facility that could result in odor complaints, potentially exceeding the threshold of five confirmed complaints per year averaged over three years. This would be a significant impact.

The outdoor recycling area would have a low potential to cause off-site odors. Bottles cans and other recyclable materials typically do not have strong odors. The localized odors produced by recyclable materials can be minimized through application of good management practices.

Mitigation Measure AQ-3: Implement Odor Reduction Measures.

The County and City shall require as an enforceable provision of the operations contract for the facility that no odors are detectable beyond the site boundaries. When approving the final building design, the County and City will ensure that it is compatible with installation of any necessary odor control systems. The operations contract will require:

Design & Construction

1. Design of facility to ensure all transfer, handling and storage of solid waste material occurs within the fully enclosed building.

   A. The County Environmental Health Division, Local Enforcement Agent(LEA)for CalRecycle, has jurisdiction over odor impacts of a solid waste facility and conducts periodic inspections and responses to complaints. If the LEA confirms off-site odor at any time, the operator will be required to implement any or all of the following controls:. Air curtains at doorways

   B. Overhead misting system

   C. Negative pressure ventilation with exhaust air directed through biofilters

Operation

1. Close all doors when facility is not operating.
2. Ensure material is not stored on site for more than 48 hours.
3. Develop and implement best management practices to clean the facility on a daily basis, including removing all odor producing food waste from facility floors and equipment.
4. Provide neighbors with a contact name and phone number to report odor or dust complaints. Such complaints shall be documented. The source or cause of any odor will be identified and actions taken to mitigate the odors shall also be documented.

The County and City shall designate a staff member to receive, document, and follow-up on odor complaints. A record shall be kept of each complaint for a minimum of five years from the date the complaint is received.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure AQ-3 provides basic odor minimization measures to be integrated into the project design and operation, with further measures that require “pre-plumbing” for additional odor-control systems, so that if complaints approach the established threshold, these additional measures would be implemented. Implementation of Mitigation Measure AQ-3 would reduce the impact to less than significant.

3.3.6 Cumulative Impacts

Impact AQ C-1: Result in a Cumulatively Considerable Contribution to Cumulative Impacts Related to Air Quality.

Project emissions of criteria air pollutants or their precursors would not make a considerable contribution to cumulative air quality impacts. As noted in the project analysis, air pollution, by nature, is mostly a cumulative impact. The significance thresholds applicable to construction and operational aspects of a project represent the levels at which a project’s individual emissions of criteria pollutants and precursors would result in a cumulatively considerable contribution to the region’s air quality conditions as described by BAAQMD (BAAQMD 2011).

The proposed project’s construction-period emissions exhaust would not exceed the quantitative significance thresholds, and fugitive dust emissions would be adequately controlled through implementation of BAAQMD best management practices. Therefore, project construction would not make a considerable contribution to cumulative air quality impacts.

Significant community risk impacts to sensitive receptors from project construction were identified as 11.6 in one million. A review of cumulative construction projects that are planned and approved in the area (see Section 3.0, Table 3-1 of this Draft EIR) did not reveal any nearby projects within 1,000 feet of the Maximally Exposed Individual (MEI) to result in a cumulative construction health risk impact. Therefore, the cumulative analysis is the same as for the project. The project's contribution to the cumulative impact is 11.6 in one million, which is over the individual threshold and therefore a considerable contribution to the cumulative impact. The cumulative impact to TACs is significant.

Mitigation Measures: AQ-1 Air Quality Control Measures during Construction and AQ-2 Select Equipment during Construction to Minimize Emissions.

Level of Significance: Less than significant with mitigation.

Incorporating Mitigation Measure AQ-2, the modeling results with this mitigation in place would have a child cancer risk of 5.87 in a million with the adult incremental cancer risk of 0.3 in million, which is below the significance threshold of 10 in one million. Therefore, implementation of Mitigation Measure AQ-2 would reduce the projects contribution to the cumulative impact to less than significant.

PermanentFootprint_141104

ConstructionFootprint_141104

Parcels

9 Residences within 1,000 feet of Project Area

Paper Size ANSI A

0 70 140 210 280 350

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California II FIPS 0402 Feet

N

GHD

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

Mendocino Solid Waste Management Authority
Central Coast Transfer Station EIR

Job Number	8411065
Revision	A
Date	04 Nov 2014

Sensitive Receptors

Figure 3.3-1

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

G:\0016201 MendoSolidWasteMgmtAuthority\8411065 MSWMA TransferStationEIR\08-GIS\Maps\Figures\EIR\F3.3-1_SensitiveReceptors.mxd

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3.4 Biological Resources

This section evaluates the potential impacts related to biological resources during construction and operation of the project. The setting section describes the existing environmental conditions for biological resources. The regulatory framework section describes the applicable regulations at the federal, state and local level. The impacts and mitigation measures section establishes the thresholds of significance, evaluates potential impacts to biological resources, and identifies the significance of impacts. Where appropriate, mitigation is presented to reduce impacts to less-than-significant levels. Information in this section is based in part on the Biological Resources Assessment prepared for this project by WRA in June 2013 (Appendix D).

3.4.1 Setting

Vegetation Communities

Sensitive biological communities include habitats that fulfill special functions or have special values, such as wetlands, streams, or riparian habitat. These habitats may be protected under federal regulations such as the Clean Water Act; state regulations such as the Porter-Cologne Act, and the California Department of Fish and Wildlife (CDFW) Streambed Alteration Program; or local ordinances or policies such as City or County tree ordinances. Other sensitive biological communities include habitats that fulfil special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB) [CDFW 2014a]. Sensitive plant communities are also provided in list format by CDFW (2009a). CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2012) methodology (see Table 3.4-1), with those alliances ranked globally (G) or statewide (S) with status of 1 through 3 considered to be of special concern as well as imperiled (CDFG 2007; CDFW 2014b).

Table 3.4-1 Score Value Ranges for Nature Serve Conservation Status Ranks

Calculated Score Value Range	Calculated Status Rank	Status Description	Definition	Threat Rank
score ≤1.5	G1, S1	Critically Imperiled	Less than 6 elemental occurrences (EO) or less than 1,000 individuals or less than 2,000 acres	S1.1 = very threatened S1.2 = threatened S1.3 = no current threats known
1.5< score ≤2.5	G2, S2	Imperiled	6-20 EOs or 1,000-3,000 individuals or 2,000-10,000 acres	S2.1 = very threatened S2.2 = threatened S2.3 = no current threats known
2.5< score ≤3.5	G3, S3	Vulnerable	21-100 EOs or 3,000-10,000 individuals or 10,000-50,000 acres	S3.1 = very threatened S3.2 = threatened S3.3 = no current threats known

Calculated Score Value Range	Calculated Status Rank	Status Description	Definition	Threat Rank
3.5< score ≤4.5	G4, S4	Apparently Secure	This rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat.	No threat rank
score >4.5	G5, S5	Secure	Demonstrably secure to ineradicable	No threat rank

Compiled from: CDFG 2007; NatureServe 2012

The application of global ranking (G#) for determination of sensitive communities is summarized in Table 3.4-1 (NaturServe 2009). Additionally, CDFW high priority natural community elements are reserved for those areas exhibiting high quality occurrences based on a criterion such as:

1. Lack of invasive species;
2. No evidence of human caused disturbance such as roads or excessive livestock grazing, or high grade logging; or,
3. Evidence of reproduction present (sprouts, seedlings, adult individuals of reproductive age), and no significant insect or disease damage, etc.

Non-sensitive biological communities are those communities that are not afforded special protection under CEQA, and other state, federal, and local laws, regulations, and ordinances. These non-sensitive communities may, however, provide suitable habitat for some special-status plant or wildlife species and are part of the general existing site conditions. Sensitive and non-sensitive habitat/vegetation types were mapped on the site and presented in the supporting biological resources evaluation to establish existing conditions at the project site (WRA 2013).

Numerous sites visits were conducted to identify suitable habitats for special-status species, and to map sensitive and non-sensitive habitats (WRA 2013). The site visit included study of 20.95 acres of APN 019-150-05 (i.e., the portion of the parcel which is north of Highway 20, and hereinafter referred to as the “property”, and “property study area”) in order to provide context for the actual 17-acre “project site” that is encompassed by the 20.95 acre property. The nomenclature and classification for habitat areas mapped on the property are presented in Table 3.4-2, and information is presented as a basis to evaluate whether mapped areas qualify as sensitive habitats by CDFW definition. Many of the habitats identified on the property study area are considered sensitive, including wetlands and at least portions of the cypress forest (particularly the stunted/pygmy portions, as well as areas where cypress are growing in conjunction with Bolander’s pine which is typical plant composition for pygmy forest). Resources mapped on the property are quantified in Table 3.4-3 and presented on Figure 3.4-1.

Table 3.4-2 Nomenclature for Vegetation Communities on Property

Habitat	Vegetation Alliance	CNDDB Global (G) and State (S) Rank	Vegetation Association	Dominant Species and CRPR Status
Bishop pine forest	Bishop pine (*Pinus muricata)* Forest Alliance	G3 S3	Bishop pine-evergreen huckleberry (*P. muricata-Vaccinium ovatum)*	*P. muricata* [CRPR none]
Cypress forest (tall)	Pygmy cypress (*Hesperocyparis pygmaea*) Forest Alliance	G2 S2	Mendocino cypress – tall (*H. pygmaea)*	*H. pygmaea* [CRPR 1B]
Cypress forest (intermediate)			Pygmy cypress / Bolander's pine (*H. pygmaea/Pinus contorta* ssp. *bolanderi*)	*H. pygmaea* [CRPR 1B] *P. contorta* ssp. *bolanderi* [CRPR 1B]
Cypress forest (pygmy); USACE Forested wetland			Pygmy cypress / Bolander's pine – pygmy (*H. pygmaea/P. contorta* ssp. *bolanderi*)	*H. pygmaea* [CRPR 1B] *P. contorta* ssp. *bolanderi* [CRPR 1B]
USACE Palustrine emergent wetland	Slough sedge sward (*Carex obnupta)* Herbaceous Alliance	G4 S3	Slough sedge/California sedge sward (*C. obnupta/C. californica)* Association	*Carex obnupta* [None] *C. californica* [CRPR 2]

Source: Sawyer et al. (2009)

Table 3.4-3 Existing Habitats Quantified for the Property

Habitat	Dominant Species	Property (acres)	Tree Count Estimate (#)	Regional Conditions (acres)[1]
Disturbed / ruderal	Various	1.11	NA	NA
Bishop pine forest	Bishop pine (*P. muricata)*	8.39	NA	14,900
Cypress forest (tall)	cypress (*H. pygmaea*)	4.78	776	NA
	Bolander's pine (*P. contorta* ssp. *bolanderi*)		100	
Cypress forest (intermediate)	cypress (*H. pygmaea*)	4.44	336	NA
	Bolander's pine		147	
Cypress forest (pygmy) / Forested wetland	cypress (*H. pygmaea*)	3.11	598	2,000
	Bolander's pine		496	
Palustrine emergent wetland	Various	0.22	NA	NA
Total		**20.95**		

[1] Regional conditions are estimated and presented for context utilizing a variety of sources that provide general mapping quantities for the area, yet are believed to be the most current data readily available based on conversation with CDFW and others (Miller, Linda 2014, Pers. Com). While approximately 4,420 acres of Pygmy Cypress forest type was mapped in 1998 by CALVEG in the area between Ten Mile and Navarro River (CDF 2005), some sources have indicated this may be reduced to as little as 2,000 acres, and mapping is highly variable on what definition, species composition, and tree height is used for this map unit. CDFW is working on mapping project currently to establish baseline existing conditions (Miller, Linda 2014, Pers. Com). 2,000 acres is used herein as a conservative estimate of what remains regionally of pygmy forest and as a basis for comparative analysis to project impacts (although project impacts are to intermediate and tall cypress/Bolander's pine). In 1998 CALVEG mapped 14,900 acres of Bishop pine in Mendocino County (CDF 2005).

<u>Bishop Pine Forest Alliance</u>: This community is known along the coast from Fort Bragg, Mendocino County to northwestern Sonoma County, and there are also stands on Point Reyes, Mount Tamalpais, and Monterey Peninsula (Sawyer et al. 2009). Vegetation associations include Bishop pine-evergreen huckleberry (*Pinus muricata-Vaccinium ovatum* Forest Association) and Bishop pine/Bolander's pine/ cypress (*Pinus muricata / P. contorta ssp. bolanderi / Hesperocyparis pygmaea* Forest Association). At the project site, this community is dominated by Bishop pine (*Pinus muricata*), with several subdominant tree species including pygmy cypress (*Hesperocyparis pygmaea*) [approximately 327 individuals scattered across the property within this map unit], Bolander's pine (*Pinus contorta* ssp. *bolanderi*) [approximately 47 individuals scattered across the property within this map unit], as well as western hemlock (*Tsuga heterophylla*), and coast redwood (*Sequoia sempervirens*). The overstory varies from somewhat open to completely closed containing mature to over-mature trees. The understory contributes to the vertical structure with a high density of shrubs and herbaceous layer. Shrub species include evergreen huckleberry (*Vaccinium ovatum*), Pacific rhododendron (*Rhododendron macrophyllum*), giant chinquapin (*Chrysolepis chrysophylla*), tanoak (*Notholithocarpus densiflorus*), and salal (*Gaultheria shallon*). Herbaceous species are sparse and include bracken fern (*Pteridium aquilinum*), bear grass (*Xerophyllum tenax*), and modesty (*Whipplea modesta*). Bishop pine forest occupies approximately 8.39 acres in the southwestern and south-central portion of the property.

<u>Pygmy Cypress Forest Alliance</u>: Cypress forest is known near the coast from Fort Bragg to Albion in Mendocino County, with true pygmy forest comprised of unique vegetation associations with pygmy/stunted trees growing on old uplifted marine terraces with restrictive acidic podzol-like soils (Blacklock Series), and in scattered stands south into Sonoma County (WRA 2013). Vegetation Associations (as described by Sawyer et al. 2009) within this Forest Alliance include Pygmy Cypress Forest Association (*Hesperocyparis pygmaea* Association) and Pygmy Cypress/Bolander's Pine Forest Association (*Hesperocyparis pygmaea/Pinus contorta* ssp. *bolanderi* Association). A total of 12.33 acres of Pygmy Cypress Forest Alliance were mapped on the property, made up of the following three morpho-types (classified based on dominant species composition and tree class/size): "cypress forest – tall," "cypress forest – intermediate," and "cypress forest – pygmy," the first of which corresponds with the pygmy cypress Association, and the latter two correspond with the pygmy cypress/Bolander's pine Association. These mapping units/associations were based on species composition and height of individual trees, and may be correlated to soil conditions, with stunted trees (cypress forest - pygmy) located on areas mapped to have a shallow cemented hardpan within the soil. Individual trees were counted in several 50-foot radius vegetation plots, and numbers estimated across the stands (WRA 2013). The three morph-types are further described below.

<u>Cypress Forest - Tall</u> is dominated by Mendocino/pygmy cypress, with scattered individuals of Bishop pine. Although cypress dominates these areas, the soils do not appear to be limiting the growth of individual trees, and average heights range from 35 to 100 feet. These areas were mapped and classified at plant association level as Mendocino cypress (*H. pygmaea* Association). For the most part, this area lacks presence of Bolander's pine which when in conjunction with pygmy cypress trees, is considered to be the typical species composition of true Mendocino pygmy forest. The dense understory is dominated by tall shrubs including Pacific rhododendron, evergreen huckleberry, and salal. This morpho-type occupies approximately 4.78 acres in the southeastern and northwestern portions of the property. Tree counts within plots in this map unit estimate approximately 776 cypress (subdominant Bishop pine was not counted), and approximately 100 Bolander's pine scattered throughout (calculated to be less than 10% of trees present in this map unit).

Cypress Forest - Intermediate is dominated by Mendocino/pygmy cypress, with subdominants of Bishop pine and Bolander's pine. The average height of trees range from 15 to 35 feet, which could have partially limited growth pattern due to soils and/or soil moisture. The area was mapped and classified by vegetation association to be consistent with Pygmy cypress / Bolander's pine (*H. pygmaea/Pinus contorta* ssp. *bolanderi* Association). The understory is dominated by dense shrubs including hairy manzanita (*Arctostaphylos columbiana*), Pacific rhododendron, evergreen huckleberry, and salal (*Gaultheria shallon*). This morpho-type occupies approximately 4.44 acres in the northern and north-eastern portion of the property. Tree counts within plots in this map unit estimate approximately 336 cypress mostly of intermediate height (Bishop pine was not counted), and approximately 147 Bolander's pine scattered throughout.

Cypress Forest - Pygmy. A habitat unique to several areas along California's north coast, pygmy forest occurs in the western part of Mendocino County. Climatic and soil conditions have created a highly specific plant community with limited growth. In the pygmy forests, soil has been leached of its nutrients, is highly acidic, and is underlain by an iron hardpan. Due to the poor soil conditions, these communities are dominated by dwarf species of plants such as pygmy manzanita, pygmy cypress, Bolander pine, and lichens (WRA 2013). The area is dominated by pygmy cypress and Bolander's pine. The soils are thought to be limiting the growth of trees whose average height ranges from 5 to 15 feet and shrubs are stunted and sparse to absent in density. The understory is composed of short statured shrubs with noticeably greater interstitial space between thickets than in intermediate cypress forest and tall cypress forest areas at the site. Scattered shrub species include Labrador tea (*Rhododendron columbianum*), wax myrtle (*Morella californica*), salal, and evergreen huckleberry. The herbaceous layer is sparse with bracken fern, bear grass, California sedge (*Carex californica*), and sporadic coast lilies (*Lilium maritimum*). Additionally, cryptogamic crusts formed from reindeer lichens (*Cladonia portentosa, Cladina impexa*) are present sporadically in open compacted areas. This morpho-type occupies approximately 3.11 acres in the eastern portion of the property and is analogous with the forested wetland map unit described below. Tree counts within plots in this map unit estimate approximately 598 cypress (stunted/pygmy) trees and approximately 496 Bolander's pine trees scattered throughout the property.

Federal and State Jurisdictional Wetlands and Waters

Palustrine Emergent Wetlands: Seasonal wetlands are known throughout California and are typically located in relatively flat locations underlain by soils with moderate to high clay content and/or substrates with a shallow impermeable layer within the upper profile. An approximately 0.22-acre seasonal palustrine emergent wetland (USACE jurisdictional) is located in the southeast corner of the property (Figure 3.4-1). This wetland is a slight concave depression which contains approximately 25 percent absolute cover of herbaceous species composed of predominantly slough sedge (*Carex obnupta*, OBL) and California sedge (FACW) [CRPR 2]. Trees and shrubs are rooted along the edge of this feature, include Bolander's pine (FAC), pygmy cypress (NL), evergreen huckleberry (FACU), and Labrador tea (OBL). The upper soil profile (0 to 9 inches) is composed of brown (7.5YR 5/8) matrix to dark grayish brown (10YR 4/2) sandy silts and silty clays with brown (7.5YR 5/8) on root channels. The subsurface layer (9 to 14 inches) is composed of very dark brown (10YR 2/2) clay loam with redoximorphic concentrations noted as present. Hydrology indicators include surface soil cracks (B6), a sparsely vegetated concave surface (B8), oxidized rhizospheres (C4), shallow aquitard (D3), and pass on the FAC-neutral test (D5). The boundary of this wetland was delineated based on topography and change in vegetation density.

Forested Wetlands: At the site, the boundary of USACE jurisdictional forested wetlands (USACE 2013) is analogous with the "cypress forest - pygmy" map unit (WRA 2013), and is approximately 3.11 acres. The vegetation is dominated by Bolander's pine (FAC), pygmy cypress (, NL), evergreen huckleberry (FACU), and Labrador tea (OBL), wax myrtle (FACW), salal (FACU), and California sedge (FACW). The upper soil profile (0 to 6 inches) is composed of light brownish gray (10YR 6/2) and brown (7.5YR 4/3) sandy clay loam. The subsoil (6 to 8 inches) is composed of yellowish brown (10YR 5/6) sandy clay loam with brown (10YR 5/8) redoximorphic features in the soil matrix. Hydrology indicators include oxidized rhizospheres (C3), water-stained leaves (B9), and a shallow aquitard (D3). The boundary of the forested wetland was delineated based on changes in soils and vegetation type, and the USACE provided a jurisdictional determination concurring with conditions as mapped by WRA (USACE 2013).

Waters of the U.S. and State: Other waters, besides wetlands, subject to USACE jurisdiction under Section 404 of the Clean Water Act include lakes, rivers and streams (including intermittent streams) for non-tidal areas. Non-tidal waters of the U.S. are defined at the ordinary high water mark (OHWM) following the USACE Regulatory Guidance Letter No. 05-05, *Ordinary High Water Mark Identification* (USACE 2005). Because the Regional Water Quality Control Board (RWQCB) does not currently ascribe a specific methodology for delineating Waters of the State, wetlands and non-wetland waters were assessed for this project following USACE guidelines and it is assumed that USACE jurisdictional wetlands are also jurisdictional by the RWQCB (although not exclusive to). The site does not contain non-wetland water features or other Waters of the U.S./State. A 200-foot linear ephemeral swale is located outside of the western edge of the property, and flows westward and terminates in a Labrador tea thicket. This area is noted herein per inquiry by CDFW, but is outside the property and thus was not mapped.

Riparian and Other Wet Areas: The property was evaluated to locate potential intermittent streams not already designated wetlands or waters of the U.S./State as well as associated riparian habitat following the standard guidance provided in *A Field Guide to Lake and Streambed Alteration Agreements, Sections 1600-1607, California Fish and Game Code*. The guidance for CDFG Section 1602 jurisdiction is typically understood to include streams and to extend laterally to the top-of-bank (WRA 2013). If riparian vegetation is present within the top-of-bank, then CDFG jurisdiction extends to the outer dripline of such vegetation. Riparian vegetation does not exist on the property.

Special-Status Plant Species

Table 3.4-4 summarizes the potential for occurrence for the special-status plant species that are recorded as occurring in the vicinity of the site. Seven plant species were determined to have a moderate or high potential to occur at the site, and four plant species were identified and mapped at the site. Species descriptions for the special-status plant species identified at the site are presented below. The remaining plant species are unlikely or have no potential to occur due to one or more of the following reasons:

- Hydrologic conditions (e.g. marsh habitat, perennial streams) necessary to support some specific special-status plant(s) are not present at the site;
- Edaphic (soil) conditions (e.g. serpentine, volcanics) necessary to support some special-status plant(s) are not present at the site;
- Topographic positions and landforms (e.g. north-facing, slopes) necessary to support some special-status plant(s) are not present at the site;

- Associated vegetation communities (e.g. chaparral, coastal prairie, dune, bluff) necessary to support some special-status plant(s) are not present at the site;
- The degree of disturbance and/or presence of extensive highly competitive, non-native plant species (e.g. dense non-native annual grassland);
- The site is outside of the known elevation and/or localized distribution of some special-status plant(s) (e.g. coastal, montane).
- Special-status seasonally-appropriate plant surveys were conducted within appropriate time of year to identify species with moderate or high potential to occur at the site, and determined absence or presence of these species.

Table 3.4-4 Potential for Special-Status Plant Species to Occur on the Property

Species	Status[1]	Habitat Requirements	Potential to Occur On-site	Results
PLANTS				
pink sand verbena *Abronia umbellata* var. *breviflora*	1B	Coastal dune, coastal strand; located on foredunes and interdunes with low vegetation cover. Elevation range: 0 – 35 feet. Blooms: June – October.	**No Potential**. The property does not contain coastal dune or coastal strand habitat necessary to support this species.	**Not Present**.
Blasdale's bent grass *Agrostis blasdalei*	1B	Coastal dune, coastal bluff scrub, coastal prairie; located on sandy to gravelly substrate close to rocks of bluff faces; typically located in nutrient poor areas with sparse vegetation cover. Elevation range: 15 – 490 feet. Blooms: May – July.	**No Potential**. The property does not contain coastal dune, coastal bluff scrub, or coastal prairie habitat necessary to support this species.	**Not Present**.
pygmy manzanita *Arctostaphylos nummularia* ssp. *mendocinensis*	1B	Closed-cone coniferous forest; located acidic, sandy clay substrate in pygmy forest stands. Elevation range: 290 – 600 feet. Blooms: January.	**High Potentia**l. The property contains suitable substrate and pygmy forest habitat that may support this species. The nearest documented occurrence is approximately seven miles from the property.	**Not Observed**. This species was not observed during plant surveys in May and July (species vegetative state would have been visible and identifiable to species level outside of bloom period).
Humboldt County milk-vetch *Astragalus agnicidus*	SE; 1B	Broadleaf upland forest, redwood forest; located in disturbed openings in timber lands, on south-facing aspects, and along ridgelines. Elevation range: 585 – 2600 feet. Blooms: April – September.	**No Potential**. The property does not contain broadleaf upland forest or redwood forest necessary to support this species.	**Not Present**.
Point Reyes Blennosperma *Blennosperma nanum* var. *robustum*	SR; 1B	Coastal prairie, coastal scrub; located on open coastal hills underlain by sandy substrate. Elevation range: 30 – 475 feet. Blooms: February – April.	**No Potential**. The property does not contain coastal prairie or coastal scrub habitat necessary to support this species.	**Not Present**.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site	Results
Thurber's reed grass *Calamagrostis crassiglumis*	2	Coastal scrub, freshwater marsh; typically located in marshy swales surrounded by grasslands or coastal scrub. Elevation range: 30 – 150 feet. Blooms: May – July.	**No Potential**. The property does not contain coastal scrub or freshwater marsh habitat necessary to support this species.	**Not Present**.
coastal bluff morning glory *Calystegia purpurata* ssp. *saxicola*	1B	Coastal dunes, coastal scrub; located on coastal bluffs. Elevation range: 30 – 330 feet. Blooms: May – September.	**No Potential**. The property does not contain coastal dune or scrub habitat necessary to support this species.	**Not Present**.
swamp harebell *Campanula californica*	1B	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows, freshwater marsh, North Coast coniferous forest; typically located in wetlands within a variety of surrounding habitats. Elevation range: 3 – 1320 feet. Blooms: June – October.	**High Potential**. The property contains wet areas within closed-cone coniferous forest (Bishop pine forest, pygmy forest) that may support this species. The nearest documented occurrence is less than one mile from the property.	**Not Observed**. This species was not observed during seasonally-appropriate plant surveys conducted in May and July during species-specific bloom time.
California sedge *Carex californica*	2B	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows, marshes and swamps; located in drier areas of swamps, bogs, and marsh margins. Elevation range: 290 – 1090 feet. Blooms: May – August.	**High Potential**. The property contains wetlands within closed-cone coniferous forest (pygmy forest) habitat that may support this species.	**Present**. Scattered individuals of this species were observed throughout the pygmy forest habitat and a seasonal wetland depression within and adjacent to the property.
lagoon sedge *Carex lenticularis* var. *limnophila*	2	Bogs and fens, marshes and swamps, North Coast coniferous forest; located on lakeshores and beaches. Elevation range: 0 – 20 feet. Blooms: June – August.	**Unlikely**. Although the property contains North Coast coniferous forest and wetlands, this species is known from coastal dune wetlands and beach pine.	**Not Present**.
livid sedge *Carex livida*	1A	Bogs and fens; historically known from sphagnum bogs. Elevation range: unknown. Blooms: June.	**No Potential**. The property does not contain sphagnum bog habitat necessary to support this species.	**Not Present**.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site	Results
Lyngbye's sedge *Carex lyngbyei*	2	Marshes and swamps; brackish to freshwater. Elevation range: 0 – 35 feet. Blooms: April – August.	**Unlikely**. Although the property contains wetland habitat, marsh habitat is not present necessary to support this species.	**Not Present**.
deceiving sedge *Carex saliniformis*	1B	Coastal prairie, coastal scrub, meadows and seeps, coastal salt marshes and swamps; located in mesic sites. Elevation range: 10 – 750 feet. Blooms: June – July.	**No Potential**. The property does not contain coastal prairie, coastal scrub, meadow, or coastal salt marsh habitat necessary to support this species.	**Not Present**.
green yellow sedge *Carex viridula* var. *viridula*	2	Bogs and fens, freshwater marshes and swamps, North Coast coniferous forest; located in mesic sites. Elevation range: 0 – 5200 feet. Blooms: June – November.	**Moderate Potential**. The property contains coniferous forest (Bishop pine forest) with wetland sites that may support this species; however, this species is closely associated with Douglas fir-coast redwood forest habitat not present.	**Not Observed**. This species was not observed during seasonally-appropriate plant surveys conducted in May and July during species-specific bloom time.
Humboldt Bay owl's-clover *Castilleja ambigua* ssp. *humboldtiensis*	1B	Coastal salt marsh; located in marshes associated with salt grass, cordgrass, pickleweed, and jaumea. Elevation range: 0 – 10 feet. Blooms: April – August.	**No Potential**. The property does not contain coastal salt marsh habitat necessary to support this species.	**Not Present**.
Oregon coast paintbrush *Castilleja litoralis*	2	Coastal bluff scrub, coastal dune, coastal scrub; located on sandy substrate. Elevation range: 45 – 325 feet. Blooms: June.	**Unlikely**. The property does not contain coastal bluff scrub, coastal dune, or coastal scrub habitat necessary to support this species. The plant surveys did not note presence of this species on property.	**Not Observed**.
Mendocino Coast paintbrush *Castilleja mendocinensis*	1B	Coastal bluff scrub, coastal scrub, coastal prairie, closed-cone coniferous forest, coastal dune; typically located on open sea bluffs and cliffs. Elevation range: 0 – 520 feet. Blooms: April – August.	**No Potential**. The property does not contain coastal scrub, coastal prairie, or coastal closed-cone coniferous forest (beach pine forest) habitat necessary to support this species.	**Not Present**.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site	Results
Howell's spineflower *Chorizanthe howellii*	FE; ST; 1B	Coastal dunes, coastal prairie, coastal scrub; located on sand dunes, sandy slopes, and sandy areas in coastal prairie. Elevation range: 0 – 115 feet. Blooms: May – July.	**No Potential**. The property does not contain coastal dune, coastal prairie, or coastal scrub habitat necessary to support this species.	**Not Present**.
Whitney's farewell-to-spring *Clarkia amoena* ssp. *whitneyi*	1B	Coastal bluff scrub, coastal scrub. Elevation range: 30 – 325 feet. Blooms: June – August.	**No Potential**. The property does not contain coastal scrub habitat necessary to support this species.	**Not Present**.
round-headed Chinese houses *Collinsia corymbosa*	1B	Coastal dunes, coastal prairie. Elevation range: 0 – 65 feet. Blooms: April – June.	**No Potential**. The property does not contain coastal dune habitat necessary to support this species.	**Not Present**.
Oregon goldthread *Coptis laciniata*	2	North Coast coniferous forest, meadows and seeps; located in mesic sites, roadsides, and streamsides. Elevation range: 0 – 3250 feet. Blooms: March – April.	**Unlikely**. The property contains North Coast coniferous forest, yet this species is closely associated with mesic sites (e.g. streambanks) in coast redwood-Douglas fir habitat.	**Not Present**.
bunchberry *Cornus canadensis*	2B.2	North coast coniferous forest, bogs and fens, meadows and seeps in a broad range of stand types and soil/site conditions. Elevation range: 200 – 6,000 feet. Blooms: May - July	**Unlikely**. The property contains coniferous forest that may support this species yet plant surveys conducted in May and July did not document presence of this species.	**Not Observed**.
Mendocino dodder *Cuscuta pacifica* var. *papillata*	1B	Coastal dunes; located in interdune depressions; likely hosts on lupines, catchflies, and cudweeds. Elevation range: 0 – 165 feet. Blooms: July – October	**No Potential**. The property does not contain coastal dune habitat necessary to support this species.	**Not Present**.
supple daisy *Erigeron supplex*	1B	Coastal bluff scrub, coastal prairie; typically located in grassy sites along the coastline. Elevation range: 30 – 165 feet. Blooms: May – July	**No Potential**. The property does not contain coastal scrub or coastal prairie habitat necessary to support this species.	**Not Present**.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site	Results
bluff wallflower *Erysimum concinnum*	1B.2	Coastal dunes, coastal bluff scrub, coastal prairie. Elevation range: 0 – 600 feet. Blooms: March - May	**Unlikely**. Preferred coastal habitat is not present at the site. The plant surveys did not note presence of this species on property.	**Not Observed**.
Menzies' wallflower *Erysimum menziesii* ssp. *menziesii*	FE; SE; 1B	Coastal dune; located on stabilized and shifting dunes and coastal strand. Elevation range: 0 – 115 feet. Blooms: March – June.	**No Potential**. The property does not contain coastal dune habitat necessary to support this species.	**Not Present**.
Roderick's fritillary *Fritillaria roderickii*	SE; 1B	Coastal bluff scrub, coastal prairie, valley and foothill grassland; located on grassy slopes, mesas, and terraces. Elevation range: 45 – 1300 feet. Blooms: March – May.	**No Potential**. The property does not contain coastal bluff scrub, coastal prairie, or coastal grassland habitat necessary to support this species.	**Not Present**.
Pacific gilia *Gilia capitata* ssp. *pacifica*	1B	Coastal bluff scrub, coastal prairie, valley and foothill grassland. Elevation range: 15 – 3090 feet. Blooms: April – August.	**No Potential**. The property does not contain coastal bluff scrub, coastal prairie, or grassland habitat necessary to support this species.	**Not Present**.
dark-eyed gilia *Gilia millefoliata*	1B	Coastal dune. Elevation range: 5 – 100 feet. Blooms: April – July.	**No Potential**. The property does not contain coastal dune habitat necessary to support this species.	**Not Present**.
white seaside tarplant *Hemizonia congesta* ssp. *congesta*	1B	Coastal scrub, valley and foothill grassland; located in grassy valleys and hills, often fallow fields. Elevation range: 65 – 1820 feet. Blooms: April – November.	**No Potential**. The property does not contain coastal scrub or grassland habitat necessary to support this species.	**Not Present**.
short-leaved evax *Hesperevax sparsiflora* var. *brevifolia*	1B	Coastal bluff scrub, coastal dune; located on sandy bluffs and flats near the immediate coastline. Elevation range: 0 – 700 feet. Blooms: March – June.	**No Potential**. The property does not contain coastal bluff scrub or coastal dune habitat necessary to support this species.	**Not Present**.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site	Results
pygmy cypress *Hesperocyparis pygmaea*	1B	Closed-cone coniferous forest; located on podzol-like soils (Blacklock series). Elevation range: 100 – 1950 feet.	**High Potential**. The property contains Blacklock series soils and closed-cone coniferous forest.	**Present**. Extensive stands of this species are located throughout the property, particularly as a stand-forming in the pygmy forest habitat.
Point Reyes horkelia *Horkelia marinensis*	1B	Coastal dunes, coastal prairie, coastal scrub; located on sandy flats and dunes near the coast; in open grassy sites within scrub. Elevation range: 15 – 1140 feet. Blooms: May – September.	**No Potential**. The property does not contain coastal dune, coastal prairie, or coastal scrub habitat necessary to support this species.	**Not Present**.
hair-leaved rush *Juncus supiniformis*	2	Marshes and swamps, bogs and fens; located in sites near the coast. Elevation range: 65 – 325 feet. Blooms: April – June.	**Unlikely**. Although the property contains wetland habitat, this species is known primarily from sphagnum bog habitat not present in the property.	**Not Present**.
Baker's goldfields *Lasthenia californica* ssp. *bakeri*	1B	Closed-cone coniferous forest, coastal scrub; located in openings in scrub and coastal forest habitat. Elevation range: 195 – 1690 feet. Blooms: April – October.	**No Potential**. The property does not contain coastal scrub or beach pine forest necessary to support this species.	**Not Present**.
perennial goldfields *Lasthenia californica* ssp. *macrantha*	1B	Coastal bluff scrub, coastal dune, coastal scrub. Elevation range: 15 – 1690 feet. Blooms: January – November.	**No Potential**. The property does not contain coastal bluff scrub, coastal dune, or coastal scrub habitat necessary to support this species.	**Not Present**.
coast lily *Lilium maritimum*	1B	Closed-cone coniferous forest, coastal prairie, coastal scrub, broadleaf upland forest, North Coast coniferous forest; typically located on sandy soils, often in raised hummocks or bogs, and roadside ditches. Elevation range: 15 – 1545 feet. Blooms: May – August.	**High Potential**. The property contains closed-cone coniferous forest and closed-cone coniferous forest (Bishop pine forest, pygmy forest) that may support this species.	**Present**. One concentrated and a second dispersed population of this species is located within or adjacent to the property, as mapped during seasonally-appropriate plant surveys conducted in May and July.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site	Results
northern microseris *Microseris borealis*	2	Bogs and fens, meadows and seeps, lower montane coniferous forest. Elevation range: 3250 – 6500 feet. Blooms: June – September.	**No Potential**. The property does not contain bog, fen, meadow, seep, or lower montane coniferous forest habitat necessary to support this species.	**Not Present**.
Wolf's evening-primrose *Oenothera wolfii*	1B	Coastal bluff scrub, coastal dune, coastal prairie, lower montane coniferous forest; located on sandy substrates in mesic sites. Elevation range: 10 – 2600 feet. Blooms: May – October.	**Unlikely**. Although the property contains coniferous forest, this species is most closely associated with open grassy sites (prairie, scrub) on the coast.	**Not Present**.
seacoast ragwort *Packera bolanderi* var. *bolanderi*	2	Coastal scrub, North Coast coniferous forest. Elevation range: 100 – 2115 feet. Blooms: January – July.	**Unlikely**. The property contains North Coast coniferous forest, yet this species is associated with coast redwood-Douglas fir forest not present on the study property.	**Not Present**.
North Coast phacelia *Phacelia insularis* var. *continentis*	1B	Coastal bluff scrub, coastal dune; located on open maritime bluffs underlain by sandy substrate. Elevation range: 30 – 555 feet. Blooms: March – May.	**No Potential**. The property does not contain coastal bluff scrub or coastal dune habitat necessary to support this species.	**Not Present**.
Bolander's pine *Pinus contorta* ssp. *bolanderi*	1B	Closed-cone coniferous forest; located on podzol-like soils (Blacklock series), closely associated with Bishop pine and pygmy cypress. Elevation range: 240 – 815 feet.	**High Potential**. The property contains Blacklock series soils and closed-cone coniferous forest.	**Present**. Extensive stands of this species are located throughout the property, particularly as stand-forming in the pygmy forest habitat.
dwarf alkali grass *Puccinellia pumila*	2	Meadows and seeps, marshes and swamps; located in mineral spring meadows and coastal salt marshes. Elevation range: 1 – 35 feet. Blooms: July.	**No Potential**. The property does not contain mineral springs, meadow, seep, or marsh habitat necessary to support this species.	**Not Present**.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site	Results
angel's hair lichen *Ramalina thrausta*	2B.1	Grows on trees in forested moist areas.	**Unlikely**. The property contains coniferous forest (Bishop pine forest), yet the species is not known from near the site.	**Not Observed**. This species was not observed by GHD project biologists per site visit May 7, 2014..
white beaked-rush *Rhynchospora alba*	2	Bogs and fens, meadows and seeps, marshes and swamps; located in freshwater perennial wetlands and sphagnum bogs. Elevation range: 195 – 6630 feet. Blooms: July – August.	**No Potential**. The property does not contain sphagnum bog or perennial marsh wetland habitat necessary to support this species.	**Not Present**.
great burnet *Sanguisorba officinalis*	2	Bogs and fens, meadows and seeps, broadleaf upland forest, marshes and swamps, North Coast coniferous forest, riparian forest; located on rocky serpentine seeps and streams. Elevation range: 195 – 4550 feet. Blooms: July – October.	**No Potential**. The property does not contain serpentine substrate necessary to support this species.	**Not Present**.
purple-stemmed checkerbloom *Sidalcea malviflora* ssp. *purpurea*	1B	Broadleaf upland forest, coastal scrub. Elevation range: 45 – 280 feet. Blooms: May – June.	**No Potential**. The property does not contain coastal prairie or broadleaf upland forest habitat necessary to support this species.	**Not Present**.
Monterey clover *Trifolium trichocalyx*	FE; SE; 1B	Closed-cone coniferous forest; located on poorly drained, nutrient-deficient soils with a hardpan; often in openings and burned areas. Elevation range: 95 – 780 feet. Blooms: April – June.	**Unlikely**. This species is most closely associated with Monterey pine forests of the Central Coast, with one occurrence from coast redwood-Douglas fir forest of the North Coast.	**Not Present**.
coastal triquetrella *Triquetrella californica*	1B	Coastal bluff scrub, coastal scrub, valley and foothill grassland; grows within 100 feet of the coastline in scrub and grasslands on open gravel substrates of roads, hillsides, bluffs, and slopes. Elevation range: 30 – 325 feet.	**No Potential**. The property does not contain coastal bluff scrub, coastal scrub, or grassland habitat necessary to support this species.	**Not Present**.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site	Results
alpine marsh violet *Viola palustris*	2	Coastal scrub, bogs and fens; located in swampy and shrubby places in coastal scrub or bog habitat. Elevation range: 0 – 490 feet. Blooms: March – August.	**No Potential**. The property does not contain coastal scrub or coastal bog habitat necessary to support this species.	**Not Present**.

1) Key to status codes:

FE	Federal Endangered
FT	Federal Threatened
FC	Federal Candidate
FD	Federal De-listed
BCC	USFWS Birds of Conservation Concern
SE	State Endangered
SD	State Delisted
ST	State Threatened
SR	State Rare
SSC	CDFG Species of Special Concern
CFP	CDFG Fully Protected Animal
1A	CRPR List 1A: Plants presumed extinct in California
1B	CRPR List 1B: Plants rare, threatened or endangered in California and elsewhere
2	CRPR List 2: Plants rare, threatened, or endangered in California, but more common elsewhere
3	CRPR List 3: Plants about which more information is needed (a review list)
4	CRPR List 4: Plants of limited distribution (a watch list)

Potential to Occur:

No Potential	Habitat on and adjacent to the site is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
Unlikely.	Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
Moderate Potential.	Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
High Potential.	All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Results: (WRA 2013; see Appendix D)

Present. Species was observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

Not Present. Species is assumed to not be present due to a lack of key habitat components.

Not Observed. Species was not observed during surveys.

Source: Table compiled from the California Department of Fish and Wildlife (CDFW) Natural Diversity Database, U.S. Fish and Wildlife Service (USFWS) Species Lists, and California Native Plant Society (CNPS) Electronic Inventory searches of the Fort Bragg, Inglenook, Dutchmans Knoll, Noyo Hill, Mathison Peak, and Mendocino USGS 7.5 Minute Quadrangles (CDFW 2014a; CNPS 2014; USFWS 2014.

The seven plant species with a moderate to high potential to occur at the site are described below. Species accounts and distribution at the site, if present, are described below. Four species were observed at the site during the protocol-level survey in March, May, and/or July, 2012, and the results of the survey are presented in Table 3.4-5).

Table 3.4-5 Special-Status Plant Species Mapped on the Property

Species	CRPR Status	Property (acres)	Plant Estimate (#)
Mendocino cypress	List 1B	12.33*	2,038
Bolander's pine	List 1B		790
Coast lily	List 1B	0.06	114
California sedge	List 2B	0.09	894

Source: WRA 2013

*12.33 acres consists of the three morpho-types of cypress forest mapped at the site—a) cypress forest (tall) that is dominated by cypress, b) cypress forest (intermediate) and cypress forest (pygmy) the later two of which are dominated by combination of both cypress and Bolander's pine.

Mendocino manzanita (*Arctostaphylos nummularia* var. *mendocinensis*). CRPR 1B. High Potential (Not Present). Mendocino manzanita is an evergreen shrub in the heath family (Ericaceae) that blooms in January, but is identifiable by vegetation and ecological characteristics throughout the year. This species is located on highly acidic sandy clay podzol-like substrates (Blacklock soil series) in closed-cone coniferous forest (pygmy forest) at elevations ranging from 290 to 650 feet (CNPS 2014, CDFG 2014a). Associated species include pygmy cypress , Bolander pine, Bishop pine, evergreen huckleberry, Pacific rhododendron, Labrador tea (*R. columbianum*), California wax myrtle, and giant chinquapin.

There is one CNDDB record for Mendocino manzanita in the greater vicinity of the property. The nearest documented occurrence is from March 1956 east of Fort Bragg, within one mile of the property. The most recent documented occurrence is from December 2003 in Jughandle State Park, approximately four miles southwest of the property (WRA 2013). Mendocino manzanita was determined to have a high potential to occur at the site due to the presence of suitable habitat, associated species, and Blacklock soils; however, this species was not observed during the protocol-level surveys performed in March, May, or July 2012.

Swamp harebell (*Campanula californica*). CRPR 1B. High Potential (Not Present). Swamp harebell is a perennial forb in the harebell family (Campanulaceae) that blooms June to October. It typically occurs in wetlands on acidic soils in bog and fen, closed-cone coniferous forest, coastal prairie, meadow, freshwater marsh, and North Coast coniferous forest habitat at elevations ranging from 3 to 1,320 feet (CNPS 2014, WRA 2013). Associated species include pygmy cypress, Bolander pine, Bishop pine, red alder (*Alnus rubra*), coast redwood, Douglas fir (*Pseudotsuga menziesii*), Pacific reedgrass (*Calamagrostis nutkaensis*), lady fern (*Athryium filix-femina*), California blackberry (*Rubus ursinus*), salmonberry (*R. spectabilis*), Labrador tea, Nootka rose (*Rosa nutkana*), evergreen huckleberry, tinker's penny (*Hypericum anagalloides*), sedges (*Carex* spp.), rushes (*Juncus* spp.), and horsetail (*Equisetum* spp.) (WRA 2013).

Swamp harebell is known from 26 USGS 7.5-minute quadrangles in Marin, Mendocino, Santa Cruz, and Sonoma counties (CNPS 2014). There are 27 CNDDB records (WRA 2013) in the greater vicinity of the property. The nearest documented occurrence is from August 1983 along Summers Lane, approximately one mile northwest of the property (WRA 2013). The most recent documented occurrence from Mendocino County is from July 2007 in Little Valley Creek Basin, approximately six miles north of the property (WRA 2013). Swamp harebell was determined to have a high potential to occur at the site due to the presence of associated species, suitable habitat, suitable hydrologic and edaphic conditions, and the relative location of the documented occurrences. However, this species was not observed during the protocol-level rare plant survey conducted in July 2012 (blooms June through October).

California sedge (*Carex californica*). CRPR 2B. High Potential (Present). California sedge is a perennial graminoid in the sedge family (Cyperaceae) that blooms May to August. It typically occurs in drier portions of wetlands in bogs and fens, closed-cone coniferous forest, coastal prairie, meadows, and marshes and swamps at elevations ranging from 290 to 1090 feet (CNPS 2014, WRA 2013). Associated species pygmy cypress, Bolander’s pine, evergreen huckleberry, Pacific rhododendron, Labrador tea, salal, glossy-leaf manzanita (*Arctostaphylos nummularia*), coast lily, bracken fern, and coast sedge (WRA 2013).

There are 21 CNDDB records for California sedge within the greater vicinity of the property. The nearest and most recent documented occurrence is from June 2010 along Summers Lane, approximately one mile northwest of the property (WRA 2013). California sedge was determined to have a high potential to occur on the property due to suitable substrate and hydrologic conditions, associated habitats and species, and the relative location of nearest documented occurrences. California sedge individuals were observed on the property with the densest populations located in transitional cypress forest and pygmy forest. Individuals within the transitional and pygmy forest community were estimated based on vegetation plot data, with a total estimate of 644 individuals. Populations within the tall cypress forest and seasonal wetland communities were discrete, and 250 individuals were counted and mapped (see Figure 3.4-1). Therefore, an estimated total of 894 individuals are estimated to be present on the property.

Green yellow sedge (*Carex viridula* var. *viridula*). CRPR 2. Moderate Potential (Not Present). Green yellow sedge is a perennial graminoid in the sedge family (Cyperaceae) that blooms from June to November. It typically occurs in mesic sites within bog and fen, freshwater marsh and swamp, and North Coast coniferous forest habitat at elevations ranging from 0 to 5,200 feet (CNPS 2014). Observed associated species include Buxbaum’s sedge (*Carex buxbaumii*), flaccid sedge (*C. leptalea*), northern bugleweed (*Lycopus uniflorus*), and marsh pea (*Lathyrus palustris*) (WRA 2013).

Green yellow sedge is known from eight USGS 7.5-minute quadrangles in Del Norte, Humboldt, Mendocino, and Tuolomne counties (CNPS 2014). There is one CNDDB record within the greater vicinity of the property. The nearest and most recent documented occurrence from Mendocino County is undated located in Inglenook Fen, MacKerricher State Park, approximately seven miles north of the property (WRA 2013). Green yellow sedge was determined to have a moderate potential to occur on the property due to the presence of associated habitats; yet few areas at the property contain hydrology sufficient to support this species. Green yellow sedge was not observed during protocol-level rare plant surveys conducted in July 2012 (blooms June through November).

Pygmy cypress (*Hesperocyparis pygmaea*). CRPR 1B. High Potential (Present). Pygmy cypress is an evergreen tree in the cypress family (Cupressaceae) which is identifiable throughout the year. It typically is stand forming on podzol-like soils (e.g. Blacklock soil series) within closed-cone coniferous forest at elevations ranging from 100 to 1,950 feet (CNPS 2014, CDFG 2014a). Observed associated species include Bishop pine, Bolander’s pine (*P. contorta* ssp. *bolanderi*), coast redwood, evergreen huckleberry, Labrador tea, Pacific rhododendron, redwood manzanita (*Arctostaphylos columbianum*), Eastwood manzanita (*A. glandulosa*), glossy-leaf manzanita (*A. nummularia*), salal, coast lily, bracken fern (*Pteridium aqulinum*), and bear grass (CDFG 2014a).

Pygmy cypress is known from 12 USGS 7.5-minute quadrangles in Mendocino and Sonoma counties (WRA 2013). There are 22 CNDDB records within the greater vicinity of the property, and 81 other records from Mendocino County (WRA 2013). The nearest documented occurrence is along Summers Lane, approximately one mile northwest of the property. The most recent documented occurrence is from Mendocino County near Noyo Hill in Jackson Demonstration State Forest, approximately 1.5 miles south of the property. Pygmy cypress was determined to have a high potential to occur at the property due to the presence of suitable soil, associated species, and the relative location of the nearest documented occurrences. Several hundred individuals of pygmy cypress were observed within three morpho-types mapped and classified at the property: cypress forest-tall, cypress forest-intermediate, and cypress forest-pygmy, based on tree height, sub dominant/associated tree species, and understory density and species (see Figure 4.3-1). Within the three morpho type polygons, approximately 2,038 individuals were estimated within the property based on vegetation plot data (WRA 2013).

Coast lily (*Lilium maritimum*). CRPR 1B. High Potential (Present). Coast lily is a rhizomatous perennial forb in the lily family (Fabaceae) that blooms from May to August. It typically occurs in wetlands on sandy substrates in hummocks, roadsides, ditches, and undisturbed areas in closed-cone coniferous forest, North Coast coniferous forest, broadleaf upland forest, coastal prairie, coastal scrub, and freshwater marsh and swamp habitat at elevations ranging from 15 to 1,545 feet (CNPS 2014, CDFG 2014a). Observed associated species include Douglas fir, coast redwood, Bishop pine, Bolander's pine (*P. contorta* ssp. *bolanderi*), tanoak, giant chinquapin, wax myrtle, evergreen huckleberry, evergreen violet (*Viola sempervirens*), bracken fern, and deer fern (*Blechnum spicant*).

Coast lily is known from 19 USGS 7.5-minute quadrangles in Marin, Mendocino, San Francisco, San Mateo, and Sonoma counties. There are 23 CNDDB records within the greater vicinity of the property, and 59 other records from Mendocino County. The nearest documented occurrence is from July 1974 along California Highway 20 immediately adjacent to the property. The most recent documented occurrence from Mendocino County is from June 2007 at the Glass Beach Headlands, approximately four miles northwest of the property (WRA 2013). Coast lily has a high potential to occur in the property due to the presence of the associated habitat, suitable substrate and hydrology, associated species, and the relative locations of documented occurrences. Two sub-populations of coast lily were observed and mapped within the property (see Figure 4.3-1). The first population is located near Highway 20 in the southwest corner of the property within Bishop pine forest; approximately 104 individuals were documented. The second population is composed of five individuals and is located within pygmy cypress forest in the eastern portion of the property. Most individuals were in bud or flower when observed during protocol-level surveys in May and/or July 2012 (blooms: May through August).

Bolander's pine (*Pinus contorta* ssp. *bolanderi*). CRPR 1B. High Potential (Present). Bolander's pine is an evergreen tree in the pine family (Pinaceae) that is identifiable throughout the year based on vegetative structures and cones. It typically occurs on podzol-like soils in closed-cone coniferous forest habitat at elevations ranging from 240 to 815 feet (CNPS 2014, CDFW 2014a). Observed associated species include pygmy cypress, Bishop pine, Labrador tea (*Rhododendron columbianum*), Pacific rhododendron, wax myrtle, evergreen huckleberry, giant chinquapin, California sedge, bracken fern, coast lily, and bear grass (WRA 2013).

Bolander's pine is known from six USGS 7.5-minute quadrangles in Mendocino County (CNPS 2014). There are 23 CNDDB records in the greater vicinity of the property, and 45 other records from Mendocino County. The nearest documented occurrence is along Summers Lane, approximately one mile northwest of the property. The most recent documented occurrence from Mendocino County is from October 2002 in Van Damme State Park, approximately ten miles south of the property (WRA 2013). Bolander's pine was determined to have a high potential to occur at the property due to the presence of associated species, suitable substrate, and the relative location of the nearest documented occurrences. Several hundred individuals of Bolander's pine were observed on the property, with the densest stands located in conjunction with cypress trees. Approximately 790 individuals were estimated on the property based on vegetation plot data (WRA 2013).

Special-Status Wildlife Species

Table 3.4-6 summarizes the special-status wildlife species recorded with presence in the greater vicinity of the property, and evaluates the potential for each of the species to occur on the property. No special-status wildlife species were observed on the property during the site assessment. Nine special-status wildlife species have a moderate to high potential to occur at the property. For the remaining species, the property either lacks potentially suitable habitat or the site may contain potential habitat, but the habitat is disturbed to the extent that the occurrence of special-status species is unlikely. Special-status wildlife species with a moderate to high potential to occur on the property are discussed below.

Table 3.4-6 Potential for Special-Status Wildlife Species to Occur in the Property

Species	Status	Habitat Requirements	Potential to Occur on the Property
Mammals			
Antrozous pallidus pallid bat	SSC	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	**Unlikely**. Suitable roosting sites are not present on the study property, although this species may occasionally forage over the area.
Aplodontia rufa nigra Point Arena mountain beaver	FE, SSC	Live in underground burrow systems with openings under vegetation, often on steep north-facing slopes or in gullies. The burrows are found in moist areas with well-drained soil.	**No potential**. The property is outside of known range of this species.
Arborimus pomo Sonoma tree vole	SSC	Occurs in old-growth and other forests, mainly Douglas-fir, redwood, and montane hardwood-conifer habitats. Feeds only on conifer leaves, almost exclusively on Douglas-fir.	**High Potential**. Suitable habitat is present on the property, and it is within the known range of this species.
Corynorhinus townsendii townsendii Townsend's big-eared bat	SSC, WBWG High	Primarily found in rural settings in a wide variety of habitats including oak woodlands and mixed coniferous-deciduous forest. Day roosts highly associated with caves and mines.	**Unlikely**. Suitable roosting sites are not present, although this species may occasionally forage over the property.
Eumetopias jubatus steller [northern] sea lion	FT	Breeds on Año Nuevo, San Miguel and Farallon islands, Point Saint George, and Sugarloaf. Hauls-out on islands and rocks. Needs haul-out and breeding sites with unrestricted access to water, near aquatic food supply.	**No potential**. The study property does not contain coastal or marine habitat.
Lasionycteris noctivagans silver-haired bat	WBWG Med Priority	This forest inhabitant is known to occur from southeastern Alaska in summer, to northeastern Mexico in winter and in xeric habitats at low elevations during seasonal migrations. They can roost in tree cavities or in bark crevices on tree trunks, especially during migration.	**Moderate potential**. Mature trees and snags that support cavities or exfoliating bark may provide roosting habitat onsite.

Species	Status	Habitat Requirements	Potential to Occur on the Property
Lasiurus cinereus hoary bat	WBWG Med Priority	Widespread occuring in all states except Alaska and south Florida. Most migrate to South America for the winter, although some stay and hibernate. Roost in the foliage of trees, and occasionally in caves, or manmade structures such as bridges and abandoned mines. It prefers woodland, mainly coniferous forests, and hunts over open areas or lakes. Mating occurs during the fall when migrating south. Young are born between May and July. Their diet consists mainly of moths.	**Moderate potential**. Mature trees with canopy or trees that support cavities or exfoliating bark may provide roosting habitat.
Martes pennanti pacifica Pacific fisher	FC, SSC	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Use cavities, snags, logs and rocky areas for cover and denning. Need large areas of mature, dense forest.	**Unlikely**. Although the study property contains suitable habitat elements, it is it not within the known current range of the species.
Myotis lucifugus little brown bat	WBWG Med Priority	Found across the US. Roosts in buildings, trees, and under rocks. Prefer forested land near water.	**Moderate potential**. Mature trees and snags that support cavities or exfoliating bark may provide roosting habitat if present onsite.
Myotis thysanodes fringed myotis	WBWG High Priority	Associated with a wide variety of habitats including mixed coniferous-deciduous forest and redwood/sequoia groves. Buildings, mines and large snags are important day and night roosts.	**Moderate potential**. Mature trees and snags that support cavities or exfoliating bark may provide roosting habitat. This species may occasionally forage over the property.
Myotis Volans long-legged myotis	WBWG High Priority	Generally associated with woodlands and forested habitats. Large hollow trees, rock crevices and buildings are important day roosts. Other roosts include caves, mines and buildings.	**Unlikely**. Suitable roosting sites are not present, although this species may occasionally forage over the property (WRA 2013).
Phoca vitulina richardsi Pacific harbor seal	MMPA	Occurs in marine and estuarine environments the length of California. Breeds on islands; hauls out on mainland sites.	**No potential**. The study property does not contain coastal or marine habitat.
Zalophus californianus California sea lion	MMPA	Occurs in marine and estuarine environments from Vancouver Island, British Columbia to the southern tip of Baja California. Breeds on offshore islands from the Channel Islands southward. Hauls out on mainland sites.	**No potential**. The property does not contain coastal or marine habitat.

Species	Status	Habitat Requirements	Potential to Occur on the Property
Birds			
Accipiter gentilis northern goshawk	SC, SSC	Year-round resident within and on the edges of mixed and coniferous forests. Usually occurs in mature, old-growth forests. Hunts medium-sized birds.	**Unlikely**. The property is located to the west of this species' Mendocino County distribution as per a recent monograph (as referenced by WRA 2013).
Agelaius tricolor tricolored blackbird	SSC	Resident, though wanders during the non-breeding season. Highly colonial when breeding. Usually nests over or near freshwater in dense cattails, tule, or thickets of willow, blackberry, wild rose or other tall herbs.	**No Potential**. The property does not contain any typical nesting habitat, and is located outside of this species' limited breeding distribution in Mendocino County per a recent monograph (per WRA 2013).
Aquila chrysaetos golden eagle	CFP	Found in rolling foothill and mountain areas, sage-juniper flats, and dessert. Cliff-walled canyons provide nesting habitat in most parts of range; also nests in large, often isolated trees.	**Unlikely**. The property contains dense, coniferous forest canopy not suitable for foraging. May rarely occur in the vicinity during dispersal or other movements.
Asio flammeus short-eared owl	SSC	Resident and winter visitor. Found in open, treeless areas (e.g. marshes, grasslands) with elevated sites for foraging perches and dense vegetation for roosting and nesting.	**No Potential**. The property does not contain suitable open habitat, and species is not known to breed in Mendocino County per a recent monograph (WRA 2013).
Asio otus long-eared owl	SSC	Largely resident. Nests in a variety of woodland habitats, including coniferous, oak and riparian. Requires adjacent open land (e.g. grasslands, meadows) for foraging, and the presence of old nests of other birds for nesting.	**Unlikely**. The property is forested, and there is very limited open habitat in the vicinity.
Athene cunicularia burrowing owl	SSC	Occurs in open grasslands and shrublands with sparse vegetation. Roosts and nests in mammal burrows, typically those of ground squirrels. Preys upon insects and small vertebrates.	**No Potential**. The property contains no habitat suitable for this species, and is outside of its range per a recent monograph in Shuford and Gardali (2008).

Species	Status	Habitat Requirements	Potential to Occur on the Property
Brachyramphus marmoratus marbled murrelet	FT, SE	Occurs in coastal marine habitats for much of the year. Breeds in old-growth conifer stands (e.g. redwood, Douglas fir) containing platform-like branches, along the coast.	**Unlikely**. The property lacks stands of old-growth redwood and Douglas fir that provide breeding habitat. There are not CNDDB breeding occurrences reported within ten miles of the property (WRA 2013). Species may fly over the area if inland breeding sites exist.
Buteo regalis ferruginous hawk	BCC	Winter visitor. Found in open habitats including grasslands, sagebrush flats, desert scrub and low foothills surrounding valleys.	**No Potential**. The property does not contain habitat typical of this species.
Chaetura vauxi Vaux's swift	SSC	Summer resident, primarily in forested areas. Nests in tree cavities, favoring those with a large vertical extent. Also uses chimneys and similar manmade substrates.	**Moderate Potential**. This species breeds throughout Mendocino County according to a recent monograph (WRA 2013).
Charadrius alexandrinus nivosus western snowy plover	FT, SSC	Resident and winter visitor. Found on sandy beaches, salt pond levees and shores of large alkali lakes. Need sandy gravelly or friable soils for nesting.	**No Potential**. The property does not contain beach, levee, or lake shore habitat necessary to support this species.
Circus cyaneus northern harrier	SSC	Resident and winter visitor. Found in open habitats including grasslands, prairies, marshes and agricultural areas. Nests in dense vegetation on the ground, typically near water.	**Unlikely**. Although this species breeds in coastal Mendocino County (WRA 2013), the property is forested and does not contain suitable open habitat.
Contopus cooperi olive-sided flycatcher	SSC	Summer resident. Breeds in montane coniferous forests, as well as mixed forests along the coast. Often associated with edge habitats.	**Moderate Potential**. The property contains coniferous forest, with some edge areas.
Dendroica petechial yellow warbler	SSC	Summer resident. Nests in riparian stands of willows, cottonwoods, aspens, sycamores, and alders. Also nests in montane shrubbery in open coniferous forests. Occurs widely during migration.	**Unlikely**. The property does not contain any riparian habitat and provides no breeding habitat for this species. May occur occasionally during migration.
Diomedea albatrus short-tailed albatross	FE, SSC	Pelagic; comes to land only when nesting. Nests on remote Pacific islands. Rare in the eastern Pacific.	**No potential**. This species is entirely marine within the coastal California region.

Species	Status	Habitat Requirements	Potential to Occur on the Property
Elanus leucurus white-tailed kite	CFP	Resident in coastal and valley lowlands with scattered trees and large shrubs, including grasslands, marshes and agricultural areas. Preys on small diurnal mammals and other vertebrates.	**No Potential**. The property does not contain open grassland, prairie, or marsh habitat necessary to support this species.
Falco peregrinus anatum American peregrine falcon	FD, SE, CFP	Resident and winter visitor. Typically found near water, including rivers, lakes, wetlands and the ocean. Requires protected cliffs, ledges or anthropogenic structures for nesting. Forages widely, feeding on a variety of avian prey, mostly waterbirds.	**Unlikely**. The property does not contain cliffs or anthropogenic structures typically used for nesting. May occasionally forage over the site.
Fratercula cirrhata tufted puffin	SSC	Pelagic and coastal marine. Nests along islands, islets, or (rarely) isolated mainland cliffs. Requires sod or earth to burrow. Forages at sea, primarily for fish.	**No potential**. The property does not contain coastal marine habitat.
Gavia immer common loon	SSC	Winter visitor, in coastal estuarine and subtidal marine habitats. Also occurs on large inland water bodies.	**No potential**. The property does not contain suitable aquatic habitat for this species.
Haliaeetus leucocephalus bald eagle	FD, SE, CFP, BCC	Primary a winter visitor, with limited breeding in the region. Requires large bodies of water, or free-flowing rivers with abundant fish adjacent snags or other perches. Nests in large, old-growth, or dominant live tree with open branchwork.	**Unlikely**. The property does not contain large bodies of water and thus provides no typical habitat or foraging resources for this species. May occasionally fly over the area.
Histrionicus histrionicus harlequin duck	SSC	Winter visitor to marine waters along the coast; breeds inland along streams in the northern Sierra Nevada.	**No Potential**. The property does not contain coastal marine habitat.
Lanius ludovicianus loggerhead shrike	SSC	Resident in open habitats with scattered shrubs, trees, posts, etc. from which to forage for large insects and small vertebrates. Nests are well-concealed above ground in densely-foliaged shrub or tree.	**No Potential**. The property does not contain open areas, and is outside of its limited Mendocino County breeding range per a recent monograph in Shuford and Gardali (2008).
Melanerpes lewis Lewis's woodpecker	BCC	Winter visitor, occurring in oak savannahs and various open woodland habitats. Often associated with recently-burned areas.	**Unlikely**. The property does not contain open woodland or oak woodland habitat necessary to support this species.

Species	Status	Habitat Requirements	Potential to Occur on the Property
Numenius americanus long-billed curlew	BCC	Winter visitor. Winters in large coastal estuaries, upland herbaceous areas, and croplands. Breeds in northeastern California in wet meadow habitat.	**No Potential**. The property does not contain suitable wetland, mudflat or grassland habitat for this species.
Oceanodroma homochroa ashy storm petrel	SSC	Pelagic and coastal marine. Breeds on the Farallon Islands off of the San Francisco/Marin Coast.	**No Potential**. The property does not contain pelagic or coastal marine habitat.
Pelecanus occidentalis californicus California brown pelican	CFP	Winter/non-breeding visitor to estuarine, marine subtidal, and marine pelagic waters along the coast. Nests on offshore islands of southern California.	**No Potential**. The property does not contain coastal marine habitat.
Phoebastris albatrus Short-tailed albatross	FE	Pelagic and coastal marine.	**No Potential**. The property does not contain pelagic or coastal marine habitat.
Progne subis purple martin	SSC	Summer resident. In NW California, typically breeds in coniferous forest and woodlands. Nests in tree cavities, usually high off the ground, and in the cavities of human-made structures (e.g. bridges, utility poles).	**Moderate Potential**. The property contains coniferous forest with potential tree cavities for nesting, and there is a documented breeding occurrence within four miles (WRA 2013).
Riparia riparia bank swallow	ST	Summer resident in lowland habitats in western California. Nests in areas with vertical cliffs and bands with fine-textured or sandy soils in which to burrow, typically riparian areas or coastal cliffs.	**No Potential**. The property does not contain suitable nesting habitat and is outside of this species' known breeding range in the state.
Selasphorus rufus rufous hummingbird	BCC	Summer resident in northwestern California. Breeds in a wide variety of habitats that provide nectar-producing flowers. Occurs throughout the state during migration.	**Unlikely**. The property is south of this species' limited California breeding range. May occur occasionally during migration.
Selasphorus sasin Allen's hummingbird	BCC	Summer resident along the California coast. Breeds in a wide variety of forest and woodland habitats that provide nectar-producing flowers, including parks and gardens. Migration generally limited to the coastal zone.	**Moderate Potential**. The property includes nectar plants and provides suitable breeding habitat for this species.

Species	Status	Habitat Requirements	Potential to Occur on the Property
Strix occidentalis caurina northern spotted owl	FT, SSC	Resident. Typically occurs in large patches of old-growth coniferous forest. Prefers dense, structurally complex canopies with large trees for foraging and roosting. Nests on horizontal substrates in dense canopy, e.g. large cavities and broken tree tops.	**Unlikely**. Coniferous forest within the property lacks structurally-complex, old-growth characters typically favored by this species. Per CDFG's Spotted Owl Viewer, the nearest documented breeding occurrences are located approximately 1.2 miles east of the property. May occasionally forage in the area, but breeding is unlikely.
Synthliborampus hypoleucus Xantus's murrelet	ST	Pelagic and coastal marine. Breads on offshore islands of southern California. Strays to northern California at sea during the non-breeding season.	**No Potential**. The property does not contain coastal marine habitat.
Reptiles and Amphibians			
Ascaphus truei Pacific tailed frog	SSC	Occurs from Mendocino County and north, in cold permanent streams, usually in forested areas of high precipitation. Primarily aquatic.	**No potential**. Although there are several documented occurrences within five miles (WRA 2013), the property does not contain stream habitat for this species.
Emys (Actinemys) marmorata Western pond turtle	SSC	Occurs in perennial ponds, lakes, rivers and streams with suitable basking habitat (mud banks, mats of floating vegetation, partially submerged logs) and submerged shelter.	**No potential**. The property does not contain aquatic habitat necessary to support this species.
Rana aurora northern red-legged frog	SSC	Associated with quiet perennial to intermittent ponds, stream pools and wetlands. Prefers shorelines with extensive emergent and/or riparian vegetation. Documented to disperse through upland habitats after rains. R. aurora found north of Big River (includes project site). South of Big River to Elk Creek is integrade zone (Shaffer 2004).	**Unlikely**. The property does not contain suitable aquatic breeding habitat for this species.
Rana boylii foothill yellow-legged frog	SSC	Found in or near rocky streams in a variety of habitats. Feed on both aquatic and terrestrial invertebrates.	**No potential**. The property does not contain stream habitat necessary to support this species.

Species	Status	Habitat Requirements	Potential to Occur on the Property
Rhyacotriton variegatus southern torrent salamander	SSC	Cold, permanent seeps and small streams with rocky substrate.	**No potential**. Although there is a documented occurrence in Hare Creek to the southwest (WRA 2013), the property does not contain stream or suitable seep habitat.
Fishes			
Eucyclogobius newberryi tidewater goby	FE, SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	**No Potential**. The property does not contain any aquatic habitat necessary to support this species.
Oncorhynchus kisutch Northern California steelhead	FE	Anadromous, spending time in the ocean, and spawning in coastal rivers and creeks.	**No Potential**. The property does not contain any aquatic habitat necessary to support this species.
Oncorhynchus tshawytscha chinook salmon - CA Coast ESU	FT, RP, NMFS	Anadromous, spending most of its life cycle in the ocean, but spawning in coastal rivers and creeks. The CA Coast ESU includes naturally spawned populations from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive).	**No Potential**. The property does not contain any aquatic habitat necessary to support this species.
Oncorhynchus mykiss steelhead - Northern CA ESU	FT, NMFS, SSC	Anadromous, spending most of its life cycle in the ocean, but spawning in coastal rivers and creeks. The federal designation refers populations occurring below impassable barriers in coastal basins from Redwood Creek to, and including, the Gualala River. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for one or more years before migrating downstream to the ocean.	**No Potential**. The property does not contain any aquatic habitat necessary to support this species.

Species	Status	Habitat Requirements	Potential to Occur on the Property
Invertebrates			
Danaus plexippus monarch butterfly	None	Winter roost sites in wind-protected tree groves (eucalyptus, Monterey pine or Monterey cypress), with nectar and water sources nearby. Individuals occur widely. No formal listing, winter roosts monitored by CDFW)	**Unlikely**. The property is forested, containing no typical tree grove habitat. Individual monarchs may occasionally pass through the property.
Lycaiedes argyrognomon lotis lotis blue butterfly	FE	Known from sphagnum-willow bogs in association with Bishop pine, pygmy forests and similar habitats. Harlequin lotus (*Hosackia gracilis*) is the suspected host plant.	**Unlikely**. The site contains pygmy cypress and Bishop pine forest, yet sphagnum-willow bog habitat or harlequin lotus are not present. Individual species may occasionally pass through the property.
Speyeria zerene behrensii Behren's silverspot butterfly	FE	Inhabits coastal terrace prairie habitat. Host plant is dog violet (*Viola adunca*).	**No Potential.** The site does not contain coastal terrace prairie habitat for dog violets.

1) Key to status codes:

FE	Federal Endangered
FT	Federal Threatened
FC	Federal Candidate
FD	Federal De-listed
BCC	USFWS Birds of Conservation Concern
SE	State Endangered
SD	State Delisted
ST	State Threatened
SR	State Rare
SSC	CDFG Species of Special Concern
CFP	CDFG Fully Protected Animal
WBWG	Western Bat Working Group High or Medium Priority species

Potential to Occur:

No Potential	Habitat on and adjacent to the site is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
Unlikely.	Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
Moderate Potential.	Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
High Potential.	All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Source: Table compiled from the California Department of Fish and Wildlife (CDFW) Natural Diversity Database (CNDDB), U.S. Fish and Wildlife Service (USFWS) Species Lists, electronic database searches of the Fort Bragg, Inglenook, Dutchmans Knoll, Noyo Hill, Mathison Peak, and Mendocino USGS 7.5 Minute Quadrangles (CDFW 2014a; USFWS 2014).

Sonoma tree vole (*Arborimus pomo*), CDFW Species of Special Concern. High Potential. The Sonoma tree vole is distributed along the northern California coast from Sonoma County to the Oregon border. It occurs in old-growth and other forest types of Douglas fir and other conifers, including stands of Bishop pine. This species breeds year-round, but most often from February through September. Nests are constructed preferentially in tall trees, and may be situated on a whorl of limbs against the trunk, or at the outer limits of branches. Males nest most frequently in a tree nest constructed of needles, or less frequently in shallow burrows at the base of the tree, beneath litter. Females tend to spend most of their lives in trees, constructing large, domed nursery nests of needles at six to 150 feet above the ground. In young second-growth Douglas fir, nests can be placed on broken tops of trees, although old-growth Douglas fir stands likely provide the optimal structural components for nest building. The Sonoma tree vole is a coniferous needle specialist; needles and twigs are gathered primarily during the night, and may be consumed where found or brought to the nest. Needle resin ducts are removed. The remaining part is eaten, and the resin ducts may be used to line the nest cup. This unique nest lining is an identifying characteristic of this species.

This species was not observed during the reconnaissance-level site visit, nor were sign of its presence observed. However, there are several documented occurrences within five miles of the property (WRA 2013), and the property contains mature Bishop pine and other conifers. For these reasons, Sonoma tree vole has a moderate to high potential to be present.

Silver-haired bat (*Lasionycteris noctivagans*) Western Bat Working Group “Medium Priority” Species. Moderate Potential. This north temperate zone conifer and mixed conifer/hardwood forests inhabitant is known to occur from southeastern Alaska in summer, to northeastern Mexico in winter and in xeric habitats at low elevations during seasonal migrations. Maternity roosts appear to be almost exclusively in trees which include inside natural hollows and bird excavated cavities or under loose bark of large diameter snags. Both males and females change roosts frequently, and use multiple roosts within a limited area throughout the summer, indicating that clusters of large trees are necessary.

While the property does not contain optimal roosting habitat for this species, and foraging areas over water are not present, cavities and exfoliating bark within mature conifers may provide suitable roosting locations during certain portions of the year, therefore this species has moderate potential to be present on the property.

Hoary bat (*Lasiurus cinereus*) Western Bat Working Group “Medium Priority” Species. Moderate Potential. This species is widespread from near the limit of trees in Canada, southward at least to Guatemala, and from Brazil to Argentina and Chile in South America. Hoary bats are uncommon in the eastern U.S. and in the northern Rocky Mountains, but are more common in the prairie states and Pacific Northwest. They are associated with forested habitats in the west. Most migrate to South America for the winter, although some stay and hibernate. These bats roost in the foliage of trees, and occasionally in caves, or manmade structures such as bridges and abandoned mines. It prefers woodland, mainly coniferous forests, but hunts over open areas or lakes. Mating occurs during the fall when migrating south. Young are born between May and July. Their diet consists mainly of moths.

While the property does not contain optimal roosting habitat for this species, and foraging areas over water are not present, canopy within mature conifers may provide suitable roosting locations during certain portions of the year, therefore this species has moderate potential to be present on the property.

Fringed myotis (*Myotis thysanodes*), Western Bat Working Group "High Priority" Species. Moderate Potential. This bat ranges through much of western North America and is found in various habitats, including desert scrubland, grassland, sage-grass steppe, old-growth forest, and subalpine coniferous and mixed deciduous forest. Oak and pinyon-juniper woodlands are most commonly used. Fringed Myotis roosts in colonies from ten to 2,000 individuals, although large colonies are rare. Caves, buildings, underground mines, rock crevices in cliff faces, and bridges are used for maternity and night roosts, while hibernation has only been documented in buildings and underground mines. Tree-roosting has also been documented in Oregon, New Mexico, and California (WBWG 2012).

While the property does not contain optimal roosting habitat for this species, cavities and exfoliating bark within mature conifers may provide suitable roosting locations during certain portions of the year, therefore this species has moderate potential to be present on the property.

Little brown bat (*Myotis lucifugus*) Western Bat Working Group "Medium Priority" Species. Moderate Potential. Found in mesic, typically forested, areas of temperate across North America. This species is an ecological generalist exploiting a wide variety of natural and man-made roost sites and a wide spectrum of flying insect prey, including emerging adults of aquatic species. Summer maternity colony sites (consisting largely of reproductive females and dependent young) include tree cavities, caves and human-occupied structures.

While the property does not contain optimal roosting habitat for this species, and foraging areas over water are not present, cavities and exfoliating bark within mature conifers may provide suitable roosting locations during certain portions of the year, therefore this species has moderate potential to be present on the property.

Vaux's swift (*Chaetura vauxi*), CDFW Species of Special Concern. Moderate Potential. Vaux's swift is a summer resident in California, breeding on the coast from central California northward and in the Cascades and Sierra Nevada. Nesting occurs in large, accessible, chimney-like tree cavities that allow birds to fly within the cavity directly to secluded nest sites. Such cavities usually occur in conifers, particularly redwoods (as reported by WRA 2013). Chimneys and similar manmade substrates are also used for nesting. This species is highly aerial and forages widely for insects in areas of open airspace. During migration, nocturnal roosting occurs communally; favored roosts may host thousands of individuals. The property contains conifers with some large, vertical-oriented cavities, and thus provides suitable breeding habitat and this species has moderate potential to be present on the property.

Olive-sided flycatcher (*Contopus cooperi*), CDFW Species of Special Concern. Moderate Potential. The olive-sided flycatcher is a summer resident in California, wintering in Central and South America. It breeds in a variety of forested habitats, typically coniferous forests at higher elevations, but also in mixed forest and woodlands at lower elevations. Breeding habitat is often associated with forest openings and edges, both natural (e.g., meadows, canyons) and man-made (e.g., logged areas) (as reported by WRA 2013). Nests are usually in conifers, and placed at variable height on the outer portions of branches. This species forages for insects, usually from prominent tree snags. The coniferous forest of the property provides suitable breeding habitat, particularly in its western portion along edge areas and this species has moderate potential to be present on the property.

Purple martin (*Progne subis*), CDFW Species of Special Concern. Moderate Potential. This large swallow is an uncommon summer resident in California, breeding in forest and woodlands at low- to mid- elevations throughout much of the state. Nesting occurs primarily in tree cavities; trees selected are usually taller or isolated, with low canopy cover at the nest height, and situated on the upper portions of slopes and/or near bodies of water where large insects (favored prey) are abundant (as reported by WRA 2013). Conifers are the most frequently used tree type in northern California. Manmade structures with suitable cavities such as bridges or utility poles are also used. Coniferous forest within the property includes taller trees with potential cavities, and recent nesting has been documented within four miles of the property (WRA 2013). This species has moderate potential to be present on the property.

Allen's hummingbird (*Selasphorus sasin*), USFWS Bird of Conservation Concern. Moderate Potential. Allen's hummingbird, common in many portions of its range, is a summer resident along the majority of California's coast and a year-round resident in portions of coastal southern California. Breeding occurs in association with the coastal fog belt, and typical habitats used include coastal scrub, riparian, woodland and forest edges, and eucalyptus and cypress groves (WRA 2013). Feeds on flower nectar, and forages for insects and spiders. The property provides some forest edge habitat as well as nectar plants; this species has a moderate potential to be present, including breeding.

3.4.2 Regulatory Framework

Many sensitive biological resources in California are protected and/or regulated by federal, state, and local laws and policies. Those most applicable to the proposed project are summarized below.

Federal

Federal Endangered Species Act

The federal Endangered Species Act of 1973 (ESA) recognizes that many species of fish, wildlife, and plants are in danger of or threatened with extinction and established a national policy that all federal agencies should work toward conservation of these species. The Secretary of the Interior and the Secretary of Commerce are designated in the act as responsible for identifying endangered and threatened species and their critical habitats, carrying out programs for the conservation of these species, and rendering opinions regarding the impact of proposed federal actions on endangered species. The act also outlines what constitutes unlawful taking, importation, sale, and possession of endangered species and specifies civil and criminal penalties for unlawful activities.

Biological assessments are required under Section 7(c) of the act if listed species or critical habitat may be present in the area affected by any major construction activity conducted by, or subject to issuance of a permit from, a federal agency as defined in Part 404.02. Under Section 7(a)(3) of the act every federal agency is required to consult with the USFWS or NOAA Fisheries on a proposed action if the agency determines that its proposed action may affect an endangered or threatened species.

Section 9 of the ESA prohibits the "take" of any fish or wildlife species listed under the ESA as endangered or threatened. Take, as defined by the ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such action." However, Section 10 allows for the "incidental take" of endangered and threatened species of wildlife by non-federal entities. Incidental take is defined by the ESA as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Section 10(a)(2)(A) requires an applicant for an incidental take permit to submit a "conservation plan" that specifies, among other things, the impacts that are likely to result from the taking and the measures the permit applicant will undertake to minimize and mitigate such impacts. Section 10(a)(2)(B) provides statutory criteria that must be satisfied before an incidental take permit can be issued.

Clean Water Act, Section 404

Proposed discharges of dredged or fill material into waters of the U.S. require USACE authorization under Section 404 of the Clean Water Act (CWA) [33 U.S.C. 1344]. Waters of the U.S. generally include tidal waters, lakes, ponds, rivers, streams (including intermittent streams), and wetlands (with the exception of isolated wetlands). Wetlands subject to the CWA Section 404 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” (33 CFR 328.3 [b]; 40 CFR 230.3 [t]). The USACE identifies wetlands using a "multi-parameter approach," which requires positive wetland indicators in three distinct environmental categories: hydrology, soils, and vegetation. According to the USACE Wetlands Delineation Manual, except in certain situations, all three parameters must be satisfied for an area to be considered a jurisdictional wetland. The Regional Supplement to the Corps of Engineers Wetland Delineation Manual (USACE 2010) is also utilized when conducting jurisdictional wetland determinations in areas identified within the boundaries of the arid west.

The CWA also defines the ordinary high water mark as the Section 404 jurisdictional limit in non-tidal waters. When adjacent wetlands are present, the limit of jurisdiction extends to the limit of the wetland. Field indicators of ordinary high water include clear and natural lines on opposite sides of the banks, scouring, sedimentary deposits, drift lines, exposed roots, shelving, destruction of terrestrial vegetation, and the presence of litter or debris. Typically, the width of waters corresponds to the two-year flood event.

Clean Water Act, Section 401

Section 401 of the CWA requires applicants acquiring a federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the United States, to also obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards. The appropriate RWQCB regulates Section 401 requirements (see under State below).

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 (50 CFR 10.13) established federal responsibilities for the protection of nearly all species of birds, their eggs and nests. A migratory bird is defined as any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle. “Take” is defined in the MBTA “to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof.” Only non-native species such as feral pigeon (*Columba livia*), house sparrow (*Passer domesticus*), and European starling (*Sturnus vulgaris*) are exempt from protection.

State

California Environmental Quality Act

Rare or endangered plant or wildlife species are defined in the CEQA Guidelines Section 15380; endangered means that survival and reproduction in the wild are in immediate jeopardy. Rare means that a species is either presently threatened with extinction or that it is likely to become endangered within the foreseeable future. A species of animal or plant shall be presumed to be rare or endangered if it is listed in Sections 670.2 or 670.5, Title 14, California Administrative Code; or Title 50, Code of Federal Regulations Sections 17.11 or 17.12 pursuant to the federal Endangered Species Act as threatened or endangered.

California Endangered Species Act

The California Endangered Species Act (CESA) includes provisions for the protection and management of species listed by the State of California as endangered or threatened or designated as candidates for such listing (Fish and Wildlife Code Sections 2050 through 2085). The act requires consultation “to ensure that any action authorized by a State lead agency is not likely to jeopardize the continued existence of any endangered or threatened species or results in the destruction or adverse modification of habitat essential to the continued existence of the species” (Section 2053). California plants and animals declared to be endangered or threatened are listed at 14 CCR 670.2 and 14 CCR 670.5, respectively. The State prohibits the take of protected amphibians (14 CCR 41), protected reptiles (14 CCR 42), and protected furbearers (14 CCR 460). The CDFW may also authorize public agencies through permits or a memorandum of understanding to import, export, take, or possess any endangered species, threatened species, or candidate species for scientific, educational, or management purposes (Section 2081[a]). The CDFW may also authorize, by permit, the take of endangered species, threatened species, and candidate species provided specific conditions are met (Section 2081[b]).

California Fish and Game Code

The recently renamed California Department of Fish and Wildlife (CDFW) enforces the California Fish and Game Code (CFGC), which provides protection for “fully protected birds” (Section 3511), “fully protected mammals” (Section 4700), “fully protected reptiles and amphibians” (Section 5050), and “fully protected fish” (Section 5515). With the exception of permitted scientific research, no take of any fully protected species is allowed.

Section 3503 of the CFGC prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Subsection 3503.5 specifically prohibits the take, possession, or destruction of any birds in the orders Falconiformes (hawks and eagles) or Strigiformes (owls) and their nests. These provisions, along with the federal MBTA, essentially serve to protect nesting native birds. Non-native species, including European starling and house sparrow, are not afforded protection under the MBTA or CFGC.

Streams, lakes, and riparian vegetation as habitat for fish and other wildlife species, are subject to jurisdiction by the CDFW under Sections 1600-1616 of the CFGC. Activity that will do one or more of the following, generally require a Section 1602 Lake and Streambed Alteration Agreement: 1) substantially obstruct or divert the natural flow of a river, stream, or lake; 2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or 3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake. The term “stream,” which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as follows: “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72). In addition, the term stream can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. Riparian is defined as, “on, or pertaining to, the banks of a stream;” therefore, riparian vegetation is defined as, “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself.” Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from the CDFW.

Clean Water Act and the State of California's Porter-Cologne Water Quality Control Act

The State Water Resources Control Board (SWRCB) regulates construction storm water discharges through SWRCB Order No. 2003-0017-DWQ, "General Waste Discharge Requirements for Dredge and Fill Discharges that Have Received State Water Quality Certification." The State's authority to regulate activities in wetlands and waters resides primarily with the SWRCB, which in turn has authorized the State's nine RWQCBs, discussed below, to regulate such activities. Under Section 401 of the federal CWA, every applicant for a federal permit for any activity that may result in a discharge to a water body must obtain State Water Quality Certification that the proposed activity will comply with state water quality standards.

In the project area, the North Coast RWQCB (NCRWQCB) regulates construction in waters of the U.S. and waters of the State, including activities in wetlands, under both the CWA and the State of California's Porter-Cologne Water Quality Control Act (California Water Code, Division 7). Under the CWA, the RWQCB has regulatory authority over actions in waters of the U.S., through the issuance of water quality certifications, as required by Section 401 of the CWA, which are issued in conjunction with permits issued by the USACE under Section 404 of the CWA. The RWQCB must certify that a USACE permit action meets State water quality objectives (§401 CWA, and Title 23 CCR 3830, et seq.) before a USACE permit is issued. Activities in areas that are outside of the jurisdiction of the USACE (e.g., isolated wetlands, vernal pool, or stream banks above the ordinary high water mark) are regulated by the nine RWQCBs, under the authority of the Porter-Cologne Act, and may require the issuance of either individual or general waste discharge requirements.

The California Wetlands Conservation Policy (Executive Order W-59-93) establishes a primary objective to "ensure no overall net loss … of wetlands acreage and values in California." The RWQCBs implement this policy and the Basin Plan Wetland Fill Policy, both of which require mitigation for wetland impacts.

State Species of Special Concern

The CDFW maintains list of species and habitats of special concern. These are broadly defined as species that are of concern to the CDFW because of population declines and restricted distributions, and/or they are associated with habitats that are declining in California; the criteria used to define special-status species are described by the CDFW. Impacts to special-status plants, animals, and habitats may be considered significant under CEQA.

State Species of Special Concern include those plants and wildlife species that have not been formally listed, yet are proposed or may qualify as endangered or threatened, or are candidates for such listing under the California Endangered Species Act (CESA). This affords protection to both listed species and species proposed for listing. In addition, CDFW Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, United States Fish and Wildlife Service (USFWS) Birds of Conservation Concern, and CDFW special-status invertebrates are considered special-status species by CDFW. Plant species included within the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (Inventory) with California Rare Plant Rank (CRPR) of 1 and 2 are also considered special-status plant species. Few Rank 3 or Rank 4 plants meet the definitions of Section 1901 Chapter 10 of the Native Plant Protection Act (see below) or Sections 2062 and 2067 of the CDFG Code that outlines the California Endangered Species Act. There are occasions where CRPR List 3 or 4 species might be considered of special-concern particularly for the type locality of a plant, for populations at the periphery of a species range, or in areas where the taxon is especially uncommon or has sustained heavy losses, or from populations exhibiting unusual morphology.

Also under the jurisdiction of CDFW and considered sensitive are vegetation alliances with a State ("S") ranking of S1 through S3 in the *List of Vegetation Alliances* (CDFG 2009a). CDFG ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB).

Native Plant Protection Act

The CDFW administers the California Native Plant Protection Act (CNPPA) (Sections 1900–1913 of the CFGC). These sections allow the California Fish and Game Commission to designate rare and endangered plant species and to notify landowners of the presence of such species. Section 1907 of the CFGC allows the Commission to regulate the "taking, possession, propagation, transportation, exportation, importation, or sale of any endangered or rare native plants." Section 1908 further directs that "[n]o person shall import into this state, or take, possess, or sell within this state, except as incident to the possession or sale of the real property on which the plant is growing, any native plant, or any part or product thereof, that the Commission determines to be an endangered native plant or rare native plant."

California Species Preservation Act

The California Species Preservation Act (CFGC Sections 900–903) includes provisions for the protection and enhancement of the birds, mammals, fish, amphibians, and reptiles of California. The administering agency is the CDFW.

Regional and Local

Mendocino County General Plan Goals and Policies

Following are the Mendocino County General Plan goals and policies most applicable to biological resources for the proposed project.

Goal RM-7 (Biological Resources): Protection, enhancement and management of the biological resources of Mendocino County and the resources upon which they depend in a sustainable manner.

Policy RM-24: Protect the County's natural landscapes by restricting conversion and fragmentation of timberlands, oak woodlands, stream corridors, farmlands, and other natural environments.

Policy RM-25: Prevent fragmentation and loss of our oak woodlands, forests, and wildlands and preserve the economic and ecological values and benefits.

Policy RM-28: All discretionary public and private projects that identify special-status species in a biological resources evaluation (where natural conditions of the site suggest the potential presence of special-status species) shall avoid impacts to special-status species and their habitat to the maximum extent feasible. Where impacts cannot be avoided, projects shall include the implementation of site-specific or project-specific effective mitigation strategies developed by a qualified professional in consultation with state or federal resource agencies with jurisdiction (if applicable) including, but not limited to, the following strategies:

- Preservation of habitat and connectivity of adequate size, quality, and configuration to support the special-status species. Connectivity shall be determined based on the specifics of the species' needs.
- Provision of supplemental planting and maintenance of grasses, shrubs, and trees of similar quality and quantity to provide adequate vegetation cover to

enhance water quality, minimize sedimentation and soil transport, and provide adequate shelter and food for wildlife.

- Provide protection for habitat and the known locations of special-status species through adequate buffering or other means.
- Provide replacement habitat of like quantity and quality on- or off-site for special-status species.
- Enhance existing special-status species habitat values through restoration and replanting of native plant species.
- Provision of temporary or permanent buffers of adequate size (based on the specifics of the special-status species) to avoid nest abandonment by nesting migratory birds and raptors associated with construction and site development activities.
- Incorporation of the provisions or demonstration of compliance with applicable recovery plans for federally listed species.

Policy RM-29: All public and private discretionary projects shall avoid impacts to wetlands if feasible. If avoidance is not feasible, projects shall achieve no net loss of wetlands, consistent with state and federal regulations.

Policy RM-31: For the purposes of implementing this General Plan, the County defines “special status species” and “sensitive biotic communities” to include all species and habitat identified as such by the California Department of Fish and Game, U.S. Fish and Wildlife Service, or NOAA Fisheries.

Policy RM-72: New development shall protect sensitive environments and resource corridors while maintaining compatibility with adjacent uses.

Policy RM-73: The design of new development should emphasize the avoidance of sensitive resources and environments rather than their removal and replacement.

Policy RM-74: Discretionary development shall be designed or conditioned to achieve no net loss of sensitive resources.

Policy RM-75: Protection of existing sensitive resources is the highest priority. Onsite replacement or offsite replacement, protection or enhancement is less desirable.

Policy RM-76: Limit land use density and intensity within and adjacent to critical wildlife habitats, such as wetlands, deer wintering range, old growth forests and riparian corridors.

Policy RM-79: Encourage farmers, land owners and property managers to protect sensitive environments, and minimize the effects of recreation, tourism, agriculture and development on these resources. Promote techniques and features such as:

- Habitat contiguity,
- Wildlife corridors,
- Maintaining compatibility with adjacent uses,
- Maintaining habitat for sensitive plant and animal species.

Policy RM-80: Vegetation removal should be reviewed when involving five (5) or more acres, assessing the following impacts:

- Grading and landform modifications including effects on site stability, soil erosion and hydrology.
- Effects on the natural vegetative cover and ecology in the project area.
- Degradation to sensitive resources, habitat and fisheries resources.
- Compatibility with surrounding uses.
- Visual impacts from public vantage points.
- Cumulative and growth-inducing impacts.

For the purposes of implementing this policy, "vegetation removal" does not include state-regulated timber harvest

Policy RM-81: Vegetation management and landscaping for public and private development should emphasize protection and continuity of natural habitats and hydrology.

Policy RM-84: Protect "pygmy" ecosystems ("pygmy" and "transitional pygmy" vegetation and soils) through the use of measures that include minimizing:

- Vegetation removal,
- Disruption of vegetation continuity, and
- The introduction of water and nutrients due to human activity, sewage disposal systems, animals or agricultural uses.

Also:

- Limit subdivision of land on agricultural lands adjacent to "pygmy" ecosystems, and
- Promote best management practices to minimize impacts.

3.4.3 Evaluation Criteria and Significance Thresholds

The project would cause a significant impact related to biological resources, as defined by the CEQA Guidelines (Appendix G), if it would:

- 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 Wildlife or U.S. Fish and Wildlife Service;

  <u>Significance Threshold</u>

  Loss or harm of individuals or loss of habitat for listed or candidate species or species of special concern

  Loss of individuals or eggs protected under the MBTA

- 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 Wildlife or U.S. Fish and Wildlife Service;

  <u>Significance Threshold</u>

  Imperiled Sensitive Habitats (State Rank S1 and S2 per CDFW criteria)

  – Removal of more than zero (0) acres of sensitive habitat at project site

Bishop Pine Habitat--High Quality (State Rank S3 per CDFW criteria)

- Loss of more than 1 acre at project site, and
- Loss of more than 1% of regional habitat

Bishop Pine Habitat--Low Quality (Uncertain State Rank per CDFW criteria)

- Loss of more than 5 acre at project site, and
- Loss of more than 10% of regional habitat

- 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;

  <u>Significance Threshold</u>

  More than zero (0) acres of fill in wetlands, waters of the U.S., or waters of the State

- 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;

  <u>Significance Threshold</u>

  Creation of a barrier to movement resulting in loss or harm to native resident or migratory fish or wildlife species

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;

  <u>Significance Threshold</u>

  Removal or damage that leads to mortality of any tree species protected by a Preservation Policy or Tree Ordinance

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

  <u>Significance Threshold</u>

  Conflict with an approved habitat conservation plan

Areas of No Project Impact

As explained below, the project would not result in impacts related to one of the significance criteria identified in Appendix G of the current California Environmental Quality Act (CEQA) Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. The project will 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 as there are no such special plans that would govern the project.

3.4.4 Methodology

The assessment of potential impacts to biological resources is based on the relationship between species and habitat distribution and the locations and activities proposed for construction and operation of the project. Potential impacts on special-status plants and wildlife has been based on known occurrences or on the likelihood that suitable habitat for special-status species would be affected.

A biological resources assessment was prepared for the project (WRA 2013). Information on special-status plant and animal species was compiled through a review of the literature and database search. Database searches for known occurrences of special-status species focused on the Fort Bragg, Inglenook, Dutchmans Knoll, Noyo Hill, Mathison Peak, and Mendocino U.S. Geologic Service 7.5-minute topographic quadrangle. The following sources were reviewed to determine which special-status plant and wildlife species have been documented in the vicinity of the property:

- U.S. Fish and Wildlife Service (USFWS) quadrangle species lists (USFWS 2014)
- California Natural Diversity Database records (CNDDB) (CDFW 2014a)
- California Native Plant Society (CNPS) Electronic Inventory records (CNPS 2014)

The potential for special-status species or habitats to occur on the property was evaluated by first determining which special-status species occur in the vicinity of the property through literature and database searches. The initial evaluation of the property, as to presence of non-sensitive biological communities, was conducted by determining what potential sensitive communities would be present, evaluating the property for presence of sensitive communities and mapping/designating such areas, and making a determination as to what would constitute a “non-sensitive” community. It should be noted that the CEQA Checklist and CEQA Guidelines Section 15065, do not restrict impact analysis to “high priority” or “sensitive” natural communities, as further discussed below and addressed by project-specific significance threshholds.

Significance thresholds have been provided for quantitative evaluation of impacts in relation to thresholds, particularly providing quantitative levels for item two (bullet two above), regarding potential impacts to areas potentially considered sensitive habitats. The significance thresholds allow for evaluation of impacts to habitats, for this project, in relation to regional context, and for evaluation of whether an impact constitutes a “substantial” adverse effect according to thresholds. The *CEQA Guidelines Section 15382* sets forth the following definition for significant effect: “Significant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including … flora, fauna..”, etc. The *CEQA Guidelines Section 15064(b)* indicates that a strict definition of significant effect is not always possible because the significance of an activity may vary with the setting. According to *CEQA Statutes Section 21083 an*d *CEQA Guidelines Section 15065* a project is considered to have a significant effect on the environment if: “The project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of fish or wildlife population, cause a fish or wildlife species to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or significantly reduce the number or restrict the range of an endangered, rare, or threatened species.” With this regional context in mind, the impacts to Bishop pine forest are evaluated under project-specific significance thresholds provided in Section 3.4.3 above, as developed by project biologist and the lead agency to further define what constitutes a substantial impact. The lead agency concludes that less than 1% impact regionally to habitats with S3 (vulnerable) ranking does not constitute a substantial degradation to quality of the environment, or substantial reduction in habitat of fish or wildlife causing such species to drop below self-sustaining levels, threaten to eliminate a plant or animal community, etc, as further elaborated on above.

The Caspar site is already developed and consists of unvegetated areas as well as some previously logged and remnant forest areas adjacent to the existing facility that is proposed for closure. As part of the closure of the facility, there would be no new ground disturbance. Therefore, there would be no impact to biological resources at the Caspar site. Impact to biological resources from closure of the Caspar facility is not discussed further.

3.4.5 Impacts and Mitigation Measures

Impact BIO-1: Substantial Adverse Effect on Special-Status Species

The County and City minimized the amount of impacts to sensitive-listed tree species through adjustment of the project footprint, and eliminated impact to the most sensitive area that is stunted and mapped as cypress forest-pygmy. This minimization and avoidance effort was conducted during the project planning phase and project layout/design per guidance of RM-74 that suggests prioritizing minimization and avoidance prior to a replacement or enhancement approach. The project layout also minimized fragmentation to sensitive species by placing the project site centered on Bishop pine area and maintaining connectivity of remaining sensitive listed plants with adjacent areas of similar character.

The proposed project would directly or indirectly impact populations of CRPR List 1B plant species. Potential impacts are shown in Table 3.4-7 and described further below.

Table 3.4-7 Project Impacts to Special Status Plant Species

On Property Existing				Impact			
Species	CRPR List	Area (acres)	Individual Plant Estimate (#)	Area (acres)	Percent of Project Site	Individual Plant Estimate (#)	Percent # of Plants
Mendocino cypress	List 1B	12.33	2,037	0.580	5%	230	11%
Bolander's pine	List 1B		790			38	5%
Coast lily	List 1B	0.06	109	0.003	5%	10	9%
California sedge	List 2	0.09	894	0.000	0%	0	0%

The project footprint would avoid the population of California sedge [CRPR List 2]. There would be no direct or indirect impact to California sedge.

The project would permanently impact five individual Coast lily (CRPR List 1B) plants within the project footprint. In addition, a 0.003 acre area where this plant is mapped would be temporarily impacted, either directly or indirectly, during construction. A portion of the 0.003 acres is within the construction buffer, with the remaining habitat close to the construction area and therefore threatened indirectly. The 0.003 acre potential impact area is estimated to include an additional five individual plants based on percent of the subpopulation polygon being impacted, with individual plant counts for the entire property provided by field biologist during seasonally-appropriate plant surveys. Temporary and permanent impacts to Coast lily would be significant. Reference Figure 3.4-2 for permanent and construction impacts by habitats and rare plants.

The project would permanently impact approximately 0.58 acre of Mendocino cypress and Bolander's pine (both CRPR List 1B) (within areas categorized as cypress forest-tall and cypress forest-intermediate). Additionally, there are scattered cypress and Bolander's pine within the Bishop pine map unit. Impact to these individual trees is based on tree counts conducted within plots, and not based on acreage due to the scattered nature and low percent cover of these two species within the Bishop pine map unit. In total, approximately 229 Mendocino cypress and approximately 38 Bolanders' pine are estimated to be impacted within the Bishop pine forest, cypress forest-tall, and cypress forest-intermediate based on estimates from tree counts conducted within plots at the property (WRA 2013). Impacts to Bolander's pine and Mendocino cypress would be significant.

The biological evaluation for the project site (WRA 2013) stated that the Sonoma tree vole, a State species of special concern, could be present at the site since conifer habitat is present and the site is within the known species range, and if present could be impacted during construction due to tree removal. Impacts to the Sonoma tree vole would be significant.

The biological evaluation for the project site (WRA 2013) determined the following special-status bird species could be present at the site, and could be impacted during construction due to tree removal: Vaux's swift, Olive-sided fly catcher, purple martin, Allen's hummingbird, all of which are State Species of Special Concern. These are summer resident avian species. There is also the potential for passerine migratory bird species to fly over or stop at the site. Nesting habitat for such species is not high quality, yet seasonal or occasional presence and/or nesting cannot be ruled out at this point in time. Impacts to special-status bird species and birds protected under the Migratory Bird Act would be significant. Project construction occurring during the March 15 through August 15 breeding season may have an adverse impact on breeding success for special-status bird species. Impacts to special-status birds would be significant.

The biological evaluation for the project site (WRA 2013) determined that the site has moderate potential to support roosting locations for some bat species listed as having "moderate to high priority for survey" per Western Bat Working Group (WBWG), and could be impacted through tree removal if present at the site. Several special-status bat species, including the Townsend's big-eared bat, silver-haired bat, hoary bat, little brown bat, and fringed myotis, have the potential to occur on the project site. No bats were observed during site evaluations, and none of the bat species are expected to occur in substantial numbers at the project site. Breeding and foraging habitat for these species on the project site and in adjacent areas is generally marginal because rock outcrops, decadent trees, and caves with suitable bat habitat are sparse to non-existent for these bat species. However, they still could forage over the project site and roost under bark or in cavities of trees. Project construction occurring during the March 1 through August 31 bat breeding season may have an adverse impact on breeding success for special-status bat species. Impacts to special-status bats could be significant.

Mitigation Measure BIO-1a: Mitigate Impacts to Coast Lily

The County and City shall implement the following measures to mitigate the temporary and permanent impacts to Coast lily plants during construction and operation of the project:

<u>During Construction (0.003 acre subpopulation polygon)</u>

The building contractor shall install construction avoidance fencing at the interface of project footprint and the edge of the 0.003 acre coast lily subpopulation present on the south edge of the project site (refer to Figure 3.4-1 of the Draft EIR). The fencing will be at a minimum 100 linear feet in length to provide a barrier between the construction footprint and adjacent coast lily subpopulation. The construction fencing will be placed so that there is no "construction buffer" in this area, so as to avoid direct impacts to coast lily individuals. The construction avoidance fencing shall be installed by a qualified biologist and inspected weekly for the duration of construction to ensure that the fencing remains installed properly.

<u>During Operation (0.003 acre subpopulation polygon)</u>

Permanent fencing shall be installed prior to operation of the project. The fencing shall be approximately 100 feet in length and placed between the driveway leading to the scalehouse and the subpopulation polygon so as to create a permanent barrier from project operation. Perimeter fencing installed around the perimeter of the transfer station facility may suffice as protection of the subpopulation polygon from operational activities.

<u>Five Individual Coast Lily Plants</u>

The five individual coast lily plants, as identified within the project footprint on Figure 3.4-1 of the Draft EIR, shall be relocated, if possible, to the south subpopulation area. If relocation is not possible a nursery will be contracted to provide locally sourced plant stock and the five plants will be replaced at a 2:1 ratio. The plant stock or plantings shall be placed in an area adjacent to the south subpopulation. The plant replacement (whether through relocation and/or replanting) shall require annual monitoring for two years, with 100% success. To ensure meeting the 100% success criteria it is recommended that supplemental planting occur at a minimum of 20% (i.e.: 1 additional plant for relocation or two additional plants for nursery-provided plant stock).

Mitigation Measure BIO-1b: Mitigate Impact to Mendocino Cypress and Bolander's Pine

The impacts to CRPR listed tree species Mendocino cypress and Bolander's pine (a 0.58 acre area) shall be mitigated through preservation at an offsite location. The County and City proposes to use a portion of a 28-acre site identified as Assessor's Parcel Number (APN) 118-50-045 which is adjacent to and north of the Caspar transfer station facility and is forested including cypress, Bishop Pine, and other related species. A photograph of the proposed mitigation site is provided as Figure 3.4-3 and the location is shown on Figure 2-3. This parcel was declared surplus by the County in 2011 and listed for sale. It is zoned Rural Residential with potential for development of a single-family house. On September 22, 2014, the County Board of Supervisors rescinded the designation as surplus and reserved the parcel for conservation mitigation if required for this project and/or other projects that could have forestry impacts. The County, owner of this property, shall place a conservation easement over a portion of it to permanently preserve an area at a 3:1 ratio for areas of sensitive listed tree species (cypress and Bolander's pine) that are impacted at the new Central Coast Transfer Station site. At a 3:1 ratio, the conservation easement shall result in preservation of 1.75 acres of mixed cypress and Bolander's pine forest. Impacts to Cypress forest - tall and Cypress forest – intermediate, based on CNDDB rank of S2 for the overall forest classification (versus status/listing of individual tree species), are mitigated as detailed in Mitigation Measure BIO-2, which requires a conservation easement of 1.8 acres (3:1 ratio for impacts to total of 0.6 acres of CNDDB S2 ranked forest). The 1.75 acres required in Mitigation Measure BIO-1b is in addition to the 1.8 acres required in Mitigation Measure BIO-2, but are coincident to the 1.8 acres (total preservation of 3.55 acres).

Mitigation Measure BIO-1c: Minimize and Avoid Impacts to Sonoma Tree Vole.

The County and City shall consult with CDFW to minimize and avoid potential impacts to Sonoma tree vole during tree removal and project construction activities. Trees shall be removed during the non-breeding season (October to January). If seasonal avoidance of breeding time (February through September) cannot be implemented for tree removal activities, pre-construction surveys shall be conducted by a qualified biologist, in a manner such as follows (to be refined if necessary in consultation with CDFW):

- No more than two weeks before tree removal activities begin, a biologist will assess what portions, if any, of the tree removal area and areas within 50 feet of tree removal, is potential tree vole habitat, based on species composition and discussion with CDFW.
- If tree vole habitat is located on portions of the property within 50 feet of tree removal areas, a qualified biologist shall conduct a survey for presence of the species on the property in areas within 50 feet of tree removal and construction footprint.
- A standard survey methodology shall include at least two trained observers conducting visual searches for tree vole nests while walking along transects spaced 25 meters apart. When either fecal pellets, resin ducts, or potential nests are observed, vole nests must be confirmed by climbing trees and examining all potential nests to see if they contain evidence of occupancy by tree voles (fecal pellets, resin ducts, and conifer branch cuttings).
- If occupied habitat is identified during pre-construction surveys, the biologist shall consult with CDFW to determine how to avoid disruption to breeding activity or if individual relocation is possible.

Mitigation Measure BIO-1d: Conduct pre-construction Avian Surveys for Nesting Passerine Birds and Avian Species of Special Concern.

The building contractor shall conduct vegetation clearing activities if possible during the fall and/or winter months from August 16 to March 14, outside of the active nesting season for migratory bird species (i.e., March 15 to August 15). If vegetation cannot be removed during the non-breeding season, the applicant shall have a qualified biologist conduct preconstruction surveys within impact area from ground disturbance and tree removal, to check for nesting activity of migratory and special-status bird species. The biologist shall conduct the preconstruction surveys within the 14-day period prior to vegetation removal and ground-disturbing activities (on a minimum of three separate days within that 14-day period). If ground disturbance and tree removal work lapses for 15 days or longer during the breeding season, a qualified biologist shall conduct supplemental avian preconstruction survey before project work may be reinitiated.

If nesting activity is detected within the project footprint or within 300 feet of construction activities, the applicant shall have trees flagged that are supporting breeding, and will not remove those trees until the nests have fledged. Construction activities shall avoid nest sites until the biologist determines that the young have fledged or nesting activity has ceased. If nests are documented outside of the construction (disturbance) footprint, but within 300 feet of the construction area, buffers will be implemented if deemed appropriate in coordination with CDFW.

Mitigation Measure BIO-1e: Avoid Impacts to Special-Status Bat Species.

The County and City shall conduct tree removal activities outside of the bat breeding period of March 1 through August 31 if possible, so ideally tree removal would occur from September 1 to February 28. If trees cannot be removed during this time, the following measures shall be implemented:

- A qualified biologist shall be retained to conduct a habitat assessment at least 30 days and no more than 90 days prior to construction activities (i.e., ground-clearing and grading, including removal or trimming of trees) of all trees on the site that are proposed for removal. The assessment shall be designed to identify trees containing suitable roosting habitat for bats and to identify mitigation measures needed to protect roosting bats.

- If the habitat assessment identifies suitable special-status bat habitat and/or habitat trees, the biologist shall identify and evaluate the type of habitat present at the project site and specify methods for habitat and/or habitat tree removal in coordination with CDFW based on site-specific conditions. If bat habitat is present, removal of trees or areas that have been identified as habitat shall occur in two phases over two days under the supervision of a qualified biologist. In the afternoon on day one, limbs and branches of habitat trees without cavities, crevices and deep bark fissures would be removed by chainsaw. On day two, the entire tree can be removed. If trees with cavities, crevices and deep bark fissures are proposed for removal, CDFW shall be consulted for removal methods.

Level of Significance: Less than significant impact with mitigation.

Mitigation Measure BIO-1a would mitigate the impact through a combination of avoidance, minimization, and replacement or relocation of individual plants and is consistent with RM-28.

Mitigation Measure BIO-1b would preserve at a 3:1 ratio, areas with cypress and Bolander's pine species composition, similar to the area of impact. Unless permanently preserved, portions of the proposed preservation site could be threatened by future development and/or encroachment from adjacent uses. Mitigation Measure BIO-1b is consistent with the intent of Mendocino County General Plan Policy RM-28 which calls for implementation of site-specific or project-specific effective mitigation strategies including preservation. Preservation will provide an immediate and permanent protection of an existing habitat similar to that being impacted, at an appropriate mitigation ratio to compensate for the use of offsite location and the proposed activity of preservation. The impact to Mendocino cypress and Bolander's pine is less than significant with mitigation.

Mitigation Measure BIO-1c identifies avoidance measures, and if avoidance is not possible outlines the process for identifying occupied habitat, and then requiring, in accordance with General Plan Policy RM-28, consultation with CDFW to determine appropriate avoidance measures if occupied habitat is found. The proposed mitigation outlines the procedure for avoidance and is consistent with the Mendocino County General Plan, therefore the impact is less than significant after mitigation.

Implementation of Mitigation Measure BIO-1d provides protection measures during construction for special-status birds and would mitigate potential impacts on special-status and migratory birds to less-than-significant levels by requiring pre-construction surveys by a qualified biologist to determine whether special-status or migratory bird nests are present at or near the project site and ensuring protection of nests and young until they have fledged.

Implementation of Mitigation BIO-1e provides protection measures for special-status bats during tree removal and would reduce the impacts to special-status bats because the disturbance caused by chainsaw noise and vibration during tree removal, coupled with the physical alteration of the branches and limbs may cause the bats to abandon the roost tree after nightly emergence for foraging. Removing the tree the next day prevents re-habituation and reoccupation of the altered tree, thereby reducing impacts to roosting bats to less-than-significant levels.

Impact BIO-2: Substantial Adverse Effect on Sensitive Natural Community.

The proposed project has the potential to permanently impact habitats considered sensitive natural communities by CDFW with State Rank 1 (critically imperiled) or 2 (imperiled) communities. While not considered imperiled, there are also impacts anticipated to Bishop pine forest, a State Rank 3 (vulnerable) habitat. Potential impacts are shown in Table 3.4-8 below.

Table 3.4-8 Project Impacts to Special Status Habitats

Existing				Impacts		
Habitat	Global (G) / State (S) Rank	Total On-Property (acres)	Regional Conditions (acres)	Total Impact (acres)	% Onsite acres	% Regional acres
Bishop pine forest	G3 S3	8.4	14,900*	4.0	48.2%	0.03%
Cypress forest (tall)	G2 S2	4.8	2,000**	0.3	6.8%	0.03%
Cypress forest (intermediate)		4.4		0.3	5.8%	
Cypress forest (pygmy) / forested wetland		3.1		0.0	0.0%	

NA = Not Available
*CALVEG 1998 mapped 14,900 acres of Bishop pine forest in Mendocino County (
**While 4,000 acres of cypress forest is often quoted as extent of this habitat type, some authors have indicated this may be reduced to as little as 2,000 acres currently. CDFW is working currently on mapping to establish baseline existing conditions (Miller 2014 Pers. com.). 2,000 acres is used herein as a conservative estimate of what remains regionally of pygmy forest and as a basis for comparative analysis, although it does not take into consideration eco tones, gradations, and various definitions of pygmy forest, nor is it known what species composition and tree heights this acreage estimate includes.

The County and City have minimized the project footprint, and eliminated impact to the cypress forest—pygmy morpho-type, where Bolander's pine and Mendocino/pygmy cypress are growing in a unique ecosystem connection with restrictive soil conditions. This effort to minimize impact to cypress forest—pygmy was conducted during the project planning and layout phase. The project layout has also minimized fragmentation to the more sensitive habitats at the property (State Rank S1 and S2) by placing the project site centered within Bishop pine forest area (State Rank S3). Impacts to State Rank S1 and S2 habitats are located along the fringe of these habitats and do not dissect or fragment these areas.

The project footprint and construction buffer will permanently impact a total of up to 0.6 acres of cypress forest (State Rank S2) consisting of two morpho-types (cypress forest—tall, and cypress forest—intermediate). The impact to cypress forest—intermediate is 0.3 acre. The cypress forest—intermediate has similar species composition as true cypress forest—pygmy with the similar species assemblage with presence of Bolander's pine, yet a more established and denser understory. Additionally, the intermediate tree height indicates the area is not limited in tree growth pattern from restrictive soil conditions, and it is therefore assumed that some of the restrictive soil conditions typical of true pygmy forest ecosystem may not be present within this map unit at the property. Still, due to species composition as well as with the State Rank (S2) of imperiled for the habitat type, and for the purposes of this analysis in regards to requirements of County General Plan and priority for minimization of impacts to pygmy forest, as well as project significance thresholds for S1 or S2 ranked habitats set at impact above zero (0), impacts to this area are considered significant. The impact to cypress forest (tall) is 0.3 acre. The cypress forest (tall) map unit, with dense shrub and herbaceous understory, and with the low coverage of Bolander's pine (a component of the pygmy forest ecosystem), does not show signs of restrictive soil conditions that are a part of the unique ecosystem relationship between vegetation and soils within the true pygmy forest. This area is considered to lack some of the soil and vegetation components typical of the pygmy forest ecosystem. Still, for the purposes of this analysis and given the State Rank (S2) of imperiled for this habitat type based on dominant species of tree, as well as project significance thresholds for S1 or S2 ranked habitats set at impact above zero (0), impacts to this area are considered significant.

While not considered imperiled, there also will be impacts to approximately 4.0 acres of Bishop pine forest, a State Rank S3 (vulnerable) habitat. This Bishop pine forest is evaluated as to whether the area is considered high priority natural community based on the following three CDFW criteria (CDFW 2014):

1) Lack of invasive species: Although the site has not specifically been evaluated from an invasive species perspective, multiple site visits did not document extensive coverage of invasive species listed as high-priority by CalIPC (Invasive Plant Council) within the Bishop pine forest, although there are likely non-native species present in varying coverages depending on proximity to roads and modified areas. The Bishop pine forest is likely to be of moderate to high priority based on this criterion.
2) No evidence of human caused disturbance such as roads or excessive livestock grazing, or high-grade logging: There are roads on the perimeter of the property, evidence of historic logging and site access, and an almost barren helicopter pad to the west of the Bishop pine forest. The Bishop pine forest is determined to be of moderate priority based on this criterion.
3) Evidence of reproduction present (sprouts, seedlings, adult individuals of reproductive age), and no significant insect or disease damage, etc: Evidence of reproduction within the Bishop pine forest was not specifically evaluated, yet the area is a relatively even-age stand and sprouts and seedlings were not noted. The area does not appear to have insect or disease damage. The Bishop pine forest is determined to be of moderate priority based on this criterion.

The Bishop pine forest (State Rank S3) on the property is therefore potentially moderate to high priority per the above CDFW criteria. The CEQA Checklist and CEQA Guidelines Section 15065, however, do not restrict impact analysis to "high priority" or "vulnerable" natural communities. The *CEQA Guidelines Section 15382* sets forth the following definition for significant effect, and as further addressed in the project significance thresholds developed by the lead agency and described above in the Significance Criteria section: "Significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including … flora, fauna..", etc. The *CEQA Guidelines Section 15064(b)* indicates that a strict definition of significant effect is not always possible because the significance of an activity may vary with the setting. According to *CEQA Statutes Section 21083 an*d *CEQA Guidelines Section 15065* a project is considered to have a significant effect on the environment if: "The project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of fish or wildlife population, cause a fish or wildlife species to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or significantly reduce the number or restrict the range of an endangered, rare, or threatened species." With this regional context in mind, the impacts to Bishop pine forest are evaluated under project-specific significance thresholds provided in Section 3.4.3 above. As provided in Table 3.4-8 above at the beginning of the Impact BIO-2 discussion, it is estimated that in relation to regional extent and quantity of Bishop pine mapped as occurring in Mendocino County (CDF 2005), the project impacts of 4.0 acres constitute approximately 0.03% of areas regionally mapped as Bishop pine forest. Per the thresholds (loss of more than 1 acre of high quality habitat and loss of more than 1% of regional high quality habitat), the loss of less than 1% of regional potentially sensitive Bishop pine habitat is determined to be less than significant.

Mitigation Measure BIO-2: Mitigate Impacts to Sensitive Listed Habitats with State Rank S2 Status (Cypress forest-tall and Cypress forest – intermediate).

The impacts to 0.6 acres of State Rank S2 status habitats shall be mitigated through preservation at an offsite location. The County and City propose to use a portion of a site identified as Assessor's Parcel Number (APN) 118-50-045 which is adjacent to and north of the Caspar transfer station parcel. A conservation easement will be placed over a portion of the preservation site to permanently preserve an area at a 3:1 ratio to areas of impact at the proposed project site (Cypress forest-tall and Cypress forest – intermediate). At a 3:1 ratio, the conservation easement shall include a minimum of 1.8 acres and may consist of a mixture of the three cypress morphotypes; pygmy, intermediate, and/or tall cypress and Bolander's pine forest. The 1.8 acres is in addition to the area already being preserved for impacts to sensitive-listed individual tree species within the habitats mitigated for under BIO-2 (cypress forest--tall and intermediate--map units), and shall be coincident to the area placed under conservation easement per Mitigation Measure BIO-1b. Therefore, in addition to the 1.75 acres proposed for permanent preservation as part of Mitigation Measure BIO-1b, an additional 0.05 acres shall be included in the preservation area for a minimum of 1.8 acres.

Level of Significance: Less than significant with mitigation.

The preservation site is identified as APN 118-50-045, and is adjacent and to the north of the current Caspar facility. The preservation site has similar, if not more pygmy-forest oriented species composition, compared to the area of impact, with a mixture of true pygmy forest (stunted with both cypress and Bolander's pine present) as well as intermediate cypress and Bolander's pine areas, and some Bishop pine (per GHD May 2014 site visit). . Unless preserved, portions of this site could be threatened by future development and/or encroachment from adjacent uses. For potential impacts to habitats with State Rank S1 or S2, preservation is deemed an appropriate mitigative activity for these areas since attempts for direct replacement of the habitats would be linked to a unique ecosystem relationship, which in this case includes slow growing species within a setting of restrictive soil conditions. Preservation will provide an immediate and permanent protection of an existing habitat similar to that being impacted, at an appropriate mitigation ratio (3:1) to compensate for the use of offsite location and the proposed activity of preservation. The 3:1 ratio is appropriate rate as it provides compensation for the use of an offsite location (versus onsite) as well as the use of preservation as opposed to other mitigation strategies such as replacement. A temporal loss is not anticipated. The mitigation approach is consistent with RM-28 which allows for preservation as a mitigative approach for impacts to special-status species habitat, and RM-74 that prioritizes minimization and avoidance prior to employing replacement, protection, or enhancement measures. In conjunction with the avoidance and minimization activities conducted during project planning, and after proposed preservation/protection activities, the impact is determined to be less than significant.

Impact BIO-3: Substantial Adverse Effect on Federally Protected Wetlands.

Approximately 0.22 acres of USACE palustrine emergent wetlands, and 3.11 acres of USACE forested wetlands (that coincide with cypress forest—pygmy polygon) were mapped within the property (WRA 2012). There are forested wetlands approximately 50 feet north and over 100 feet east of the project footprint. The palustrine emergent wetland area is approximately 200 feet east of the project footprint and approximately 25 feet north of the SR 20 improvements. The USACE provided a jurisdictional determination concurring with the wetland delineation as mapped (USACE 2013). State jurisdictional areas beyond the USACE jurisdictional wetlands, such as isolated wetlands or other waters, seasonal/ephemeral drainages, etc., were not observed and are believed to be coincident with USACE jurisdictional wetlands. The project footprint avoids impacts to state and federal jurisdictional wetlands and waters. There would be no impact to federally protected wetlands.

Mitigation Measures: No mitigation is necessary.

Level of Significance: **No impact.**

Impact BIO-4: Interfere Substantially with Movement of Native Resident or Wildlife Species or With Established Native Resident or Migratory Wildlife Corridors, or Impede Use of Native Wildlife Nursery.

The project site is not a migratory wildlife corridor nor does it support a native wildlife nursery. With regard to protection under the Migratory Bird Act, refer to the analysis under Impact BIO-1.

Mitigation Measures: No mitigation is necessary.

Level of Significance: **Less than significant.**

Impact BIO-5: Conflict with Local Policies or Ordinances Protecting Biological Resources.

The project does not conflict with approved local, regional, or state habitat conservation plans, as there are no such special plans that would govern the project other than compliance with Mendocino County General Plan goals and policies in relation to minimization of impacts to biological resources, as discussed under Impact BIO-1 and BIO-2 above. Impact BIO-2 and Mitigation Measure BIO-2 address minimization of impacts to pygmy forest where feasible per the guidance of County General Plan goals and policies. The project does not conflict with local policies for the protection of biological resources.

Mitigation Measures: No mitigation is necessary.

Level of Significance: **Less than significant.**

3.4.6 Cumulative Impacts

Impact BIO-C-1: Result in Cumulatively Considerable Contribution to Cumulative Impacts Related to Biological Resources.

Project impacts to Coast lily would be mitigated to a no-net loss level. Therefore, the project would not contribute to a cumulative impact to Coast lily.

Project impacts to cypress forest-intermediate, and cypress forest-tall, which are State Rank S2 habitats, have been assessed both from a habitat perspective (calculated on an acreage basis), and on an individual tree basis for CRPR sensitive listed tree species dominant within some tree stands at the site. On a regional basis, the project impact (prior to mitigation) would be approximately up to 0.03%, although this calculation utilizes the estimate of 2,000 acres for regional extent of pygmy forest, while the project impacts are actually to cypress forest—intermediate and tall (not to cypress forest-pygmy). The cumulative projects listed in Table 3.0-1, do not currently have identified impacts to cypress forest—intermediate and/or cypress forest—tall habitat. Therefore, the project plus cumulative project would not result in cumulative impact to cypress forest—intermediate and —tall. There is no impact from the project to cypress forest—pygmy as this sensitive area on the property has been avoided through project layout.

Project impacts to Bishop pine forest, which is State Rank S3 habitat, have been assessed from a habitat perspective on an acreage basis within the regional context of habitat extent and quantity. On a regional basis, the project impact would be approximately up to 0.03% of the habitat mapped in the County. Per the individual project thresholds (loss of more than 1 acre of high quality habitat and loss of more than 1% of regional high quality habitat), the loss of less than 1% of regional potentially sensitive Bishop pine habitat is less than significant. Of the cumulative projects listed in Table 3.0-1, none have known impacts to Bishop pine. Therefore, the project plus cumulative project would not result in additional cumulative impact.

With regard to impacts to special-status birds, bats, and voles, it is assumed the cumulative projects could have similar impacts as described for the project and would follow similar mitigation included in this EIR. The mitigation measures identified in this EIR comply with all appropriate policies for preserving and protecting biological resources in the Mendocino County General Plan and follow standard procedures recommended by resource agencies. Specific cumulative projects, as well as other projects in the greater Mendocino Coast area would be required to follow similar mitigation to avoid or protect special-status birds and bats. Therefore, impacts remaining after implementation of mitigation would not occur or would be minor and would not make a considerable contribution to cumulative impact on special-status birds, bats, or voles.

Mitigation Measures: No mitigation is necessary.

Level of Significance: **Less than significant.**

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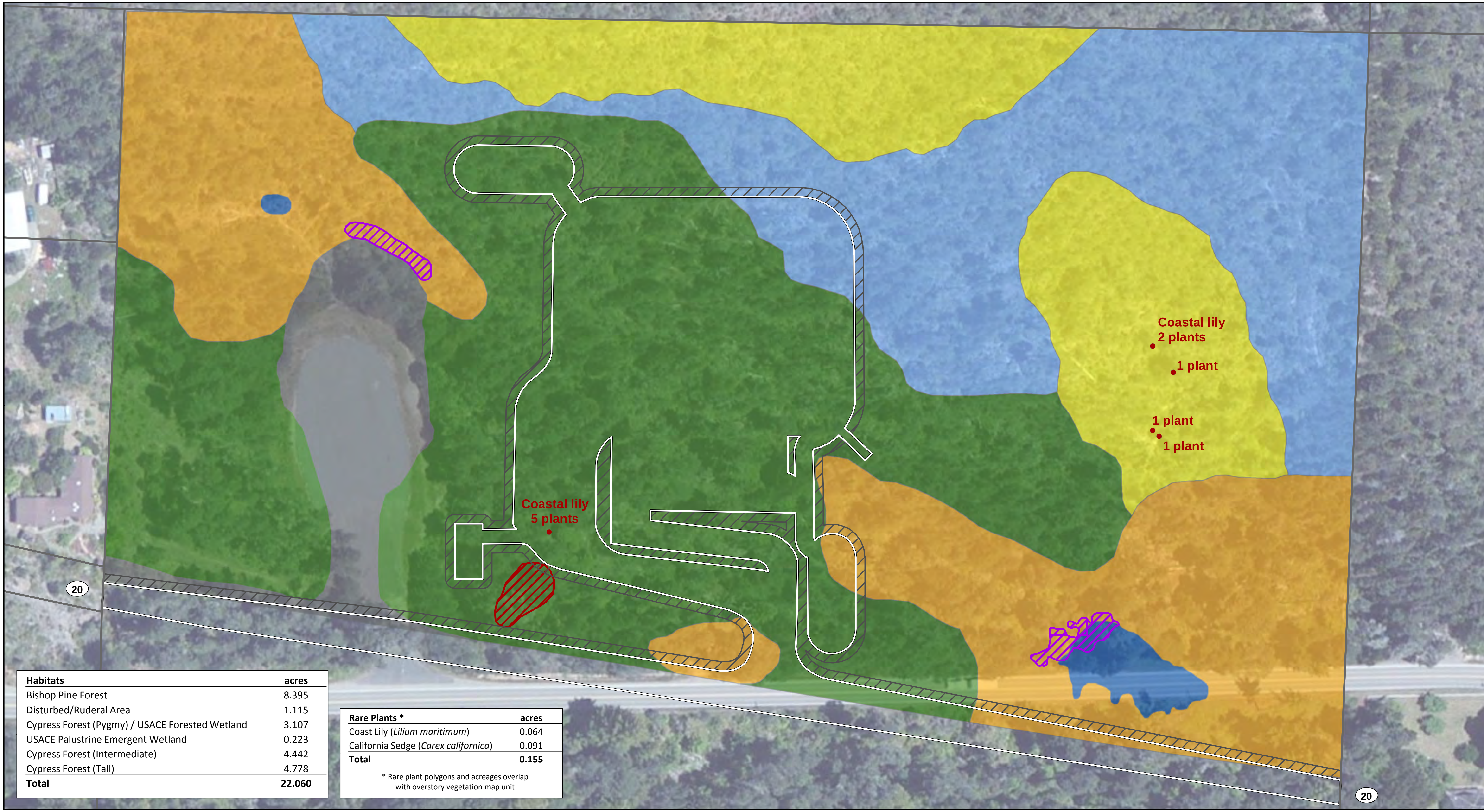

Habitats	acres
Bishop Pine Forest	8.395
Disturbed/Ruderal Area	1.115
Cypress Forest (Pygmy) / USACE Forested Wetland	3.107
USACE Palustrine Emergent Wetland	0.223
Cypress Forest (Intermediate)	4.442
Cypress Forest (Tall)	4.778
Total	**22.060**

Rare Plants *	acres
Coast Lily (*Lilium maritimum*)	0.064
California Sedge (*Carex californica*)	0.091
Total	**0.155**

* Rare plant polygons and acreages overlap with overstory vegetation map unit

Paper Size 11" x 17" (ANSI B)

0 50 100 150 200

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California II FIPS 0402 Feet

N

Bishop Pine Forest
Disturbed/Ruderal Area
Cypress Forest (Pygmy) / USACE Forested Wetland
USACE Palustrine Emergent Wetland
Cypress Forest (Intermediate)
Cypress Forest (Tall)
Rare Plant Individuals - Coast Lily
Rare Plants - California Sedge
Rare Plants - Coast Lily
Construction Footprint
Permanent Footprint
Parcels

Mendocino Solid Waste Management Authority
Central Coast Transfer Station EIR

Job Number	8411065.04
Revision	A
Date	04 Nov 2014

Permanent & Construction Footprints Existing Conditions - Biology

Figure 3.4-1

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Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:jrousseau

718 Third Street Eureka CA 95501 USA T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

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	Impacts Area (acres)	
Habitats	**Construction**	**Permanent**
Bishop Pine Forest	0.680	3.362
Disturbed/Ruderal Area	0.071	0.035
Cypress Forest (Pygmy) / USACE Forested Wetland	.	.
USACE Palustrine Emergent Wetland	.	.
Cypress Forest (Intermediate)	0.057	0.201
Cypress Forest (Tall)	0.155	0.169
Total	**0.962**	**3.768**
Rare Plants *		
Coast Lily (*Lilium maritimum*)	0.003	.
California Sedge (*Carex californica*)	.	.
Total	**0.003**	**.**

* Rare plant polygons and acreages overlap with overstory vegetation map unit

Paper Size 11" x 17" (ANSI B)

0 50 100 150 200

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California II FIPS 0402 Feet

N

- Bishop Pine Forest
- Disturbed/Ruderal Area
- Cypress Forest (Pygmy) / USACE Forested Wetland
- USACE Palustrine Emergent Wetland
- Cypress Forest (Intermediate)
- Cypress Forest (Tall)
- Rare Plant Individuals - Coast Lily
- Rare Plants - California Sedge
- Rare Plants - Coast Lily
- Construction Footprint
- Permanent Footprint
- Parcels

GHD

Mendocino Solid Waste Management Authority
Central Coast Transfer Station EIR

Job Number	8411065.04
Revision	A
Date	04 Nov 2014

Permanent & Construction Footprints Impacts - Biology

Figure 3.4-2

718 Third Street Eureka CA 95501 USA T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

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Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:jrousseau

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Mitigation Site

Parcels

Rivers/Streams

Paper Size 8.5" x 11" (ANSI A)

0 100 200 300 400 500

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

Mendocino Solid Waste Management Authority
Central Coast Transfer Station EIR

Job Number	8411065
Revision	A
Date	07 Nov 2014

Mitigation Site

Figure 3.4-3

718 Third Street Eureka CA 95501 USA T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

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Data source: USDA NAIP Imagery, 2010; USA Base Map, 2013; GHD data, 2013. Created by:emgutierrez

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3.5 Cultural Resources

This section evaluates the potential impacts related to cultural resources during construction and operation of the project. To provide the basis for this evaluation, the Setting section describes the archaeological and historical setting for the project area, and the Regulatory Framework section describes the applicable federal, state and local regulations affecting the project area. Descriptions in this section are based on reviews of published information, reports, and plans regarding cultural resources. The evaluation criteria and impacts and mitigation measures sections establish the thresholds of significance, evaluate potential cultural resource impacts, and identify the significance of impacts and feasible mitigation measures if necessary.

A cultural resources study was prepared for this project by the Anthropological Studies Center (ASC) at Sonoma State University. The results of the study are described below.

3.5.1 Setting

Neither closure of the Caspar transfer station site nor the Russian Gulch State Park land swap site would result in any ground disturbance nor involve historic structures. Therefore, these two sites are not included in the setting.

Prehistoric Context

An analytic framework for the interpretation of the San Francisco Bay and North Coast Ranges prehistory is provided by Fredrickson (1974), who divided human history in California into three broad periods: the Paleoindian period, the Archaic period, and the Emergent period. The scheme used sociopolitical complexity, trade networks, population, and the introduction and variations of artifact types to differentiate between cultural units. The significance of prehistoric sites rests partly on their ability to help archaeologists explain the reasons for these changes in different places and at different times in prehistory. The scheme, with minor revisions (Fredrickson 1994), remains the dominant framework for prehistoric archaeological research in the region.

The earliest documented human occupation in California, the Paleoindian period (ca. 10,000-6000 B.C.), was a time of variable climate, rising sea levels, and other broad-scale environmental change. People lived in small, highly mobile groups, moving through broad geographic areas and leaving relatively meager archaeological remains.

With the more stable climate of the long Archaic period (6000 B.C. to A.D. 1000), people gradually became more sedentary, new groups entered the area, and regional distinctions developed. The Archaic has been divided into three subperiods (Lower, Middle, and Upper), based on changes in sociopolitical complexity, trade networks, populations, and the introduction of new artifact types (Fredrickson 1974, 1994). Many of the archaeological sites in the North Coast Ranges were first used in the Middle and Upper Archaic, when populations were increasing and groups moved into new areas to exploit a more diverse range of resources. By the Upper Archaic period beginning around 500 B.C., mobility was being replaced by a more sedentary adaptation that included a reliance on intensive acorn processing and storage. Numerous small villages and the beginnings of a more complex society and economy characterize the end of this period.

During the Emergent, or Late, period (ca. A.D. 1000 to the historic period), social complexity developed toward the contact-period settlement pattern of large, central villages where political leaders resided, with associated hamlets and specialized activity sites. Innovations associated with the period include the bow and arrow, small corner-notched points, and a diversity of beads and ornaments. Archaeological sites dating to this period are common throughout the North Coast

Ranges; they include sites of ritual significance, such as rock art; small resource-processing areas marked by stone-tool-manufacturing debris (debitage) and flaked-stone tools or milling equipment (such as mortars and pestles); or moderate- to large-sized occupation sites marked by midden soils, dietary bone and shell, and a diversity of artifacts.

Ethnographic Context

Ethnographic literature indicates that at the time of historic contact, the project area was within the territory of speakers of the Northern Pomo language, one of the seven Pomoan languages (McLendon and Oswalt 1978:283-285; Kroeber 1925:222). According to Kroeber (1925:237), the greater Pomo (i.e., the combined populations of the seven language groups) formed the second most populous group in California, with an estimated pre-contact population of as many as 8,000 people.

The area occupied by Northern Pomo speakers was roughly defined by the Navarro River in the southwest; Horse Mountain and the western banks of Clear Lake along the eastern border; and Potter Valley, the areas around the current communities of Willits, Sherwood, and Fort Bragg along the northern border. The western border was defined by a stretch of the Pacific Ocean a few miles north of Fort Bragg, and Albion (McLendon and Oswalt 1978:283). The Northern Pomo were in contact with Cahto and Yukian speakers to the north and the Central Pomo to the south. The Northern Pomo did not live year round along the coast until European encroachment, preferring to seasonally occupy campsites for collecting seafood in the summers. The Northern Pomo comprised a number of village communities, consisting of semisubterranean ceremonial houses, temporary structures, and dwelling houses made from redwood bark. Politically, the Northern Pomo were organized into groups referred to by anthropologists as “tribelets,” and kin groups with secular chieftains as well as ceremonial shamans (Bean and Theodoratus 1978:289–298).

The Northern Pomo utilized a variety of resources in their environment; their diet depended in part on the time of the year. Fish, acorns, grains roots, bulbs, and buckeye nuts were eaten year round. Fish were dried and supplemented with fresh meat, waterfowl, fresh greens, berries, and fruit. Northern Pomo lands were divided into village-owned tracts with gathering and hunting rights belonging exclusively to members of the owning community (Kroeber 1925:228-229).

Barrett makes note of two old village sites within the Fort Bragg area. The closest of these to the project site is thought to be Toldam, situated at the edge of the redwood forest one mile east from the ocean on the ridge between the Noyo and Hare Rivers (Barrett 1908:135).

Historic Context

The northern coast of California was left relatively unexplored by Euro-Americans until 1855 when an expedition from the Bureau of Indian Affairs visited the Fort Bragg area looking for a site to establish a reservation. A year later the Mendocino Indian Reservation was established at Noyo. Lieutenant Horatio Gates Gibson was ordered in 1857 to establish a military post on the reservation to maintain order. The settlement was named after General Braxton Bragg, Gibson’s former commanding officer in the Mexican War (Hoover at al. 1990:196). The fort was later abandoned in 1864 and the reservation was discontinued in 1866, opening the land for settlement.

After military occupation, the focus of the new town switched to lumber and the available harbor for shipping. The Fort Bragg Redwood Company was incorporated in 1885 and eventually became the Union Lumber Company. This enterprise led to the development of railroad service to Fort Bragg. The California Western Railroad ran a line to the town from Willits that still transports tourists aboard the “Skunk Train” (Hoover et al. 1990:196). Fort Bragg has also supported thriving commercial fishing, farm, and dairying industries over the years.

State Route 20 runs east from Fort Bragg through the central portion of the state, eventually ending at Interstate 80 near Emigrant Gap in the Sierra Nevada. The portion of the highway from Fort Bragg to Willits was extended over an existing County road in 1953. This route appears close to its current alignment on the 1867 and 1868 General Land Office maps. Little development appears to have occurred along this route prior to the 1950’s.

Records and Literature Search

On March 28, 2014 the ASC conducted a records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System. The NWIC, an affiliate of the State of California Office of Historic Preservation, is the official state repository of archaeological and historical records and reports for an 18-County area that includes Mendocino County. The records search included a review of all site records and study reports on file within a 1/4-mile radius of the project site.

The records search and literature review for this study were done to (1) determine whether known cultural resources had been recorded within or adjacent to the study area; (2) assess the likelihood of unrecorded cultural resources based on archaeological, ethnographic, and historical documents and literature, and on the environmental setting of nearby sites; and (3) develop a context for preliminary recommendation of identified resources.

Included in the review were the California Inventory of Historical Resources (California Department of Parks and Recreation 1976), California Office of Historic Preservation’s Five Views: An Ethnic Historic Site Survey for California (CA-OHP 1988), California Historical Landmarks (CA-OHP 1990), California Points of Historical Interest (CA-OHP 1992), and the Historic Properties Directory Listing (CA-OHP 2012). The Historic Properties Directory includes the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR), and the most recent listings (through April 5th, 2012) of the California Historical Landmarks and California Points of Historical Interest.

Previous Research

The record search indicated that nine cultural resource studies (see Table 3.5-1) have been conducted in the record search radius. No cultural resources have been recorded within the record search radius. The closest known resource is approximately 1.8 miles west and consists of the remains of an 1884 trestle constructed by the Caspar, South Fork & Eastern Railroad operated by the Caspar Lumber Company (P-23-002503) (Hamilton 1994).

The project area was included within an overview of Historical Resources within JDSF in 1993, but does not appear to have been surveyed as part of this or any other cultural survey (Gary and Hines 1993). The land adjacent and to the north of the project area was included within a 2000 survey, but was not surveyed due to extremely dense vegetation (Jones and Stokes 2000).

Table 3.5-1 Previous Studies within 1/4 –Mile Record Search Radius of Project

Study No.	Date	Author	Findings	Distance from Project Area
S-6043	1983	Flaherty	None	0.13 mile southwest
S-15118	1993	Gary and Hines	None in search radius	General project area included, though not surveyed
S-28263	1994	Susan	None	485 feet southeast
S-21667	1999	Roach	None in search radius	560 feet south
S-22724	2000	Jones & Stokes	None	Adjacent to northern boundary
S-32136	2006	Sternberg	None	Adjacent to northern boundary
S-38863	2011	Tiley	None, overview	Along SR 20 adjacent to southern boundary
S-38864	2011	Meyer, Kaijankoski,and Rosenthal	None, overview	Along SR 20 adjacent to southern boundary
S-38865	2011	Leach-Palm et al.	None	Along SR 20 adjacent to southern boundary

Source: Anthropological Studies Center, 2014.

Organization Contact

On August 7, 2014, the State of California Native American Heritage Commission (NAHC) was asked to review the Sacred Lands File for information on Native American cultural resources in the study area. On August 12, 2014, the NAHC responded with a letter stating that the search failed to indicate the presence of Native American cultural resources within the immediate project area. Additionally, a contact list of people responsible for Native American concerns in the area was provided by the NAHC. ASC sent letters to each listed individual regarding the project on August 13, 2014. A letter was received from the Sherwood Valley Band of Pomo Indians on September 3, 2014, in response to the ASC letter. The Sherwood Valley Band of Pomo Indians stated "at this time the Tribe is not aware of existing resources in the project area. However, we are requesting a tribal monitor be present during the survey. Additionally, upon reviewing the scope of work, we may request the presence of a tribal monitor during any ground disturbance activities."

Field Survey

ASC conducted a cultural resources field survey of the project area on August 11, 2014. Field methods consisted of an on-foot mixed strategy survey of the project area. The survey was primarily focused where development of the transfer station will take place.

Nearly all of the project site is covered by impenetrable forest and thick vegetation in the form of tangled understory and brush. The survey was conducted from the southern and western boundaries where the project site is bounded by SR 20 and the CalFire helipad. Accessible game trails and logging roads were followed until vegetation prohibited further access. Non-linear transects were followed across portions of the project area where vegetation allowed. Ground visibility was extremely poor throughout most of the project area due to dense brush, heavy duff, and pine needle cover. Where possible, sections of vegetation were cleared at varying intervals to expose the ground surface for indicators of archaeological deposits. Additionally, several locations within the project site were occupied by active or past transient camps. These areas and modern garbage dumps on the property were not surveyed due to health and safety concerns. No cultural resources were identified during the course of the study.

3.5.2 Regulatory Framework

Federal

There are no federal regulations that apply to the project related to cultural resources. The regulations related to the National Register of Historic Places would not apply as there are no historic resources on or within an area of potential affect by the project site.

State

California Environmental Quality Act

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historic, architectural, archaeological, cultural, or scientific importance. Under CEQA statutes, an impact on a cultural resource is considered significant if a project would result in an impact that may change the significance of the resource (Public Resources Code [PRC] Section 21084.1). Demolition, replacement, substantial alteration, and relocation of historic properties are actions that would change the significance of a historic resource (California Code of Regulations, Title 14, 15064.5). The following steps are normally taken in a cultural resources investigation to comply with CEQA:

- Identification of cultural resources.
- Evaluate the significance of the cultural resources based on established thresholds of significance.
- Evaluate the impacts of a project on cultural resources.
- Develop and implement measures to mitigate the impacts of the project on significant cultural resources.

Because the project is located on non-federal land in California, it is also necessary to comply with state laws pertaining to the inadvertent discovery of human remains of Native American origin. The procedures that must be followed if burials of Native American origin are discovered on non-federal land in California are described in the Impacts and Mitigation Measures section, below.

California Public Resources Code

As part of the determination made pursuant to PRC Section 21080.1, the lead agency must determine whether a project would have a significant effect on archaeological and paleontological resources.

Several sections of the PRC protect cultural resources and PRC Section 5097.5 protects vertebrate paleontological sites located on public land. Under Section 5097.5, no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site (including fossilized footprints), inscriptions made by humans, rock art, or any other archaeological, paleontological, or historical feature situated on public lands, except with the express permission of the public agency that has jurisdiction over the lands. Violation of this section is a misdemeanor.

PRC Section 5097.98 states that if Native American human remains are identified within a project area, the landowner must work with the Native American Most Likely Descendant as identified by the NAHC to develop a plan for the treatment or disposition of the human remains and any items associated with Native American burials with appropriate dignity. These procedures are also addressed in Section 15046.5 of the CEQA Guidelines. Section 30244 of the PRC requires reasonable mitigation for impacts on paleontological and archaeological resources that occur as a result of development on public lands.

California Health and Safety Code

California Health and Safety Code Section 7050.5 prohibits disinterring, disturbing, or removing human remains from a location other than a dedicated cemetery. Section 7050.5 also requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If determined to be Native American, the coroner must contact the California NAHC.

California Native American Historical, Cultural and Sacred Sites Act

This Act applies to both State and private lands. The Act requires that upon discovery of human remains, that construction or excavation activity cease and that the County Coroner be notified. If the remains are of a Native American, the coroner must notify the NAHC. The NAHC then notifies those persons mostly likely to be descended from the Native American remains. The Act stipulates the procedures the descendants may follow for treating or disposing of the remains and associated grave goods.

Regional and Local

Mendocino County General Plan Goals and Policies

The following are the goals and policies from the *Mendocino County General Plan* that are most applicable to the project with regard to cultural resources.

Goal DE-6 (Cultural Resources): Protection and preservation of the County's significant historical, archaeological and cultural resources.

Policy DE-113: The County and other public agencies are encouraged to protect, maintain and restore historical, archaeological and cultural resources under their ownership or management.

Policy DE-115: Cultural resources evaluations (i.e., archaeological and historical investigations) shall be conducted at the County's determination for project applications, where it is determined that cultural resources may occur. The evaluations should identify cultural resources (i.e., prehistoric sites and isolated artifacts and features) in a project area, determine their eligibility for inclusion in the California Register of Historical Resources, and provide mitigation measures for any resources in a project area that cannot be avoided. Cultural resources evaluations shall be completed by a professional archaeologist that meets the Secretary of the Interior's Standards and Guidelines for Professional Qualifications in archaeology and/or history.

If, during the course of implementing County-approved projects, cultural resources (i.e., prehistoric sites, historic sites, and isolated artifacts and features) are discovered, all work shall be halted immediately within 50 feet of the discovery, the County Planning and Building Services Department shall be notified, and a professional archaeologist that meets the Secretary of the Interior's Standards and Guidelines for Professional Qualifications in archaeology shall be retained to determine the significance of the discovery.

The County and project applicant shall consider mitigation recommendations presented by a professional archaeologist that meets the Secretary of the Interior's Standards and Guidelines for Professional Qualifications in archaeology for any unanticipated discoveries. The County and project applicant shall consult and agree upon implementation of a measure or measures that they deem feasible and appropriate. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures. The project applicant will implement the agreed upon mitigation measures necessary for the protection of cultural resources.

3.5.3 Evaluation Criteria and Significance Thresholds

Under criteria based on Appendix G of the CEQA Guidelines, the project would be considered to have a significant impact on cultural resources if it would result in any of the following:

- Cause a substantial change in the significance of a historical resource as defined in Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

3.5.4 Methodology

The impact analysis included in this section is based on the cultural resources study conducted for the project by ASC as described above. The NAHC was also contacted for a review of the Sacred Lands File and for contact information for the appropriate tribal communities to be contacted regarding the project.

3.5.5 Impacts and Mitigation Measures

Impact CR-1: Cause Substantial Change in the Significance of a Historic or Archaeological Resource.

Based on previous research and the results of ASC's cultural resources study, no cultural resources, including archaeological, tribal or historical resources, were identified within or immediately adjacent to the project site. However, ground visibility was poor throughout most of the project area due to dense brush, heavy duff, and pine needle cover, therefore, it is possible that significant (as defined by CEQA) historical or unique archaeological resources that could not be observed during the course of the field survey may be buried on the project site. The disturbance of these resources during site excavation activities would be a significant impact.

Mitigation Measure CR-1: Disturbance of Undiscovered Archaeological Resources.

During the course of ground-disturbing activities associated with project construction activities, if any cultural resources are discovered, work shall be halted immediately within 50 feet of the discovery, and the Mendocino County Planning Department shall be immediately notified. At that time, the County will coordinate any necessary investigation and evaluation of the discovery with a qualified archaeologist. If the archaeological resources are Native American, representatives of the appropriate culturally affiliated tribe shall also be enlisted to help evaluate the find and suggest appropriate treatment.

The County shall consult with the archaeologist and agree upon implementation of treatment of the resources that is deemed appropriate and feasible. Such treatment may include avoidance, curation, documentation, excavation, preservation in place, or other appropriate measures.

Level of Significance: Less than significant with mitigation.

Mitigation measures CR-1 would reduce potentially significant impacts on undiscovered archaeological resources to a less-than-significant level by providing a process for evaluation of any unknown resources encountered during construction, and avoidance or data recovery of resources that meet the CEQA definition of historical or unique archaeological resources. This mitigation measure is in accordance with Mendocino County General Plan Policy DE-115.

Impact CR-2: Potential Impacts to Unknown Paleontological Resources.

There are no known unique paleontological resources or geologic features in the project area, however, there is the possibility of unanticipated discovery of paleontological resources during ground-disturbing activities associated with construction of the project. Therefore, implementation of the project could impact significant paleontological resources. Impacts to unknown paleontological resources would be a significant impact.

Mitigation Measure CR-2: Potential Disturbance of Undiscovered Paleontological Resources.

During the course of ground-disturbing activities associated with project construction activities, if any paleontological resources are discovered, work shall be halted immediately within 50 feet of the discovery, and the Mendocino County Planning Department shall be immediately notified. At that time, the County will coordinate any necessary investigation of the discovery with a qualified paleontologist.

The County shall consider the mitigation recommendations of the qualified paleontologist for any unanticipated discoveries of paleontological resources. The County shall consult with the paleontologist and agree upon implementation of a measure(s) that are deemed appropriate and feasible. Such mitigation measures may include avoidance, curation, documentation, excavation, preservation in place, or other appropriate measures.

Level of Significance: Less than significant with mitigation.

Mitigation measures CR-2 would reduce potentially significant impacts on undiscovered paleontological resources to a less-than-significant level by providing a process for evaluation of any unknown resources encountered during construction, and avoidance or data recovery of resources that meet the CEQA definition of unique paleontological resources.

Impact CR-3: Potential Disturbance of Human Remains.

While no evidence exists for the presence of historic or prehistoric burials at the project site, this does not preclude the existence of buried subsurface human remains. If any human remains were unearthed during project construction, particularly those that were determined to be Native American, a potentially significant disturbance of human remains would occur.

Mitigation Measure CR-3: Potential to Uncover Human Remains.

If construction activities result in the discovery of human remains during ground disturbing construction activities, in accordance with California Health and Safety Code Section 7050.5, no further disturbance shall occur until the Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. The Coroner shall be notified of the find immediately and there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the Coroner makes the required determinations regarding the remains. If the human remains are determined to be prehistoric, the Coroner shall notify the NAHC, which shall determine and notify a Most Likely Descendant. The Most Likely Descendant shall complete the inspection of the site within 48 hours of notification and may recommend scientific removal and non-destructive analysis of human remains and items associated with Native American burials.

Level of Significance: Less than significant with mitigation.

Mitigation measures CR-3 would reduce potentially significant impacts on uncovering human remains to a less-than-significant level by providing direction on who to notify in the event human remains are found.

3.5.6 Cumulative Impacts

Impact CR-C-1: Result in Cumulatively Considerable Contribution to Cumulative Impacts Related to Cultural Resources

There are no known cultural resources that would be impacted by the project. As described in this EIR, appropriate studies were undertaken to ensure that cultural resources that could be impacted by the project were identified, and that mitigation measures are put forth that would reduce the impacts to unknown cultural resources to a less-than-significant level. These measures are consistent with Mendocino County General Plan Policy DE-115 and Public Resources Code 7050.5. Therefore, the project’s incremental effect to cultural resources is not cumulatively considerable and would not contribute to any significant impacts to cultural resources that may be caused by other cumulative projects.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

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3.6 Geology and Soils

This section evaluates the potential impacts related to geology and soils. The impacts and mitigation measures section establishes the thresholds of significance, evaluates potential geological impacts, and identifies the significance of impacts. Where appropriate, mitigation is presented to reduce impacts to less-than-significant levels. The potential impacts from construction and operation of a septic tank and leachfield to water quality are discussed in Section 3.9 (Hydrology and Water Quality), and potential impacts to sensitive habitats are discussed in Section 3.4 (Biological Resources).

Since there is no disturbance of the Caspar transfer station site or the Russian Gulch State Park land swap site, they are not included in this analysis.

3.6.1 Setting

Geologic Setting

The site is characterized by relatively flat (two percent to five percent slopes) to gently sloping (five percent to nine percent slopes) terrain. Elevations at the project site range from a low of approximately 400 feet above mean sea level (msl) on the western portion to a high of approximately 430 feet msl at the northeast corner. Surface drainage on the site generally ranges from northwest to southwest. The basement rock in the project area is coastal belt Franciscan complex, composed primarily of greywacke sandstone with shale lenses. Unconformably overlying the Franciscan complex are quaternary marine terrace deposits, including the older Lower Caspar Orchard deposits, which underlie the project site. These marine deposits typically consist of yellowish to light gray, moderately sorted, poorly consolidated, silty to clayey sand with occasional lenses of coarser sand and/or gravel. (LACO 2012)

Soils

Soils at the project site are mapped as Shinglemill-Gibney complex (NRCS 2014). A preliminary geotechnical evaluation (LACO 2012, Appendix E) was conducted for the project site, and test borings (SE-1 through SE-4) encountered primarily medium dense to dense sands (some of which are cemented) generally located below a surficial, highly organic topsoil and “duff” layer of up to about 12 inches-thick. However, a thin (approximately six inches-thick) zone of sandy clay/sandy silt was encountered in one boring at a depth of approximately 21 inches below ground surface (bgs). Organic laden topsoil is unsuitable for support of structures, including pavements; the organic topsoil thicknesses are anticipated to be generally less than approximately 12 inches across the site, although they will likely increase in thickness within low-lying areas.

Soils Suitable for On-site Sewage Disposal

Construction and operation of an on-site sewage disposal system, such as a septic tank and leachfield, require suitable soil and site conditions to ensure sufficient movement and treatment of effluent before wells, surface water, or groundwater are encountered. Ground slope, soil depth, depth to groundwater, and soil percolation are all factors in determining appropriate site conditions. Soil percolation suitability is determined using a Soil Percolation Suitability Chart, which accounts for soil texture, bulk-density, gravel and cobble content. The chart has four soil texture zones to indicate suitability for use in a standard sewage disposal system. Zone 1 soils are coarse (and readily accept effluent), Zone 2 soils are acceptable, Zone 3 soils are marginal, and Zone 4 soils are unacceptable for standard sewage disposal systems. (North Coast RWQCB 1979)

Soils in the area of boring SE-4 fall into the Soil Percolation Suitability Zone 1 (Coarse) and 2B (Acceptable) based on hydrometer testing. In the area of boring SE-4, groundwater was encountered at approximately 10 feet bgs. Soils in the areas of borings SE-1 through SE-3 contained shallow, perched groundwater (i.e., approximately two to five feet bgs) and/or the presence of cemented soils.

Seismicity

The 2007 Working Group on California Earthquake Probabilities has evaluated the probability of one or more earthquakes of magnitude 6.7 or higher occurring in California over the next thirty years (USGS 2008). Five known faults traverse Mendocino County and are considered potentially active or active; the San Andreas Fault, Whale Gulch Fault, Maacama Fault, Round Valley Fault, and Etsel Ridge Fault. Thirty miles northwest and offshore of the County is the Cascadia Subduction Zone, which is capable of generating large earthquakes. The San Andreas Fault is offshore generally to the west of the project site and is capable of generating very strong earthquakes. The last major earthquake on this portion of the San Andreas Fault was the 1906 San Francisco earthquake, which was estimated at a magnitude of 7.9. Associated with the San Andreas Fault is the Whale Gulch Fault, which is located a few miles west of the offshore San Andreas Fault and west of the project area. It is considered to be potentially active. The Maacama Fault, east of the project area, has historically generated only a few moderate earthquakes. However, an abundance of micro-earthquakes (less than magnitude 3) are clearly associated with the fault. The Round Valley Fault traverses the northeastern corner of Mendocino County, east of the project area. The Round Valley Fault has not been found to exhibit activity more recently than 1.6 million years ago, although is considered potentially active. The Etsel Ridge Fault is the easternmost potentially active fault in Mendocino County, which occurs east of the project area and has been classified as potentially active. In addition to the San Andreas and Maacama faults, the Cascadia Subduction Zone is the most significant seismic source and located thirty miles northwest of Mendocino County and offshore. (Mendocino County 2009)

No active faults are known to extend through the project site.

Seismic Hazards

Seismic hazards include those hazards that could reasonably be expected to occur at the project site during a major earthquake on any of the regional faults. Some hazards can be more severe than others, depending on the location, underlying materials, and level of ground shaking.

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude and nature of fault rupture can vary for different faults or even along different strands of the same fault. Surface rupture can damage or collapse buildings, cause severe damage to roads and pavement structures, and cause failure of overhead as well as underground utilities. As a result of the damage, buildings could become uninhabitable, roads could close, and utility service could be disrupted for an undetermined length of time. Ground rupture is typically confined to relatively narrow zones (a few feet to tens of feet wide) and considered more likely along active faults. The project area does not fall within an Alquist-Priolo Fault Rupture Hazard Zone Map, as designated through the Alquist-Priolo Earthquake Fault Zoning Act (CGS 2007). Since surface fault rupture generally follows the trace of pre-existing active faults, the risk of future surface rupture at this site is considered to be low to non-existent (LACO 2012).

Ground Shaking

Earthquakes on the active faults have the capacity to produce a range of ground shaking intensities at the project site. Ground shaking may affect areas hundreds of miles distant from an earthquake's epicenter. Ground motion during an earthquake is described by the parameters of acceleration and velocity as well as the duration of the shaking. A common measure of ground motion is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g)[1]. Moderate earthquake hazard areas are defined as areas with ground accelerations of less than .092g and Violent earthquake hazard areas have ground accelerations of .65g to 1.24g.

The nearest known active fault is the San Andreas fault (Shelter Cove section) located approximately eight miles southwest of the project site; past seismic history suggests that moderate to strong shaking is possible from earthquakes on this and other active faults in the region (LACO 2012). Another fault, the Pacific Star fault, is located approximately 10 miles north of Fort Bragg.

Liquefaction, Lateral Spreading and Subsidence

Liquefaction is a phenomenon whereby unconsolidated and/or near-saturated soils lose cohesion and are converted to a fluid state as a result of severe vibratory motion. The relatively rapid loss of soil shear strength during strong earthquake shaking results in temporary, fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage roads, pipelines, underground cables and buildings with shallow foundations. The CGS has not investigated the project site for potential designation as a Seismic Hazard Zone for liquefaction.

The preliminary geotechnical and engineering evaluation prepared for the project site included geotechnical test borings. The soils encountered at depth in the test borings are generally not considered to be liquefiable during strong ground shaking due to their density, however it is possible that some isolated, thin lenses of loose, saturated sands near the ground may liquefy during severe ground shaking. (LACO 2012)

Lateral spreading refers to landslides that commonly forms on gentle slopes and that have rapid fluid-like flow movement, like water. The project site is characterized by relatively flat to gently sloping terrain. Because the project site has gentle slopes that may be susceptible to liquefaction, project facilities could be susceptible to lateral spreading.

Subsidence (e.g., settlement) is the depression of the bearing soil when a load, such as that of a building or new fill material, is placed upon it. Subsidence could occur if loose, saturated sands near the ground liquefy during severe ground shaking. (LACO 2012)

Geologic Hazards

Slope Failure and Landslides

Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Earthquake motions can induce significant horizontal and vertical dynamic stresses in slopes that can trigger failure. Earthquake-induced landslides can occur in areas with steep slopes that are susceptible to strong ground motion during an earthquake.

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[1] Acceleration of gravity (g) = 980 centimeters per second squared. 1.0g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

The project site is characterized by relatively flat (two percent to five percent slopes) to gently sloping (five percent to nine percent slopes) terrain; therefore, landslide hazards to the planned structures are considered to be low. The nearest slope having a gradient of 25 percent or greater is approximately 200 feet to the southwest of the project site. (LACO 2012)

Expansive Soils

Expansive soils possess a "shrink-swell" characteristic. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Structural damage may occur over a long period of time due to expansive soils, usually the result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils.

The surface and near-surface soils encountered in the test borings at the site are primarily composed of medium dense to dense sands generally located below a surficial, highly organic topsoil and "duff" layer up to approximately 12 inches thick. An approximately six-inch thick zone of sandy clay/sandy silt was encountered in one boring at a depth of approximately 21 inches bgs. Based on laboratory testing this clay/silt soil has a high to very high expansion potential. (LACO 2012)

Soil Erosion

Soil erosion is a process whereby soil materials are worn away and transported to another area, either by wind or water. Areas susceptible to erosion occur where surface soils possess low-density and/or low-strength properties. Slopes are another factor in soil erosion – the greater the slope, the greater the erosion hazard, especially if the soil is bare of vegetation. Most soils present in the County have only a slight erosion hazard at slopes less than 9 percent, except for Redvine soils which have a moderate hazard. Soils on nine percent slopes and greater have a moderate erosion hazard, and soils on slopes greater than 15 percent have a high erosion hazard. (Mendocino County 2009)

The project site is characterized by relatively flat (two percent to five percent slopes) to gently sloping (five percent to nine percent slopes) terrain with Shinglemill-Gibney complex soils (LACO 2012). For this soil type, surface runoff is slow or medium, and the hazard of water erosion is slight to moderate if the surface is left bare (USDA 2006). According to the criteria set by the Mendocino County General Plan, the project site would also have slight to moderate erosion potential. Grading or stockpiling activities during construction could also result in soil erosion.

3.6.2 Regulatory Framework

Federal

There are no federal policies or regulations relevant to the project for geology and soils.

State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the State Geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Because many active faults are complex and consist of more than one branch, each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace.

Title 14 of the California Code of Regulations (CCR), Section 3601(e), defines buildings intended for human occupancy as those that would be inhabited for more than 2,000 hours per year. The proposed project site does not cross an Alquist-Priolo Earthquake Fault Zone (CGS 2007; CDC 2007), and does not include buildings that meet this criterion for human occupancy. Therefore, the provisions of the act do not apply to the project.

Seismic Hazards Mapping Act

Like the Alquist-Priolo Act, the Seismic Hazards Mapping Act of 1990 (Public Resources Code [PRC] Sections 2690 to 2699.6) is intended to reduce damage resulting from earthquakes. While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong groundshaking, liquefaction and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act: the state is charged with identifying and mapping areas at risk of strong groundshaking, liquefaction, landslides, and other corollary hazards, with cities and counties required to regulate development within mapped Seismic Hazard Zones.

Under the California Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development. Specifically, cities and counties are prohibited from issuing development permits for sites within Seismic Hazard Zones until appropriate site-specific geologic and/or geotechnical investigations have been conducted and measures to reduce potential damage have been incorporated into the development plans. The California Geological Survey has not yet evaluated the project site or surrounding area under the Seismic Hazards Mapping Act. Action Item DE-233.2 of the Mendocino County General Plan states, “implement the Seismic Hazards Mapping Act when maps become available for Mendocino County (Public Resources Code, Division 2, Chapter 7.8).”

California Building Code

The State of California provides minimum standards for building design through the California Building Code (CBC). Where no other building codes apply, CBC Chapter 29 regulates excavation, foundations, and retaining walls. The CBC applies to building design and construction in the state and is based on the federal Uniform Building Code (UBC) used widely throughout the country. The CBC has been modified for California conditions with numerous more detailed and/or more stringent regulations. Specific minimum seismic safety and structural design requirements are set forth in CBC Chapter 16. The Code identifies seismic factors that must be considered in structural design. Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, and Appendix Chapter A33 regulates grading activities, including drainage and erosion control, and construction on unstable soils, such as expansive soils and areas subject to liquefaction.

State Earthquake Protection Law (Health and Safety Code, Division 13, Part 3)

This law establishes the requirement that all buildings be designed to resist lateral forces from seismic motion, and allows local governments to enact local requirements to mitigate the risk from existing buildings, such as unreinforced masonry buildings and others not designed in consideration of seismic motion.

Regional and Local

Mendocino County Multi-Hazard Mitigation Plan

The 2008 Mendocino County Multi-Hazard Mitigation Plan (MHMP) is the County's plan to identify and reduce hazards before any type of hazard event occurs. It aims to reduce losses from future disasters. Hazard mitigation is a process in which hazards are identified and profiled, people and facilities at risk are analyzed, and mitigation actions are developed. The purpose of the plan is to implement the mitigation actions, which includes long-term strategies for planning, policy changes, programs, projects, and other activities. The 2013 MHMP is still in draft form and has not yet been adopted.

Mendocino County Code and Division of Environmental Health Regulations

Mendocino County Code Title 9, Chapter 16.8 regulates on-site sewage systems. Title 18 addresses general building and construction practices and provides minimum standards to safeguard lives and property and protect the public health, safety and general welfare. Title 18 requires construction in conformance with the UBC, Uniform Mechanical Code, and Uniform Plumbing Code, among others.

The Mendocino Division of Environmental Health regulates and monitors the proper management of wastes and environmental hazards, and issues permits for on-site sewage systems. The project would be required to obtain a permit from the County for the construction of a septic tank and leachfield or sewage holding tank. Conformance with the Minimum Standards for On-Site Sewage Systems, which sets construction and design requirements, would also be required.

Mendocino County General Plan Goals and Policies

The following are the goals and policies from the *Mendocino County General Plan* that are applicable to the project.

Goal DE-24: (Safety): To reduce, to the extent possible, the risk and exposure of life, property and the environment to hazardous conditions and events such as earthquakes, landslides, wildfires, floods, inundation, energy emergencies, and toxic releases.

Goal DE-27: (Geologic Conditions): To locate and design development in a manner that avoids or is compatible with risk posed by geologic and seismic hazards.

Policy DE-232: All new buildings and structures shall comply with the uniform construction codes and other regulations adopted by the County and State to minimize geologic hazards.

3.6.3 Evaluation Criteria and Significance Thresholds

The project would cause a significant impact related to geology and soils, as defined by the CEQA Guidelines (Appendix G), if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides;
- Result in substantial soil erosion or the loss of topsoil;

- 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;
- 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; or
- 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.

Area of No Project Impact

As explained below, the project would not result in impacts related to portions of two significance criteria identified in Appendix G of the current CEQA Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- **Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?** The project is not located within an active or potentially active fault zone, and is not located within a special studies zone or an Alquist-Priolo Fault Rupture Hazard Zone Map. Therefore, this significance criterion is not applicable to the project and is not discussed further.
- **Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides, or 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 landslides?** The project site is characterized by relatively flat to gently sloping terrain of approximately 2 percent to 9 percent. Landslide hazards to the planned structures are considered to be low (LACO 2012). The nearest slope having a gradient of 25 percent or greater is approximately 200 feet to the southwest of the project site (LACO 2012). Because of the relatively flat terrain, the project is not anticipated to result in on- or off-site landslides, and no impact would occur. Therefore, this significance criterion is not applicable to the project and is not discussed further.

3.6.4 Methodology

The descriptions of geology and soils in this section rely on information gathered from the USGS, the Natural Resources Conservation Service (NRCS), the CGS, and the preliminary geotechnical and engineering evaluation prepared for the project. This section also incorporates previous research and analyses provided in the Mendocino County General Plan and the preliminary geotechnical and engineering evaluation prepared for the project. This information was reviewed to determine relevant information for the EIR analysis. Project improvements are evaluated for their potential to be affected by, or to increase, risks associated with identified geologic and seismic hazards. Appropriate mitigation measures are identified for impacts determined to be significant.

3.6.5 Impacts and Mitigation Measures

Impact GEO-1: Expose People or Structures to Potential Substantial Adverse Effects Involving Strong Seismic Ground Shaking or Seismic-related Ground Failure, including Liquefaction.

Past seismic history suggests that the project area is susceptible to moderate to strong seismic ground shaking (LACO 2012). The project includes reinforced structures that would be at risk of collapse from ground shaking and a groundwater well, sewage treatment system, and road improvements that would be susceptible to damage during strong seismic ground shaking. The soils encountered during test borings at the project site are not considered to be liquefiable (LACO 2012). However, it is possible that some isolated, thin lenses of loose, saturated sands near the ground may liquefy during severe ground shaking, based on the relatively thin lenses of loose sand encountered, which could damage structures, foundations, concrete slabs, asphalt pavement, and utilities (LACO 2012). The impact from liquefaction is considered significant.

Project design would be required to conform to the Mendocino County Building Code, California Building Code, and the State Earthquake Protection Law, which set design criteria for seismic resistant structures and construction in areas with liquefiable soils. Because a design-level geotechnical study has not yet been prepared for the project, the impact related to strong seismic ground shaking or seismic-related ground failure including liquefaction is potentially significant.

Mitigation Measure GEO-1: Conduct a Geotechnical Study and Implement Recommendations.

The County and City shall require a California registered Geotechnical Engineer to conduct a design-level geotechnical study for the project. The geotechnical study shall address all areas of ground disturbance, evaluate seismic hazards, and provide recommendations to mitigate the effects of: strong ground shaking, liquefiable soils, lateral spreading, and subsidence in adherence with applicable design standards, including applicable CBC and Mendocino County Building Code standards for earthquake resistant construction. The seismic criteria shall take into account the active faults that will affect the project site, and ground motions and shaking related to the faults.

The geotechnical study shall also include evaluation of unstable soils in the project area, including areas susceptible to liquefaction or subsidence, and areas containing expansive soils. The study shall provide measures to repair, stabilize, or avoid such soils, and include grading, drainage, paving, and foundation design recommendations such that adherence with current applicable standards for earthquake resistant construction would be achieved. This may include, but would not be limited to, one or more of the following measures (or equivalent measures) to meet the performance standards:

- Maintain wet optimum moisture content of clay soils where the soils will support foundations, concrete slabs, and asphalt concrete pavements, until covered with permanent construction and install moisture barriers.
- Remove organic topsoil from planned structure areas prior to construction.

The project shall be designed and constructed in conformance with the specific recommendations contained in the design-level geotechnical study, including recommendations for grading, ground improvement, foundations, concrete slabs and asphalt concrete pavements. The recommendations made in the geotechnical study shall be incorporated into the final plans and specifications and implemented during construction. Professional inspection of foundation and excavation, earthwork and other geotechnical aspects of site development shall be performed during construction in accordance with the current version of the CBC.

Level of Significance: Less than significant with mitigation.

Mitigation Measure GEO-1 would reduce impacts to a less than significant level by requiring a site specific geotechnical study and design and construction in conformance with applicable design standards that would reduce the risk to life or property during a seismic event.

Impact GEO-2: Result in Substantial Soil Erosion or Loss of Topsoil.

The project site is within a mostly undeveloped, forested parcel in the Jackson Demonstration State Forest (JDSF), and is covered with an approximately 12-inch layer of organic laden topsoil. The project site is relatively flat to gently sloping. The natural erosion rate of the soils present at the project site is slight to moderate (USDA 2006). Grading, earthwork, and stockpiling during construction could result in increased potential for erosion or loss of topsoil on and off-site, which would be a potentially significant impact.

Following construction, stormwater runoff would be managed onsite. As described in Section 3.09, Hydrology and Water Quality, project stormwater conveyance capabilities and capacities would not substantially exceed pre-development conditions. The site is relatively flat and trucks and other vehicles and equipment would utilize designated paved access roads and loading/unloading areas at the proposed Transfer Station site. The potential for erosion or loss of topsoil to occur during operation would be minimal. Therefore, the operational impact from soil erosion would be less than significant.

Mitigation Measure HYD-1: NPDES and Storm Water Pollution Prevention Plan.

(see Section 3.9, Hydrology and Water Quality)

Level of Significance: Less than significant with mitigation.

Mitigation Measure HYD-1 would reduce construction-related impacts to a less than significant level by requiring a Storm Water Pollution Prevention Plan (SWPPP) to be prepared for the project. The SWPPP would include erosion and sediment control measures, such as the use of temporary sediment basins, filter screens, and gravel bags, which would prevent substantial soil erosion during construction.

Impact GEO-3: Be Located on Geologic Unit or Soil that is Unstable, or would become Unstable as a Result of the Project, and Potentially Result in Liquefaction, Lateral Spreading, Subsidence, or Collapse.

The soils encountered during test borings at the project site are generally not considered to be liquefiable, but it is possible that some isolated, thin lenses of loose, saturated sands near the ground may liquefy during severe ground shaking, based on the relatively thin lenses of loose sand encountered (LACO 2012). Because of the potential for liquefaction and the 2 percent to 9 percent slopes present on site, the project site is potentially susceptible to lateral spreading from liquefaction. Subsidence from liquefaction also could occur. Structures could be susceptible to damage or collapse, and other project improvements such as the roadway widening, utilities, or sewage treatment systems could be damaged. Because a design-level geotechnical study has not yet been prepared for the project, the impact would be potentially significant.

Mitigation Measure GEO-1: Conduct a Geotechnical Study and Implement Recommendations

Level of Significance: Less than significant with mitigation.

Mitigation Measure GEO-1 would reduce impacts to a less than significant level by requiring a site-specific geotechnical study for project design and construction to be in conformance with applicable design standards that would reduce the risk to life or property due to unstable soils.

Impact GEO-4: Be Located on Expansive Soil, as Defined in Table 18-1-B of Uniform Building Code (1994), Creating Substantial Risks to Life or Property.

Sandy clay/sandy silt soils encountered in boring SE-3 have a high to very high expansion potential (LACO 2012). Expansive soils can damage structures, foundations and buried utilities. Because only a preliminary geotechnical study was prepared for the project site, the extent of expansive soils present onsite is not known, therefore, the impact from expansive soils would be potentially significant.

There would be no impact related to expansive soils due to closure of the Caspar Transfer Station, including the 25-acre portion associated with the land transfer. At the Caspar Transfer Station, the project would remove all solid waste from the site and operations would cease; no alterations would be made to existing structures. The land transfer would not include any additional development or ground disturbance beyond that included in the proposed project. No impact would occur.

Mitigation Measure GEO-1: Conduct a Geotechnical Study and Implement Recommendations

Level of Significance: Less than significant with mitigation.

Mitigation measure GEO-1 would reduce impacts to a less than significant level by requiring a site-specific geotechnical study and for project design and construction to be in conformance with applicable design standards that would reduce the risk to life or property due to expansive soils.

Impact GEO-5: Have Soils Incapable of Adequately Supporting Use of Septic Tanks or Alternative Waste Water Disposal Systems.

The project includes the option to construct and operate an on-site septic tank and leachfield to treat and manage the wastewater produced at the project site. As an alternative to a septic tank and leachfield, a sewage holding tank could be installed. Construction of the septic tank and leachfield or holding tank would be in accordance with the Mendocino County Division of Environmental Health's Minimum Standards for On-site Sewage Systems standards, including appropriate materials, access ports, and an over flow alarm.

Septic treatment is provided by the soil column beneath the leachfield. The preliminary geotechnical evaluation determined that the site soils in the area of boring SE-4 would accommodate the design and construction of a conventional onsite sewage disposal system (e.g., leachfield area) because these soils fall into Soil Percolation Suitability Zone 1 (Coarse) and 2B (Acceptable) (LACO 2012). The location of boring SE-4 generally coincides with the proposed location for the leachfield, as shown on Figure 2-2, Site Plan.

Construction and operation of on-site sewage systems are regulated through a permit process with the Mendocino County Environmental Health Division. Because the project would be designed in accordance with the Mendocino County standards for on-site sewage systems, and because the project would be required to obtain coverage under the Mendocino County Environmental Health Division permit process, construction and operation of a septic tank and leachfield or sewage holding tank would not occur in an area with soils incapable of adequately supporting the use of septic tanks or alternate waste water disposal systems. Therefore, because of required compliance with existing regulations and because suitable soils for septic systems are present onsite, the impact from the on-site waste water disposal system would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.6.6 Cumulative Impacts

Impact GEO-C-1: Result in Cumulatively Considerable Contribution to Cumulative Impacts Related to Geology and Soils.

The nature of geologic impacts is largely site-specific. Therefore, geologic hazards do not accumulate as impacts on resources do, as indicated in other sections of this EIR. The project would comply with state and local regulations and policies, and mitigation measures GEO-1 and HYD-1 would be implemented to reduce the risk to life and property from these geologic hazards and potential soil erosion. There would be no contribution to a cumulative impact related to geologic impacts.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No impact.

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3.7 Greenhouse Gas Emissions and Energy

This section evaluates the potential impacts related to greenhouse gas (GHG) emissions and energy resources during construction and operation of the project. The impacts and mitigation measures section establishes the thresholds of significance, evaluates GHG and energy impacts, and identifies the significance of impacts. Where appropriate, mitigation measures are presented to reduce impacts to less than significant.

3.7.1 Setting

Gases that trap heat in the atmosphere are referred to as greenhouse gases because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse. The accumulation of GHGs has been implicated as the driving force for global climate change. The primary GHGs are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), ozone (O3), and water vapor (H2O).

While GHGs in the atmosphere are naturally occurring, the emission rate of CO2, CH4 and N2O has been accelerated by human activities. Emissions of CO2 are largely by-products of fossil fuel combustion, whereas CH4 results from off-gassing associated with such as activities as agricultural practices and landfills. Other GHGs include hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride, which are generated during certain industrial processes. GHGs are typically reported in “carbon-dioxide-equivalent” measures (CO2e).

There is international scientific consensus that human-caused increases in GHGs have contributed, and will continue to contribute, to climate change. Potential climate change impacts in California may include, but are not limited to, a decrease in snowpack; sea level rise; and a greater number of extreme heat days per year, high ozone days, large forest fires, and drought years. Secondary effects are likely to include impacts on agriculture, changes in disease vectors, and changes in habitat and biodiversity.

The Environmental Protection Agency (EPA) reports U.S. GHG emissions for 2011 as 6,702 million metric tons of CO2e (MMT CO2e). Electricity production accounts for 33 percent, followed by the transportation sector at 28 percent and the industrial sector at 20 percent. Commercial and residential fuel use and the agricultural sector accounted for the remaining 19 percent (U.S. EPA 2013).

The California Air Resources Board (CARB) estimated that in 2011 California produced about 448 MMT CO2e. The transportation sector was the highest source at 38 percent of the State’s total GHGs, followed by the industrial sector at 22 percent, and electricity generation (both in-state and out-of-state) at 19 percent. Commercial and residential fuel use, recycling and waste, high global warming potential, and agricultural sectors accounted for the remaining 21 percent of the State’s total GHGs (CARB 2013).

3.7.2 Regulatory Framework

Federal

There are no federal regulations that apply to this type of project as related to GHG emissions.

State

In 2006, the Governor signed AB32, the “Global Warming Solutions Act of 2006,” committing the State of California to reducing GHG emissions to 1990 levels by 2020. The statute requires CARB to track emissions through mandatory reporting, determine the 1990 emission levels, set annual emissions limits that will result in meeting the 2020 target, and design and implement regulations and other feasible and cost effective measures to ensure that statewide GHG emissions will be reduced to 1990 levels by 2020.

In December 2007, CARB approved the 2020 emissions limit at 427 MMT CO2e. Projected business-as-usual emissions for 2020 are 507 MMT CO2e. Therefore, a reduction of 80 MMT CO2e is needed to meet the goal (CARB 2012).

In December 2008, pursuant to AB 32, CARB adopted the *Climate Change Scoping Plan*, which outlined measures to attain the 2020 greenhouse gas emissions limit. The Climate Change Scoping Plan estimated that implementation of identified measures would result in a reduction of 105.3 MMT CO2e from various sectors including transportation, energy, forestry, and high global warming potential gas sectors (originally reported as 174 MMT CO2e, but updated to 105.3 MMT CO2e in the Status of Scoping Plan Recommended Measures found at the CARB website). This is 24 percent more than is needed to meet the 2020 mandate.

In May 2014, CARB released the *First Update to the Climate Change Scoping Plan* which describes the progress made to meet the near-term (2020) objectives of AB 32 and defines California's climate change priorities and activities for the next several years (CARB 2014). The Plan also updated the 2020 emissions limit and business-as-usual emissions for 2020. The 2020 limit is now 431 MMT CO2e and the business-as-usual forecast is 509 MMT CO2e. Finally, the plan provides recommendations for establishing a mid-term emissions limit that aligns with the long-term reduction goals of Executive Order S-3-05 (signed by then Governor Schwarzenegger, EO S-3-05 establishes GHG reduction targets for 2050). The recommendations cover the Energy, Transportation, Agriculture, Water, Waste Management, Natural and Working Lands, Short-lived Climate Pollutants, Green Building, and Cap-and-Trade sectors.

With regard to forest lands in California, the initial Scoping Plan included a target to maintain net carbon sequestration. This was to be achieved using the mechanisms provided by the Forest Practice Rules, timberland conversion regulations, fire safety requirements, forest improvement assistance programs, and CEQA. The *First Update Climate Change Scoping Plan* acknowledges the complexities of measuring forest land as a carbon sink as well as a biogenic source of GHG emissions. Consequently the Board of Forestry and Fire Protection has been evaluating the adequacy of existing forest regulations and programs for achieving GHG emission reductions and ensuring carbon sequestration on forest lands. As part of the next steps for Natural and Working Lands (referred to as Forest Lands in the initial Scoping Plan) sector, the California Natural Resources Agency and CalEPA are to convene an inter-agency forest climate workgroup to prepare and publish a "Forest Carbon Plan" to set quantitative targets for net forest carbon storage, identify actions to meet the targets, evaluate GHG emissions and carbon sequestration trends, and develop recommendations regarding funding actions.

Regional and Local

Mendocino County Air Quality Management District (MCAQMD)

The MCAQMD has not adopted regulations regarding the evaluation of GHG emissions in a CEQA document. However, MCAQMD recommends using 1,100 metric tons per year for land use based projects in accordance with the BAAQMD thresholds (MCAQMD 2014).

Fort Bragg Climate Action Plan (CAP)

The City of Fort Bragg has voluntary GHG emission reduction goals for the City and community of 30 percent and 15 percent, respectively, by 2020. In 2012, the City adopted a CAP that includes projects and strategies that, once implemented, will meet the City's reduction goals. The strategies include a variety of changes in operations, purchasing, technology, policy, and behavior at the municipal level, and the implementation of education programs, regulation, and incentives at the community level. Under the category "Proposed Measures - Waste Reduction" is a strategy to establish a coastal solid waste transfer station. The purpose of the coastal solid waste transfer station, as identified in the CAP, would be to reduce the transportation costs and GHG emissions associated with transportation of solid waste and to improve opportunities for local recycling and reuse (Fort Bragg 2012).

Mendocino County General Plan Goals and Policies

The following is the policy from the *Mendocino County General Plan* that is applicable to the project.

Policy RM-50: Mendocino County acknowledges the real challenge of climate change and will implement existing strategies to reduce greenhouse gas emissions and incorporate future measures that the State adopts in the coming years.

3.7.3 Evaluation Criteria and Significance Thresholds

The project would cause a significant impact related to GHG emissions, as defined by the CEQA Guidelines (Appendix G), if it would:

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

There is currently no applicable federal, State, or local significance thresholds pertaining to construction activities. Therefore, the analysis of construction-related GHG emissions uses a qualitative approach in accordance with Section 15064.4(a)(2) of the CEQA Guidelines.

For operation, generation of GHG emissions would be considered significant if operation of the project would create more than 1,100 metric tons of CO2 per year. For determining a conflict with an applicable plan, the Project is evaluated for its compliance with the State's *First Update Climate Change Scoping Plan* (the implementing tool of AB 32) and the *City of Fort Bragg Draft Climate Action Plan* as the two plans adopted for the purpose of reducing GHG emissions which also are applicable to the project area. There are no County-level plans that have been adopted for the purpose of reducing GHG emissions.

Areas of No Project Impact

The project would not result in impacts related to Appendix F Energy Conservation of the current CEQA Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- **Use of energy in an inefficient manner.** Although operation of the proposed project would consume energy, the increased efficiencies achieved by reducing the number of vehicle miles traveled by transfer trailers, collection trucks, and self-haul vehicles would substantially offset the energy consumption associated with on-site operations. Overall VMT would be reduced by 272,271 miles (refer to Table 3.7-1). The proposed project would improve energy efficiency of off-site mobile sources, thus creating a beneficial impact to energy consumption.

3.7.4 Methodology

The GHG emissions impact analysis considers construction and operational impacts associated with the proposed project. Operation period GHG emissions were modelled using the latest version of the California Emissions Estimator Model, CalEEMod (Version 2013.2.2). Construction impacts are analysed qualitatively.

Project operation was assumed to produce emissions from worker commute vehicles and use of energy for the on-site facilities (building, lighting, etc.). Emissions from off-road equipment (one crane, one forklift, and one rubber-tired loader) used to process material on site, was assumed to be neutral for the purposes of calculating GHG emissions. This is because the same amount of material would be processed under the project as existing conditions, just relocated to a different site. Therefore, emissions from off-road equipment are not included in the calculations in this analysis. CalEEMod was used to compute operational emissions from worker commute vehicles and on-site facilities.

Traffic emissions associated with operation of the facility were computed using the EMFAC2011 model developed by the CARB. This included modelling of self-haul vehicles, franchise hauling trucks, and use of large trucks to transfer material to Willits. Self-haul vehicles were assumed to be a mix of light-duty trucks, medium-duty trucks, and light heavy duty trucks, consistent with the vehicle miles traveled distribution computed by EMFAC2011. Current haul trucks were assumed to consist of diesel-powered T6 heavy duty trucks. New project haul trips were assumed to be made by larger T7 heavy duty trucks. The franchise haul trucks were assumed to be solid waste collection trucks.

The mobile emissions from the self-haul vehicles, franchise trucks, and solid waste transfer trucks are based on the net projected change in vehicle miles traveled (VMT) combined with the emissions rates computed using EMFAC2011(results shown in Appendix C). Changes to VMT are based on different vehicle travel characteristics for the existing conditions (self-haul to Caspar, and transfer of materials from the Pudding Creek, Albion, and Caspar sites to the Willits Transfer Station) and the project scenario where all self-haul materials and collected solid waste are brought to the proposed Central Coast Transfer Station, then transported to a landfill in larger trucks. The VMT calculations are shown in Table 3.7-1. The emission rates from EMFAC2011 are based on Mendocino County default annual conditions, aggregate year of 2016 and an average travel speed of 30 miles per hour.

Table 3.7-1 Annual Vehicle Miles Traveled – Existing and Project Conditions

Existing Conditions	Existing Annual Mileage	Project Conditions	Project Annual Mileage	Net Difference
Self-haul to Caspar	289,952	Self-haul to CCTS	127,920	(162,032)
Collection Trucks to Pudding Creek[1]	--	Collection Trucks to CCTS	19,656	19,656
Solid Waste Transfer from Pudding Creek to Willits Transfer Station[2]	254,030	Solid Waste Transfer from CCTS Site up to Willits Transfer Station	124,384	(129,646)
Recyclables & Green Waste from Caspar	--	Recyclables & Green Waste from CCTS	--	(5,096)
Albion to Willits Transfer Station[4]	3,110	Albion up to Willits Transfer Station via CCTS[3]	957	(2,153)
TOTAL				**(279,271)**

Source: MSWMA, Central Coast Transfer Station Project – Vehicle Miles Traveled, 2014

1. Existing mileage does not change as collection trucks would continue to start and end their routes at the Pudding Creek facility, under the project. The Project would require additional miles to deliver waste to the CCTS site.
2. In addition to the travel route being reconfigured under the project, trips would be reduced because larger haul trucks would be used. Trips would be reduced from 3,588 to 2,080 per year.
3. The mileage reduction comes from shifting the starting point of the delivery route from Caspar to the proposed Central Coast Transfer Station.
4. Savings in miles due to consolidation of Albion waste at Central Coast Transfer Station instead of separate haul to Willits Transfer Station.

3.7.5 Impacts and Mitigation Measures

Impact GG-1: Generate Greenhouse Gas Emissions that may have Significant Impact on Environment.

Construction activities would result in a temporary (approximately 6 months) increase in GHG emissions, including exhaust emissions from on-road haul trucks, worker commute vehicles, and off-road heavy duty equipment. Project emissions during construction would not be a considerable contribution to the cumulative GHG impact, given that construction would be temporary and would require standard clearing, earthmoving, hauling, and delivery equipment, as used for similar projects, and which have been accounted for in the State's emission inventory and reduction strategy outlined in the Scoping Plan. The impact from construction GHG emissions would be less than significant. Although no mitigation is required to reduce construction related GHG impacts, it is noted that in Section 3.3, Air Quality and Odor, Mitigation Measure AQ-1 Air Quality Control Measures during Construction also would assist in reducing GHG emissions with implementation of the reduced idling times and proper maintenance of construction vehicles.

Operation of the project would generate a net reduction of 139.97 metric tons per year of GHG emissions (refer to Table 3.7-2). Although on-site emissions would be 89.55 metric tons per year, this would be more than off-set by the reduction in emissions that would result from the reduction in VMT. Therefore, there would be no impact to GHG emissions. In fact, implementation of the project is considered to have a beneficial impact to GHG emissions.

Table 3.7-2 Annual Operational Greenhouse Gas Emissions

	Metric Tons per Year
On-site (buildings, worker trips)	89.55
Mobile (self-haul, franchise trucks, etc.)	(229.52)
Total	(139.97)

Source: EMFAC2011 (see Appendix C)

Mitigation Measures: No mitigation is necessary.

Level of Significance: Beneficial Impact.

Impact GG-2: Conflict with Applicable Plan, Policy, or Regulation Adopted for Purpose of Reducing Emissions of Greenhouse Gases.

This section evaluates the Project's potential to conflict with the *First Update Climate Change Scoping Plan* and the *Fort Bragg Climate Action Plan*.

First Update Climate Change Scoping Plan

The recommended next steps in the *First Update Climate Change Scoping Plan* are broad policy and regulatory initiatives that will be implemented at the State level and, in general, do not relate to the construction and operation of an individual project such as the Central Coast Transfer Station. Although project construction may benefit from implementation of some of the state-level regulations and policies, such as the Phase 2 heavy-duty truck GHG standards proposed to be implemented within the transportation sector, the project would not impede the state in implementing the policies. Project operation would not impede the state in implementing state policies related to forest lands and the preparation of the "Forest Carbon Plan" as called for in the *First Update Climate Change Scoping Plan.*

At this time it is not possible to determine if the project would conflict with the proposed Forest Carbon Plan, as it has not yet been adopted and it is not known what targets or recommendations might be included. The initial Scoping Plan indicated that maintaining net carbon sequestration was to be achieved using the mechanisms provided by the Forest Practice Rules, timberland conversion regulations, and CEQA. As noted in Chapter 2, Project Description, approvals for the project include a Timberland Conversion Permit, including preparing of a Timberland Conversion Plan, and preparation and approval of a Timber Harvest Plan. In issuing these approvals for the project, the California Department of Forestry & Fire Protection will verify the project complies with the timberland conversion regulations.

The project would not conflict or impede the state from implementing the broad policy and regulatory initiatives, and would comply with timberland conversion regulations, therefore, no impact would occur.

Fort Bragg Climate Action Plan

As noted in the setting section, the *Fort Bragg Climate Action Plan* includes a strategy to establish a coastal solid waste transfer station to reduce the transportation GHG emissions associated with transportation of solid waste and to improve opportunities for local recycling and reuse. Implementation of the project would fulfil this strategy. Therefore, the project would not conflict with the *Fort Bragg Climate Action Plan* and, in fact, would help to implement the CAP.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No Impact.

3.7.6 Cumulative Impacts

Impact GG-C-1: Result in Cumulatively Considerable Contribution to a Significant Cumulative Impact Relative to Greenhouse Gas Emissions.

GHG emissions, by their nature, represent a cumulative impact. No single project could generate enough GHG emissions to noticeably change the global average temperature. Instead, GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. Therefore, the project analysis presented above also represents the cumulative analysis for impacts from GHG emissions.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Beneficial Impact.

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3.8 Hazards and Hazardous Materials

This section evaluates the potential impacts related to hazards and hazardous materials during construction and operation of the project. This section is based in part on information from the Environmental Data Resources (EDR) report for the project site (reference Appendix F). This section describes the hazards and hazardous materials setting for the project and Caspar sites and the impacts and mitigation measures section establishes the thresholds of significance, evaluates potential hazard and hazardous material impacts, and identifies the significance of impacts. Where appropriate, mitigation is presented to reduce impacts to less than significant levels.

3.8.1 Setting

The Caspar self-haul transfer station prohibits any hazardous waste except for a limited number of recyclable household hazardous waste items that are typically generated by residences.

Definition of Hazardous Materials

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, State, or local agency, or if it has characteristics defined as hazardous by such an agency. Factors that influence the health effects of exposure to hazardous materials include the dose to which the person is exposed, the frequency of exposure, the exposure pathway, and individual susceptibility.

The California Code of Regulations (CCR) defines a hazardous material as a substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either: (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed (CCR, Title 22, Division 4.5, Chapter 10, Article 2, Section 66260.10). Hazardous materials are classified according to four properties: toxicity, ignitability, corrosivity, and reactivity (CCR, Title 22, Chapter 11, Article 3), which are defined in the CCR, Title 22, Sections 66261.20-66261.24.

Potential Receptors/Exposure

The sensitivity of potential receptors in the areas of known or potential hazardous materials contamination is dependent on several factors, the primary factor being an individual's potential pathway for exposure. Exposure pathways include external exposure, inhalation, and ingestion of tainted air, water, or food. The magnitude, frequency, and duration of human exposure can cause a variety of health affects ranging from short-term acute symptoms or long term chronic effects. Potential health effects from exposure can be evaluated in a health risk assessment. The principle elements of exposure assessments typically include:

- Evaluation of the fate and transport processes for hazardous materials at a given site;
- Identification of potential exposure pathways;
- Identification of potential exposure scenarios;
- Calculation of representative chemical concentrations;
- Estimation of potential chemical uptake.

Schools and residences are examples of sensitive receptors that could be susceptible to significant effects from exposure to hazardous materials. There are no schools within 0.25 mile of the project site. The closest school to the project site is Fort Bragg High School which is 2.3 miles northwest of the project site. The closest residences to the project site are approximately 375 feet to the west of the project site's western boundary, and approximately 600 feet west of the operational facilities of the project. There are also a few residences southeast of the project site, south of SR 20, which are less than 800 feet from the operational facilities of the project and 150 feet from the property line. The potential exposure of workers, contamination of soils and groundwater, and transportation-related hazards are discussed below.

Fire Hazards

Fire protection in Mendocino County is provided by local districts, cities, and CalFire. The project site is within the Fort Bragg Rural Fire Protection District. CalFire identifies fire hazard severity zones in State Responsibility Areas (SRA) throughout California. The project site is located in a very high fire hazard severity zone (CalFire 2007). The County of Mendocino Office of Emergency Services coordinates emergency response in Mendocino County through the Fire and Rescue Mutual Aid Coordinator. The Fire and Rescue Mutual Aid Coordinator functions within the California Fire Service and Rescue Emergency Mutual Aid System (PMC 2009).

Airports

The closest public airport in the project vicinity is the Little River Airport in Little River, approximately 10.5 aerial miles due south of the project site. The nearest private airport to the project is the Fort Bragg Airport, located approximately 4.7 aerial miles northwest of the project site. Permission is required prior to landing.

3.8.2 Regulatory Framework

Hazardous materials and hazardous wastes are subject to numerous federal, State, and local laws and regulations intended to protect public health and safety and the environment. The U.S. Environmental Protection Agency (U.S. EPA), U.S. Department of Transportation (DOT), California Environmental Protection Agency (Cal/EPA), and Department of Toxic Substances Control (DTSC) are the primary agencies that enforce these regulations. The main focus of the federal Occupational Safety and Health Administration (Fed/OSHA) and California Occupational Safety and Health Administration (Cal/OSHA) are to prevent work-related injuries and illnesses, including those from exposures to hazardous materials. CalFire implements fire safety regulations. In accordance with Chapter 6.11 of the California Health and Safety Code (CHSC, Section 25404, et seq.), local regulatory agencies enforce many federal and state regulatory programs through the Certified Unified Program Agency (CUPA) program, including:

- State Uniform Fire Code requirements (Section 80.103 of the Uniform Fire Code as adopted by the State Fire Marshal pursuant to Health and Safety Code Section 13143.9);
- Underground storage tanks (Chapter 6.7 of the Health and Safety Code, Sections 25280 et seq.).

The CUPA for Mendocino County is the Mendocino County Environmental Health Department.

Federal

The primary federal agencies with responsibility for hazardous materials management include the US EPA, US Department of Labor Occupational Safety and Health Administration (Fed/OSHA), and the DOT. Federal laws, regulations, and responsible agencies relevant to the project are summarized in Table 3.8-1.

State and local agencies often have either parallel or more stringent regulations than federal agencies. In most cases, State law mirrors or overlaps federal law and enforcement of these laws is the responsibility of the State or of a local agency to which enforcement powers are delegated. For these reasons, the requirements of the law and its enforcement are discussed under either the State or local regulatory section.

Table 3.8-1 Federal Laws and Regulations Related to Hazardous Materials Management

Classification	Law or Responsible Federal Agency	Description
Hazardous Materials Management and Soil and Groundwater Contamination	Community Right-to-Know Act of 1986 (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA)	Imposes requirements to ensure that hazardous materials are properly handled, used, stored, and disposed of and to prevent or mitigate injury to human health or the environment in the event that such materials are accidentally released.
	Comprehensive Environmental Response, Compensation and Liability Act of 1980 (amended by SARA 1986 and Brownfields Amendments 2002)	Regulates the cleanup of sites contaminated by releases of hazardous substances.
Hazardous Materials Transportation and Handling	U.S. Department of Transportation	Has the regulatory responsibility for the safe transportation of hazardous materials. The DOT regulations govern all means of transportation except packages shipped by mail (49 CFR).
Occupational Safety	Occupational Safety and Health Act of 1970	Fed/OSHA sets standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries (29 CFR).

State

Soil and Groundwater Contamination

The cleanup of sites contaminated by releases of hazardous substances is regulated primarily by the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), which was amended by the Superfund Amendment and Reauthorization Act of 1986 (SARA), the Brownfields Amendments (2002) and by similar State laws. Under CERCLA, the EPA has authority to seek the parties responsible for releasing hazardous substances and to ensure their cooperation in site remediation. CERCLA provides a defense to CERCLA liability, for those persons who could demonstrate, among other requirements, that they ‘‘did not know and had no reason to know’’ prior to purchasing a property that any hazardous substance that is the subject of a release or threatened release was disposed of on, in, or at the property. Such persons, to demonstrate that they had ‘‘no reason to know’’ must have undertaken, prior to, or on the date of acquisition of the property, ‘‘all appropriate inquiries’’ (AAI) into the previous ownership and uses of the property consistent with good commercial or customary standards and practices (EPA 2005). Among the required inquiries is the provision to comply with land use restrictions established or relied on in connection with a response action (EPA 2005). CERCLA also provides federal funding (the "Superfund") for remediation. SARA Title III, the Emergency Planning and Community Right-to-Know Act, requires companies to declare potential toxic hazards to ensure that local communities can plan for chemical emergencies.

The State's Hazardous Waste and Substances Sites List (Cortese List, Government Code Section 65962.5) identifies sites with leaking underground fuel tanks, hazardous waste facilities subject to corrective actions, solid waste disposal facilities from which there is a known migration of hazardous waste, and other sites where environmental releases have occurred. Before a local agency accepts an application as complete for any development project, the applicant must certify whether or not the project site is in the Cortese List. Databases that provide information regarding the facilities or sites identified as meeting Cortese List requirements are managed by the DTSC and SWRCB. At sites where contamination is suspected or known to have occurred, the site owner is required to perform a site investigation and conduct site remediation, if necessary. There are two clean-up standards; one for residential and the other for commercial/industrial land uses. Standards are set for soil, groundwater, soil gas, and vapor intrusion of contaminants into buildings.

Hazardous Materials Transportation

The State of California has adopted DOT regulations for the intrastate movement of hazardous materials. State regulations are contained in Title 26 of the CCR. In addition, the State of California regulates the transportation of hazardous waste originating in the state and passing through the state. Both regulatory programs apply in California. The two State agencies that have primary responsibility for enforcing federal and State regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol (CHP) and the Caltrans.

Occupational Safety

Worker health and safety is regulated at the federal level by the U.S. Department of Labor, Fed/OSHA. Under this jurisdiction, workers at hazardous waste sites (or workers coming into contact with hazardous wastes that might be encountered during excavation of contaminated soils) must receive specialized training and medical supervision according to the Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations. Worker health and safety in California is regulated by Cal/OSHA. California standards for workers dealing with hazardous materials (including hazardous wastes) are contained in CCR Title 8. DTSC and the State Department of Occupational Health and Safety are the agencies that are responsible for overseeing that appropriate measures are taken to protect workers from exposure to potential soiled groundwater contaminants. At sites known or suspected to have soil or groundwater contamination, a site health and safety plan must be prepared and generally require approval by the CUPA. The health and safety plan establishes policies and procedures to protect workers and the public from exposure to potential hazards at the contaminated site.

Hazardous Materials Release Response Plans and Inventory Act of 1985

The California Hazardous Materials Release Response Plans and Inventory Act of 1985 (Business Plan Act) requires preparation of Hazardous Materials Business Plans and disclosure of hazardous materials inventories. A business plan includes information such as an inventory of hazardous materials handled, facility floor plans showing where hazardous materials are stored, an emergency response plan, and provisions for employee training in safety and emergency response procedures (California Health and Safety Code, Division 20, Chapter 6.95, Article 1). Statewide, Cal/EPA and DTSC have primary regulatory responsibility for management of hazardous materials, with delegation of authority to local jurisdictions that enter into agreements with the state.

Emergency Response

California has developed an emergency response plan to coordinate emergency services provided by federal, State, and local government, and private agencies. Responding to hazardous materials incidents is a part of this plan. The plan is administered by the State Office of Emergency Services (OES), which coordinates the responses of other agencies such as local fire and police agencies, emergency medical providers, CHP, the CDFW, and Caltrans.

Mendocino County has adopted a Multi-Hazard Mitigation Plan (MHMP) and Emergency Operations Plan (EOP) as identified below.

Risk of Fires

The California PRC sets forth fire safety regulations that include the following:

- Earthmoving and portable equipment with internal combustion engines must be equipped with a spark arrestor to reduce the potential for igniting a wildland fire (PRC Section 4442).
- Appropriate fire suppression equipment must be maintained during the highest fire danger period – from April 1 to December 1 (PRC Section 4428).
- On days when a burning permit is required, flammable materials must be removed to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor would maintain the appropriate fire suppression equipment (PRC Section 4427).
- On days when a burning permit is required, portable tools powered by gasoline-fueled internal combustion engines must not be used within 25 feet of any flammable materials (PRC Section 4431).

Regional and Local

Mendocino County Multi-Hazard Mitigation Plan

The 2008 MHMP is the County's plan to identify and reduce hazards before any type of hazard event occurs. It aims to reduce losses from future disasters such as dam failure, earthquakes, floods, hazardous materials events, landslides, tsunamis, urban conflagration, and wildland fire. The MHMP also includes a vulnerability analysis and identifying mitigation actions. The 2013 MHMP is still in draft form as of December, 2014.

Mendocino County Emergency Operations Plan

The Mendocino County EOP identifies emergency planning, organization, policies, procedures, and response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies. The plan also addresses integration and coordination with other governmental levels when required. The EOP accomplishes the following:

- Establishes the emergency management organization required to mitigate any significant emergency or disaster affecting the emergency operational area.
- Identifies the responsibilities, policies and procedures required to protect the health and safety of the population, public and private property, and the environmental effects of natural and technological emergencies and disasters.
- Establishes the operational concepts and procedures associated with field response to emergencies, County Emergency Operations Center (EOC) activities, and the recovery process.

Mendocino County General Plan Goals and Policies

The following goals and policies from the Mendocino County General Plan most relevant to the proposed project are as follows:

Goal DE-20 (Solid Waste): To reduce risks to human and environmental health posed by solid, hazardous and toxic materials and wastes.

Goal DE-24 (Safety): To reduce, to the extent possible, the risk and exposure of life, property and the environment to hazardous conditions and events such as earthquakes, landslides, wildfires, floods, inundation, energy emergencies, and toxic releases.

Policy DE-203: All development projects shall include plans and facilities to store and manage solid waste and hazardous materials and wastes in a safe and environmentally sound manner.

Policy DE-208: Land uses, densities and intensities shall be designed to reduce human risk and exposure to hazardous conditions and events.

Policy DE-209: Locate and design critical infrastructure to withstand and operate during hazard events and subsequent recovery phases. Standards and policies include:

- Generally prohibit the construction of public or private structures designed for emergency services or public safety in areas of unacceptable risk, which shall be defined as any location at which an incident capable of either causing the facility to become inoperable has a likelihood of more than 1/1,000,000 per year.
- Facilities and structures owned or used by public entities should be designed or retrofitted, used, and occupied consistent with Uniform Building Code requirements to protect life and property from hazards.

Policy DE-210: Development shall not hinder the maintenance and use of routes and sites critical to evacuation, emergency operations and recovery.

Policy DE-213: Development, densities, intensities and type shall be consistent with the state wildfire hazard rating system and Fire Safe Guidelines (addressing weather, fuel and slope, access, water and other factors).

3.8.3 Evaluation Criteria and Significance Thresholds

Based on Appendix G of the CEQA Guidelines, a hazards or hazardous materials impact is considered significant if implementation of the proposed project would do any of the following:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- 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;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- 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;
- 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;
- 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;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Areas of No Project Impact

As explained below, construction and operation of the project would not result in impacts related to four of the significance criteria identified in Appendix G of the current CEQA Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- **Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.** No schools are located within one-quarter mile of the project site or Caspar site. The closest school to the project site is the Fort Bragg High School which is located approximately 2.3 miles northwest of the proposed Central Coast Transfer Station site. Fort Bragg High School is approximately 6.9 miles north of the Caspar site. There are no schools within one-quarter mile of the project site. Therefore, the project's effects on schools will not be evaluated further in this Draft EIR.
- **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.** The State's Hazardous Waste and Substances Sites List (Cortese List, Government Code Section 65962.5) identifies sites with leaking underground fuel tanks, hazardous waste facilities subject to corrective actions, solid waste disposal facilities from which there is a known migration of hazardous waste, and other

sites where environmental releases have occurred. According to the list, and the EDR Report prepared for the project, the nearest listed site is the Georgia-Pacific Corporation site at 90 West Redwood Avenue in Fort Bragg (CalEPA 2012). This site is approximately 3.5 air miles northwest of the proposed Central Coast Transfer Station site and approximately nine air miles north of the Caspar site. The Caspar Landfill is closed and is not on the Cortese list. Therefore this significance criterion is not applicable to the proposed project and is not discussed further in this Draft EIR.

- **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.** The proposed project site and the Caspar site are not located within an airport land use plan or within two miles of a public airport. Therefore this significance criterion is not applicable to the proposed project and is not discussed further in this Draft EIR.
- **Within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area.** The proposed project site and Caspar site are not located within the vicinity of a private airstrip. Therefore this significance criterion is not applicable to the proposed project and is not discussed further in this Draft EIR.

3.8.4 Methodology

This analysis considers the range and nature of foreseeable hazardous materials use, storage, and disposal resulting from the proposed project and identifies the primary ways that these hazardous materials could expose the environment or individuals to health and safety risks. Local and State agencies would be expected to continue to enforce applicable regulations to the extent that they currently do.

The following reports were used in the analysis of hazardous conditions at the project site:

- Site plan for the proposed project;
- Available literature, including documents published by County, State and federal agencies;
- Applicable elements from the Mendocino County General Plan;
- The Mendocino Coast Recreation and Park District Golf Course Project Draft EIR;
- *Preliminary Geotechnical and Engineering Evaluation Proposed Solid Waste Transfer Station* (LACO 2012).

The information obtained from these sources was reviewed and summarized to establish existing conditions and to identify potential environmental effects, based on the significance thresholds in this section. In determining the level of significance, the analysis assumes that construction and operation of the project would comply with federal, State, and local ordinances and regulations.

3.8.5 Impacts and Mitigation Measures

Impact HAZ-1: Create Significant Hazard through Routine Transport, Use, or Disposal of Hazardous Materials.

Used motor oil and used antifreeze would be collected in secure tanks with secondary containment (reference Figure 2-2 #2, #3). Secondary containment regulations are designed and issued to prevent hazardous liquids from discharging into the surrounding land if a leak or spill occurs. Other recyclable household hazardous waste items, including electronics, fluorescent lights, and batteries, would be collected in secure containment areas (reference Figure 2-2 #6). All other hazardous wastes would be prohibited at the facility and customers would be referred to the periodic HazMobile household and small business hazardous waste mobile collection system. The gate attendant would routinely inspect incoming loads for any prohibited hazardous waste items and prohibit the customer from depositing them with trash, and instead refer the customer to the periodic HazMobile household hazardous waste collection events. If any prohibited hazardous waste items are discovered on the tipping floor of the facility, they would be removed by facility employees to a secure hazardous waste locker for later removal by HazMobile technicians (see further details under "operation" below). Numerous laws and regulations ensure the safe transportation, use, storage, and disposal of hazardous materials (see Section 3.8.2, Regulatory Framework). Caltrans and the CHP regulate the transportation of hazardous materials and wastes, including container types and packaging requirements, and licensing and training for truck operators, chemical handlers, and hazardous waste haulers. Worker safety regulations cover hazards related to the prevention of exposure to hazardous materials and a release to the environment from hazardous materials use. Cal-OSHA also enforces hazard communication program regulations, which contain worker safety training and hazard information requirements, such as procedures for identifying and labelling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees. Because hazardous materials brought to, and stored at, and then removed from the site would follow existing regulations for the safe transportation, storage, and disposal of hazardous materials the impact from exposure to people or the environment during operation of the proposed Central Coast Transfer Station would be less than significant with the preparation of a Hazardous Materials Business Plan per the Business Plan Act per Mitigation Measure HAZ-1 below.

Construction of the project would involve site grading, excavation, trenching, backfilling, and the construction of facilities that could result in the exposure of construction workers and residents in the project area to routine hazardous materials used in construction including chemicals, contaminated debris, petroleum hydrocarbons, and other hazardous substances that could be inadvertently spilled or otherwise spread. The site is undeveloped forest land and is not known to contain any contaminated soils. The EDR report (Appendix F) prepared for the project did not identify any hazardous materials mapped sites at the project site.

Because the project site is undeveloped forest land, no hazardous sites are in the project vicinity. The operator and its contractors would be required to comply with existing and future hazardous materials laws and regulations covering the transport, use, and disposal of hazardous materials. The impacts associated with the potential to create a significant hazard to the public or the environment during construction of the proposed project would be less than significant.

There are potential hazardous materials at the Caspar site due to unloaded materials from self-haul vehicles; however, prior to ceasing operation at the Caspar Site, hazardous materials would be removed in accordance with existing laws and regulations regarding the removal, transport, and disposal of hazardous materials. The impact from exposure to people or the environment from the removal of hazardous materials at the Caspar Site would be less than significant.

Mitigation Measure HAZ-1: Prepare Hazardous Materials Business Plan.

The MSWMA shall ensure that the owner/operator of the facility prepare a Hazardous Materials Business Plan prior to operations pursuant to the Business Plan Act. The Hazardous Materials Business would include, but not be limited to, an inventory of hazardous materials handled, facility floor plans showing where hazardous materials are stored, an emergency response plan, and provisions for employee training in safety and emergency response procedures. In addition, the

Hazardous Materials Business Plan would also include a Spill Prevention Plan. The Spill Prevention Plan would include, but not be limited to, restrictions and procedures for fuel storage location, fueling activities, regular equipment maintenance, and training and lines of communication to facilitate the prevention, response, containment, and cleanup of spills during construction activities would also outlined.

Level of Significance: Less than significant with mitigation.

Mitigation Measure HAZ-1 would reduce potentially significant impacts associated with hazardous materials handling, storage, and emergency response to a less-than-significant level.

Impact HAZ-2: Create Significant Hazard Through Reasonably Foreseeable Upset and Accident Conditions Involving Release of Hazardous Materials.

Construction

There are two types of accidental releases that could occur during construction: 1) accidental spills; and 2) discovery of existing contaminated soil or groundwater at the construction sites. The project site is undeveloped and does not appear on a list of hazardous materials sites. Encountering existing contaminated soil or groundwater is unlikely. Accidental spills could occur during construction as hazardous materials would be used in varying amounts during construction of the proposed project. Construction activities would use hazardous materials including but not limited to cleaning products; fuels (diesel and gasoline); lubricants and oils; paints and paint thinners; and glues. Construction workers and residents in the project vicinity could be exposed to hazards and hazardous materials as a result of improper handling and storage.

CCR Titles 8 and 22 codify hazardous materials regulations, and their enabling legislation is set forth in Chapter 6.5 (Section 25100 et seq.) of the California Health and Safety Code. This legislation was established at the State level to ensure compliance with federal regulations to reduce the risk to the environment and human health from the routine use of hazardous substances. Construction specifications would include the following requirements in compliance with applicable regulations and codes, including, but not limited to CCR Titles 8 and 22, Uniform Fire Code, and Division 20 of the California Health and Safety Code: all reserve fuel supplies and hazardous materials must be stored within the confines of a designated construction area; equipment refuelling and maintenance must take place only within the staging area; and construction vehicles shall be inspected daily for leaks. Off-site activities (e.g., utility construction) would also be required to comply with these regulations. These regulations and codes must be implemented, as appropriate, and are monitored by the State and/or local jurisdictions, including the Fort Bragg Rural Fire Protection District and CalFire.

Contractors would be required to comply with Cal/EPA's Unified Program; regulated activities would be managed by Mendocino County Environmental Health department, the designated CUPA for Mendocino County, in accordance with the regulations included in the unified Program. Such compliance would reduce the potential for accidental release of hazardous materials during construction of the proposed project. As a result, it would lessen the risk of exposure of construction workers and the public to accidental release of hazardous materials, as well as the demand for incident emergency response. The impact from potential release of hazardous materials would be less than significant.

Operation

The project would prohibit acceptance of hazardous waste delivered or mixed in with the municipal solid waste loads; however, there is a potential that hazardous materials may be transported unknowingly in the Municipal Solid Waste (MSW) loads brought to the site. Other recyclable household hazardous waste items, including electronics, fluorescent lights, and batteries, would be collected in secure containment areas. If such materials are found prior to unloading, the driver would not be allowed to unload the hazardous materials. If hazardous wastes are found, specific notification, future load inspection, and appropriate handling, storage, and disposal procedures would be implemented per state and federal regulations noted above.

Occasionally hazardous materials are discovered on the tipping floor of a transfer station. The spotters working in the transfer station would be trained to recognize hazardous materials and to deal with them appropriately. Such materials would be segregated in a hazardous waste locker kept on or near the tipping floor for that purpose. They would be kept in locked storage until they can be removed from the site by a licensed hauler. Depending on the quantities and types of materials found, materials found on the tipping floor may be stored in the household hazardous waste (HHW) locker until removed.

Most of the hazardous material brought to the HHW facility would be common household items that require special recycling or disposal approaches, such as batteries, paint, used oil and oil filters, and aerosol cans, as well as smaller quantities of herbicides, pesticides, solvents, antifreeze and similar materials. The facility would not accept explosives, medical waste, or radioactive materials. The materials would be stored temporarily inside the designated HHW locker in segregated containers that separate incompatible substances. All HHW would be removed at regular intervals by licensed haulers and transported to off-site facilities for recycling or disposal (California Health and Safety Code, Division 20, Chapter 6.95). The process of isolating and only temporarily storing hazardous materials at the site combined with transporting the materials to proper off-site facilities in accordance with applicable local, State and federal requirements would minimize the project's potential to create a hazard to the environment or the public.

A Spill Prevention Plan would be prepared to control any accidental spills or fuel leaks. Provisions of the plan are likely to include: storage of petroleum products, solvents, paints, and other potentially hazardous liquids in a secured location with secondary containment; maintenance of emergency response contact information on-site; maintenance of spill response materials and equipment in a readily accessible location; training of all workers in spill control and emergency response procedures; designation of a specific individual as primary on-site contact for emergency response to spills; regular maintenance of heavy equipment and vehicles to prevent leakage of fuel or lubricants; immediate cleanup of spills, however small, in accordance with established procedures; and adherence with established reporting procedures for all spills, regardless of size.

As with construction, operation of the proposed project is required to be consistent with federal, State, and local laws and regulations addressing hazardous materials management and environmental protection, including, but not limited to 49 CFR 173 and 177, and CCR Title 26, Division 6 for transportation of hazardous materials, and CCR Titles 8 and 22, Uniform Fire Code, and Division 20 of the California Health and Safety Code for routine use of hazardous materials. These regulations and codes must be implemented, as appropriate, and are monitored by the State and/or local jurisdictions, including Caltrans, the Mendocino County Environmental Health Department, and CalFire.

The Mendocino County Environmental Health Department, as the local CUPA, overseas hazardous materials registrations, aboveground petroleum storage tank spill prevention control and countermeasure plans, UST programs, monitoring wells, and the California Accidental Release Program. Additionally, businesses are regulated as employers by Cal/OSHA and are therefore required to ensure employee safety. Specific requirements include identifying hazardous materials in the workplace, providing safety information to workers that handle hazardous materials, and providing adequate training to workers.

The proposed project would be required to comply with all applicable federal, State, and local regulations pertaining to spill prevention, safe-transit practices, workplace safety, explosions, fires, and other hazardous materials-related concerns. The Mendocino County Environmental Health Department, CalFire, and other agencies would be required to enforce compliance, including issuing permits and tracking and inspections of hazardous materials storage and transportation. Additionally, existing regulatory requirements would ensure that the proposed project does not pose a significant hazard to off-site receptors including nearby residents. As a result, construction and operation of the proposed project would not create a significant hazard to the environment and general public involving the release of hazardous materials into the environment. Therefore, this impact, for both construction and operation, is considered less than significant.

Mitigation Measures: Mitigation Measure HAZ-1.

Level of Significance: Less than significant with mitigation.

Mitigation Measure HAZ-1 would reduce potentially significant impacts associated with accident conditions to a less-than-significant level.

Impact HAZ-3: Emergency Response Plans and Wildland Fire Risk.

The project is not anticipated to affect emergency response plans because the County's Sheriff Department and Fire Department would review the site design and circulation layout as part of the project review process to ensure that adequate emergency access is provided. Even though the project area is within a Very High Fire Hazard Severity Zone as mapped by CalFire (CalFire 2007), the project is not anticipated to result in significant wildland fire risks because the project would not expose a substantial number of people or structures to wildland fire risks, and fire suppression infrastructure, such as sprinklers, would be incorporated into the site design in order to minimize fire hazards (reference Figure 2-2 for the location of the water storage tank). According to the MHMP, there have been no historic wildland fires in the project area. Therefore, the project would not interfere with or impair emergency response plans or emergency evacuation plans and would not expose people or structures to a significant risk of loss, injury, or death involving wildland fire. This impact would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.8.6 Cumulative Impacts

Impact HAZ-C-1: Result in Cumulatively Considerable Contribution to a Significant Cumulative Impact Related to Hazards or Hazardous Materials.

Cumulative development would include some commercial/industrial uses, which could involve the use of various hazardous products during construction and operation. Residential development would also increase the use of household-type hazardous materials. The storage, use, disposal, and transport of hazardous materials could result in potential spills and accidents. All construction activities, as well as all new development, would be subject to compliance with existing hazardous materials regulations. Future development would be required to evaluate their respective hazards and hazardous materials impacts on a project-by-project basis. Compliance with all Federal, State, and local regulations during the construction and operation of new developments would ensure that there are no cumulatively considerable significant hazards to the public or the environment associated with the routine transportation, use, disposal or release of hazardous materials, thereby ensuring that a less than significant, cumulatively considerable, impact would occur.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

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3.9 Hydrology and Water Quality

This section evaluates the potential impacts related to hydrology and water quality during construction and operation of the project. To provide the basis for this evaluation, the Setting section describes the hydrological setting for the project area, including regional and local surface water and groundwater characteristics. Descriptions in this section are based on reviews of published information, reports, and plans regarding regional and local hydrology, climate, topography, and geology. The evaluation section establishes the thresholds of significance, evaluates potential hydrology and water quality impacts, and identifies the significance of impacts. Where appropriate, mitigation measures are presented to reduce impacts to a less than significant level.

3.9.1 Setting

The following discusses the hydrology and water quality-related context in which the proposed project would be constructed and would operate, including descriptions of the project area and stormwater management system of the project site; regional climate and hydrology; beneficial uses of surface waters; surface water quality; drainage and flooding; and local groundwater basin and beneficial uses. The setting focuses on the site for the proposed Central Coast Transfer Station. Closure of the Caspar Facility and the land transfer described in the Project Description would not result in new land uses or ground disturbance that would affect the hydrology or water quality of the area. Therefore, the hydrology and water quality-related context for the Caspar Facility area are not described in this section.

Regional Climate

The project area is characterized by cool, foggy summers and cool, rainy winters. Due to the proximity to the Pacific Ocean, the project site has very mild weather throughout the year. Most of the rainfall occurs from November to April with some light showers during the summer. Fog and low overcast clouds are common within the area, especially during the evening and early morning hours. The intense maritime effect of the Pacific Ocean causes uniquely cool summers for the area. In places a few miles inland, consistently hotter summer temperatures are found, a phenomenon typical of the Californian coastline.

January is the coldest month, with an average maximum temperature of 55.1 °F (12.8 °C) and an average minimum temperature of 39.9 °F (4.4 °C). The warmest month of the year is September, which has an average maximum temperature of 65.8 °F (18.8 °C) and an average minimum temperature of 49.2 °F (9.6 °C). Freezing temperatures occur during the winter months with an average of 11.1 days annually (NOAA 2014).

More than 96 percent of the total precipitation occurs in an 8-month period beginning in October and ending in May. Average annual precipitation is 40.24 inches at the project site. The wettest year on record was 1995 with 61.90 inches and the driest year on record was 2013 with 12.31 inches. The maximum precipitation recorded in one month was 21.60 inches in December 2002. The maximum 24-hour rainfall was 4.36 inches on December 28, 2002. Snow is extremely rare at the project site with the only recorded snowfall in January 1907 (NOAA 2014).

Regional Hydrology

The proposed project site was evaluated by LACO and Associates (LACO) in June 2012 to determine soil characteristics and drainage features (LACO 2012). The site was determined to be characterized by relatively flat (2 to 5% slopes) to gently sloping (5 to 9% slopes) terrain.

Elevations at the site range from a low of approximately 400 feet above mean sea level (msl) on the western portion to a high of approximately 430 feet msl at the northeast corner. Surface drainage on the site is generally split into two different drainage areas. The northwestern portion of the site generally drains to the northwest, while the southeastern portion of the site drains to the east. The undeveloped site is predominately covered by a very dense mixed forest with the only clearings consisting of a turnout off Highway 20, and jeep trails along a portion of the north and east perimeters. There are no creeks located on the project site.

Beneficial Uses of Surface Waters

The current 2011 Basin Plan prepared by the North Coast Regional Water Quality Control Board (NCRWQCB) identifies the beneficial uses of surface waters and groundwater within its region (NCRWQCB 2011). The Basin Plan assigns beneficial uses by Hydrologic Areas and Sub Areas. The project is located within the Noyo River Hydrologic Area (113.20), which includes the following existing beneficial uses: Municipal and Domestic Supply; Agricultural Supply; Industrial Service Supply; Groundwater Recharge; Hydropower Generation; Freshwater Replenishment; Navigation; Water Contact Recreation; Non-Contact Water Recreation; Commercial and Sport Fishing; Warm Freshwater Habitat; Cold Freshwater Habitat; Wildlife Habitat; Rare, Threatened, or Endangered Species; Migration of Aquatic Organisms; Spawning, Reproduction, and/or Early Development; and Aquaculture. The beneficial uses provide the basis for determining appropriate water quality objectives for the region (NCRWQCB, p. 2-11 2011).

Surface Water Quality

In accordance with Section 303(d) of the Federal Clean Water Act, state governments must present the U.S. Environmental Protection Agency (U.S. EPA) with a list of “impaired water bodies,” defined as those water bodies that do not meet water quality standards, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology.

The current 2010 Clean Water Act Section 303(d) list assigns impaired water bodies by Hydrologic Areas and Sub Areas. The project is located within the Noyo River Hydrologic area, which is listed as impaired for sediment/siltation and water temperature (SWRCB 2010).

Placement of a water body on the Section 303(d) list acts as the trigger for developing a Total Maximum Daily Load (TMDL), which is a pollution control plan for each water body and associated pollutant/stressor on the list. The TMDL identifies the quantity of a pollutant that can be safely assimilated by a water body without violating water quality standards.

A TMDL for sediment in the Noyo River was adopted by the United States Environmental Protection Agency (USEPA) on December 16, 1999. The TMDL includes numeric targets, source analysis, and sediment loading rates within the watershed (USEPA 1999). To date, no TMDL has been developed for the Noyo River temperature impairment.

Drainage and Flooding

The Federal Emergency Management Agency (FEMA) delineates regional flooding hazards as part of the National Flood Insurance Program. According to local Flood Insurance Rate Maps, the project site is not located within a 100-year floodplain, or other flood area (FEMA 2011).

Areas along streams may be inundated during major or prolonged storms. FEMA has mapped the areas susceptible to flooding during the 100-year storm event. While the 100-year floodplain may be relatively limited in extent along smaller streams or streams incised valleys, the floodplain can be wide and extensive for major rivers, particularly where they pass through relatively flat valleys.

Floodways are the portion of the stream that carries peak runoff. Floodways cannot be filled or developed without causing increased flooding in other parts of the watershed.

In addition to natural flood hazards, flooding can occur as a result of inundation caused by failure of a dam, a result of seiches (i.e., earthquake-induced oscillating waves in an enclosed water body), tsunamis (i.e., earthquake-induced waves formed in the open ocean that reach a shoreline), or mudflows. The project area is not located near isolated bodies of water that would be subject to inundation by seiche. Similarly, the project area is not located within a coastal area subject to inundation from tsunami (Cal EMA 2009). The topography of the project area is generally flat and no areas that are likely to produce mudflows have been mapped or are present (USGS 1997).

Local Groundwater Basin and Beneficial Uses

The project area is located within the Fort Bragg Terrace Area Groundwater Basin (Basin 1-21). The groundwater system within the basin provides numerous benefits to the region, including rural residential and municipal water supplies, irrigation water for agriculture, and base flow to streams and surface water bodies.

The basement rock in the project area is coastal belt Franciscan complex, composed primarily of greywacke sandstone with shale lenses. Unconformably overlying the Franciscan complex are quaternary marine terrace deposits, including the older Lower Caspar Orchard deposits, which underlie the project site. The marine deposits consist mainly of fine-grained sand, with interbedded clayey layers.

The current 2011 Basin Plan prepared by the NCRWQCB identifies the beneficial uses of groundwater within its region. The Basin Plan assigns the following existing beneficial uses for groundwater: Municipal and Domestic Supply; Agricultural Supply; Industrial Water Supply; Industrial Process Water Supply; and Freshwater Replenishment to Surface Waters; among others (NCRWQCB 2011).

3.9.2 Regulatory Framework

Federal

Clean Water Act

The federal Clean Water Act (CWA), enacted by Congress in 1972 and amended several times since, is the primary federal law regulating water quality in the United States and forms the basis for several State and local laws throughout the country. The CWA established the basic structure for regulating discharges of pollutants into the waters of the United States. The CWA gave the U.S. EPA the authority to implement federal pollution control programs, such as setting water quality standards for contaminants in surface water, establishing wastewater and effluent discharge limits for various industry categories, and imposing requirements for controlling nonpoint source pollution. At the federal level, the CWA is administered by the U.S. EPA and U.S. Army Corps of Engineers (USACE). At the state and regional levels in California, the act is administered and enforced by the SWRCB and the nine RWQCBs.

Section 303(d) of CWA requires state governments to present the U.S. EPA with a list of “impaired water bodies,” defined as those water bodies that do not meet water quality standards, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology.

Sections 404 and 401 of the CWA require permitting and state certification for construction and/or other work conducted in “waters of the United States.” Such work includes levee work, dredging, filling, grading, or any other temporary or permanent modification of wetlands, streams, or other water bodies.

National Flood Insurance Program

FEMA administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA also issues Flood Insurance Rate Maps identifying which land areas are subject to flooding. The maps provide flood information and identify flood hazard zones in each community. The design standard for flood protection is established by FEMA, with the minimum level of flood protection for new development determined to be the 1-in-100 annual exceedance probability (i.e. the 100-year flood event).

National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program was established in the CWA to regulate industrial and municipal discharges to surface waters of the United States. NPDES permit regulations have been established for broad categories of discharges including point source municipal waste discharges and nonpoint source stormwater runoff.

NPDES permits identify limits on allowable concentrations and mass emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits.

State

Porter Cologne Water Quality Control Act

The Porter Cologne Water Quality Control Act is the primary statute covering the quality of waters in California. Under the Act, the SWRCB has the ultimate authority over State water rights and water quality policy. The nine RWQCBs regulate water quality under this Act through the regulatory standards and objectives set forth in Water Quality Control Plans (also referred to as Basin Plans) prepared for each region.

The five-member SWRCB allocates water rights, adjudicates water right disputes, develops state-wide water protection plans, establishes water quality standards, and guides the nine RWQCBs located in the major watersheds of the state. The joint authority of water allocation and water quality protection enables the SWRCB to provide comprehensive protection for California’s waters. The SWRCB is responsible for implementing the Clean Water Act, issues NPDES permits to cities and counties through RWQCBs, and implements and enforces the NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) (Order No. 2009-0009, as amended by Order No. 2010-0014). Order No. 2009-0009 took effect on July 1, 2010 and was amended on February 14, 2011. The Order applies to construction sites that include one or more acre of soil disturbance. Construction activities include clearing, grading, grubbing, excavation, stockpiling, and reconstruction of existing facilities involving removal or replacement.

Safe Drinking Water Act

The 1974 Federal Safe Drinking Water Act, as amended in 1986 and 1996, requires the protection of drinking water and its sources (i.e., rivers, lakes, reservoirs, springs, and groundwater wells). The act authorizes the EPA to set national standards for drinking water to protect against pollutants. The EPA, states, and local agencies work together to enforce these standards.

In California, the EPA has delegated the responsibility of administration of the California drinking water system to the California Department of Health Services (DHS). The DHS is accountable to the EPA for program implementation and for adopting standards and regulations that are at least as stringent as those developed by the EPA. The applicable state primary and secondary maximum contaminant levels (MCLs) are set forth in Title 22 CCR Division 4, Chapter 15, Article 16.

Water Rights in California

California has a dual system of water rights for surface water that recognizes both riparian and appropriative rights. A riparian right is the right to use water based on the ownership of property which abuts a natural watercourse. Water claimed by virtue of a riparian right must be used on the riparian parcel, and cannot be sold for use elsewhere. An appropriative right is an entitlement to water based on the actual use of the water. Appropriate rights may be sold or transferred.

California recently has passed three bills (AB 1739, SB 1168, and SB 1319), which together create a framework for implementing sustainable, local groundwater management for the first time in California history. However, these recently approved bills do not apply to this project as the groundwater sustainability plans will not come into effect until 2020 or 2022 depending on the priority level assigned to the various groundwater basins. Generally, landowners overlying a groundwater resource have a right to make reasonable use of that groundwater. The project will use groundwater under this principle.

Regional and Local

Regional Water Quality Control Board

Regional Water Boards adopt and implement Water Quality Control Plans (Basin Plans) which recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality problems. The current 2011 Basin Plan prepared by the NCRWQCB provides a definitive program of actions designed to preserve and enhance water quality and to protect beneficial uses of water in the North Coast Region.

The NCRWQCBs' planning process also includes water quality planning programs (adoption, review, and amendment of state-wide and basin water quality control plans and policies), including development and adoption of TMDLs and implementation plans; regulatory programs (permitting and control of discharges to water through "NPDES" and WDR permits, discharge to land – "Chapter 15," and storm water and storage tanks programs); monitoring and quality assurance programs; nonpoint source management programs, including the "Watershed Management Initiative;" and funding assistance programs, including grants and loans.

North Coast RWQCB Basin Plan

As set forth in the Basin Plan, specific beneficial uses of surface water and groundwater have been established for the Hydrologic Area in which the project is located (see Section 3.9.1, Setting). To protect these beneficial uses, the Basin Plan sets forth the following water-resource protection objectives for inland surface waters:

<u>Color:</u> Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.

<u>Tastes and Odors</u>: Waters shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance or adversely affect beneficial uses.

<u>Floating Material:</u> Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.

Suspended Material: Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Settleable Material: Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or adversely affect beneficial uses.

Oil and Grease: Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses.

Biostimulatory Substances: Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

Sediment: The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Turbidity: Turbidity shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof.

pH: The pH shall conform to those limits listed in the basin plan. The pH shall not be depressed below 6.5 nor raised above 8.5.

Changes in normal ambient pH levels shall not exceed 0.2 units in waters with designated marine (MAR) or saline (SAL) beneficial uses nor 0.5 units within the range specified above in fresh waters with designated COLD or WARM beneficial uses.

Dissolved Oxygen: The dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time:

- Waters designated WARM, MAR, or SAL 5.0 mg/l
- Waters designated COLD 6.0 mg/l
- Waters designated SPWN 7.0 mg/l
- Waters designated SPWN during critical spawning and egg incubation period 9.0 mg/l

Bacteria: The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following:

- In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed 50/100 ml, nor shall more than ten percent of total samples during any 30-day period exceed 400/100 ml (State Department of Health Services).
- At all areas where shellfish may be harvested for human consumption (SHELL), the fecal coliform concentration throughout the water column shall not exceed 43/100 ml for a 5-tube decimal dilution test or 49/100 ml when a three-tube decimal dilution test is used (National Shellfish Sanitation Program, Manual of Operation).

Temperature: Temperature objectives for COLD interstate waters, WARM interstate waters, and Enclosed Bays and Estuaries are as specified in the "Water Quality Control Plan for Control of

Temperature in the Coastal and Interstate Waters and Enclosed Bays of California" including any revisions thereto. In addition, the following temperature objectives apply to surface waters:

- The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.
- At no time or place shall the temperature of any COLD water be increased by more than 5°F above natural receiving water temperature.
- At no time or place shall the temperature of WARM intrastate waters be increased more than 5°F above natural receiving water temperature.

Toxicity: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.

The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary for other control water that is consistent with the requirements for "experimental water" as described in Standard Methods for the Examination of Water and Wastewater, 18th Edition (1992). As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour bioassay.

In addition, effluent limits based upon acute bioassays of effluents will be prescribed. Where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances will be encouraged.

Pesticides: No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no bioaccumulation of pesticide concentrations found in individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no bioaccumulation of pesticide concentrations found in bottom sediments or aquatic life.

Waters designated for use as domestic or municipal supply shall not contain concentrations of pesticides in excess of the limiting concentrations set forth in California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64444.5.

Chemical Constituents: Waters designated for use as domestic or municipal supply shall not contain concentrations of chemical constituents in excess of the limits specified in California Code of Regulations, Title 22, Chapter 15, Division 4, Article 4, Section 64435.

Waters designated for use as agricultural supply shall not contain concentrations of chemical constituents in amounts which adversely affect such beneficial use.

North Coast RWQCB NPDES Permit

Projects that discharge stormwater runoff to waters of the U.S. from land disturbances greater than one acre require a General Construction Stormwater Discharge Permit from the RWQCB, as required under NPDES Order No. 2009-0009, as amended by Order No. 2010-0014. To obtain a permit, a discharger files a Notice of Intent to be included under the State's NPDES permit. General conditions of the permit require that dischargers must eliminate non-stormwater discharges to stormwater systems, develop and implement a Storm Water Pollution Prevention Plan (SWPPP), and perform inspections of stormwater pollution prevention measures.

Mendocino County Groundwater Ordinance

The Mendocino County Groundwater Ordinance (Ordinance) is the guidance document that the County Environmental Health Division uses to evaluate proof of water, as required in Policy 6b. The standards from the Ordinance are used as the significance thresholds for groundwater quantity impacts discussed in this Section.

Mendocino County General Plan Goals and Policies

The Mendocino County General Plan contains the following goals and policies that are relevant to hydrology and water quality for the project:

Goal RM-2 (Water Supply): Protection, enhancement, and management of the water resources of Mendocino County.

Goal RM-3 (Water Quality): Land use development and management practices that protect or enhance water quality.

Policy RM-18: No division of land or Use Permit shall be approved without proof of an adequate (as defined by the County Environmental Health Division) potable water supply for each parcel being created or proposed for special use.

Policy RM-19: Promote the incorporation of project design features that will improve water quality by minimizing impervious surface areas, maximizing on-site retention of storm water runoff, and preserving existing vegetation to the extent possible. Examples include:

- Using Low Impact Development (LID) techniques.
- Updating the County's Building Codes to address "green" building and LID techniques that can reduce pollution of runoff water, and promoting these techniques.

Policy RM-20: Require integration of storm water best management practices, potentially including those that mimic natural hydrology, into all aspects of development and community design, including streets and parking lots, homes and buildings, parks, and public landscaping.

3.9.3 Evaluation Criteria and Significance Thresholds

The project would cause a significant impact related to hydrology and water quality, as defined by the CEQA Guidelines (Appendix G), if it would:

- Violate any water quality standards or waste discharge requirements;

  Significance Threshold (Sources)

  Non-compliance with Waste Discharge Requirements for Low Threat Discharges to Surface Waters in the North Coast Region (NCRWQCB Order No. R1-2009-0045)

  Non-compliance with the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities. (State Water Resources Control Board Order No 2009-0009 as amended by Order No 2012-0006)

- 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 (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);

<u>Significance Threshold (Sources)</u>

Mendocino County Coastal Groundwater Development Guidelines

- 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;
- 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;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- 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; or
- Inundation by seiche, tsunami, or mudflow.

Areas of No Project Impact

As explained below, construction of the project would not result in impacts related to several of the significance criteria identified in Appendix G of the current CEQA Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- ***Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map***. The proposed project does not include the construction of new housing or structures for human occupancy. Therefore, the significance criterion related to the placement of housing within a 100-year flood hazard zone is not applicable to the proposed project and is not discussed further.
- ***Place within a 100-year flood hazard area structures which would impede or redirect flood flows***. The proposed project does not include the construction of structures within a FEMA designated 100-year flood hazard area. Therefore, the significance criterion related to impeding or redirecting flood flows within a 100-year flood hazard area is not applicable to the proposed project and is not discussed further.
- ***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***. The proposed project does not include the construction of structures within an area subject to inundation from failure of a levee or dam (Mendocino County 2008). Therefore, the significance criterion

related to flooding as a result of the failure of a levee or dam is not applicable to the proposed project and is not discussed further.

- ***Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow***. The project area is not located near an isolated body of water that would be subject to inundation by seiche. The proposed project does not include the construction of structures within an area subject to inundation from a tsunami (Cal EMA 2009). The project area is generally flat and not capable of a mudflow event and according to the MHMP has a landslide hazard rating of low (Mendocino County 2008). Therefore, the significance criterion related to inundation by seiche, tsunami, or mudflow is not applicable to the proposed project and is not discussed further.

3.9.4 Methodology

Potential impacts to hydrology and surface water quality are evaluated for both construction and operational activities. The project is evaluated to determine compliance with applicable federal, State, and local permitting and design requirements related to storm water quality, flooding, and drainage. Potential impacts related to groundwater depletion are evaluated, including the potential for pumping of groundwater for excavation dewatering. Flooding impacts are evaluated by determining if the project is located within a FEMA flood hazard area or other area of flooding, as well as assessing the project's compliance with local storm water requirements. The evaluation also considers additional runoff from new impervious areas, and whether such increases would exacerbate flooding at or downstream of the project area. Regional documents and maps were reviewed to identify hydrology and water quality resources that could be directly or indirectly affected by construction or operational activities.

The Caspar site is already developed and there would be no new ground disturbance or changes in the existing drainage as part of site closure. Therefore, there would be no impact to hydrology and water quality at the Caspar site. Therefore, impacts to hydrology and water quality-related impacts at the Caspar Facility are not described further.

3.9.5 Impacts and Mitigation Measures

Impact HWQ-1: Violate any Water Quality Standards or Waste Discharge Requirements.

The project is required to obtain and comply with necessary permits and comply with other Mendocino County and the NCRWQCB requirements, acting to prevent, or essentially reduce the potential for the project to violate any water quality standards or waste discharge requirements.

<u>Construction</u>

SWRCB Order No. 2009-0009 applies to public and private construction projects that include one or more acres of soil disturbance. Because the proposed Central Coast Transfer Station site is anticipated to disturb up to 4.72 acres of land, compliance with Order No. 2009-0009 would be required. Therefore, if construction activities associated with the project are not properly managed, applicable water quality standards and waste discharge requirements could be violated. The impact is considered significant.

Well Development

The proposed project would require a groundwater well to be drilled and operated for on-site water use. The short term impacts associated with construction and well development activities, are related to site grading, exploratory drilling, well installation, well head and well house construction, well development, connection piping trenching and storage tank construction.

Well drilling activities would include a reverse mud rotary drilling technique utilizing a mud slurry to remove drill cuttings from the bore hole shaft. These cuttings and mud slurry are circulated through settlement tanks and not allowed to flow over the surface of the site or commingle with surface waters. The contractor would utilize large on-site tanks for well drilling and testing operations. The drilling mud would be contained in these tanks and removed from the site. Because the slurry would not be discharged but would be contained and removed, the impact to water quality associated with well drilling activities is considered less than significant.

After drilling is complete, the well would be developed by purging and testing. Well development purging consists of flushing the developed well and removal of any residual drilling mud. A pump test consists of continuous pumping and well performance monitoring over an approximately 72-hour period, and takes place after the well development purging. In addition, during this phase of construction, the well is disinfected with chlorine (sodium hypochlorite).

Well testing water that is discharged to the environment is required to conform to pertinent water quality standards. Well development and well pump test discharge water could be high in suspended solids and could contain chlorine residual. Impacts to water quality from discharge of well testing water are considered significant.

Operation

Some liquids could be generated on the tipping floor from cleaning, odor reduction misting, or solid waste trucks when unloading solid waste after rainstorms. The design of the main indoor drainage control system would direct liquids from the waste and unloading areas to flow through a clarifier to remove solids, then to an on-site 500-gallon above ground storage tank. Liquids would not be allowed to leave the site and stormwater would not be allowed to enter the building. Facility and equipment inspections, combined with monitoring of the storage tank containment area, allow for the detection of potential sources of leachate leaks to the environment and early corrective actions to be implemented if necessary. The amount of wastewater generated is expected to be of such minimal quantity that most of the water is anticipated to evaporate. Facility operations would include removal of the wastewater by a licensed waste hauler with disposal at a permitted wastewater treatment facility when the tank becomes full. Therefore, impacts related to wastewater generated from operations would be less than significant.

Stormwater discharges from operation of the project are required to comply with applicable provisions and performance standards stated in the National Pollutant Discharge Elimination System (NPDES) permit. As required by the NPDES permit, County and NCRWQCB requirements, waste materials will not be discharged to drainage areas. Because the Central Coast Transfer Station has the potential to discharge pollutants from a point source (e.g., leaking oil from hauling trucks), the facility would be required to obtain an Industrial SWPPP under California Water Code Section 13260. The impact to water quality during operation of the project is considered significant.

Construction and operations of the proposed project would result in potentially significant water quality impact.

Mitigation Measure HWQ-1a: Manage Construction Storm Water.

The County and City shall obtain coverage under State Water Resources Control Board Order No. 2009-0009-DWQ, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities, Waste Discharge Requirements for

Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities, as amended by Order No. 2012-0006. In compliance with the NPDES requirements, a Notice of Intent (NOI) shall be prepared and submitted to the NCRWQCB, providing notification and intent to comply with the State of California General Permit. In addition, a Construction Storm Water Pollution Prevention Plan (SWPPP) will be prepared for pollution prevention and control prior to initiating site construction activities. The Construction SWPPP shall identify and specify the use of erosion sediment control best management practices (BMPs) for control of pollutants in stormwater runoff during construction related activities, and will be designed to address water erosion control, sediment control, off-site tracking control, wind erosion control, non-stormwater management control, and waste management and materials pollution control. A sampling and monitoring program shall be included in the Construction SWPPP that meets the requirements of the NCRWQCB to ensure the BMPs are effective. A Qualified Storm Water Pollution Prevention Plan Practitioner shall oversee implementation of the Plan, including visual inspections, sampling and analysis, and ensuring overall compliance.

Mitigation Measure HWQ-1b: Industrial Storm Water General Permit.

The County and City shall obtain coverage under State Water Resources Control Board Order No. 97-03-DWQ, Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities. This shall include submittal of a notice of intent to obtain permit coverage, and preparation, retention on site, and implementation of a SWPPP. The SWPPP shall identify the sources of pollution that affect the quality of industrial storm water discharges and authorized non-storm water discharges, and describe and ensure the implementation of best management practices to reduce or prevent pollutants in industrial storm water discharges. The SWPPP shall also include a monitoring program and other requirements contained in Order No. 97-03. Implementation of the SWPPP shall include the necessary inspections, monitoring, and overall compliance.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measures HWQ-1a and HWQ-1b would mitigate potential impacts on water quality standards and waste discharge requirements to a less than significant level by complying with, and receiving coverage under, the NPDES General Permit for Discharge of Stormwater associated with construction and operational activities. The implementation of BMPs, consistent with the requirements of the site's NPDES General Permit for Discharge of Stormwater associated with Construction Activity and the SWPPP, would ensure that the project does not violate any water quality standards or waste discharge requirements. With implementation of Mitigation Measures HWQ-1a and HWQ-1b, the projects construction and operational water quality impacts would be reduced to a less than significant level.

Mitigation Measure HWQ-1c: Well Development According to Mendocino County and California State Standards.

The contractor shall ensure that any well development and well pump test water is disposed of in accordance to the discharge limitations of the NCRWQCB general permit for Dewatering and Other Low Threat Discharges to Surface Waters if disposed of in the drainage system. If sediment concentrations are in excess of surface discharge standards then compliance shall be achieved through the on-site detention of water in a storage tank to allow for the settlement of suspended solids. In addition, the contractor shall discharge all well development disinfection discharges containing chlorine residuals after treating the discharge to meet discharge requirements. With implementation of the above mitigation measures, the water quality impacts due to well development would be reduced to a less-than-significant level.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure HWQ-1c would mitigate potential impacts on water quality standards and waste discharge requirements to a less than significant level by complying with NCRWQCB general permit for Dewatering and Other Low Threat Discharges to Surface Waters. With implementation of Mitigation Measures HWQ-1c, the project's construction water quality impacts would be reduced to a less than significant level.

Impact HWQ-2: Substantially Deplete Groundwater Supplies or Interfere Substantially with Groundwater Recharge.

Pumping of groundwater that causes the groundwater gradient (slope of the water table surface) to change either its direction or its magnitude by more than 10% of the pre-Project direction and magnitude is considered significant (groundwater flow is directionally proportional to the gradient). Based on the Mendocino County Coastal Groundwater Development Guidelines, a project using groundwater cannot cause interference of more than 10% of the existing drawdown at neighboring wells or reduction of well yield to less than 90% of the maximum-day demand. Excessive groundwater pumping has the potential to significantly impact the underlying aquifer and lower the local groundwater table.

A groundwater study was performed for the proposed Mendocino Coast Regional Park and Golf Course project adjacent to, and north of the project site. Prepared by Lawrence and Associates (March 2005), the study included the installation of several pumping and observation wells. The wells were drilled to a maximum depth of 91 feet below ground surface (bgs), where bedrock was encountered. The pumping and observation wells were constructed approximately 1,800 feet north of the project site and within the same geologic unit (Lower Caspar Orchard marine terrace sediments) underlying the project site. Testing of the wells determined groundwater was approximately 20 feet bgs and produced a long term yield of 4 to 5 gallons per minute (gpm) for a 2-inch diameter well with a 40-foot well screen.

The model area developed by Lawrence and Associates (March 2005), while considerably larger than the project area, included the location of the proposed project. A total of 24 wells, pumping at an average rate of 10 gpm were evaluated to access the possible impacts to groundwater. It was determined that neither the direction nor magnitude of the groundwater gradient changed significantly with pumping. The groundwater model predicted that the water pumped was approximately 92% from aquifer storage and about 8% from a reduction in stream flow from Newman Gulch. It was determined that the reduction in flow was less than the standard significance of 10 percent. In addition, the groundwater model showed that pumping from the wells would not cause the standards of significance for groundwater level or quantity to be exceeded.

Based on the geotechnical investigation performed by LACO and Associates (June 2012) for the project site, a groundwater well with a screen interval between 25 to 60 feet bgs within the terrace sediments at the site will likely provide at least 2 gpm. The report recommended that at a minimum, the well should be located at least 100 feet from the leachfield, and at the easterly portion of the site where the terrace sediments are likely thicker and the higher elevation will facilitate gravity flow to the facility. During the site investigation by LACO, groundwater was encountered at the project site to be on average 10 feet bgs. In the upslope areas, shallow perched groundwater was encountered at depths ranging from approximately 2 to 5 feet bgs.

Water demand for the project is expected to be less than 1,000 gallons per day, mainly for employee use. Assuming the groundwater well produces 2 gpm, the pump would need to operate for about 9 hours per day to meet the projects daily water demand.

The required groundwater production rate would be lower than the significance threshold of 10 percent. Therefore, impacts from groundwater pumping would be less than significant.

Mitigation Measures: No Mitigation is necessary.

Level of Significance: Less than significant.

Impact HWQ-3: Substantial Additional Sources of Polluted Runoff or Otherwise Substantially Degrade Water Quality.

The development of the proposed project would alter the types, quantities, and timing of stormwater contaminates relative to existing conditions. If this stormwater runoff is uncontrolled and not treated, the water quality of the discharge could affect off-site drainage channels and downstream water bodies.

Construction activities could result in stormwater discharges of suspended solids and other pollutants into local drainage channels from the project site. Construction related chemicals (e.g., fuels, paints, adhesives, etc.) could be washed into surface waters by stormwater runoff. The deposition of pollutants (e.g., gas, oil, etc.) onto the ground surface by construction equipment could similarly result in the transport of pollutants to surface waters by stormwater runoff or in seepage of such pollutants into groundwater.

The operation of the proposed project site could also introduce new stormwater pollutant sources. These pollutant sources would include oils and greases, petroleum hydrocarbons (e.g., gas and diesel fuels), nitrogen, phosphorous, and heavy metals. These pollutants could adversely affect stormwater discharges from the site.

The Local Enforcement Agency’s Solid Waste Facilities permit for the potential site would prohibit the discharge of drainage containing solids, wash water, or leachate from solid wastes (14 CCR Article 6). The proposed project would be required to comply with these requirements by containing waste processing operations within the interior of the transfer station building and directing contact water into the building’s interior collection system. Therefore, the discharge of drainage during operation from the solid waste processing area would not occur.

The type and concentration of stormwater discharge contaminants for developed areas varies based on a variety of factors, including intensity of urban uses such as vehicle traffic, types of activities occurring on site, types of chemicals used on-site (e.g., pesticides, herbicides, cleaning agents, petroleum by-products), road surface pollutants, and rainfall intensity. The design of the facility's stormwater management system would incorporate Low Impact Development (LID) strategies including minimization of the amount of stormwater generated and treated, retention and detention in vegetated bioswales, rain gardens, and oil/water separators in order to limit the contaminants entering stormwater flows. However, due to the industrial nature of the proposed project, there is the potential to contribute additional sources of polluted runoff and to degrade water quality during site operations if not handled properly and done in compliance with State regulations. The impact to water quality is considered significant.

Mitigation Measures HWQ-1a: Manage Construction Storm Water and HWQ-1b: Industrial Storm Water General Permit.

Level of Significance: Less than significant with mitigation.

As described above under HWQ-1a and HWQ-1b, the implementation of BMPs, consistent with the requirements of the site's NPDES General Permit for Discharge of Stormwater associated with construction and operational activities, would ensure that the project does not violate any water quality standards. With implementation of the Mitigation Measures HWQ-1a and HWQ-1b, the project's construction and operational water quality impacts would be reduced to a less than significant level.

Impact HWQ-4: Substantially Alter Existing Drainage Pattern, or Substantially Increase Rate or Amount of Runoff in a Manner which would Result in Flooding On- or Off-site.

The project would not significantly alter the existing drainage patterns at the site. However, development of the project could lead to increased runoff due to removal of vegetation and the creation of impervious surfaces. Culverts, storm drains, seasonal drainage swales, and inlet and outlet structures would need to be constructed to manage stormwater. Prevention of localized flooding would depend on adequately sizing the onsite drainage features. The County requires that drainage features be designed in accordance with the Mendocino County Drainage Standards, and that peak runoff for the 2, 10, 50 and 100-year/24-hour storm events following development are not greater than under pre-development conditions.

A surface water hydrologic analysis has been performed for the project, considering pre- and post-development conditions (GHD 2014) and can be found in Appendix G. As part of this analysis the project area was divided into two drainage areas, identified as Drainage Area 1 and 2 (see Figure 2-3, in the Hydrologic Study located in Appendix G). A comparison of the peak runoff rates and volume for the 2, 10, 50 and 100-year/24-hour storm events under existing and project conditions are presented in Table 3.9-1. Comparing existing conditions to project conditions, shows that the project would increase runoff rates and volumes as a result of the change in land use due to the increase in impervious area (e.g., roofs and pavement surfaces), resulting in a significant impact.

The hydrologic report did not explicitly assess the stormwater contribution from the groundwater well house and access road (10-foot wide and 55-foot long), which would add approximately 0.01 acres of impervious area to the project site. Further review determined that the addition of 0.01 acres of impervious area would add approximately 0.02 cfs to the stormwater runoff for the facility.

Given the conservative nature of the hydrologic analysis, the original estimate of the amount of impervious area for the proposed transfer station took into account the entire foot print of the facility. This estimate is considered conservative due to the fact that the facility is not entirely impervious (e.g., some areas will be gravel and have grass strips). If the pervious areas were subtracted out and the impervious area of the well house and access road are added to the hydrologic analysis, there would be no net increase in the amount of impervious area. Therefore, the predicted stormwater runoff volumes in the hydrologic analysis are still considered valid.

Stormwater captured in the project area will be conveyed through sheet flow to a series of bioswales that surround the facility. The purpose of the bioswales is to control the concentration of flow from the project area as well as filter out sediment and chemical constituents that could impair water quality. This would be achieved by allowing stormwater to partially infiltrate and pass through the bioswale before being released to the detention basins.

Bioswales have been shown to remove pollutants such as phosphorous, metals (e.g., Cu, Zn, Pb), nitrogen, solids, organics, and bacteria at removal rates ranging from 68-98% (CASQA 2003). In order to handle runoff effectively, a bioswale needs to be sized appropriately for the area that it collects stormwater.

Table 3.9-1: Peak Runoff Rates and Volumes for Pre and Post-Project Conditions

Drainage Area		2-year/24-hour			10-year/24-hour			50-year/24-hour			100-year/24-hour		
		Pre-Project	Post-Project	% Diff.	Pre-Project	Post-Project	% Diff.	Pre-Project	Post-Project	% Diff.	Pre-Project	Post-Project	% Diff.
Basin 1	Peak Flow (cfs)	3.8	5.2	26%	8.0	10.0	15%	12.8	14.3	10%	14.7	16.1	9%
	Total Storm Volume (ac-ft)	0.22	0.30	26%	0.48	0.56	15%	0.74	0.82	10%	0.84	0.92	9%
Basin 2	Peak Flow (cfs)	4.6	5.5	16%	10.0	11.0	8%	15.5	16.4	6%	17.8	18.7	5%
	Total Storm Volume (ac-ft)	0.27	0.32	16%	0.58	0.63	8%	0.89	0.94	6%	1.02	1.07	5%

Estimating the size of the required swale should be based on estimates that include site runoff, site soils, slope, swale vegetation, infiltration time, and space available. Based on the results of the surface water hydrologic analysis performed for the project, water surface elevations for the receiving stormwater channels are approximately 1-foot or less (assuming a 2-foot wide channel) and channel velocities are not expected to be above 4 feet per second (fps), under all storm events

A preliminary detention basin analysis was conducted to determine approximate detention basin volumes that would be necessary to keep runoff rates and volumes to pre-project conditions (GHD 2014). The detention basins were sized to reduce peak flow rates and volumes to pre-project conditions. These results were then compared to results from methods used to size detention ponds to minimize sediment transport potential from on-site to off-site drainages. The results from the hydrologic analyses demonstrate that use of the proposed detention ponds would serve to retain the potential increase in peak flows, runoff volumes, and increased sedimentation associated with conversion from existing to project conditions.

The required detention pond volumes are presented in Table 3.9-2. As shown in Table 3.9-2, the detention basin sizes presented can be constructed on-site.

Table 3.9-2: Detention Basin Volumes

Drainage Area	Detention Basin Volume (ac-ft)
Basin 1	0.77
Basin 2	0.85

The largest storage volume required is for Detention Basin 2, with 0.85 acre-feet. Based on the results of the surface water hydrologic analysis for the project site, the required area for each detention basin is approximately 50 by 129 feet.

The drainage patterns for the project area are unlikely to significantly change under the proposed project. Under existing conditions, overland flow from Drainage Area 1 and 2 flows predominately to the northwest and to the south, respectively. Runoff generated on-site would continue to be allowed to flow in the same orientation and direction as under existing conditions.

Mitigation Measure HWQ-4: Reduce Potential for Offsite Runoff.

The applicant shall design and construct detention basins within the project area to reduce stormwater runoff volume, rates, and sedimentation in addition to allowing stormwater to infiltrate. The specific locations of these detention basins will be determined during the development of the grading and drainage plans, as required by Mendocino County. To facilitate this, the applicant shall submit a final detailed design-level hydrologic and hydraulic analysis as necessary to Mendocino County detailing the implementation of the proposed drainage plans, including detention basin facilities that will conform to the following standards and include the following components, at a minimum:

1. The project shall ensure the peak runoff for the 2-, 10-, 50- and 100-year/24-hour storm events for post-development conditions is not greater than under existing conditions. The final grading and drainage plan, including detention basin designs, shall be prepared by a California licensed Professional or Civil Engineer. All design and construction details shall be depicted on the grading and drainage plans and shall include, but not be limited to, inlet and outlet water control structures, grading, designated maintenance access, and connection to existing drainage facilities.

2. Mendocino County shall review and approve the grading and drainage plans prior to implementation to ensure compliance with County standards. The project shall incorporate any additional improvements deemed necessary by the County.
3. Once constructed, the drainage components, including detention basins and conveyance structures will be inspected by the County and maintained per the guidelines outlined in the projects SWPPP.

The contractor shall ensure that all disturbed areas of the project are graded in conformance with the approved grading and drainage plans in such a manner as to direct stormwater runoff to properly designed detention basins.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure HWQ-4 would reduce the impact to less than significant by requiring the project to incorporate all necessary drainage and stormwater management systems, and to comply with all stormwater system design, construction, and operational requirements in the mitigation measure and by Mendocino County. In combination, the project's stormwater management components and compliance with mitigation measures and regulatory requirements act to preclude potentially adverse drainage and stormwater runoff impacts.

More specifically, the project drainage concepts will maintain the site's primary drainage patterns, and will modify and enhance drainage areas in order to accept developed stormwater discharged from the project site. Stormwater conveyance capabilities and capacities provided by the project will ensure that post-development stormwater runoff volumes and velocities do not exceed pre-development conditions. In addition, long term maintenance of stormwater controls would be required for compliance with the project's SWPPP.

3.9.6 Cumulative Impacts

Impact HWQ-C1: Result in a Cumulatively Considerable Contribution to Cumulative Impacts Related to Hydrology and Water Quality.

Cumulative projects identified in Table 3.0-1 would have the potential to affect water quality and increased runoff during construction and long-term operation. The projects would contribute stormwater flows to the local and regional drainage facilities. However, construction activities associated with cumulative projects would be subject to existing federal, State, and local regulations. Existing County policies for project design and approval, as well as NCRWQCB regulations, would minimize potential impacts to a less than significant level. Implementation of the Project plus the cumulative projects would not result in a significant cumulative impact on hydrology and water quality. Therefore, cumulative impacts would be less than significant.

Mitigation Measures: No Mitigation is necessary.

Level of Significance: Less than significant.

3.10 Land Use and Planning

This section contains a discussion of the existing land use and planning setting for the project site and surrounding area and evaluates the potential impacts related to land use and planning during construction and operation of the project. Figure 2-3 shows the location of the project site, the Caspar site, and the 12.6 acres of redwood forest at the northeastern corner of Russian Gulch State Park. These 12.6 acres are forested in large second growth redwood trees. There would be no alteration or disturbance of these acres. The impacts and mitigation measures section establishes the thresholds of significance, evaluates potential land use and planning impacts, and identifies the significance of impacts. Where appropriate, mitigation measures are presented to reduce impacts to less than significant levels.

3.10.1 Setting

On-site Land Use

The project site is within a 17-acre portion of APN 019-150-05 within Mendocino County as shown in Figures 2-1 and 2-2. The topography is relatively flat and elevations range from approximately 400 to 430 feet above sea level. The site is undeveloped, consisting primarily of closed-cone coniferous forest (Bishop pine forest and pygmy cypress forest). The project site is bordered by SR 20 along the south.

The 60-acre Caspar site includes the footprint of the closed landfill, the existing transfer station, and the remaining property consists of vegetation (shrubs and trees) (Figure 2-3). The topography is relatively flat (excluding the footprint of the closed landfill) and elevations range from approximately 364 to 409 feet above sea level.

The 12.6 acres of redwood forest at the northeastern corner of Russian Gulch State Park (Figure 2-3), north of Caspar Little Lake Road, is undeveloped and consists of forestland. The topography slopes gently down from south to north and elevations range from approximately 495 to 565 feet above sea level.

Surrounding Land Use

Land uses in the vicinity the project site consist of:

North: Coniferous forest.

East: Coniferous forest. There are also a few low density single family residential homes and the Wildwood Campground and RV Park is approximately 0.6 mile east of the site.

South: SR 20 is directly south of the project site along with coniferous forest and scattered low density single family residential homes.

West: The CalFire helipad is immediately adjacent to the project site to the west. Farther west consists of low density single family residential homes and coniferous forest.

Land uses surrounding the Caspar site include low density single family residential homes to the west, north and east; coniferous forest in all directions; and Russian Gulch State Park to the south. Land uses surrounding the 12.6 acre portion of Russian Gulch State Park consist of forestland in all directions with a few rural residential homes northwest along Caspar Little Lake Road.

General Plan Land Use Designations

A general plan can be described as a City/County's blueprint for future development. It has a long-term outlook, identifying the types of development that will be allowed, the spatial relationships among land uses, and the general pattern of future development and circulation. Mendocino County's General Plan (August 2009) is the guiding plan for the project area and surrounding unincorporated area.

The General Plan land use designation for the project site is Public Lands (PL – Timber Preserve). Allowable uses include agricultural, forestry, conservation and development of natural resources, public facilities (proposed project), recreation, and utility installations.

General Plan Land Use designations for surrounding land to the north are Forestland (F-L). Land to the east is designated Upland Residential (RMR 40), Rural Residential (RR10), and Timber Preserve (FL160). Land to the south is designated Timber Preserve (PL), and land to the west (beyond the helipad) is designated Rural Residential (RR2).

The Caspar site is designated Public Facility (PF - Public Facility) and would remain PF, therefore, there is no further analysis of the Caspar site below. The 12.6 acres at Russian Gulch State Park is designated Public Lands (PL) and would remain PL.

Zoning Designations

The Mendocino County Zoning Code provides the general requirements for all development and new land uses and mandates that all proposed projects be consistent with the County's Zoning Code. Zoning on the project site is Timberland Production (TP). Permitted uses in this district include residential use types, civic use types, agricultural use types and accessory uses as provided in Chapter 20.164. The project would require a Major Use Permit. Uses subject to a Major Use Permit include residential, civic (proposed project), commercial, and agricultural use types. Section 20.068.030 (Special Provisions) states that no use permit shall be granted in a TPZ District until a specific finding has been made that the proposed use is compatible with the growing and harvesting of timber and timber products.

The Caspar site is zoned Public Facility (PF-PD) and would remain PF-PD. Zoning to the north of the project site also is TP. Zoning to the east is Upland Residential (UR), Rural Residential (RR), and Timber Preserve (TP). Zoning to the south is TP, and zoning to the west is RR. The 12.6 acres at Russian Gulch State Park is zoned PF and would remain PF.

3.10.2 Regulatory Framework

Federal

There are no federal land use plans, policies or regulations pertaining to the project.

State

There are no State land use plans, policies or regulations pertaining to the project. AB 384 removes the project site from the JDSF and therefore the JDSF Management Plan is no longer applicable.

Regional and Local

Mendocino County General Plan

The following goals and policies related to land use and planning are applicable to the proposed project.

Goal DE-1: (Land Use): Land use patterns that maintain the rural character of Mendocino County, preserve its natural resources, and recognize the constraints of the land and the limited availability of infrastructure and public services.

Policy DE-2: Figure 3-14, "Land Use Map," depicts the land use policy of the County of Mendocino. The standards shown or contained in this General Plan shall apply to the land use categories shown on the Land Use Map. All discretionary approvals shall be in conformance with these standards unless explicitly stated otherwise in this General Plan.

Policy DE-19: Land Use Category: PL-Public Lands

Intent: The Public Lands classification is intended to be applied to land in public ownership not appropriately included in some other classification. The classification is also intended to be applied to lands held and managed for public recreation or appropriate for acquisition for public purposes.

General Uses: Agricultural uses, forestry, conservation and development of natural resources, public facilities, recreation, utility installations.

Minimum Parcel Size: Not applicable.

Maximum Dwelling Density: No dwellings permitted except where required to meet the Public Lands intent.

Policy DE-43: Maximize land use compatibility between community areas and the surrounding lands.

Policy DE-203: All development projects shall include plans and facilities to store and manage solid waste and hazardous materials and wastes in a safe and environmentally sound manner.

Mendocino County Zoning Code

Division I of Title 20 of the Mendocino County Municipal Code constitutes the zoning ordinance of Mendocino County. The *Mendocino County Zoning Code*, which incorporates by reference the County's Zoning Map, implements the General Plan and provides location-specific regulations, such as use restrictions and building height, setback, and bulk limitations. Zoning designations in the project area are discussed above.

3.10.3 Evaluation Criteria and Significance Thresholds

Consistent with CEQA Guidelines Appendix G, an impact to land use and planning is considered significant if the proposed project would:

- Physically divide an established community;
- 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; or
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

Areas of No Project Impact

Construction and operation of the project would not result in impacts related to some of the significance criterion identified in Appendix G of the current CEQA Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reason:

- ***Physically divide an established community.*** The project is not capable of physically dividing an established community because the project site is not located within an established community.
- ***Conflict with any applicable habitat conservation plan or natural community conservation plan**.* There are no habitat conservation plans or natural community conservation plans applicable to the proposed project (USFWS 2014; CDFW 2014).

3.10.4 Methodology

For the purposes of this impact analysis, a significant impact would occur if implementation of the proposed project would result in inconsistencies or conflicts with the adopted goals and policies of the Mendocino County General Plan and/or applicable rules and regulations of the Mendocino County Zoning Code.

3.10.5 Impacts and Mitigation Measures

Impact LU-1: Conflict with Any Applicable Land Use Plan, Policy, or Regulation.

The project site has a General Plan Land Use designation of PL – Timber Preserve and a zoning designation of TP - Timberland Production. The PL land use classification is intended to be applied to land in public ownership that is not appropriately included in some other classification. The classification is also intended to be applied to lands held and managed for public recreation or appropriate for acquisition for public purposes. General uses include agricultural uses, forestry, conservation and development of natural resources, public facilities, recreation, and utility installations. As a public facility, the construction and operation of a transfer station is an allowable use within the PL designation. Therefore, the project would not conflict with the General Plan land use designation.

The *Mendocino County Zoning Code* (Title 20) states that the TP "district is intended to be applied to areas of the County which because of their general soil types, location and timber growing capabilities are suited for and should be devoted to the growing, harvesting, and production of timber and timber related products and are taxed as such." Permitted uses in this district include residential use types, civic use types, agricultural use types and accessory uses as provided in Chapter 20.164. The proposed project will require a Major Use Permit per Section 20.068.025, (B) Civic Use Types, of the *Mendocino County Zoning Code.* According to this section of the code, Civic Use Types include Major Impact Services and Utilities such as the proposed project. Uses subject to a Major Use Permit include residential, civic (proposed project), commercial, and agricultural use types. Major Impact Services and Utilities are allowed in this district with issuance of a Major Use Permit. Therefore, the project would not conflict with the Zoning Code.

At the request of the County of Mendocino and City of Fort Bragg, Assembly Bill (AB) 384 was enacted in 2011 which included provisions authorizing a land swap whereby the State would transfer ownership of the 17-acre JDSF site (project site) to the County/City in exchange for either ownership of 35 acres at the Caspar Landfill site or control over its future uses. The land swap would be consistent with AB 384 and the California Board of Forestry and Fire Protection

Resolution on the transfer of JDSF land for construction of a solid waste transfer station (State of California Board of Forestry and Fire Protection 2010).

The project site is not within the coastal zone and is not subject to a Specific Plan. The proposed project would not conflict with the Mendocino County General Plan or Zoning Code, therefore, there is no impact.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No impact.

3.10.6 Cumulative Impacts

Impact LU-C-1: Result in Cumulatively Considerable Contribution to Cumulative Impacts Related to Land Use.

Cumulative development would result in new residential, commercial/industrial, lodging, and recreational uses (reference Table 3-1). Cumulative projects would be evaluated on a project-by-project basis. Each proposed project would undergo a similar plan review process as the proposed project, in order to determine potential land use planning policy and regulation conflicts. Each cumulative project would be analyzed independent of other projects, within the context of their respective land use and regulatory setting. As part of the review process, each project would be required to demonstrate compliance with the provisions of the applicable land use designation(s) and zoning district(s). It is assumed that cumulative development would progress in accordance with the General Plan and Zoning/Development Code of the respective jurisdictions and regulations and guidelines of the each jurisdiction' is consistently upheld. The project was determined to have no impact with regard to applicable land use plans, policies, and regulations; therefore it cannot contribute to a cumulative impact.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No Impact.

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3.11 Noise

This section describes the existing noise setting and evaluates the potential impacts related to noise and vibration during construction and operation of the project. The impacts and mitigation measures section establishes the thresholds of significance, evaluates potential noise and vibration impacts, and identifies the significance of impacts. Where appropriate, mitigation is presented to reduce impacts to less than significant levels.

3.11.1 Setting

Fundamentals of Acoustics

Noise may be defined as unwanted sound. Noise is often objectionable when it is disturbing or annoying. The objectionable nature of sound could be caused by its pitch or its loudness. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 3.11-1.

There are several methods of characterizing sound. The most common method in California is the A-weighted sound level or (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called Leq. The most common averaging period is hourly, but Leq can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep - 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Day/Night Average Sound Level (Ldn) is average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 PM and 7:00 AM. The Community Noise Equivalent

Level, (CNEL), is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 PM - 10:00 PM) and a 10 dB addition to nocturnal (10:00 PM - 7:00 AM) noise levels.

Table 3.11-1 Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this section are A-weighted, unless indicated otherwise.
L01, L10, L50, L90	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, Leq	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 PM to 10:00 PM and after addition of 10 decibels to sound levels in the night between 10:00 PM and 7:00 AM.
Day/Night Noise Level, Ldn or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 PM and 7:00 AM.
Lmax, Lmin	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several methods are typically used to quantify the amplitude of vibration including Peak Particle Velocity (PPV) and Root Mean Square (RMS) velocity. PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. RMS velocity is defined as the average of the squared amplitude of the signal, usually measured in decibels referenced to 1micro-in/sec and reported in VdB. PPV and VdB vibration velocity amplitudes are used in this analysis to evaluate the effect on buildings and human response to vibration.

Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. This rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows. In urban environments sources of groundborne vibration include construction activities, light and heavy rail transit, and heavy trucks and buses.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

Project Site

The proposed location for the new transfer station lies within the Jackson Demonstration State Forest (JDSF) approximately 3.5 miles southeast of downtown Fort Bragg. Sensitive receptors include residences to the west of the site, located north and south of SR 20, residences to the southeast of the site, and the Wildwood Campground and RV Park, located approximately 2,000 feet to the east.

Existing Noise Environment

A noise monitoring survey was performed between Wednesday, August 13, 2014 and Thursday, August 14, 2014 in order to document ambient noise conditions at locations representative of the nearest residences in the vicinity of the project site. The noise monitoring survey included one unattended long-term noise measurement (LT-1) and two attended short-term noise measurements (ST-1 and ST-2). Noise measurement locations are shown on Figure 3.11-1 and noise measurement data are shown on Figure 3.11-2.

Long-term noise measurement LT-1 quantified existing noise levels at a distance of 75 feet from the centerline of SR 20. Ambient noise levels measured at this location were primarily the result of local traffic along the roadway. Hourly average noise levels typically ranged from about 60 to 69 dBA Leq during daytime hours. Maximum instantaneous noise levels during the daytime were typically 75 dBA Lmax to 85 dBA Lmax. The calculated day-night average noise level at LT-1 was 69 dBA Ldn. These data are summarized in Figure 3.11-2.

A series of short-term noise measurements were made on Wednesday, August 13, 2014 in order to document ambient noise levels with various distances from SR 20 adjacent to residential receptors located west of the site. Short-term noise measurement site ST-1 was 155 feet from the centerline of SR 20. The average noise level measured during the late afternoon was 57 dBA Leq. The estimated day-night average noise level at this position was 60 dBA Ldn. Noise measurement ST-2 was made approximately 350 feet from the center of SR 20, and the average noise during the late afternoon was 50 dBA Leq. The estimated day-night average noise level at Site ST-2 was 52 dBA Ldn. Based on these measured data, noise levels at the residences located furthest from SR 20, approximately 530 feet from the roadway centerline, are estimated to be 47 dBA Ldn.

3.11.2 Regulatory Framework

Federal

No federal standards related to noise and vibration would be applicable to the project.

State

No State regulations related to noise and vibration would be applicable to the project. However, the California Department of Transportation (Caltrans) has published guidelines for evaluating potential vibration impacts from construction projects. Caltrans' Transportation and Construction Vibration Guidance Manual indicates that vibration in excess of 0.3 inches per second (in/sec) PPV could cause cosmetic damage to structures, and 0.1 in/sec PPV could cause residential annoyance during sleep periods.

Regional and Local

Mendocino County General Plan Goals and Policies

The Noise Element of the Mendocino County General Plan (adopted August, 2009) sets forth goals and policies related to noise and land use compatibility. Applicable policies to this project are as follows:

Policy DE-98: The County will protect residential areas and other noise-sensitive uses from excessive noise by doing the following:

1) Requiring that new land uses, new roadways, and other new noise sources do not create unacceptable noise levels on adjacent parcels.
2) Allowing homes or noise-sensitive uses to be developed only in places where existing and projected noise levels will meet the exterior noise guidelines and standards shown in Policies DE-100 and DE-101.
3) Requiring that County decisions which would cause or allow an increase in noise created by stationary or mobile sources (such as development of noise-generating land uses or the construction of new or wider roadways) be informed by a noise analysis and accompanied by noise reduction measures to keep noise at acceptable levels.

Policy DE-99: To implement Policy DE-98, the following shall apply:

1) No new use regulated by the County shall be permitted to generate noise that would cause the ambient noise on any adjacent parcel to exceed the "completely compatible" 24-hour guidelines shown in Policy DE-101 or the 30-minute noise standards in Policy DE-100.
2) The County shall ensure that noise mitigation to achieve a "completely compatible" 24-hour exterior noise level and conformance with the 30-minute

exterior noise standard is provided in conjunction with any decision (Ex: roadway construction projects, public park construction, General Plan amendments, changes of zone conditional use permits, and site plan review approval) it makes that would cause a violation of item 1) above.

3) Developers of new residential or other noise-sensitive uses which are placed in environments subject to existing or projected noise that exceeds the “completely compatible” guidelines in Policy DE-101 shall be responsible for ensuring that acceptable exterior and interior noise levels will be achieved.

4) The County shall ensure that roadway projects include mitigation measures to maintain at least “tentatively compatible” noise levels as shown in Policy DE-101. Mitigation for roadway noise may be deferred where “tentatively compatible” noise guidelines would be exceeded on vacant lands, but shall be installed as part of the roadway project where the noise would affect existing homes. Deferred mitigation shall be the responsibility of the project which places residential units on vacant lands.

5) Developers of new noise-creating uses shall be responsible for implementing noise reduction techniques either at the source or at the residential use to achieve acceptable exterior and interior noise levels.

6) The County shall be responsible for providing noise mitigation required as the result of County decisions to increase transportation noise standards.

7) The County shall seek to obtain noise mitigation from other agencies (including the State of California) required to address the noise impacts of decisions made by those agencies (including, but not limited to, roadway widenings).

<u>Action Item DE-99.1</u>: Apply the State Noise Insulation Standards, zoning and building controls, buffers, sound barriers, traffic controls, and other effective measures to reduce exposure to unsafe and undesired noise sources.

<u>Action Item DE-99.2:</u> Require acoustical studies for:

1) The Significant new noise generators,

2) New noise-sensitive uses in noise-impacted areas or near noise generators, or

3) New uses which are proposed to be developed in areas which do not meet the “completely compatible” exterior noise guidelines contained in Policy DE-100 or Policy DE-101.

If information on the noise environment at a project site is not available, a measurement of the noise environment by a qualified acoustical engineer may be needed to make a determination whether a proposed project complies with the guidelines and standards in Policy DE-100 or DE-101.

<u>Action Item DE-99.3</u>: The County will seek to obtain noise mitigation from other agencies (including the State of California) required to address the noise impacts of decisions made by those agencies (including, but not limited to, roadway widenings and railroad operations).

Policy DE-100: The following are the County's standards for maximum exterior noise levels for residential land uses.

Table 3-J (as identified in General Plan)
Exterior Noise Level Standards (Levels not to be exceeded more than 30 minutes in any hour)

	Time Period	
Single-Family Homes and Duplexes	10 p.m. to 7 a.m.	50
	7 a.m. to 10 p.m.	60
Multiple Residential 3 or More Units Per Building (Triplex +)	10 p.m. to 7 a.m.	55
	7 a.m. to 10 p.m.	60

- Where existing ambient noise levels exceed these standards, the ambient noise level shall be the highest allowable noise level as measured in dBA Leq (30 minutes).
- The noise levels specified above shall be lowered by 5 dB for simple tonal noises (such as humming sounds), noises consisting primarily of speech or music, or for recurring impulsive noises (such as pile drivers, punch presses, and similar machinery).
- The County may impose exterior noise standards which are less restrictive than those specified above, provided that:
  1) The noise impact on the residential or other noise-sensitive use is addressed in an environmental analysis,
  2) A finding is made by the approving body stating the reasons for accepting a higher exterior noise standard, and
  3) Interior noise standards will comply with those identified in Policy DE-103.

Policy DE-101: The following are noise compatibility guidelines for use in determining the general compatibility of planned land uses:

Table 3-K (as identified in General Plan)
Noise Compatibility Guidelines (Expressed as a 24-hour day-night average or Ldn)

Land Use	Completely Compatible	Tentatively Compatible	Normally Incompatible	Completely Incompatible
Residential	Less than 55 dBA	55-60 dBA	60-75 dBA	Greater than 75 dBA
Commercial	Less than 65 dBA	65-75 dBA	75-80 dBA	Greater than 80 dBA
Industrial	Less than 70 dBA	70-80 dBA	80-85 dBA	Greater than 85 dBA

See Policy DE-102 for the definitions of these levels of compatibility.

- These guidelines apply to land designated by this General Plan for these uses. Residential, retail, or public parks which have been developed on land designated for other uses shall be subject to the exterior noise guidelines for the land on which they are located.

- Non-residential uses located on residentially designated land shall be subject to the exterior noise guidelines for residential lands.
- All uses on Commercial lands, including non-commercial uses, shall be subject to the standards for Commercial land.
- Land use designations not listed above do not have exterior noise compatibility standards. Land use designations with no exterior noise compatibility standard include office and industrial.

Policy DE-102: The following definitions shall be used in combination with the standards in the Noise Compatibility Guidelines shown above.

- "Transportation Noise" consists of noise generated by motor vehicles, trains, and airports.
- "Completely Compatible" means that the specified land use is satisfactory and both the indoor and outdoor environments are pleasant.
- "Tentatively Compatible" means that noise exposure may be of concern, but common building construction practices will make the indoor living environment acceptable, even for sleeping quarters, and the outdoor environment will be reasonably pleasant.
- "Normally Incompatible" means that noise exposure warrants special attention, and new construction or development should generally be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features are included in the design. Careful site planning or exterior barriers may be needed to make the outdoor environment tolerable.
- "Completely Incompatible" means that the noise exposure is so severe that new construction or development should generally not be undertaken.

Policy DE-104: New or expanded uses shall comply with adopted noise standards to ensure minimal impact on established noise-sensitive uses.

Policy DE-105: A 5 dB increase in CNEL or Ldn noise levels shall be normally considered to be a significant increase in noise.

Action Item DE-105.1: Adopt standards and requirements for acoustical studies to ensure consistent identification of noise impacts.

Mendocino County Inland Zoning Code

Title 20, Division 1 presents exterior noise limit standards as summarized in Table 3.11-2, below:

Table 3.11-2 Mendocino County Inland Zoning Code Exterior Noise Limit Standards

Receiving Land Use Category[3],[4]	Time Period	Noise Level Standards (dBA)[1],[2]	
		Rural/Suburban	Urban/Highways[5]
One and Two Family Residential	10:00 p.m. - 7:00 a.m. 7:00 a.m. - 10:00 p.m.	40 50	50 60
Multifamily Public Spaces	10:00 p.m. - 7:00 a.m. 7:00 a.m. - 10:00 p.m.	45 50	55 60
Limited Commercial Some Multifamily	10:00 p.m. - 7:00 a.m. 7:00 a.m. - 10:00 p.m.	55 60	
Commercial	10:00 p.m. - 7:00 a.m. 7:00 a.m. - 10:00 p.m.	60 65	
Light Industrial Heavy Industrial	Any time Any time	70 75	
Adjustments to Noise Level Standard			
Duration L50 L25 L0	 30 minutes per hour 15 minutes per hour Maximum permissible level	 Standard Standard + 5 dB Standard + 20 dB	
Character	Tone, whine, screech, hum, or impulsive, hammering, riveting, or music or speech	Standard + 5 dB	
Ambient Level(1)	Existing ambient L50, L25 Existing ambient L0	Standard + 5dB Existing maximum	

Interpretive Footnotes

(1) When an acoustical study demonstrates that ambient levels exceed the noise standard, then the ambient levels become the standard.
(2) Higher noise levels may be permitted for temporary, short-term or intermittent activities when no sensitive or residential uses will be affected.
(3) County staff shall recommend which receiving land use category applies to a particular project, based on the mix of uses and community noise levels. Industrial noise limits intended to be applied at the boundary of industrial zones, rather than within industrial areas.
(4) The "rural/suburban" standard should be applied adjacent to noise sensitive uses such as hospitals or convalescence homes.
(5) "Highways" apply to roads and highways where average daily traffic (ADT) exceeds 10,000.
(Ord. No. 4017 (part), adopted 1998)

3.11.3 Evaluation Criteria and Significance Thresholds

The project would cause a significant impact related to noise, as defined by the CEQA Guidelines (Appendix G), if it would:

- Result in 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;

  Significance Threshold (Sources)

  55 dBA Ldn – (Mendocino County General Plan Policy DE-99)
  60 dBA L50 – (Mendocino County General Plan Policy DE-100)
  50 dBA L50 – (Mendocino County Inland Zoning Code (Daytime Noise Level Standard for Rural/Suburban One and Two Family Residential Land Uses)

- Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

  Significance Threshold (Sources)

  0.3 in in/sec PPV – cosmetic damage to structures – (Caltrans Transportation and Construction Vibration Guidance Manual)

- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

  Significance Threshold (Sources)

  5 dBA Ldn above existing conditions – (Mendocino County General Plan Policy DE-105)

- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

  Significance Threshold (Sources)

  Daytime - 60 dBA Leq and 5 dBA Leq or more above the ambient for a period greater than one year – (Standard industry practice)

- 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, and expose people residing or working in the project area to excessive noise levels.
- Located within the vicinity of a private airstrip, and expose people residing or working in the project area to excessive noise levels.

Areas of No Project Impact

As explained below, the project would not result in impacts related to two of the significance criteria identified in Appendix G of the current California Environmental Quality Act (CEQA) Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- **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, and expose people residing or working in the project area to excessive noise levels.** The proposed project is not located within an airport land use plan or within two miles of a public airport. Therefore this significance criterion is not applicable to the proposed project and is not discussed further.
- **Located within the vicinity of a private airstrip, and expose people residing or working in the project area to excessive noise levels.** The proposed project is not located within the vicinity of a private airstrip. Therefore this significance criterion is not applicable to the proposed project and is not discussed further.

3.11.4 Methodology

The noise and vibration impact assessment evaluates noise and vibration impacts associated with construction and operation of the project. The assessment of potential noise impacts was conducted using the anticipated noise that would be produced during construction and operation of the project as compared to noise level thresholds established by the regulatory criteria. The assessment of vibration impacts was conducted using information on anticipated vibration levels generated during the construction of the project.

For construction noise, the potential for impacts was assessed by considering several factors, including the proximity of project-related noise sources to noise-sensitive land uses (i.e., sensitive receptors), typical noise levels associated with construction equipment, the potential for construction noise levels to interfere with daytime activities, and the duration that sensitive receptors would be affected. Construction equipment for this project would include aerial lifts, air compressors, bore/drill rigs, cement and mortar mixers, concrete/industrial saws, cranes, crawler tractors, crushing equipment, dumpers/tenders, excavators, forklifts, generator sets, graders, off-highway tractors, off-highway trucks, pavers and paving equipment, plate compactors, pressure washers, pumps, rollers, rough terrain forklifts, rubber tired dozers and loaders, scrapers, signal boards, skid steer loaders, surfacing equipment, sweepers/scrubbers, loaders/backhoes, trenchers, welders, and other general equipment. For operational noise, the potential for impacts was assessed by evaluating the noise generation potential of noise sources, proximity of sensitive receptors, and the potential for operational noise to remain within the established local limits at the nearest receptors. Operational noise sources for this project would include automobile and truck traffic accessing the site, noise generated by equipment located inside the industrial building and transmitted outside through the doorways, and two front-end loaders (one inside the building, one outside).

A computer model was used to calculate operational noise levels for the proposed project. The model, SoundPLAN Version V7.3, is a three-dimensional ray-tracing program, which takes into account the sources of noise, the frequency spectra, and the topography of the area. A2013 Annual Average Daily Traffic (AADT) volume of 10,800 vehicles (Caltrans 2013b) was input into the model and calibrated to long-term and short-term noise measurement data collected during the noise monitoring survey as presented in the setting section, resulting in a modeled input of 15,500 vehicles over a 24 hour period. The source noise level data used to represent the noise levels resulting from operations at the proposed transfer station were taken from previous measurements at similarly sized facilities (6 to 15 acre sites) of similar usage[1]. The source noise level for operations inside the waste and unloading area (including trucks and a front-end loader) was 72 dBA Leq at a distance of 50 feet from the loading bay exit. An additional front-end loader was input as the primary noise source at the outdoor recycling area and a source noise level of 74 dBA Leq at a distance of 50 feet was used. Automobile and truck traffic volumes were also input into the model based on the data contained in the Central Cost Transfer Station Project Vehicle Miles Traveled memo prepared by MSWMA and dated January 8, 2015 (the VMT data from the memo is summarized in Table 3.7-1 of Section 3.7). All operations were assumed to occur between the hours of 8:00 a.m. and 5:00 p.m.

The Caltrans guidelines for vibration are the basis for the significance criteria for annoyance and potential building damage (Caltrans 2013a). Caltrans recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern, and a conservative limit of 0.08 in/sec PPV for ancient buildings or buildings that are documented to be structurally weakened. Proposed construction areas would not be in the vicinity of fragile structures but older structures exist within the vicinity of the project site. Based on Caltrans guidance, this analysis establishes 0.3 in/sec PPV as the significance threshold for construction vibration to avoid damage to buildings from vibration sources.

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[1] Greenwaste Recovery Inc, Material Processing and Transfer Station, Santa Clara, California (I&R job #09-049); and Pacific Recycling Solutions, Recycling and Resource Recovery Center, Ukiah, California (I&R job #12-001)

3.11.5 Impacts and Mitigation Measures

Impact NO-1: Exposure of Persons to or Generation of Noise Levels in Excess of Standards.

Mendocino County General Plan Policy DE-99 states, “No new use regulated by the County shall be permitted to generate noise that would cause the ambient noise on any adjacent parcel to exceed the ‘completely compatible’ 24-hour guidelines shown in Policy DE-101 (55 dBA Ldn) or the 30-minute noise standards in Policy DE-100 (60 dBA L50).” The Inland Zoning Code establishes a more restrictive noise standard of 50 dBA L50, except in areas where ambient noise levels exceed the standard. In these cases, the adjusted noise limit is 55 dBA L50.

Figure 3.11-3 (Map 1) shows the noise contour output from the Sound PLAN noise model for all operations and traffic resulting from the proposed project. The noise contours are in terms of the hourly average noise level represented by the Leq acoustical descriptor. The Leq is typically 0 to 3 dBA higher than the 30-minute, or median (L50) noise level. For comparative purposes with the L50 noise level limit, the Leq is considered a conservative descriptor. The Leq is also the building block used in the calculation of the Ldn, which is used to test whether or not a substantial permanent increase in noise levels would occur with the operation of the project (discussed under Impact NO-3).

The ambient noise environment resulting from traffic along SR 20 exceeds 50 dBA L50 during the daytime at the nearest receptors to the project site which adjoin the roadway. As noted above, the adjusted noise limit is 55 dBA L50 during the daytime. Ambient noise levels at second row receptors near the site are at or below 50 dBA L50 during the daytime, therefore, the unadjusted noise limit of 50 dBA L50 applies.

The noise contours displayed in Figure 3.11-3 (Map 1) show that operational noise levels from vehicles and equipment operating at the project site (including the sounds of intermittent back-up alarms) at the nearest residential property lines west of the site would range from 49 to 50 dBA Leq. Operational noise levels would not exceed the adjusted noise limit of 55 dBA L50 during the daytime at the first-row residence near SR 20 or the unadjusted noise limit of 50 dBA L50 at the second-row residence located further from SR 20.

The noise contours displayed in Figure 3.11-4 (Map 2) show the day-night average noise levels expected as a result of the operation of the project between the hours of 8:00 a.m. and 5:00 p.m. In all cases, operational noise levels resulting from the project would be less than the “completely compatible” noise level of 55 dBA Ldn and below ambient noise levels resulting from SR 20 traffic.

Operational noise levels would comply with Mendocino County General and Inland Zoning Code standards, and therefore the impact would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact NO-2: Result in Exposure of Persons to or Generation of Excessive Groundborne Vibration or Groundborne Noise Levels.

Construction of the Central Coast Transfer Station would include the following construction phases; site preparation, grading/excavation, trenching, exterior building construction, interior building construction, and paving. Major sources of groundborne vibration such as impact or vibratory pile drivers are not proposed as part of the project.

Table 3.11-3 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. As indicated in Table 3.11-3, vibration levels produced by a vibratory roller can reach 0.210 in/sec, PPV at a distance of 25 feet. Jackhammers typically generate vibration levels of 0.035 in/sec PPV and drilling typically generates vibration levels of 0.09 in/sec PPV at a distance of 25 feet. Vibration levels would vary depending on soil conditions, construction methods, and equipment used.

Table 3.11-3 Vibration Source Levels for Project Construction Equipment

Equipment	PPV at 25 ft. (in/sec)	Approximate Lv at 25 ft. (VdB)
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006.

A review of the construction equipment list for the project was made to identify the specific pieces of construction equipment that would result in the highest vibration levels at nearby receptors. A vibratory roller would be used during the grading/excavation and paving phases of the project, and the nearest receptor would be located approximately 100 feet from portions of the SR 20 that would undergo grading and paving. At a distance of 100 feet, vibration levels produced by a vibratory roller would be approximately 0.046 in/sec PPV, below the 0.3 in/sec PPV threshold used to avoid cosmetic damage to buildings that are found to be structurally sound but where structural damage is a major concern. Vibration levels produced by other equipment proposed as part of the project and at locations further from receptors would also be less than the 0.3 in/sec PPV threshold. This would be a less-than-significant impact.

Closure of the Caspar site would not involve any activities that would result in groundborne vibrations. Recyclables stored at the Caspar Facility would be removed with existing equipment, and then operation would cease. Operation at the proposed Central Coast Transfer Station would involve use of standard off-road equipment, none of which would result in groundborne vibrations detected off site. There would be no impact to groundborne vibrations from closure of the Caspar site or operation of the new facility.

Mitigation Measures: No mitigation is necessary.

Level of Significance: **Less than significant.**

Impact NO-3: Substantial Permanent Increase in Ambient Noise Levels in the Project Vicinity.

Mendocino County General Plan Policy DE-105 states, “A 5 db increase in CNEL or Ldn noise levels shall be normally considered to be a significant increase in noise.”

Figure 3.11-5 (Map 3) shows the existing noise contour output from the SoundPLAN noise model. Existing residential land uses adjoining SR 20 are currently exposed to noise levels ranging from about 60 to 70 dBA Ldn. Second-row residences are typically exposed to noise levels ranging from 45 to 55 dBA Ldn due to SR 20 traffic.

Figure 3.11-6 (Map 4) shows the existing plus project condition. The Ldn noise contours in the immediate vicinity of the site extend westward, northward, and eastward from the transfer station, but do not change dramatically at the nearest sensitive receptors to the west or east.

Figure 3.11-7 (Map 5) shows the noise increase (Ldn) when comparing the existing and existing plus project conditions. The maximum noise increase attributable to project operations is 1 dBA Ldn. This permanent noise increase would occur at the second-row residence from SR 20, northwest of the project site. The predicted Ldn noise level increase at the remainder of residential receptors in the project vicinity would be less than 1 dBA Ldn. The impact resulting from the operation of the project would be less than significant as project-generated noise levels at noise-sensitive receptors are calculated to increase by less than 5 dBA Ldn above existing background noise levels.

Closure of the Caspar Facility does not involve any new noise-generating activities. In fact, noise would be reduced at the site with closure of the facility as the compactor and loader would no longer be in use. There would be no impact to ambient noise at the Caspar site.

Mitigation Measures: No mitigation is necessary.

Level of Significance: **Less than significant.**

Impact NO-4: Substantial Temporary or Periodic Increase in Ambient Noise Levels in the Project Vicinity.

Construction of the Central Coast Transfer Station would include the following construction phases; site preparation, grading/excavation, trenching, exterior building construction, interior building construction, and paving. Construction noise levels were calculated with the Federal Highway Administration’s (FHWA) Roadway Construction Noise Model (RCNM v 1.1). Construction equipment identified on the proposed construction equipment list was input into the RCNM Model. The results of the calculations showed that hourly average noise levels would range from 82 to 86 dBA Leq at a distance of 50 feet from the center of the construction site during busy construction periods. There would be variations in construction noise levels on a day-to-day basis depending on the specific activities occurring at the site. Appendix K includes the output data for RCNM model.

The daytime exterior noise level threshold is 60 dBA Leq recognizing that at this level, noise begins to interfere with outdoor speech communication. Additionally, at residential properties exposed to an exterior noise level of 60 dBA Leq, interior noise levels would be expected to be about 45 dBA Leq assuming that a typical house achieves an approximate 15 dBA reduction indoors with the windows open. Interior noise levels exceeding 45 dBA Leq can interfere with activities such as reading or watching television.

Construction generated noise levels drop off at a rate of about 6 dBA per doubling of distance between the noise source and receptor. The nearest receptors are located approximately 500 feet from the primary construction areas, and would typically be exposed to construction noise levels of approximately 62 to 66 dBA Leq. When construction activities would occur at portions of the site closest to existing receptors (at distances of approximately 100 to 200 feet) hourly average noise levels resulting from project construction activities would range from 60 to 80 dBA Leq. Daytime construction noise levels are calculated to exceed the 60 dBA Leq threshold at receptors within

1,000 feet of the center of the construction site having direct line of sight to project construction activities. Shielding by buildings or terrain would result in lower construction noise levels at distant receptors. For example, the CAL FIRE helipad is positioned between and above (the facility was constructed with substantial fill thus increasing the elevation of the helipad) the project site and residences to the northwest and west.

Although construction noise levels would exceed the 60 dBA Leq noise level threshold, the impact from daytime construction noise over an approximate six to seven-month construction period is not considered significant. The impact would be less than significant recognizing the relatively short-duration of the proposed construction activities.

Closure of the Caspar Facility does not involve any new noise-generating activities. Recyclables stored at the Caspar Facility would be removed with existing equipment, and then operation would cease.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.11.6 Cumulative Impacts

Impact NO-C-1: Cumulative Impacts from Noise.

Construction

The nearest cumulative project that could be constructed concurrently with the proposed project is the Hare Creek Shopping Mall in Fort Bragg. The exact timing for construction of this project is unknown. However, the distance separating the Hare Creek Shopping Mall site and the project site from one another would be too far for noise from the cumulative projects to add to one another and result in a significant cumulative noise impact at receptors common to each project. The project's construction would not contribute to a significant cumulative impact.

Operation

As noted above, the maximum noise increase attributable to project operations is 1 dBA Ldn. This permanent noise increase would occur at the second-row residence from SR 20, northwest of the project site. The predicted Ldn noise level increase at the remainder of residential receptors in the project vicinity would be less than 1 dBA Ldn. The impact resulting from the operation of the project would be less than significant as project-generated noise levels at noise-sensitive receptors are calculated to increase by less than 5 dBA Ldn above existing background noise levels. There are no cumulative projects in the project vicinity. The closest cumulative project to the project site is the proposed Hare Creek Shopping Mall at the corner of SR 20 and Highway 1, approximately three miles west of the project site. The distance is too far to create a cumulative impact. Therefore, project operation would not contribute to a significant cumulative impact.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Paper Size 11" x 17" (ANSI B)

0 50 100 150 200

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California II FIPS 0402 Feet

N

17 Acre Portion of APN 019-150-05

Parcels

Bio-swale

Direction of Travel

GHD

Mendocino Solid Waste Management Authority
Central Coast Transfer Station EIR

Job Number	8411065
Revision	A
Date	07 Jul 2014

Noise Measurement Locations **Figure 3.11-1**

G:\0016201 MendoSolidWasteMgmtAuthority\8411065 MSWMA TransferStationEIR\08-GIS\Maps\Figures\F2_SitePlan.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:gldavidson

718 Third Street Eureka CA 95501 USA T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

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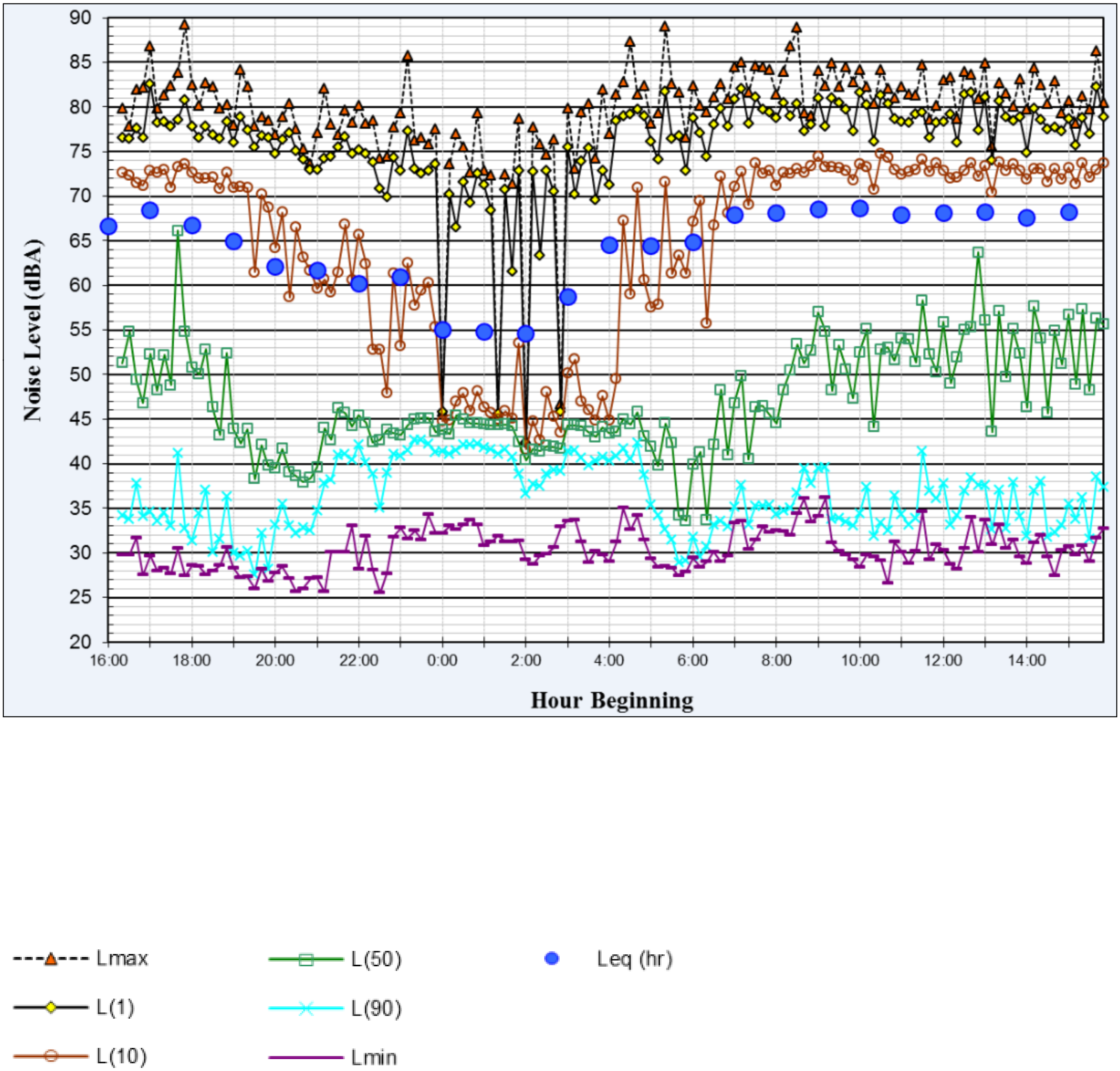
Noise Levels at Noise Measurement Site LT-1
~75 feet from the Center of SR 20
August 13-14, 2014



Paper Size ANSI A

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Central Coast Transfer Station
Project No. 14-016

Job Number	8411065.99
Revision	A
Date	18 Nov 2014

Summary of Noise Measure Data

Figure 3.11-2

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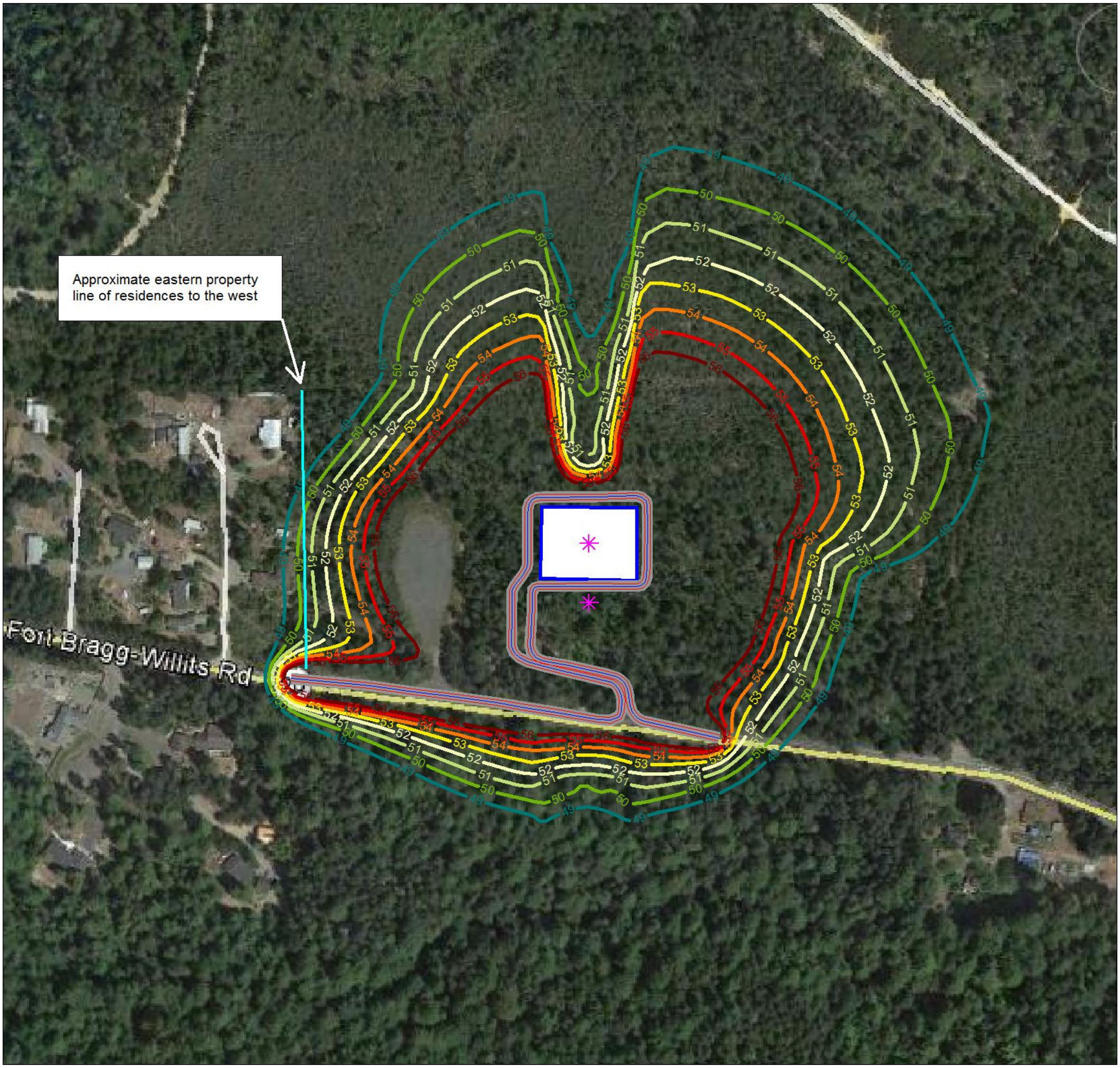

Leq Noise Level
in dB(A)

= 56
= 55
= 54
= 53
= 52
= 51
= 50
= 49

Road axis
Emission line
Point source
Industrial building

Leq Noise Levels from Project

Acoustical attenuation provided by ground and foliage

Calculated at 5 feet above ground

Not to Scale

Paper Size ANSI A

N

GHD

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

Central Coast Transfer Station
Project No. 14-016

Job Number	8411065.99
Revision	A
Date	18 Nov 2014

Operational Noise Level

Figure 3.11-3

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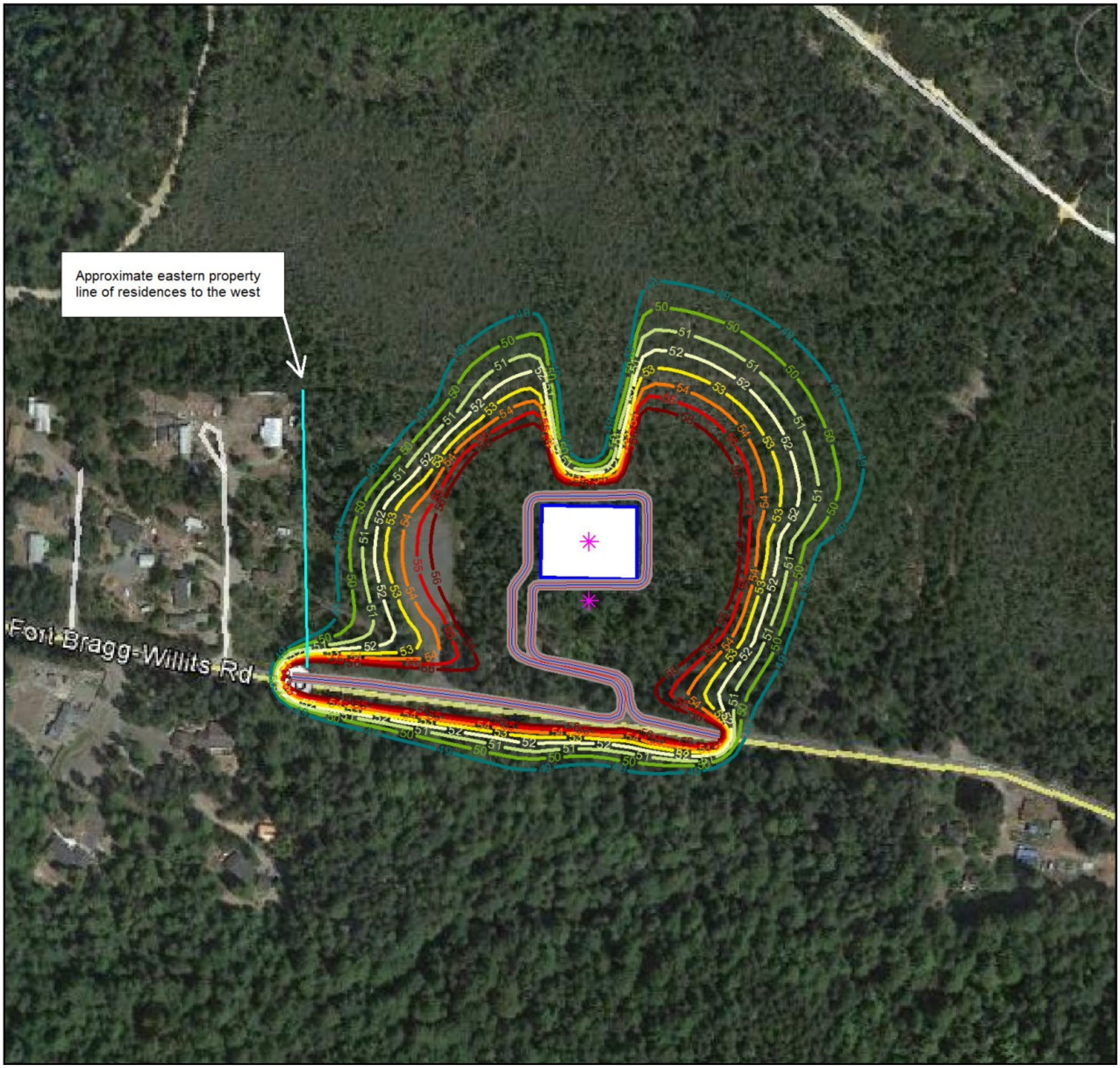

Ldn Noise Level
in dB(A)

= 56
= 55
= 54
= 53
= 52
= 51
= 50
= 49

Road axis
Emission line
Point source
Industrial building

Ldn Noise Levels from Project

Acoustical attenuation provided by ground and foliage

Calculated at 5 feet above ground

Not to Scale

Paper Size ANSI A

N

GHD

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Acoustics • Air Quality

Central Coast Transfer Station
Project No. 14-016

Job Number	8411065.99
Revision	A
Date	18 Nov 2014

Operational Noise Level

Figure 3.11-4

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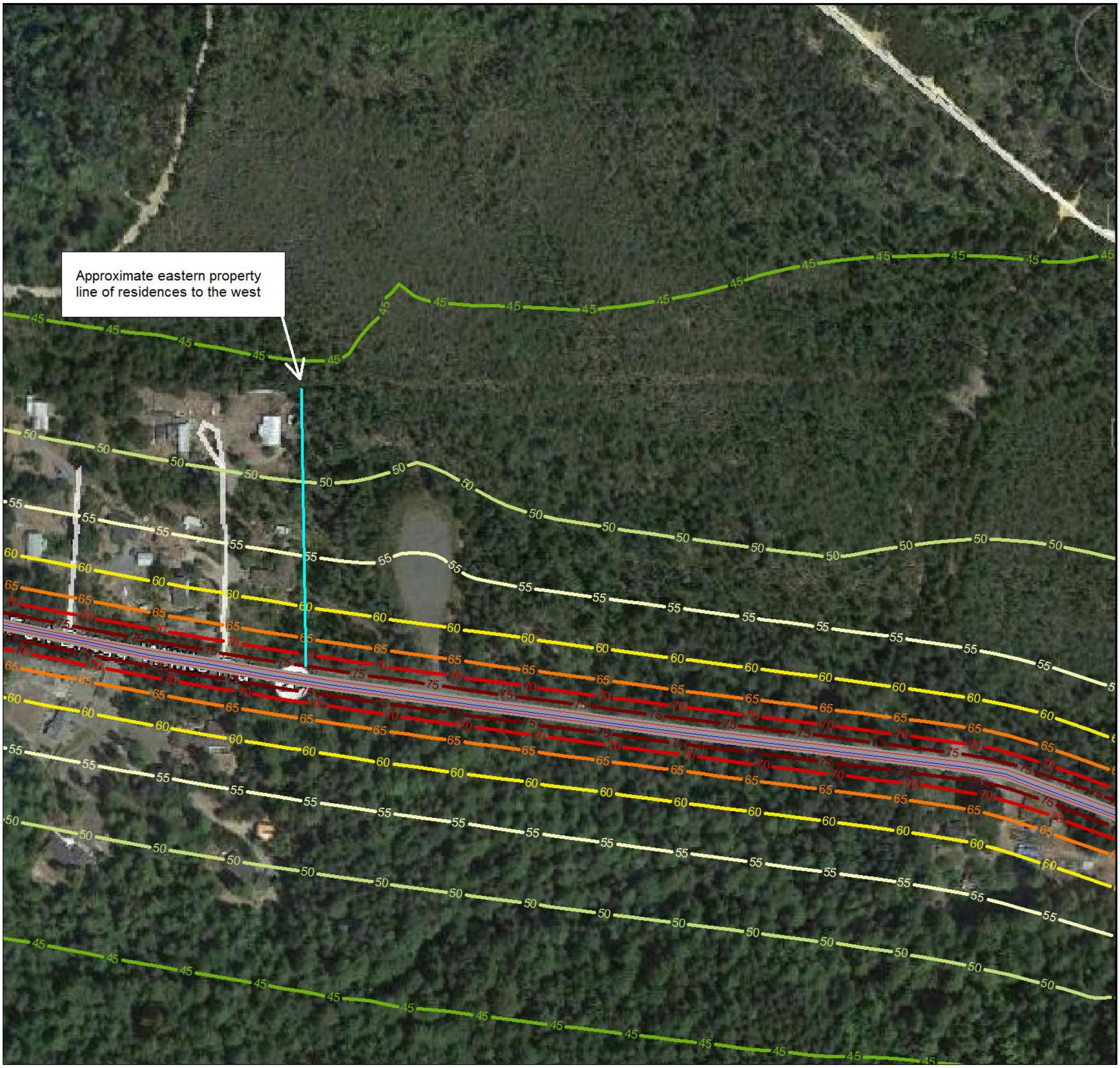

Ldn Noise Level
in dB(A)

- = 75
- = 70
- = 65
- = 60
- = 55
- = 50
- = 45

- Road axis
- Emission line
- Point source
- Industrial building

Existing Ldn Noise Levels

Acoustical attenuation provided by ground and foliage

Calculated at 5 feet above ground

Not to Scale

Paper Size ANSI A

N

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Acoustics • Air Quality

Central Coast Transfer Station
Project No. 14-016

Job Number	8411065.99
Revision	A
Date	18 Nov 2014

Existing Noise Level

Figure 3.11-5

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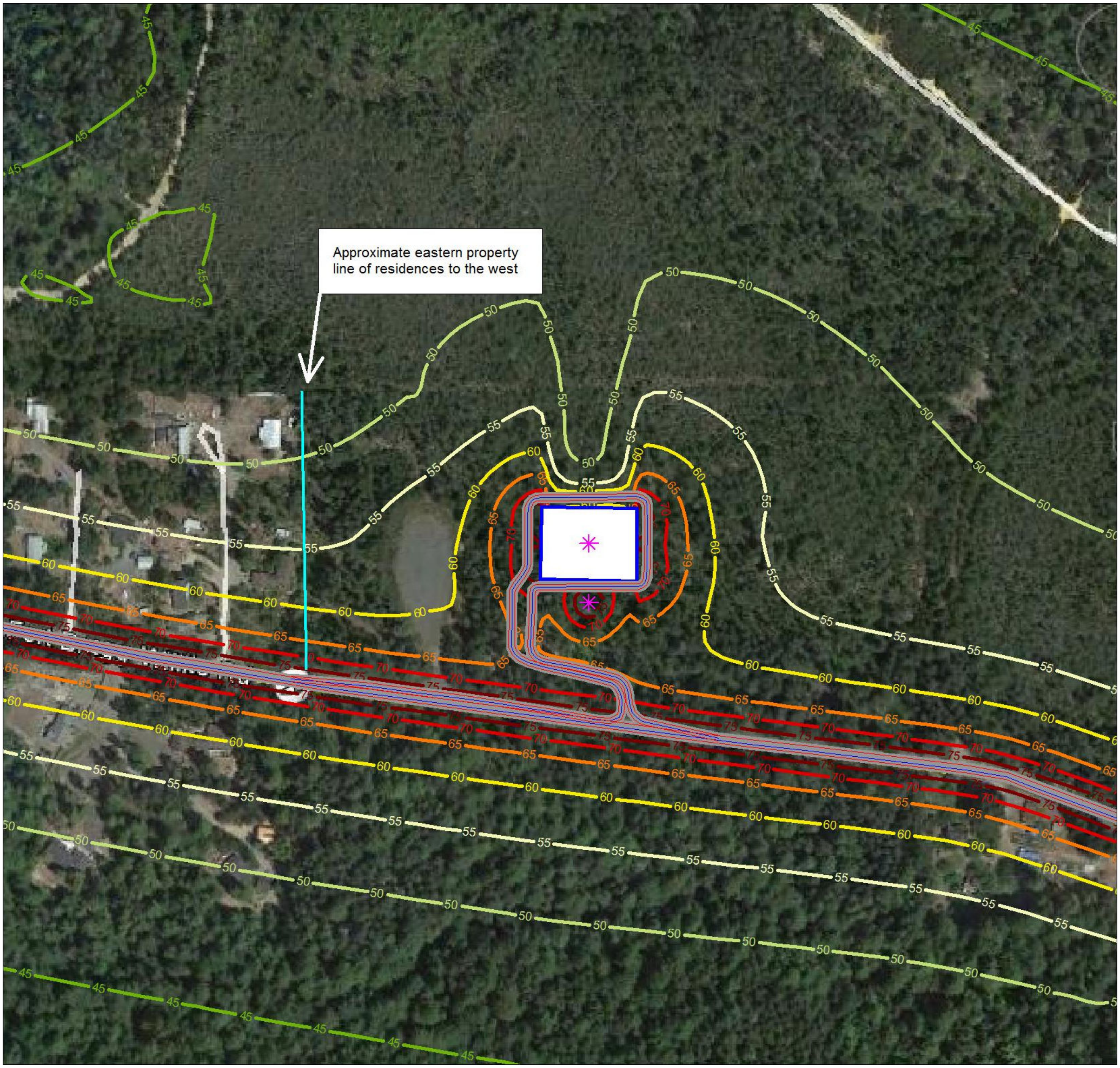

Ldn Noise Level
in dB(A)

- = 75
- = 70
- = 65
- = 60
- = 55
- = 50
- = 45

Road axis
Emission line
Point source
Industrial building

Existing plus Project Ldn Noise Levels

Acoustical attenuation provided by ground and foliage

Calculated at 5 feet above ground

Not to Scale

Paper Size ANSI A

N

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Acoustics • Air Quality

Central Coast Transfer Station
Project No. 14-016

Job Number	8411065.99
Revision	A
Date	18 Nov 2014

Existing Plus Ldn Noise Levels Figure 3.11-6

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com
G:\0016201 MendoSolidWasteMgmtAuthority\8411065 MSWMA TransferStationEIR\08-GIS\Maps\Figures\EIR\F3.11-6_ExistingPlusPjNoiseLevel.mxd

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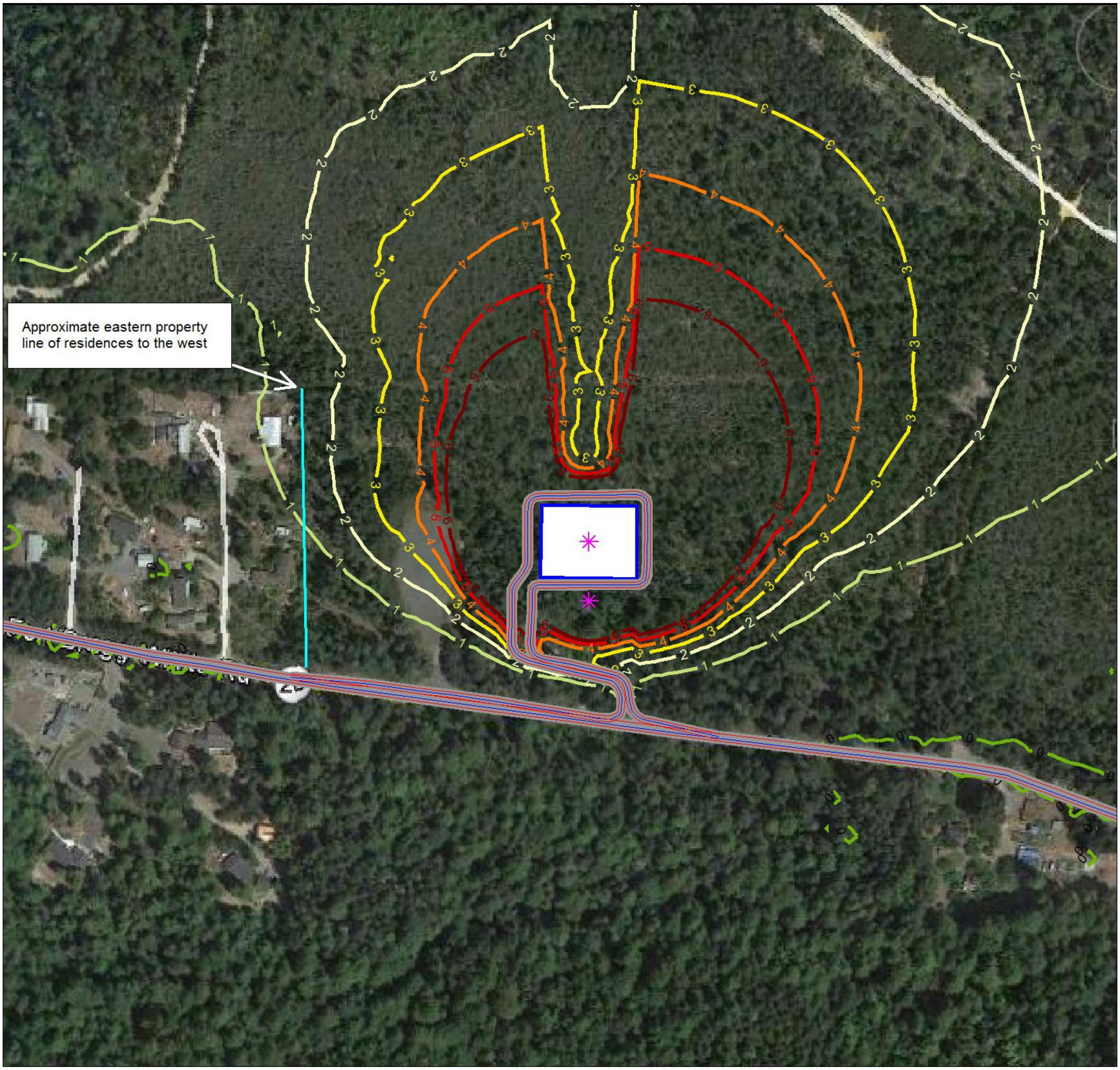

Ldn Noise Level Increase
in dB(A)

- = 6
- = 5
- = 4
- = 3
- = 2
- = 1
- = 0

Road axis
Emission line
Point source
Industrial building

Ldn Noise Level Increases from Project

Acoustical attenuation provided by ground and foliage

Calculated at 5 feet above ground

Not to Scale

Paper Size ANSI A

N

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Acoustics • Air Quality

Central Coast Transfer Station
Project No. 14-016

Job Number	8411065.99
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Ldn Noise Level Increases

Figure 3.11-7

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3.12 Transportation

This section evaluates the potential impacts related to transportation during construction and operation of the project. To provide the basis for this evaluation, the setting section describes the existing transportation setting for the project area, and the regulatory framework section describes applicable federal, State, and local regulations. The evaluation section establishes the thresholds of significance, evaluates potential transportation impacts, identifies the significance of impacts, and applies mitigation measures if applicable.

3.12.1 Setting

The following discusses the transportation-related context in which the proposed project would be constructed and would operate, including a description of the project area and roadway network that serves the project site; existing transit service, bicycle, and pedestrian facilities near the project site; definitions of intersection and roadway segment level of service (LOS); and a summary of current LOS conditions. Figure 3.12-1 shows the project area roadways and the specific intersections evaluated in this EIR. The setting focuses on the site for the proposed Central Coast Transfer Station. Closure of the Caspar Facility and the land transfer described in the Project Description would not result in new land uses that would generate traffic or affect the local transportation system. Therefore, the transportation-related context for Caspar Facility area is not described in this section.

Existing Roadway System

Roadways in the project area are classified as state highways, which are high-speed limited access roadways serving primarily regional and County-wide travel. The proposed project site is located off of State Route 20 (SR 20), a two-lane east/west highway extending from State Route 1 near Fort Bragg to US Highway 101 in Willits. The posted speed limit on SR 20 within the project area is 55 miles per hour.

The average daily traffic along SR 20 near the project site is approximately 3,100 vehicles, with 300 vehicles occurring during the peak hour (Caltrans 2013). Trucks with two or more axles account for approximately 10 to 16 percent of the average daily traffic along SR 20 (Caltrans 2012).

SR 20 intersects with SR 1 approximately three miles to the west of the project site. The westbound approach of SR 20 to SR 1 features dedicated left and right-turn lanes. At its intersection with SR 20, SR 1 features a dual left turn lane and one through lane in the southbound direction, and a dual through lane with a channelized right turn lane in the northbound direction. The posted speed limit on SR 1, in the vicinity of the intersection, is 40 miles per hour.

Existing Public Transit, Bicycle, and Pedestrian Facilities

The Mendocino Transit Authority (MTA) provides regional transit service on a daily basis to the nearby City of Fort Bragg. MTA Transit Route 65 is the only known bus route that currently traverses SR 20 in the project area, providing regional service between Fort Bragg, Willits, Ukiah and Santa Rosa. No bus stops or transit facilities for Route 65 are located within, or adjacent to, the project site.

No bicycle routes, sidewalks, or other bicycle and pedestrian facilities are currently located along SR 20 adjacent to the project area. The nearest striped bicycle lanes are located approximately 0.6 mile to the west of the proposed project site, near the intersection of SR 20 and Gravel Pit Road.

Pedestrian traffic in the vicinity of the project site is limited, as the area is at the edge of rural residential development and nearly three miles from any commercial facilities.

The 2012 Mendocino County Regional Bikeway Plan (Mendocino County 2012) includes a proposed bikeway improvement project along SR 20 that would install a Class III bicycle route from SR 1 to the Lake County Line. Class III bicycle route improvements typically include designated pavement markings to indicate the use of bicycles within the vehicular travel lane of a roadway. The portion of SR 20 that fronts the proposed transfer facility does not yet have these improvements.

Existing Intersection Level of Service

LOS is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, LOS A represents free flow conditions and LOS F represents forced flow or breakdown conditions. The LOS designation for intersections is generally accompanied by a unit of measure, which indicates a level of delay.

As part of the traffic impact study prepared for the proposed project (see Appendix H), the existing LOS for the intersection of SR 20 and SR 1 was calculated. The existing LOS calculations for this intersection are summarized in Table 3.12-1, which shows that the intersection currently operates at LOS B or better during peak periods. Because there is no existing intersection along SR 20 at the proposed project site, no existing LOS for this intersection is computable.

Table 3.12-1 Summary of Existing Peak Hour Intersection Level of Service Calculations

Intersection		Existing Conditions		
		Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak
		Delay/LOS	Delay/LOS	Delay/LOS
1.	SR 20 / SR 1[1]	10.2/B	15.1/B	13.0/B
2.	SR 20 / Project Access	*N/A*	*N/A*	*N/A*

Notes: 1LOS based on HCM2010 method of analysis for signalized intersections.

Existing Intersection Queuing Length

As part of the traffic impact study prepared for the proposed project (see Appendix H), the existing peak hour 50th percentile queue lengths were reviewed against the existing lane storage capacity at the intersection of SR 20 and SR 1. The existing peak hour queue lengths for the intersection are summarized in Table 3.12-2, which shows that the queue lengths are within existing storage lane capacity at the intersection.

Table 3.12-2 Summary of Existing Peak Hour Intersection Queue Analysis

Movement	Lanes / Available Storage	Queue Length - 50th (feet)		
		a.m.	p.m.	midday
SR 20 / SR 1				
Westbound Right Turn	1 / 120 ft	0	0	0
Northbound Through	1 / 170 ft	60	94	82
Northbound Right Turn	1 / 120 ft	0	0	0
Southbound Left Turn	2 / 320 ft	26	48	35

Notes: Queue shown is maximum after two cycles.

3.12.2 Regulatory Framework

Federal

There are no federal regulations that apply to the proposed project related to transportation in Mendocino County.

State

California Department of Transportation

The California Department of Transportation (Caltrans) is responsible for planning, design, construction, and maintenance of all State highways. The project proposes improvements to SR 20 to provide access to the project site. Such improvements would be under the jurisdiction of Caltrans, as would any changes in traffic levels at the signalized intersection of SR 20 and SR 1.

The Caltrans Guide for the Preparation of Traffic Impact Studies (Guide) (2002) includes criteria for evaluating the effects of land use development and changes to the circulation system on state highways. The Guide defines when traffic studies should be conducted to address impacts to state facilities. The Guide states that Measures of Effectiveness are used to evaluate Caltrans facilities, and provides a LOS significance threshold for signalized intersections. Specifically, the Guide states that the agency strives to maintain a LOS value of C or better on its signalized intersections. The Guide states, however, that the appropriate target LOS varies by facility and congestion level, and is defined differently by Caltrans depending on the analyzed facility.

Mendocino County General Plan

The County of Mendocino General Plan provides goals and policies for roadway systems and transportation corridors within the County. While the study area roadway network falls within the limits of Mendocino County, the General Plan does not provide an explicit LOS standard for intersections.

The Development Element of the Mendocino County 2009 General Plan contains several goals and policies related to the overall transportation and circulation system in Mendocino County. The policies most applicable to the proposed project are listed below.

Goal DE-9 (Road Systems): A Countywide road system that provides safe, efficient and attractive access, coordinated with interstate, state, local and area-wide systems.

Policy DE-126: Provide for multiple transportation modes and functions within transportation corridors and rights-of-way constructed by project developers or using appropriate grants funding.

Policy DE-128: Ensure that transportation infrastructure accommodates the safety and mobility of motorists, pedestrians, bicyclists, and persons in wheelchairs.

Policy DE-136: The County will ensure that development projects which propose direct access to a state highway have legal entitlements for such access.

Policy DE-145: Maximize the compatibility of major highway and road realignments, extensions and capacity-increasing projects with community objectives, and minimize impacts on commercial areas, neighborhoods, and resources.

Policy DE-148: Land divisions and other discretionary projects shall not be approved until access and road improvements adequate for the intended uses, density or intensity are identified and constructed or funding mechanisms are in place.

Policy DE-149: Major development applications shall include traffic studies to evaluate and mitigate cumulative effects on network level of service and safety.

3.12.3 Evaluation Criteria and Significance Thresholds

The project would cause a significant impact related to transportation, as defined by the CEQA Guidelines (Appendix G), if it would:

- 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;
- 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;
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access; or
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Areas of No Project Impact

As explained below, construction and operation of the project would not result in impacts related to two of the significance criteria identified in Appendix G of the current CEQA Guidelines. The following significance criteria are not discussed further in the impact analysis section for the following reasons:

Would the Project 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? Mendocino County is considered rural and does not have a Congestion Management Agency or an adopted Congestion Management Program. Therefore, no conflict with an applicable congestion management program would occur. This significance criterion is not applicable to the proposed project and is not discussed further.

Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? The proposed project is not located within an airport land use plan or within two miles of a public airport. Project construction and operation would include only ground-based travel. Therefore, this significance criterion is not applicable to the proposed project and is not discussed further.

3.12.4 Methodology

A traffic impact study prepared for the project provides an evaluation of operating conditions for select intersections during weekday and weekend peak periods (see Appendix H). The traffic impact study analyzed existing conditions, existing conditions plus the project, cumulative conditions, and cumulative conditions plus the project. In addition to vehicular analysis, the traffic impact study provides an evaluation of project impacts related to vehicle queuing, public transit routes, and pedestrian and bicycle movements.

Closure of the Caspar Facility and the land transfer described in the Project Description would not result in new land uses that would generate new traffic or otherwise result in transportation-related impacts. Therefore, closure of the Caspar Facility and the land transfer were not evaluated further in the traffic impact study prepared for the project.

Level of Service Methodology

Two intersections were analyzed using methodologies from the 2010 Highway Capacity Manual. The methodology used to analyse the signalized intersection of SR 20 at SR 1 is based on factors including traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For the purpose of analysis, a LOS C standard is used as the significance threshold. The ranges of delay associated with the various signalized LOS are indicated in Table 3.12-3.

Table 3.12-3 Signalized Level of Service Ranges of Delay

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

Source: 2010 Highway Capacity Manual (Transportation Research Board, 2010).

The methodology used to analyze the proposed unsignalized intersection of SR 20 at the proposed project site is based on the unsignalized intersection capacity method. For side-street stop controls, this method determines a LOS for each minor turning movement by estimating the level of average delay in seconds per vehicle. The movement with the highest level of delay is presented as the worst case LOS. The ranges of delay associated with the various unsignalized levels of service are indicated in Table 3.12-4.

Table 3.12-4 Unsignalized Level of Service

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Little or no delay	< 10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded (for an all-way stop), or with approach/turn movement capacity exceeded (for a side street stop controlled intersection)	> 50.0

Source: 2010 Highway Capacity Manual (Transportation Research Board, 2010).

Vehicle Queuing Methodology

Vehicle queuing was evaluated for the signalized intersection of SR 20 at SR 1. The evaluation determines the capacity of intersection movements to accommodate the number of vehicles expected to wait at the intersections before being able to pass through or turn. The analysis was performed to determine if there is enough queuing space between intersections, or if project-related traffic may result in the overflow of vehicles that would obstruct the operations of the roadway. For the analysis, the Synchro software program was used to determine the 50th percentile movement queue lengths based on the 2010 Highway Capacity Manual methodology for movements with storage lanes.

As the Highway Capacity Manual does not provide specific guidance for the procedure to determine the length of vehicle queues at unsignalized intersections, queuing analysis at the proposed intersection of SR 20 and the project site was not explicitly performed. However, the conceptual site plan was utilized to evaluate how the proposed geometrics affect the adjacent roadway. Most critical to this evaluation is distance provided between the proposed ingress lanes and the scale at which arriving vehicles must stop to be weighed to determine the potential queuing effect that the scale could have, and the potential for the length of queue to “back-up” onto the left and right-turn lanes proposed for SR 20.

Hazardous Design and Emergency Access

The project is evaluated for consistency with applicable Caltrans roadway regulations and emergency access requirements.

Public Transit, Bicycle, and Pedestrian Facilities

The project is evaluated for consistency with policies contained in the Mendocino County General Plan and the Mendocino County Regional Bikeway Plan regarding public transit, bicycle and pedestrian facilities.

3.12.5 Impacts and Mitigation Measures

Impact TR-1: Conflict with an Applicable Plan, Ordinance, or Policy Establishing Measures of Effectiveness for the Performance of the Circulation System.

<u>Construction</u>

LOS standards are intended to regulate long-term impacts from operation of future projects as opposed to temporary impacts from construction. Therefore, a qualitative analysis of potential construction related impacts on motor vehicle traffic is provided here. Construction traffic associated with the proposed project would result in a short-term increase in construction-related vehicle trips on SR 20 and SR 1. Construction would result in vehicle trips by construction workers, haul-truck trips for disposal of construction debris, and material and equipment deliveries to the project site. Construction-related traffic would be temporary, would vary on a daily basis, and would be spread out over the course of a work day.

Based on traffic count data obtained in August 2013, the existing LOS for the intersection of SR 20 at SR 1 is LOS B during peak periods. Therefore, under existing conditions, the intersection is known to have recently been operating satisfactorily in accordance with the Caltrans LOS C standard. Only a portion of the construction-related vehicles expected on any one day would occur during a peak hour period, and therefore, even with the addition of temporary construction-related vehicles, the temporary contribution of construction traffic is not anticipated to cause local intersection LOS to deteriorate below adopted standards. Traffic impacts during construction would be less than significant.

Construction of the acceleration and deceleration lanes adjacent to SR 20 may require a temporary partial lane closure along SR 20 adjacent to the project site. Although such closures are anticipated to be of short-duration, they would temporarily alter the normal functionality of the highway and result in a temporary decrease in its overall performance and safety, including the potential for conflicts between construction vehicles with slower speeds and wider turning radii than autos and vehicles sharing the roadway, as well as confusion or frustration of drivers related to construction activities and traffic routing. The impact would be significant.

Operation

Roadway Level of Service

Project-generated trips are expected to consist of self-haul trash and recyclables, franchise hauler traffic, outhaul traffic for recyclables, and transfer truck traffic. The projected peak hour project-generated traffic based on the traffic counts at the existing Caspar self-haul transfer station with respect to the different types of project trips is summarized in Table 3.12-5. For the purpose of analysis, it was assumed that 10 percent of the weekday and weekend daily project-generated trips would occur during the peak hour of the adjacent roadway traffic volumes.

Table 3.12-5 Summary of Projected Peak Hour Project Trips

	Weekday Daily Traffic (Total Trips)	Weekday Peak Hour Traffic (Total Trips)	Weekend Daily Traffic (Total Trips)	Weekend Peak Hour Traffic (Total Trips)
Self-Haul Customers	91	10	138	14
Franchise Hauler Collection Trucks	20	2	0	0
Recycling Outhaul	1	0	0	0
Transfer Truck Outhaul	2	2	2	2
Employee Commute	4	4	4	0

Vehicular trips generated by the new transfer facility would utilize SR 20 for both entrance and exit access. For the purpose of analysis, the distribution of project-generated trips to local roadways was performed based on the probable origins and destinations of the trips relative to the location of existing facilities that would be replaced by the new facility, as well as existing traffic patterns established from existing turning movement counts, and knowledge of the population distribution of the region. Specifically, self-haul customers and franchise hauler trucks were assumed to arrive/depart from the west of the project site and rural areas outside and within the City of Fort Bragg. Recycling outhaul traffic is minimal, and was assumed to not affect the peak hour of operations. Transfer truck outhaul traffic was assumed to arrive/depart from the east of the project site.

The LOS calculations of study intersections with the addition of project-generated traffic are summarized in Table 3.12-6. With the addition of project-related traffic, the intersection of SR 20 at SR 1 would continue to operate acceptably at LOS B, and the new intersection of SR 20 at the project site would operate acceptably at LOS A and LOS B. Therefore, the vehicular traffic impact from the project would be less than significant.

Table 3.12-6 Summary of Peak Hour Intersection Level of Service Calculations – Existing plus Project

Intersection	Existing			Existing plus Project		
	Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak	Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak
	Delay/LOS	Delay/LOS	Delay/LOS	Delay/LOS	Delay/LOS	Delay/LOS
1. SR- 20 / SR 1[1]	10.2/B	15.1/B	13.0/B	10.4/B	15.6/B	13.3/B
2. SR 20 / Project Access[2]						
Eastbound Left Turn	*N/A*	*N/A*	*N/A*	*0.8/A*	*0.5/A*	*0.6/A*
Southbound Approach	*N/A*	*N/A*	*N/A*	*9.6/A*	*10.1/B*	*9.5/A*

Notes: *Italics* = results for minor movements at unsignalized intersections
Bold = results exceed acceptable LOS
* = Intersection in downtown, no LOS threshold
Results are indicated in Delay (average seconds per vehicle)/LOS
[1]LOS based on HCM2010 method of analysis for Signalized intersections.
[2]LOS based on HCM2010 method of analysis for TWSC intersections.

Queue Length

Queue lengths at the intersection of SR 20 and SR 1 with the addition of project-generated traffic are summarized in Table 3.12-7. The peak hour 50th percentile queue lengths are within the existing storage lane capacities of the intersection. Therefore, the project impact on queue length and lane storage capacity at the intersection of SR 20 and SR 1 would be less than significant.

Evaluation of the proposed geometrics of the conceptual site plan show that the scalehouse for incoming vehicles at the project site is proposed to be approximately 350 feet from the proposed point of ingress. Assuming a standard passenger vehicle or pickup truck would be the typical type of vehicle to utilize the scalehouse, this distance provides room for approximately 14 vehicles in queue. Looking at the anticipated traffic volumes to be generated by the project site, the maximum traffic flow coming into the site would be expected to be 18 vehicles per hour. Using an assumed service rate of approximately two minutes per vehicle at the scalehouse, the average queue at the scalehouse during a peak hour would be approximately one vehicle. Based on probable arrival rates during the peak hour, it is not anticipated that any maximum queue lengths will surpass the amount of distance provided with the proposed site entrance geometrics. The impact would be less than significant.

Table 3.12-7 Summary of Existing plus Project Peak Hour Intersection Queue Analysis

Movement	Lanes / Avail. Storage	Queue Length - 50th / 95th (feet/feet)		
		a.m.	p.m.	midday
SR 1 / SR 20				
WBR	1 / 120 ft	0	0	0
NBT	1/ 170 ft	60	95	83
NBR	1 / 120 ft	0	0	0
SBL	2 / 320 ft	27	50	36

Notes: Queue shown is maximum after two cycles.

Mitigation Measure TR-1: Traffic Control Plan.

The County and City shall require the construction contractor to prepare and implement an approved traffic control plan for the proposed construction activities. The plan shall conform to applicable provisions of the State's Manual of Traffic Controls for Construction and Maintenance Work Areas, shall include measures that address work that would occur within the Caltrans right-of-way, and shall include, but not necessarily be limited to, the following measures as applicable to site-specific conditions:

- Flaggers and signage shall be used to guide vehicles through and/or around the construction zone.
- Lane closures shall be limited during peak hours to the extent feasible. In addition, outside of allowed working hours, or when work is not in progress, roadways shall be restored to normal operations, where feasible, with all trenches covered with steel plates.
- Signs shall be provided to advise bicyclists and pedestrians of temporary detours around construction zones.
- Access to the CalFire helipad shall be maintained during construction by using steel trench plates. If access must be restricted for brief periods (more than one hour), CalFire shall be notified in advance of such closures.
- The contractor(s) shall be required to have ready at all times the means necessary to accommodate access by emergency vehicles, such as plating over excavations, short detours, and/or alternate routes.

Level of Significance: Less than significant with mitigation.

Mitigation Measure TR-1 would require the County and City and their contractor to implement a traffic control plan to reduce potential impacts on traffic flows and safety hazards during construction activities. With implementation of this mitigation measure, the potential impact of increased traffic safety hazards for during construction of the project would be reduced to a less-than-significant level.

Impact TR-2: Substantially Increase Hazards Due to Design Feature or Incompatible Use.

Evaluation criterion TR-2 is intended to address siting and design impacts and, therefore, does not apply to temporary construction impacts. Therefore, this significance criterion is not applicable to project construction activities and is only evaluated as it relates to long-term operational impacts.

The project would include improvements to SR 20, including acceleration and deceleration lanes in accordance with preliminary discussions with Caltrans and the Caltrans Highway Design Manual. As described in Section 2, Project Description, and illustrated on Figure 2-2, a portion of SR-20 would be widened from the roadway centerline north to accommodate the lanes, as well as for the new eastbound and westbound turn pockets at the project access point. SR-20 is anticipated to be widened by approximately 12 to 15 feet over an approximately 1,300 foot reach of SR-20.

SR 20 is currently traversed by similarly sized haul trucks as would occur under the proposed project, and the new improvements would provide an adequate line of sight. Because the project would not introduce vehicles that are incompatible with current or anticipated roadways, and because the improvements to SR 20 would be designed and constructed in accordance with Caltrans oversight, the potential safety hazards associated with project-operation would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact TR-3: Result in Inadequate Emergency Access.

Construction of the acceleration and deceleration lanes adjacent to SR 20 may require a temporary partial lane closure along SR 20 adjacent to the project site. Such closures are anticipated to be of short duration, and access through the construction area would be maintained at all times to allow traffic flow in both directions, including emergency vehicles. Therefore, a temporary lane closure along SR 20 would not substantially block or delay emergency access through the area, and the potential impact of construction activities on emergency access would be less than significant.

Following construction, the entrance to the project site and the internal roadways would provide adequate emergency access. The LOS analyses performed for the project determined that the maximum increase in average control delay would be less than one second. Therefore, emergency vehicles would be able to move along local roadway corridors and intersections with essentially the same ability as under existing conditions. No entrances or exits of nearby emergency facilities would be blocked or impeded by the proposed roadway improvements and project-generated traffic. Therefore, the long-term impact on emergency access would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact TR-4: Conflict with Adopted Policies, Plans, or Programs Regarding Public Transit, Bicycle, or Pedestrian Facilities.

MTA Bus Route 65 is the only public transit bus route that currently traverses SR 20 in the project area. Because no bus stops for Route 65 are located within the project construction area, and because SR 20 would remain open to vehicle travel during construction, the construction-related impact on the performance or safety of Route 65 would be less than significant.

Following construction, SR 20 in the project area would include acceleration / deceleration lanes for vehicles entering and exiting the project site. These improvements would not interrupt Bus Route 65, and given that the maximum peak hour increase in average control delay as a result of the project would be less than one second, travel times for Route 65 would not be affected. The project impact on public transit would be less than significant.

No bicycle routes or pedestrian facilities are currently located within the project area along SR 20. Therefore, construction activities would not impact the performance or safety of bicycle or pedestrian facilities. No impact would occur.

Following construction, the project would not prevent the establishment of a future Class III bicycle route along SR 20 as envisioned in the Mendocino County Regional Bikeway Plan. Class III bicycle routes do not require substantial space restrictions. Striping and signage in accordance with the design speed of SR 20 would be required to indicate that vehicles and bicycles are adjacent to and/or within the road. The project’s improvements to SR 20 would not preclude the Class III bicycle improvements from being implemented as adequate space would be available. No operational impact to bicycle facilities would occur.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No impact.

3.12.6 Cumulative Impacts

Impact TR-C-1: Result in Cumulatively Considerable Contribution to Cumulative Impacts Related to Transportation.

Construction

As noted in Impact TR-1 above, LOS standards are intended to regulate long-term impacts from operation of future projects as opposed to temporary impacts from construction. Therefore, a qualitative analysis, rather than a quantitative analysis, of potential construction related cumulative impacts on motor vehicle traffic is provided here.

The cumulative projects identified in Chapter 3 of this EIR would occur in the City of Fort Bragg and the City of Willits. Based on the location of the cumulative projects, the distribution of construction traffic is anticipated to primarily include SR 1. The intersection of SR 1 at SR 20, which would likely be used by construction traffic from both the project and cumulative projects, currently operates acceptably at LOS B during peak periods. Cumulative construction traffic would be temporary, would vary on a daily basis, and would be spread out over the course of a work day. Only a portion of the cumulative construction-related vehicles expected on any one day would occur during a peak hour period, and therefore, even with the addition of temporary cumulative construction-related vehicles, the temporary contribution of construction traffic is not anticipated to cause local intersection LOS to deteriorate below adopted standards. Therefore, cumulative traffic impacts during construction would be less than significant.

Operation

Roadway Level of Service

To evaluate the cumulative effect of the project on local roadways, the same methodology was applied as was utilized for the project-specific analysis reported in Impact TR-1. The potential cumulative impacts of future development to the study area were evaluated consistent with Caltrans requirements, which uses a 20-year forecast to represent cumulative conditions. The 20-year forecast conditions were estimated using Caltrans 20-year growth factors, which included applying a 20-year growth factor of 1.05 to the existing turning movement volumes for SR 20 and a factor of 1.15 to the existing turning movement volumes for SR 1.

Cumulative without Project

The LOS calculations for the intersection of SR 20 at SR 1 under cumulative conditions without the project is summarized in Table 3.12-8, which shows that the intersection would operate at LOS B during peak periods. Because there is no existing intersection along SR 20 at the proposed project site, no cumulative LOS for this intersection is computable.

Table 3.12-8 Summary of Cumulative Peak Hour Intersection Level of Service Calculations

Intersection		Cumulative Condition		
		Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak
		Delay/LOS	Delay/LOS	Delay/LOS
1.	SR 20 / SR 1[1]	10.6/B	18.9/B	14.2/B

Notes: *Italics* = results for minor movements at unsignalized intersections
* = Intersection in downtown, no LOS threshold
Results are indicated in Delay (average seconds per vehicle)/LOS
[1]LOS based on HCM2010 method of analysis for Signalized intersections.

Cumulative with Project

With the addition of project-related traffic volumes to the projected cumulative traffic volumes, all of the movements within the study intersections are expected to operate at acceptable LOS with respect to significance thresholds. The intersection of SR 20 at SR 1 goes from LOS B in the cumulative condition to LOS C in the weekday PM peak hour.

The LOS calculations for the study intersections under cumulative conditions with the project are summarized in Table 3.12-9. Under the cumulative plus project scenario, the addition of project-related traffic volumes would lower the LOS at the intersection of SR 20 at SR 1 from LOS B to LOS C in the weekday PM peak hour. This LOS would not exceed the Caltrans LOS C threshold. Under the cumulative plus project scenario, the LOS at the proposed new intersection of SR 20 at the project site would operate acceptably at LOS A and LOS B. Because the study intersections are expected to continue operating at acceptable LOS under cumulative conditions, the cumulative impact would be less than significant.

Table 3.12-9 Summary of Peak Hour Intersection Level of Service Calculations - Cumulative plus Project

Intersection		Cumulative plus Project		
		Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak
		Delay/LOS	Delay/LOS	Delay/LOS
1.	SR- 20 / SR 1[1]	10.9/B	20.0/C	14.7/B
2.	SR 20 / Project Access[2]			
	Eastbound Left Turn	*0.8/A*	*0.5/A*	*0.6/A*
	Southbound Approach	*9.6/A*	*10.2/B*	*9.6/A*

Notes: *Italics* = results for minor movements at unsignalized intersections
* = Intersection in downtown, no LOS threshold
Results are indicated in Delay (average seconds per vehicle)/LOS
[1]LOS based on HCM2010 method of analysis for Signalized intersections.
[2]LOS based on HCM2010 method of analysis for TWSC intersections.

Queue Length

Queue lengths for the intersection of SR 20 at SR 1 under cumulative conditions with the project are summarized in Table 3.12-10. The anticipated peak hour 50th percentile queue lengths are within the existing storage lane capacities of the intersection. Therefore, the cumulative impact on queue length and lane storage capacity at the intersection of SR 20 and SR 1 would be less than significant.

Table 3.12-10 Summary of Cumulative plus Project Peak Hour Intersection Queue Analysis

Movement	Lanes / Available Storage	Queue Length - 50th (feet)		
		a.m.	p.m.	midday
SR 1 / SR 20				
Westbound Right Turn	1 / 120 ft	0	6	0
Northbound Through	1 / 170 ft	72	116	102
Northbound Right Turn	1 / 120 ft	0	0	0
Southbound Left Turn	2 / 320 ft	32	80	46

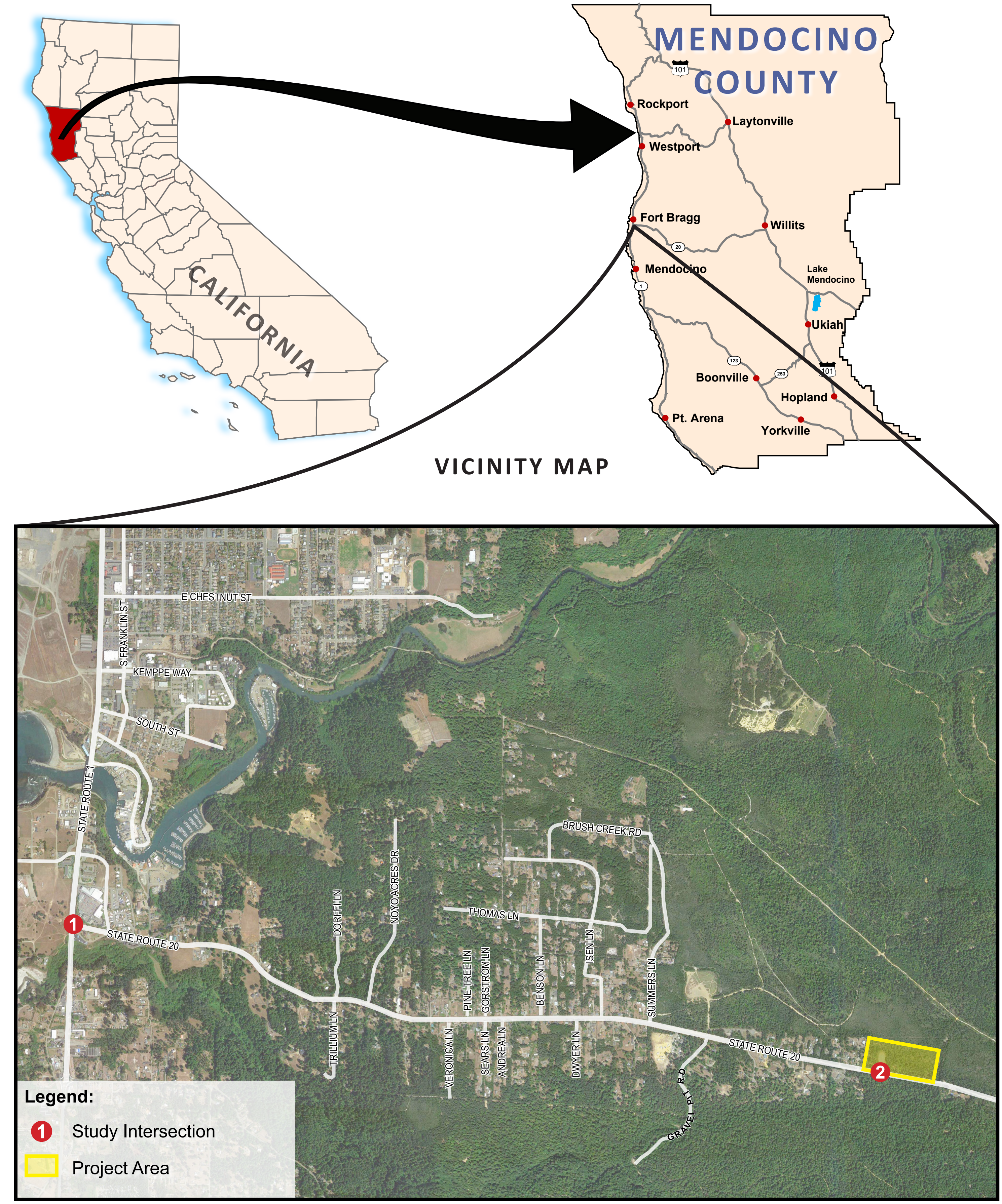
Notes: Queue shown is maximum after two cycles
Bold = results where available storage is exceeded by more than one standard vehicle, 25 ft.

Public Transit, Bicycles, and Pedestrian Facilities

As described in Impact TR-4, the project would not result in a conflict with applicable goals and policies regarding public transit, bicycle or pedestrian facilities. Therefore, the project would not contribute to any conflict with the applicable policies and plans in the cumulative condition.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.



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GHD

Mendocino Solid Waste Management Authority
Central Coast Transfer Station EIR

Job Number	8411065
Revision	
Date	Aug 2014

Roadway and Intersection Locations **Figure 3.12-1**

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718 Third Street Eureka California 95501 USA **T** 1 707 443 8326 **F** 1 707 444 8330 **W** www.ghd.com

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4.0 Alternatives Description and Analysis

4.1 Introduction

This chapter presents the alternatives analysis for the project. Section 15126.6(a) of the CEQA Guidelines requires EIRs to “describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason.” Section 15126.6(b) of the CEQA Guidelines also identifies the purpose of an EIR’s discussion and analysis of project alternatives which is to identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.

The CEQA Guidelines further require that the alternatives be compared to the proposed project’s environmental impacts and that the “no project” alternative be considered (Section 15126.6[d][e]). CEQA Guidelines Section 15126.6(e)(1) states that the purpose of describing and analyzing the no project alternative is “to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.” The no project analysis is required to “discuss the existing conditions at the time the notice of preparation is published…as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services (Section 15126.6[e][2]). If the project is a “development project on identifiable property, the “no project” alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the property remaining in its existing state against environmental effects which would occur if the project is approved. In certain instances, the no project alternative means “no build” wherein the existing environmental setting is maintained. This would be the case for the Central Coast Transfer Station project. The "no project" alternative would entail continuing existing self-haul operations at the Caspar Facility and continuing use of the Willits Transfer Station as the coast's commercial long-haul transfer station.

4.1.1 Identifying Project Alternatives

The County of Mendocino and City of Fort Bragg began their search for a potential transfer station site in 2007. Consultants surveyed dozens of potential locations throughout the greater Fort Bragg area. From 2009 to 2011, City and County staff studied five potential locations. In 2011, the City and County named two of these sites as finalists for more intensive investigation, and on August 13, 2013, designated 30075 Fort Bragg-Willits Road (SR 20) as the preferred project site. The alternatives analyzed in this chapter in addition to the proposed project include the No Project Alternative and the Caspar Site Alternative. The environmentally superior alternative is described in

Section 4.3, and alternatives which were considered but are not being carried further in this Draft EIR are described in Section 4.4 below.

4.2 Description of Alternatives

4.2.1 Alternative 1: No Project Alternative

Under the No Project Alternative solid waste in the coastal wasteshed would continue to be handled in the same manner as under existing conditions. Waste would be hauled to the Willits Transfer Station and self-haul would continue to occur at the Caspar facility. No new development would occur at the SR 20 site. Existing haul routes would remain the same and there would be no modification to any of the existing facilities including those at the Caspar, Pudding Creek, or Albion sites.

The SR 20 site is currently undeveloped and consists of various forest land and vegetation. Under the No Project Alternative the SR 20 site would remain as part of the JDSF. In the short- and long-term no changes are expected to the project site. Therefore, the project site would remain in its undeveloped, forested, and vegetated state.

Under the No Project Alternative the hauling inefficiency would remain the same as under existing conditions. The No Project Alternative includes no changes or improvements to the existing facilities and therefore would not increase criteria air pollutants, energy use, GHG emissions, noise, or traffic relative to existing conditions; however, the efficiencies that would be gained with the project would not occur. In fact, in the context of GHG, the project would cause a net reduction of emissions and therefore results in a beneficial impact. Impacts of the No Project Alternative on GHG emissions, as well as energy, would be greater than with the project.

Under the No Project Alternative there would be no vegetation removal, ground disturbance or construction, and therefore there would be no impact on aesthetics, forest resources, biological resources, cultural resources, geology, hazards, or land use.

4.2.2 Alternative 2: Caspar Site

The Caspar site is located at 14000 Prairie Way in Caspar (Figure 2-3). The 62-acre Caspar site was used for a landfill from 1967 to 1992 and for a self-haul transfer station from 1992 until the present. It is jointly owned by the County and City. The surrounding area is rural residential. The nearest residence is 950 feet from the transfer station area and there are three residences within 1,000 feet. Russian Gulch State Park borders the facility to the south.

The Caspar site was originally forest land but much of the original vegetation was stripped many years ago and there is now a large cleared area used for the existing self-haul facility. Little or no vegetation removal would be required if the proposed project was sited at the Caspar site.

A proposal from the County Solid Waste Division in 2006 for a new 2,500 square-foot self-haul building included schematics that showed how new construction could fit into the existing developed area. A commercial transfer station would require a larger footprint but it could be placed at the same spot, toward the southern end of the existing facilities. Electrical service, road access, and water wells are already established at the Caspar site, and on-site wastewater disposal could be developed to replace the existing portable toilets.

Aesthetics

The visual resource impacts of this alternative would be greater than the proposed project because the existing Caspar site has less vegetation to shield views of a new facility from a greater number of residences and recreational users. Even though this alternative would include development of a transfer station facility at an existing solid waste facility, there would l be greater viewsheds impacted at the Caspar site compared to the proposed project site.

Agriculture and Forest Resources

There would be no impact to agricultural resources or conflict with a Williamson Act or agricultural zoning with Alternative 2. There would also be no forest land impacts with Alternative 2 because this alternative is already developed as a solid waste facility and would not require the removal of forest land to expand the facility.

Air Quality

The air quality impacts, for both air pollutants and air contaminants, associated with construction activities at the Caspar site would generally be similar to the proposed project, assuming development of a similar transfer station. The operational air quality impacts with this alternative would be approximately the same as the proposed project if the transfer station is constructed at the Caspar site because operation would be similar to the proposed project. However, the air pollutant emissions from transfer trailers, franchise hauler's collection trucks and self-haul vehicles would be higher with this alternative than the proposed project because the Caspar site is approximately seven miles south of the approximate center of waste generation, which is considered to be the intersection of SR 1 at SR 20. Overall, this alternative would have greater air quality impacts than the proposed project

Biological Resources

Implementation of this alternative would eliminate the biological resources impacts anticipated with implementation of the proposed project because this site is already developed and used as a transfer station. A commercial transfer station at the Caspar site could be placed within the boundaries of the existing facility, toward the southern end of the site. Because the Caspar site is already developed, the biological resources impacts associated with this alternative would be less than with the proposed project as no impacts would occur at the SR 20 site.

Cultural Resources

The potential impacts on cultural resources anticipated with this alternative are expected to be less than with the proposed project because the Caspar site is already developed including paved and graded areas. However, as with the proposed project, construction of the project at the Caspar site could unearth unknown cultural resources which would be a significant impact. The same mitigation measures for the proposed project (Mitigation Measures CR-1, CR-2, and CR-3) would also be applicable to this alternative.

Geology and Soils

The Caspar site is located in a similar geologic area, and with similar soils, as the proposed project site. Also, the Caspar site is relatively flat and has been partially developed. Therefore, the development of the Caspar site for transfer station operations would be expected to result in the same seismic and erosion hazards that would be anticipated with development of the project site.

Greenhouse Gas Emissions

Operationally, this alternative would have similar emissions as the proposed project because they would both be similarly sized. Overall, this alternative would generate higher emissions than the proposed project because the Caspar site is approximately seven miles south of the approximate center of waste generation (SR 1 at SR 20), which means collection trucks (and self-haul vehicles) would need to make an average round trip of approximately 14 miles to the Caspar site to empty each load. Since the outbound transfer trucks will exit the region via SR 20, they would similarly have to drive these additional miles.

Hazards and Hazardous Materials

The Caspar site would include the same uses on a similarly sized site as the proposed project. Therefore, the Caspar site would generally have the same hazard impacts as the proposed project.

Hydrology and Water Quality

Similar to the project site, the Caspar site is relatively flat and would not experience excessive erosion with additional site development. The Caspar site would direct stormwater runoff to the existing facilities currently used by the existing transfer station. Also, the Caspar site is already partially developed with impervious surfaces. Therefore, it would not be expected to substantially increase the peak runoff during storm events. As with the project site, the hydrology and water quality impacts associated with this site would be considered less than significant following implementation of appropriate hydrology and water quality mitigation measures. The hydrology impacts associated with this alternative are anticipated to be less than with the proposed project.

Land Use and Planning

The Caspar site would require an amendment to its Major Use Permit for the new facility. However, since the site is already used for solid waste transfer activities, the issues involved with the amendment would be limited. Therefore, the land use impacts of this alternative would be less than the proposed project if a new transfer building was fully enclosed.

Noise

Similar to the proposed project, development of this alternative would generate construction noise associated with the use of heavy equipment for demolition, site grading and excavation, installation of utilities, paving, and building fabrication. The noise impact of a facility at Caspar would depend on whether the transfer building was fully enclosed. If it was not, noise impacts could be greater than the proposed project. However, the Caspar site has fewer residential homes within the project vicinity compared to the proposed project.

Transportation

Transportation impacts associated with this alternative would be greater than with the proposed project. The disadvantages of the Caspar site arise from its location. Access goes through the intersection of Highway 1 with County Road 409. Caltrans has stated that this intersection is substandard for large, slow truck traffic and has limited potential for improvements because of the presence of the Highway 1 bridge over Caspar Creek just to the north. Caltrans has indicated that the left turn pocket off Highway 1 is 300 feet and the standard size would need to be 435 feet.

The Caspar site's geographic location is relatively inefficient for purposes of a transfer station. Caspar was originally purchased by the City and County for use as a landfill, so a remote location was desirable. A transfer station, conversely, is most efficient when it is close to the center of waste generation and to the route of outhaul. The Caspar site is approximately seven miles south of the approximate center of waste generation (Highway 1 at SR 20), which means collection trucks would need to make an average round trip of approximately 14 miles to the Caspar site to empty each load. Since the outbound transfer trucks will exit the region via SR 20, they would similarly have to drive these additional miles. Compared to the proposed project site on SR 20, the Caspar location would result in approximately 25,000 additional miles of truck travel per year.

4.3 Environmentally Superior Alternative

As summarized in Table 1-1, in Chapter 1, the project would have impacts to air quality, odors, biological resources, cultural resources, geology and soils, hydrology, and transportation. All of which have been mitigated to less than significant. Based on the analysis above, the No Project Alternative has greater impacts than the project under two resource categories (GHG emissions and energy) and fewer impacts under all other categories. While Alternative 2: Caspar Site has greater impacts than the project under five resource categories (aesthetics, air quality, GHG emissions, energy, and traffic) with all other resource impacts being the same (odor, cultural, geology, and hazards) or less (biological resources, hydrology, and land use). Selection of the environmentally superior alternative could depend on what weight is given to the various environmental impacts. This can be a subjective judgment. If it is assumed that all categories of environmental impact have equal weight, then the environmentally superior alternative, based on the analysis above, is the No Project Alternative because it has the fewest number of impacts to environmental resources. According to CEQA Guidelines Section 15126.6(e), if the No Project Alternative is determined to be the environmentally superior alternative, then the EIR shall also identify an environmentally superior alternative among the other alternatives. Among the other alternatives, the environmentally superior alternative is the proposed project as mitigated, given it would achieve greater reductions in various environmental resource categories including aesthetics, air quality, energy consumption, greenhouse gas emissions, and transportation. Although it has greater impacts to biological resources than Alternative 2, the impacts have been fully mitigated and are outweighed by the beneficial impact to GHG emissions and energy consumption.

4.4 Alternatives Considered but not Carried Forward in this EIR

4.4.1 Georgia-Pacific Woodwaste Landfill, Georgia-Pacific Haul Road, Fort Bragg

Approximately 20 acres of the 80-acre Georgia-Pacific woodwaste landfill property could be the site of a transfer station; however, the owner is not willing to sell. Its remote location would have the advantage of isolation from other land uses, but the least expensive access route would be Summers Lane, which is a narrow residential road. In addition to improvements to Summers Lane, Summers Lane would need to be extended 3,000 feet to reach the woodwaste landfill property. A 2007 estimate of these road improvement costs was estimated at $2 million. There is no electric service currently to this site. This potential site is comprised entirely of pygmy forest. Together with the new road construction and installation of utilities, this site would require removal of more forest land than other sites, the owner is continuing to address SWRCB clean-up requirements, and the owner is not a willing seller.

4.4.2 Empire Waste Management, 219 Pudding Creek Road, Fort Bragg

Empire Waste Management, the franchised solid waste collector for the City and County, owns 9.24 acres which accommodates a recycling buy-back center, truck garage, and truck depot. There is space on the northern edge of this property where a transfer station building could be built. Empire

Waste Management is willing to build such a facility, but only under its own ownership and operation, therefore, one of the primary project objectives of public ownership could not be met.

This site would have the advantages of pre-existing uses for recycling and heavy truck operation, together with existing utilities, paved access, and other services. The disadvantages of this site arise from its location on the north side of the City of Fort Bragg, approximately 2.6 miles beyond the City center on Main Street. Access for transfer station traffic would be through the City's congested Main Street (SR 1), which reduces from four to two lanes at Laurel Street, creating a "choke point" with substantial backups during peak periods and seasons. The City does not want to increase truck traffic at this location. Furthermore, development of a transfer station at this location would likely require installation of a traffic signal at the intersection of SR 1 and Pudding Creek Road.

A transfer station at this site would be very close to the 63-unit Ocean Lake Subdivision which borders Empire Waste Management's property to the north, therefore, it would be less successful in meeting one of the project objectives of isolation from other land uses.

4.4.3 California Western (Skunk Train) Railroad

Solid waste transfer via railroad, instead of highway, was suggested by some people who commented on the scope of this EIR. If it were feasible, rail haul would alter the design of the project, but it would not eliminate the need for a transfer station facility where both the franchised collector's trucks and self-haul vehicles could dump waste.

Rail haul requires extra steps in loading and unloading compared to truck haul and is only used in the solid waste industry for very long hauls, typically several hundred miles or more. The California Western Railroad connects Fort Bragg to Willits but there is no rail service beyond Willits. Therefore, the use of rail haul for this project would require unloading and reloading at the Willits Transfer Station (which is close to the California Western Railroad tracks). This would be inconsistent with one of the project objectives which is to make it possible for Central Coast solid waste to be hauled directly to a destination landfill.

Rail haul on the California Western Railroad route would be subject to occasional interruption due to landslides, washouts, and tunnel collapse. Therefore, a truck haul backup would need to be constantly available, either by maintaining specialized flatbed semi-trailers that can accommodate the rail containers, or by using conventional truck transfer trailers. Either approach would impose additional costs.

Rail haul wouldn't avoid the need for a transfer station facility similar in size to the proposed project, therefore, the siting challenge would be altered, but not eliminated. Presumably the new site would be adjacent or very near to the California Western Railroad depot at the west end of Laurel Street. Due to frequent traffic congestion, the City of Fort Bragg has opposed siting a transfer station anywhere north of the point where Main Street reduces down to two lanes. Also, land near the California Western Railroad depot is valuable and privately owned, meaning that acquisition would be costly and possibly require condemnation. The vicinity of the California Western Railroad depot includes extensive residential, commercial, tourist, and historic sites.

4.4.4 Leisure Time RV Park, 30801 SR 20, Fort Bragg

This property is a 24.3 acre parcel on the south side of SR 20 currently used as a trailer park. The owner has offered to sell the property for $1.2 million; however, this would significantly increase the capital expense of development of a transfer station. The property has 700 feet of frontage on SR

20, with good sight distance in both directions. No major streams or waterways are located on the property and approximately 12 acres are flat and useable. A seven-acre portion of the property is already cleared of forest. Private sewer and water systems are in place.

This site would have some of the same advantages as the proposed project site, which is approximately 0.7 mile farther east on SR 20. The proposed project site and this site both lie along the exit route for solid waste transfer on SR 20. This site would require removal of little or no forest since a substantial area is already cleared. However, it is close to many residences to the northwest, west, and east. The closest residential building is approximately 20 feet from the western boundary. There are approximately 24 residential parcels within 1,000 feet of the western boundary and 12 parcels within 1,000 feet of the eastern boundary. Therefore it would be less successful in meeting one of the project objectives of isolation from other land uses.

4.4.5 Mendocino Parks & Recreation District Property, 30812 SR 20, Fort Bragg

These 173.5 acres are presently undeveloped land, mostly forested. As of October, 2014, the property is owned by the Mendocino Parks & Recreation District which is in bankruptcy and owes approximately $2.3 million on the property. The property is listed for sale. Acquisition cost would significantly increase the capital expense of transfer station development. Furthermore, the City of Fort Bragg attempted to purchase the property at fair market value as established by an appraisal in early 2014 and its purchase offer was rejected, thus it is not certain that the property could be sold to a public entity (public entities are prohibited by law from paying more than fair market value for property).

No major streams or waterways are located on the property. It is flat to gently sloping and mostly forested with Pygmy species. It contains some wetlands. The property is the headwaters of the Sholars Bog.

Approximately seven acres were cleared of vegetation for use as a stockpile area, and would therefore be the most appropriate as part of the property for transfer station development. This cleared area is located in the southwestern corner of the property, close to the intersection of SR 20 with Summers Lane. An access driveway connects to SR 20, with good sight distance in both directions.

This site would have some of the same advantages of the preferred site, which is about 0.7 mile farther east on SR 20. Both lie along the exit route for solid waste transfer. This site would require removal of little to no forest since a substantial area is already cleared. However, it is closer to a much greater number of residences to the northwest, west, and south. The closest neighbor’s building is 20 feet from the northern boundary of the site. There are approximately 35 residential parcels within 1,000 feet of the western and northern borders. Therefore, it would be less successful in meeting the project objective of isolation from other land uses.

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5.0 Other CEQA-Required Sections

5.1 Significant Unavoidable Effects

Detailed mitigation measures proposed by the County and City have been identified throughout Chapter 3 of this report and are intended to mitigate project effects to the extent feasible. All of these mitigation measures are identified in Table 1-1. After implementation of the proposed mitigation measures, there are no significant unavoidable impacts.

5.2 Growth-Inducing Impacts of the Project

CEQA Guidelines Section 15126.2(d) requires an EIR to discuss the growth-inducing impact(s) of a proposed project. Specifically, CEQA Guidelines state that the EIR shall “discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.”

Projects can have direct and/or indirect growth inducement potential. An example of direct growth inducement would be the construction of new housing. Examples of indirect growth inducement include establishing substantial new permanent employment opportunities and removing obstacles to population growth (e.g. the expansion or improvement of utilities which allows for more growth within a service area).

Growth inducement itself is not an environmental effect but may lead to an environmental effect(s). Environmental effects may include increased demand on other public services and infrastructure, increased noise and traffic, degradation or loss of plant or animal habitats, degradation of air and water quality, or conversion of open space land to urban development.

The proposed Central Coast Transfer Station facility would accommodate 58% more waste than is currently handled for the Mendocino County Solid Waste Refuse Collection Area #2. The increased capacity is not considered growth inducing because there are currently no limitations on growth in the Mendocino County Solid Waste Refuse Collection Area #2 with regard to waste disposal. The facility would be designed to accommodate growth established by local general plans, and future technology that would allow waste to be processed in a more efficient manner.

The proposed project would generate new employment within the County, which could contribute to the demand for housing. The proposed project is expected to generate a net employment increase of three full-time equivalent (FTE) employees (loss of two FTE at Caspar self-haul facility and addition of five FTE at new Central Coast Transfer Station). However, due to the project’s location along a primary transportation corridor within Mendocino County, employees would be drawn from throughout the region. Employees would logically be anticipated to reside in Fort Bragg primarily and in the greater region secondarily. Fort Bragg has a variety of housing options and had a 10.4 percent vacancy rate as of 2010 (U.S. Census Bureau 2010). The expected dispersal of employees across the region would minimize the effects of increased housing demands within the City of Fort Bragg and Mendocino County. For these reasons, the proposed project would not be expected to generate a substantial demand for new housing, nor be growth-inducing.

6.0 List of Preparers

Mendocino Solid Waste Management Authority

Mike Sweeney, General Manager

GHD

Patricia Collins, Project Director

Misha Schwarz, Project Manager

James Alcorn, Deputy Project Manager

Frank Penry, Senior Traffic Engineer

Kristine Gaspar, Senior Environmental Planner

Dagan Short, Project Engineer

Ryan Crawford, Project Geologist

Matthew Wargula, Project Engineer

Lia Webb, Biologist

Gary Davidson, GIS Analyst

Chelsea Phlegar, Planner

Jakob Schillinger, Project Engineer

Illingworth and Rodkin (Subconsultant)

James Reyff, Senior Consultant

Michael Thill, Senior Consultant

Sonoma State University - Anthropological Studies Center (Subconsultant)

Kate Erickson Green, Staff Archaeologist

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Appendices

Appendix A

Notice of Preparation and
Letters in Response to NOP

Notice of Preparation

January 27, 2014

To: State Clearinghouse
Responsible Agencies
Trustee Agencies

Subject: Notice of Preparation of an Environmental Impact Report

Project name: Central Coast Transfer Station

Lead Agency:

County of Mendocino & City of Fort Bragg, acting together through their Caspar Landfill Joint Powers Agreement [CEQA Guidelines Section 15051(d)]
c/o Mendocino Solid Waste Management Authority
3200 Taylor Drive
Ukiah, CA 95482
Contact: Mike Sweeney, General Manager
Phone: (707) 468-9710

The lead agency will prepare an Environmental Impact Report (EIR) for the project identified below. We need to know the views of your agency as to the scope and content of environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency may need to use the EIR prepared by our agency when considering any permit or other approvals for the project.

The project description, location, and potential environmental impacts are described in the attachment.

Due to the time limits imposed by State Law, your response must be sent at the earliest possible date but *not later than 30 days* after receipt of this Notice of Preparation.

A scoping meeting will be held on February 19, 2014, at 2 p.m. at Town Hall, 363 N. Main Street, Fort Bragg, California.

Please send your response to Mike Sweeney, General Manager, Mendocino Solid Waste Management Authority, 3200 Taylor Drive, Ukiah CA 95482, sweeney@pacific.net. Please include the name of a contact person at your agency.

Mike Sweeney
General Manager, Mendocino Solid Waste Management Authority

Attachment to

Notice of Preparation

Central Coast Transfer Station Environmental Impact Report

1. Project Description & Location

The project is the construction and operation of a municipal solid waste transfer station serving the incorporated City of Fort Bragg and the surrounding unincorporated coastal area of Mendocino County extending from the town of Westport to the Navarro River. The proposed transfer station location is a 17-acre portion of Jackson Demonstration State Forest, adjacent to State Highway 20, at 30075 Highway 20, Fort Bragg, California, and is 3.0 miles east of the intersection of State Highway 1 and State Highway 20.

The site is a portion of Mendocino County Assessor's Parcel Number 019-150-5 and is undeveloped forest land. While it is just within the northern edge of Jackson Demonstration State Forest, the site has no recreational facilities or recreational access and no recent history of timber production. County of Mendocino zoning is Timber Production Zone. The site is outside the Coastal Zone.

The facility will include an enclosed waste transfer building, a scalehouse, an outdoor recycling drop-off area that may have roof coverage, paved driveways, perimeter fencing, a water well and other utility services. A conceptual site plan is attached, which shows the elements of the proposed facility; however, the facility is not at the final design stage.

The facility would serve both self-haul and commercial customers in a wasteshed consisting of the incorporated City of Fort Bragg and the surrounding unincorporated area in County Solid Waste Refuse Collection Area #2. In 2012, this wasteshed generated 11,060 tons of solid waste. The facility would replace the existing Caspar self-haul transfer station at 14000 Prairie Way, Caspar, which would be closed once the Central Coast Transfer Station is operational. The facility would receive not only the self-haul traffic, but also the compactor trucks and roll-off trucks of Empire Waste Management which is the franchised solid waste collector for both the city and county areas. The facility would eliminate the existing practices of hauling solid waste in suboptimal truck payloads to the Willits Transfer Station where it is reloaded for further transfer to Potrero Hills Landfill in Suisun, California. Instead, the facility would allow transfer trucks to be loaded to maximum highway weight for direct haul to Potrero Hills or some other regional landfill. The destination landfill would be determined by the contract with the private operator, and could be any of the large landfills currently available in Northern California, such as Potrero Hills, Redwood, Hay Road, Ostrum Road, or Anderson.

The haul route would be State Highway 20, with State Highway 1 as an emergency alternative.

The transfer station will operate five days per week for self-haul customers and the franchised hauler, and on a limited basis two additional days per week for the franchised hauler only. Based on the current wastestream, the solid waste throughput would average 35 tons per day. To accommodate future growth and technological changes, the facility would be designed to handle an average of 75 tons per day.

The only hazardous wastes that would be accepted at the facility would be household-generated recyclable items such as motor oil, oil filters, batteries, electronics and antifreeze. Drop-off collection events for other household hazardous waste (HHW) is provided monthly by the Mendocino Solid Waste Management Authority (MSWMA) at a different location in Fort Bragg.

The facility would occupy only a portion of the 17-acre property, approximately four acres. The remainder of the property would remain forestland with the minimum possible disturbance.

The site is bordered by forestland to the north, east and south (across State Highway 20), and by a helicopter landing pad to the west. There is one residence across State Highway 20 to the southeast, and rural resident development to the west beyond the helicopter landing pad. The closest residence to the projected transfer station building site is approximately 600 feet away to the west.

2. Project Maps

A regional map, an aerial closeup and a conceptual site plan are attached.

3. Probable Environmental Effects of the Project

A. Traffic

Access to the facility will be via State Highway 20, which is the principal road serving the Fort Bragg coastal area. Development of the project will result in the redirection of the current self-haul customer traffic from the Caspar Transfer Station to the new facility. Additional trips will be generated by the franchised hauler's collection trucks and outbound solid waste transfer trucks. While the volume of traffic generated by the project won't be substantial in relation to the capacity of State Highway 20 or its existing traffic volume, the turning movements into and out of the facility will require analysis in the EIR. Another issue will be sufficient queuing capacity. It is anticipated that changes will be made to the conceptual site plan prior to Draft EIR circulation to address this issue.

B. Biological Resources

The project site is relatively undisturbed mixed conifer forest. A biological resource assessment has been prepared which identified special-status plant and animal species and habitats. A wetland delineation was also prepared, which mapped wetlands on a small portion of the site. The project will require removal of vegetation on a portion of the site to allow construction of buildings, paved areas and driveways. The biological resources impacts, the significance of potential impacts, and potential mitigation measures need to be further analyzed.

C. Odor and Air Quality

The project will have the potential, unless there is effective mitigation, to generate odors from solid waste at the facility. The project will generate diesel truck and equipment emissions during construction and operation.

D. Greenhouse Gas Emissions and Energy Use

Operation and construction of the facility will cause the release of greenhouse gases primarily from vehicles. However, the purpose of the project is to reduce cost, energy use, and greenhouse gas emissions compared to the existing solid waste transfer system in use in the region. Therefore the net impact on Greenhouse Gas Emissions is expected to be reduced with project implementation.

E. Aesthetics

The facility will include a large metal building with sufficient height to allow dump truck operation. There will also be a paved outdoor recycling dropoff area and smaller buildings. Unless the undisturbed vegetation on-site provides a sufficient visual screen, or other visual mitigation is introduced, there is the potential for negative aesthetic impacts.

F. Noise

Construction of the project would result in noise generated by construction equipment. The facility will generate noise from its traffic and from equipment used for solid waste and recycling operations. Appropriate design of the facilities can mitigate noise impacts. Additionally, there is substantial existing ambient noise from traffic on State Highway 20.

G. Agriculture and Forest Resources

The project will remove the entire 17-acre site from future timber operations. However, the acquisition of the site will be accomplished through a land exchange that would result in Jackson Demonstration State Forest acquiring additional forest land, together with the State of California gaining control over 35 acres of City & County property that has similar characteristics to the project site. The net effect of these ownership changes would determine whether there are potentially significant environment impacts.

H. Cultural Resources

There is no evidence of prior development on the site. An anthropological survey will determine whether there are cultural resources on the project site which require avoidance or mitigation.

I. Geology/Soils/Seismicity

The geotechnical characteristics of the site must be suitable for the proposed development, considering both potential for fault rupture, ground shaking, landslides and any other consequences of geologic hazards.

J. Hazards & Hazardous Materials

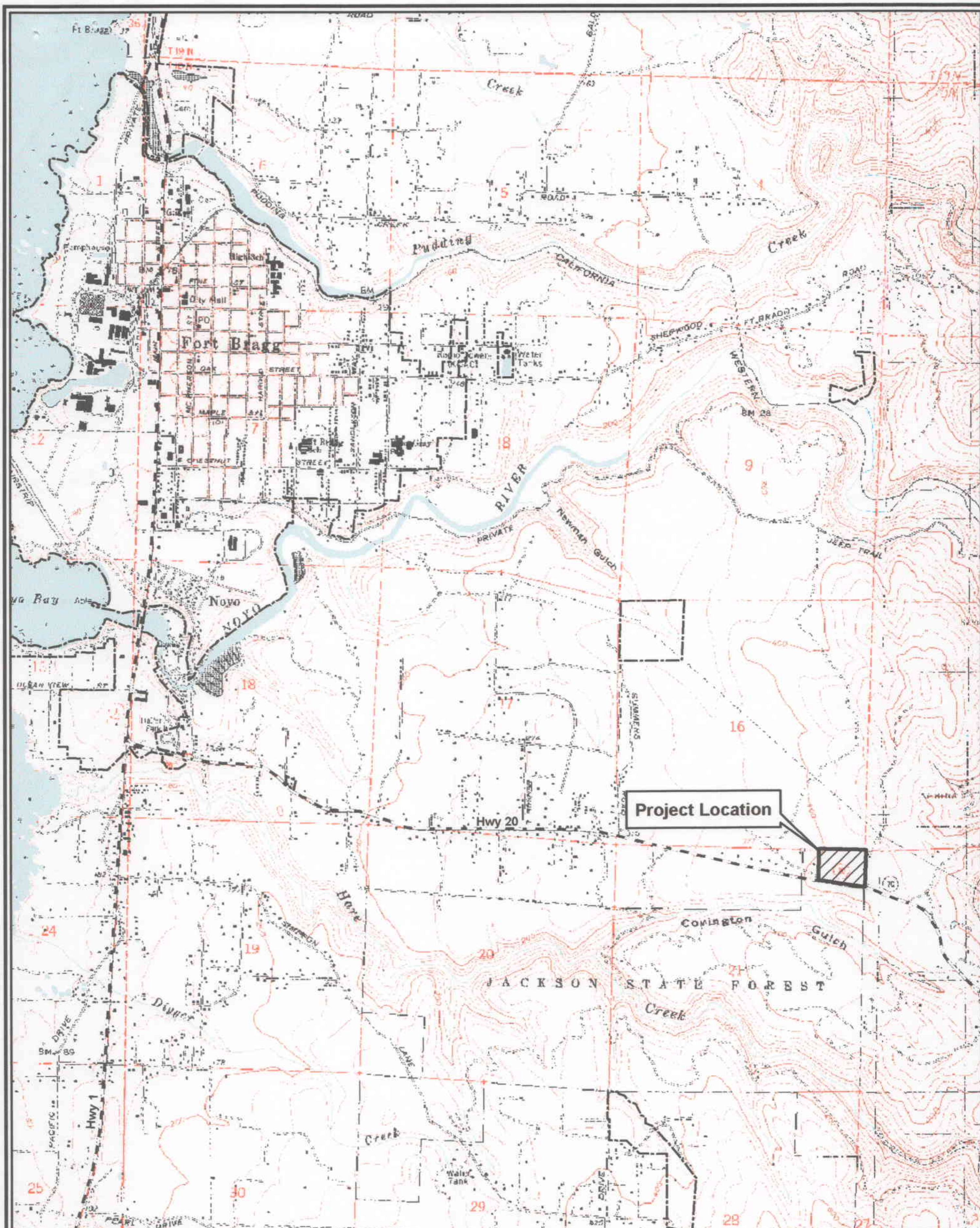
While the facility will not receive hazardous waste except for self-haul recyclable oil, oil filters, antifreeze, electronics and batteries, any municipal solid waste disposal site can create the potential for release of hazardous materials into the environment. The operation of a solid waste transfer station can create hazards that could affect the personal safety of employees and/or users.

K. Hydrology and Water Quality

Construction of the project would result in the potential for short-term impacts to surface water quality due to grading and other temporary surface disturbance. After construction, the project will affect stormwater due to covering of native soils in some areas with impervious roofs and pavement. The facility will draw its water supply from an on-site well. Wastewater generated during operation may be disposed of in an on-site disposal system.

L. Land Use and Planning

The site lies outside the Coastal Zone and within the unincorporated territory of the County of Mendocino. The County's zoning is Timber Production Zone and General Plan Land Use is Timber Preserve. "Major Impact Services and Utilities" are allowed in this zoning under a major use permit. Issuance of this permit by the Mendocino County Board of Supervisors would be an integral part of the project.

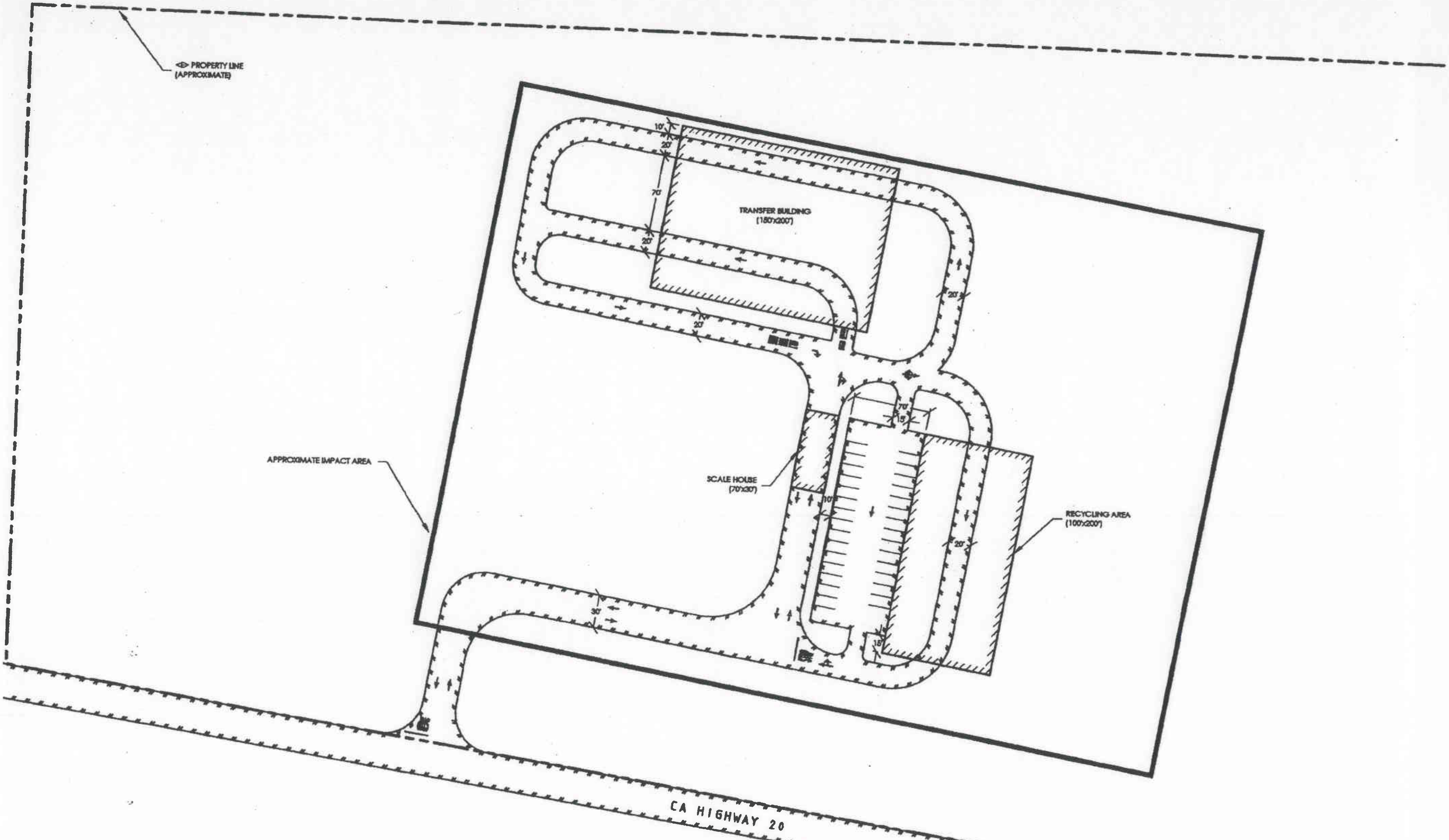


Project Location

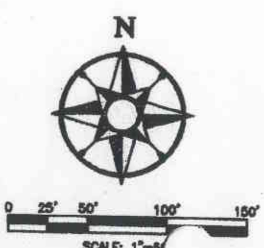
Project Site

0.25 0.125 0 0.25 Miles

Highway 20 North Transfer Station Site
30075 Highway 20, Fort Bragg



Site Concept
Central Coast Transfer Station
30075 Highway 20, Fort Bragg



ELAINE TAVELLI
Post Office Box 1791
Fort Bragg, CA 95437

February 7, 2014

Mendocino Solid Waste Authority
3200 Taylor Drive
Ukiah, CA 95482

RE: EIR Report Scoping Meeting February 19, 2014

Dear Sir:

I am unable to attend the Noticed meeting, but would like to see the issues below studied in the EIR.

1. Illumination of the proposed site, referred to in the Mendocino County General Plan as dark sky policy.

2. Water and conservation effects of the proposed development, with attention paid to the use of Low Impact Policy (LIP) in development techniques.

3. Damage to water quality due to decreased water infiltration, changes in run-off pattens, and decreased population of native plants.

4. Protection of the pygmy forest and its unique scenic value.

5. Protection of Timberland Protection zone.

6. Guidelines for commercial signage and off-premises signs.

7. Elimination of visual blight along State Route 20 east of Fort Bragg.

The above provisions of the Mendocino County Plan are meant to maintain the rural quality of life desired by resident and visitors. Please add to the scoping intent and public comment.

Sincerely,

Elaine Tavelli

Elaine Tavelli

cc: City Council Members, Fort Bragg
Board of Supervisors, Mendocino County

DEPARTMENT OF TRANSPORTATION
DISTRICT 1, P. O. BOX 3700
EUREKA, CA 95502-3700
PHONE (707) 441-4540
FAX (707) 441-5869
TTY 711

Flex your power!
Be energy efficient!

February 12, 2014

Mike Sweeney
General Manager
Mendocino Solid Waste Management Authority
3200 Taylor Drive
Ukiah, CA 95482

1-MEN-20-2.90
Fort Bragg Transfer Station
DB # 19060

Dear Mr. Sweeney,

Thank you for the opportunity to comment on the proposed Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the Central Coast Transfer Station. The project proposes to develop 4 acres of a 17-acre parcel along State Route (SR) 20, approximately three miles east of SR 1 in Mendocino County (1-MEN-20-2.90). The proposed project will construct a municipal solid waste transfer station which will serve the City of Fort Bragg and the surrounding coastal area from Westport to the Navarro River. The facility will include an enclosed waste transfer building, a scale house, an outdoor recycling drop-off area, and water well. According to the NOP, the facility will have an average solid waste throughput of 35-tons per day, but will be designed to handle an average throughput of 75-tons per day.

We have been working with the Mendocino Solid Waste Management Authority (MSWMA) during the pre-development process of this proposal and have the following comments for preparation of the next phase of this project:

Based on information gathered during pre-development correspondence, it is estimated that the facility could generate as much as 40-50 trips per hour during the weekday peak period. To minimize impact to through-traffic on SR 20, the project will require mitigation for the proposed turn movements to-and-from the facility. Construction of an eastbound left turn lane and a westbound right turn lane as opening day mitigation is required for this project. The following calculations are based on Index 405.2 of the Caltrans Highway Design Manual, 6th Edition:

- The left turn lane should be a minimum of 583-ft. (storage=100-ft., deceleration=483-ft.)
- The right turn lane should be a minimum of 375-ft. (storage=100-ft., deceleration=275-ft.)

Recognizing that it's still early in the process, Caltrans is willing to consider alternate mitigation if identified in the traffic analysis of the EIR.

All work within the State right of way requires an approved encroachment permit. Encroachment permit applications are reviewed for consistency with State standards and are subject to Department approval. Request for Caltrans encroachment permit application forms can be sent to

Caltrans District 1 Permits Office, P.O. Box 3700, Eureka, CA 95502-3700, or requested by phone at (707) 445-6389. For additional information, the Caltrans Permit Manual is available online at: http://www.dot.ca.gov/traffops/developserv/permits/

If you have questions regarding the comments outlined in this letter or need further assistance, please contact me at (707) 441-4540 or tatiana.ahlstrand@dot.ca.gov.

Sincerely,

Tatiana Ahlstrand
Associate Transportation Planner
District 1 Office of Community Planning

2-17-14

To The Fort Bragg City Council:

I Fred Uhlich have owned This property on Porterfield Ln for the Past 30 yrs. + lived here for 23 yrs. since retireing. I am concerned and opposed to this dump or transfer station moving here to my back yard for numerous reasons: the noise, air pollution, air vapors from autos, trucks exhaust from the traffic congestion with the traffic light on the truck turn out.

Garbage drippings along with the garbage odor. trucks that leak oil along with spillage during refueling which will eventually end up in the Noyo River contaminating Ft. Bragg water supply. due to the natural water shed running down hill.

Increasing dump fees. Decrease in Property Values. Possible ground water Contamination and decreasing or eliminating my well water supply.

Rare plants + trees to be destroyed in the pgymy Forest.

The alternatives which have been presented seemed to been pushed under the table are:

1- Pudding Creek Recycling which is established.

2- Skunk Train by Rail - which would elimanate fuel cost and wear and tear on Hwy 20 the main artery for Tourists etc to FT. Bragg.
3- Shipping out by ship.

How about using the method use in Sweden alled "Waste-To-Energy" which creates steam that runs turbines that provid energy for electric power. There are scrubbers + filters to clean the emissions to the air.

Sincerely
F Uhlich

Statement by Erik Thorbecke, February 19, 2014 Presented to the Mendocino County Board of Supervisors, members of the Fort Bragg City Council and Mike Sweeney.

Allow me to introduce myself. I am Erik Thorbecke and reside half the year on my wife's Cherry Cove Ranch which borders the proposed transfer station on Highway 20. Cherry Cove Ranch has been in Charla's family ever since her grandfather who had emigrated from Norway bought the property in 1892 (we still have the deed signed by President Benjamin Harrison). Charla grew up on the ranch and we were married here. It is one of the few remaining private redwood forests in the area (the oldest redwood tree on our ranch is over one thousand year old).

Charla and I tried hard over the years to enhance the natural beauty of the ranch even when we were away at Cornell University where I was a professor of economics. When Charla came back to settle permanently here in 2000, her goal was to continue to try to beautify the ranch. Your own mayor lived with his family on the ranch for a few years when he first moved back to Fort Bragg. He and his family contributed to develop the ranch and can testify to its natural beauty. The reward for all these efforts is the proposal to place a dump next to our land.

While the proposed transfer station would strongly negatively affect the ranch, we are also very concerned about the potential negative environmental impact on Fort Bragg residents. Our principal concerns are; i) that the municipal water supply might be polluted because of possible seepage from the transfer station, ii) that traffic congestion will lead to increased incidence of accidents at a vulnerable section of Highway 20 marked by a sharp turn a couple of hundred yards east of the proposed station, iii) the unfavorable impression on visitors and tourists of seeing a dump at the gateway of Fort Bragg.

We fully understand that the city needs a transfer station. We are convinced that there are better, less expensive, more environmentally-friendly alternatives such as Pudding Creek combined with the trash being moved by rail to Willits (both the manager of the Pudding Creek station and the manager of the local train company are supportive of this option)

Finally, let me make it clear that as a professional economist (Ph. D. UC, Berkeley, Professor of Economics Emeritus Cornell University) with a long career in economic development, I plan to subject the EIR to close critical scrutiny when it is completed.

Mike Sweeney

From: "Jennifer Silva" <jsilva@pacific.net>
Date: Thursday, February 20, 2014 8:14 AM
To: "Mike Sweeney" <sweeney@pacific.net>
Subject: Fw: Coastal Transfer Station att: Mike Sweeney

Jennifer Silva
Office Manager
Mendocino Solid Waste Management Authority
3200 Taylor Drive
Ukiah, CA 95482
707-468-9710
707-462-3517 (fax)
www.MendoRecycle.org
-----Original Message-----
From: Rick Sacks
Sent: Thursday, February 20, 2014 7:41 AM
To: undisclosed-recipients:
Subject: Coastal Transfer Station att: Mike Sweeney

Mike,
In considering the relocation of the transfer station following yesterday's scoping meeting at Town Hall,
I wanted to make a couple comments.

A friend of mine that is a professor at the university in Ames, Iowa, would tell me about this incinerator that provides clean emissions and cheap electricity in that community burning the trash rather than shipping it. I don't know what percentage does not get burned, but it sure sounded like a step forward. You might contact that town for information to tell us why it would not work here please.

As far as trucking trash out, we have Solid Waste of Willits and Waste Management both able to bid on this and possibly a couple others. This provides some alternative should one fail or be disappointing in some regard. With the train option, there is zero competition and the track record (pun intended) shows a history with failing companies and a bankruptcy, and a collapsed tunnel. Should the old tracks fail, do we live with a growing mound meanwhile?

Other than that, thanks for conducting an orderly meeting and keeping us in the loop as government should.
Rick Sacks

Scoping Session Comments

I am concerned about the transfer station proposed for Highway 20 in Fort Bragg. I believe the proposed station threatens the habitat of the pygmy forest and will have a negative impact on groundwater, especially in times of drought such as we are now experiencing.

I am particularly concerned with what is not addressed in the Scoping Session Agenda, namely the future of waste management here and elsewhere. Communities will one day be charged with taking responsibility for their own garbage. In order to preserve the environment and conserve resources, the onus will be passed to local communities. Shifting the location of a dump and expecting different results is absurd; there are better solutions to our garbage problems, and I call upon the investigators preparing the EIR to consider other options.

A cogeneration plant can provide electricity while burning our trash, and waste management authorities should look into acquiring cost-effective burners, now or in the near future. Controlling our own trash will create jobs that can be paid for by the bottles and cans and electronics we recycle. Presently, we have little control over how much we pay to have our trash hauled or the tipping fee charged self-haulers. The projected five million dollar cost for the new dump will be paid for by the people in the form of increased taxes or fees, despite the pretense that the dump's operator will absorb the cost of construction without raising disposal rates.

While waiting for cogeneration technology to become cost effective for smaller communities, it will be cleaner and cheaper to transfer our garbage by rail. The Skunk train is ready and available to haul trash from Fort Bragg to Willits. I was surprised to learn that until recently Mr. Sweeney had not contacted Robert Pinole, the Skunk train manager. It is evident that Mr. Sweeney has already made up his mind that a transfer station on Highway 20 is the best available option. Mr. Pinole says he can do it faster and cleaner with available equipment.

Meanwhile, county residents should be taught how to compost their waste to fertilize their gardens. Local gardens and farmers markets are increasingly important and, in times of drought, vital to the preservation of rural economies.

The residents of Road 409 have spoken out about the stench, traffic problems, litter, air and water pollution, and other environmental hazards, and they have forced the joint powers to close their garbage station. The same problems will force the early closure of the five-million-dollar boondoggle on Highway 20, and there are even more environmental hazards along the way should the operation proceed.

The proposed seventeen acres on Highway 20 is presently pristine pygmy with rare and endangered plants and nesting birds. There are less than 4000 acres of pygmy in the world, mostly in California. We cannot replace the pygmy forest once the land is bulldozed and paved over, as is proposed.

To assert, as Mr. Sweeney has repeatedly done, that the stench of garbage would be eliminated by fully-enclosed trailers and sweetened with perfume, ignores one's olfactory senses and the repugnance many people feel about dealing with stink by sweetening it. Moreover, self-haulers will not be required to perfume their loads.

While promising that nearby properties will not be affected, the noise and traffic created while the garbage station is being built and the roads widened are not mitigated. It goes without saying that property values will be compromised. The potential threat to life and limb due to the proximity of the helicopter pad adjacent to the proposed station poses an even greater danger. Used to carry patients suffering from conditions the local hospital cannot treat, the helipad saves lives when the local hospital is mired in fog and landing there is prohibited. The helipad is also used by CDF in times of forest fire or other emergencies.

Fort Bragg's economy is based on a thriving tourist trade. With the addition of several large trucks a day and heavy construction, Highway 20 will experience logjams and vehicular accidents that will keep tourists away. Self-haulers will litter the highway, undetected by Fort Bragg's police but quite apparent to residents who will have to avoid the litter while driving at or below the posted speed limit of 55 mph.

While Mr. Sweeney claims no water will be leached into the ground, cleanup and restroom effluent will undoubtedly infiltrate the ground, poisoning local wells and reservoirs that the city is building less than two miles downstream from the proposed plant.

In order to assess the impact of constructing and operating this plant, many tests must be undertaken. For example, a soils report by a geotechnical engineer based on a minimum of fifteen-foot borings at various locations on site should be undertaken. If the soil is sandy clay with a caliche base at, say, twelve feet, drainage can be sent downhill and the city's water poisoned.

The project is fraught with trouble. There are better solutions to our garbage problems. I entreat the authorities to look elsewhere. What failed to appease the residents of 409 is not going to please the residents and travelers along Highway 20.

Thank you for your attention.

Sincerely,

John Fremont

John Fremont

Post Office Box 944
Mendocino, CA 95460

19 February 2014

Mike Sweeney, General Manager
Solid Waste Management Authority
3200 Taylor Drive
Ukiah, CA 95482

Re: Notice of Preparation, Central Coast Transfer Station Environmental Impact Report

Dear Mr. Sweeney:

On February 19th, 2014, I attended the scoping session for the Draft Environmental Impact Report for the proposed Highway 20 transfer station. Among items discussed in the introduction to the proceedings was the "net benefit" of timber to be swapped from the Russian Gulch State Parks property to Jackson State Demonstration Forest in the legislated land swap. This net benefit concept needs to be applied in the Draft EIR to all aspects of the project. For example, the DEIR should adequately study the current traffic conditions at the existing Caspar Transfer Site and compare the overall net advantages and limitations, including but not limited to financial costs, of moving the waste stream traffic from Road 409 to Highway 20.

Recently, we have noted that "pod" semis leaving Road 409 and heading north no longer use the stop sign at the foot of the road. Rather, they use the dirt area just north of the stop sign to get a head start from less of an angle so that they may merge more easily into Highway One. A truck using this method of egress to the highway completely blocks the view of passenger vehicles pulling in at the stop sign. Conversely, when coming off the Caspar Bridge heading south, we have seen waste trucks cutting across the infield so that they do not have to wait in the turn lane before heading east on Road 409.

Views north and south from the Road 409 intersection are already limited by brush along the roadside to the south, and the bridge railing to the north. Trucks block the limited views and impede safe access to the highway. A 24 ton semi would imped visibility at this site even more. These safety situations would be eliminated if the transfer station were elsewhere. The DEIR should reflect these realities. Traffic conditions, safety considerations, and transportation cost savings/expenses for all alternatives under consideration for waste hauling need to be clearly detailed in the DEIR.

Thank you for addressing these issues in the DEIR.

William Lemos

To the engineers preparing an EIR on the transfer station proposed for Highway 20 in Fort Bragg.

Dear Reporters:

I believe the proposed station threatens the habitat of the pygmy forest and will have a negative impact on groundwater leached to the reservoir two miles away.

The residents of Road 409 have spoken out about the stench, traffic problems, litter, air and water pollution, and other environmental hazards, and they have forced the joint powers to close their garbage station. The same problems will force the early closure of the five-million-dollar boondoggle on Highway 20, and there are even more environmental hazards along the way should the operation proceed.

The proposed seventeen acres on Highway 20 is presently pristine pygmy with rare and endangered plants and nesting birds. There are some 2000 acres of pygmy in the world, mostly in California. We cannot replace the pygmy once the land is bulldozed and paved over, as is proposed.

Shifting the location of a dump from Road 409 and expecting different results is an exercise in futility; there are better solutions to our garbage problems, and I call upon investigators preparing the EIR to consider other options. To assert that the stench of garbage would be eliminated by fully enclosed trailers and sweetened with perfume ignores one's olfactory sensitivities and the repugnance many people feel about dealing with stink by sweetening it. Moreover, self-haulers will not be required to perfume their loads and will strew garbage along Highway 20.

The noise and traffic created while the garbage station is being built and the roads widened cannot be mitigated. It goes without saying that property values will be compromised. The potential threat to life and limb due to the proximity of the helicopter pad adjacent to the proposed station poses an even greater danger. Used to carry patients suffering from conditions the local hospital cannot treat, the helipad saves lives when the local hospital is mired in fog and landing there is prohibited. The helipad is also used by CDF in times of forest fire or other emergencies.

Fort Bragg's economy is based on a thriving tourist trade. With the addition of several large trucks a day and heavy construction, Highway 20 will experience logjams and vehicular accidents that will keep tourists away. Self-haulers will litter the highway, undetected by Fort Bragg's police but quite apparent to residents who will have to avoid the litter while driving at the posted speed limit of 55 mph.

Claims that no water will be leached into the ground are unfounded. Trailer cleanup and restroom effluent will undoubtedly infiltrate the ground, poisoning local wells and reservoirs that the city is building less than two miles downstream from the proposed plant.

A better solution is a cogeneration plant that can provide electricity while burning our trash, and EIR authorities should do a cost-benefit analysis of controlling our own trash. Co-generation will create jobs that can be paid for by recycled bottles, cans and electronics.

Residents will have little control over how much they will have to pay to have their trash removed or the tipping fee charged self-haulers. The projected five million dollar cost for the new dump will be paid for in the form of increased taxes or fees, despite the pretense that the dump's operator will absorb the cost of construction without raising disposal rates. I request the EIR compare current disposal rates with projected tipping fees.

While waiting for cogeneration technology to become cost effective for smaller communities, it will be cleaner and cheaper to transfer our garbage by rail. The Skunk train is ready and available to haul trash from Fort Bragg to Willits, but this has not been considered by the joint powers authority. Robert Pinole, the Skunk train manager, says he can do it faster and cleaner with available equipment.

In order to assess the impact of constructing and operating the proposed transfer station, many tests should be undertaken. A soils report by a geotechnical engineer based on a minimum of fifteen-foot borings at various locations on site should be undertaken. If the soil is sandy clay with a caliche base at, say, twelve feet, drainage will be sent downhill and the city's water poisoned.

Sincerely,

John Fremont

Mike Sweeney
General Manager
Mendocino Solid Waste Management Authority,
3200 Taylor Drive, Ukiah CA 95482

Thank you for the opportunity to share concerns at the scoping meeting for the proposed Central Coast Transfer Station on February 19, 2014. I am convinced the plan to develop this facility along the Highway 20 corridor on State Forest land 3 miles east of Highway 1 is both ill-conceived and short-sighted.

In addition to the items already listed as potential issues in the Notice of Preparation of the EIR, http://www.mendorecycle.org/NOP/NOP%20Central%20Coast%20TS%20EIR.pdf, the Environmental Impact Report must address the following specifics:

A) Traffic/Safety: Impacts to bicycle use and safety should be evaluated. Numerically, traffic increases may not be significant, but the nature of this traffic aggravates risks in the form of additional large truck traffic and self-haulers distracted by their loads to the detriment of keeping their eyes on the road and bike lane. Bicyclists may also be at increased risk of accidents due to an increase of road-side litter and debris from self-haulers driving at speeds up to and in excess of posted limits.
B) Biological Resources:
    a. Mendocino County designates the pygmy forest as an "Environmentally Sensitive Habitat Area" and restricts development. The pygmy forest supports a rare and fragile association of soils, microbes, plants, and animals (including at least four species of lichens previously unreported in California). The delicate balance of this unique community is vulnerable to hydrologic change resulting from vegetation removal, and construction of roads or other impervious surfaces, ditches, and other drainage features, as well as, the addition of nutrients resulting from garbage and other unnatural discharges. Biological resources may be further threatened by the introduction of rats and other vermin that follows hand-in-hand with garbage nuisances.
    b. Wetland habitats will also be affected by hydrologic change and ground disturbance. Drainage required for suitable building foundations may diminish nearby wetlands.
C) Odor and Air Quality:
D) Greenhouse Gas Emissions and Energy Use: Again, the nature of the traffic increases and perceived safety risk may further deter bicycle commuters from traveling the highway bike lane and thereby enhance emissions and energy use.
E) Aesthetics:
    a. The Highway 20 corridor is the primary gateway to the Mendocino Coast. Visitors do not travel that route hoping to see or smell our garbage as they wind through the final few miles to the coast. Siting a solid waste facility here is not a prudent move for an economically depressed community hoping to advance and benefit from its reputation as a world class tourist destination.
    b. Additionally, new turn lanes will require highway widening and conversion of forested road sides to paved surfaces.
    c. Road-side litter will increase. This increase will be aggravated by the higher speed limits along the highway relative to county roads where alternative sites exist.
    d. Illegal dumping along the Highway 20 corridor will impact both private property and Jackson State Forest.

F) Noise: There is no assurance that hours of operation will be limited to minimize the impact of noise.

G) Agriculture and Forest Resources: Although the Jackson State Forest will not suffer a net loss in acreage as a result of the land swap, the dispersed recreation that currently occurs at the Highway 20 site will be impacted. Numerous trails traverse the parcel providing evidence of recreational use. The land that Jackson will acquire from Russian Gulch State Park is already available for dispersed recreation. The acquired land lies within the Caspar Creek Experimental Watersheds, and as such, will not be available for the full spectrum of uses that other forested acreage is.

H) Cultural Resources

I) Geology/Soils/Seismicity: Aside from geologic hazards, the soils at this site are a unique resource. Characterized by low nutrient content, acidity, and a relatively impervious shallow hard pan, rapid surface runoff occurs during even small to moderate rainfall events. After several inches of rain, the soil becomes saturated and a perched water table forms at the surface. Such conditions preclude standard septic systems because the waste water cannot be absorbed and filtered adequately. Similarly, accidental discharge of waste materials would not be absorbed and filtered by the soil making timely containment of seepage, spills, or leaks difficult to impossible.

J) Hazards and Hazardous Materials:
   a. Non-point source of pollution from roads and vehicles is probable. This pollution would occur in the Noyo Watershed, Fort Bragg's municipal water source.
   b. Although discharge of wastewater or non-treated runoff would not be permitted, these measures are not fail-proof. Accidents happen as evidenced by the recent tragedies in West Virginia and North Carolina. Accidental discharges could potentially affect municipal water supply, as well as the wells of residents in the unincorporated area between Highway 20 and the Noyo River.

K) Hydrology and Water Quality:
   a. The proposed site is within the Noyo River Watershed. Not only does this watershed provide Fort Bragg's municipal drinking water, it is also a sediment-impaired river and habitat for threatened and endangered salmonids. The community of Fort Bragg has very few options if this water supply is compromised by unintended, unforeseen release of hazardous waste or sediment. The fish have no options.
   b. Surface water and subsurface flow paths must both be evaluated using field-based methodologies.
   c. Storm water runoff models must accurately reflect the hydrology of the soils. These do not exist for pygmy soils and extrapolations from nearby watersheds could result in errors of several orders of magnitude.
   d. Altered hydrology resulting from removal of vegetation, creation of new impervious surfaces, and construction of drainage structures will potentially affect wetlands, streamflow processes, and water quality.

L) Land-use planning: Conversion from Timber Production/Preserve is unwarranted when the Pudding Creek Recycling Center and the Road 409 Caspar Landfill sites are already converted and industrialized.

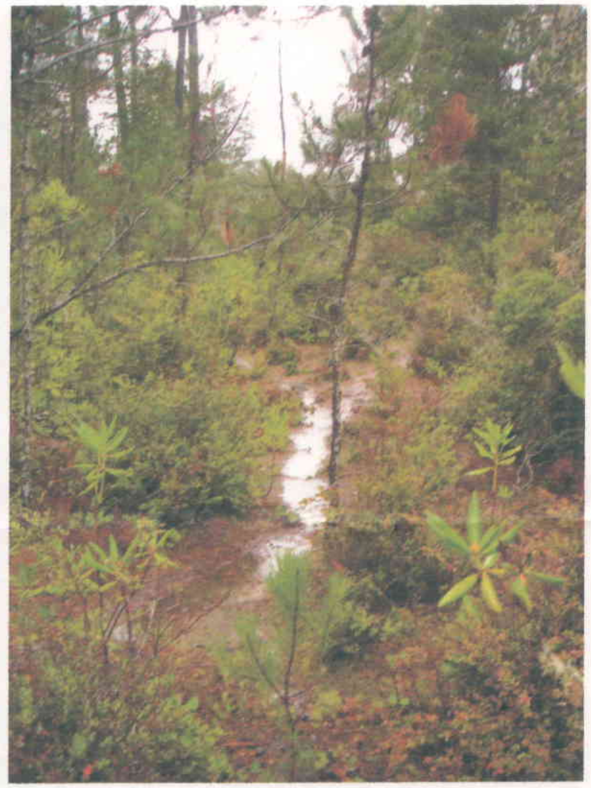
Sincerely,

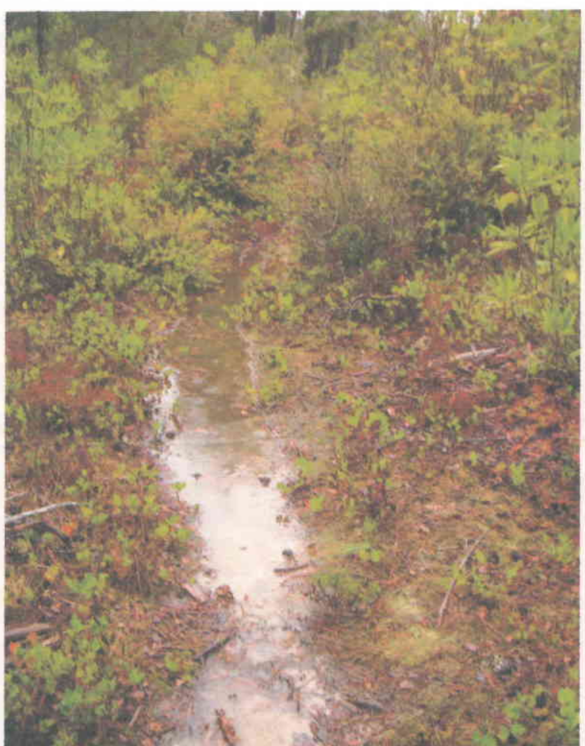
Elizabeth Keppeler

Elizabeth Keppeler, hydrologist, 31681 Highway 20, Fort Bragg, CA 95437

(The attached photos depict elevated water table and surface runoff during a recent rain event)

Proposed Transfer Station Site 3 miles out Highway 20, February 8, 2013:





Sierra Club, Mendocino Group
PO Box 522
Mendocino CA 95460

February 26, 2014

Mike Sweeney
General Manager
Mendocino Solid Waste Management Authority
3200 Taylor Drive
Ukiah CA 95482
<sweeney@pacific.net>

Subject: Central Coast Transfer Station, Notice Of Preparation of an Environmental Impact Report

Dear Mr. Sweeney:

Thank you for the opportunity to offer scoping comments on the Notice of Preparation of an Environmental Impact Report for the proposed project, the construction and operation of a waste transfer station 3 miles inland on Highway 20, Fort Bragg.

Our comments fall into two areas: the effects of the project on biological resources and the effects of building the project to over twice the size needed for the current waste stream volumes.

Biological Resources - Mendocino Pygmy Cypress Forest and Bishop Pine Forest

We are concerned that in choosing, as an option, the Highway 20 site for the construction and operation of a waste transfer station – Waste Management is giving inadequate consideration to the sensitivity of, and the potential impacts to, the rare Mendocino Pygmy Cypress and Northern Bishop Pine Forests located on site. We are also concerned that any hydrological changes to the site as a result of the project will impact the off-site pygmy forest to the north as well as impact the on-site vegetation.

It seems counterproductive to start by selecting a site that includes a habitat type unique to Mendocino County. This rare vegetation type deserves the utmost protection yet is fast being destroyed and degraded by (mostly) private development. It would be unconscionable for the county itself to choose to degrade what should be seen as an invaluable and irreplaceable biological asset of the county, a treasure to be guarded.

We concur with the scoping comments of the California Native Plant Society and defer, in general, to their expertise regarding the specifics of potential impacts to rare plants and vegetation at this site. We believe it too sensitive an area for such a use and that an EIR would find there were potential impacts that could not be mitigated. There should be no impacts to pygmy forest as a result of this project.

We urge the city and the county to re-consider its choice of this site as suitable for a transfer station and to look at alternatives that would not impact rare vegetation types.

The Proposed Project is Oversized

We believe that Mendocino County should be exploring options such as, for example, reducing the waste stream or using waste to generate energy rather than hauling it out of the county. In addition, the proposed project is being scaled at a capacity of more than twice what is needed to handle current waste. "To accommodate future growth and technological changes…" the facility will be designed to handle 75 tons/day, more than double our current waste stream that averages 35 tons/day. This suggests that (1) the design is creating the potential for expansion without adequate consideration for the multiplication of impacts relevant to biological resources, water quality and quantity, traffic, noise, odor, etc. and (2) that exploration of waste reduction for the future has not been considered.

The project needs to be amended to include exploration of alternative means of waste disposal and of the reduction, rather than expansion, of the waste stream

Sincerely,

Linda Perkins
Conservation Chair

cc: Rick Macedo, California Department of Fish and Wildlife and
<jsilva@MendoRecycle.org>

Jennifer Silva

From: "Erik Thorbecke" <et17@cornell.edu>
Date: Thursday, February 27, 2014 2:42 PM
To: "Jennifer Silva" <jsilva@pacific.net>
Subject: EIR Proposed Transfer Station on Highway 20

Attention: EIR and Mike Sweeney

Please take into consideration in your EIR the sundews a small fly eating plant found in the Pigmy forest.
Yours truly,

Charla Thorbecke

Jennifer Silva

From: "Erik Thorbecke" <et17@cornell.edu>
Date: Tuesday, February 25, 2014 2:13 PM
To: "Jennifer Silva" <jsilva@pacific.net>
Attach: Statement by Charla Thorbecke.docx
Subject: Scoping meeting on Proposed Transfer station on Highway 20

Dear Jennifer,
I attach the statement of my wife read at the scoping meeting.
Please forward to Mike Sweeney and EIR team.
All the best,
Erik

Statement by Charla Thorbecke

To the Mendocino County Board of Supervisor and members of the Fort Bragg City Council and Mike Sweeney:
Thank you for this opportunity to speak.
I am Charla Westerberg Thorbecke. My grandparents bought our land on highway 20 in 1892

My land borders the proposed transfer station.
I am against the transfer station being built on highway 20.
First the city water supply from Newman gulch is likely to be contaminated from seepage from the transfer station.
Second, the Pygmy forest on the proposed site will be destroyed. There are only 4,000 acres of Pygmy forest left in the whole world and when you destroy the 17 acres of pigmy forest land, you destroy it not just for Fort Bragg and Mendocino County but for the whole world.
The pigmy forest should be a welcoming park to Fort Bragg. Welcoming visitors at the gateway of Fort Bragg should be the goal.
There are better alternatives. The transfer station should be at Pudding Creek, and the trash hauled by rail to Willits. It is time for Fort Bragg to wake up. Don't spend our money on trash but on true development.

Mike Sweeney

From: "Melehani, Candace@DGS" <Candace.Melehani@dgs.ca.gov>
Date: Tuesday, January 21, 2014 9:12 AM
To: "Mike Sweeney" <sweeney@pacific.net>
Subject: RE: Land Exchange - AB 384

Thank you for the billing information. I will add it to the request and move it forward.

I will also remind Matt that you are waiting for his call.

Candace Melehani
Asset Management Branch
Real Estate Services Division
Department of General Services
707 Third Street, 5th Floor
West Sacramento, CA 95605
(916) 376-1894 (Tel)
(916) 376-1833 (Fax)
candace.melehani@dgs.ca.gov

From: Mike Sweeney [mailto:sweeney@pacific.net]
Sent: Tuesday, January 21, 2014 9:11 AM
To: Melehani, Candace@DGS
Subject: Re: Land Exchange - AB 384

I regret that I haven't heard from Matt Keefe but I don't want to delay anything here.

The agency that will pay costs is

Mendocino Solid Waste Management Authority
ATTN: Mike Sweeney, General Manager
101 W. Church St. #9
Ukiah, CA 95482

after April 1, 2014, our mailing address will change to

Mendocino Solid Waste Management Authority
3200 Taylor Drive
Ukiah, CA 95482

Mike Sweeney

From: mailto:Candace.Melehani@dgs.ca.gov
Sent: Tuesday, January 14, 2014 2:39 PM
To: sweeney@pacific.net
Subject: RE: Land Exchange - AB 384

Hi Mr. Sweeney,

I just wanted to let you know that Matt Keefe will be calling you with information on what the review will entail as well as an estimate of the cost. I'm not sure when he will make the call but hopefully within the next day or so.

Thanks,

Candace Melehani
Asset Management Branch
Real Estate Services Division
Department of General Services
707 Third Street, 5th Floor
West Sacramento, CA 95605
(916) 376-1894 (Tel)
(916) 376-1833 (Fax)
candace.melehani@dgs.ca.gov

From: Melehani, Candace@DGS
Sent: Monday, January 13, 2014 5:07 PM
To: 'sweeney@pacific.net'
Subject: FW: Land Exchange - AB 384

Dear Mr. Sweeney,

The email message displayed below indicates that Mike Salyer with CAL FIRE spoke to you in late November about a proposed land exchange to facilitate development of a city/county waste management transfer station in Mendocino county.

CAL FIRE has asked the Department of General Services (DGS) to perform appraisal review services in connection with the land exchange and has indicated that DGS should bill your organization directly for the requested services. Will you please provide contact information for the person who should receive the bill as well as any special instructions that may be required? Typically, DGS bills for the services before delivery of the work product.

Sincerely,

Candace Melehani
Asset Management Branch
Real Estate Services Division
Department of General Services
707 Third Street, 5th Floor
West Sacramento, CA 95605
(916) 376-1894 (Tel)
(916) 376-1833 (Fax)
candace.melehani@dgs.ca.gov

From: Salyer, Mike@CALFIRE

Sent: Thursday, November 21, 2013 11:25 AM
To: Klinger, Alice@DGS; Van Zuuk, Marc@CALFIRE
Cc: Butler, Michael@DGS; Melehani, Candace@DGS; Pisi, Lorina@CALFIRE
Subject: RE: Land Exchange - AB 384

Alice,

I spoke today with the Mendocino City/County representative, Mike Sweeney at 707-468-9710, regarding the proposed land exchange that will facilitate development of a City/County waste management transfer station. Mr. Sweeney said he had anticipated that costs associated with the exchange are the responsibility of his organization (I'm not sure if he works for the County, City or a JPA). I explained that CAL FIRE would initiate a CRUISE request to commence; however, DGS needs compensated for their services. He asked that DGS bill his organization directly, if possible. Subsequent to my recent conversation with him, I recommend DGS contact him about billing arrangements.

CAL FIRE will start the CRUISE process ASAP.

Let me know if you have questions.

Michael Salyer SR/WA
Capital Outlay Project Manager
California Department of Forestry & Fire Protection
CAL FIRE Headquarters, Technical Services Section
1300 U Street, Sacramento, CA 95818
916-324-1643 Direct
916-324-3400 FAX
Mike.Salyer@fire.ca.gov

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Northern Region 1
601 Locust Street
Redding, CA 96001
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

February 28, 2014

Mr. Mike Sweeney, General Manager
Mendocino Solid Waste Management Authority
3200 Taylor Drive
Ukiah, California 95482
sweeney@pacific.net

Dear Mr. Sweeney:

RE: Notice of Preparation for the Central Coast Transfer Station Draft Environmental Impact Report (SCH # 2014012058) Mendocino County, California

On January 29, 2014, the California Department of Fish and Wildlife (CDFW) received from Mendocino County (Mendocino Solid Waste Management) and the City of Fort Bragg (joint-Lead Agency) a Notice of Preparation for the Central Coast Transfer Station (CCTS) Draft Environmental Impact Report (DEIR; State Clearing House Number 2014012058). CDFW staff visited the project site and reviewed the project description, biological resources assessment, and project maps.

CDFW has jurisdiction over the conservation, protection and management of fish, wildlife, native plants and their habitat. As a responsible agency, CDFW administers the California Endangered Species Act (CESA) and other provisions of the Fish and Game Code (FGC) that conserve the State's fish and wildlife public trust resources.

CDFW's primary environmental concerns involve future development within the project area that include: a) impacts to Mendocino Pygmy Cypress Woodland and Northern Bishop Pine Forest habitats, b) impacts to wetland habitat, c) impacts to special-status plant and wildlife species, d) water use and potential impacts to downstream water availability, e) erosion and potential impacts to water quality on-site and downstream and f) potential cumulative impacts especially to Mendocino Pygmy Woodland Forest and Northern Bishop Pine Forest habitats.

CDFW offers the following comments and recommendations on this project in our role as a trustee and responsible agency pursuant to the California Environmental Quality Act (CEQA; California Public Resource Code §21000 *et seq.*).

Project Description
The proposed CCTS will include construction and operation of a municipal solid waste transfer station that will process materials from the incorporated City of Fort Bragg and the surrounding unincorporated coastal area of Mendocino County (Westport south to the Navarro River). The proposed CCTS location involves 17 acres of undeveloped forest land (Mendocino Pygmy Forest Woodland and Northern Bishop Pine Forest)

within Jackson Demonstration State Forest (JDSF) at address 30075, Highway 20, Fort Bragg, California (Mendocino County Assessor's Parcel Number 019-150-5). Specific project components include a waste transfer building, a scalehouse, outdoor recycling drop-off area, paved driveways, perimeter fencing, water well and other utility services.

Mendocino Pygmy Cypress Woodland and Northern Bishop Pine Forest Habitats
The proposed CCTS site currently maintains exceptionally high quality Mendocino Pygmy Cypress Woodland and good Northern Bishop Pine Forest habitats. While many of these habitat types have been degraded or eradicated throughout Mendocino County, this site has been generally protected from habitat-altering, adverse impacts. With the exception of the "helicopter pad" that exists to the west, this parcel supports habitat of the highest quality.

When assessing potential impacts to sensitive plant alliances, CDFW ranks alliances according to their degree of imperilment (as measured by rarity, trends, and threats). Mendocino Pygmy Cypress Woodland and Northern Bishop Pine vegetation types are State rank S2 alliances, which defines these habitats as highly imperiled or "rare and threatened in California."

Mendocino County's General Plan Policy RM-84 provides guidance for projects that will impact Mendocino Pygmy Cypress Woodland habitat. Policy RM-84, among other directives, calls for protecting this habitat by minimizing "vegetation removal" and the "disruption of vegetation continuity." In addition, Jackson Demonstration State Forest's (JDSF) 2008 EIR/Management Plan discloses the intent to "maintain the current distribution and species composition of Mendocino Pygmy Cypress Woodland habitat and protect it from harmful human disturbance, while continuing to allow compatible recreational activities...".

Given this project has the potential to remove acres of high quality habitat in a rare, threatened, and declining vegetation type, CDFW finds it is highly likely this project will result in significant impacts to Mendocino Pygmy Cypress Woodland. Because the proposed project location is likely to result in significant impacts to rare vegetation types, CDFW recommends the DEIR include at least one feasible alternative project location that would avoid or substantially lessen the impacts to rare vegetation types (**Recommendation 1**). This alternative project site(s) could serve as the environmentally superior alternative pursuant to CEQA Section 15126.6(e)(2).

The DEIR should detail how proposed impacts to Mendocino Pygmy Cypress Woodland habitat address directives in Mendocino County's General Plan and in Jackson Demonstration State Forest's (JDSF) 2008 EIR/Management Plan that call for protecting this sensitive habitat (**Recommendation 2**). Should direct or indirect significant impacts to Mendocino Pygmy Cypress Woodland and Northern Bishop Pine Forest habitats occur as a result of this project, the DEIR should prepare a detailed mitigation plan that outlines measures for avoidance, minimization, mitigation, and monitoring.

CDFW is unaware of any documented successful large-scale ecological restoration of Mendocino Pygmy Cypress Woodland habitat. Consequently, if avoidance is not a feasible alternative, acquisition and management in perpetuity of high quality Mendocino Pygmy Cypress Woodland and Northern Bishop Pine Forest habitats may be the only feasible mitigation strategy for addressing the potential project-related loss of these sensitive endemic habitats (**Recommendation 2**). Because habitat preservation as a form of compensatory mitigation results in the direct loss of habitat area, this type of mitigation strategy typically requires higher mitigation ratios than other types of mitigation.

Wetlands
The biological resources assessment prepared for the property identified existing wetland habitat. It is the policy of the Fish and Game Commission (Commission), to seek to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California. Further, it is the policy of the Fish and Game Commission to strongly discourage development in or conversion of wetlands. It opposes, consistent with its legal authority, any development or conversion which would result in a reduction of wetland acreage or wetland habitat values. To that end, the Commission opposes wetland development proposals unless, at a minimum, project mitigation assures there will be "no net loss" of either wetland habitat values or acreage. The Commission has directed CDFW to apply this policy as appropriate. The DEIR should prepare a detailed conservation plan which outlines measures for avoidance, minimization, mitigation, and monitoring of affected wetland habitat (**Recommendation 3**).

Rare Plants and Wildlife
The biological resources assessment prepared for the property identified several special-status plant and wildlife species. While no plant or wildlife species listed pursuant to CESA have been identified on the subject parcel, the identified special-status species may qualify as endangered, rare or threatened species pursuant to CEQA Section 15380. Therefore, the DEIR should include a detailed plan that includes avoidance measures, mitigation, and monitoring (**Recommendation 4**).

Mitigation and Project Alternatives
The DEIR should analyze and disclose all probable costs of the proposed CCTS including costs for land acquisition, restoration and maintenance that will likely be required to, in part, adequately mitigate for project-related impacts (**Recommendation 5**). Because an Environmental Impact Report must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly [CEQA Section 15126.6(b)]. For purposes of analyzing environmentally superior alternatives, DEIR's

project alternatives section should include locations that are void of or have a minimum amount of sensitive species and/or habitats (**Recommendation 6**).

Water Supply and Demand
The City of Fort Bragg and several nearby communities face water shortage concerns especially during dry-year periods. The DEIR shall analyze and disclose the CCTS's potential impacts involving water consumption including: a) total estimated water consumption per day, week and year; b) a hydrological analysis that determines if the water source will come from groundwater (e.g. percolating groundwater) or from a source that is hydrologically connected to surface water and c) a hydrological-based assessment that addresses potential impacts to surface water including small watercourse and down-slope connecting streams/rivers (**Recommendation 7**).

In addition to water availability, the proposed project could result in accelerated erosion and resulting adverse impacts to downstream water quality. The DEIR should include a detailed erosion control plan and Low Impact Development (LID) strategy that details site-specific measures for reducing erosion, maintaining on- and off-site water quality and encouraging on-site retention of storm flow runoff (**Recommendation 8**).

Cumulative Impacts
Mendocino County currently lacks a comprehensive plan for protecting sensitive species and habitats including Mendocino Pygmy Cypress Woodland and Northern Bishop Pine Forest. Impacts to these sensitive habitats are on-going, especially outside of the Coastal Zone. The DEIR's cumulative impacts section should analyze and disclose how the proposed CCTS may contribute to impacts incrementally with consideration given to other closely related past, present or reasonably foreseeable probable future projects (CEQA Guidelines section 15355) (**Recommendation 9**).

Lake and Streambed Alteration Agreement
The project area is drained by a series of small watercourses. Depending upon a given watercourse and proposed activities within or near these watercourses, an Agreement may be required by CDFW pursuant to FGC section 1602 (**Recommendation 10**). For more information on this process, refer to http://www.dfg.ca.gov/habcon/1600/.

Recommendations:

For the protection of fish, wildlife and plant resources and their habitats, CDFW recommends that the following be fully addressed in the DEIR:

1. DEIR shall include at least one feasible alternative project location that would avoid or substantially lessen the impacts to rare vegetation types.

2. The DEIR shall detail how proposed impacts to Mendocino Pygmy Cypress Woodland habitat address protection directives in Mendocino County's General

Plan and in the Jackson Demonstration State Forest's (JDSF) 2008 EIR/Management Plan.

3. The DEIR shall include a detailed mitigation plan which outlines measures for avoidance, minimization, mitigation, and monitoring. Should the approved project result in adverse impacts to sensitive habitats, the mitigation plan should include proposals for acquiring, restoring, managing and protecting in perpetuity nearby, high quality habitats including Mendocino Pygmy Woodland Forest, Northern Bishop Pine and wetland.

4. The DEIR shall include a detailed plan that includes avoidance measures, mitigation, and monitoring for special-status species including those designated as endangered, rare or threatened species pursuant to CEQA section 15380.

5. The DEIR shall analyze and disclose all probable costs of the proposed CCTS project including costs for land acquisition, restoration and maintenance that will likely be required to, in part, adequately mitigate the project.

6. The DEIR's project alternatives section shall include alternate locations that are void of or have a minimum amount of sensitive species and/or habitats.

7. The DEIR shall analyze and disclose the CCTS's potential impacts involving water consumption including: a) total estimated water consumption per day, week and year; b) a hydrological analysis that determines if the water source will come from groundwater (e.g. percolating groundwater) or from a source that is hydrologically connected to surface water and c) a hydrological-based assessment that addresses potential impacts to surface water including small watercourse and down-slope connecting streams/rivers.

8. The DEIR shall include a detailed erosion control plan and LID strategy that details site-specific measures for reducing erosion, maintaining on- and off-site water quality and encouraging on-site retention of storm flow runoff.

9. The DEIR's cumulative impacts section should analyze and disclose how the proposed CCTS project may contribute to impacts incrementally with consideration given to other closely related past, present or reasonably foreseeable probable future projects (CEQA Guidelines section 15355).

10. If project-related activities will result in substantial modifications to streambed, bank, or channel or substantial water diversion from a lake or stream, the project proponent is required to notify CDFW pursuant to FGC section1602 before undertaking any of these activities (see to http://www.dfg.ca.gov/habcon/1600)/).

If you have questions or comments regarding this matter, please contact Environmental Scientist Rick Macedo at (707) 928-4369, or at 619 Second Street, Eureka, California, 95501.

Sincerely,

Curt Babcock
Environmental Program Manager

cc: Ms. Linda Ruffing
City of Fort Bragg
416 N. Franklin Street
Fort Bragg, California 95437
lruffing@fortbragg.com

ec: Curt Babcock, Rick Macedo, Angela Liebenberg, Terra Fuller, Wes Stokes, Scott Koller, Gordon Leppig, Michael van Hattem, Brad Valentine, and Laurie Hansberger
California Department of Fish and Wildlife
curt.babcock@wildlife.ca.gov, richard.macedo@wildlife.ca.gov, angela.liebenberg@wildlife.ca.gov,terra.fuller@wildlife.ca.gov, wesley.stokes@wildlife.ca.gov, scott.koller@wildlife.ca.gov, michael.vanhattem@wildlife.ca.gov, gordon.leppig@wildlife.ca.gov, Brad.Valentine@wildlife.ca.gov, laurie.harnsberger@wildlife.ca.gov,

CEQA-2014-0028-R1

Mendocino County Health & Human Services Agency

Healthy People, Healthy Communities

Dave Jensen, Director

Public Health Branch

Division of Environmental Health

Ukiah Office: 860 N Bush St, Ukiah CA 95482 Phone: 707-234-6625

Fort Bragg Office: 120 W Fir St, Fort Bragg CA 95437 Phone: 707-961-2714

February 27, 2014

Mendocino Solid Waste Management Authority
Mike Sweeney
3200 Taylor Dr.
Ukiah Ca, 95482

Subject: Comments on the Notice of Preparation of an Environmental Impact Report for proposed Central Coast Transfer Station.

The Mendocino County Environmental Health serving as the designated Local Enforcement Agency (LEA) has reviewed the Notice of Preparation of an Environmental Impact Report for the proposed Central Coast Transfer Station located 30075 Highway 20, Fort Bragg, Ca.

The proposed facility would serve both self-haul and commercial costumers and would be designed to handle an average of 75 tons of material per day. The project, as designed, will require a Medium Transfer Solid Waste permit from the Mendocino County LEA. With the average amount of waste throughput, the operator can either apply for a Medium Volume transfer station permit (below 100 TPD)or a Large Volume transfer station permit (above 100 TPD at any give time) if the operator foresees the need for a higher tier in the future. In both instances, the operation shall comply with requirements set forth by CalRecycle's Title 14 and/or Title 27 along with the California State Minimum Standards.

Phil Chou
Environmental Health Tech
(707) 234-6625

California
Native Plant Society
Dorothy King Young Chapter
P.O. Box 850 - Point Arena, CA 95468

February 27, 2014

Mendocino Solid Waste Management Authority
3200 Taylor Drive
Ukiah, CA 95482

Mike Sweeney, Manager

Board of Directors:
Meg Courtney, Ron Orenstein, Dan Hamburg, John McCowen, Mary Anne Landis

Re: Comments, Proposed Waste Transfer Station, Fort Bragg

Dear Mr. Sweeney and MSWMA Board of Directors,

These comments are submitted on behalf of the Dorothy King Young Chapter of the California Native Plant Society (CNPS). CNPS requests that this letter be entered into the record for this project.

Location of Transfer Station
CNPS understands that the City of Fort Bragg needs a better way to handle its waste. At the same time, CNPS very much wants to see a solution that preserves irreplaceable Mendocino Cypress Woodland, commonly known as "Mendocino Pygmy Forest." Since the preferred site for the new transfer station on Highway 20 contains this rare plant community, CNPS would like other, less environmentally sensitive sites to be considered. The preferred site also contains another rare plant community, Northern Bishop Pine Forest, several rare plant species and wetlands

One obvious alternative is the existing disposal center on Pudding Creek Road. It appears that this site was discounted because it is already under the control of one entity and could not be taken over by an independent company. It is not clear why this must be regarded as a negative factor.

Clearly the plan to truck large waste loads over Highway 20 argues for a transfer station along that road, but it would be preferable to choose a site that does not contain pygmy forest. Free acquisition of the preferred site on Highway 20 might be offset by the high cost of mitigation for damage to biological resources.

Comments on Biological Resources Assessment
4.2 The concept of "transitional pygmy forest" cited in the Assessment has no scientific validity. When taller trees are found in pygmy forest it may indicate that something has penetrated the hardpan layer, allowing for larger tree growth. Pygmy forest also occurs in a mosaic with other plant communities, such as bishop pine forest, and this can occur where soil types meet.

Table 1 There is no point in identifying "tall" or "short" or "extreme" pygmy forest. The plant community characterized by the presence of Mendocino cypress and Bolander pine is one rare plant community, recognized as such by the California Department of Fish and Wildlife. The height of the plants is not an issue.

Figure 3 See comments above.

4.3.2 With regard to distribution of Mendocino Pygmy Cypress Forest, all reliable evidence indicates that this vegetation type does **not** occur in Sonoma County. The so-called "pygmy forest" within Salt

Point State Park was erroneously thought to include Bolander pine. Repeated visits to the site by plant experts have failed to locate this pine. Unlike Bolander pine, pygmy cypress is well known to occur on a variety of soil types. The vegetation type at the Salt Point location appears to be Northern Maritime Chaparral, with chaparral shrubs like manzanita sharing dominance with somewhat dwarfed cypress and bishop pine trees.

With regard to the pygmy forest "morpho-types" cited in the Assessment, CNPS asks that the EIR not rely on this language. Height has no effect on determination of rarity, and "transitional" has no validity.

High Vulnerability of Pygmy Forest

If the transfer station is built on a site containing pygmy forest, the Environmental Impact Report (EIR) must include all current scientific information about this rare and unique resource. Mendocino Cypress Woodland is a very rare plant community dominated by two rare trees: Pygmy cypress (*Hesperocyparis pygmaea*) and Bolander pine (*Pinus contorta ssp. bolanderi*). It doesn't matter how tall or short the trees are, since their height can vary due to the density and thickness of the underlying hardpan layer.

Pygmy forest is totally dependent on a shallow, flat, nutrient-depleted, highly acidic substrate, in which water is trapped by an underlying layer of hardpan rock or dense clay. Water in this forest is slow moving, spreading laterally. The plants that grow in this environment are highly adapted to these extreme conditions and highly sensitive to any alterations to these conditions.

Activities like digging, trenching or paving that alter the hydrology or break up the hardpan layer are very damaging, and often ultimately fatal to pygmy forest. Pygmy forest is also degraded by the influx of nutrients, as from sewage or plant fertilizers.

The unusual requirements for pygmy forest viability make it impossible to preserve pygmy forest merely by limiting the development footprint, or "avoiding" some pygmy forest during construction. Pygmy forest is highly vulnerable to cumulative impacts from nearby habitat alteration, including activities on adjacent parcels.

Thus, on-site mitigation measures for impacts to pygmy forest are rendered largely inadequate. Project proponents must look to offsite mitigation measures designed to preserve contiguous tracts of pygmy forest in perpetuity.

Pygmy Forest Rarity and Condition

In recent years there have been few surveys for pygmy forest occurrence or viability, due to lack of agency funding. Data, observations and photo-documentation by local biologists and state agency personnel are vitally important to inform and augment data collected earlier.

Some estimates put the total number of acres of Mendocino pygmy forest at 2,600 or less. Acceptance of this statistic must be tempered by evidence that the majority of pygmy forest stands are in decline, and that it is often not possible to examine pygmy forest on private lands.

The California Department of Fish and Wildlife, in 2013, stated that: "... approximately 70 percent of pygmy forest habitat is currently under some form of unprotected status (e.g., subject to ministerial building construction, future development or other impacts that would eradicate or notably alter natural function of this habitat type). Consequently, the amount of unprotected pygmy forest acreage may be as low as 540 to acres to as high as 1,200 acres."

However, much of pygmy forest under public ownership, and supposedly protected, is receiving very poor protection from such impacts as macro-trash dumping, homeless encampments, off-road vehicle use, unauthorized trail building and wild craft collecting of lichens and manzanita branches.

An internal report from State Parks, dated April 16, 26 & 30 – 2012, provides a number of blatant examples for the area where State Parks property intersects with Jackson Demonstration State Forest, owned by the California Department of Forestry and Fire Protection (CalFire).

Ideally, a thorough survey of all public forest stands on public and private lands would classify occurrences by level of degradation, and pygmy forest stands below a certain degradation threshold would be excluded from the total acreage.

Mitigation Measures

As explained above, the transfer station project can be expected to cause heavy impacts to the pygmy forest that cannot be mitigated with on-site measures.

Much of the pygmy forest in public ownership that was meant to be protected, often receives very little protection at all. Private pygmy forest lands adjacent to these public lands are also impacted by the spillover from unauthorized and damaging activities.

One suggested mitigation measure would be to create a cooperative partnership between State Parks, CalFire, Mendocino County and private landowners to increase protection of pygmy forest lands already set aside. This could take the form of monitoring, signage, barriers, a public awareness campaign and enforcement measures.

A letter from Richard Macedo of the California Department of Fish and Wildlife, dated 10/31/2013 states that: "[The] Department is interested in working with Mendocino County staff to develop a county-wide strategy for protecting and managing pygmy forest habitat. This strategy will likely focus on protecting large, contiguous areas of this unique habitat. Without such a plan, we will continue to lose pygmy forest areas as well as experience reduced options for abating this loss."

Protecting large tracts of existing pygmy forest on public lands, plus adjacent private lands, would dovetail nicely with the Department's strategy. An ideal area for this type of mitigation is the pygmy forest in Jug Handle State Reserve that continues into Jackson Demonstration State Forest and includes the Mitchell Creek area.

CNPS would also hope to see effective mitigation measures for loss of Bishop Pine Forest, rare plant species and wetlands.

Sincerely,

Lori Hubbart, Conservation Chair
Dorothy King Young Chapter, California Native Plant Society

CC: Misha Schwarz, Project Manager
GHD - 3831 North Freeway Blvd.
Suite 220
Sacramento, CA 95834

Linda Ruffing
Community Development Director
City of Fort Bragg

Richard Macedo
California Department of Fish & Wildlife
Coastal Conservation Planning
Northern Region

Greg Suba, Conservation Director
California Native Plant Society
2707 K Street, Suite 1
Sacramento, CA 95816-5113

Transferring of Trash

To whom it may concern,

Whilst reading the paper this afternoon, I was perplexed at how such a topic would arrive at such confusion. Fort Bragg is a small city, and the surrounding towns are vastly less populated. Alas, we produce garbage like anywhere else. There have been several opinions on how to rid of the waste from this area. I will add several more.

- Keep it Local – Everybody, mostly, on the coast does their best to support the mindset and framework that keeping things local is the most efficient way to sustain the economy of this city, and those around us. So, why not just deal with it here? Why do we need to use resources to ship garbage to another place? While shipping it out on the train, being the most efficient way to distribute,or receive anything, still seems like we are sweeping dust under the carpets.

- Canada Burns It – There are several manufactures that produce machines which incinerate garbage (ALL KINDS, including hazardous materials, metals, etc.) using Plasma Gasification. They burn, and evaporate the garbage down at temperatures that are close to, or hotter than, the Sun. Garbage (Household, Industrial, Biomass, and other wastes) is fed into the chamber and incinerated with Plasma and O2 into slag or recovered metals. When you incinerate vapor is a created, which can thereby be cooled by quenching it. It is then filtered and cleaned, heated again, and the by-product is steam. Steam creates pressure, which can, therefore, rotate a turbine, which can then be used for several options. One is creating raw power, which can be punched back into the city's grid, thus requiring fewer resources to send it to Fort Bragg. PG&E would be happy to receive that likely. Or, the steam could be used to create Ethanol, which could be sold for roughly $1.25/ gal. Why can we not employ several trained technicians (thus creating jobs locally) to operate a facility that does this? All you would need is a place, and not very large, to situate the procedure, and people to run it. It would save fuel and give something back to the community. A temporary city tax would fund the project, and then the process itself would be able to pay the city back in hardly anytime at all, then the tax would be lifted. These are just a few ideas of what is possible with Plasma Gasification. The options of what you can do with this are only limited by not considering options.

- Re-cycle – I do not understand the re-cycling process and its fickle ways. How can something be turned down to be re-cycled? Everything should be re-cycled that is being discarded. Not doing this seems highly illogical. Why can we not have a local re-cycling facility that gathers and/or collects re-cyclable goods? What excuses do we have for not doing this? Is it just our laziness, or are people just uninformed? One thought: Most of the people around here drink out of glass bottles. When they are thrown away, they could be sent to a facility to be sorted, stripped of everything, sanitized, and placed back into local bottling companies. Here is another major idea, take a third, or even one half of the glass bottles and shatter or crush them, tumble them to a safe standard, and dump them back into glass beach that supports a massive tourist drive. We are the only city on the coast to have a Glass Beach (which people sometimes drive days to visit), so why are we not supporting that by keeping the beaches environment, local artisans, and thus the local economy, sustained?

- Create a fuel for Stoves – People in this community depend on several sources of heat. Propane, Natural Gas, Kerosine, Electricity, and especially Wood. If we are going to clear-cut forests, God help us, why not recycle ANYTHING left behind to decompose? These trimmings that are just left behind could be turned into firewood, pellets, compost to be sold or used locally, etcetera. This goes for paper as well; any and all paper can be re-cycled to be turned into fire logs which can burn for several hours, among regular re-cycling to be re-created into re-cycled paper.

- Compost – This should be an easy one guys. Take yard waste, process or shred it, add a decomposition accelerant, and reuse it.

These are just a few thoughts from an average resourceful mind. It is not rocket science people. Use what you have, and find ways to re-use, re-fine, and re-cycle the remains. I supported the idea to deliver or send goods via boat (as we have a harbor[and they used that method here over a century ago as well], and especially trains (as we have tracks leading to another major local city). We cannot continue to function under the presumption that the only method of something is to use trucks and fuel. Drivers and workers can remain employed locally under different titles. People would be employed; jobs would be created, and people would be happy to support such a responsible cause in such an awe inspiring area.

Positively,

Andrew Atkinson

witherupandwrite@gmail.com

562.472.7996

From: Ron Munson
Sent: Sunday, March 09, 2014 11:40 AM
To: jsilva@mendorecycle.org
Subject: support for Highway 20 transfer station

My family and I support the preferred alternative of locating the new waste transfer station out Highway 20. It is the most logical and expedient location for hauling the waste to it's inland destination.
It does not make sense to have the waste trucked through town to Pudding Creek and back out through town again, nor does it make sense to haul it down to Caspar and back.
The design element also seems sufficient to alleviate fears of water contamination.
In spite of appeals to protect the pygmy forest community, this seems to be the most appropriate place for the transfer station. The pygmy forest is characterized by acidic impoverished soils that do not support vigorous vegetative growth.
The idea of utilizing the train is intriguing, but does not seem not practical at this time. I doubt the idea of burning the waste for power generation would do much for air quality here either.
Most of the opposition to the Highway 20 location seems to come from the NIMBYs. Those of us who support the Highway 20 location are apt to be less vocal, so we want to let you know that we do support this preferred alternative.
Thanks,
Ron & Susan Munson

Appendix B
Health Impact Calculations

Central Coast Transfer Station Construction Health Impact Summary
Unmitigated DPM
Construction Health Impact Summary

Construction Year	Maximum Concentrations		Cancer Risk (per million)		Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM2.5/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Child	Adult	(-)	($\mu g/m^3$)
2016	0.1326	0.1521	11.6	0.6	0.027	0.285
Total	-	-	**11.6**	**0.6**	-	-
Maximum Annual	0.1326	0.1521	-	-	**0.027**	**0.285**

Central Coast Transfer Station Construction Health Impact Summary
Construction Emissions by Phase and Year

	Unmitigated Exhaust PM2.5 Emissions (TPY)					
Year	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**	**Total**
2016	0.0736					**0.0736**
Total	**0.0736**	**0**	**0**	**0**	**0**	**0.0736**

	Fugitive PM2.5 Emissions (TPY)					
Year	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**	**Total**
2016	0.0659					**0.06590**
Total	**0.0659**	**0**	**0**	**0**	**0**	**0.0659**

Central Coast Transfer Station Construction Health Impact Summary

Unmitigated DPM Construction Emissions and Modeling Emission Rates

Construction Year	Activity	Source	DPM Emissions (ton/year)	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate $g/s/m^2$
2016	Construction	Exhaust	0.0736	147.2	0.01680	2.12E-03	12064.0	1.76E-07
Total			***0.0736***	***147.20***	***0.0168***			***1.7550E-07***

Notes:

Emissions assumed to be evenly distributed over each construction areas

24	hr/day =	(8am - 5pm)
365	days/yr =	
8760	ours/year =	

Central Coast Transfer Station Construction Health Impact Summary
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Residential Receptor Locations - 1.5 meter height

Cancer Risk (per million) = CPF x Inhalation Dose x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
AT = Averaging time period over which exposure is averaged.
10^{-6} = Conversion factor

Values

Parameter	Child	Adult
CPF =	1.10E+00	1.10E+00
DBR =	581	302
A =	1	1
EF =	350	350
AT =	25,550	25,550

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Child - Exposure Information			Child	Adult - Exposure Information			Adult				
	Exposure			Exposure	Cancer	Modeled		Exposure	Cancer				
Exposure	Duration	DPM Conc (ug/m3)		Adjust	Risk	DPM Conc (ug/m3)		Adjust	Risk			Fugitive	Total
Year	(years)	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)		HI	PM2.5	PM2.5
1	1	2016	0.1326	10	11.61	2016	0.132585	1	0.60	2016	0.027	0.1521	0.285
2	1		0.0000	10	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
3	1		0.0000	4.75	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
4	1		0.0000	3	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
5	1		0.0000	3	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
6	1		0.0000	3	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
7	1		0.0000	3	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
8	1		0.0000	3	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
9	1		0.0000	3	0.00		0.0000	1	0.00				
10	1		0.0000	3	0.00		0.0000	1	0.00				
11	1		0.0000	3	0.00		0.0000	1	0.00				
12	1		0.0000	3	0.00		0.0000	1	0.00				
13	1		0.0000	3	0.00		0.0000	1	0.00				
14	1		0.0000	3	0.00		0.0000	1	0.00				
15	1		0.0000	3	0.00		0.0000	1	0.00				
16	1		0.0000	3	0.00		0.0000	1	0.00				
17	1		0.0000	1.5	0.00		0.0000	1	0.00				
18	1		0.0000	1	0.00		0.0000	1	0.00				
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65	1		0.0000	1	0.00		0.0000	1	0.00				
66	1		0.0000	1	0.00		0.0000	1	0.00				
67	1		0.0000	1	0.00		0.0000	1	0.00				
68	1		0.0000	1	0.00		0.0000	1	0.00				
69	1		0.0000	1	0.00		0.0000	1	0.00				
70	1		0.0000	1	0.00		0.0000	1	0.00				
Total Increased Cancer Risk					**11.61**				**0.60**				

Central Coast Transfer Station Construction Health Impact Summary
Mitigated
Construction Health Impact Summary

Construction Year	Maximum Concentrations: Exhaust PM2.5/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2016	0.0670	0.1521	5.9	0.3	0.013	0.219
Total	-	-	**5.9**	**0.3**	-	-
Maximum Annual	0.0670	0.1521	-	-	**0.013**	**0.219**

Central Coast Transfer Station Construction Health Impact Summary
Construction Emissions by Phase and Year

Year	Mitigated Exhaust PM2.5 Emissions (TPY)					
	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total
2016	0.0372					**0.0372**
Total	**0.0372**	**0**	**0**	**0**	**0**	**0.0372**

Year	Fugitive PM2.5 Emissions (TPY)					
	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total
2016	0.0659					**0.06590**
Total	**0.0659**	**0**	**0**	**0**	**0**	**0.0659**

Central Coast Transfer Station Construction Health Impact Summary

DPM Construction Emissions and Modeling Emission Rates

Construction Year	Activity	Source	DPM Emissions (ton/year)	(lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	DPM Emission Rate $g/s/m^2$
2016	Construction	Exhaust	0.0372	74.4	0.00849	1.07E-03	12064.0	8.87E-08
Total			***0.0372***	***74.40***	***0.0085***			***8.8705E-08***

Notes:

Emissions assumed to be evenly distributed over each construction areas

24	hr/day =	(8am - 5pm)
365	days/yr =	
8760	ours/year =	

Central Coast Transfer Station Construction Health Impact Summary
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Residential Receptor Locations - 1.5 meter height

Cancer Risk (per million) = CPF x Inhalation Dose x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
AT = Averaging time period over which exposure is averaged.
10^{-6} = Conversion factor

Values

Parameter	Child	Adult
CPF =	1.10E+00	1.10E+00
DBR =	581	302
A =	1	1
EF =	350	350
AT =	25,550	25,550

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Child - Exposure Information			Child	Adult - Exposure Information			Adult				
	Exposure			Exposure	Cancer	Modeled		Exposure	Cancer				
Exposure	Duration	DPM Conc (ug/m3)		Adjust	Risk	DPM Conc (ug/m3)		Adjust	Risk			Fugitive	Total
Year	(years)	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)		HI	PM2.5	PM2.5
1	1	2016	0.0670	10	5.87	2016	0.067013	1	0.30	2016	0.013	0.1521	0.219
2	1		0.0000	10	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
3	1		0.0000	4.75	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
4	1		0.0000	3	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
5	1		0.0000	3	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
6	1		0.0000	3	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
7	1		0.0000	3	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
8	1		0.0000	3	0.00		0.000000	1	0.00	0	0.000	0.0000	0.000
9	1		0.0000	3	0.00		0.0000	1	0.00				
10	1		0.0000	3	0.00		0.0000	1	0.00				
11	1		0.0000	3	0.00		0.0000	1	0.00				
12	1		0.0000	3	0.00		0.0000	1	0.00				
13	1		0.0000	3	0.00		0.0000	1	0.00				
14	1		0.0000	3	0.00		0.0000	1	0.00				
15	1		0.0000	3	0.00		0.0000	1	0.00				
16	1		0.0000	3	0.00		0.0000	1	0.00				
17	1		0.0000	1.5	0.00		0.0000	1	0.00				
18	1		0.0000	1	0.00		0.0000	1	0.00				
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮				
65	1		0.0000	1	0.00		0.0000	1	0.00				
66	1		0.0000	1	0.00		0.0000	1	0.00				
67	1		0.0000	1	0.00		0.0000	1	0.00				
68	1		0.0000	1	0.00		0.0000	1	0.00				
69	1		0.0000	1	0.00		0.0000	1	0.00				
70	1		0.0000	1	0.00		0.0000	1	0.00				
Total Increased Cancer Risk					**5.87**				**0.30**				

Appendix C
CalEEMod Model Run

MSWMA Central Coast Transfer Station

Mendocino-Coastal County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	30.00	1000sqft	5.00	30,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	86
Climate Zone	1			**Operational Year**	2017
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Based on project description and estimate of acreage

Construction Phase - Based on provided construction equipment list and schedule

Off-road Equipment - Based on provided construction equipment list and schedule

Off-road Equipment - Based on provided construction equipment list and schedule

Off-road Equipment - Based on provided construction equipment list and schedule

Off-road Equipment - Based on provided construction equipment list and schedule

Off-road Equipment - Based on provided construction equipment list and schedule

Off-road Equipment - Based on provided construction equipment list and schedule

Trips and VMT - Asphalt trips = 1210 cy/9 * 2 = 269

Grading - Based on provided construction equipment list and schedule

Vehicle Trips - Used EMFAC2011 to seperately compute mobile emissions

Construction Off-road Equipment Mitigation - Tier 2 equipment and BMPs for PM2.5/PM10

Operational Off-Road Equipment - Estimate based on project description

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
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tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
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tblConstEquipMitigation	Tier	No Change	Tier 2
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tblConstEquipMitigation	Tier	No Change	Tier 2
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tblConstructionPhase	NumDays	18.00	44.00
tblConstructionPhase	NumDays	230.00	76.00
tblConstructionPhase	NumDays	8.00	31.00
tblConstructionPhase	NumDays	18.00	14.00
tblConstructionPhase	NumDays	5.00	13.00
tblConstructionPhase	PhaseEndDate	12/15/2016	11/1/2016
tblConstructionPhase	PhaseEndDate	10/26/2016	10/14/2016
tblConstructionPhase	PhaseEndDate	6/30/2016	6/27/2016
tblConstructionPhase	PhaseEndDate	11/21/2016	10/20/2016
tblConstructionPhase	PhaseEndDate	7/25/2016	7/12/2016
tblConstructionPhase	PhaseStartDate	10/15/2016	9/1/2016
tblConstructionPhase	PhaseStartDate	7/13/2016	7/1/2016
tblConstructionPhase	PhaseStartDate	5/19/2016	5/15/2016
tblConstructionPhase	PhaseStartDate	11/2/2016	10/1/2016
tblConstructionPhase	PhaseStartDate	6/28/2016	6/15/2016
tblGrading	AcresOfGrading	7.94	4.00
tblGrading	MaterialExported	0.00	5,000.00
tblGrading	MaterialImported	0.00	6,000.00
tblLandUse	LotAcreage	0.69	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	6.00	5.60
tblOffRoadEquipment	UsageHours	7.00	2.20
tblOffRoadEquipment	UsageHours	8.00	4.10

tblOffRoadEquipment	UsageHours	8.00	3.60
tblOffRoadEquipment	UsageHours	8.00	6.80
tblOffRoadEquipment	UsageHours	8.00	4.10
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tblOffRoadEquipment	UsageHours	8.00	6.90
tblOffRoadEquipment	UsageHours	8.00	5.70
tblOffRoadEquipment	UsageHours	8.00	4.10
tblOffRoadEquipment	UsageHours	8.00	7.40
tblOffRoadEquipment	UsageHours	7.00	5.10
tblOffRoadEquipment	UsageHours	8.00	4.10
tblOffRoadEquipment	UsageHours	8.00	7.40
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	4.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	4.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	OperationalYear	2014	2017
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripNumber	0.00	269.00
tblTripsAndVMT	VendorTripLength	6.60	0.30
tblTripsAndVMT	VendorTripLength	6.60	0.30
tblTripsAndVMT	VendorTripLength	6.60	0.30
tblTripsAndVMT	VendorTripLength	6.60	0.30
tblTripsAndVMT	VendorTripLength	6.60	0.30
tblTripsAndVMT	VendorTripLength	6.60	0.30
tblTripsAndVMT	WorkerTripLength	16.80	0.30
tblTripsAndVMT	WorkerTripLength	16.80	0.30
tblTripsAndVMT	WorkerTripLength	16.80	0.30
tblTripsAndVMT	WorkerTripLength	16.80	0.30
tblTripsAndVMT	WorkerTripLength	16.80	0.30
tblTripsAndVMT	WorkerTripLength	16.80	0.30
tblVehicleTrips	ST_TR	1.32	0.10
tblVehicleTrips	SU_TR	0.68	0.10
tblVehicleTrips	WD_TR	6.97	0.10

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					

2016	0.5094	1.2961	1.1900	1.2600e-003	0.2806	0.0782	0.3588	0.0659	0.0736	0.1395	0.0000	113.9991	113.9991	0.0277	0.0000	114.5811
Total	**0.5094**	**1.2961**	**1.1900**	**1.2600e-003**	**0.2806**	**0.0782**	**0.3588**	**0.0659**	**0.0736**	**0.1395**	**0.0000**	**113.9991**	**113.9991**	**0.0277**	**0.0000**	**114.5811**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.4199	1.0740	1.1298	1.2600e-003	0.1580	0.0372	0.1952	0.0165	0.0372	0.0536	0.0000	113.9990	113.9990	0.0277	0.0000	114.5810
Total	**0.4199**	**1.0740**	**1.1298**	**1.2600e-003**	**0.1580**	**0.0372**	**0.1952**	**0.0165**	**0.0372**	**0.0536**	**0.0000**	**113.9990**	**113.9990**	**0.0277**	**0.0000**	**114.5810**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**17.57**	**17.14**	**5.06**	**0.00**	**43.71**	**52.46**	**45.61**	**75.01**	**49.54**	**61.57**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1520	0.0000	2.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.4000e-004	5.4000e-004	0.0000	0.0000	5.7000e-004
Energy	6.0000e-004	5.4100e-003	4.5500e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	47.1717	47.1717	1.9800e-003	4.9000e-004	47.3665
Mobile	4.6000e-003	0.0153	0.0515	7.0000e-005	1.2974	1.9000e-004	1.2975	0.1297	1.8000e-004	0.1299	0.0000	5.6821	5.6821	2.6000e-004	0.0000	5.6875
Offroad	0.1171	1.3998	0.4931	1.2600e-003		0.0587	0.0587		0.0540	0.0540	0.0000	117.1540	117.1540	0.0359	0.0000	117.9078
Waste						0.0000	0.0000		0.0000	0.0000	7.5513	0.0000	7.5513	0.4463	0.0000	16.9229
Water						0.0000	0.0000		0.0000	0.0000	2.2010	10.9205	13.1214	0.2266	5.4400e-003	19.5654
Total	**0.2742**	**1.4205**	**0.5495**	**1.3600e-003**	**1.2974**	**0.0593**	**1.3566**	**0.1297**	**0.0546**	**0.1843**	**9.7522**	**180.9288**	**190.6810**	**0.7110**	**5.9300e-003**	**207.4506**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1520	0.0000	2.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.4000e-004	5.4000e-004	0.0000	0.0000	5.7000e-004
Energy	6.0000e-004	5.4100e-003	4.5500e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	47.1717	47.1717	1.9800e-003	4.9000e-004	47.3665
Mobile	4.6000e-003	0.0153	0.0515	7.0000e-005	1.2974	1.9000e-004	1.2975	0.1297	1.8000e-004	0.1299	0.0000	5.6821	5.6821	2.6000e-004	0.0000	5.6875
Offroad	0.1171	1.3998	0.4931	1.2600e-003		0.0587	0.0587		0.0540	0.0540	0.0000	117.1540	117.1540	0.0359	0.0000	117.9078
Waste						0.0000	0.0000		0.0000	0.0000	7.5513	0.0000	7.5513	0.4463	0.0000	16.9229

Water						0.0000	0.0000		0.0000	0.0000	2.2010	10.9205	13.1214	0.2265	5.4300e-003	19.5619
Total	**0.2742**	**1.4205**	**0.5495**	**1.3600e-003**	**1.2974**	**0.0593**	**1.3566**	**0.1297**	**0.0546**	**0.1843**	**9.7522**	**180.9288**	**190.6810**	**0.7109**	**5.9200e-003**	**207.4471**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**42.69**	**98.54**	**89.75**	**92.65**	**0.00**	**98.99**	**4.33**	**0.00**	**98.92**	**29.30**	**0.00**	**64.75**	**61.44**	**5.06**	**0.17**	**56.84**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	5/1/2016	5/18/2016	5	13	
2	Grading	Grading	5/15/2016	6/27/2016	5	31	
3	Trenching	Trenching	6/15/2016	7/12/2016	5	20	
4	Building Construction	Building Construction	7/1/2016	10/14/2016	5	76	
5	Interior Construction	Architectural Coating	9/1/2016	11/1/2016	5	44	
6	Paving	Paving	10/1/2016	10/20/2016	5	14	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 45,000; Non-Residential Outdoor: 15,000 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Excavators	1	4.60	162	0.38
Site Preparation	Other Construction Equipment	1	5.50	171	0.42
Site Preparation	Rubber Tired Dozers	1	7.40	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	7.40	97	0.37
Grading	Excavators	1	4.10	162	0.38
Grading	Graders	1	4.10	174	0.41
Grading	Other Construction Equipment	1	2.30	171	0.42
Grading	Other Construction Equipment	1	4.10	171	0.42
Grading	Rubber Tired Dozers	1	4.10	255	0.40
Grading	Tractors/Loaders/Backhoes	1	4.10	97	0.37
Trenching	Excavators	1	4.80	162	0.38
Trenching	Other Construction Equipment	1	4.80	171	0.42
Trenching	Plate Compactors	1	4.80	8	0.43
Trenching	Tractors/Loaders/Backhoes	1	4.80	97	0.37
Building Construction	Cement and Mortar Mixers		4.20	9	0.56
Building Construction	Cranes	1	2.20	226	0.29
Building Construction	Forklifts	1	3.60	89	0.20
Building Construction	Generator Sets	1	6.80	84	0.74
Building Construction	Skid Steer Loaders	1	4.10	64	0.37
Building Construction	Tractors/Loaders/Backhoes	1	5.10	97	0.37
Building Construction	Welders	1	3.00	46	0.45
Interior Construction	Aerial Lifts	1	3.80	62	0.31
Interior Construction	Air Compressors	2	5.60	78	0.48
Interior Construction	Other General Industrial Equipment	1	5.80	87	0.34
Interior Construction	Skid Steer Loaders	1	6.40	64	0.37

Paving	Cement and Mortar Mixers	1	5.70	9	0.56
Paving	Pavers	1	6.90	125	0.42
Paving	Paving Equipment	1	6.90	130	0.36
Paving	Rollers	1	5.70	80	0.38
Paving	Tractors/Loaders/Backhoes	1	5.70	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	4	10.00	0.00	0.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	1,088.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT
Trenching	4	10.00	0.00	0.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT
Building Construction	6	13.00	5.00	0.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT
Interior Construction	5	3.00	0.00	0.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	269.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0362	0.0000	0.0362	0.0199	0.0000	0.0199	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0139	0.1525	0.1094	1.2000e-004		7.9300e-003	7.9300e-003		7.3000e-003	7.3000e-003	0.0000	11.2548	11.2548	3.3900e-003	0.0000	11.3261
Total	**0.0139**	**0.1525**	**0.1094**	**1.2000e-004**	**0.0362**	**7.9300e-003**	**0.0441**	**0.0199**	**7.3000e-003**	**0.0272**	**0.0000**	**11.2548**	**11.2548**	**3.3900e-003**	**0.0000**	**11.3261**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	7.0000e-005	1.0500e-003	0.0000	6.5900e-003	0.0000	6.5900e-003	6.6000e-004	0.0000	6.6000e-004	0.0000	0.0253	0.0253	0.0000	0.0000	0.0254
Total	**2.7000e-004**	**7.0000e-005**	**1.0500e-003**	**0.0000**	**6.5900e-003**	**0.0000**	**6.5900e-003**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**0.0000**	**0.0253**	**0.0253**	**0.0000**	**0.0000**	**0.0254**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0163	0.0000	0.0163	4.4800e-003	0.0000	4.4800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.0200e-003	0.1035	0.0782	1.2000e-004		2.9300e-003	2.9300e-003		2.9300e-003	2.9300e-003	0.0000	11.2548	11.2548	3.3900e-003	0.0000	11.3261
Total	**4.0200e-003**	**0.1035**	**0.0782**	**1.2000e-004**	**0.0163**	**2.9300e-003**	**0.0192**	**4.4800e-003**	**2.9300e-003**	**7.4100e-003**	**0.0000**	**11.2548**	**11.2548**	**3.3900e-003**	**0.0000**	**11.3261**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	7.0000e-005	1.0500e-003	0.0000	4.0400e-003	0.0000	4.0400e-003	2.0000e-004	0.0000	2.0000e-004	0.0000	0.0253	0.0253	0.0000	0.0000	0.0254
Total	**2.7000e-004**	**7.0000e-005**	**1.0500e-003**	**0.0000**	**4.0400e-003**	**0.0000**	**4.0400e-003**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.0253**	**0.0253**	**0.0000**	**0.0000**	**0.0254**

3.3 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0500	0.0000	0.0500	0.0265	0.0000	0.0265	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0320	0.3451	0.2216	2.6000e-004		0.0183	0.0183		0.0168	0.0168	0.0000	24.8111	24.8111	7.4800e-003	0.0000	24.9683
Total	**0.0320**	**0.3451**	**0.2216**	**2.6000e-004**	**0.0500**	**0.0183**	**0.0683**	**0.0265**	**0.0168**	**0.0433**	**0.0000**	**24.8111**	**24.8111**	**7.4800e-003**	**0.0000**	**24.9683**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0139	0.0174	0.1971	2.0000e-005	0.0552	9.0000e-005	0.0553	5.5300e-003	8.0000e-005	5.6100e-003	0.0000	1.4245	1.4245	3.0000e-005	0.0000	1.4252
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	2.6000e-004	3.7600e-003	0.0000	0.0236	0.0000	0.0236	2.3600e-003	0.0000	2.3600e-003	0.0000	0.0904	0.0904	2.0000e-005	0.0000	0.0907
Total	**0.0149**	**0.0176**	**0.2009**	**2.0000e-005**	**0.0788**	**9.0000e-005**	**0.0789**	**7.8900e-003**	**8.0000e-005**	**7.9700e-003**	**0.0000**	**1.5148**	**1.5148**	**5.0000e-005**	**0.0000**	**1.5159**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0225	0.0000	0.0225	5.9700e-003	0.0000	5.9700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.3900e-003	0.2263	0.1828	2.6000e-004		6.6200e-003	6.6200e-003		6.6200e-003	6.6200e-003	0.0000	24.8111	24.8111	7.4800e-003	0.0000	24.9683
Total	**9.3900e-003**	**0.2263**	**0.1828**	**2.6000e-004**	**0.0225**	**6.6200e-003**	**0.0291**	**5.9700e-003**	**6.6200e-003**	**0.0126**	**0.0000**	**24.8111**	**24.8111**	**7.4800e-003**	**0.0000**	**24.9683**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0139	0.0174	0.1971	2.0000e-005	0.0338	9.0000e-005	0.0339	1.7100e-003	8.0000e-005	1.8000e-003	0.0000	1.4245	1.4245	3.0000e-005	0.0000	1.4252
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	2.6000e-004	3.7600e-003	0.0000	0.0145	0.0000	0.0145	7.3000e-004	0.0000	7.3000e-004	0.0000	0.0904	0.0904	2.0000e-005	0.0000	0.0907
Total	**0.0149**	**0.0176**	**0.2009**	**2.0000e-005**	**0.0483**	**9.0000e-005**	**0.0484**	**2.4400e-003**	**8.0000e-005**	**2.5300e-003**	**0.0000**	**1.5148**	**1.5148**	**5.0000e-005**	**0.0000**	**1.5159**

3.4 Trenching - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.6000e-003	0.0918	0.0618	9.0000e-005		5.2000e-003	5.2000e-003		4.7800e-003	4.7800e-003	0.0000	8.4174	8.4174	2.5000e-003	0.0000	8.4700
Total	**8.6000e-003**	**0.0918**	**0.0618**	**9.0000e-005**		**5.2000e-003**	**5.2000e-003**		**4.7800e-003**	**4.7800e-003**	**0.0000**	**8.4174**	**8.4174**	**2.5000e-003**	**0.0000**	**8.4700**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-004	1.1000e-004	1.6200e-003	0.0000	0.0101	0.0000	0.0101	1.0200e-003	0.0000	1.0200e-003	0.0000	0.0389	0.0389	1.0000e-005	0.0000	0.0390
Total	**4.1000e-004**	**1.1000e-004**	**1.6200e-003**	**0.0000**	**0.0101**	**0.0000**	**0.0101**	**1.0200e-003**	**0.0000**	**1.0200e-003**	**0.0000**	**0.0389**	**0.0389**	**1.0000e-005**	**0.0000**	**0.0390**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.5600e-003	0.0769	0.0663	9.0000e-005		2.5400e-003	2.5400e-003		2.5400e-003	2.5400e-003	0.0000	8.4174	8.4174	2.5000e-003	0.0000	8.4700
Total	**3.5600e-003**	**0.0769**	**0.0663**	**9.0000e-005**		**2.5400e-003**	**2.5400e-003**		**2.5400e-003**	**2.5400e-003**	**0.0000**	**8.4174**	**8.4174**	**2.5000e-003**	**0.0000**	**8.4700**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-004	1.1000e-004	1.6200e-003	0.0000	6.2200e-003	0.0000	6.2200e-003	3.1000e-004	0.0000	3.1000e-004	0.0000	0.0389	0.0389	1.0000e-005	0.0000	0.0390
Total	**4.1000e-004**	**1.1000e-004**	**1.6200e-003**	**0.0000**	**6.2200e-003**	**0.0000**	**6.2200e-003**	**3.1000e-004**	**0.0000**	**3.1000e-004**	**0.0000**	**0.0389**	**0.0389**	**1.0000e-005**	**0.0000**	**0.0390**

3.5 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0505	0.4120	0.2892	4.5000e-004		0.0275	0.0275		0.0263	0.0263	0.0000	39.8073	39.8073	8.0100e-003	0.0000	39.9755
Total	**0.0505**	**0.4120**	**0.2892**	**4.5000e-004**		**0.0275**	**0.0275**		**0.0263**	**0.0263**	**0.0000**	**39.8073**	**39.8073**	**8.0100e-003**	**0.0000**	**39.9755**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.4700e-003	5.3700e-003	0.0423	1.0000e-005	0.0193	4.0000e-005	0.0193	1.9300e-003	4.0000e-005	1.9700e-003	0.0000	0.4549	0.4549	1.0000e-005	0.0000	0.4550
Worker	2.0300e-003	5.6000e-004	8.0000e-003	0.0000	0.0501	1.0000e-005	0.0501	5.0100e-003	1.0000e-005	5.0200e-003	0.0000	0.1920	0.1920	4.0000e-005	0.0000	0.1928
Total	**5.5000e-003**	**5.9300e-003**	**0.0503**	**1.0000e-005**	**0.0694**	**5.0000e-005**	**0.0694**	**6.9400e-003**	**5.0000e-005**	**6.9900e-003**	**0.0000**	**0.6469**	**0.6469**	**5.0000e-005**	**0.0000**	**0.6478**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0177	0.3794	0.2905	4.5000e-004		0.0149	0.0149		0.0149	0.0149	0.0000	39.8072	39.8072	8.0100e-003	0.0000	39.9755
Total	**0.0177**	**0.3794**	**0.2905**	**4.5000e-004**		**0.0149**	**0.0149**		**0.0149**	**0.0149**	**0.0000**	**39.8072**	**39.8072**	**8.0100e-003**	**0.0000**	**39.9755**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.4700e-003	5.3700e-003	0.0423	1.0000e-005	0.0118	4.0000e-005	0.0119	6.0000e-004	4.0000e-005	6.4000e-004	0.0000	0.4549	0.4549	1.0000e-005	0.0000	0.4550
Worker	2.0300e-003	5.6000e-004	8.0000e-003	0.0000	0.0307	1.0000e-005	0.0307	1.5500e-003	1.0000e-005	1.5600e-003	0.0000	0.1920	0.1920	4.0000e-005	0.0000	0.1928
Total	**5.5000e-003**	**5.9300e-003**	**0.0503**	**1.0000e-005**	**0.0425**	**5.0000e-005**	**0.0426**	**2.1500e-003**	**5.0000e-005**	**2.2000e-003**	**0.0000**	**0.6469**	**0.6469**	**5.0000e-005**	**0.0000**	**0.6478**

3.6 Interior Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3476					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0237	0.1842	0.1468	2.2000e-004		0.0142	0.0142		0.0137	0.0137	0.0000	19.2924	19.2924	3.8900e-003	0.0000	19.3742
Total	**0.3713**	**0.1842**	**0.1468**	**2.2000e-004**		**0.0142**	**0.0142**		**0.0137**	**0.0137**	**0.0000**	**19.2924**	**19.2924**	**3.8900e-003**	**0.0000**	**19.3742**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	8.0000e-005	1.0700e-003	0.0000	6.6900e-003	0.0000	6.6900e-003	6.7000e-004	0.0000	6.7000e-004	0.0000	0.0257	0.0257	0.0000	0.0000	0.0258
Total	**2.7000e-004**	**8.0000e-005**	**1.0700e-003**	**0.0000**	**6.6900e-003**	**0.0000**	**6.6900e-003**	**6.7000e-004**	**0.0000**	**6.7000e-004**	**0.0000**	**0.0257**	**0.0257**	**0.0000**	**0.0000**	**0.0258**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3476					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.1000e-003	0.1879	0.1463	2.2000e-004		7.5900e-003	7.5900e-003		7.5900e-003	7.5900e-003	0.0000	19.2924	19.2924	3.8900e-003	0.0000	19.3742
Total	**0.3567**	**0.1879**	**0.1463**	**2.2000e-004**		**7.5900e-003**	**7.5900e-003**		**7.5900e-003**	**7.5900e-003**	**0.0000**	**19.2924**	**19.2924**	**3.8900e-003**	**0.0000**	**19.3742**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	8.0000e-005	1.0700e-003	0.0000	4.1000e-003	0.0000	4.1000e-003	2.1000e-004	0.0000	2.1000e-004	0.0000	0.0257	0.0257	0.0000	0.0000	0.0258
Total	**2.7000e-004**	**8.0000e-005**	**1.0700e-003**	**0.0000**	**4.1000e-003**	**0.0000**	**4.1000e-003**	**2.1000e-004**	**0.0000**	**2.1000e-004**	**0.0000**	**0.0257**	**0.0257**	**0.0000**	**0.0000**	**0.0258**

3.7 Paving - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.9500e-003	0.0824	0.0562	8.0000e-005		4.8900e-003	4.8900e-003		4.5000e-003	4.5000e-003	0.0000	7.7771	7.7771	2.3000e-003	0.0000	7.8254
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**7.9500e-003**	**0.0824**	**0.0562**	**8.0000e-005**		**4.8900e-003**	**4.8900e-003**		**4.5000e-003**	**4.5000e-003**	**0.0000**	**7.7771**	**7.7771**	**2.3000e-003**	**0.0000**	**7.8254**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.4500e-003	4.2900e-003	0.0487	0.0000	0.0137	2.0000e-005	0.0137	1.3700e-003	2.0000e-005	1.3900e-003	0.0000	0.3522	0.3522	1.0000e-005	0.0000	0.3524
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	1.0000e-004	1.4700e-003	0.0000	9.2300e-003	0.0000	9.2300e-003	9.2000e-004	0.0000	9.2000e-004	0.0000	0.0354	0.0354	1.0000e-005	0.0000	0.0355
Total	**3.8200e-003**	**4.3900e-003**	**0.0502**	**0.0000**	**0.0229**	**2.0000e-005**	**0.0229**	**2.2900e-003**	**2.0000e-005**	**2.3100e-003**	**0.0000**	**0.3876**	**0.3876**	**2.0000e-005**	**0.0000**	**0.3879**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.3500e-003	0.0718	0.0607	8.0000e-005		2.4700e-003	2.4700e-003		2.4700e-003	2.4700e-003	0.0000	7.7771	7.7771	2.3000e-003	0.0000	7.8254
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.3500e-003**	**0.0718**	**0.0607**	**8.0000e-005**		**2.4700e-003**	**2.4700e-003**		**2.4700e-003**	**2.4700e-003**	**0.0000**	**7.7771**	**7.7771**	**2.3000e-003**	**0.0000**	**7.8254**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.4500e-003	4.2900e-003	0.0487	0.0000	8.3700e-003	2.0000e-005	8.3900e-003	4.2000e-004	2.0000e-005	4.4000e-004	0.0000	0.3522	0.3522	1.0000e-005	0.0000	0.3524
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	1.0000e-004	1.4700e-003	0.0000	5.6600e-003	0.0000	5.6600e-003	2.9000e-004	0.0000	2.9000e-004	0.0000	0.0354	0.0354	1.0000e-005	0.0000	0.0355
Total	**3.8200e-003**	**4.3900e-003**	**0.0502**	**0.0000**	**0.0140**	**2.0000e-005**	**0.0141**	**7.1000e-004**	**2.0000e-005**	**7.3000e-004**	**0.0000**	**0.3876**	**0.3876**	**2.0000e-005**	**0.0000**	**0.3879**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	4.6000e-003	0.0153	0.0515	7.0000e-005	1.2974	1.9000e-004	1.2975	0.1297	1.8000e-004	0.1299	0.0000	5.6821	5.6821	2.6000e-004	0.0000	5.6875
Unmitigated	4.6000e-003	0.0153	0.0515	7.0000e-005	1.2974	1.9000e-004	1.2975	0.1297	1.8000e-004	0.1299	0.0000	5.6821	5.6821	2.6000e-004	0.0000	5.6875

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	3.00	3.00	3.00	11,590	11,590
Total	3.00	3.00	3.00	11,590	11,590

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.384082	0.108040	0.162747	0.139268	0.082424	0.009513	0.021337	0.076815	0.001366	0.001470	0.007920	0.001291	0.003726

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	41.2803	41.2803	1.8700e-003	3.9000e-004	41.4393
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	41.2803	41.2803	1.8700e-003	3.9000e-004	41.4393
NaturalGas Mitigated	6.0000e-004	5.4100e-003	4.5500e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	5.8914	5.8914	1.1000e-004	1.1000e-004	5.9272
NaturalGas Unmitigated	6.0000e-004	5.4100e-003	4.5500e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	5.8914	5.8914	1.1000e-004	1.1000e-004	5.9272

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	110400	6.0000e-004	5.4100e-003	4.5500e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	5.8914	5.8914	1.1000e-004	1.1000e-004	5.9272
Total		**6.0000e-004**	**5.4100e-003**	**4.5500e-003**	**3.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**5.8914**	**5.8914**	**1.1000e-004**	**1.1000e-004**	**5.9272**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	110400	6.0000e-004	5.4100e-003	4.5500e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	5.8914	5.8914	1.1000e-004	1.1000e-004	5.9272
Total		**6.0000e-004**	**5.4100e-003**	**4.5500e-003**	**3.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**5.8914**	**5.8914**	**1.1000e-004**	**1.1000e-004**	**5.9272**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	141900	41.2803	1.8700e-003	3.9000e-004	41.4393

Total		41.2803	1.8700e-003	3.9000e-004	41.4393

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	141900	41.2803	1.8700e-003	3.9000e-004	41.4393
Total		**41.2803**	**1.8700e-003**	**3.9000e-004**	**41.4393**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1520	0.0000	2.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.4000e-004	5.4000e-004	0.0000	0.0000	5.7000e-004
Unmitigated	0.1520	0.0000	2.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.4000e-004	5.4000e-004	0.0000	0.0000	5.7000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0348					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1172					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	2.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.4000e-004	5.4000e-004	0.0000	0.0000	5.7000e-004
Total	**0.1520**	**0.0000**	**2.8000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**5.4000e-004**	**5.4000e-004**	**0.0000**	**0.0000**	**5.7000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0348					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Consumer Products	0.1172					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	2.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.4000e-004	5.4000e-004	0.0000	0.0000	5.7000e-004
Total	**0.1520**	**0.0000**	**2.8000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**5.4000e-004**	**5.4000e-004**	**0.0000**	**0.0000**	**5.7000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	13.1214	0.2265	5.4300e-003	19.5619
Unmitigated	13.1214	0.2266	5.4400e-003	19.5654

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	6.9375 / 0	13.1214	0.2266	5.4400e-003	19.5654
Total		**13.1214**	**0.2266**	**5.4400e-003**	**19.5654**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	6.9375 / 0	13.1214	0.2265	5.4300e-003	19.5619
Total		**13.1214**	**0.2265**	**5.4300e-003**	**19.5619**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e

		MT/yr		
Mitigated	7.5513	0.4463	0.0000	16.9229
Unmitigated	7.5513	0.4463	0.0000	16.9229

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	37.2	7.5513	0.4463	0.0000	16.9229
Total		**7.5513**	**0.4463**	**0.0000**	**16.9229**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	37.2	7.5513	0.4463	0.0000	16.9229
Total		**7.5513**	**0.4463**	**0.0000**	**16.9229**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Cranes	1	4.00	260	226	0.29	Diesel
Forklifts	1	4.00	260	89	0.20	Diesel
Rubber Tired Loaders	1	8.00	260	199	0.36	Diesel

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Forklifts	0.0137	0.1187	0.0812	1.0000e-004		9.7900e-003	9.7900e-003		9.0100e-003	9.0100e-003	0.0000	9.2139	9.2139	2.8200e-003	0.0000	9.2732
Rubber Tired Loaders	0.0612	0.7810	0.2328	8.0000e-004		0.0266	0.0266		0.0245	0.0245	0.0000	73.9021	73.9021	0.0226	0.0000	74.3776
Cranes	0.0421	0.5000	0.1792	3.7000e-004		0.0223	0.0223		0.0205	0.0205	0.0000	34.0380	34.0380	0.0104	0.0000	34.2570
Total	**0.1171**	**1.3998**	**0.4931**	**1.2700e-003**		**0.0587**	**0.0587**		**0.0540**	**0.0540**	**0.0000**	**117.1540**	**117.1540**	**0.0359**	**0.0000**	**117.9078**

10.0 Vegetation

Qty	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	Annual Hours	Comments
Project Name:		**Central Coast Transfer Station EIR**						**Complete ALL Portions in Yellow**
	See Equipment Type TAB for type, horsepower and load factor							
	Project Size	**30,000**	**square feet bldngs**	**17**	**acres**	**Permanent impact = 3.76 acres, const/temporary impact = 0.96 acres.**		
	Construction Hours	**8**	**am to**	**6**	**pm**			
Quantity	**Site Preperation**	**Start Date:**	**5/1/2016**	**Total days:**	**13**			Any pavement demolished and hauled? _n/a_ tons
		End Date:	**5/14/2016**					
1	Excavator	162	0.38	6	10	4.6	60	
1	Rubber Tired Dozers	255	0.38	8	12	7.4	96	
1	Backhoe	97	0.37	8	12	7.4	96	
1	Dump Truck[1]	171	0.42	6	10	4.6	60	
1	Water Truck[1]	171	0.42	6	12	5.5	72	
	Grading / Excavation	**Start Date:**	**5/15/2016**	**Total days:**	**31**			
		End Date:	**6/15/2016**					**Soil Hauling Volume**
1	Excavator	162	0.38	6	21	4.1	126	Export volume = _5,000_ cubic yards?
1	Grader	174	0.41	6	21	4.1	126	Import volume = _6,000_ cubic yards?
1	Rubber Tired Bull Dozers	255	0.40	6	21	4.1	126	
1	Backhoe	97	0.37	6	21	4.1	126	
2	Dump Truck[1]	171	0.42	6	21	4.1	252	
1	Vibratory Roller[1]	171	0.42	6	12	2.3	72	
1	Water Truck[1]	171	0.42	6	21	4.1	126	
	Trenching	**Start Date:**	**6/15/2016**	**Total days:**	**20**			
		End Date:	**7/5/2016**					
1	Backhoe	97	0.37	6	16	4.8	96	
1	Excavator	162	0.38	6	16	4.8	96	
1	Dump Truck[1]	171	0.42	6	16	4.8	96	
1	Plate Compactor	8	0.43	6	16	4.8	96	
1	Water Truck[1]	171	0.42	6	16	4.8	96	
	Building - Exterior	**Start Date:**	**7/1/2016**	**Total days:**	**76**			**Cement Trucks? _?_ Total Round-Trips**
		End Date:	**9/15/2016**					
1	Crane	226	0.29	8	21	2.2	168	Electric? (Y/N) _N_ Otherwise assumed diesel
1	Forklift	89	0.20	6	45	3.6	270	Liquid Propane (LPG)? (Y/N) _N_ Otherwise Assumed diesel
1	Generator Sets	84	0.74	8	65	6.8	520	Or temporary line power? (Y/N) _N_
1	Backhoes	97	0.37	6	65	5.1	390	
1	Welders	46	0.45	5	45	3.0	225	
1	Flatbed Truck[1]	171	0.42	6	60	4.7	360	
1	Mini Bobcat[1]	171	0.42	7	45	4.1	315	
1	Cement and Mortar Mixers	9	0.56	8	40	4.2	320	
1	Water Truck[1]	171	0.42	6	65	5.1	390	
	Building - Interior/Architectural Coating	**Start Date:**	**9/1/2016**	**Total days:**	**44**			
		End Date:	**10/15/2016**					
2	Air Compressors	78	0.32	7	35	5.6	490	
1	Aerial Lift	62	0.30	8	21	3.8	168	
1	Pneumatic Tools[2]	150	0.34	8	32	5.8	256	
1	Mini Bobcat[1]	171	0.42	8	35	6.4	280	
	Paving	**Start Date:**	**10/1/2016**	**Total days:**	**14**			
		Start Date:	**10/15/2016**					
1	Cement and Mortar Mixers	9	0.56	8	10	5.7	80	
1	Pavers	125	0.42	8	12	6.9	96	
1	Paving Equipment	130	0.36	8	12	6.9	96	**Asphalt 1,210 cy**
1	Vibratory Roller[1]	80	0.38	8	10	5.7	80	
1	Backhoes	97	0.37	8	10	5.7	80	
1	Water Truck[1]	171	0.42	8	12	6.9	96	

Central Coast Transfer Station

Change in Vehicle Emissions

Vehicle Type	Annual Trips		Miles/Trip	Annual VMT	Emissions (tons/year) ROG	NOx	PM10	PM2.5	CO2e
Self haul[1]	42640		3.0	(162,032)	-0.09778	-0.20809	-0.0109	-0.00529	-86.199
Franchise Trucks[2]	3276		28.0	19,656	0.004737	0.116474	0.005767	0.003744	25.39785
Solid Waste Transfer	2080		29.8	(129,646)					
Existing[3]	7176		35.4	(254,030)	-0.06123	-1.50529	-0.07454	-0.04839	-328.237
New[4]	4160	11	29.9	124,384	0.039458	0.923666	0.026097	0.016738	248.2216
Net					-0.02177	-0.58162	-0.04844	-0.03165	-80.0153
Recyclables and Greenwaste	260	1	9.8	(5,096)	-0.00123	-0.0302	-0.0015	-0.00097	-6.58463
Albion Transfer Station[5]	52			2,111					
Existing[3]	104		29.9	(3,110)	-0.00075	-0.01843	-0.00091	-0.00059	-4.01797
New[4]	32	0	29.9	957	0.000304	0.007105	0.000201	0.000129	1.909397
Net					-0.00045	-0.01132	-0.00071	-0.00046	-2.10857
t Emissions Resulting from Project				(406,806)	(0.14)	(1.30)	(0.10)	(0.07)	(229.52)

[1] Assumed to be a mix of light-duty, medium-duty and light heavy-duty trucks per County distribution

[2] Assumed to be Solid Waste Collection Truck type

[3] Assumed to be T6 Heavy-Duty diesel truck

[4] Assumed to be T7 Heavy-Duty diesel truck

[5] Only comparing difference in trips from transfer station

EMFAC2011 Emission Rates
Region Type: County
Region: Mendocino
Calendar Year: 2016
Season: Annual
Vehicle Classification: EMFAC2007 Categories

Region	CalYr	Season	Veh_Class		Fuel	MdlYr	Speed	VMT		ROG_RUNEX	ROG Addl	CO_RUNEX	NOX_RUNE	X	CO2_RUNE	CO2_RUNE	X(Pavley I+l	PM10_RUN	PM10 Addl	PM2_5_RU	PM2.5
							(miles/hr)	(miles/day)		(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)		(gms/mile)	(gms/mile)		(gms/mile)	(gm/mi)	(gms/mile)	(gm/mi)
Mendocinc	2016	Annual	LDA	LDA	GAS	Aggregatec	30	89044.36		0.056728404	0.124309587	1.696039	0.17036	0.043444	355.1843	286.6522	10.31393	0.002409	0.045405	0.002209	0.01833
Mendocinc	2016	Annual	LDA	LDA	DSL	Aggregatec	30	1280.482		0.041765526	0	0.243244	0.504664	0	303.1941	250.6177	0	0.029518	0.04479	0.027156	0.017766
Mendocinc	2016	Annual	LDT1	LDT1	GAS	Aggregatec	30	25262.89	20%	0.187610849	0.476597522	4.974333	0.54686	0.094607	410.8542	341.0522	13.13209	0.005741	0.046063	0.005257	0.01893
Mendocinc	2016	Annual	LDT1	LDT1	DSL	Aggregatec	30	18.04352	0%	0.064780407	0	0.297033	0.485806	0	308.4613	247.6839	0	0.055723	0.04479	0.051265	0.017766
Mendocinc	2016	Annual	LDT2	LDT2	GAS	Aggregatec	30	38187.68	30%	0.085570746	0.237633243	2.55094	0.346026	0.090124	484.9049	416.5498	15.08766	0.00275	0.045453	0.002519	0.018373
Mendocinc	2016	Annual	LDT2	LDT2	DSL	Aggregatec	30	17.08649	0%	0.040926587	0	0.249483	0.577427	0	307.8161	263.6712	0	0.032506	0.04479	0.029906	0.017766
Mendocinc	2016	Annual	LHD1	LHD1	GAS	Aggregatec	30	14212.97	11%	0.232874033	1.161582376	3.31895	0.81285	0.955611	619.4336	597.7534	22.93039	0.002687	0.04586	0.002485	0.018751
Mendocinc	2016	Annual	LHD1	LHD1	DSL	Aggregatec	30	17923.33	14%	0.193750755	0	0.845265	3.503303	0	525.9836	507.5742	0	0.04398	0.089373	0.040462	0.036577
Mendocinc	2016	Annual	LHD2	LHD2	GAS	Aggregatec	30	887.631		0.177038017	0.805521294	2.995275	0.521226	0.794448	619.4336	597.7534	24.23544	0.002038	0.04597	0.0018	0.018763
Mendocinc	2016	Annual	LHD2	LHD2	DSL	Aggregatec	30	2796.529		0.174770219	0	0.799534	3.23273	0	523.7197	505.3895	0	0.039855	0.102082	0.036667	0.042004
Mendocinc	2016	Annual	MCY	MCY	GAS	Aggregatec	30	1855.547		2.179263763	1.079729159	17.81984	1.180672	0.083609	144.2192	139.1715	11.35237	0.000497	0.045335	0.000402	0.018196
Mendocinc	2016	Annual	MDV	MDV	GAS	Aggregatec	30	32744.8	26%	0.150296733	0.397474219	3.932504	0.703914	0.178895	612.64	548.7652	20.92417	0.003474	0.045661	0.003204	0.01857
Mendocinc	2016	Annual	MDV	MDV	DSL	Aggregatec	30	29.81686	0%	0.04507713	0	0.230933	0.367396	0	297.8068	262.5196	0	0.036706	0.04479	0.03377	0.017766
Mendocinc	2016	Annual	MH	MH	GAS	Aggregatec	30	705.0114		0.320214343	0.041496897	8.705412	1.368708	0.013755	619.4336	597.7535	0.321273	0.003728	0.044812	0.003395	0.017785
Mendocinc	2016	Annual	MH	MH	DSL	Aggregatec	30	102.3942		0.214615041	0	0.836424	7.920518	0	1231.56	1188.455	0	0.195202	0.142468	0.179586	0.058913
Mendocinc	2016	Annual	OBUS	OBUS	GAS	Aggregatec	30	131.6733		0.295597959	1.611986494	4.50719	1.904395	2.730667	619.4336	597.7534	37.06574	0.001056	0.045781	0.00098	0.018685
Mendocinc	2016	Annual	OBUS	OBUS	DSL	Aggregatec	30	155.4577		0.203701149	0	0.776778	6.471737	0	1538.158	1484.322	0	0.070848	0.143954	0.06518	0.06028
Mendocinc	2016	Annual	SBUS	SBUS	GAS	Aggregatec	30	229.9028		1.791560519	0.813625478	26.92729	3.271198	0.349482	619.4336	597.7534	13.07875	0.00749	0.0458	0.006594	0.018639
Mendocinc	2016	Annual	SBUS	SBUS	DSL	Aggregatec	30	465.6944		0.15915236	0	0.610942	9.667998	0	1240.621	1197.199	0	0.098394	0.762181	0.090523	0.326814
Mendocinc	2016	Annual	T6	T6	GAS	Aggregatec	30	811.0065		0.360495821	2.011027567	6.21666	1.113125	1.151809	619.4336	597.7535	33.41336	0.001874	0.048266	0.001627	0.020594
Mendocinc	2016	Annual	T6	T6	DSL	Aggregatec	30	3637.946		0.218841316	0	0.82772	5.380454	0	1215.795	1173.242	0	0.122463	0.143958	0.112666	0.060283
Mendocinc	2016	Annual	T7	T7	GAS	Aggregatec	30	152.1526		1.661370094	2.607095355	45.97242	6.288087	1.800171	619.4335	597.7534	19.24998	0.002077	0.047498	0.001799	0.019983
Mendocinc	2016	Annual	T7	T7	DSL	Aggregatec	30	14096.08		0.288040148	0	1.161025	6.742736	0	1877.732	1812.012	0	0.091161	0.099343	0.083868	0.038318
Mendocinc	2016	Annual	UBUS	UBUS	GAS	Aggregatec	30	522.0258		0.456405153	0.198727858	6.688119	3.054707	0.255796	619.4336	597.7534	4.858079	0.000945	0.044833	0.000876	0.017805
Mendocinc	2016	Annual	UBUS	UBUS	DSL	Aggregatec	30	270.6803		0.657928147	0	2.446614	18.03907	0	2588.998	2498.383	0	0.320035	0.850584	0.294433	0.363106
Mendocinc	2016	Annual	T7 SWCV		DSL	Aggregatec	30	76.15569		0.114512271	0.130363504	0.575166	14.98173		1914.415	1847.41		0.068723	0.102931	0.063225	0.040187
					Self Haul (LD/MD) travel			128396.6	1.00	**0.547943717**		3.225849	**1.166104**		523.4453	**483.0447**		**0.061093**		**0.029659**	
					T6 Diesel					0.218841316			5.380454			1173.242		0.26642		0.172949	
					T7 Diesel					0.288040148			6.742736			1812.012		0.190504		0.122186	

EMFAC2011 Veh & Tech	EMFAC2011 Vehicle	Description	Source	EMFAC2007 Vehicle	EMFAC2007 Vehicle Code	Truck / Non-Truck Category	Truck 1 / Truck 2 / Non-Truck Category
LDA - DSL	LDA	Passenger Cars	EMFAC2011-LDV	LDA	PC	Non-Trucks	Non-Trucks
LDA - GAS			EMFAC2011-LDV			Non-Trucks	Non-Trucks
LDT1 - DSL	LDT1	Light-Duty Trucks (0-3750 lbs)	EMFAC2011-LDV	LDT1	T1	Non-Trucks	Non-Trucks
LDT1 - GAS			EMFAC2011-LDV			Non-Trucks	Non-Trucks
LDT2 - DSL	LDT2	Light-Duty Trucks (3751-5750 lbs)	EMFAC2011-LDV	LDT2	T2	Non-Trucks	Non-Trucks
LDT2 - GAS			EMFAC2011-LDV			Non-Trucks	Non-Trucks
LHD1 - DSL	LHD1	Light-Heavy-Duty Trucks (8501-10000 lbs)	EMFAC2011-LDV	LHDT1	T4	Trucks	Truck 1
LHD1 - GAS			EMFAC2011-LDV			Trucks	Truck 1
LHD2 - DSL	LHD2	Light-Heavy-Duty Trucks (10001-14000 lbs)	EMFAC2011-LDV	LHDT2	T5	Trucks	Truck 1
LHD2 - GAS			EMFAC2011-LDV			Trucks	Truck 1
MCY - GAS	MCY	Motorcycles	EMFAC2011-LDV	MCY	MC	Non-Trucks	Non-Trucks
MDV - DSL	MDV	Medium-Duty Trucks (5751-8500 lbs)	EMFAC2011-LDV	MDV	T3	Non-Trucks	Non-Trucks
MDV - GAS			EMFAC2011-LDV			Non-Trucks	Non-Trucks
MH - DSL	MH	Motor Homes	EMFAC2011-LDV	MH	MH	Non-Trucks	Non-Trucks
MH - GAS			EMFAC2011-LDV			Non-Trucks	Non-Trucks
T6 Ag - DSL	T6 Ag	Medium-Heavy Duty Diesel Agriculture Truck	EMFAC2011-HD	MHDT	T6	Trucks	Truck 2
T6 CAIRP heavy - DSL	T6 CAIRP heavy	Medium-Heavy Duty Diesel CA International Registration Plan Truck with GVWR>26000 lbs	EMFAC2011-HD			Trucks	Truck 2
T6 CAIRP small - DSL	T6 CAIRP small	Medium-Heavy Duty Diesel CA International Registration Plan Truck with GVWR<=26000 lbs	EMFAC2011-HD			Trucks	Truck 2
T6 instate construction heavy - DSL	T6 instate construction heavy	Medium-Heavy Duty Diesel instate construction Truck with GVWR>26000 lbs	EMFAC2011-HD			Trucks	Truck 2
T6 instate construction small - DSL	T6 instate construction small	Medium-Heavy Duty Diesel instate construction Truck with GVWR<=26000 lbs	EMFAC2011-HD			Trucks	Truck 2
T6 instate heavy - DSL	T6 instate heavy	Medium-Heavy Duty Diesel instate Truck with GVWR>26000 lbs	EMFAC2011-HD			Trucks	Truck 2
T6 instate small - DSL	T6 instate small	Medium-Heavy Duty Diesel instate Truck with GVWR<=26000 lbs	EMFAC2011-HD			Trucks	Truck 2
T6 OOS heavy - DSL	T6 OOS heavy	Medium-Heavy Duty Diesel Out-of-state Truck with GVWR>26000 lbs	EMFAC2011-HD			Trucks	Truck 2
T6 OOS small - DSL	T6 OOS small	Medium-Heavy Duty Diesel Out-of-state Truck with GVWR<=26000 lbs	EMFAC2011-HD			Trucks	Truck 2
T6 Public - DSL	T6 Public	Medium-Heavy Duty Diesel Public Fleet Truck	EMFAC2011-HD			Trucks	Truck 2
T6 utility - DSL	T6 utility	Medium-Heavy Duty Diesel Utility Fleet Truck	EMFAC2011-HD			Trucks	Truck 2
T6TS - GAS	T6TS	Medium-Heavy Duty Gasoline Truck	EMFAC2011-LDV			Trucks	Truck 2
T7 Ag - DSL	T7 Ag	Heavy-Heavy Duty Diesel Agriculture Truck	EMFAC2011-HD	HHDT	T7	Trucks	Truck 2
T7 CAIRP - DSL	T7 CAIRP	Heavy-Heavy Duty Diesel CA International Registration Plan Truck	EMFAC2011-HD			Trucks	Truck 2
T7 CAIRP construction - DSL	T7 CAIRP construction	Heavy-Heavy Duty Diesel CA International Registration Plan Construction Truck	EMFAC2011-HD			Trucks	Truck 2
T7 NNOOS - DSL	T7 NNOOS	Heavy-Heavy Duty Diesel Non-Neighboring Out-of-state Truck	EMFAC2011-HD			Trucks	Truck 2
T7 NOOS - DSL	T7 NOOS	Heavy-Heavy Duty Diesel Neighboring Out-of-state Truck	EMFAC2011-HD			Trucks	Truck 2
T7 other port - DSL	T7 other port	Heavy-Heavy Duty Diesel Drayage Truck at Other Facilities	EMFAC2011-HD			Trucks	Truck 2
T7 POAK - DSL	T7 POAK	Heavy-Heavy Duty Diesel Drayage Truck in Bay Area	EMFAC2011-HD			Trucks	Truck 2
T7 POLA - DSL	T7 POLA	Heavy-Heavy Duty Diesel Drayage Truck near South Coast	EMFAC2011-HD			Trucks	Truck 2
T7 Public - DSL	T7 Public	Heavy-Heavy Duty Diesel Public Fleet Truck	EMFAC2011-HD			Trucks	Truck 2
T7 Single - DSL	T7 Single	Heavy-Heavy Duty Diesel Single Unit Truck	EMFAC2011-HD			Trucks	Truck 2
T7 single construction - DSL	T7 single construction	Heavy-Heavy Duty Diesel Single Unit Construction Truck	EMFAC2011-HD			Trucks	Truck 2
T7 SWCV - DSL	T7 SWCV	Heavy-Heavy Duty Diesel Solid Waste Collection Truck	EMFAC2011-HD			Trucks	Truck 2
T7 tractor - DSL	T7 tractor	Heavy-Heavy Duty Diesel Tractor Truck	EMFAC2011-HD			Trucks	Truck 2
T7 tractor construction - DSL	T7 tractor construction	Heavy-Heavy Duty Diesel Tractor Construction Truck	EMFAC2011-HD			Trucks	Truck 2
T7 utility - DSL	T7 utility	Heavy-Heavy Duty Diesel Utility Fleet Truck	EMFAC2011-HD			Trucks	Truck 2
T7IS - GAS	T7IS	Heavy-Heavy Duty Gasoline Truck	EMFAC2011-LDV			Trucks	Truck 2
PTO - DSL	PTO	Power Take Off	EMFAC2011-HD			Trucks	Truck 2
SBUS - DSL	SBUS	School Buses	EMFAC2011-HD	SBUS	SB	Non-Trucks	Non-Trucks
SBUS - GAS			EMFAC2011-LDV			Non-Trucks	Non-Trucks
UBUS - DSL	UBUS	Urban Buses	EMFAC2011-LDV	UBUS	UB	Non-Trucks	Non-Trucks
UBUS - GAS			EMFAC2011-LDV			Non-Trucks	Non-Trucks
Motor Coach - DSL	Motor Coach	Motor Coach	EMFAC2011-HD	OBUS	OB	Non-Trucks	Non-Trucks
OBUS - GAS	OBUS	Other Buses	EMFAC2011-LDV			Non-Trucks	Non-Trucks
All Other Buses - DSL	All Other Buses	All Other Buses	EMFAC2011-HD			Non-Trucks	Non-Trucks

Appendix D
Biological Resources Assessment

Biological Resources Assessment

Portion of Jackson State Demonstration Forest
Fort Bragg, Mendocino County, California

Prepared For:
Mike Sweeney
Mendocino Solid Waste Authority
101 W. Church Street, Suite 9
Ukiah, CA 95482

Linda Ruffing
Community Development Director
Fort Bragg City Hall
416 N. Franklin Street
Fort Bragg, CA 95437

Contact:
Matt Richmond
richmond@wra-ca.com

Date:
June 2013

ENVIRONMENTAL CONSULTANTS

2169-G East Francisco Blvd., San Rafael, CA 94901 (415) 454-8868 tel (415) 454-0129 fax info@wra-ca.com www.wra-ca.com

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EXECUTIVE SUMMARY

The purpose of this report is to provide an analysis of natural community and special-status species issues at an approximately 20.7-acre portion of a 200-acre Jackson Demonstration State Forest parcel (APN 019-15-005) situated north of Highway 20, near Fort Bragg, Mendocino County, California (Study Area).

On March 15, May 11, and July 10, 2012, WRA, Inc. (WRA) conducted a wetland delineation, biological resources assessment, and protocol-level rare plant survey within the Study Area and immediately adjacent areas (Study Area). WRA observed five biological communities and 77 plant species. Five sensitive biological communities covering approximately 17 acres of the Study Area were identified. Seven special-status plant species were assessed to have a moderate or high potential to occur in the Study Area. Of these, four species, California sedge (*Carex californica*), pygmy cypress (*Hesperocyparis pygmaea*), coast lily (*Lilium maritimum*), and Bolander's pine (*Pinus contorta* ssp. *bolanderi*), were observed within the Study Area. Six special-status wildlife species have a moderate or high potential occur in the Study Area.

1.0 INTRODUCTION

On March 15, May 11, and July 10, 2012, WRA, Inc. (WRA) performed an assessment of biological resources in 20.7 acres of a 200-acre parcel (APN 019-15-005) situated north of California Highway 20, near Fort Bragg, Mendocino County, California (Study Area; Figure 1). The Study Area is located along and immediately north of California Highway 20, approximately three aerial miles southeast of downtown Fort Bragg. The property is currently held in the Jackson Demonstration State Forest under the ownership of the California Department of Forestry and Fire Protection. The purpose of the assessment was to gather information necessary to complete a review of biological resources to support regulatory agency permits and a California Environmental Quality Act (CEQA) review. This report describes the results of the site visit, which includes (1) a protocol-level rare plant survey; (2) assessment for the presence of special-status wildlife species; (3) a delineation of wetlands and non-wetland waters; and (4) an assessment of potentially sensitive biological resources protected by local, state, and federal laws and regulations.

A biological resources assessment provides general information on the potential presence of sensitive species and habitats. The biological assessment is not an official protocol-level survey for listed species that may be required for project approval by local, state, or federal agencies. However, a protocol-level rare plant survey and a routine wetland delineation of wetlands and non-wetlands were conducted concurrent with this assessment, the results of which are summarized herein and detailed in a separate report (Appendix E). This assessment is based on information available at the time of the study and on site conditions that were observed on the date of the site visit.

2.0 REGULATORY BACKGROUND

The following sections explain the regulatory context of the biological assessment, including applicable laws and regulations that were applied to the field investigations and analysis of potential project impacts.

2.1 Sensitive Biological Communities

Sensitive biological communities include habitats that fulfill special functions or have special values, such as wetlands, streams, or riparian habitat. These habitats are protected under federal regulations such as the Clean Water Act; state regulations such as the Porter-Cologne Act, the California Department of Fish and Game (CDFG[1]) Streambed Alteration Program, and CEQA; or local ordinances or policies such as city or county tree ordinances.

[1] California Department of Fish and Game (CDFG) changed their official title to California Department of Fish Wildlife (CDFW) January 1, 2013. CDFG is used herein only for publications & references dated prior to January 1, 2013, otherwise CDFW is used for all other references to the agency as well as publications dated post January 1, 2013.

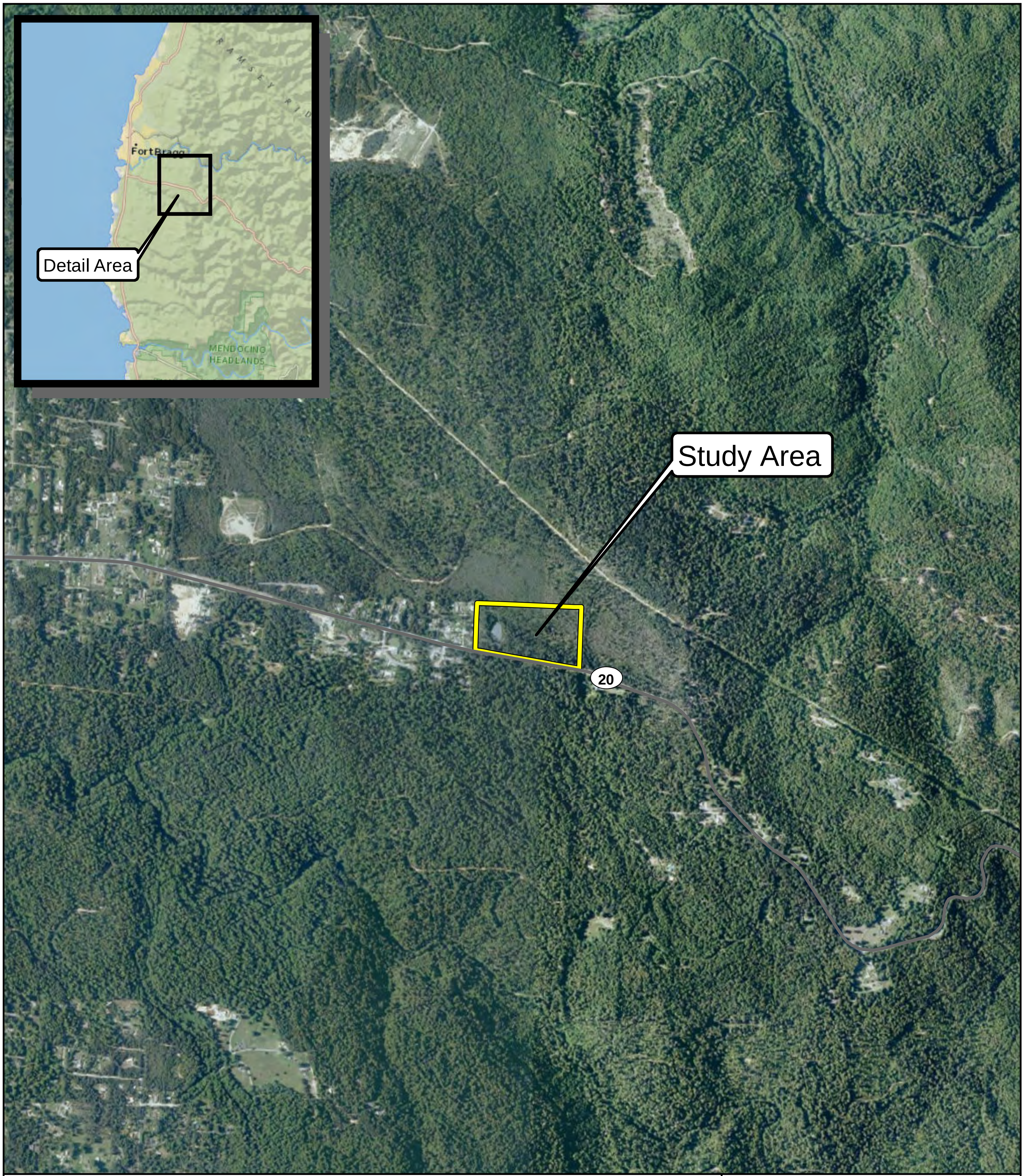


Figure 1. Study Area Location

Mendocino County, California

N
W E
S

0 0.25 0.5
Miles

wra
ENVIRONMENTAL CONSULTANTS

Map Date: October 2012
Map By: Chris Zumwalt
Base Source: ESRI World Imagery

Path: L:\Acad 2000 Files\22000\22045\gis\arcmap\Location Map.mxd

2.1.1 Waters of the United States

The U.S. Army Corps of Engineers (Corps) regulates "Waters of the United States" under Section 404 of the Clean Water Act. Waters of the U.S. are defined in the Code of Federal Regulations (CFR) as waters susceptible to use in commerce, including interstate waters and wetlands, all other waters (intrastate waterbodies, including wetlands), and their tributaries (33 CFR 328.3). Potential wetland areas, according to the three criteria used to delineate wetlands as defined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast* (WMVC; Corps 2010), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Areas that are inundated at a sufficient depth and for a sufficient duration to exclude growth of hydrophytic vegetation are subject to Section 404 jurisdiction as "other waters" and are often characterized by an ordinary high water mark (OHWM). Other waters, for example, generally include lakes, rivers, and streams. The placement of fill material into Waters of the U.S generally requires an individual or nationwide permit from the Corps under Section 404 of the Clean Water Act.

2.1.2 Waters of the State

The term "Waters of the State" is defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope and has special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and are not systematically protected by other programs. RWQCB jurisdiction includes "isolated" wetlands and waters that may not be regulated by the Corps under Section 404. Waters of the State are regulated by the RWQCB under the State Water Quality Certification Program which regulates discharges of fill and dredged material under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. Projects that require a Corps permit, or fall under other federal jurisdiction, and have the potential to impact Waters of the State, are required to comply with the terms of the Water Quality Certification determination. If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to Waters of the State, the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements.

2.1.3 Streams, Lakes, and Riparian Habitat

Streams and lakes, as habitat for fish and wildlife species, are subject to jurisdiction by CDFG under Sections 1600-1616 of California Fish and Game Code. Alterations to or work within or adjacent to streambeds or lakes generally require a 1602 Lake and Streambed Alteration Agreement. The term "stream", which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life…[including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). In addition, the term "stream" can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). "Riparian" is defined as "on, or pertaining to, the banks of a stream." Riparian vegetation is defined as "vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself" (CDFG

1994). Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from CDFG.

2.1.4 Other Sensitive Biological Communities

Other sensitive biological communities not discussed above include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFG. CDFG ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFG 2012). Sensitive plant communities are also identified by CDFG (2009). CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2013) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFG or USFWS must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). Specific habitats may also be identified as sensitive in city or county general plans or ordinances.

2.2 Special-status Species

<u>Plant and Wildlife Species</u>

Special-status species include those plants and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the federal Endangered Species Act (ESA) or California Endangered Species Act (CESA). These acts afford protection to both listed species and species proposed for listing. In addition, CDFW Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, United States Fish and Wildlife Service (USFWS) Birds of Conservation Concern, and CDFW special-status invertebrates are all considered special-status species. Although CDFW Species of Special Concern generally have no special legal status, they are given special consideration under the CEQA. In addition to regulations for special-status species, most birds in the United States, including non-status species, are protected by the Migratory Bird Treaty Act of 1918. Under this legislation, destroying active nests, eggs, and young is illegal.

Plant species included within the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (Inventory) with California Rare Plant Rank (Rank) of 1 and 2 are also considered special-status plant species and must be considered under CEQA. Very few Rank 3 or Rank 4 plants meet the definitions of Section 1901 Chapter 10 of the Native Plant Protection Act or Sections 2062 and 2067 of the CDFG Code that outlines the California Endangered Species Act. However, CNPS and CDFW strongly recommend that these species be fully considered during the preparation of environmental documentation relating to CEQA. This may be particularly appropriate for the type locality of a Rank 4 plant, for populations at the periphery of a species range or in areas where the taxon is especially uncommon or has sustained heavy losses, or from populations exhibiting unusual morphology or occurring on unusual substrates.

3.0 METHODS

On March 15, May 11, and July 10, 2012, the Study Area was traversed on foot to determine (1) plant communities present within the Study Area, (2) whether existing conditions provide suitable habitat for any special-status plant or wildlife species, (3) the presence of special-status plant species through the performance of a protocol-level rare plant survey, and (4) whether sensitive habitats are present. Additionally, a routine delineation of wetlands and non-wetland waters was performed on July 10, 2012, the results of which are included in Appendix E. All plant and wildlife species encountered were recorded, and are summarized in Appendix A. Plants were identified using *The Jepson Manual: Vascular Plants of California 2nd Edition* (Baldwin et al. 2012), to the taxonomic level necessary to determine rarity. Some plants were cross referenced and identified using *The Jepson Manual* (Hickman 1993) as some agencies and jurisdictions may base rarity on older names. Names given follow *The Jepson Manual: Vascular Plants of California 2nd Edition* (Baldwin et al. 2012). For cases in which regulatory agencies or CNPS base rarity on older plant classification, precedence was given to the classification used by those agencies.

3.1 Biological Communities

Prior to the site visit, the *Soil Survey of Mendocino County, California, Western Part* (USDA 2006), the U.S. Geologic Survey (USGS) Fort Bragg 7.5-minute quadrangle map (USGS 1960), and available aerial imagery of the Study Area were examined to determine if any unique soil types that could support sensitive plant communities and/or aquatic features were present in the Study Area. Biological communities present in the Study Area were classified based on existing plant community descriptions described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), and *A Manual of California Vegetation, 2nd Edition* (Sawyer et al. 2009). However, in some cases it is necessary to identify variants of community types or to describe non-vegetated areas that are not described in the literature. Biological communities were classified as sensitive or non-sensitive as defined by CEQA and other applicable laws and regulations.

3.1.1 Non-sensitive Biological Communities

Non-sensitive biological communities are those communities that are not afforded special protection under CEQA, and other state, federal, and local laws, regulations, and ordinances. These communities may, however, provide suitable habitat for some special-status plant or wildlife species and are identified or described in Section 4.3.1 below.

3.1.2 Sensitive Biological Communities

Sensitive biological communities are defined as those communities that are given special protection under CEQA and other applicable federal, state, and local laws, regulations and ordinances. Applicable laws and ordinances are discussed above in Section 2.0. Special methods used to identify sensitive biological communities are discussed below.

Wetlands and Non-wetland Waters

The Study Area was surveyed to determine if any wetlands and non-wetland waters potentially subject to jurisdiction by the Corps and RWQCB were present. The delineation followed protocols outlined in the *Corps of Engineers Wetlands Delineation Manual* (Corps Manual; Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast* (WMVC; Corps 2010). The three parameters used to delineate wetlands are the presence of: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology.

Data on vegetation, hydrology, and soils collected at sample points during the delineation site visit were reported on WMVC Supplement data forms. Once an area was determined to be a potential jurisdictional wetland, its boundaries were delineated using a sub-meter accurate global positioning system (GPS) unit and mapped on a topographic map. The areas of potential jurisdictional wetlands were measured digitally using ArcGIS software. Detailed methodology is included in a separate delineation report (Appendix E).

WRA also evaluated the presence of “waters of the U.S.” other than wetlands (non-wetland waters) potentially subject to U.S. Army Corps of Engineers jurisdiction under Section 404 of the Clean Water Act. Other areas, besides wetlands, subject to Corps jurisdiction include lakes, rivers and streams (including intermittent streams) in addition to all areas below the high tide line (HTL) in areas subject to tidal influence. Identification of the ordinary high water mark followed the Corps Regulatory Guidance Letter No. 05-05, *Ordinary High Water Mark Identification* (Corps 2005).

Because the RWQCB does not currently ascribe a specific methodology for delineating Waters of the State, all wetlands and non-wetland waters were assessed following Corps guidelines. Likewise, the Study Area was surveyed to locate any potential streams, lakes, and riparian habitat following the standard guidance provided in *A Field Guide to Lake and Streambed Alteration Agreements, Sections 1600-1607, California Fish and Game Code* (CDFG 1994). The field guidance for CDFG Section 1602 jurisdiction is typically understood to include all streams and to extend laterally to the top-of-bank. If riparian vegetation is present within the top-of-bank, then CDFG jurisdiction extends to the outer dripline of such vegetation.

Other Sensitive Biological Communities

Prior to the site visit, aerial photographs, soil maps, geologic maps, the *List of Vegetation Alliances* (CDFG 2009), *A Manual of California Vegetation* (Sawyer et al. 2009), and *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) were reviewed to assess the potential for sensitive biological communities to occur in the Study Area. Other sensitive biological communities were classified based on existing descriptions in Holland (1986), Sawyer et al. (2009), and CDFG (2009). However, in some cases it may be necessary to identify variants of vegetation alliances and/or associations. Other biological communities observed within the Study Area that were classified sensitive include those afforded special consideration under CEQA, all vegetation alliances with a State (“S”) ranking of S1 through S3, and/or designated with a star (*) in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) or in the *List of Vegetation Alliances* (CDFG 2009). These communities are described in Section 4.3 below.

3.2 Special-status Species

3.2.1 Literature Review

The potential for special-status species to occur within the Study Area was evaluated by first determining which special-status species occur in the vicinity of the Study Area through a literature and database search. Database searches for known occurrences of special-status species focused on the Inglenook, Fort Bragg, Mendocino, Dutchmans Knoll, Noyo Hill, and Mathison Peak 7.5 minute USGS quadrangles. The following sources were reviewed to determine which special-status plant and wildlife species have been documented to occur in the vicinity of the Study Area:

- California Natural Diversity Database (CNDDB) records (CDFG 2012)
- USFWS quadrangle species lists (USFWS 2012)
- CNPS Inventory records (CNPS 2012)
- Consortium of California Herbaria (CCH 2012)
- CDFG publication “California’s Wildlife, Volumes I-III” (Zeiner et al. 1990)
- CDFG publication “Amphibians and Reptile Species of Special Concern in California” (Jennings and Hayes 1994)
- A Field Guide to Western Reptiles and Amphibians (Stebbins 2003)

3.2.2 Site Assessment

A site visit was made to the Study Area to search for suitable habitats for special-status species. Habitat conditions observed at the Study Area were used to evaluate the potential for presence of special-status species based on these searches and the professional expertise of the investigating biologists. The potential for each special-status species to occur in the Study Area was then evaluated according to the following criteria:

> No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
>
> Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
>
> Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
>
> High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
>
> Present. Species is observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

The site assessment is intended to identify the presence or absence of suitable habitat for each special-status species known to occur in the vicinity in order to determine its potential to occur in the Study Area. The site visit does not constitute a protocol-level survey and is not intended to determine the actual presence or absence of a species; however, if a special-status species is observed during the site visit, its presence will be recorded and discussed.

For some species, a site assessment visit at the level conducted for this report may not be sufficient to determine presence or absence of a species to the specifications of regulatory agencies. In these cases, a species may be assumed to be present or further protocol-level special-status species surveys may be necessary. WRA conducted protocol-level rare plant surveys concurrent with the site assessment (see Section 3.2.3 below); however, special-status wildlife species for which further protocol-level surveys may be necessary are described below in Section 5.0.

3.2.3 Protocol-level Rare Plant Survey

Three floristic, protocol-level rare plant surveys were conducted on March 15, May 11, and July 10, 2012. The surveys corresponded to peak periods for observing and accurately identifying hundreds of plant species in Mendocino County, including the seven vascular special status plant species with the potential to occur in the Study Area. The field survey was conducted by botanists with extensive experience in the flora of coastal forest habitats of Mendocino County. Where and when possible, WRA reviewed dates of historical documentation, consulted with other botanists, or conducted reference site visits to ensure that the surveys were conducted within a period sufficient to identify the potentially occurring special status plant species.

The surveys followed the protocol for plant surveys described by Nelson (1987), which complies with recommended resource agency guidelines (CNPS 2001, CDFG 2000, CDFG 2009, USFWS 1996). All plants were identified using *The Jepson Manual, 2nd Edition* (Baldwin et al. 2012), to the taxonomic level necessary to determine whether or not they were rare. Names given follow the Baldwin et al. (2012). The plant surveys were floristic in nature with all observed species recorded and included as a species list provided in Appendix A.

To estimate the numbers of extensive, stand-forming special-status plant species, several vegetation plots were located within each vegetation community. All trees within a 50-foot radius were counted and their cover density estimated, while special-status herbaceous species within a 30-foot radius were counted and their cover density estimated across the stand (Appendix D). Conversely, discrete populations of special-status species were mapped and counted.

4.0 SITE DESCRIPTION AND RESULTS

The Study Area occupies approximately 20.7-acre section of Jackson Demonstration State Forest located immediately north of California Highway 20, approximately three aerial miles southeast of Fort Bragg, Mendocino County. It is set in a relatively undisturbed extensive closed-cone coniferous forest. Calfire maintains an emergency helipad within the property immediately adjacent to the Study Area. Rural residences are present as neighboring parcels to the east and west, with contiguous open space to the north, and Highway 20 to the south.

Appendix A lists the plant species observed in the Study Area during the site assessment. The following sections discuss the biological communities observed in the Study Area as well as the potential for occurrence of special-status species.

4.1 Topography and Soils

The Study Area is situated on a marine terrace north of Covington Gulch. As such the topography in the northern, eastern, and central portions is relatively flat. Elevations range from approximately 400 to 430 feet above sea level. The Study Area generally slopes from the northeast to southwest, with few, virtually indistinct micro-topographic shifts.

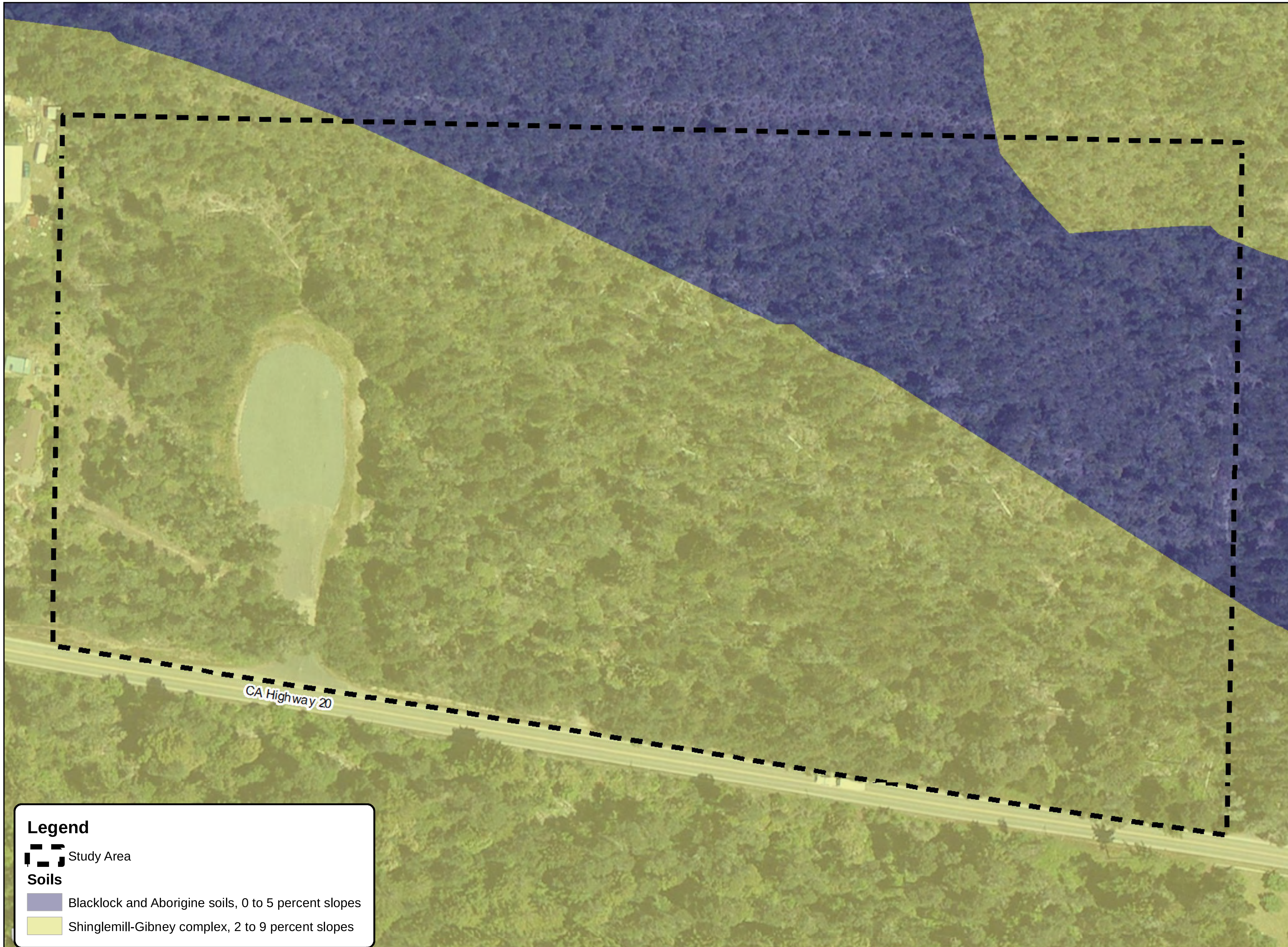
The *Soil Survey of Mendocino County, California, Western Part* (USDA 2006) indicates that the Study Area contains two native soil types containing two soil series each, the Shinglemill-Gibney complex, and the Blacklock and Aborigine soils. Individual soil series are described below and illustrated in Figure 2.

<u>Shinglemill loam, 2 to 15 percent slopes</u>: This series consists of very deep loam soils formed in marine sediments of mixed rock type located on marine terraces and coastal hills at elevations ranging from 200 to 750 feet. These soils are considered hydric, and are poorly drained with slow to medium runoff, and slow permeability. Native vegetation associated with these soils includes coastal coniferous forest including Bishop pine (*Pinus muricata*), pygmy cypress (*Hesperocyparis pygmaea*), evergreen huckleberry (*Vaccinium ovatum*), glossy-leaf manzanita (*Arctostaphylos nummularia* ssp. *nummularia*), Pacific rhododendron (*Rhododendron macrophyllum*), Labrador tea (*R. columbianum*), and bear grass (*Xerophyllum tenax*) (USDA 2006).

A representative profile of this series contains an O-horizon of duff typically from pine needles, manzanita and rhododendron leaves, and twigs from 2 to 0 inches depth. This is underlain by an E-horizon of very strongly acid (pH 4.5) very pale brown (10YR 7/4) and grayish brown (10YR 5/2) moist loam from approximately 0 to 3 inches depth. This is underlain by a B-horizon of very strongly acid (pH 4.6) yellowish brown (10YR 5/4, 5/6) moist loam to clay with prominent white (10YR 8/1, 8/2) mottles from approximately 3 to 63 inches depth (USDA 2006).

Shinglemill loam has the potential to support special-status plants with an affinity for high acidicity, and has the potential to support wetland habitat in depressional areas where surface and subsurface waters may become impounded.

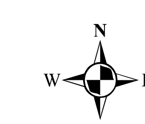
<u>Gibney loam, 2 to 15 percent slopes</u>: This series consists of very deep loam soils formed in marine sediments of mixed rock type located on marine terraces at elevations ranging from 200 to 750 feet. These soils are not considered hydric, and are somewhat poorly drained with slow runoff, and slow permeability. Native vegetation associated with these soils includes coastal coniferous forest including Bishop pine (*Pinus muricata*), pygmy cypress (*Hesperocyparis pygmaea*), evergreen huckleberry (*Vaccinium ovatum*), glossy-leaf manzanita (*Arctostaphylos nummularia* ssp. *nummularia*), and bear grass (*Xerophyllum tenax*) (USDA 2006).



wra ENVIRONMENTAL CONSULTANTS

Mendocino County, California

Figure 2.
Study Area Soils



Map Date: October 2012
Map By: Chris Zumwalt
Base Source: Bing Maps

Path: L:\Acad 2000 Files\22000\22045\gis\arcmap\Soils.mxd

A representative profile of this series contains an O-horizon of duff typically from pine needles, manzanita and rhododendron leaves, and twigs from 3 to 0 inches depth. This is underlain by an A-horizon of very moderately acid (pH 5.6) yellowish (10YR 5/4) when moist loam from approximately 0 to 9 inches depth. This is underlain by a B-horizon of very strongly acid (pH 4.5) to extremely acid (pH 4.2) yellowish brown (10YR 5/4, 5/6) when moist clay loam to clay to light brownish clay (2.5Y 6/2) when moist sandy clay loam with distinct to prominent strong brown (7.5YR 5/6) mottles from approximately 9 to 63 inches depth (USDA 2006).

Gibney loam has the potential to support special-status plants with an affinity for high acidicity, and has the potential to support wetland habitat in depressional areas where surface and subsurface waters may become impounded.

Blacklock fine sandy loam, 0 to 7 percent slopes: This series consists of shallow sandy loam soils formed in sandy marine sediments located on marine terraces at elevations ranging from 25 to 650 feet. These soils are considered hydric, and are very poorly drained with slow to medium runoff, and moderate permeability. Native vegetation associated with these soils includes Bishop pine (*Pinus muricata*), pygmy cypress (*Hesperocyparis pygmaea*), western hemlock (*Tsuga heterophylla*), evergreen huckleberry (*Vaccinium ovatum*), glossy-leaf manzanita (*Arctostaphylos nummularia* ssp. *nummularia*), Pacific rhododendron (*Rhododendron macrophyllum*), salal (*Gaultheria shallon*), Labrador tea (*R. columbianum*), and bear grass (*Xerophyllum tenax*) (USDA 2006).

A representative profile of this series consists of an O-horizon of duff from pine needles and manzanita leaves and twigs from 1 to 0 inches depth. This is underlain by an A-horizon of very strongly acid (pH 4.6) dark gray (10YR 4/1) when moist fine sandy loam to gray (10YR 6/1) when moist loamy fine sand from approximately 0 to 9 inches depth. This is underlain by an E-horizon of very strongly acid (pH 4.5) white (N 8/0) to gray (10YR 6/1) when dry loamy fine sand from approximately 9 to 13 inches depth. This is underlain by a B-horizon of very strongly acid (pH 4.6) dark reddish gray (5YR 4/2) when dry mucky loam from approximately 13 to 15 inches depth. This is underlain by a cemented B-horizon of medium acid (pH 5.2) yellowish brown (10YR 5/6) when dry strongly cemented sands to very pale brown (10YR 7/4) when dry strongly cemented sands from approximately 15 to 52 inches depth. This is underlain by a C-horizon of medium acid (pH 5.2) light olive brown (2.5Y 5/6) when dry fractured sandstone (USDA 2006).

Blacklock has a high potential to support special-status plants which are associated with hardpans and that have an affinity for high acidicity. Additionally these soils are very likely to support wetland habitat in depressional or low-gradient areas due the presence of a shallow hardpan which prevents infiltration creating a perched water table.

Aborigine sandy loam, 0 to 5 percent slopes: This series consists of very deep sandy loam soils formed from marine or lacustrine sediments on marine terraces at elevations ranging from 250 to 800 feet. These soils are considered hydric, and are very poorly drained with very slow to slow runoff, and very slow permeability. Native vegetation associated with these soils includes Bishop pine (*Pinus muricata*), pygmy cypress (*Hesperocyparis pygmaea*), western hemlock (*Tsuga heterophylla*), evergreen huckleberry (*Vaccinium ovatum*), glossy-leaf manzanita (*Arctostaphylos nummularia* ssp. *nummularia*), Pacific rhododendron (*Rhododendron macrophyllum*), salal (*Gaultheria shallon*), Labrador tea (*R. columbianum*), and bear grass (*Xerophyllum tenax*) (USDA 2006).

A representative profile of this series consists of an O-horizon of duff from cypress and pine needles from 3 to 0 inches depth. This is underlain by an E-horizon of extremely acid (pH 4.4) to light brownish gray (10YR 6/2) when moist sandy loam to strongly acid (pH 5.5) pale brown (10YR 6/3) when moist loam from approximately 0 to 16 inches depth. This is underlain by B-horizon extremely acid (pH 4.2) light gray (10YR 7/1, 6/1) when moist clay and sandy clay from approximately 16 to 64 inches depth (USDA 2006).

Aborigine sandy loam has the high potential to support special-status plants with an affinity for high acidicity, and may support wetland habitat in depressional areas due the presence of a shallow clay layer which reduces infiltration.

4.2 Climate and Hydrology

The Study Area is located in the coastal fog belt of Mendocino County. Average annual precipitation for Fort Bragg, located approximately three aerial miles northwest, is 41.25 inches, with the majority falling as rain and fog drip in the winter months (December through March). The mean daily low and high temperatures in degrees Fahrenheit range from 39.5 in December to 66.4 in August/September (USDA 2013).

The Study Area experiences substantial rainfall events, and evidence of surface ponding, a perched water table, and/or saturated substrates for extended periods (14 days or greater) are present sporadically within with the Study Area, particularly in the eastern portion. Areas dominated by Bishop pine (*Pinus muricata*) and tall pygmy cypress (*Hesperocyparis pygmaea*) appear to permeate somewhat rapidly, with depressional areas in transitional and extreme pygmy forest in the eastern portion experiencing extended saturation.

4.3 Biological Communities

Table 2 summarizes the area of biological communities observed in the Study Area. All biological communities within the Study Area are considered sensitive, and include Bishop pine forest, pygmy forest, forested wetland, and seasonal wetland depression. Descriptions for each biological community are contained in the following sections. Sensitive biological communities within the Study Area are illustrated in Figure 3.

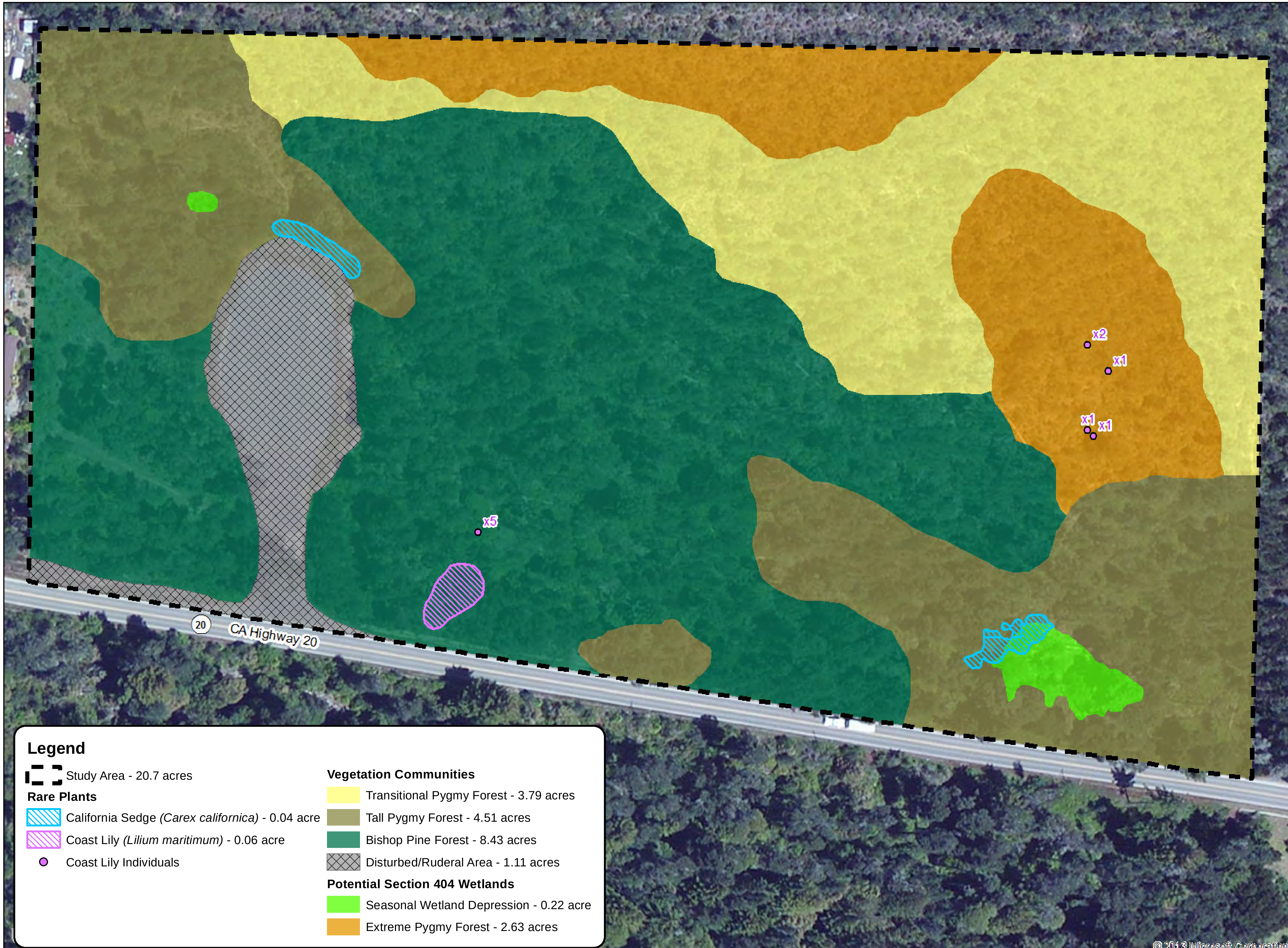
4.3.1 Non-sensitive Biological Communities

The Study Area contains an approximately 1.11 acre helipad maintained by Calfire in the western portion. This area was classified as developed / ruderal and is predominantly composed of compacted gravel. The helipad is virtually devoid of vegetation with the exception of sporadic non-native herbaceous species in the center and a narrow, dense band of French broom (*Genista monspessulana*) around the perimeter.

Table 1. Biological Communities within the Study Area

Community Type	**Vegetation Type**[1]	**Vegetation Alliance**[2]	**Vegetation Association**[2]	**Rank**	**Acres**
Developed / Ruderal Area				none	1.11
Closed-cone coniferous forest	Northern Bishop pine forest	Bishop pine forest (*Pinus muricata* Forest Alliance)	Bishop pine-evergreen huckleberry forest (*P. muricata-Vaccinium ovatum* Forest Association)	G3 S3	8.43
	Mendocino pygmy cypress forest	Pygmy cypress forest (*Hesperocyparis pygmaea* Forest Alliance)	Pygmy cypress forest – tall pygmy forest (*H. pygmaea* Forest Association)	G2 S2	4.51
			Pygmy cypress/Bolander's pine forest – transitional pygmy forest (*H. pygmaea/Pinus contorta* ssp. *bolanderi* Forest Association)		3.79
			Pygmy cypress/Bolander's pine forest – extreme pygmy forest [forested wetland] (*H. pygmaea/P. contorta* ssp. *bolanderi* Forest Association)		2.63
Meadow and seep	Seasonal Wetland Depression	Slough sedge sward (*Carex obnupta* Herbaceous Alliance)	Slough sedge/California sedge sward (*C. obnupta/C. californica* Herbaceous Association)	G4 S3	0.22
TOTAL					20.69

[1]Holland (1986)
[2]Sawyer et al. (2009)



Mendocino County, California

Figure 3.

Biological Communities and Special-Status Species within the Study Area

Map Date: August 2012
Map By: Derek Chan
Base Source: Bing Maps

Path: L:\Acad 2000 Files\22000\22045\gis\arcmap\FigX_BioComm_20130625.mxd

4.3.2 Sensitive Biological Communities

Wetlands and Non-wetland Waters

<u>Seasonal wetland depression</u>: Seasonal wetland depressions are known throughout California. These features are typically located in relatively flat locations underlain by clay soils or substrates with an impermeable layer within the upper two feet.

An approximately 0.22-acre seasonal wetland depression is located in the southeast corner of the Study Area (Figure 3). This wetland is a slight concave depression contains approximately 25 percent absolute cover of herbaceous species composed of slough sedge (*Carex obnupta*, OBL) and California sedge (*C. californica*, FACW). Trees and shrubs are directly rooted within this feature, but are located on the edge, and include Bolander's pine (*Pinus contorta* ssp. *bolanderi*, FAC), pygmy cypress (*Hesperocyparis pygmaea*, NL), evergreen huckleberry (*Vaccinium ovatum*, FACU), and Labrador tea (*Rhododendron columbianum*, OBL).

Field soil samples reveal that the upper soil profile (0 to 9 inches) is composed of brown (7.5YR 5/8) to dark grayish brown (10YR 4/2) sandy silts and silty clays with strongly brown (7.5YR 5/8) redoximorphic concentrations on root channels and the soil matrix. The lower soil profile (9 to 14 inches) is composed of very dark brown (10YR 2/2) clay loam with redoximorphic concentrations. Hydrology indicators include surface soil cracks (Indicator B6), a sparsely vegetated concave surface (Indicator B8), oxidized rhizospheres (Indicator C4), shallow aquitard (Indicator D3), and FAC-neutral test (Indicator D5). The boundary of this wetland was delineated based on topography and change in vegetation density.

<u>Forested Wetland</u>: Forested wetlands are known intermittently throughout northwestern coastal California. These features are typically located on relatively flat to slightly concave locations underlain by acidic substrates with an impermeable layer.

Within the Study Area, the boundary of forested wetlands is analogous with the extreme pygmy cypress forest (see Section 4.3.2.3 below), and compose approximately 2.63 acres (Figure 3). The vegetation is dominated by Bolander's pine (*Pinus contorta* ssp. *bolanderi*, FAC), pygmy cypress (*Hesperocyparis pygmaea*, NL), evergreen huckleberry (*Vaccinium ovatum*, FACU), and Labrador tea (*Rhododendron columbianum*, OBL), wax myrtle (*Morella californica*, FACW), salal (*Gaultheria shallon*, FACU), and California sedge (*Carex californica*, FACW).

Field soil samples reveal that the upper soil profile (0 to 6 inches) is composed of light brownish gray (10YR 6/2) and brown (7.5YR 4/3) clay sandy loam. The lower soil profile (6 to 8 inches) is composed of yellowish brown (10YR 5/6) clay sandy loam with strongly brown (10YR 5/8) redoximorphic features on the soil matrix. Hydrology indicators include oxidized rhizospheres (Indicator C3), water-stained leaves (Indicator B9), and a shallow aquitard (Indicator D3). The boundary of the forested wetland was delineated based on changes in soils, vegetation structure, and vegetation density.

The Study Area does not contain non-wetland water features. A 200-foot linear ephemeral swale is located immediately outside of the western edge of the Study Area, which flows westward and terminates in Labrador tea (*Rhododendron columbianum*) thicket (Figure 3).

Other Sensitive Biological Communities

Northern Bishop Pine Forest: Northern Bishop pine forest is known from near the coast from Fort Bragg, Mendocino County to northwestern Sonoma County, with stands on Point Reyes, Mount Tamalpais, and Monterey Peninsula (Holland 1986). This vegetation community is characteristic of the northern Bishop pine forest described in Holland (1986), and Bishop pine forest (*Pinus muricata* Forest Alliance) described in Sawyer et al. (2009). Vegetation associations were not mapped but include Bishop pine-evergreen huckleberry (*Pinus muricata-Vaccinium ovatum* Forest Association) and Bishop pine//Bolander's pine/pygmy cypress forest (*Pinus muricata/P. contorta ssp. bolanderi/Hesperocyparis pygmaea* Forest Association).

Bishop pine forest occupies approximately 8.43 acres in the southwestern and south-central portion of the Study Area (Figure 3). This community is dominated by Bishop pine (*Pinus muricata*), with several characteristic and subdominant tree species including pygmy cypress (*Hesperocyparis pygmaea*), Bolander's pine (*Pinus contorta* ssp. *bolanderi*), western hemlock (*Tsuga heterophylla*), and coast redwood (*Sequoia sempervirens*). The overstory is somewhat open to completely closed containing mature to over-mature trees. The understory contributes to the vertical structure with a high density of shrubs and depauperate herbaceous layer. Shrub species include evergreen huckleberry (*Vaccinium ovatum*), Pacific rhododendron (*Rhododendron macrophyllum*), giant chinquapin (*Chrysolepis chrysophylla*), tanoak (*Notholithocarpus densiflorus*), and salal (*Gaultheria shallon*). Herbaceous species are sparse and include bracken fern (*Pteridium aquilinum*), bear grass (*Xerophyllum tenax*), and modesty (*Whipplea modesta*). Individual trees were counted in 50-foot radius vegetation plots, and numbers estimated across the stand (Appendix D).

Mendocino Pygmy Cypress Forest: Mendocino pygmy cypress forest is known from near the coast on ancient marine terraces composed of acidic podzol-like soils (Blacklock series) from Fort Bragg to Albion in Mendocino County, and in scattered stands south into Sonoma County (Holland 1986, Sawyer et al. 2009). This vegetation community is characteristic of Mendocino pygmy cypress forest described in Holland (1986), and pygmy cypress forest (*Hesperocyparis pygmaea* Forest Alliance) described in Sawyer et al. (2009). Vegetation associations were not mapped but include pygmy cypress forest (*Hesperocyparis pygmaea* Forest Association), pygmy cypress/Bishop pine forest (*Hesperocyparis pygmaea/Pinus muricata* Forest Association), and pygmy cypress/Bolander's pine forest (*Hesperocyparis pygmaea/Pinus contorta* ssp. *bolanderi* Forest Association).

Three morpho-types were identified and mapped within the Study Area, "tall pygmy forest", "transitional pygmy forest", and "extreme pygmy forest." These mapping units were based on species composition and height of individual trees, and appeared to be correlated with the depth of a cemented hardpan within the substrate, with stunted trees (extreme pygmy forest) located on soils with a very shallow cemented hardpan. Individual trees were counted in several 50-foot radius vegetation plots each morpho-type, and numbers estimated across the stand (Appendix D).

> Tall pygmy forest is dominated pygmy cypress (*Hesperocyparis pygmaea*), with a few scattered individuals of Bishop pine (*Pinus muricata*). This morpho-type occupies approximately 4.51 acres in the southeastern and northwestern portions of the Study Area (Figure 3). Although pygmy species dominated these areas, the soils do not appear to be limiting the growth of individual trees, and average heights range from 35 to 100 feet. The understory is dominated by tall, dense shrubs including Pacific

rhododendron (*Rhododendron macrophyllum*), evergreen huckleberry (*Vaccinium ovatum*), and salal (*Gaultheria shallon*).

Transitional pygmy forest is dominated pygmy cypress (*Hesperocyparis pygmaea*), with subdominants of Bishop pine (*Pinus muricata*) and Bolander's pine (*Pinus contorta* ssp. *bolanderi*). This morpho-type occupies approximately 3.79 acres in the northern and northeastern portion of the Study Area (Figure 3). The soils appear to be somewhat limiting the growth of individual trees, and average heights range from 15 to 35 feet. The understory is dominated by dense shrubs including hairy manzanita (*Arctostaphylos columbiana*), Pacific rhododendron (*Rhododendron macrophyllum*), evergreen huckleberry (*Vaccinium ovatum*), and salal (*Gaultheria shallon*).

Extreme pygmy forest is dominated by pygmy cypress (*Hesperocyparis pygmaea*) and Bolander's pine (*Pinus contorta* ssp. *bolanderi*). This morpho-type occupies approximately 2.63 acres in the eastern portion of the Study Area (Figure 3). The soils appear to be extremely limiting the growth of trees and shrubs whose average height ranges from 5 to 15 feet. The understory is composed of short statured dense thickets of shrubs with greater interstitial space between thickets than in transitional pygmy forest and tall pygmy forest. Shrub species include Labrador tea (*Rhododendron columbianum*), wax myrtle (*Morella californica*), salal (*Gaultheria shallon*), and evergreen huckleberry (*Vaccinium ovatum*). The herbaceous layer is sparse with bracken fern (*Pteridium aquilinum*), bear grass (*Xerophyllum tenax*), California sedge (*Carex californica*), and sporadic coast lilies (*Lilium maritimum*). Additionally, cryptogamic crusts formed from reindeer lichens (*Cladonia portentosa, Cladina impexa*) are present sporadically in open areas that appear to pond water in the wet months.

4.4 Special-status Species

4.4.1 Special-status Plant Species

Forty-seven special-status plant species have been documented in the greater vicinity of the Study Area (Figure 4). Appendix B summarizes the potential for occurrence for each special-status plant species occurring in the vicinity of the Study Area. Seven species have a moderate or high potential to occur in the Study Area. The remaining 40 species are unlikely or have no potential to occur due to one or more of the following reasons:

- Hydrologic conditions (e.g. marsh habitat, perennial streams) necessary to support the special-status plant(s) are not present in the Study Area;
- Edaphic (soil) conditions (e.g. serpentine, volcanics) necessary to support the special-status plant(s) are not present in the Study Area;
- Topographic positions and landforms (e.g. north-facing, slopes, dunes) necessary to support the special-status plant(s) are not present in the Study Area;
- Associated vegetation communities (e.g. chaparral, coastal prairie) necessary to support the special-status plant(s) are not present in the Study Area;
- The degree of disturbance and/or presence of extensive highly competitive, non-native plant species (e.g. dense non-native annual grassland);
- The Study Area is outside of the known elevation and/or localized distribution of the special-status plant(s) (e.g. coastal sites).

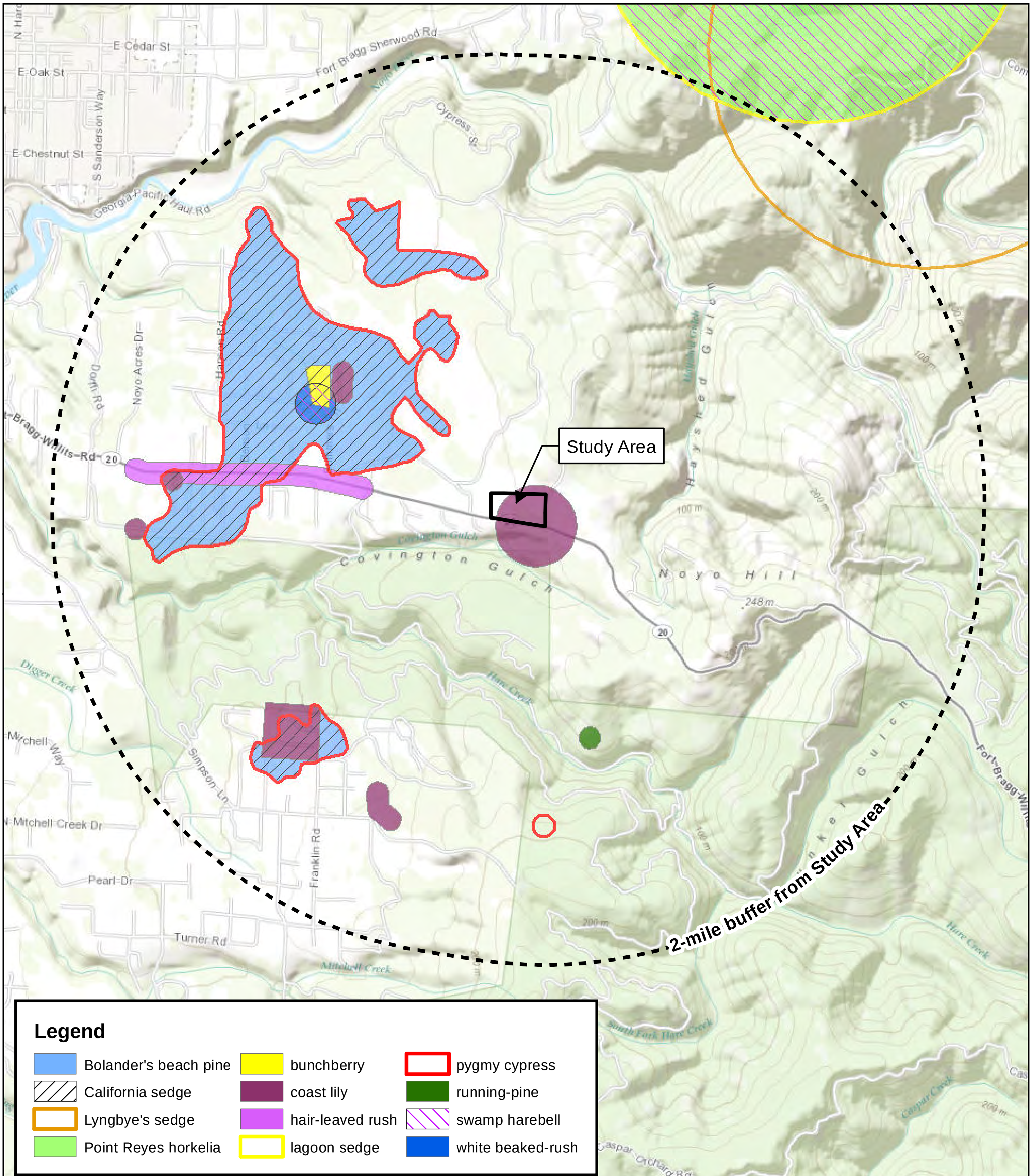


Figure 4. Special Status Plant Species within 2 miles of the Study Area

Mendocino County, California

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ENVIRONMENTAL CONSULTANTS

Date: June 2013
Map By: Derek Chan
Map Source: CNDDB

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The seven species with a moderate to high potential to occur in the Study Area are detailed below. Four species were observed in the Study Area during the protocol-level survey in March, May, and/or July. Detailed population accounts are included under the species descriptions below and illustrated in Figure 3.

Mendocino manzanita (*Arctostaphylos nummularia* var. *mendocinensis*). CNPS Rank 1B. High Potential. Mendocino manzanita is an evergreen shrub in the heath family (Ericaceae) that blooms in January, but is identifiable by vegetation and ecological characteristics throughout the year. This species is located on highly acidic sandy clay podzol-like substrates (Blacklock soil series) in closed-cone coniferous forest (pygmy forest) at elevations ranging from 290 to 650 feet (CNPS 2012, CDFG 2012). Observed associated species include pygmy cypress (*Hesperocyparis pygmaea*), Bolander pine (*Pinus contorta* ssp. *bolanderi*), Bishop pine (*P. muricata*), evergreen huckleberry (*Vaccinium ovatum*), Pacific rhododendron (*Rhododendron macrophyllum*), Labrador tea (*R. columbianum*), California wax myrtle (*Morella californica*), and giant chinquapin (*Chrysolepis chrysophylla*) (CDFG 2012).

Mendocino manzanita is known from one USGS 7.5-minute quadrangle in Mendocino County (CNPS 2012). There is one CNDDB (CDFG 2012) record within the greater vicinity of the Study Area, and 10 CCH (2012) records from Mendocino County. The nearest documented occurrence is from March 1956 east of Fort Bragg, within one mile of the Study Area (CCH 2012). The most recent documented occurrence is from December 2003 in Jughandle State Park, approximately four miles southwest of the Study Area (CCH 2012).

Mendocino manzanita has a high potential to occur in the Study Area due to the presence of suitable habitat, associated species, and Blacklock soils; however, this species was not observed during the protocol-level surveys performed in March, May, or July 2012.

Swamp harebell (*Campanula californica*). CNPS Rank 1B. High Potential. Swamp harebell is a perennial forb in the harebell family (Campanulaceae) that blooms June to October. It typically occurs in wetlands on acidic soils in bog and fen, closed-cone coniferous forest, coastal prairie, meadow, freshwater marsh, and North Coast coniferous forest habitat at elevations ranging from 3 to 1320 feet (CNPS 2012, CDFG 2012). Observed associated species include pygmy cypress (*Hesperocyparis pygmaea*), Bolander pine (*Pinus contorta* ssp. *bolanderi*), Bishop pine (*Pinus muricata*), red alder (*Alnus rubra*), coast redwood (*Sequoia sempervirens*), Douglas fir (*Pseudotsuga menziesii*), Pacific reedgrass (*Calamagrostis nutkaensis*), lady fern (*Athryium filix-femina*), California blackberry (*Rubus ursinus*), salmonberry (*R. spectabilis*), Labrador tea (*Rhododendron columbianum*), Nootka rose (*Rosa nutkana*), evergreen huckleberry (*Vaccinium ovatum*), tinker's penny (*Hypericum anagalloides*), sedges (*Carex* spp.), rushes (*Juncus* spp.), and horsetail (*Equisetum* spp.) (CDFG 2012).

Swamp harebell is known from 26 USGS 7.5-minute quadrangles in Marin, Mendocino, Santa Cruz, and Sonoma counties (CNPS 2012). There are 27 CNDDB (CDFG 2012) records in the greater vicinity of the Study Area, and 21 CCH (2012) records from Mendocino County. The nearest documented occurrence is from August 1983 along Summers Lane, approximately one mile northwest of the Study Area (CDFG 2012). The most recent documented occurrence from Mendocino County is from July 2007 in Little Valley Creek Basin, approximately six miles north of the Study Area (CDFG 2012).

Swamp harebell has a high potential to occur in the Study Area due to the presence of associated species, suitable habitat, suitable hydrologic and edaphic conditions, and the relative location of the documented occurrences. However, this species was not observed during the protocol-level rare plant survey conducted in July 2012.

California sedge (*Carex californica*). CNPS Rank 1B. High Potential (Present). California sedge is a perennial graminoid in the sedge family (Cyperaceae) that blooms May to August. It typically occurs in drier portions of wetlands in bogs and fens, closed-cone coniferous forest, coastal prairie, meadows, and marshes and swamps at elevations ranging from 290 to 1090 feet (CNPS 2012, CDFG 2012). Observed associated species pygmy cypress (*Hesperocyparis pygmaea*), Bolander's pine (*Pinus contorta* ssp. *bolanderi*), evergreen huckleberry (*Vaccinium ovatum*), Pacific rhododendron (*Rhododendron macrophyllum*), Labrador tea (*R. columbianum*), salal (*Gaultheria shallon*), glossy-leaf manzanita (*Arctostaphylos nummularia*), coast lily (*Lilium maritimum*), bracken fern (*Pteridium aquilinum*), and coast sedge (*Carex obnupta*) (CDFG 2012).

California sedge is known from eight USGS 7.5-minute quadrangles in Mendocino County (CNPS 2012). There are 21 CNDDB (CDFG 2012) records within the greater vicinity of the Study Area, and 28 CCH (2012) records from Mendocino County. The nearest and most recent documented occurrence is from June 2010 along Summers Lane, approximately one mile northwest of the Study Area (CDFG 2012).

California sedge has a high potential to occur in the Study Area due to suitable substrate and hydrologic conditions, associated habitats and species, and the relative location of nearest documented occurrences. Several hundred individuals of California sedge were observed throughout the Study Area, with the densest populations located in transitional pygmy forest and extreme pygmy forest. Individuals within the transitional and extreme pygmy forest community were estimated based on vegetation plot data, and total 644 individuals. Populations within the tall pygmy forest and seasonal wetland depression communities were discrete, and 250 individuals were counted. Therefore, an estimated total of 894 individuals are situated within the Study Area.

Green yellow sedge (*Carex viridula* var. *viridula*). CNPS Rank 2. Moderate Potential. Green yellow sedge is a perennial graminoid in the sedge family (Cyperaceae) that blooms from June to November. It typically occurs in mesic sites within bog and fen, freshwater marsh and swamp, and North Coast coniferous forest habitat at elevations ranging from 0 to 5200 feet (CNPS 2012, CDFG 2012). Observed associated species include Buxbaum's sedge (*Carex buxbaumii*), flaccid sedge (*C. leptalea*), northern bugleweed (*Lycopus uniflorus*), and marsh pea (*Lathyrus palustris*) (CDFG 2012).

Green yellow sedge is known from eight USGS 7.5-minute quadrangles in Del Norte, Humboldt, Mendocino, and Tuolomne counties (CNPS 2012). There is one CNDDB (CDFG 2012) record within the greater vicinity of the Study Area, and no CCH (2012) records from Mendocino County. The nearest and most recent documented occurrence from Mendocino County is undated located in Inglenook Fen, MacKerricher State Park, approximately seven miles north of the Study Area (CDFG 2012).

Green yellow sedge has a moderate potential to occur in the Study Area due to the presence of associated habitats; however, few areas within the Study Area contain hydrology sufficient to support this species. Green yellow sedge was not observed during protocol-level rare plant surveys conducted in July 2012.

Pygmy cypress (*Hesperocyparis pygmaea*). CNPS Rank 1B. High Potential (Present). Pygmy cypress is an evergreen tree in the cypress family (Cupressaceae) which is identifiable throughout the year. It typically is stand forming on podzol-like soils (e.g. Blacklock soil series) within closed-cone coniferous forest at elevations ranging from 100 to 1950 feet (CNPS 2012, CDFG 2012). Observed associated species include Bishop pine (*Pinus muricata*), Bolander's pine (*P. contorta* ssp. *bolanderi*), coast redwood (*Sequoia sempervirens*), evergreen huckleberry (*Vaccinium ovatum*), Labrador tea (*Rhododendron columbianum*), Pacific rhododendron (*R. macrophyllum*), redwood manzanita (*Arctostaphylos columbianum*), Eastwood manzanita (*A. glandulosa*), glossy-leaf manzanita (*A. nummularia*), salal (*Gaultheria shallon*), coast lily (*Lilium maritimum*), bracken fern (*Pteridium aqulinum*), and bear grass (*Xerophyllum tenax*) (CDFG 2012).

Pygmy cypress is known from 12 USGS 7.5-minute quadrangles in Mendocino and Sonoma counties (CNPS 2012). There are 22 CNDDB (CDFG 2012) records within the greater vicinity of the Study Area, and 81 CCH (2012) records from Mendocino County. The nearest documented occurrence is from April 1986 along Summers Lane, approximately one mile northwest of the Study Area (CNDDB 2012). The most recent documented occurrence from Mendocino County is from September 2008 near Noyo Hill in Jackson State Demonstration Forest, approximately 1.5 miles south of the Study Area.

Pygmy cypress has a high potential to occur in the Study Area due to the presence of suitable soil, associated species, and the relative location of the nearest documented occurrences. Several hundred individuals of pygmy cypress were observed throughout the Study Area, with the densest stands located in pygmy cypress forest. Due to extensive distribution of this stand-forming species, individuals were not mapped; however, 2,038 individuals were estimated across the Study Area based on vegetation plot data (Appendix D).

Coast lily (*Lilium maritimum*). CNPS Rank 1B. High Potential (Present). Coast lily is a rhizomatous perennial forb in the lily family (Fabaceae) that blooms from May to August. It typically occurs in wetlands on sandy substrates in hummocks, roadsides, ditches, and undisturbed areas in closed-cone coniferous forest, North Coast coniferous forest, broadleaf upland forest, coastal prairie, coastal scrub, and freshwater marsh and swamp habitat at elevations ranging from 15 to 1545 feet (CNPS 2012, CDFG 2012). Observed associated species include Douglas fir (*Pseudotsuga menziesii*), coast redwood (*Sequoia sempervirens*), Bishop pine (*Pinus muricatus*), Bolander's pine (*P. contorta* ssp. *bolanderi*), tanoak (*Notholithocarpus densiflorus*), giant chinquapin (*Chrysolepis chrysophylla*), wax myrtle (*Morella californica*), evergreen huckleberry (*Vaccinium ovatum*), evergreen violet (*Viola sempervirens*), bracken fern (*Pteridium aquilinum*), and deer fern (*Blechnum spicant*) (CDFG 2012).

Coast lily is known from 19 USGS 7.5-minute quadrangles in Marin, Mendocino, San Francisco, San Mateo, and Sonoma counties (CNPS 2012). There are 23 CNDDB (CDFG 2012) records within the greater vicinity of the Study Area, and 59 CCH (2012) records from Mendocino County. The nearest documented occurrence is from July 1974 along California Highway 20 immediately adjacent to the Study Area (CNDDB 2012). The most recent documented occurrence from Mendocino County is from June 2007 at the Glass Beach Headlands, approximately four miles northwest of the Study Area (CNDDB 2012).

Coast lily has a high potential to occur in the Study Area due to the presence of the associated habitat, suitable substrate and hydrology, associated species, and the relative locations of documented occurrences. Two sub-populations of coast lily were observed and mapped within the Study Area. The first population is located near Highway 20 in the southwest corner of the Study Area within Bishop pine forest, and contains 104 individuals. The second population is composed of five individuals and is located within extreme pygmy cypress forest in the eastern portion of the Study Area (Figure 3). Most individuals were in bud or flower when observed in May and/or July.

Bolander's pine (*Pinus contorta* ssp. *bolanderi*). CNPS Rank 1B. High Potential (Present). Bolander's pine is an evergreen tree in the pine family (Pinaceae) that is identifiable throughout the year based on vegetative structures and cones. It typically occurs on podzol-like soils in closed-cone coniferous forest habitat at elevations ranging from 240 to 815 feet (CNPS 2012, CNDDB 2012). Observed associated species include pygmy cypress (*Hesperocyparis pygmaea*), Bishop pine (*Pinus muricata*), Labrador tea (*Rhododendron columbianum*), Pacific rhododendron (*R. macrophyllum*), wax myrtle (*Morella californica*), evergreen huckleberry (*Vaccinium ovatum*), giant chinquapin (*Chrysolepis chrysophylla*), California sedge (*Carex californica*), bracken fern (*Pteridium aquilinum*), coast lily (*Lilium maritimum*), and bear grass (*Xerophyllum tenax*) (CDFG 2012).

Bolander's pine is known from six USGS 7.5-minute quadrangles in Mendocino County (CNPS 2012). There are 23 CNDDB (CDFG 2012) records in the greater vicinity of the Study Area, and 45 CCH (2012) records from Mendocino County. The nearest documented occurrence is from 1983 along Summers Lane, approximately one mile northwest of the Study Area (CDFG 2012). The most recent documented occurrence from Mendocino County is from October 2002 in Van Damme State Park, approximately ten miles south of the Study Area (CDFG 2012).

Bolander's pine has a high potential to occur in the Study Area due to the presence of associated species, suitable substrate, and the relative location of the nearest documented occurrences. Several hundred individuals of Bolander's pine were observed throughout the Study Area, with the densest stands located in pygmy forest. Due to extensive distribution of this stand-forming species, individuals were not mapped; however, 790 individuals were estimated across the Study Area based on vegetation plot data (Appendix D).

4.4.2 Special-status Wildlife Species

Fifty-one special-status species of wildlife have been recorded in the greater vicinity of the Study Area (Figure 5). Appendix B summarizes the potential for each of these species to occur in the Study Area. No special-status wildlife species were observed in the Study Area during the site assessment. Six special-status wildlife species have a moderate to high potential to occur in the Study Area. For the remaining 45 species, the Study Area either lacks potentially suitable habitat or the Study Area may contain potential habitat, but the habitat is fragmented and disturbed to the extent that the occurrence of special-status species is unlikely. Special-status wildlife species with a moderate to high potential to occur in the Study Area are discussed below.

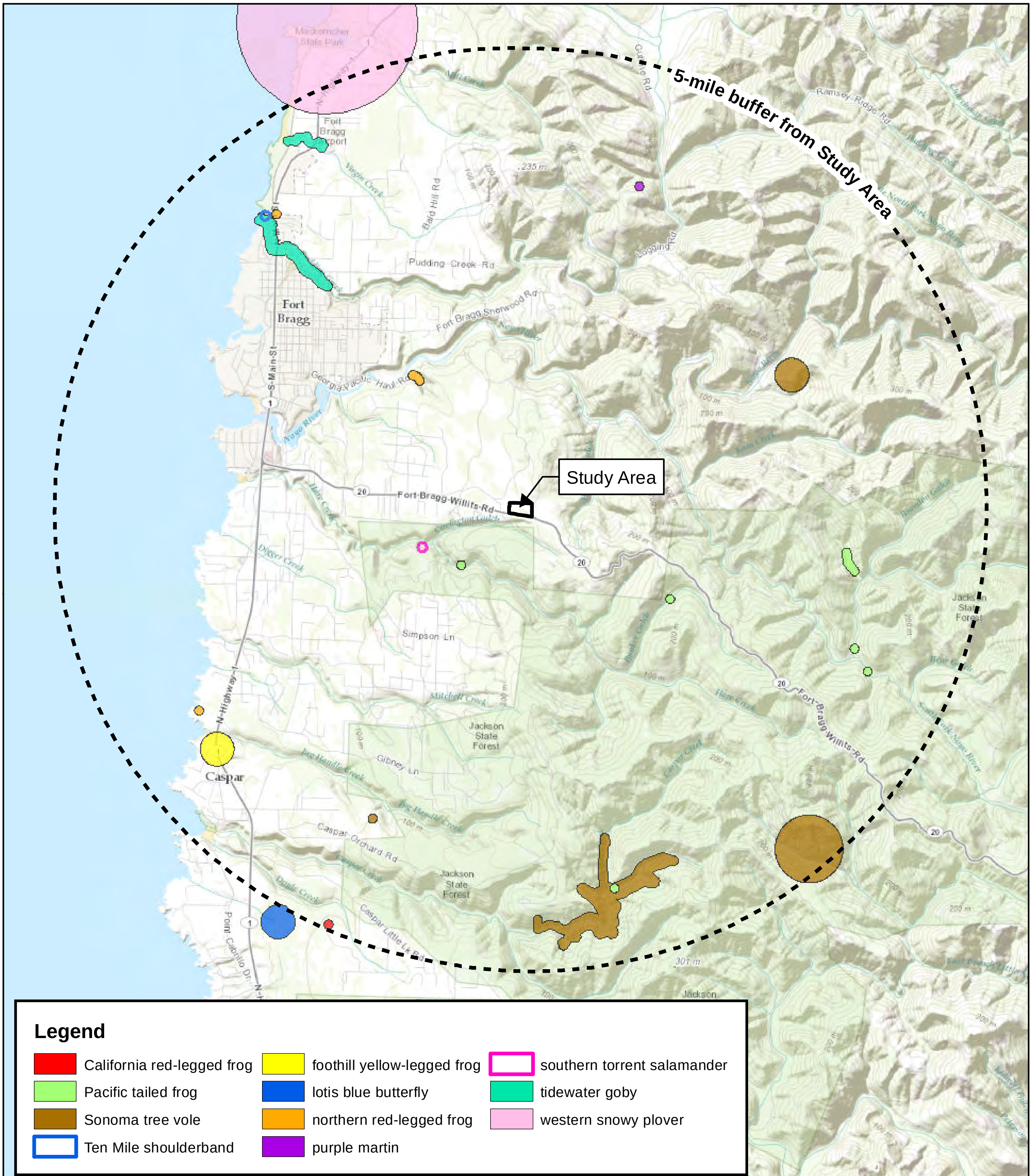

Figure 5. Special Status Wildlife Species within 5 miles of the Study Area

Mendocino County, California

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ENVIRONMENTAL CONSULTANTS

Date: June 2013
Map By: Derek Chan
Map Source: CNDDB

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Sonoma tree vole (*Arborimus pomo*), CDFW Species of Special Concern. High Potential. The Sonoma tree vole is distributed along the northern California coast from Sonoma County to the Oregon border. It occurs in old-growth and other forest types of Douglas and other conifers, including stands of Bishop pine. This species breeds year-round, but most often from February through September. Nests are constructed preferentially in tall trees, and may be situated on a whorl of limbs against the trunk, or at the outer limits of branches. Males nest most frequently in a tree nest constructed of needles, or less frequently in shallow burrows at the base of the tree, beneath litter. Females tend to spend most of their lives in trees, constructing large, domed nursery nests of needles at six to 150 feet above the ground (Howell 1926). In young second-growth Douglas-fir, nests are often placed on broken tops of trees (Maser et al. 1981), although old-growth Douglas fir stands likely provide the optimal structural components for nest-building (BLM 2002). The Sonoma tree vole is a coniferous needle specialist; needles and twigs are gathered primarily during the night, and may be consumed where found or brought to the nest. Needle resin ducts are removed. The remaining part is eaten, and the resin ducts may be used to line the nest cup. This unique nest lining is an identifying characteristic of STV nests.

This species was not observed during the reconnaissance-level site visit, nor was any sign of its presence observed. However, there are several documented occurrences within five miles of the Study Area (CDFW 2013), and the Study Area contains mature Bishop pines and other conifers. For these reasons, Sonoma tree vole has a high potential to be present.

Fringed myotis (*Myotis thysanodes*), Western Bat Working Group “High Priority” Species. Moderate Potential. This bat ranges through much of western North America and is found in various habitats, including desert scrubland, grassland, sage-grass steppe, old-growth forest, and subalpine coniferous and mixed deciduous forest. Oak and pinyon-juniper woodlands are most commonly used. Fringed Myotis roosts in colonies from ten to 2,000 individuals, although large colonies are rare. Caves, buildings, underground mines, rock crevices in cliff faces, and bridges are used for maternity and night roosts, while hibernation has only been documented in buildings and underground mines. Tree-roosting has also been documented in Oregon, New Mexico, and California (WBWG 2010).

While the Study Area does not contain optimal roosting habitat for this species, cavities and exfoliating bark within the mature conifers present may provide suitable roosting locations during certain portions of the year.

Vaux’s swift (*Chaetura vauxi*), CDFW Species of Special Concern. Moderate Potential. Vaux's swift is a summer resident in California, breeding on the coast from central California northward and in the Cascades and Sierra Nevada. Nesting occurs in large, accessible, chimney-like tree cavities that allow birds to fly within the cavity directly to secluded nest sites. Such cavities usually occur in conifers, most particularly old redwoods (Shuford and Gardali 2008). Chimneys and similar manmade substrates are also used for nesting. This species is highly aerial and forages widely for insects in areas of open airspace. During migration, nocturnal roosting occurs communally; favored roosts may host thousands of individuals. The Study Area contains conifers with some large, vertical-oriented cavities, and thus provides suitable breeding habitat.

Olive-sided flycatcher (*Contopus cooperi*), CDFW Species of Special Concern. Moderate Potential. The olive-sided flycatcher is a summer resident in California, wintering in Central and South America. It breeds in a variety of forested habitats, typically coniferous forests at higher elevations, but also in mixed forest and woodlands at lower elevations. Breeding habitat is often associated with forest openings and edges, both natural (e.g., meadows, canyons) and man-made (e.g., logged areas) (Altman and Sallabanks 2012). Nests are usually in conifers, and placed at variable height on the outer portions of branches. This species forages for insects, usually from prominent tree snags. The coniferous forest of the Study Area provides suitable breeding habitat, particularly in its western portion along edge areas.

Purple martin (*Progne subis*), CDFW Species of Special Concern. Moderate Potential. This large swallow is an uncommon summer resident in California, breeding in forest and woodlands at low- to mid- elevations throughout much of the state. Nesting occurs primarily in tree cavities; trees selected are usually taller or isolated, with low canopy cover at the nest height, and situated on the upper portions of slopes and/or near bodies of water where large insects (favored prey) are abundant (Shuford and Gardali 2008). Conifers are the most frequently used tree type in northern California. Manmade structures with suitable cavities such as bridges or utility poles are also used. Coniferous forest within the Study Area includes taller trees with cavities, and recent nesting has been documented within four miles of the site (CDFW 2013).

Allen's hummingbird (*Selasphorus sasin*), USFWS Bird of Conservation Concern. Moderate Potential. Allen's hummingbird, common in many portions of its range, is a summer resident along the majority of California's coast and a year-round resident in portions of coastal southern California. Breeding occurs in association with the coastal fog belt, and typical habitats used include coastal scrub, riparian, woodland and forest edges, and eucalyptus and cypress groves (Mitchell 2000). Feeds on flower nectar, and forages for insects and spiders. The Study Area provides some forest edge habitat as well as nectar plants; this species has a moderate potential to be present, including breeding.

5.0 SUMMARY OF RESOURCES AND POTENTIAL JURISDICTION

Four sensitive biological communities were identified within the Study Area. Seven special-status plant species were assessed to have a moderate to high potential to occur, four of which were observed within the Study Area. Six special-status wildlife species have a moderate to high potential to occur within the Study Area; however, protocol-level surveys were not conducted.

5.1 Sensitive Biological Communities

Wetlands and Non-wetland Waters

Two wetland types were mapped within the Study Area, seasonal depression wetland and forest wetland. These wetlands were delineated following the Corps protocol and guidelines for the Western Mountains, Valleys, and Coasts supplement (Corps 2010), and submitted to the San Francisco Corps District (Appendix E). Therefore, these features are jurisdictional under Section 404/401 of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act, with the regulatory authority the San Francisco District Army Corps of Engineers and the North Coast Region RWQCB. Impacts to these features would require permits with the Corps and RWQCB, and would require mitigation.

Other Sensitive Biological Communities

Two sensitive forest habitats were mapped within the Study Area, Northern Bishop pine forest and Mendocino pygmy cypress forest. These forests were delineated based on aerial photographs, soil maps, and vegetation plot data (Appendix D). These forests would likely be considered during CEQA review, and impacts to these communities would likely require mitigation.

5.2 Special-status Plant Species

Four special-status plant species were mapped within the Study Area, Mendocino pygmy cypress, Bolander's pine, California sedge, and coast lily. The cypress, pine, and sedge are composed of extensive populations, while the coast lily is relatively confined to several areas. These species would likely be considered during CEQA review, and impacts to these species would likely require mitigation.

5.3 Special-status Wildlife Species

Six special-status wildlife species have the potential to be present within the Study Area, two mammals and four birds. All of these species would likely be considered during CEQA review if they are present on-site or have the potential to be present. Pre-construction surveys for such species are typically required prior to project initiation, and appropriate mitigation measures implemented (including avoidance and minimization practices), dependent upon the survey results. Sonoma tree vole and special-status bats (including those named "High Priority" species by the Western Bat Working Group) are protected by CDFW. Special-status birds are protected by the USFWS and/or CDFW. Additionally, most native birds that are not special-status receive baseline protection under both the federal Migratory Bird Treaty Act and CDFW codes. Impacts to birds generally consist of the "take" of active nests during the breeding season (i.e., nests with eggs and/or chicks).

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Appendix A

Plant Species Observed within the Study Area

Table A-1. Plant species observed in the Study Area, March 15, May 11, and July 10, 2012

Family	Scientific name	Common name	Life form	Origin	Invasive Status[1]	Rare Status[2]	Wetland indicator[3]
Apiaceae	*Daucus carota*	wild carrot	perennial forb	non-native	assessed	--	FACU
Aquifoliaceae	*Ilex aquifolium*	English holly	evergreen tree	non-native	moderate	--	NL
Asteraceae	*Baccharis pilularis*	coyote brush	evergreen shrub	native	--	--	NL
Asteraceae	*Bellis perennis*	English lawn daisy	perennial forb	non-native	assessed	--	NL
Asteraceae	*Carduus pycnocephalus*	Italian thistle	annual forb	non-native	moderate	--	NL
Asteraceae	*Cirsium vulgare*	bull thistle	perennial forb	non-native	moderate	--	FACU
Asteraceae	*Leontodon saxatilis*	hawkbit	annual forb	non-native	--	--	FACU
Asteraceae	*Senecio jacobaea*	tansy ragwort	perennial forb	non-native	limited	--	FACU
Asteraceae	*Sonchus oleraceus*	common sow thistle	annual forb	non-native	--	--	NL
Brassicaceae	*Cardamine oligosperma*	Idaho bittercress	annual forb	native	--	--	NL
Brassicaceae	*Raphanus sativus*	cultivated radish	perennial forb	non-native	limited	--	NL
Caprifoliaceae	*Lonicera hispidula*	pink honeysuckle	evergreen shrub	native	--	--	FACU
Cupressaceae	*Hesperocyparis pygmaea*	pygmy cypress	evergreen tree	native	--	Rank 1B	NL
Cupressaceae	*Sequoia sempervirens*	coast redwood	evergreen tree	native	--	--	NL
Cyperaceae	*Carex californica*	California sedge	perennial graminoid	native	--	Rank 2	FACW
Cyperaceae	*Carex obnupta*	slough sedge	perennial graminoid	native	--	--	OBL
Dennstaedtiaceae	*Pteridium aquilinum*	bracken fern	perennial fern	native	--	--	FACU
Dryopteridaceae	*Polystichum munitum*	western sword fern	perennial fern	native	--	--	FACU
Ericaceae	*Arctostaphylos columbiana*	hairy manzanita	evergreen shrub	native	--	--	NL
Ericaceae	*Arctostaphylos nummularia*	glossy-leaf manzanita	evergreen shrub	native	--	--	NL
Ericaceae	*Gaultheria shallon*	salal	evergreen shrub	native	--	--	FACU
Ericaceae	*Rhododendron columbianum*	western Labrador tea	evergreen shrub	native	--	--	OBL
Ericaceae	*Rhododendron macrophyllum*	California rose bay	evergreen shrub	native	--	--	NL
Ericaceae	*Vaccinium ovatum*	evergreen huckleberry	evergreen shrub	native	--	--	FACU
Ericaceae	*Vaccinium parvifolium*	red huckleberry	evergreen shrub	native	--	--	FACU
Fabaceae	*Acacia dealbata*	silver wattle	evergreen tree	non-native	moderate	--	NL
Fabaceae	*Cytisus scoparius*	Scotch broom	evergreen shrub	non-native	high	--	NL
Fabaceae	*Genista monspessulana*	French broom	evergreen shrub	non-native	high	--	NL
Fabaceae	*Hosackia rosea*	tree lotus	perennial forb	native	--	--	FACU
Fabaceae	*Lotus corniculatus*	bird's-foot trefoil	perennial forb	non-native	assessed	--	FAC

Family	Scientific name	Common name	Life form	Origin	Invasive Status[1]	Rare Status[2]	Wetland indicator[3]
Fabaceae	*Lupinus bicolor*	miniature lupine	annual forb	native	--	--	NL
Fabaceae	*Trifolium dubium*	shamrock clover	annual forb	non-native	--	--	FACU
Fabaceae	*Trifolium repens*	white clover	perennial forb	non-native	--	--	FAC
Fabaceae	*Trifolium striatum*	knotted clover	annual forb	non-native	--	--	NL
Fabaceae	*Trifolium subterraneum*	subterranean clover	annual forb	non-native	--	--	NL
Fabaceae	*Vicia sativa ssp. nigra*	garden vetch	annual forb	non-native	--	--	UPL
Fagaceae	*Chrysolepis chrysophylla*	giant chinquapin	evergreen tree	native	--	--	NL
Fagaceae	*Notholithocarpus densiflorus*	tanoak	evergreen tree	native	--	--	NL
Geraniaceae	*Geranium dissectum*	cutleaf geranium	annual forb	non-native	moderate	--	NL
Hydrangeaceae	*Whipplea modesta*	modesty	evergreen vine	native	--	--	NL
Iridaceae	*Iris douglasiana*	Douglas' iris	perennial forb	native	--	--	NL
Juncaceae	*Juncus effusus ssp. pacificus*	Pacific rush	perennial graminoid	native	--	--	FACW
Juncaceae	*Juncus patens*	common rush	perennial graminoid	native	--	--	FACW
Juncaceae	*Luzula comosa*	Pacific woodrush	perennial graminoid	native	--	--	FAC
Juncaceae	*Luzula parviflora*	small-flowered woodrush	perennial graminoid	native	--	--	FAC
Lamiaceae	*Stachys rigida var. quercetorum*	rough hedgenettle	perennial forb	native	--	--	FACW
Liliaceae	*Lilium maritimum*	coast lily	perennial forb	native	--	Rank 1B	FACW
Melanthiaceae	*Trillium ovatum*	Pacific trillium	perennial forb	native	--	--	FACU
Melanthiaceae	*Xerophyllum tenax*	common beargrass	perennial forb	native	--	--	NL
Moraceae	*Morella californica*	California wax myrtle	evergreen shrub	native	--	--	FACW
Papaveraceae	*Eschscholzia californica*	California poppy	perennial forb	native	--	--	NL
Pinaceae	*Pinus contorta ssp. bolanderi*	Bolander's pine	evergreen tree	native	--	Rank 1B	FAC
Pinaceae	*Pinus muricata*	bishop pine	evergreen tree	native	--	--	NL
Pinaceae	*Pseudotsuga menziesii*	Douglas fir	evergreen tree	native	--	--	FACU
Pinaceae	*Tsuga heterophylla*	western hemlock	evergreen tree	native	--	--	FACU
Plantaginaceae	*Plantago lanceolata*	English plantain	perennial forb	non-native	limited	--	FACU
Poaceae	*Agrostis exarata*	spike bentgrass	perennial graminoid	native	--	--	FACW
Poaceae	*Anthoxanthum odoratum*	sweet vernal grass	perennial graminoid	non-native	moderate	--	FACU
Poaceae	*Briza maxima*	rattlesnake grass	annual graminoid	non-native	limited	--	NL

Family	Scientific name	Common name	Life form	Origin	Invasive Status[1]	Rare Status[2]	Wetland indicator[3]
Poaceae	*Bromus carinatus*	California brome	perennial graminoid	native	--	--	NL
Poaceae	*Bromus diandrus*	ripgut brome	annual graminoid	non-native	moderate	--	NL
Poaceae	*Bromus hordeaceus*	soft chess	annual graminoid	non-native	limited	--	FACU
Poaceae	*Bromus laevipes*	Chinook brome	perennial graminoid	native	--	--	NL
Poaceae	*Cortaderia jubata*	pampas grass	perennial graminoid	non-native	high	--	FACU
Poaceae	*Danthonia californica*	California oatgrass	perennial graminoid	native	--	--	FAC
Poaceae	*Festuca arundinacea*	tall fescue	perennial graminoid	non-native	moderate	--	FAC
Poaceae	*Festuca idahoensis*	Idaho fescue	perennial graminoid	native	--	--	NL
Poaceae	*Festuca myuros*	rattail sixweeks grass	perennial graminoid	non-native	moderate	--	FACU
Poaceae	*Festuca rubra*	red fescue	perennial graminoid	native	--	--	FAC
Poaceae	*Holcus lanatus*	common velvet grass	perennial graminoid	non-native	moderate	--	FAC
Poaceae	*Hordeum brachyantherum*	meadow barley	perennial graminoid	native	--	--	FACW
Poaceae	*Triticum aestivum*	bread wheat	annual graminoid	non-native	--	--	NL
Polygonaceae	*Rumex acetosella*	common sheep sorrel	perennial forb	non-native	moderate	--	FACU
Rhamnaceae	*Frangula californica*	California coffeeberry	evergreen shrub	native	--	--	NL
Rosaceae	*Cotoneaster pannosus*	silverleaf cotoneaster	evergreen shrub	non-native	moderate	--	NL
Rosaceae	*Rubus ursinus*	California blackberry	evergreen shrub	native	--	--	FACU
Violaceae	*Viola sempervirens*	evergreen violet	perennial forb	native	--	--	NL

- All species identified using the *Jepson Manual* (Hickman 1993) and *Jepson Manual II: Vascular Plants of California* (Baldwin et al. 2012)
- Nomenclature follows *Jepson Manual II: Vascular Plants of California* (Baldwin et al. 2012)

[1]Invasive Status: California Invasive Plant Inventory (Cal-IPC 2006)
[2]Rare Status: The CNPS Inventory of Rare and Endangered Plants (CNPS 2012)
[3]Wetland Status: National List of Plant Species that Occur in Wetlands, California (Lichvar 2012)

Appendix B

Potential for Special-status Species to Occur in the Study Area

Table B-1. Potential for Special-status Plant Species to Occur in the Study Area. List compiled from the California Department of Fish and Game (CDFG) Natural Diversity Database (March 2012), U.S. Fish and Wildlife Service (USFWS) Species Lists (March 2012), and California Native Plant Society (CNPS) Electronic Inventory (March 2012) searches of the Inglenook, Fort Bragg, Mendocino, Dutchmans Knoll, Noyo Hill, and Mathison Peak USGS 7.5'.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA	RESULTS AND RECOMMENDATIONS
PLANTS				
pink sand verbena *Abronia umbellata* var. *breviflora*	Rank 1B	Coastal dune, coastal strand; located on foredunes and interdunes with low vegetation cover. Elevation range: 0 – 35 feet. Blooms: June – October.	**No Potential.** The Study Area does not contain coastal dune or coastal strand habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
Blasdale's bent grass *Agrostis blasdalei*	Rank 1B	Coastal dune, coastal bluff scrub, coastal prairie; located on sandy to gravelly substrate close to rocks of bluff faces; typically located in nutrient poor areas with sparse vegetation cover. Elevation range: 15 – 490 feet. Blooms: May – July.	**No Potential.** The Study Area does not contain coastal dune, coastal bluff scrub, or coastal prairie habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
pygmy manzanita *Arctostaphylos nummularia* ssp. *mendocinensis*	Rank 1B	Closed-cone coniferous forest; located acidic, sandy clay substrate in pygmy forest stands. Elevation range: 290 – 600 feet. Blooms: January.	**High Potential.** The Study Area contains suitable substrate conditions and pygmy forest habitat that may support this species. The nearest documented occurrence is from approximately seven miles from the Study Area.	**Not Present.** This species was not observed during rare plant surveys in May and July.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA	RESULTS AND RECOMMENDATIONS
Humboldt County milk-vetch *Astragalus agnicidus*	SE; Rank 1B	Broadleaf upland forest, redwood forest; located in disturbed openings in timber lands, on south-facing aspects, and along ridgelines. Elevation range: 585 – 2600 feet. Blooms: April – September.	**No Potential.** The Study Area does not contain broadleaf upland forest or redwood forest necessary to support this species.	**Not Present.** No further actions are recommended for this species.
Point Reyes Blennosperma *Blennosperma nanum* var. *robustum*	SR; Rank 1B	Coastal prairie, coastal scrub; located on open coastal hills underlain by sandy substrate. Elevation range: 30 – 475 feet. Blooms: February – April.	**No Potential.** The Study Area does not contain coastal prairie or coastal scrub habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
Thurber's reed grass *Calamagrostis crassiglumis*	Rank 2	Coastal scrub, freshwater marsh; typically located in marshy swales surrounded by grasslands or coastal scrub. Elevation range: 30 – 150 feet. Blooms: May – July.	**No Potential.** The Study Area does not contain coastal scrub or freshwater marsh habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
coastal bluff morning glory *Calystegia purpurata* ssp. *saxicola*	Rank 1B	Coastal dunes, coastal scrub; located on coastal bluffs. Elevation range: 30 – 330 feet. Blooms: May – September.	**No Potential.** The Study Area does not contain coastal dune or coastal scrub habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA	RESULTS AND RECOMMENDATIONS
swamp harebell *Campanula californica*	Rank 1B	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows, freshwater marsh, North Coast coniferous forest; typically located in wetlands within a variety of surrounding habitats. Elevation range: 3 – 1320 feet. Blooms: June – October.	**High Potential.** The Study Area contains wet areas within closed-cone coniferous forest (Bishop pine forest, pygmy forest) that may support this species. The nearest documented occurrence is less than one mile from the Study Area.	**Not Observed.** This species was not observed during rare plant surveys in May and July.
California sedge *Carex californica*	Rank 2	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows, marshes and swamps; located in drier areas of swamps, bogs, and marsh margins. Elevation range: 290 – 1090 feet. Blooms: May – August.	**High Potential.** The Study Area contains wetlands within closed-cone coniferous forest (pygmy forest) habitat that may support this species.	**Present.** Scattered individuals of this species were observed throughout the pygmy forest habitat and a seasonal wetland depression within and adjacent to the Study Area.
lagoon sedge *Carex lenticularis* var. *limnophila*	Rank 2	Bogs and fens, marshes and swamps, North Coast coniferous forest; located on lakeshores and beaches. Elevation range: 0 – 20 feet. Blooms: June – August.	**Unlikely.** Although the Study Area contains North Coast coniferous forest and wetland habitat, this species is known from sites nearer the coast associated with inland dune wetlands and beach pine forest.	**Not Present.** No further actions are recommended for this species.
livid sedge *Carex livida*	Rank 1A	Bogs and fens; historically known from sphagnum bogs. Elevation range: unknown. Blooms: June.	**No Potential.** The Study Area does not contain sphagnum bog habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA	RESULTS AND RECOMMENDATIONS
Lyngbye's sedge *Carex lyngbyei*	Rank 2	Marshes and swamps; brackish to freshwater. Elevation range: 0 – 35 feet. Blooms: April – August.	**Unlikely.** Although the Study Area contains wetland habitat, marsh habitat is not present necessary to support this species.	**Not Present.** No further actions are recommended for this species.
deceiving sedge *Carex saliniformis*	Rank 1B	Coastal prairie, coastal scrub, meadows and seeps, coastal salt marshes and swamps; located in mesic sites. Elevation range: 10 – 750 feet. Blooms: June – July.	**No Potential.** The Study Area does not contain coastal prairie, coastal scrub, meadow, or coastal salt marsh habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
green yellow sedge *Carex viridula* var. *viridula*	Rank 2	Bogs and fens, freshwater marshes and swamps, North Coast coniferous forest; located in mesic sites. Elevation range: 0 – 5200 feet. Blooms: June – November.	**Moderate Potential.** The Study Area contains coniferous forest (Bishop pine forest) with wetland sites that may support this species; however, this species is closely associated with Douglas fir-coast redwood forest habitat not present.	**Not Observed.** This species was not observed during rare plant surveys in May and July.
Oregon coast paintbrush *Castilleja affinis* ssp. *littoralis*	Rank 2	Coastal bluff scrub, coastal dune, coastal scrub; located on sandy substrate. Elevation range: 45 – 325 feet. Blooms: June.	**No Potential.** The Study Area does not contain coastal bluff scrub, coastal dune, or coastal scrub habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
Humboldt Bay owl's-clover *Castilleja ambigua* ssp. *humboldtiensis*	Rank 1B	Coastal salt marsh; located in marshes associated with salt grass, cordgrass, pickleweed, and jaumea. Elevation range: 0 – 10 feet. Blooms: April – August.	**No Potential.** The Study Area does not contain coastal salt marsh habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA	RESULTS AND RECOMMENDATIONS
Mendocino Coast paintbrush *Castilleja mendocinensis*	Rank 1B	Coastal bluff scrub, coastal scrub, coastal prairie, closed-cone coniferous forest, coastal dune; typically located on open sea bluffs and cliffs. Elevation range: 0 – 520 feet. Blooms: April – August.	**No Potential.** The Study Area does not contain coastal scrub, coastal prairie, or coastal closed-cone coniferous forest (beach pine forest) habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
Howell's spineflower *Chorizanthe howellii*	FE; ST; Rank 1B	Coastal dunes, coastal prairie, coastal scrub; located on sand dunes, sandy slopes, and sandy areas in coastal prairie. Elevation range: 0 – 115 feet. Blooms: May – July.	**No Potential.** The Study Area does not contain coastal dune, coastal prairie, or coastal scrub habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
Whitney's farewell-to-spring *Clarkia amoena* ssp. *whitneyi*	Rank 1B	Coastal bluff scrub, coastal scrub. Elevation range: 30 – 325 feet. Blooms: June – August.	**No Potential.** The Study Area does not contain coastal scrub habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
round-headed Chinese houses *Collinsia corymbosa*	Rank 1B	Coastal dunes, coastal prairie. Elevation range: 0 – 65 feet. Blooms: April – June.	**No Potential.** The Study Area does not contain coastal dune habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
Oregon goldthread *Coptis laciniata*	Rank 2	North Coast coniferous forest, meadows and seeps; located in mesic sites, roadsides, and streamsides. Elevation range: 0 – 3250 feet. Blooms: March – April.	**Unlikely.** Although the Study Area contains North Coast coniferous forest (Bishop pine forest), this species is closely associated with mesic sites (e.g. streambanks) in coast redwood-Douglas fir forest habitat.	**Not Present.** No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA	RESULTS AND RECOMMENDATIONS
Mendocino dodder *Cuscuta pacifica* var. *papillata*	Rank 1B	Coastal dunes; located in interdune depressions; likely hosts on lupines, catchflies, and cudweeds. Elevation range: 0 – 165 feet. Blooms: July – October.	**No Potential.** The Study Area does not contain coastal dune habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
supple daisy *Erigeron supplex*	Rank 1B	Coastal bluff scrub, coastal prairie; typically located in grassy sites along the coastline. Elevation range: 30 – 165 feet. Blooms: May – July.	**No Potential.** The Study Area does not contain coastal scrub or coastal prairie habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
Menzies' wallflower *Erysimum menziesii* ssp. *menziesii*	FE; SE; Rank 1B	Coastal dune; located on stabilized and shifting dunes and coastal strand. Elevation range: 0 – 115 feet. Blooms: March – June.	**No Potential.** The Study Area does not contain coastal dune habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
Roderick's fritillary *Fritillaria roderickii*	SE; Rank 1B	Coastal bluff scrub, coastal prairie, valley and foothill grassland; located on grassy slopes, mesas, and terraces. Elevation range: 45 – 1300 feet. Blooms: March – May.	**No Potential.** The Study Area does not contain coastal bluff scrub, coastal prairie, or coastal grassland habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
Pacific gilia *Gilia capitata* ssp. *pacifica*	Rank 1B	Coastal bluff scrub, coastal prairie, valley and foothill grassland. Elevation range: 15 – 3090 feet. Blooms: April – August.	**No Potential.** The Study Area does not contain coastal bluff scrub, coastal prairie, or grassland habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
dark-eyed gilia *Gilia millefoliata*	Rank 1B	Coastal dune. Elevation range: 5 – 100 feet. Blooms: April – July.	**No Potential.** The Study Area does not contain coastal dune habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA	RESULTS AND RECOMMENDATIONS
white seaside tarplant *Hemizonia congesta* ssp. *congesta*	Rank 1B	Coastal scrub, valley and foothill grassland; located in grassy valleys and hills, often fallow fields. Elevation range: 65 – 1820 feet. Blooms: April – November.	**No Potential.** The Study Area does not contain coastal scrub or grassland habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
short-leaved evax *Hesperevax sparsiflora* var. *brevifolia*	Rank 1B	Coastal bluff scrub, coastal dune; located on sandy bluffs and flats near the immediate coastline. Elevation range: 0 – 700 feet. Blooms: March – June.	**No Potential.** The Study Area does not contain coastal bluff scrub or coastal dune habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
pygmy cypress *Hesperocyparis pygmaea*	Rank 1B	Closed-cone coniferous forest; located on podzol-like soils (Blacklock series). Elevation range: 100 – 1950 feet.	**High Potential.** The Study Area contains Blacklock series soils and closed-cone coniferous forest.	**Present.** Extensive stands of this species are located throughout the Study Area, particularly as a stand-forming in the pygmy forest habitat.
Point Reyes horkelia *Horkelia marinensis*	Rank 1B	Coastal dunes, coastal prairie, coastal scrub; located on sandy flats and dunes near the coast; in open grassy sites within scrub. Elevation range: 15 – 1140 feet. Blooms: May – September.	**No Potential.** The Study Area does not contain coastal dune, coastal prairie, or coastal scrub habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
hair-leaved rush *Juncus supiniformis*	Rank 2	Marshes and swamps, bogs and fens; located in sites near the coast. Elevation range: 65 – 325 feet. Blooms: April – June.	**Unlikely.** Although the Study Area contains wetland habitat, this species is known primarily from sphagnum bog habitat not present in the Study Area.	**Not Present.** No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA	RESULTS AND RECOMMENDATIONS
Baker's goldfields *Lasthenia californica* ssp. *bakeri*	Rank 1B	Closed-cone coniferous forest, coastal scrub; located in openings in scrub and coastal forest habitat. Elevation range: 195 – 1690 feet. Blooms: April – October.	**No Potential.** The Study Area does not contain coastal scrub or beach pine forest necessary to support this species.	**Not Present.** No further actions are recommended for this species.
perennial goldfields *Lasthenia californica* ssp. *macrantha*	Rank 1B	Coastal bluff scrub, coastal dune, coastal scrub. Elevation range: 15 – 1690 feet. Blooms: January – November.	**No Potential.** The Study Area does not contain coastal bluff scrub, coastal dune, or coastal scrub habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
coast lily *Lilium maritimum*	Rank 1B	Closed-cone coniferous forest, coastal prairie, coastal scrub, broadleaf upland forest, North Coast coniferous forest; typically located on sandy soils, often in raised hummocks or bogs, and roadside ditches. Elevation range: 15 – 1545 feet. Blooms: May – August.	**High Potential.** The Study Area contains closed-cone coniferous forest and closed-cone coniferous forest (Bishop pine forest, pygmy forest) that may support this species.	**Present.** One concentrated and a second dispersed population of this species is located within or adjacent to the Study Area.
northern microseris *Microseris borealis*	Rank 2	Bogs and fens, meadows and seeps, lower montane coniferous forest. Elevation range: 3250 – 6500 feet. Blooms: June – September.	**No Potential.** The Study Area does not contain bog, fen, meadow, seep, or lower montane coniferous forest habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA	RESULTS AND RECOMMENDATIONS
Wolf's evening-primrose *Oenothera wolfii*	Rank 1B	Coastal bluff scrub, coastal dune, coastal prairie, lower montane coniferous forest; located on sandy substrates in mesic sites. Elevation range: 10 – 2600 feet. Blooms: May – October.	**Unlikely.** Although the Study Area contains coniferous forest, this species is most closely associate with open grassy sites (prairie, scrub) on the coast.	**Not Present.** No further actions are recommended for this species.
seacoast ragwort *Packera bolanderi* var. *bolanderi*	Rank 2	Coastal scrub, North Coast coniferous forest. Elevation range: 100 – 2115 feet. Blooms: January – July.	**Unlikely.** Although the Study Area contains North Coast coniferous forest, this species is closely associated with coast redwood-Douglas fir forest habitat not present in the Study Area.	**Not Present.** No further actions are recommended for this species.
North Coast phacelia *Phacelia insularis* var. *continentis*	Rank 1B	Coastal bluff scrub, coastal dune; located on open maritime bluffs underlain by sandy substrate. Elevation range: 30 – 555 feet. Blooms: March – May.	**No Potential.** The Study Area does not contain coastal bluff scrub or coastal dune habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
Bolander's pine *Pinus contorta* ssp. *bolanderi*	Rank 1B	Closed-cone coniferous forest; located on podzol-like soils (Blacklock series), closely associated with Bishop pine and pygmy cypress. Elevation range: 240 – 815 feet.	**High Potential.** The Study Area contains Blacklock series soils and closed-cone coniferous forest.	**Present.** Extensive stands of this species are located throughout the Study Area, particularly as stand-forming in the pygmy forest habitat.
dwarf alkali grass *Puccinellia pumila*	Rank 2	Meadows and seeps, marshes and swamps; located in mineral spring meadows and coastal salt marshes. Elevation range: 1 – 35 feet. Blooms: July.	**No Potential.** The Study Area does not contain mineral springs, meadow, seep, or marsh habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA	RESULTS AND RECOMMENDATIONS
white beaked-rush *Rhynchospora alba*	Rank 2	Bogs and fens, meadows and seeps, marshes and swamps; located in freshwater perennial wetlands and sphagnum bogs. Elevation range: 195 – 6630 feet. Blooms: July – August.	**No Potential.** The Study Area does not contain sphagnum bog or perennial marsh wetland habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
great burnet *Sanguisorba officinalis*	Rank 2	Bogs and fens, meadows and seeps, broadleaf upland forest, marshes and swamps, North Coast coniferous forest, riparian forest; located on rocky serpentine seeps and streams. Elevation range: 195 – 4550 feet. Blooms: July – October.	**No Potential.** The Study Area does not contain serpentine substrate necessary to support this species.	**Not Present.** No further actions are recommended for this species.
purple-stemmed checkerbloom *Sidalcea malviflora* ssp. *purpurea*	Rank 1B	Broadleaf upland forest, coastal scrub. Elevation range: 45 – 280 feet. Blooms: May – June.	**No Potential.** The Study Area does not contain coastal prairie or broadleaf upland forest habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
Monterey clover *Trifolium trichocalyx*	FE; SE; Rank 1B	Closed-cone coniferous forest; located on poorly drained, nutrient-deficient soils with a hardpan; often in openings and burned areas. Elevation range: 95 – 780 feet. Blooms: April – June.	**Unlikely.** This species is most closely associated with Monterey pine forests of the Central Coast, with one occurrence from coast redwood-Douglas fir forest of the North Coast.	**Not Present.** No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA	RESULTS AND RECOMMENDATIONS
coastal triquetrella *Triquetrella californica*	Rank 1B	Coastal bluff scrub, coastal scrub, valley and foothill grassland; grows within 100 feet of the coastline in scrub and grasslands on open gravel substrates of roads, hillsides, bluffs, and slopes. Elevation range: 30 – 325 feet.	**No Potential.** The Study Area does not contain coastal bluff scrub, coastal scrub, or grassland habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.
alpine marsh violet *Viola palustris*	Rank 2	Coastal scrub, bogs and fens; located in swampy and shrubby places in coastal scrub or bog habitat. Elevation range: 0 – 490 feet. Blooms: March – August.	**No Potential.** The Study Area does not contain coastal scrub or coastal bog habitat necessary to support this species.	**Not Present.** No further actions are recommended for this species.

Table B-2. Potential for Special-status Wildlife Species to Occur in the Study Area. List compiled from California Department of Fish and Game (CDFG) Natural Diversity Database (CNDDB) (May 2012), and U.S. Fish and Wildlife Service (USFWS) Species Lists (May 2012) of the Dutchman's Knoll, Fort Bragg, Inglenook, Mathison Peak, Mendocino, and Noyo Hill USGS 7.5' quadrangles, and a review of other CDFG lists and publications (Jennings and Hayes 1994, Zeiner et al. 1990).

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA
Mammals			
Antrozous pallidus pallid bat	SSC	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	**Unlikely.** Suitable roosting sites are not present in Study Area, although this species may occasionally forage over the Study Area.
Aplodontia rufa nigra Point Arena mountain beaver	FE, SSC	Live in underground burrow systems with openings under vegetation, often on steep north-facing slopes or in gullies. The burrows are found in moist areas with well-drained soil.	**No potential**. The Study Area is outside of known range of this species.
Arborimus pomo Sonoma tree vole	SSC	Occurs in old-growth and other forests, mainly Douglas-fir, redwood, and montane hardwood-conifer habitats. Feeds only on conifer leaves, almost exclusively on Douglas-fir.	**High Potential.** Suitable habitat is present within the Study Area, and it is within the known range of this species.
Corynorhinus townsendii townsendii Townsend's big-eared bat	SSC, WBWG High	Primarily found in rural settings in a wide variety of habitats including oak woodlands and mixed coniferous-deciduous forest. Day roosts highly associated with caves and mines. Very sensitive to human disturbance.	**Unlikely.** Suitable roosting sites are not present, although this species may occasionally forage over the Study Area.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA
Eumetopias jubatus steller [northern] sea lion	FT	Breeds on Año Nuevo, San Miguel and Farallon islands, Point Saint George, and Sugarloaf. Hauls-out on islands and rocks. Needs haul-out and breeding sites with unrestricted access to water, near aquatic food supply and with no human disturbance.	**No potential.** The Study Area does not contain any coastal or marine habitat.
Martes pennanti pacifica Pacific fisher	FC, SSC	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Use cavities, snags, logs and rocky areas for cover and denning. Need large areas of mature, dense forest.	**Unlikely.** Although the Study Area contains suitable habitat elements, it is it not within the known current range of the species.
Myotis thysanodes fringed myotis	WBWG High Priority	Associated with a wide variety of habitats including mixed coniferous-deciduous forest and redwood/sequoia groves. Buildings, mines and large snags are important day and night roosts.	**Moderate potential.** Mature trees and snags that support cavities or exfoliating bark may provide roosting habitat. This species may occasionally forage over the Study Area.
Myotis volans long-legged myotis	WBWG High Priority	Generally associated with woodlands and forested habitats. Large hollow trees, rock crevices and buildings are important day roosts. Other roosts include caves, mines and buildings.	**Unlikely.** Suitable roosting sites are not present, although this species may occasionally forage over the Study Area.
Phoca vitulina richardsi Pacific harbor seal	MMPA	Occurs in marine and estuarine environments the length of California. Breeds on islands; hauls out on mainland sites.	**No potential.** The Study Area does not contain any coastal or marine habitat.
Zalophus californianus California sea lion	MMPA	Occurs in marine and estuarine environments from Vancouver Island, British Columbia to the southern tip of Baja California. Breeds on offshore islands from the Channel Islands southward. Hauls out on mainland sites.	**No potential.** The Study Area does not contain any coastal or marine habitat.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA
Birds			
Accipiter gentilis northern goshawk	SC, SSC	Year-round resident within and on the edges of mixed and coniferous forests. Usually occurs in mature, old-growth forests. Hunts medium-sized birds.	**Unlikely.** The Study Area is located to the west of this species' Mendocino County distribution as per a recent monograph in Shuford and Gardali (2008).
Agelaius tricolor tricolored blackbird	SSC	Resident, though wanders during the non-breeding season. Highly colonial when breeding. Usually nests over or near freshwater in dense cattails, tules, or thickets of willow, blackberry, wild rose or other tall herbs.	**No Potential.** The Study Area does not contain any typical nesting habitat, and is located outside of this species' limited breeding distribution in Mendocino County per a recent monograph in Shuford and Gardali (2008).
Aquila chrysaetos golden eagle	CFP	Found in rolling foothill and mountain areas, sage-juniper flats, and dessert. Cliff-walled canyons provide nesting habitat in most parts of range; also nests in large, often isolated trees.	**Unlikely.** The Study Area contains a dense, coniferous forest canopy not suitable for foraging. May rarely occur in the vicinity during dispersal or other movements.
Asio flammeus short-eared owl	SSC	Resident and winter visitor. Found in open, treeless areas (e.g. marshes, grasslands) with elevated sites for foraging perches and dense vegetation for roosting and nesting.	**No Potential.** The Study Area does not contain suitable open habitat for this species, which is not known to breed in Mendocino County per a recent monograph in Shuford and Gardali (2008).
Asio otus long-eared owl	SSC	Largely resident. Nests in a variety of woodland habitats, including coniferous, oak and riparian. Requires adjacent open land (e.g. grasslands, meadows) for foraging, and the presence of old nests of other birds for nesting.	**Unlikely.** The Study Area is forested, and there is very limited open habitat in the vicinity.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA
Athene cunicularia burrowing owl	SSC	Occurs in open grasslands and shrublands with sparse vegetation. Roosts and nests in mammal burrows, typically those of ground squirrels. Preys upon insects and small vertebrates.	**No Potential.** The Study Area contains no habitat suitable for this species, and is outside of its range per a recent monograph in Shuford and Gardali (2008).
Brachyramphus marmoratus marbled murrelet	FT, SE	Occurs in coastal marine habitats for much of the year. Breeds in old-growth conifer stands (e.g. redwood, Douglas fir) containing platform-like branches, along the coast.	**Unlikely.** The Study Area lacks stands of old-growth redwood and Douglas fir that provide typical breeding habitat. There are no CNDDB breeding occurrences within ten miles of the Study Area (CDFW 2013). May fly over the area to more inland breeding sites, if such sites exist.
Buteo regalis ferruginous hawk	BCC	Winter visitor. Found in open habitats including grasslands, sagebrush flats, desert scrub and low foothills surrounding valleys.	**No Potential.** The Study Area contains no habitat typical of this species.
Chaetura vauxi Vaux's swift	SSC	Summer resident, primarily in forested areas. Nests in tree cavities, favoring those with a large vertical extent. Also uses chimneys and similar manmade substrates.	**Moderate Potential.** The Study Area is forested, and this species breeds throughout Mendocino County according to a recent monograph in Shuford and Gardali (2008).
Charadrius alexandrinus nivosus western snowy plover	FT, SSC	Resident and winter visitor. Found on sandy beaches, salt pond levees and shores of large alkali lakes. Need sandy gravelly or friable soils for nesting.	**No Potential.** The Study Area does not contain beach, levee, or lake shore habitat necessary to support this species.
Circus cyaneus northern harrier	SSC	Resident and winter visitor. Found in open habitats including grasslands, prairies, marshes and agricultural areas. Nests in dense vegetation on the ground, typically near water.	**Unlikely.** Although this species breeds in coastal Mendocino County (Shuford and Gardali 2008), the Study Area is forested and does not contain suitable open habitat.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA
Contopus cooperi olive-sided flycatcher	SSC	Summer resident. Breeds in montane coniferous forests, as well as mixed forests along the coast. Often associated with edge habitats.	**Moderate Potential.** The Study Area contains coniferous forest, with some edge areas.
Dendroica petechia yellow warbler	SSC	Summer resident. Nests in riparian stands of willows, cottonwoods, aspens, sycamores, and alders. Also nests in montane shrubbery in open coniferous forests. Occurs widely during migration.	**Unlikely.** The Study Area does not contain any riparian habitat and provides no breeding habitat for this species. May occur occasionally during migration.
Diomedea albatrus short-tailed albatross	FE, SSC	Pelagic; comes to land only when nesting. Nests on remote Pacific islands. Rare in the eastern Pacific.	**No potential.** This species is entirely marine within the coastal California region.
Elanus leucurus white-tailed kite	CFP	Resident in coastal and valley lowlands with scattered trees and large shrubs, including grasslands, marshes and agricultural areas. Preys on small diurnal mammals and other vertebrates.	**No Potential.** The Study Area does not contain open grassland, prairie, or marsh habitat necessary to support this species.
Falco peregrinus anatum American peregrine falcon	FD, SE, CFP	Resident and winter visitor. Typically found near water, including rivers, lakes, wetlands and the ocean. Requires protected cliffs, ledges or anthropogenic structures for nesting. Forages widely, feeding on a variety of avian prey, mostly waterbirds.	**Unlikely.** The Study Area does not contain cliffs or anthropogenic structures typically used for nesting. May occasionally forage over the site.
Fratercula cirrhata tufted puffin	SSC	Pelagic and coastal marine. Nests along the coast on islands, islets, or (rarely) isolated mainland cliffs. Require sod or earth into which the birds can burrow. Forages at sea, primarily for fish.	**No potential.** The Study Area does not contain coastal marine habitat.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA
Gavia immer common loon	SSC	Winter visitor, found in estuarine and subtidal marine habitats along the coast. Also occurs on large inland water bodies.	**No potential.** The Study Area does not contain suitable aquatic habitat for this species.
Haliaeetus leucocephalus bald eagle	FD, SE, CFP, BCC	Primary a winter visitor, with limited breeding in the region. Requires large bodies of water, or free-flowing rivers with abundant fish adjacent snags or other perches. Nests in large, old-growth, or dominant live tree with open branchwork.	**Unlikely.** The Study Area does not contain large bodies of water and thus provides no typical habitat or foraging resources for this species. May occasionally fly over the area.
Histrionicus histrionicus harlequin duck	SSC	Winter visitor to marine waters along the coast; breeds inland along streams in the northern Sierra Nevada.	**No Potential.** The Study Area does not contain coastal marine habitat.
Lanius ludovicianus loggerhead shrike	SSC	Resident in open habitats with scattered shrubs, trees, posts, etc. from which to forage for large insects and small vertebrates. Nests are well-concealed above ground in densely-foliaged shrub or tree.	**No Potential.** The Study Area does not contain open areas, and is outside of its limited Mendocino County breeding range per a recent monograph in Shuford and Gardali (2008).
Melanerpes lewis Lewis's woodpecker	BCC	Winter visitor, occurring in oak savannahs and various open woodland habitats. Often associated with recently-burned areas.	**Unlikely.** The Study Area does not contain open woodland or oak woodland habitat necessary to support this species.
Numenius americanus long-billed curlew	BCC	Winter visitor. Winters in large coastal estuaries, upland herbaceous areas, and croplands. Breeds in northeastern California in wet meadow habitat.	**No Potential**. The Study Area does not contain suitable wetland, mudflat or grassland habitat for this species.
Oceanodroma homochroa ashy storm petrel	SSC	Pelagic and coastal marine. Breeds on the Farallon Islands off of the San Francisco/Marin Coast.	**No Potential.** The Study Area does not contain pelagic or coastal marine habitat.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA
Pelecanus occidentalis californicus California brown pelican	FE, SE, CFP	Winter/non-breeding visitor to estuarine, marine subtidal, and marine pelagic waters along the coast. Nests on offshore islands of southern California.	**No Potential.** The Study Area does not contain coastal marine habitat.
Progne subis purple martin	SSC	Summer resident. In northwestern California, typically breeds in coniferous forest and woodlands. Nest in tree cavities, usually high off the ground, and in the cavities of human-made structures (e.g. bridges, utility poles).	**Moderate Potential.** The Study Area contains coniferous forest with tree cavities suitable for nesting, and there is a documented breeding occurrence within four miles (CDFW 2013).
Riparia riparia bank swallow	ST	Summer resident in lowland habitats in western California. Nests in areas with vertical cliffs and bands with fine-textured or sandy soils in which to burrow, typically riparian areas or coastal cliffs.	**No potential.** The Study Area does not contain suitable nesting habitat and is outside of this species' known breeding range in the state.
Selasphorus rufus rufous hummingbird	BCC	Summer resident in northwestern California. Breeds in a wide variety of habitats that provide nectar-producing flowers. Occurs widely throughout the state during migration.	**Unlikely.** The Study Area is south of this species' limited California breeding range. May occur occasionally during migration.
Selasphorus sasin Allen's hummingbird	BCC	Summer resident along the California coast. Breeds in a wide variety of forest and woodland habitats that provide nectar-producing flowers, including parks and gardens. Migration generally limited to the coastal zone.	**Moderate Potential.** The Study Area includes nectar plants and provides suitable breeding habitat for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA
Strix occidentalis caurina northern spotted owl	FT, SSC	Resident. Typically occurs in large patches of old-growth coniferous forest. Prefers dense, structurally complex canopies with large trees for foraging and roosting. Nests on horizontal substrates in dense canopy, e.g. large cavities and broken tree tops.	**Unlikely.** Coniferous forest within the Study Area lacks the structurally-complex, old-growth characters typically favored by this species. Per CDFG's Spotted Owl Viewer, the nearest documented breeding occurrences are located approximately 1.2 miles east of the Study Area. May occasionally forage in the area, but breeding is unlikely.
Synthliborampus hypoleucus Xantus's murrelet	ST	Pelagic and coastal marine. Breads on offshore islands of southern California. Strays to northern California at sea during the non-breeding season.	**No Potential.** The Study Area does not contain coastal marine habitat.
Reptiles and Amphibians			
Actinemys marmorata Pacific pond turtle	SSC	Occurs in perennial ponds, lakes, rivers and streams with suitable basking habitat (mud banks, mats of floating vegetation, partially submerged logs) and submerged shelter.	**No potential.** The Study Area does not contain aquatic habitat necessary to support this species.
Ascaphus truei tailed frog	SSC	Occurs from Mendocino County northward in cold permanent streams, usually in forested areas of high precipitation. Primarily aquatic.	**No potential.** Although there are several documented occurrences within five miles (CDFW 2013), the Study Area does not contain any stream habitat.
Rana aurora draytonii northern red-legged frog	SSC	Associated with quiet perennial to intermittent ponds, stream pools and wetlands. Prefers shorelines with extensive emergent and/or riparian vegetation. Documented to disperse through upland habitats after rains.	**Unlikely.** The Study Area does not contain any suitable aquatic habitat for this species. No documented occurrences are known from within five miles of the Study Area.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA
Rana boylii foothill yellow-legged frog	SSC	Found in or near rocky streams in a variety of habitats. Feed on both aquatic and terrestrial invertebrates.	**No potential.** The Study Area does not contain stream habitat necessary to support this species.
Rhyacotriton variegatus southern torrent salamander	SSC	Cold, permanent seeps and small streams with rocky substrate.	**No potential.** Although there is a documented occurrence in Hare Creek located to the southwest (CDFW 2013), the Study Area does not contain any stream or suitable seep habitat.
Fishes			
Eucyclogobius newberryi tidewater goby	FE, SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	**No Potential.** The Study Area does not contain any aquatic habitat necessary to support this species.
Oncorhynchus tshawytscha chinook salmon - CA Coast ESU	FT, RP, NMFS	Anadromous, spending most of its life cycle in the ocean, but spawning in coastal rivers and creeks. The California Coast ESU includes all naturally spawned populations from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive). Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel.	**No Potential.** The Study Area does not contain any aquatic habitat necessary to support this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN STUDY AREA
Oncorhynchus mykiss steelhead - Northern CA ESU	FT, NMFS, SSC	Anadromous, spending most of its life cycle in the ocean, but spawning in coastal rivers and creeks. The federal designation refers populations occurring below impassable barriers in coastal basins from Redwood Creek to, and including, the Gualala River. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for one or more years before migrating downstream to the ocean.	**No Potential.** The Study Area does not contain any aquatic habitat necessary to support this species.
Invertebrates			
Danaus plexippus monarch butterfly	None (winter roosts monitored by CDFG)	Winter roost sites located in wind-protected tree groves (typically eucalyptus, Monterey pine or Monterey cypress), with nectar and water sources nearby. Individual butterflies occur widely.	**Unlikely.** The Study Area is forested, containing no typical tree grove habitat. Individual monarchs may occasionally pass through the Study Area.
Lycaiedes argyrognomon lotis lotis blue butterfly	FE	Known from sphagnum-willow bogs in association with Bishop pine, pygmy forests and similar habitats. Harlequin lotus (*Hosackia gracilis*) is the suspected host plant.	**Unlikely.** Although the Study Area contains pygmy forest and Bishop pine forest, sphagnum-willow bog habitat or harlequin lotus are not present. Individual lotis blues may occasionally pass through the Study Area.
Speyeria zerene behrensii Behren's silverspot butterfly	FE	Inhabits coastal terrace prairie habitat. Host plant is dog violet (*Viola adunca*).	**No Potential.** The Study Area does not contain coastal terrace prairie habitat or dog violets.

*** Key to status codes:**

FE	Federal Endangered
FT	Federal Threatened
FC	Federal Candidate
FD	Federal De-listed
BCC	USFWS Birds of Conservation Concern
SE	State Endangered
SD	State Delisted
ST	State Threatened
SR	State Rare
SSC	CDFG Species of Special Concern
CFP	CDFG Fully Protected Animal
WBWG	Western Bat Working Group High or Medium Priority species
Rank 1A	CNPS Rank 1A: Plants presumed extinct in California
Rank 1B	CNPS Rank 1B: Plants rare, threatened or endangered in California and elsewhere
Rank 2	CNPS List 2: Plants rare, threatened, or endangered in California, but more common elsewhere
Rank 3	CNPS List 3: Plants about which CNPS needs more information (a review list)
Rank 4	CNPS Rank 4: Plants of limited distribution (a watch list)

Potential to Occur:

No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Results and Recommendations:

Present. Species was observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

Not Present. Species is assumed to not be present due to a lack of key habitat components.

Not Observed. Species was not observed during surveys.

Appendix C

Representative Photographs of the Study Area

Top: Northern Bishop pine forest located on the western edge of the Project Site, exterior view of overstory (view: east).

Bottom: Northern Bishop pine forest on the southern edge of the Project Site, interior view of understory (view: north).

Photographs taken July 10, 2012

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Top: Tall pygmy forest in the northwestern portion of the Project Site, interior view of overstory (view: southwest).

Bottom: Transitional pygmy forest in the northern portion of the Project Site, interior view of middlestory (view: west).

Photographs taken July 10, 2012

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Top: Extreme pygmy forest in eastern portion of the Project Site, interior view of overstory and understory (view: west).

Bottom: Forested wetland (extreme pygmy forest), interior view with patchy understory (view: southwest).

Photographs taken July 10, 2012

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Top: Seasonal wetland depression with California sedge in foreground and wetland edge in background (view: north).

Bottom: Bolander's pine (*Pinus contorta* ssp. *bolanderi*) in extreme pygmy forest, CNPS Rank 1B.

Photographs taken July 10, 2012

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Top: Coast lily (*Lilium maritimum*) on edge of Bishop pine forest , CNPS Rank 1B.

Bottom: California sedge (*Carex californica*) in seasonal wetland depression, CNPS Rank 1B.

Photographs taken July 10, 2012

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Appendix D

Vegetation Plot Data Collected within the Study Area

Table D-1. Summary of vegetation plot data for Bolander's pine, pygmy cypress, and California sedge counts across each biological community

Biological Community	Plot Size		Biological Community Area		Aggregate Sample Area[1]		Bolander's pine		Pygmy cypress		California sedge	
	Tree (50' r)	Herb (30'r)	Acres	Sq. Ft.	Tree	Herb	Plot AVG	Stand AVG	Plot AVG	Stand AVG	Plot AVG	Stand AVG
Bishop Pine Forest (n=5)	7,850	2,826	8.43	367,211	47	130	1	47	7	327	0	0
Tall Pygmy Forest (n=4)	7,850	2,826	4.51	196,456	25	70	4	100	31	776	0	0
Transitional Pygmy Forest (n=4)	7,850	2,826	3.79	165,092	21	58	7	147	16	336	2	117
Extreme Pygmy Forest (n=4)	7,850	2,826	2.63	114,563	15	41	34	496	41	598	13	527
Estimated Total								**790**		**2,038**		**644**

[1]Aggregated sample area is number of tree (50' r) and herb (30'r) plots needed to fill the remainder of the total biological community area, used to interpolated average stem counts across the entire biological community

Appendix E

Preliminary Jurisdiction Determination of Waters of the U.S. (WRA 2012)

Preliminary Jurisdiction Determination of Waters of the U.S.

Portion of Jackson State Demonstration Forest
Fort Bragg, Mendocino County, California

Prepared For:
Mike Sweeney
Mendocino Solid Waste Authority
101 W. Church Street, Suite 9
Ukiah, CA 95482

Linda Ruffing
Community Development Director
Fort Bragg City Hall
416 N. Franklin Street
Fort Bragg, CA 95437

Contact:
Matt Richmond
richmond@wra-ca.com

Date:
October 2012

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EXECUTIVE SUMMARY

This report presents the results of a wetland delineation conducted within a parcel currently owned by the State of California and managed by Jackson State Demonstration Forest (Study Area) near Fort Bragg, Mendocino County, California. The Study Area is located in portion of Jackson State Demonstration Forest owned by California Department of Forestry and Fire. WRA, Inc. conducted the delineation on May 11 and July 10, 2012 to assess the presence of “Waters of the United States” including potential wetlands and non-wetland waters subject to federal jurisdiction under Section 404 of the Clean Water Act. In addition, this delineation identifies potential “Waters of the State,” which is identical to the delineation of potential wetlands and non-wetland waters, but also includes the extent of non-wetland riparian habitat.

A total of 2.85 acres of wetlands and no non-wetland waters that may be considered jurisdictional under Section 404 of the Clean Water Act were delineated in the Study Area (Appendix A). The wetland areas include a two seasonal wetland depressions and extreme pygmy forest wetland. These areas are dominated by hydrophytic vegetation with facultative (FAC), facultative wetland (FACW), and obligate wetland (OBL) classified plants. They also contain hydric soil indicators and wetland hydrology indicators.

Wetland features delineated within the Study Area (2.85 acre) are potentially jurisdictional under both state and federal regulations.

1.0 INTRODUCTION

WRA, Inc. (WRA) prepared this report on behalf of the Mendocino Solid Waste Authority and City of Fort Bragg to present a delineation of “Waters of the United States,” including wetlands, as defined in 33 Code of Federal Regulations (CFR) Part 328.3, potentially present in a 20.7-acre section of Jackson State Demonstration Forest (Study Area).

WRA conducted a routine wetland delineation of “Waters of the United States” and “Waters of the State” on in the Study Area on May 11 and July 10, 2012. These surveys focused on documenting the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundaries were mapped based on transitions in topography, surface hydrology, and/or vegetation. WRA performed the Study Area delineation to assess the presence of potential wetlands and non-wetland waters subject to federal jurisdiction under Section 404 of the Clean Water Act. In addition, these surveys assessed the presence of all habitat subject to state jurisdiction (i.e., “Waters of the State”) under the Porter-Cologne Water Quality Control Act.

1.1 Study Area Location

The Study Area is an approximately 20.7-acre portion of Jackson State Demonstration Forest (JSDF) bounded to the south by California Highway 20, and contiguous open forested habitat to the north, east, and west, with rural residential units to the east and west. It is located approximately three miles southeast of downtown Fort Bragg. This section of JSDF contains a gravel helipad owned and operated by Calfire, as well as relatively undisturbed closed-cone coniferous forest.

1.2 Regulatory Background

1.2.1 Section 404 of the Clean Water Act

Section 404 of the Clean Water Act (CWA) gives the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers regulatory and permitting authority regarding discharge of dredged or fill material into “navigable waters of the United States”. Section 502(7) of the Clean Water Act defines “navigable waters” as “Waters of the United States, including territorial seas.” Section 328 of Chapter 33 in the Code of Federal Regulations defines the term “Waters of the United States” as it applies to the jurisdictional limits of the authority of the Corps under the Clean Water Act. In summary, the regulatory definition of “Waters of the U.S.” in 33 CFR Section 328.3 includes (1) waters used in interstate or foreign commerce; (2) interstate waters and wetlands; (3) other waters such as intrastate lakes, rivers, streams, and wetlands, the use, degradation, or destruction of which could affect interstate or foreign commerce; (4) impoundments of waters that otherwise meet the definition of “waters of the U.S.”; (5) tributaries to the above waters; (6) territorial seas; and (7) wetlands adjacent to any of the above waters.

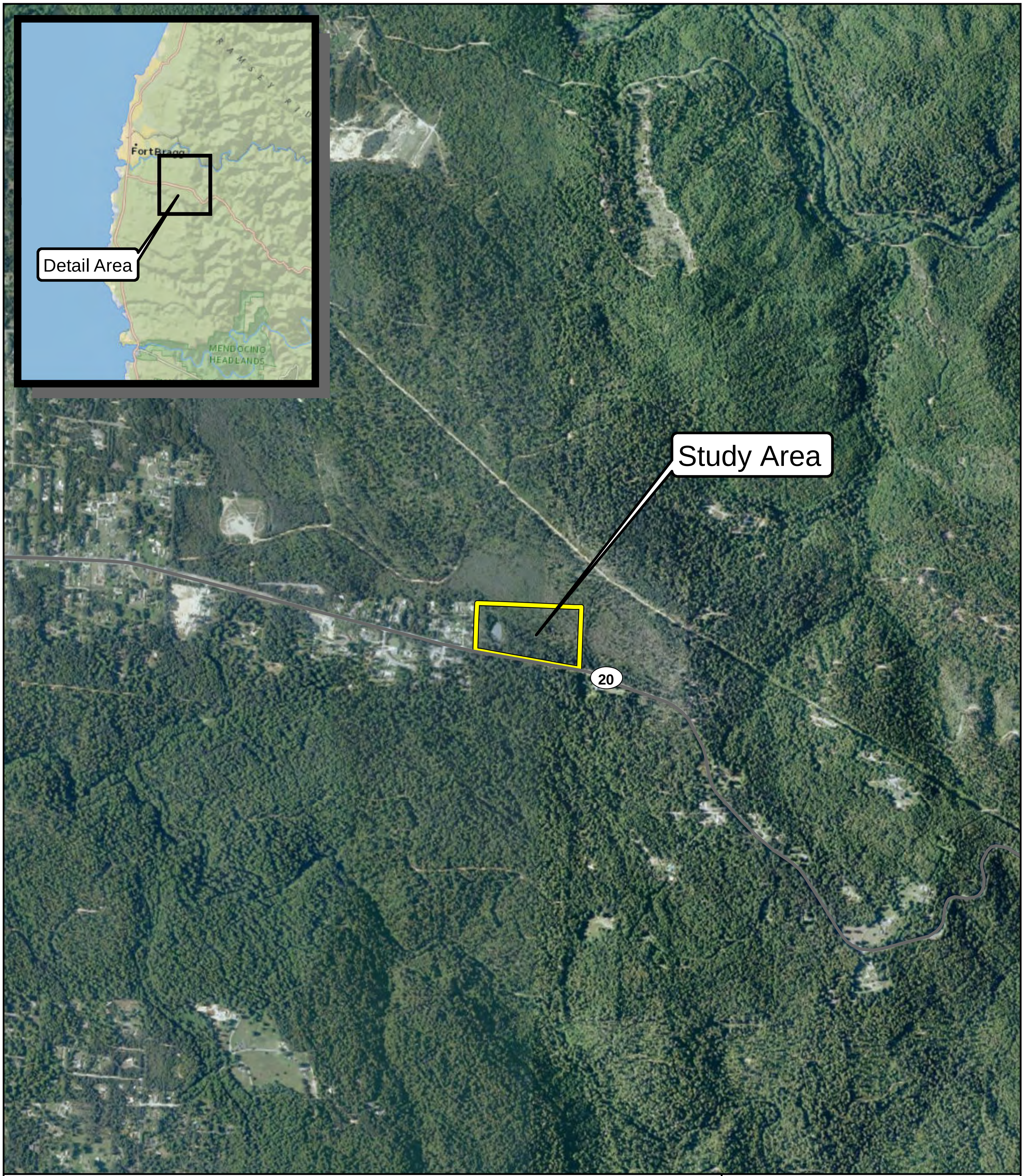

Figure 1. Study Area Location

Mendocino County, California

N
W E
S

0 0.25 0.5
Miles

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Map Date: October 2012
Map By: Chris Zumwalt
Base Source: ESRI World Imagery

Path: L:\Acad 2000 Files\22000\22045\gis\arcmap\Location Map.mxd

In the Corps Rivers and Harbors regulations (33 CFR Part 329.4), the term “navigable waters of the U.S.” is defined to include those waters that are subject to the ebb and flow of the tide, and/or presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

In 2006, the Supreme Court addressed the jurisdictional scope of Section 404 of the Clean Water Act in Rapanos v. U.S. and in Carabell v. U.S (collectively known as "Rapanos"). The decision provides two analytical standards for assessing whether water bodies that are not traditional navigable waters (TNWs), including wetlands adjacent to those non-TNWs, are subject to CWA jurisdiction: (1) if the water body is relatively permanent, or if the water body is a wetland that directly abuts (e.g., the wetland is not separated from the tributary by uplands, a berm, dike, or similar feature) a relatively permanent water (RPW), or (2) if a water body, in combination with wetlands adjacent to that water body, has a significant nexus with TNWs.

When assessing whether a water body qualifies as a TNW, relevant considerations include whether:

- A Corps district has determined that the water body is a navigable waters of the U.S. pursuant to 33 CFR Section 329.14;
- The water body qualifies as a navigable water of the U.S. under any of the tests set forth in 33 CFR Section 329;
- A federal court has determined that the water body is navigable-in-fact under federal law for any purpose; or
- The water body is navigable-in-fact under the standards that have been used by the federal courts.

As a result of the Rapanos decision, the EPA and Corps have issued guidance describing jurisdiction over the following categories of water bodies:

- Traditional navigable waters (TNWs);
- Wetlands adjacent to TNWs;
- Non-navigable tributaries of TNWs that are relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally); and
- Wetlands that directly abut such tributaries.

Additionally, the EPA and Corps will assert jurisdiction over waterbodies that are not a RPW if that water body is evaluated (on the basis of a fact-specific analysis) to possess a significant nexus with a TNW. The classes of water body that are subject to EPA and Corps jurisdiction only if such a significant nexus is demonstrated are:

- Non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally;
- Wetlands adjacent to such tributaries; and
- Wetlands adjacent to, but that do not directly abut a relatively permanent, non-navigable tributary.

The limits of Corps jurisdiction under Section 404 as given in 33 CFR Section 328.4 are as follows: (a) *Territorial seas:* three nautical miles in a seaward direction from the baseline; (b) *Tidal waters of the U.S.:* high tide line or to the limit of adjacent non-tidal waters; (c) *Non-tidal waters of the U.S.:* ordinary high water mark or to the limit of adjacent wetlands; and (d) *Wetlands:* to the limit of the wetland.

1.2.2 Section 10 of the Rivers and Harbors Act

The Corps of Engineers also has jurisdiction over "navigable waters" under Section 10 of the Rivers and Harbors Act of 1899. Section 10 of this Act applies to tidal areas below Mean High Water (MHW) and includes tidal areas currently subject to tidal influence, as well as historical tidal areas behind levees that both historically and presently reside at or below MHW. "Navigable waters of the U.S.", as defined in 33 CFR Part 329, are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. The act prohibits any unauthorized action that obstructs the "navigable capacity of any waters of the United States." These actions can include building of structures; excavation, fill; alterations and modifications to navigable waters (33 USC 403). A determination of navigability, once made, applies laterally over the entire surface of the waterbody and is not extinguished by later actions or events which impede or destroy navigable capacity. The upper limit of navigable water is at the point along its length where the character of the river changes from navigable to non-navigable, such as at a major fall or rapids. Since the upper limit of navigability of waterways under Section 10 jurisdiction is sometimes difficult to discern, determinations of navigability under Section 10 are often made by the Corps and kept on file, independent of submitted permit applications or delineations.

1.2.3 Water Quality Control Board

The Dickey Water Pollution Act of 1949 and Porter-Cologne Act of 1969 established the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCB) in the State of California. The SWRCB and RWQCB regulate activities in waters of the State which include "Waters of the U.S." "Waters of the State" are defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state."

The RWQCB regulates discharges of fill and dredged material that require a Section 404 permit from the Corps under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act through the State Water Quality Certification Program. State Water Quality Certification is necessary for projects that require a Corps permit, or fall under other federal jurisdiction, and have the potential to impact "Waters of the State." In order for a Section 404 permit to be valid, Section 401 of the Clean Water Act requires a Water Quality Certification or waiver to be obtained. The Water Quality Certification (or waiver) is issued if the RWQCB assesses that permitted activities will not violate water quality standards individually or cumulatively over the term of the action. Water Quality Certification must be consistent with the requirements of the Federal Clean Water Act, the California Environmental Quality Act, the California Endangered Species Act, and the Porter-Cologne Act.

If a proposed project or portion of a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to "Waters of the State," the RWQCB has the option to regulate the dredge and fill activity under its state authority in the form of Waste Discharge Requirements or Certification of Waste Discharge Requirements. In these cases a Water Quality Certification is not necessary under Section 401 of the Clean Water Act because federal jurisdiction does not apply.

2.0 SUMMARY OF POTENTIAL JURISDICTIONAL AREAS

Appendix A depicts sample point locations in the Study Area and the location of potential jurisdictional areas. Appendix B includes the sample point data collected by WRA during field investigations. Wetland features mapped within the Study Area are summarized in Table 1 and shown in Appendix A. Upon completion of the delineation, 2.85 acres of federal jurisdictional wetlands, and no non-wetland waters, were delineated in the Study Area.

Potentially jurisdictional areas, as identified in this report, were those areas that possessed three wetland parameters (i.e., hydrology, soil, and vegetation).

Table 1. Summary of Potential Section 404 Jurisdictional Areas in the Study Area

Wetland Type	Cowardin Wetland Classification (1979)	Potential Jurisdictional Area
Seasonal wetland depression	PEMC	0.22 acre
Forest wetland	PFO4	2.63 acres
TOTAL		2.85 acres

There is 2.85 acres of potentially jurisdictional wetlands present in the Study Area. These areas are low-lying, depressional, or broad swale areas dominated by hydrophytic vegetation and containing hydric soils and wetland hydrology indicators. Additionally, the wetlands located within the Study Area (2.85 acres, Table 1) are considered waters of the State.

3.0 METHODS

Prior to conducting field surveys, WRA reviewed reference materials, including the *Soil Survey of Mendocino County, Western Part* (USDA 2005), the Fort Bragg USGS 7.5' quadrangle (1960), and recent aerial photos of the site.

WRA evaluated indicators of wetlands and non-wetland waters in the Study Area on May 11 and July 10, 2012. Wetland boundaries were mapped based on subtle shifts in topography, the evidence of extended inundation and/or saturation, and/or change in vegetation. Methods used in this study to delineate jurisdictional wetlands and other waters are based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* ("Corps Manual"; Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, Version 2.0* ("WMVC Supplement"; Corps 2010). The routine method for wetland delineation described in the Corps Manual was used to identify areas potentially subject to Corps Section 404 jurisdiction within the Study Area. WRA generated a general description of the Study Area, including plant communities present, topography, and land use during delineation visits. Methods for evaluating the presence of wetlands and non-wetland waters employed during the site visit are described in detail below.

3.1 Potential Section 404 Waters of the U.S.

3.1.1 Wetlands

The Study Area was evaluated for the presence or absence of indicators of the three wetland parameters described in the Corps Manual (Environmental Laboratory 1987) and WMVC Supplement (Corps 2010).

33 CFR Section 328.3 defines wetlands 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. Wetlands generally include swamps, marshes, bogs, and similar areas."*

EPA, 40 CFR 230.3 and CE, 33 CFR 328.3

The three parameters used to delineate wetlands are the presence of: (1) hydrophytic vegetation, (2) wetland hydrology, and (3) hydric soils. According to the Corps Manual, for areas not considered “problem areas” or “atypical situations”:

> *"...[E]vidence of a minimum of one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland delineation."*

Data on vegetation, hydrology, and soils collected at sample points during the delineation site visit was reported on WMVC Supplement data forms. If field personnel delineated an area as a potential jurisdictional wetland, they located its boundaries using Global Positioning System (GPS) equipment and mapped the area on a topographic map. Field personnel used indicators described in the WMVC Supplement to make wetland assessments at each sample point in the Study Area. Wetland indicators are summarized below.

<u>Vegetation</u>

Field personnel assigned plant species identified within the Study Area a wetland status according to the Corps list of plant species that occur in wetlands (Lichvar and Kartesz 2009). This wetland classification system is based on the expected frequency of occurrence in wetlands as follows:

OBL	Obligate Wetland	Always found in wetlands	>99% frequency
FACW	Facultative Wetland	Usually found in wetlands	67-99%
FAC	Facultative	Equal in wetland or non-wetlands	34-66%
FACU	Facultative Upland	Usually found in non-wetlands	1-33%
NL	Not Listed	An upland plant	<1%

WRA assessed the presence of hydrophytic vegetation based on indicator tests described in the WMVC Supplement. The WMVC Supplement requires that a four-step process be conducted to identify whether hydrophytic vegetation is present. The procedure first requires the delineator to apply a rapid test for hydrophytic vegetation (Indicator 1; Rapid Test) described in the manual. The delineator visually assesses the dominant species across all strata at the sample location. If all dominant species contain a FACW or OBL status, then the vegetation is considered hydropthytic at the sample location.

If the sample point fails Indicator 1, then the delineator applies the “50/20 rule” (Indicator 2; Dominance Test) described in the manual. To apply the “50/20 rule”, dominant species are chosen independently from each stratum of the community. Dominant species are identified for each vegetation stratum from a sampling plot of an appropriate size surrounding the sample point. Dominant species are the most abundant species that individually or collectively account for more than 50 percent of the total vegetative cover in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total cover. If greater than 50 percent of the dominant species has an OBL, FACW, or FAC status, ignoring + and - qualifiers, the sample point meets the hydrophytic vegetation criterion.

If the sample point fails Indicator 1 and Indicator 2 and both hydric soils and wetland hydrology are not present, then the sample point does not meet the hydrophytic vegetation criterion, unless the site is a problematic wetland situation. However, if the sample point fails Indicator 2 but hydric soils and wetland hydrology are both present, the delineator must apply Indicator 3.

Indicator 3 is known as the Prevalence Index (PI). The prevalence index is a weighted average of the wetland indicator status for all plant species within the sampling plot. Each indicator status is given a numeric code (OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5). Indicator 3 requires the delineator to estimate the percent cover of each species in every stratum of the community and sum the cover estimates for any species that is present in more than one stratum. The delineator must then organize species into groups according to their wetland indicator status and calculate the Prevalence Index using the following formula, where A equals total percent cover:

$$PI = \frac{A_{OBL} + 2A_{FACW} + 3A_{FAC} + 4A_{FACU} + 5A_{UPL}}{A_{OBL} + A_{FACW} + A_{FAC} + A_{FACU} + A_{UPL}}$$

The Prevalence Index will yield a number between 1 and 5. If the Prevalence Index is equal to or less than 3, the sample point meets the hydrophytic vegetation criterion. However, if the community fails Indicator 2, the delineator must proceed to Indicator 3.

Indicator 4 is known as Morphological Adaptations. If more than 50 percent of the individuals of a FACU species have morphological adaptations for life in wetlands, then that species is considered to be a hydrophyte and its indicator status should be reassigned to FAC. If such observations are made, the delineator must recalculate Indicators 1 and 2 using a FAC indicator status for this species. The sample point meets the hydrophytic vegetation criterion if either test is satisfied.

Soils

The Natural Resource Conservation Service (NRCS) defines a hydric soil as follows:

> *"A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part."*

Federal Register July 13, 1994,
U.S. Department of Agriculture, NRCS

Soils formed over long periods of time under wetland (anaerobic) conditions often possess characteristics that indicate they meet the definition of hydric soils. Hydric soils can have a hydrogen sulfide (rotten egg) odor, low chroma matrix color (generally designated 0, 1, or 2, used to identify them as hydric), presence of redox concentrations, gleyed or depleted matrix, or high organic matter content.

Specific indicators that can be used to assess whether a soil is hydric for the purposes of wetland delineation are provided in the NRCS *Field Indicators of Hydric Soils in the U.S.* (USDA 2010). The WMVC Supplement provides a list of 19 of these hydric soil indicators which are known to occur in the WMVC region. Field personnel collected and described soil samples according to the methodology provided in the WMVC Supplement to assess if hydric soil indicators were present (i.e., the soil samples met one or more of the 19 hydric soil indicators described in the WMVC Supplement). Field personnel assessed soil chroma and values using a standard Munsell soil color chart (Gretag Macbeth 2000).

Hydrology

The Corps jurisdictional wetland hydrology criterion is satisfied if an area is inundated or saturated for a period sufficient to create anoxic soil conditions during the growing season (a minimum of 14 consecutive days in the WMVC region). Evidence of wetland hydrology can include primary indicators, such as visible inundation or saturation, drift deposits, oxidized root channels, and salt crusts, or secondary indicators such as the FAC-neutral test, presence of a shallow aquitard, or crayfish burrows. The WMVC Supplement contains 19 primary hydrology indicators and 9 secondary hydrology indicators. Only one primary indicator is required to meet the wetland hydrology criterion. However, if secondary indicators are used, at least two secondary indicators must be present to conclude that an area has wetland hydrology.

Field personnel used presence or absence of the primary or secondary indicators described in the WMVC Supplement to assess whether sample points within the Study Area met the wetland hydrology criterion.

3.1.2 Non-wetland Waters

This study also evaluated the presence of non-wetland waters of the U.S. potentially subject to Corps Section 404 jurisdiction. Other areas, besides wetlands, subject to Corps jurisdiction include lakes, rivers, and streams (including intermittent streams), in addition to areas below the

HTL in areas subject to tidal influence. Jurisdiction in non-tidal areas extends to the ordinary high water mark (OHWM) defined as:

> "*...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*"

Federal Register Vol. 51, No. 219,
Part 328.3 (d). November 13, 1986

Identification of OHWM followed the Corps Regulatory Guidance Letter No. 05-05, *Guidance on Ordinary High Water Mark Identification* (Corps 2005). The High Tide Line (HTL) for the Study Area was calculated in areas of tidal influence based on data from the National Oceanic and Atmospheric Administration (NOAA 2005) for the Port Chicago tide station, located just north of the Study Area.

3.1.3 Waters of the State

The SWRCB and RWQCB have not established a formal wetland definition nor have they developed a wetland delineation protocol; however, these agencies generally adhere to the same delineation protocol set forth by the Corps (Environmental Laboratory 1987; Corps 2008). Therefore, the methods used to identify potential "Waters of the State" were the same as those described above for potential Section 404 jurisdiction. However, if present, WRA also identified the extent of non-wetland riparian habitat since the San Francisco RWQCB has taken jurisdiction over such areas during the 401 water quality certification process. Non-wetland riparian habitat consists of stream-dependent vegetation immediately adjacent to watercourses that generally lack wetland hydrology or hydric soils. If non-wetland riparian habitat is observed, the boundary of the area is identified by the edge of dripline.

3.2 Areas Outside of Section 404 Jurisdiction

Some areas that meet the technical criteria for wetlands or non-wetland waters may not be jurisdictional under the Clean Water Act. Included in this category are some man-induced wetlands, which are areas that have developed at least some characteristics of naturally occurring wetlands due to either intentional or incidental human activities. Examples of man-induced wetlands may include, but are not limited to, irrigated wetlands, impoundments, drainage ditches excavated in uplands, wetlands resulting from filling of formerly deep water habitats, dredged material disposal areas, and depressions within construction areas.

In addition, some isolated wetlands and waters may also be considered outside of Corps jurisdiction as a result of the Supreme Court's decision in *Solid Waste Agency of Northern Cook County (SWANCC) v. United States Army Corps of Engineers* (531 U.S. 159 (2001)). Isolated wetlands and waters are those areas that do not have a surface or groundwater connection to, and are not adjacent to a navigable "Waters of the U.S.," and do not otherwise exhibit an interstate commerce connection. WRA evaluated the Study Area to assess if any wetland or other waters areas observed are not subject to Section 404 jurisdiction.

4.0 STUDY AREA DESCRIPTION

The Study Area is a 20.7-acre section of JSDF approximately three miles southeast of downtown Fort Bragg, Mendocino County. The Study Area is dominated by relatively undisturbed closed-cone coniferous forest, with a compacted gravel helipad and adjacent invasive shrubs. Detailed information on the vegetation, topography, soils, climate, and hydrology of the Study Area is provided below.

4.1 Vegetation

The vegetative composition of the Study Area is composed of two forest types, Bishop pine forest and pygmy cypress forest, as well as a narrow band of non-native scrub surrounding the gravel helipad. The scrub is dominated by French broom (*Genista monspessulana*, NL) and Scotch broom (*Cytisus scoparius*, NL).

The pygmy cypress forest is composed of three morpho-types: tall pygmy cypress forest, transitional pygmy cypress forest, and extreme pygmy cypress forest. The three morpho-types were separated based on the height and density of trees. The overstory of pygmy cypress forests in the Study Area is composed of native closed-cone conifer species such as Bishop pine (*Pinus muricata*, NL), pygmy cypress (*Hesperocyparis pygmaea*, NL), and Bolander's pine (*Pinus contorta* ssp. *bolanderi*, FAC). The understory is composed of dense thickets of Pacific rhododendron (*Rhododendron macrophyllum*, NL), evergreen huckleberry (*Vaccinium ovatum*, FACU), wax myrtle (*Morella californica*, FACW), Labrador tea (*Rhododendron columbianum*, OBL), glossy-leaf manzanita (*Arctostaphylos nummularia* ssp. *nummularia*, NL), and salal (*Gaultheria shallon*, FACU). The herbaceous layer is depauperate, but composed of sporadic individuals of bear grass (*Xerophyllum tenax*, NL), bracken fern (*Pteridium aquilinum*, FACU), and western sword fern (*Polystichum munitum*, FACU).

The Bishop pine forest is dominated by Bishop pine trees, with occasional individuals of pygmy cypress, coast redwood (*Sequoia sempervirens*, NL), western hemlock (*Tsuga heterophylla*, FACU), Douglas fir (*Pseudotsuga menziesii*, FACU), and Bolander's pine. The middle story contains sporadic thickets of tanoak (*Notholithocarpus densiflorus*, NL), giant chinquapin (*Chrysolepis chrysophylla*, NL), and Pacific rhododendron (*Rhododendron macrophyllum*, NL). The lower understory contains a similar species composition and density as the pygmy cypress forest.

4.2 Topography and Soils

The Study Area is situated on a marine terrace north of Covington Gulch and south of the Noyo River. As such the topography in the northern, eastern, and central portions is relatively flat. Elevations range from approximately 400 to 430 feet above sea level. The Study Area generally slopes from the northeast to southwest, with few, virtually indistinct micro-topographic shifts.

The *Soil Survey of Mendocino County, Western Part* (USDA 2005) indicates that the Study Area contains two native soil types containing two soil series each, the Shinglemill-Gibney complex, and the Blacklock and Aborigine soils. Individual soil series are described below and illustrated in Figure 2.

Shinglemill loam, 2 to 15 percent slopes: This series consists of very deep loam soils formed in marine sediments of mixed rock type located on marine terraces and coastal hills at elevations ranging from 200 to 750 feet. These soils are considered hydric, and are poorly drained with slow to medium runoff, and slow permeability. Native vegetation associated with these soils includes coastal coniferous forest including Bishop pine, pygmy cypress, evergreen huckleberry, glossy-leaf manzanita, Pacific rhododendron, Labrador tea, and bear grass (USDA 2005).

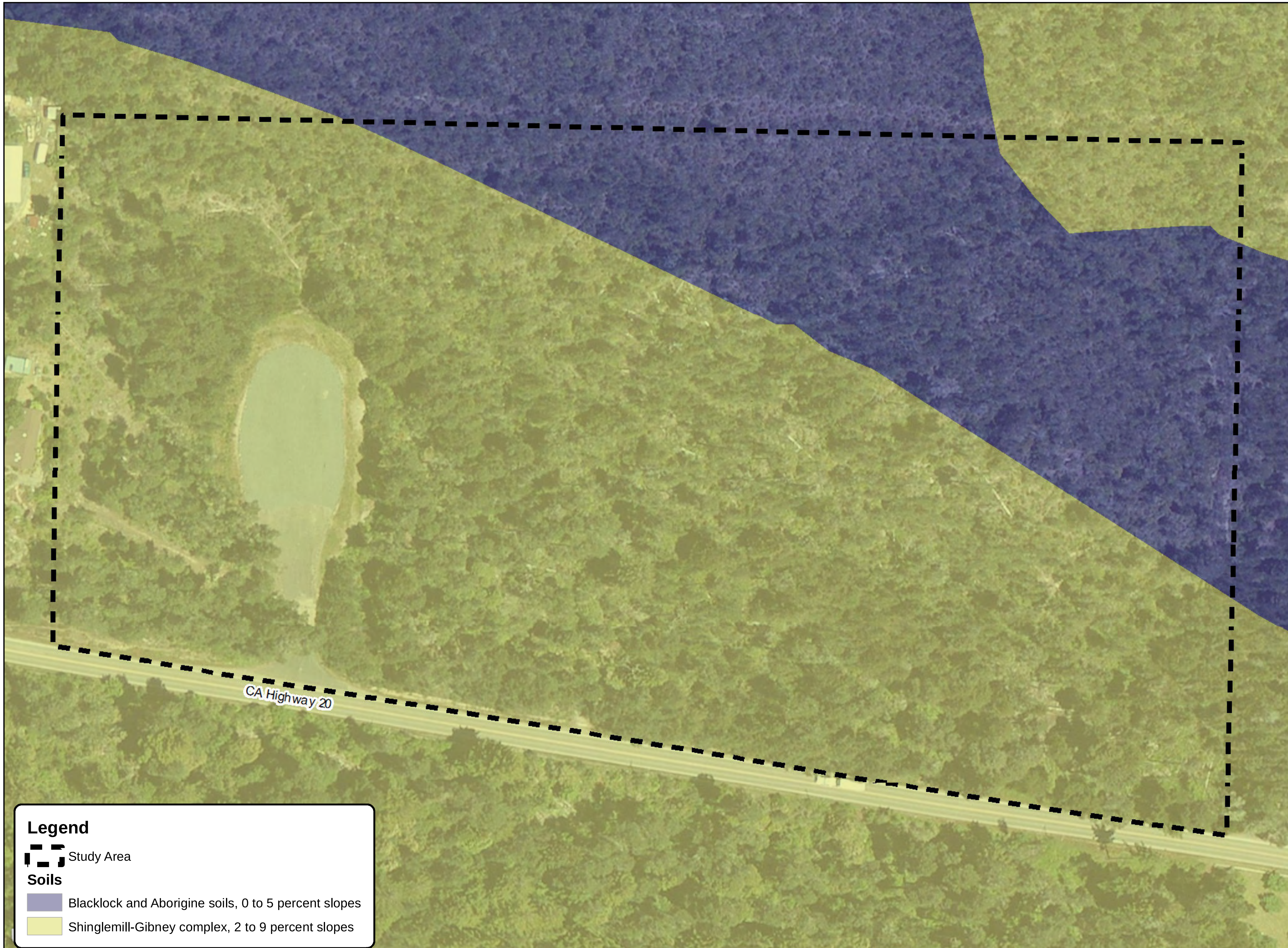
A representative pedon of this series contains an O-horizon of duff typically from pine needles, manzanita and rhododendron leaves, and twigs from 2 to 0 inches depth. This is underlain by an E-horizon of very strongly acid (pH 4.5) very pale brown (10YR 7/4) and grayish brown (10YR 5/2) moist loam from approximately 0 to 3 inches depth. This is underlain by a B-horizon of very strongly acid (pH 4.6) yellowish brown (10YR 5/4, 5/6) moist loam to clay with prominent white (10YR 8/1, 8/2) mottles from approximately 3 to 63 inches depth (USDA 2005).

Gibney loam, 2 to 15 percent slopes: This series consists of very deep loam soils formed in marine sediments of mixed rock type located on marine terraces at elevations ranging from 200 to 750 feet. These soils are not considered hydric, and are somewhat poorly drained with slow runoff, and slow permeability. Native vegetation associated with these soils includes coastal coniferous forest including Bishop pine, pygmy cypress, evergreen huckleberry, glossy-leaf manzanita, and bear grass (USDA 2005).

A representative pedon of this series contains an O-horizon of duff typically from pine needles, manzanita and rhododendron leaves, and twigs from 3 to 0 inches depth. This is underlain by an A-horizon of very moderately acid (pH 5.6) yellowish (10YR 5/4) when moist loam from approximately 0 to 9 inches depth. This is underlain by a B-horizon of very strongly acid (pH 4.5) to extremely acid (pH 4.2) yellowish brown (10YR 5/4, 5/6) when moist clay loam to clay to light brownish clay (2.5Y 6/2) when moist sandy clay loam with distinct to prominent strong brown (7.5YR 5/6) mottles from approximately 9 to 63 inches depth (USDA 2005).

Blacklock fine sandy loam, 0 to 7 percent slopes: This series consists of shallow sandy loam soils formed in sandy marine sediments located on marine terraces at elevations ranging from 25 to 650 feet. These soils are considered hydric, and are very poorly drained with slow to medium runoff, and moderate permeability. Native vegetation associated with these soils includes Bishop pine, pygmy cypress, western hemlock, evergreen huckleberry, glossy-leaf manzanita, Pacific rhododendron, salal, Labrador tea, and bear grass (USDA 2005).

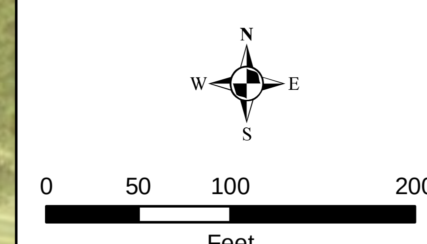
A representative pedon of this series consists of an O-horizon of duff from pine needles and manzanita leaves and twigs from 1 to 0 inches depth. This is underlain by an A-horizon of very strongly acid (pH 4.6) dark gray (10YR 4/1) when moist fine sandy loam to gray (10YR 6/1) when moist loamy fine sand from approximately 0 to 9 inches depth. This is underlain by an E-horizon of very strongly acid (pH 4.5) white (N 8/0) to gray (10YR 6/1) when dry loamy fine sand from approximately 9 to 13 inches depth. This is underlain by a B-horizon of very strongly acid (pH 4.6) dark reddish gray (5YR 4/2) when dry mucky loam from approximately 13 to 15 inches depth. This is underlain by a cemented B-horizon of medium acid (pH 5.2) yellowish brown (10YR 5/6) when dry strongly cemented sands to very pale brown (10YR 7/4) when dry strongly cemented sands from approximately 15 to 52 inches depth. This is underlain by a C-horizon of medium acid (pH 5.2) light olive brown (2.5Y 5/6) when dry fractured sandstone (USDA 2005).



wra
ENVIRONMENTAL CONSULTANTS

Mendocino County, California

Figure 2.
Study Area Soils



Map Date: October 2012
Map By: Chris Zumwalt
Base Source: Bing Maps

Path: L:\Acad 2000 Files\22000\22045\gis\arcmap\Soils.mxd

Aborigine sandy loam, 0 to 5 percent slopes: This series consists of very deep sandy loam soils formed from marine or lacustrine sediments on marine terraces at elevations ranging from 250 to 800 feet. These soils are considered hydric, and are very poorly drained with very slow to slow runoff, and very slow permeability. Native vegetation associated with these soils includes Bishop pine, pygmy cypress, western hemlock, evergreen huckleberry, glossy-leaf manzanita, Pacific rhododendron, salal, Labrador tea, and bear grass (USDA 2005).

A representative pedon of this series consists of an O-horizon of duff from cypress and pine needles from 3 to 0 inches depth. This is underlain by an E-horizon of extremely acid (pH 4.4) to light brownish gray (10YR 6/2) when moist sandy loam to strongly acid (pH 5.5) pale brown (10YR 6/3) when moist loam from approximately 0 to 16 inches depth. This is underlain by B-horizon extremely acid (pH 4.2) light gray (10YR 7/1, 6/1) when moist clay and sandy clay from approximately 16 to 64 inches depth (USDA 2005).

4.3 Climate and Hydrology

The Study Area is located in the coastal fog belt of Mendocino County. Average annual precipitation for Fort Bragg, located approximately three aerial miles northwest, is 41.25 inches, with the majority falling as rain and fog drip in the winter months (December through March). The mean daily low and high temperatures in degrees Fahrenheit range from 39.5 in December to 66.4 in August/September (USDA 2012).

The Study Area experiences substantial rainfall events, and evidence of surface ponding, a perched water table, and/or saturated substrates for extended periods (14 days or greater) are present sporadically within the Study Area, particularly in the eastern portion. Areas composed of Bishop pine forest (*Pinus muricata*) and tall pygmy cypress forest (*Hesperocyparis pygmaea*) appear to permeate somewhat rapidly, with lower portions in transitional and extreme pygmy cypress forest in the eastern portion experiencing extended saturation and inundation.

5.0 RESULTS

WRA recorded vegetation, soils, and hydrology data collected during the delineation site visits on standard Corps WMVC Region data forms (Appendix B). Potential Section 404 and Porter-Cologne jurisdictional areas are described in the following sections. Appendix A and Appendix B present the locations of sample points and potential jurisdictional features, and data collected during the site visit. Appendix C provides a list of plant species observed during the site visit. Appendix D contains photos of representative portions of the Study Area.

5.1 Potential Section 404 Waters of the U.S.

5.1.1 Wetlands

WRA delineated two seasonal wetland depressions and one forest wetland totaling 2.85 acres (Appendix A). One seasonal wetland depression is located in a low spot in the southeast portion of the Study Area, while the second seasonal wetland depression is located in the northwest portion. The forest wetland is analogous to the extreme pygmy cypress forest located in the eastern and northern portions of the Study Area (Appendix A).

Absolute cover of vegetation in the seasonal wetland depression in the southeast portion of the Study Area is approximately ten percent with very little shrub and tree cover, while the vegetation cover in the northwest seasonal wetland depression is predominantly shrubs and herbs. Herbaceous vegetation is dominated by the hydrophytes, slough sedge (*Carex obnupta*, OBL) and California sedge (*C. californica*, FACW). Dominant shrubs in the northwest portion include Labrador tea and wax myrtle. The soils, when moist, are dark yellowish brown (10YR 4/4), dark grayish brown (10YR 4/2), and brown (7.5YR 4/4) sandy silts and silty clays in the upper pedon and very dark brown (10YR 2/2) clay loams in the lower pedon, with redox iron in the middle portion of the pedon, meeting the Redox Dark Surface (F6). A cemented layer is present at approximately 14 inches depth. The soils sampled are darker and contain higher concentrations of iron redox than detailed in the soil survey (USDA 2005). Extended inundation and saturation is evident from surface soil cracks, a sparsely vegetation concave surface, and oxidation on living roots, as well as passing the FAC-neutral test and the presence of a shallow aquitard, meeting the wetland hydrology indicators B6, B8, C3, D3, and D5 (Corps 2010).

The forest wetland is located in the eastern and northern portions of the Study Area, and is connected to a larger contiguous forest wetland habitat that continues beyond the Study Area boundary. The vegetation is dominated by perennial hydrophytes including Bolander's pine, Labrador tea, wax myrtle, California sedge, and coast lily (*Lilium maritimum*, FACW). The soils, when moist, are light brownish gray (10YR 6/2) and brown clay sandy loams in the upper pedon, underlain by yellowish brown (10YR 5/6) clay sandy loam with iron redox in the lower pedon, meeting Sandy Redox (S5). A cemented layer is present at approximately eight to ten inches depth. The soils sampled are similar to those detailed in soil survey (USDA 2005). Extended inundation and saturation is evident from oxidation on living root channels, water-stained leaves, and presence of a shallow aquitard, meeting the wetland hydrology indicators C3, B9, and D3 (Corps 2010).

5.1.2 Non-wetland Waters

The Study Area does not contain non-wetland waters.

5.1.3 Waters of the State

The wetlands summarized in Section 5.1.1 are potentially jurisdictional under Section 401 of the CWA, and are therefore considered Waters of the State.

6.0 POTENTIAL CORPS AND RWQCB JURISDICTION

The Study Area contains 2.85 acres of wetlands and no non-wetland waters that may be considered jurisdictional under Section 404 of the Clean Water Act. All of the wetlands observed were evaluated as jurisdictional, and therefore are also Waters of the State. The wetland areas were either seasonal or perennial dominated by hydrophytic vegetation with FAC, FACW, and OBL classified plants, contained hydric soil, and exhibited hydrologic conditions sufficient to support wetlands.

The conclusion of this delineation is based on conditions observed at the time of the field surveys conducted on May 11 and July 10, 2012.

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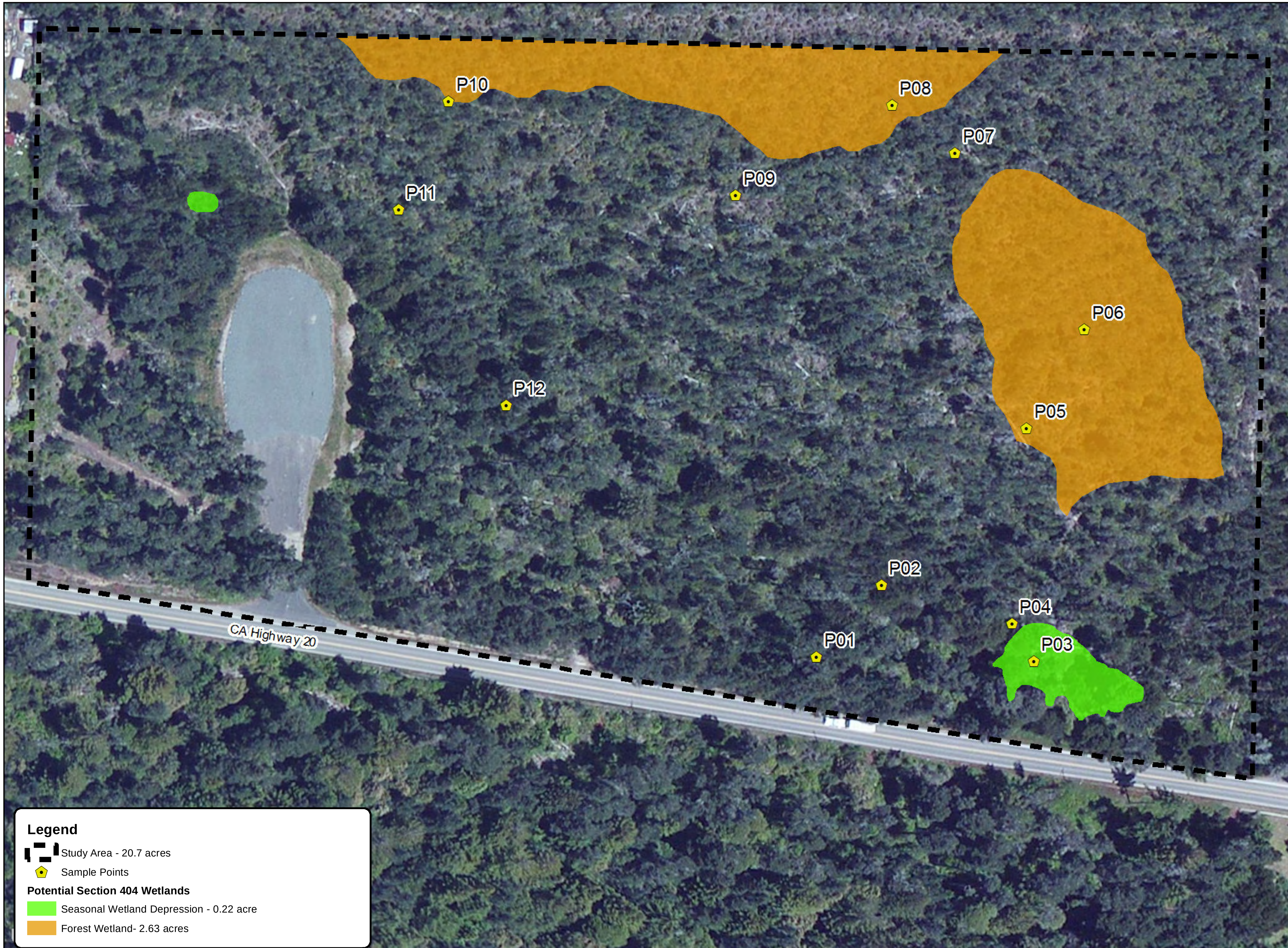
Appendix A

Preliminary Section 404 Jurisdictional Map



Mendocino County, California

Appendix A.
Preliminary Section 404 Jurisdictional Map

Map Date: October 2012
Map By: Chris Zumwalt
Base Source: Bing Maps

Path: L:\Acad 2000 Files\22000\22045\gis\arcmap\Wetland_Delin.mxd

Appendix B

WMVC Delineation Data Sheets

Wetland Determination Data Form - Western Mountains, Valleys and Coast Region

Project/Site: Fort Bragg Transfer Site | City: Fort Bragg | County: Mendocino | Sampling Date: 7/10/2012

Applicant/Owner: Mendocino County Solid Waste Authority | State: CA | Sampling Point: **P01**

Investigator(s): Matt Richmond, Aaron Arthur, Morgan Trieger | Section,Township,Range: T18N, R8W, sec16

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): flat | Slope(%): 2

Subregion(LRR): LRR A (Coastal Redwood Belt) | Lat: 39.41 | Long: -123.75 | Datum: WGS 84

Soil Map Unit Name: Shinglemill-Gibney complex, 2-9% slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☒ No	**Is the Sampled Area within a Wetland?** ☐ **Yes** ☒ **No**
Hydric Soil Present?	☐ Yes ☒ No	
Wetland Hydrology Present?	☐ Yes ☒ No	

Remarks: The sample point is within a pygmy cypress dominated area (tall pygmy) of closed-cone coniferous forest. The sample point does not contain a dominance/prevalence of hydrophytic vegetation, hydric soils, or wetland hydrology.

VEGETATION (use scientific names)

	Absolute % cover	Dominant Species?	Indicator Status
TREE STRATUM **Plot Size:** 30' r			
1. *Hesperocyparis pygmaea*	70	yes	NL
2. *Pinus muricata*	25	yes	NL
3. *Sequoia sempervirens*	5	no	NL
4. *Chrysolepis chrysophylla*	5	no	NL
Tree Stratum Total Cover:	**105**		
SAPLING/SHRUB STRATUM **Plot Size:** 30' r			
1. *Vaccinium ovatum*	40	yes	FACU
2. *Gaultheria shallon*	30	yes	FACU
3. *Rhododendron macrophyllum*	5	no	NL
4. *Morella californica*	5	no	FACW
Sapling/Shrub Stratum Total Cover:	**80**		
HERB STRATUM **Plot Size:** 10' r			
1. *Pteridium aqulinum*	10	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	**10**		
WOODY VINES **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 90 | % cover of biotic crust N/A

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	0	(A)
Total number of dominant species across all strata?	5	(B)
% of dominant species that are OBL, FACW, or FAC?	0	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:
OBL species		x1
FACW species		x2
FAC species		x3
FACU species		x4
UPL species		x5
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is </= 3.0[1]
- ☐ 4 - Morphological adaptations[1] (provide supporting data in remarks)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ 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

Remarks: The sample point does not contain a dominance or prevalence of hydrophytic vegetation.

SOIL

Sampling Point P01

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
5-0	N/A						duff	
0-4	7.5YR 5/2	100					loam	
4+	7.5YR 5/2	100					cemented loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in remarks)

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

Restrictive Layer (if present):

Type: hard pan

Depth (inches): 4

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: The sample point does not contain hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except NW coast)
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stressed Plants (D1)(LRR AA)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9)(NW coast)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6)(LRR A)
- ☐ Frost-Heave Hummocks (D7)

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):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point does not contain wetland hydrology.

Wetland Determination Data Form - Western Mountains, Valleys and Coast Region

Project/Site Fort Bragg Transfer Site | City Fort Bragg | County Mendocino | Sampling Date 7/10/2012

Applicant/Owner Mendocino County Solid Waste Authority | State CA | Sampling Point **P02**

Investigator(s) Matt Richmond, Aaron Arthur, Morgan Trieger | Section,Township,Range T18N, R8W, sec16

Landform (hillslope, terrace, etc.) terrace | Local Relief (concave, convex, none) very slightly convex | Slope(%) 2

Subregion(LRR) LRR A (Coastal Redwood Belt) | Lat: 39.41 | Long: -123.75 | Datum: WGS 84

Soil Map Unit Name Shinglemill-Gibney complex, 2-9% slopes | NWI classification N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☒ No	**Is the Sampled Area within a Wetland?** ☐ **Yes** ☒ **No**
Hydric Soil Present?	☐ Yes ☒ No	
Wetland Hydrology Present?	☐ Yes ☒ No	

Remarks: The sample point is within a pygmy cypress dominated area (tall pygmy) of closed-cone coniferous forest. The sample point does not contain a dominance/prevalence of hydrophytic vegetation, hydric soils, or wetland hydrology.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 30' r	Absolute % cover	Dominant Species?	Indicator Status
1. *Hesperocyparis pygmaea*	60	yes	NL
2. *Pinus contorta bolanderi*	15	no	FAC
3. *Pinus muricata*	5	no	NL
4.			
Tree Stratum Total Cover:	**80**		
SAPLING/SHRUB STRATUM **Plot Size:** 30' r			
1. *Vaccinium ovatum*	60	yes	FACU
2. *Gaultheria shallon*	15	no	FACU
3. *Rhododendron columbianum*	5	no	OBL
4.			
Sapling/Shrub Stratum Total Cover:	**80**		
HERB STRATUM **Plot Size:** 10' r			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:			
WOODY VINES **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 100 | % cover of biotic crust N/A

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)
% of dominant species that are OBL, FACW, or FAC?	0	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is </= 3.0[1]
- ☐ 4 - Morphological adaptations[1] (provide supporting data in remarks)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ 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

Remarks: The sample point does not contain a dominance or prevalence of hydrophytic vegetation.

SOIL

Sampling Point P02

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
1-0	N/A						duff	
0-1	10YR 4/4	100					sandy silt	
1-6	7.5YR 5/2	95					loamy clay	
6-16	10YR 2/2	100					clayey loam	
16+	10YR 5/2	100					cemented	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in remarks)

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

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: The sample point does not contain hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except NW coast)
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stressed Plants (D1)(LRR AA)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9)(NW coast)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6)(LRR A)
- ☐ Frost-Heave Hummocks (D7)

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):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point does not contain wetland hydrology.

Wetland Determination Data Form - Western Mountains, Valleys and Coast Region

Project/Site: Fort Bragg Transfer Site | City: Fort Bragg | County: Mendocino | Sampling Date: 7/10/2012

Applicant/Owner: Mendocino County Solid Waste Authority | State: CA | Sampling Point: **P03**

Investigator(s): Matt Richmond, Aaron Arthur, Morgan Trieger | Section,Township,Range: T18N, R8W, sec16

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): broadly, slightly concave | Slope(%): 2

Subregion(LRR): LRR A (Coastal Redwood Belt) | Lat: 39.41 | Long: -123.75 | Datum: WGS 84

Soil Map Unit Name: Shinglemill-Gibney complex, 2-9% slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☒ Yes	☐ No
Hydric Soil Present?	☒ Yes	☐ No
Wetland Hydrology Present?	☒ Yes	☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: The sample point is within a pygmy cypress dominated area (tall pygmy) of closed-cone coniferous forest. It is located within a slight depression with downed woody debris, substantial bare ground, and stunted, sparse vegetation. The sample point contains a dominance of hydrophytic vegetation, hydric soils, and wetland hydrology. Boundary based on slight change in topography, increase in upland vegetation, and changes in soil surface characteristics.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 30' r	Absolute % cover	Dominant Species?	Indicator Status
1. *Pinus contorta bolanderi*	15	yes	FAC
2. *Hesperocyparis pygmaea*	5	yes	NL
3.			
4.			
Tree Stratum Total Cover:	**20**		
SAPLING/SHRUB STRATUM Plot Size: 30' r			
1. *Vaccinium ovatum*	5	yes	FACU
2. *Rhododendron columbianum*	3	yes	OBL
3. *Pinus contorta bolanderi*	3	yes	FAC
4. *Hesperocyparis pygmaea*	3	yes	NL
Sapling/Shrub Stratum Total Cover:	**14**		
HERB STRATUM Plot Size: 10' r			
1. *Carex obnupta*	15	yes	OBL
2. *Carex californica*	10	yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	**25**		
WOODY VINES Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 75 | % cover of biotic crust: N/A

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	5	(A)
Total number of dominant species across all strata?	8	(B)
% of dominant species that are OBL, FACW, or FAC?	62.5	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:
OBL species		x1
FACW species		x2
FAC species		x3
FACU species		x4
UPL species		x5
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☒ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is </= 3.0[1]
- ☐ 4 - Morphological adaptations[1] (provide supporting data in remarks)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ 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

Remarks: The sample point is dominated by hydrophytic vegetation.

SOIL

Sampling Point P03

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[1]	Texture	Remarks
0-1	10YR 4/4	100					sandy silt	
1-9	7.5YR 5/2	50					silty clay	
	10YR 4/2	50	7.5YR 5/8	5	C	RC	silty clay	redox present
9-14	10YR 2/2	100	7.5YR 5/8	5	C	M	clayey loam	redox present
			7.5YR 4/6	2	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in remarks)

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

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: The sample point contains hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except NW coast)
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stressed Plants (D1)(LRR AA)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9)(NW coast)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6)(LRR A)
- ☐ Frost-Heave Hummocks (D7)

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):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point contains wetland hydrology.

Wetland Determination Data Form - Western Mountains, Valleys and Coast Region

Project/Site Fort Bragg Transfer Site | City Fort Bragg | County Mendocino | Sampling Date 7/10/2012

Applicant/Owner Mendocino County Solid Waste Authority | State CA | Sampling Point **P04**

Investigator(s) Matt Richmond, Aaron Arthur, Morgan Trieger | Section,Township,Range T18N, R8W, sec16

Landform (hillslope, terrace, etc.) terrace | Local Relief (concave, convex, none) flat | Slope(%) 2

Subregion(LRR) LRR A (Coastal Redwood Belt) | Lat: 39.41 | Long: -123.75 | Datum: WGS 84

Soil Map Unit Name Shinglemill-Gibney complex, 2-9% slopes | NWI classification N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☒ No	**Is the Sampled Area within a Wetland?** ☐ **Yes** ☒ **No**
Hydric Soil Present?	☐ Yes ☒ No	
Wetland Hydrology Present?	☐ Yes ☒ No	

Remarks: The sample point is within a pygmy cypress dominated area (tall pygmy) of closed-cone coniferous forest. The sample point is a paired upland point with wetland point P03.

VEGETATION (use scientific names)

	Absolute % cover	Dominant Species?	Indicator Status
TREE STRATUM **Plot Size:** 30' r			
1. *Pinus contorta bolanderi*	30	yes	FAC
2. *Hesperocyparis pygmaea*	15	yes	NL
3. *Pinus muricata*	5	no	NL
4.			
Tree Stratum Total Cover:	**50**		
SAPLING/SHRUB STRATUM **Plot Size:** 30' r			
1. *Vaccinium ovatum*	35	yes	FACU
2. *Gaultheria shallon*	20	yes	FACU
3. *Rhododendron macrophyllum*	15	yes	NL
4. *Notholithocarpus densiflorus*	5	no	NL
Sapling/Shrub Stratum Total Cover:	**75**		
HERB STRATUM **Plot Size:** 10' r			
1. *Carex californica*	10	yes	FACW
2. *Pteridium aquilinum*	5	yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	**15**		
WOODY VINES **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 85 | % cover of biotic crust N/A

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	2	(A)
Total number of dominant species across all strata?	7	(B)
% of dominant species that are OBL, FACW, or FAC?	28.5	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:
OBL species		x1
FACW species		x2
FAC species		x3
FACU species		x4
UPL species		x5
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is </= 3.0[1]
- ☐ 4 - Morphological adaptations[1] (provide supporting data in remarks)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ 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

Remarks: The sample point does not contain a dominance of hydrophytic vegetation.

SOIL

Sampling Point P04

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[1]	Texture	Remarks
2-0	N/A						duff	
0-4	10YR 4/3	100					sandy silt	
4-12	7.5YR 5/4	60					sandy silt	
	10YR 4/3	40					sandy silt	
12-16	10YR 3/3	100	7.5YR 5/8	2	C	M	sandy silt	
			7.5YR 4/6	1	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in remarks)

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

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: The sample point does not contain hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except NW coast)
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stressed Plants (D1)(LRR AA)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9)(NW coast)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6)(LRR A)
- ☐ Frost-Heave Hummocks (D7)

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):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point does not contain wetland hydrology.

Wetland Determination Data Form - Western Mountains, Valleys and Coast Region

Project/Site: Fort Bragg Transfer Site | City: Fort Bragg | County: Mendocino | Sampling Date: 7/10/2012

Applicant/Owner: Mendocino County Solid Waste Authority | State: CA | Sampling Point: **P05**

Investigator(s): Matt Richmond, Aaron Arthur, Morgan Trieger | Section,Township,Range: T18N, R8W, sec16

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): relatively flat | Slope(%): 2

Subregion(LRR): LRR A (Coastal Redwood Belt) | Lat: 39.41 | Long: -123.75 | Datum: WGS 84

Soil Map Unit Name: Shinglemill-Gibney complex, 2-9% slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology — Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☒ No	**Is the Sampled Area within a Wetland?** ☒ **Yes** ☐ **No**
Hydric Soil Present?	☒ Yes ☐ No	
Wetland Hydrology Present?	☒ Yes ☐ No	

Remarks: The sample point is located on the edge of a Bolander pine dominated area (extreme pygmy) and pygmy cypress dominated area (tall pygmy) of closed-cone coniferous forest. The sample point is located on the edge of forest wetland. Hydric soils and wetland hydrology are present, though strong hydrophytic vegetation is lacking. Due to evidence of hydric soils and wetland hydrology, this sample point is included as an edge point in forest wetland.

VEGETATION (use scientific names)

	Absolute % cover	Dominant Species?	Indicator Status
TREE STRATUM **Plot Size:** 30' r			
1. *Pinus contorta bolanderi*	25	yes	FAC
2. *Pinus muricata*	10	yes	NL
3. *Hesperocyparis pygmaea*	2	no	NL
4.			
Tree Stratum Total Cover:	**37**		
SAPLING/SHRUB STRATUM **Plot Size:** 30' r			
1. *Vaccinium ovatum*	20	yes	FACU
2. *Rhododendron macrophyllum*	20	yes	NL
3. *Gaultheria shallon*	15	yes	FACU
4.			
Sapling/Shrub Stratum Total Cover:	**55**		
HERB STRATUM **Plot Size:** 10' r			
1. *Pteridium aqulinum*	5	yes	FACU
2. *Xerophyllum tenax*	5	yes	NL
3. *Carex californica*	3	yes	FACW
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	**13**		
WOODY VINES **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 90 | % cover of biotic crust: 20

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	2	(A)
Total number of dominant species across all strata?	8	(B)
% of dominant species that are OBL, FACW, or FAC?	25	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species	0	x1	0
FACW species	3	x2	6
FAC species	25	x3	75
FACU species	40	x4	160
UPL species	37	x5	185
Column Totals	105	(A)	426 (B)

Prevalence Index = B/A = 4.05

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is </= 3.0[1]
- ☐ 4 - Morphological adaptations[1] (provide supporting data in remarks)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ 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

Remarks: The sample point does not contain a dominance of hydrophytic vegetation.

SOIL

Sampling Point P05

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-7	10YR 6/2	100					loamy fine sand	
7+	10YR 6/2	100					cemented	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in remarks)

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

Restrictive Layer (if present):

Type: hardpan

Depth (inches): 7

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: The sample point contains hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☒ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except NW coast)
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stressed Plants (D1)(LRR AA)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☒ Water-Stained Leaves (B9)(NW coast)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6)(LRR A)
- ☐ Frost-Heave Hummocks (D7)

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):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point contains wetland hydrology. Lichen cover on soil surface.

Wetland Determination Data Form - Western Mountains, Valleys and Coast Region

Project/Site: Fort Bragg Transfer Site | City: Fort Bragg | County: Mendocino | Sampling Date: 7/10/2012

Applicant/Owner: Mendocino County Solid Waste Authority | State: CA | Sampling Point: **P06**

Investigator(s): Matt Richmond, Aaron Arthur, Morgan Trieger | Section,Township,Range: T18N, R8W, sec16

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): relatively flat | Slope(%): 2

Subregion(LRR): LRR A (Coastal Redwood Belt) | Lat: 39.41 | Long: -123.75 | Datum: WGS 84

Soil Map Unit Name: Blacklock-Aborigine soils, 0-2% slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☒ Yes ☐ No	**Is the Sampled Area within a Wetland?** ☒ **Yes** ☐ **No**
Hydric Soil Present?	☒ Yes ☐ No	
Wetland Hydrology Present?	☒ Yes ☐ No	

Remarks: The sample point is located in a Bolander pine - pygmy cypress dominated area (extreme pygmy) of closed-cone coniferous forest. The sample point contains a dominance of hydrophytic vegetation, hydric soils, and wetland hydrology. Boundary based on slight change in topography, increase in upland vegetation, and changes in soil surface characteristics.

VEGETATION (use scientific names)

	Absolute % cover	Dominant Species?	Indicator Status
TREE STRATUM **Plot Size:** 30' r			
1. *Hesperocyparis pygmaea*	30	yes	NL
2. *Pinus contorta bolanderi*	10	yes	FAC
3.			
4.			
Tree Stratum Total Cover:	**40**		
SAPLING/SHRUB STRATUM **Plot Size:** 30' r			
1. *Rhododendron columbianum*	30	yes	OBL
2. *Vaccinium ovatum*	10	yes	FACU
3. *Gaultheria shallon*	10	yes	FACU
4. *Morella californica*	5	no	FACW
Sapling/Shrub Stratum Total Cover:	**55**		
HERB STRATUM **Plot Size:** 10' r			
1. *Carex californica*	2	yes	FACW
2. *Lilium maritimum*	1	yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	**3**		
WOODY VINES **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 99 | % cover of biotic crust: N/A

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	4	(A)
Total number of dominant species across all strata?	7	(B)
% of dominant species that are OBL, FACW, or FAC?	57.1	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:
OBL species		x1
FACW species		x2
FAC species		x3
FACU species		x4
UPL species		x5
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☒ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is </= 3.0[1]
- ☐ 4 - Morphological adaptations[1] (provide supporting data in remarks)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ 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

Remarks: The sample point contains a dominance of hydrophytic vegetation.

SOIL

Sampling Point P06

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[1]	Texture	Remarks
1-0	N/A						duff	
0-6	10YR 6/2	90					clay sandy loam	
	7.5YR 4/3	10					clay sandy loam	
6-8	10YR 5/6	100	7.5YR 4/6	10	C	M	clay sandy loam	redox present
8+	10YR 5/6	100					cemented	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in remarks)

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

Restrictive Layer (if present):

Type: hardpan

Depth (inches): 8

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: The sample point contains hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except NW coast)
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stressed Plants (D1)(LRR AA)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☒ Water-Stained Leaves (B9)(NW coast)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6)(LRR A)
- ☐ Frost-Heave Hummocks (D7)

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):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point contains wetland hydrology.

Wetland Determination Data Form - Western Mountains, Valleys and Coast Region

Project/Site: Fort Bragg Transfer Site | City: Fort Bragg | County: Mendocino | Sampling Date: 7/10/2012

Applicant/Owner: Mendocino County Solid Waste Authority | State: CA | Sampling Point: **P07**

Investigator(s): Matt Richmond, Aaron Arthur, Morgan Trieger | Section,Township,Range: T18N, R8W, sec16

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): relatively flat | Slope(%): 2

Subregion(LRR): LRR A (Coastal Redwood Belt) | Lat: 39.41 | Long: -123.75 | Datum: WGS 84

Soil Map Unit Name: Blacklock-Aborigine soils, 0-2% slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☒ No	**Is the Sampled Area within a Wetland?** ☐ **Yes** ☒ **No**
Hydric Soil Present?	☒ Yes ☐ No	
Wetland Hydrology Present?	☐ Yes ☒ No	

Remarks: The sample point is located in Bishop pine and pygmy cypress dominated area (transitional pygmy) of closed-cone coniferous forest. The sample point does not contain hydrophytic vegetation or wetland hydrology; however, depleted hydric soils are present.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 30' r	Absolute % cover	Dominant Species?	Indicator Status
1. *Pinus muricata*	30	yes	NL
2. *Hesperocyparis pygmaea*	20	yes	NL
3. *Pinus contorta bolanderi*	10	no	FAC
4.			
Tree Stratum Total Cover:	**60**		
SAPLING/SHRUB STRATUM Plot Size: 30' r			
1. *Vaccinium ovatum*	40	yes	FACU
2. *Gaultheria shallon*	20	yes	FACU
3. *Rhododendron macrophyllum*	15	no	NL
4. *Rhododendron columbianum*	5	no	OBL
Sapling/Shrub Stratum Total Cover:	**80**		
HERB STRATUM Plot Size: 10' r			
1. *Carex californica*	<1	yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	**<1**		
WOODY VINES Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 99 | % cover of biotic crust: N/A

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	1	(A)
Total number of dominant species across all strata?	5	(B)
% of dominant species that are OBL, FACW, or FAC?	20	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:
OBL species		x1
FACW species		x2
FAC species		x3
FACU species		x4
UPL species		x5
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is </= 3.0[1]
- ☐ 4 - Morphological adaptations[1] (provide supporting data in remarks)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ 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

Remarks: The sample point does not contain a dominance of hydrophytic vegetation.

SOIL

Sampling Point P07

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
2-0	N/A						duff	
0-8	10YR 4/2	100	10YR 4/6	10	C	M	sandy loam	redox present
8-16	2.5Y 5/4	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☒ Other (explain in remarks)

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

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: The sample point contains hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except NW coast)
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stressed Plants (D1)(LRR AA)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9)(NW coast)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6)(LRR A)
- ☐ Frost-Heave Hummocks (D7)

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):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point does not contain wetland hydrology.

Wetland Determination Data Form - Western Mountains, Valleys and Coast Region

Project/Site Fort Bragg Transfer Site City Fort Bragg County Mendocino Sampling Date 7/10/2012

Applicant/Owner Mendocino County Solid Waste Authority State CA Sampling Point **P08**

Investigator(s) Matt Richmond, Aaron Arthur, Morgan Trieger Section,Township,Range T18N, R8W, sec16

Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) relatively flat Slope(%) 2

Subregion(LRR) LRR A (Coastal Redwood Belt) Lat: 39.41 Long: -123.75 Datum: WGS 84

Soil Map Unit Name Blacklock-Aborigine soils, 0-2% slopes NWI classification N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☒ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☒ No	**Is the Sampled Area within a Wetland?** ☒ **Yes** ☐ **No**
Hydric Soil Present?	☒ Yes ☐ No	
Wetland Hydrology Present?	☒ Yes ☐ No	

Remarks: The sample point is located on the edge of Bolander pine and pygmy cypress dominated area (transitional pygmy and extreme pygmy) on closed-cone coniferous forest. The sample point is located near the edge of forest wetland. Hydric soils and wetland hydrology are present, though strong hydrophytic vegetation is lacking. Due to evidence of hydric soils and wetland hydrology, this sample point is included as an edge point in forest wetland.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 30' r	Absolute % cover	Dominant Species?	Indicator Status
1. *Pinus contorta bolanderi*	35	yes	FAC
2. *Hesperocyparis pygmaea*	15	yes	NL
3. *Pinus muricata*	1	no	NL
4.			
Tree Stratum Total Cover:	**51**		
SAPLING/SHRUB STRATUM **Plot Size:** 30' r			
1. *Vaccinium ovatum*	60	yes	FACU
2. *Gaultheria shallon*	10	no	FACU
3. *Rhododendron macrophyllum*	10	no	NL
4.			
Sapling/Shrub Stratum Total Cover:	**80**		
HERB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:			
WOODY VINES **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 100 % cover of biotic crust N/A

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	1	(A)
Total number of dominant species across all strata?	3	(B)
% of dominant species that are OBL, FACW, or FAC?	33.3	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species	0	x1	0
FACW species	0	x2	0
FAC species	35	x3	105
FACU species	70	x4	280
UPL species	26	x5	130
Column Totals	131 (A)		515 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is </= 3.0[1]
- ☐ 4 - Morphological adaptations[1] (provide supporting data in remarks)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ 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

Remarks: The sample point does not contain a dominance of hydrophytic vegetation.

SOIL

Sampling Point P08

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[1]	Texture	Remarks
0-2	7.5YR 6/2	100					fine sandy loam	
2-6	7.5YR 6/2	100	10YR 4/6	2	C	M	fine sandy loam	
6+	7.5YR 6/2						cemented	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☒ Other (explain in remarks)

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

Restrictive Layer (if present):

Type: hardpan

Depth (inches): 6

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: The sample point contains hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except NW coast)
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stressed Plants (D1)(LRR AA)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☒ Water-Stained Leaves (B9)(NW coast)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6)(LRR A)
- ☐ Frost-Heave Hummocks (D7)

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):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point contains wetland hydrology.

Wetland Determination Data Form - Western Mountains, Valleys and Coast Region

Project/Site: Fort Bragg Transfer Site | City: Fort Bragg | County: Mendocino | Sampling Date: 7/10/2012

Applicant/Owner: Mendocino County Solid Waste Authority | State: CA | Sampling Point: **P09**

Investigator(s): Matt Richmond, Aaron Arthur, Morgan Trieger | Section,Township,Range: T18N, R8W, sec16

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): relatively flat | Slope(%): 2

Subregion(LRR): LRR A (Coastal Redwood Belt) | Lat: 39.41 | Long: -123.75 | Datum: WGS 84

Soil Map Unit Name: Blacklock-Aborigine soils, 0-2% slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology | (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes	☒ No
Hydric Soil Present?	☒ Yes	☐ No
Wetland Hydrology Present?	☐ Yes	☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: The sample point is located in a Bishop pine dominated area (transitional pygmy) of closed-cone coniferous forest. The sample point does not contain hydrophytic vegetation or wetland hydrology; however, depleted hydric soils are present.

VEGETATION (use scientific names)

	Absolute % cover	Dominant Species?	Indicator Status
TREE STRATUM **Plot Size:** 30' r			
1. *Pinus muricata*	30	yes	NL
2. *Hesperocyparis pygmaea*	10	yes	NL
3. *Pinus contorta bolanderi*	5	no	FAC
4.			
Tree Stratum Total Cover:	**45**		
SAPLING/SHRUB STRATUM **Plot Size:** 30' r			
1. *Gaultheria shallon*	30	yes	FACU
2. *Rhododendron macrophyllum*	25	yes	NL
3. *Vaccinium ovatum*	10	no	FACU
4. *Arctostaphylos nummularia nummularia*	5	no	NL
Sapling/Shrub Stratum Total Cover:	**70**		
HERB STRATUM **Plot Size:** 10' r			
1. *Xerophyllum tenax*	5	yes	NL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	**5**		
WOODY VINES **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 95 | % cover of biotic crust: N/A

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	0	(A)
Total number of dominant species across all strata?	5	(B)
% of dominant species that are OBL, FACW, or FAC?	0	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:
OBL species		x1
FACW species		x2
FAC species		x3
FACU species		x4
UPL species		x5
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is </= 3.0[1]
☐ 4 - Morphological adaptations[1] (provide supporting data in remarks)
☐ 5 - Wetland Non-Vascular Plants [1]
☐ 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

Remarks: The sample point does not contain a dominance of hydrophytic vegetation.

SOIL

Sampling Point P09

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
2-0	N/A						duff	
0-6	10YR 6/2	100					fine sandy loam	
6+	10YR 6/2	100					cemented	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in remarks)

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

Restrictive Layer (if present):

Type: hardpan

Depth (inches): 6

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: The sample point contains hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except NW coast)
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stressed Plants (D1)(LRR AA)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9)(NW coast)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6)(LRR A)
- ☐ Frost-Heave Hummocks (D7)

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):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point does not contain wetland hydrology.

Wetland Determination Data Form - Western Mountains, Valleys and Coast Region

Project/Site: Fort Bragg Transfer Site | City: Fort Bragg | County: Mendocino | Sampling Date: 7/10/2012

Applicant/Owner: Mendocino County Solid Waste Authority | State: CA | Sampling Point: **P10**

Investigator(s): Matt Richmond, Aaron Arthur, Morgan Trieger | Section,Township,Range: T18N, R8W, sec16

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): relatively flat | Slope(%): 2

Subregion(LRR): LRR A (Coastal Redwood Belt) | Lat: 39.41 | Long: -123.75 | Datum: WGS 84

Soil Map Unit Name: Blacklock-Aborigine soils, 0-2% slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☒ No	**Is the Sampled Area within a Wetland?** ☒ **Yes** ☐ **No**
Hydric Soil Present?	☒ Yes ☐ No	
Wetland Hydrology Present?	☒ Yes ☐ No	

Remarks: The sample point is located on edge of pygmy cypress and Bolander pine dominated area between extremely stunted (extreme pygmy) and moderately stunted trees (transitional pygmy) of closed-cone coniferous forest. The sample point is located on the edge of forest wetland. Hydric soils and wetland hydrology are present, though strong hydrophytic vegetation is lacking. Due to evidence of hydric soils and wetland hydrology, this sample point is included as an edge point in forest wetland.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 30' r	Absolute % cover	Dominant Species?	Indicator Status
1. *Hesperocyparis pygmaea*	20	yes	NL
2. *Pinus contorta bolanderi*	10	yes	FAC
3. *Pinus muricata*	5	no	NL
4.			
Tree Stratum Total Cover:	**35**		
SAPLING/SHRUB STRATUM Plot Size: 30' r			
1. *Vaccinium ovatum*	50	yes	FACU
2. *Gaultheria shallon*	20	yes	FACU
3. *Rhododendron macrophyllum*	15	no	NL
4. *Arctostaphylos nummularia nummularia*	5	no	NL
Sapling/Shrub Stratum Total Cover:	**90**		
HERB STRATUM Plot Size: 10' r			
1. *Xerophyllum tenax*	3	yes	NL
2. *Carex californica*	2	yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	**5**		
WOODY VINES Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 95 | % cover of biotic crust: N/A

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	2	(A)
Total number of dominant species across all strata?	6	(B)
% of dominant species that are OBL, FACW, or FAC?	33.3	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species	0	x1	0
FACW species	3	x2	6
FAC species	10	x3	30
FACU species	70	x4	280
UPL species	48	x5	240
Column Totals	131 (A)		556 (B)

Prevalence Index = B/A = 4.24

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is </= 3.0[1]
- ☐ 4 - Morphological adaptations[1] (provide supporting data in remarks)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ 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

Remarks: The sample point does not contain a dominance of hydrophytic vegetation.

SOIL

Sampling Point P10

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
2-0	N/A						duff	
0-4	10YR 5/2	100					fine sandy loam	
4-8	10YR 6/2	100					fine sandy loam	
8+	10YR 6/2	100					cemented	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in remarks)

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

Restrictive Layer (if present):

Type: hardpan

Depth (inches): 6

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: The sample point contains hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except NW coast)
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stressed Plants (D1)(LRR AA)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☒ Water-Stained Leaves (B9)(NW coast)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6)(LRR A)
- ☐ Frost-Heave Hummocks (D7)

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):

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point contains wetland hydrology.

Wetland Determination Data Form - Western Mountains, Valleys and Coast Region

Project/Site: Fort Bragg Transfer Site | City: Fort Bragg | County: Mendocino | Sampling Date: 7/10/2012

Applicant/Owner: Mendocino County Solid Waste Authority | State: CA | Sampling Point: **P11**

Investigator(s): Matt Richmond, Aaron Arthur, Morgan Trieger | Section,Township,Range: T18N, R8W, sec16

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): relatively flat | Slope(%): 2

Subregion(LRR): LRR A (Coastal Redwood Belt) | Lat: 39.41 | Long: -123.75 | Datum: WGS 84

Soil Map Unit Name: Shinglemill-Gibney complex, 2-9% slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology — Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☒ No
Hydric Soil Present?	☐ Yes ☒ No
Wetland Hydrology Present?	☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: The sample point is located in Bishop pine dominated area of closed-cone coniferous forest. The sample point does not contain hydrophytic vegetation or wetland hydrology; however, depleted hydric soils are present.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: 30' r	Absolute % cover	Dominant Species?	Indicator Status
1. *Pinus muricata*	25	yes	NL
2. *Pinus contorta bolanderi*	15	yes	FAC
3. *Hesperocyparis pygmaea*	5	no	NL
4.			
Tree Stratum Total Cover:	**45**		
SAPLING/SHRUB STRATUM Plot Size: 30' r			
1. *Vaccinium ovatum*	40	yes	FACU
2. *Gaultheria shallon*	20	yes	FACU
3. *Rhododendron macrophyllum*	10	no	NL
4. *Arctostaphylos nummularia nummularia*	5	no	NL
Sapling/Shrub Stratum Total Cover:	**75**		
HERB STRATUM Plot Size: 10' r			
1. *Xerophyllum tenax*	5	yes	NL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	**5**		
WOODY VINES Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 95 | % cover of biotic crust: N/A

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	1	(A)
Total number of dominant species across all strata?	5	(B)
% of dominant species that are OBL, FACW, or FAC?	20	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is </= 3.0[1]
- ☐ 4 - Morphological adaptations[1] (provide supporting data in remarks)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ 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

Remarks: The sample point does not contain a dominance of hydrophytic vegetation.

SOIL

Sampling Point P11

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[1]	Texture	Remarks
1-0	N/A						duff	
0-2	10YR 6/2	100					fine sandy loam	
2-6	10YR 5/6	50					fine sandy loam	
	10YR 6/2	50					fine sandy loam	
6-10	10YR 5/6	100					fine sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in remarks)

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

Restrictive Layer (if present):

Type: N/A

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: The sample point contains hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except NW coast)
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stressed Plants (D1)(LRR AA)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9)(NW coast)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6)(LRR A)
- ☐ Frost-Heave Hummocks (D7)

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):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point does not contain wetland hydrology.

Wetland Determination Data Form - Western Mountains, Valleys and Coast Region

Project/Site: Fort Bragg Transfer Site | City: Fort Bragg | County: Mendocino | Sampling Date: 7/10/2012

Applicant/Owner: Mendocino County Solid Waste Authority | State: CA | Sampling Point: **P12**

Investigator(s): Matt Richmond, Aaron Arthur, Morgan Trieger | Section,Township,Range: T18N, R8W, sec16

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): relatively flat | Slope(%): 2

Subregion(LRR): LRR A (Coastal Redwood Belt) | Lat: 39.41 | Long: -123.75 | Datum: WGS 84

Soil Map Unit Name: Shinglemill-Gibney complex, 2-9% slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology | (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☒ No	**Is the Sampled Area within a Wetland?** ☐ **Yes** ☒ **No**
Hydric Soil Present?	☒ Yes ☐ No	
Wetland Hydrology Present?	☐ Yes ☒ No	

Remarks: The sample point is located in a linear depression within a Bishop pine dominated area of closed-cone coniferous forest. The sample point does not contain hydrophytic vegetation or wetland hydrology; however, depleted hydric soils are present.

VEGETATION (use scientific names)

	Absolute % cover	Dominant Species?	Indicator Status
TREE STRATUM **Plot Size:** 30' r			
1. *Pinus muricata*	60	yes	NL
2. *Hesperocyparis pygmaea*	15	yes	NL
3.			
4.			
Tree Stratum Total Cover:	**75**		
SAPLING/SHRUB STRATUM **Plot Size:** 30' r			
1. *Vaccinium ovatum*	30	yes	FACU
2. *Gaultheria shallon*	30	yes	FACU
3. *Morella californica*	5	no	FACW
4. *Rhododendron macrophyllum*	1	no	NL
Sapling/Shrub Stratum Total Cover:	**66**		
HERB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:			
WOODY VINES **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 100 | % cover of biotic crust: N/A

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	0	(A)
Total number of dominant species across all strata?	4	(B)
% of dominant species that are OBL, FACW, or FAC?	0	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:
OBL species		x1
FACW species		x2
FAC species		x3
FACU species		x4
UPL species		x5
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is </= 3.0[1]
- ☐ 4 - Morphological adaptations[1] (provide supporting data in remarks)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ 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

Remarks: The sample point does not contain a dominance of hydrophytic vegetation.

SOIL

Sampling Point P12

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[1]	Texture	Remarks
4-0	N/A						duff	
0-6	10YR 6/2	100					fine sandy loam	
6+	10YR 6/2	100					cemented	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in remarks)

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

Restrictive Layer (if present):

Type: hardpan

Depth (inches): 6

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: The sample point contains hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except NW coast)
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stressed Plants (D1)(LRR AA)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9)(NW coast)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6)(LRR A)
- ☐ Frost-Heave Hummocks (D7)

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):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point does not contain wetland hydrology.

Appendix C

Plant Species Observed in the Study Area

Table C-1. Plant species observed in the Study Area, May 11 and July 10, 2012

Family	Scientific name	Common name	Life form	Origin	Invasive Status[1]	Rare Status[2]	Wetland indicator[3]
Apiaceae	*Daucus carota*	wild carrot	perennial forb	non-native	assessed	N/A	FACU
Aquifoliaceae	*Ilex aquifolium*	English holly	evergreen tree	non-native	moderate	N/A	NL
Asteraceae	*Baccharis pilularis*	coyote brush	evergreen shrub	native	N/A	N/A	NL
Asteraceae	*Bellis perennis*	English lawn daisy	perennial forb	non-native	assessed	N/A	NL
Asteraceae	*Carduus pycnocephalus*	Italian thistle	annual forb	non-native	moderate	N/A	NL
Asteraceae	*Cirsium vulgare*	bull thistle	perennial forb	non-native	moderate	N/A	FACU
Asteraceae	*Leontodon saxatilis*	hawkbit	annual forb	non-native	N/A	N/A	FACU
Asteraceae	*Senecio jacobaea*	tansy ragwort	perennial forb	non-native	limited	N/A	FACU
Asteraceae	*Sonchus oleraceus*	common sow thistle	annual forb	non-native	N/A	N/A	NL
Brassicaceae	*Cardamine oligosperma*	Idaho bittercress	annual forb	native	N/A	N/A	NL
Brassicaceae	*Raphanus sativus*	cultivated radish	perennial forb	non-native	limited	N/A	NL
Caprifoliaceae	*Lonicera hispidula*	pink honeysuckle	evergreen shrub	native	N/A	N/A	FACU
Cupressaceae	*Hesperocyparis pygmaea*	pygmy cypress	evergreen tree	native	N/A	Rank 1B	NL
Cupressaceae	*Sequoia sempervirens*	coast redwood	evergreen tree	native	N/A	N/A	NL
Cyperaceae	*Carex californica*	California sedge	perennial graminoid	native	N/A	Rank 2	FACW
Cyperaceae	*Carex obnupta*	slough sedge	perennial graminoid	native	N/A	N/A	OBL
Dennstaedtiaceae	*Pteridium aquilinum*	bracken fern	perennial fern	native	N/A	N/A	FACU
Dryopteridaceae	*Polystichum munitum*	western sword fern	perennial fern	native	N/A	N/A	FACU
Ericaceae	*Arctostaphylos columbiana*	hairy manzanita	evergreen shrub	native	N/A	N/A	NL
Ericaceae	*Arctostaphylos nummularia* ssp. *nummularia*	glossy-leaf manzanita	evergreen shrub	native	N/A	N/A	NL
Ericaceae	*Gaultheria shallon*	salal	evergreen shrub	native	N/A	N/A	FACU
Ericaceae	*Rhododendron columbianum*	western Labrador tea	evergreen shrub	native	N/A	N/A	OBL
Ericaceae	*Rhododendron macrophyllum*	California rose bay	evergreen shrub	native	N/A	N/A	NL
Ericaceae	*Vaccinium ovatum*	evergreen huckleberry	evergreen shrub	native	N/A	N/A	FACU
Ericaceae	*Vaccinium parvifolium*	red huckleberry	evergreen shrub	native	N/A	N/A	FACU
Fabaceae	*Acacia dealbata*	silver wattle	evergreen tree	non-native	moderate	N/A	NL
Fabaceae	*Cytisus scoparius*	Scotch broom	evergreen shrub	non-native	high	N/A	NL
Fabaceae	*Genista monspessulana*	French broom	evergreen shrub	non-native	high	N/A	NL
Fabaceae	*Hosackia rosea*	tree lotus	perennial forb	native	N/A	N/A	FACU

Family	Scientific name	Common name	Life form	Origin	Invasive Status[1]	Rare Status[2]	Wetland indicator[3]
Fabaceae	*Lotus corniculatus*	bird's-foot trefoil	perennial forb	non-native	assessed	N/A	FAC
Fabaceae	*Lupinus bicolor*	miniature lupine	annual forb	native	N/A	N/A	NL
Fabaceae	*Trifolium dubium*	shamrock clover	annual forb	non-native	N/A	N/A	FACU
Fabaceae	*Trifolium repens*	white clover	perennial forb	non-native	N/A	N/A	FAC
Fabaceae	*Trifolium striatum*	knotted clover	annual forb	non-native	N/A	N/A	NL
Fabaceae	*Trifolium subterraneum*	subterranean clover	annual forb	non-native	N/A	N/A	NL
Fabaceae	*Vicia sativa ssp. nigra*	garden vetch	annual forb	non-native	N/A	N/A	UPL
Fagaceae	*Chrysolepis chrysophylla*	giant chinquapin	evergreen tree	native	N/A	N/A	NL
Fagaceae	*Notholithocarpus densiflorus*	tanoak	evergreen tree	native	N/A	N/A	NL
Geraniaceae	*Geranium dissectum*	cutleaf geranium	annual forb	non-native	moderate	N/A	NL
Hydrangeaceae	*Whipplea modesta*	modesty	evergreen vine	native	N/A	N/A	NL
Iridaceae	*Iris douglasiana*	Douglas' iris	perennial forb	native	N/A	N/A	NL
Juncaceae	*Juncus effusus ssp. pacificus*	Pacific rush	perennial graminoid	native	N/A	N/A	FACW
Juncaceae	*Juncus patens*	common rush	perennial graminoid	native	N/A	N/A	FACW
Juncaceae	*Luzula comosa*	Pacific woodrush	perennial graminoid	native	N/A	N/A	FAC
Juncaceae	*Luzula parviflora*	small-flowered woodrush	perennial graminoid	native	N/A	N/A	FAC
Lamiaceae	*Stachys rigida var. quercetorum*	rough hedgenettle	perennial forb	native	N/A	N/A	FACW
Liliaceae	*Lilium maritimum*	coast lily	perennial forb	native	N/A	Rank 1B	FACW
Melanthiaceae	*Trillium ovatum*	Pacific trillium	perennial forb	native	N/A	N/A	FACU
Melanthiaceae	*Xerophyllum tenax*	common beargrass	perennial forb	native	N/A	N/A	NL
Moraceae	*Morella californica*	California wax myrtle	evergreen shrub	native	N/A	N/A	FACW
Papaveraceae	*Eschscholzia californica*	California poppy	perennial forb	native	N/A	N/A	NL
Pinaceae	*Pinus contorta ssp. bolanderi*	Bolander’s pine	evergreen tree	native	N/A	Rank 1B	FAC
Pinaceae	*Pinus muricata*	bishop pine	evergreen tree	native	N/A	N/A	NL
Pinaceae	*Pseudotsuga menziesii*	Douglas fir	evergreen tree	native	N/A	N/A	FACU
Pinaceae	*Tsuga heterophylla*	western hemlock	evergreen tree	native	N/A	N/A	FACU
Plantaginaceae	*Plantago lanceolata*	English plantain	perennial forb	non-native	limited	N/A	FACU
Poaceae	*Agrostis exarata*	spike bentgrass	perennial graminoid	native	N/A	N/A	FACW
Poaceae	*Anthoxanthum odoratum*	sweet vernal grass	perennial graminoid	non-native	moderate	N/A	FACU

Family	Scientific name	Common name	Life form	Origin	Invasive Status[1]	Rare Status[2]	Wetland indicator[3]
Poaceae	*Briza maxima*	rattlesnake grass	annual graminoid	non-native	limited	N/A	NL
Poaceae	*Bromus carinatus*	California brome	perennial graminoid	native	N/A	N/A	NL
Poaceae	*Bromus diandrus*	ripgut brome	annual graminoid	non-native	moderate	N/A	NL
Poaceae	*Bromus hordeaceus*	soft chess	annual graminoid	non-native	limited	N/A	FACU
Poaceae	*Bromus laevipes*	Chinook brome	perennial graminoid	native	N/A	N/A	NL
Poaceae	*Cortaderia jubata*	pampas grass	perennial graminoid	non-native	high	N/A	FACU
Poaceae	*Danthonia californica*	California oatgrass	perennial graminoid	native	N/A	N/A	FAC
Poaceae	*Festuca arundinacea*	tall fescue	perennial graminoid	non-native	moderate	N/A	FAC
Poaceae	*Festuca idahoensis*	Idaho fescue	perennial graminoid	native	N/A	N/A	NL
Poaceae	*Festuca myuros*	rattail sixweeks grass	perennial graminoid	non-native	moderate	N/A	FACU
Poaceae	*Festuca rubra*	red fescue	perennial graminoid	native	N/A	N/A	FAC
Poaceae	*Holcus lanatus*	common velvet grass	perennial graminoid	non-native	moderate	N/A	FAC
Poaceae	*Hordeum brachyantherum*	meadow barley	perennial graminoid	native	N/A	N/A	FACW
Poaceae	*Triticum aestivum*	bread wheat	annual graminoid	non-native	N/A	N/A	NL
Polygonaceae	*Rumex acetosella*	common sheep sorrel	perennial forb	non-native	moderate	N/A	FACU
Rhamnaceae	*Frangula californica*	California coffeeberry	evergreen shrub	native	N/A	N/A	NL
Rosaceae	*Cotoneaster pannosus*	silverleaf cotoneaster	evergreen shrub	non-native	moderate	N/A	NL
Rosaceae	*Rubus ursinus*	California blackberry	evergreen shrub	native	N/A	N/A	FACU
Violaceae	*Viola sempervirens*	evergreen violet	perennial forb	native	N/A	N/A	NL

- All species identified using the *Jepson Manual* (Hickman 1993) and *Jepson Manual II: Vascular Plants of California* (Baldwin et al. 2012)
- Nomenclature follows *Jepson Manual II: Vascular Plants of California* (Baldwin et al. 2012)

[1]Invasive Status: California Invasive Plant Inventory (Cal-IPC 2006)
[2]Rare Status: The CNPS Inventory of Rare and Endangered Plants (CNPS 2012)
[3]Wetland Status: National List of Plant Species that Occur in Wetlands, California (Lichvar and Kartesz 2009)

Appendix D

Representative Photographs of the Study Area

Top: Representative upland: Bishop pine forest understory (view: east).

Bottom: Representative upland: Bishop pine forest understory (view: north).

Photographs taken July 10, 2012

ENVIRONMENTAL CONSULTANTS

Top: Forested wetland (extreme pygmy cypress forest), interior view with patchy understory (view: southwest).

Bottom: Forested wetland (extreme pygmy cypress forest), interior view with patchy understory (view: west).

Photographs taken July 10, 2012

wra ENVIRONMENTAL CONSULTANTS

Top: Seasonal wetland depression with California sedge in foreground and wetland edge in background (view: north).

Bottom: Seasonal wetland depression with slough sedge in foreground and wetland edge in background (view: west).

Photographs taken July 10, 2012

ENVIRONMENTAL CONSULTANTS

Top: Sandy loam soils with substantial and evident iron redoximorphic features on the matrix.

Bottom: Surface soil cracks from seasonal wetland depression.

Photographs taken July 10, 2012

wra
ENVIRONMENTAL CONSULTANTS

Appendix E
Preliminary Geotechnical and Engineering Evaluation

LACO

June 7, 2012

7423.01

Mendocino Solid Waste Management Authority
101 W. Church Street, No. 9
Ukiah, California 95482

Attention: Mr. Michael E. Sweeney, General Manager

Subject: Preliminary Geotechnical and Engineering Evaluation
Proposed Solid Waste Transfer Station
30075 Highway 20, Fort Bragg, California
Assessor's Parcel Number (APN) 019-150-05

Dear Mr. Sweeney:

In accordance with your April 12, 2012, Agreement For Professional Services, we are pleased to present this Summary Letter Report regarding Preliminary Geotechnical and Engineering Feasibility for solid waste transfer station development on the subject parcel (see attached Figure 1 for project location).

As contracted, we have performed the following tasks:

<u>Task I – Field Exploration and Percolation Testing</u>

- This task included subsurface exploration of the site at three to five locations using hand auger equipment to depths of no more than 10 feet; performing percolation testing in one to twp hand auger borings to measure the rate of water infiltration into the subsurface soils; and obtaining soil samples from the borings for select laboratory testing.

<u>Task II – Laboratory Testing</u>

This task included performing the following tests on select soil samples at a minimum:

- Two hydrometer tests to determine the grain size percentages of subsurface soils for onsite septic system suitability evaluation.
- Two moisture content and dry density determinations to check for soil index properties such as bearing strength.

<u>Task III – Analysis and Report</u>

- This task consisted of 1) reviewing the RFP-presented data as outlined below, 2) reviewing other documents, data, and studies pertinent to the site selected by LACO, 3) analyzing the field and office data and performing preliminary

21 W. 4th Street, Eureka, California 95501 707 443-5054 Fax 707 443-0553
311 Main Street, Ukiah, California 95482 707 462-0222 Fax 707 462-0223
3450 Regional Parkway, Suite B2, Santa Rosa, California 95403 707 443-5054 Fax 707 443-0553

Toll Free 800 515-5054 www.lacoassociates.com

engineering analyses, and 4) presenting the City and County, as represented by the Mendocino Solid Waste Management Authority (MSWMA), with a preliminary geotechnical and engineering evaluation report summarizing the following:

A. Geotechnical suitability of the site for construction of the proposed transfer station building and paved access driveways, including any conditions which would create unusual costs or obstacles to typical transfer station design.
B. Suitability of the site for onsite sewage disposal, either for a small system serving only sanitary facilities for site employees, or a larger system that could receive other flows.
C. Suitability of the site for an onsite water well to supply facility's water usage.
D. Identification of engineering considerations that may be discovered in the completion of items A through C above, that may constitute significant obstacles to cost-effective development of a transfer station on the site.

This evaluation did not include subsurface investigation for design purposes nor does it include an assessment of possible hazardous or toxic materials, or corrosion potential at the site. LACO's assumptions/exclusions also included:

- LACO would provide one 8-hour day of field work using two LACO staff engineers/geologists.
- No permits were needed to perform the work.
- Permission to access the site was provided by Client to LACO.
- LACO services would result in a preliminary report evaluating suitability of the proposed development, and would not be suitable for project design purposes.
- Design-level evaluation services were not included in LACO's current Scope of Services. LACO would be pleased to provide a scope and fee estimate for these additional services upon request, as needed.

Pursuant to special legislation (AB 384), we understand the State of California has offered a land swap that would give the County of Mendocino and City of Fort Bragg ownership of the eastern-most 17 acres of the part of Jackson Demonstration State Forest (JDSF) north of Highway 20 at this location (hereinafter, "site"); however, it should be noted that the site will not include approximately 5 acres at the western end, which is partly developed as a helipad and will remain under the JDSF ownership.

We further understand that if the site is selected for development of a solid waste transfer station, an engineered site design will be prepared. However, for purposes of this preliminary evaluation, the currently preferred development layout has been presented on the attached Site Map, Figure 2 (based on the Conceptual Site Plan, dated February 6, 2012, provided to us by the MSWMA. As required by the MSWMA, this layout is the basis for determining the feasibility of 1) building and driveway construction, 2) an onsite sewage disposal system, and 3) a groundwater well. In addition, we understand the design of the transfer station building is undetermined, but an approximate description would be a metal building on a concrete slab of 10,000 square feet, potentially with a subway for top-loading transfer trailers. The capacity of the transfer station will be 200 tons per day, and the maximum customer count would be 200 per day. Figure 2 also shows new access driveways on the site, which will need to handle the weight of loaded and offloaded transfer trailers.

A comprehensive Environmental Impact Report (EIR) was prepared in 2005 for the Mendocino Parks and Recreation District golf course project on 600 acres adjoining the site to the north. This EIR included several studies that are relevant to the site, including:

- EIR Section 4.1: Geology, Soils, and Seismicity
- EIR Section 4.2: Hydrology and Water Quality
- EIR Appendix 1-2: Onsite Sewage Disposal Feasibility Study, etc.
- EIR Appendix 4.2-1: Aquifer Testing and Groundwater Modeling, etc.
- EIR Appendix 4.4-1: Phase I Environmental Site Assessment, etc.

These studies were provided to us by the MSWMA, and were reviewed as part of our work for this evaluation; Section 4.1 formed the basis for the geologic setting section of this Report.

Additionally, the Mendocino County Environmental Health Division had records for onsite sewage disposal systems for several residences west of the site along Highway 20, including:

- 30700 Highway 20, APN 19-680-01
- 30500 Highway 20, APN 19-680-07
- 30650 Highway 20, APN 19-680-02

The relevant pages from these files were provided to us by the MSWMA, and were reviewed as part of our work for this evaluation.

The results of our evaluation (study) are summarized below.

FIELD EXPLORATION AND LABORATORY/PERCOLATION TESTING

Our Certified Engineering Geologist and Staff Geologist performed a brief site reconnaissance on February 20, 2012, during our proposal preparation phase of the project. On April 27, 2012, we performed two exploratory test borings using hand auger equipment to supplement the two shallow hand auger borings we had performed during our February 20 site visit. Test borings were installed by our Certified Engineering Geologist, Staff Geologist, and/or Field Engineer to a maximum depth of refusal (with the equipment used) and/or up to 10.1 feet below the ground surface (bgs). Test borings were located across the site and in the near vicinity of the proposed buildings to provide a representative cross-sectional view of subsurface conditions. The locations of the borings (labeled SE-1 through SE-4) are shown on Figure 2. Percolation testing was also performed in boring SE-4; infiltration measurements were made in two distinctly different soil profiles: silty/clayey sand 48 inches bgs, and poorly graded sand at 80 inches bgs.

The test borings were logged in the field in general accordance with the American Society for Testing and Materials (ASTM) D2488 Visual-Manual Procedure. Soil Boring Logs depicting the materials encountered beneath the site are presented in Attachment 1. Attachment 1 also presents the results of our percolation measurements.

Select soil samples were delivered to the LACO materials testing laboratory for pertinent testing of their physical and engineering properties. Tests performed included:

- Hydrometer (Mendocino County Environmental Health Procedure)
- Natural moisture content (ASTM D2216)
- Density of soils in-place (ASTM D2937)
- Atterberg Limits (ASTM D4318)

Laboratory Test Results are summarized in Attachment 2.

SITE AND GEOLOGIC SETTING

The site is characterized by relatively flat (2% to 5% slopes) to gently sloping (5% to 9% slopes) terrain. Elevations at the site range from a low of approximately 400 feet above mean sea level (msl) on the western portion to a high of approximately 430 feet msl at the northeast corner. Surface drainage on the site generally ranges from northwest to southwest. The undeveloped site is predominantly covered by a very dense mixed forest with the only clearings consisting of a turnout off Highway 20, and jeep trails along a portion of the north and east site perimeters.

The basement rock in the project area is coastal belt Franciscan complex, composed primarily of greywacke sandstone with shale lenses. Unconformably overlying the Franciscan complex are quaternary marine terrace deposits, including the older Lower Caspar Orchard deposits, which underlain the project site. These marine deposits typically consist of yellowish to light gray, moderately sorted, poorly consolidated, silty to clayey sand with occasional lenses of coarser sand and/or gravel. These soil types were generally encountered in our subsurface exploration (test borings) drilled at the site (see Attachment 1).

FINDINGS

Based on the results of this evaluation, it is feasible to develop this site as conceptually planned. Our preliminary evaluation found no identifiable geologic hazards that would preclude use of the site for the proposed development. The main potential geologic hazard identified at the site is from future strong earthquake ground shaking. Our evaluation further indicates that the site soils are conducive to onsite sewage disposal, both for a small system serving only sanitary facilities for site employees, or a larger system that could receive other flows, and to installation of an onsite water well to supply the facility's water usage. Specific findings for geotechnical suitability, onsite sewage disposal suitability, and onsite groundwater well suitability of the site are presented in the following sections.

Geotechnical Suitability

No active faults are known to extend through the site. Since surface fault rupture generally follows the trace of pre-existing active faults, the risk of future surface rupture at this site is considered to be low to non-existent. The intensity of ground shaking from future earthquakes will depend on several factors, including the distance from the site to the earthquake focus, the magnitude and duration of the earthquake, and the response of the underlying soil or bedrock. The nearest known active fault is the San Andreas fault (Shelter Cove section) located approximately 8 miles southwest of the site. Past seismic history suggests that moderate to strong shaking is possible from earthquakes on this and other active faults in the region.

During severe vibration from earthquakes, liquefaction can occur in saturated, loose, cohesionless sands. The soils encountered at depth in our test borings drilled at the site are not considered to be liquefiable during strong ground shaking due to their density. It is possible that some isolated, thin lenses of loose, saturated sands near the ground may liquefy during severe ground shaking; however, we judge that on the basis of the relatively thin lenses loose sand encountered, settlement from this liquefaction (should it occur) will be tolerable (i.e., no significant detrimental settlement) for a structure designed to current building code standards.

The site is relatively level and gently sloping, and landslide hazards to the planned structures are considered to be low. The nearest slope having a gradient of 25 percent or greater is approximately 200 feet to the southwest of the site.

The surface and near-surface soils encountered in our test borings at the site are primarily medium dense to dense sands (some of which are cemented) generally located below a surficial, highly organic topsoil and “duff” layer of up to about 12 inches-thick. However, a thin (approximately 6 inches-thick) zone of sandy clay/sandy silt was encountered in boring SE-3 at a depth of about 21 inches bgs. Based on our laboratory Atterberg Limits testing (see Attachment 2), we judge that this clay/silt soil has a high to very high expansion potential (i.e., is subject to large volume changes -- shrink or swell-- with changes in moisture content). Therefore, the geologic/geotechnical concerns at this site are as follows: the existence of a relatively thin (1-foot or less thick at the locations of our test borings) layer of organic material; the existence of expansive soils; the control of surface and subsurface drainage; and the potential for strong seismic ground shaking and related liquefaction from future moderate to major earthquakes in the region.

Organic laden topsoil is unsuitable for support of structures, including pavements and should be removed from planned structure areas prior to construction. The organic topsoil thicknesses are anticipated to be generally less than about 12 inches thick across the site, although they will likely increase in thickness within low lying areas. The high to very high expansion potential of the near-surface clay layer encountered in boring SE-3 (see Figure 2) at the site will require special consideration. However, because this clay layer is relatively thin (approximately 6 inches thick), and was encountered below the surface soils and only in one of the four borings located across the site, we judge that it should not be a significant obstacle to cost-effective development of the transfer station. Proper design and construction of foundations, concrete slabs-on-grade, and asphalt concrete pavements in order to decrease the potential for damage to these structural elements due to heave (swelling) can easily include maintaining the clays wet optimum moisture content where they will support foundations, concrete slabs, and asphalt concrete pavements, until covered with permanent construction. However, depending on the final design grades, the slabs and pavements may experience differential heave and/or cracking near their edges adjacent to landscaping if clay subgrade soils are exposed to seasonal variations in moisture content. Moisture barriers are a common mitigation measure to effectively reduce this risk.

Onsite Sewage Disposal Suitability

Based on our preliminary evaluation, it appears that the site soils in the area of boring SE-4 (see Figure 2) will allow the design and construction of a relatively conventional onsite sewage disposal system (leachfield area). Shallow, perched groundwater, and/or the presence of cemented soils currently leads us to conclude that onsite sewage disposal in the areas of borings SE-1 through SE-3 would be both technically challenging and costly.

Soils in the area of boring SE-4 fell into the Soil Percolation Suitability Zone 1 (Coarse) and 2B (Acceptable) based on hydrometer testing (see Attachment 2). This area of the site appears to represent approximately 3-acres, assuming similar soil profiles exist north of boring SE-4. The measured percolation rate (see Attachment 2) for the Zone 1 soil was 1.14 minutes per inch, while the Zone 2B soil percolation rate was 13.7 minutes per inch.

Groundwater was encountered at a depth of approximately 10 feet below the groundwater table in the area of boring SE-4. However, in the upslope borings SE-2 and SE-3, we encountered shallow, perched, groundwater at depths of from approximately 2- to 5-feet bgs. This perched groundwater appears to be the result of the dense, partially-cemented (relatively low permeability) nature of the near-surface soils, and the time of year that exploration was performed, i.e., during the winter rain season and following relatively prolonged seasonal rainfall.

Actual design of an onsite sewage disposal system should be based on additional percolation testing in the area of boring SE-4 to confirm the limits of a suitable leachfield area. Due to the possible seasonal presence of shallow groundwater upslope of boring SE-4, we recommend that a sub-drain be installed just upslope of the onsite sewage disposal system to reduce the risk of perched groundwater moving in the downslope direction and entering into the leachfield. We currently anticipate that the sub-drain will be from 3- to 6-feet deep, and will consist of perforated pipe, drain rock, and filter fabric installed within a 12-inch-wide trench with a 12-inch-thick compacted soil cap. Actual details of the sub-drain system should be based on additional subsurface exploration to confirm the limits of perched groundwater after the final location and size of the system is determined. Because of the possible presence of groundwater within the upper 10 feet of the ground surface, we further recommend the installation of monitoring wells for winter groundwater measurements prior to the final sewage disposal system design and construction.

Onsite Groundwater Well Suitability

As part of the above referenced EIR process, an aquifer testing and groundwater modeling study was performed for a proposed Mendocino Coast Regional Park and Golf Course project adjacent to, and north of, the site. This study (prepared by Lawrence & Associates and dated March 7, 2005), included installation of a pumping well and observation well. The holes for the wells were drilled with a CME-55 truck-mounted hollow-stem auger rig, using 7-5/8-inch (outside diameter) augers to a maximum depth of 91 feet bgs, at which point bedrock was encountered. The pumping well (PW-5) and observation well (OB-6) were located approximately 1,800-lineal-feet north of the site, and within the same geologic unit (Lower Caspar Orchard marine terrace sediments) underlying the site. Pertinent data obtained from actual aquifer test data from PW-5 and OB-6 included a measured groundwater elevation approximately 20 feet bgs and a long-term yield of 4 to 5 gallons per minute (gpm) for a 2-inch diameter well with 40 feet of well screen. Assuming the bedrock elevation recorded by the Lawrence & Associates study is similar to the elevation at the site, a groundwater well installed within the terrace sediments would be no more than 60 feet deep if installed in the easterly portion of the site. Following State and County requirements for a 50-foot seal, this would leave only 10 feet of sediments for the screened interval. We recommend you consider requesting a variance to allow a 25-foot seal to increase the thickness of formation exposed to the well screen.

On the basis of the information recorded by Lawrence & Associates, a groundwater well screened 25- to 60-feet bgs within the terrace sediments at the site will likely provide at least 2 gpm, which we understand is sufficient water for a proposed transfer station facility. We suggest that the project water supply be initially designed using an onsite water well pumping rate of 2 gpm with final design based on specific onsite pumping well installation and testing. At a minimum, the well should be located at least 100 feet from the leachfield, and at the easterly end of the site (where the terrace sediments are likely thicker and the higher elevation will facilitate gravity feed of water to the transfer station facility).

LIMITATIONS

Conclusions and recommendations contained in this Report are based on our field observations and percolation tests; data from published geologic/geotechnical literature and maps; a conceptual plan for proposed site development; laboratory testing of limited soil samples; and our experience in the project vicinity. Hence, the conclusions and recommendations presented herein should be considered preliminary. It is possible that site surface and subsurface conditions could vary from those described in this preliminary evaluation Report. It is imperative that more detailed investigation be conducted for the proposed development at this site to adequately characterize the site and soil conditions prior to preparation of final construction plans. The geotechnical criteria for final design and construction of proposed foundations, slabs, and pavements should be determined by a site-specific geotechnical investigation, including subsurface exploration, laboratory testing, and engineering analysis. The final septic system design criteria should be confirmed by additional soil profiling, hydrometer tests and wet-weather percolation testing in the identified leachfield and required leachfield expansion areas. Initial leachfield sizing can be based on the calculated wastewater flows of the facility and the preliminary percolation test results presented herein.

Our firm has prepared this Report for the exclusive use of the Mendocino Solid Waste Management Authority (Client) in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the site area at the time of our study. No warranty is expressed or implied. The preliminary conclusions and recommendations provided in this Report are based on the assumption that a geotechnical investigation and subsequent program of tests and observations will be conducted by our firm during the final design and construction phases of the project in order to for us to evaluate compliance with our recommendations. If we are not retained for these services, our Client must assume LACO's responsibility for potential claims that may arise during or after construction.

We trust this Letter Report provides you with the information that you require at this time. If you have questions or need additional information, please contact us at (707) 462-0222.

Respectfully submitted,
LACO Associates

Richard E. Yahn

REGISTERED PROFESSIONAL ENGINEER
RICHARD E. YAHN
No. 913
Exp. 3-31-14
GEOTECHNICAL
STATE OF CALIFORNIA

Richard E. Yahn, P.E.
G.E. 913, Exp. 3/31/14

REY:tmc

LIST OF FIGURES AND ATTACHMENTS

Figure 1:	Location Map
Figure 2:	Site Map with Boring Locations
Attachment 1:	Soil Boring Logs
Attachment 2:	Field and Laboratory Test Data

Appendix F

EDR Report

Potential Central Coast Transfer Station
30075 Highway 20
Fort Bragg, CA 95437

Inquiry Number: 3925512.2s
April 28, 2014

The EDR Radius Map™ Report

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION | **PAGE**

GEOCHECK ADDENDUM

GeoCheck - Not Requested

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

30075 HIGHWAY 20
FORT BRAGG, CA 95437

COORDINATES

Latitude (North):	39.4136000 - 39˚ 24' 48.96''
Longitude (West):	123.7621000 - 123˚ 45' 43.56''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	434392.2
UTM Y (Meters):	4362744.0
Elevation:	373 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	39123-D7 FORT BRAGG, CA
Most Recent Revision:	1978
East Map:	39123-D6 NOYO HILL, CA
Most Recent Revision:	1991

AERIAL PHOTOGRAPHY IN THIS REPORT

Photo Year:	2012
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL - National Priority List

EXECUTIVE SUMMARY

Proposed NPL - - - - - - Proposed National Priority List Sites
NPL LIENS - - - - - - Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL - - - - - - National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY - - - - - - Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP - - - - - - CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS - - - - - - Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF - - - - - - RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG - - - - - - RCRA - Large Quantity Generators
RCRA-SQG - - - - - - RCRA - Small Quantity Generators
RCRA-CESQG - - - - - - RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS - - - - - - Engineering Controls Sites List
US INST CONTROL - - - - - - Sites with Institutional Controls
LUCIS - - - - - - Land Use Control Information System

Federal ERNS list

ERNS - - - - - - Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE - - - - - - State Response Sites

State- and tribal - equivalent CERCLIS

ENVIROSTOR - - - - - - EnviroStor Database

State and tribal landfill and/or solid waste disposal site lists

SWF/LF - - - - - - Solid Waste Information System

State and tribal leaking storage tank lists

LUST - - - - - - Geotracker's Leaking Underground Fuel Tank Report
SLIC - - - - - - Statewide SLIC Cases

EXECUTIVE SUMMARY

INDIAN LUST - - - - - Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

UST - - - - - Active UST Facilities
AST - - - - - Aboveground Petroleum Storage Tank Facilities
INDIAN UST - - - - - Underground Storage Tanks on Indian Land
FEMA UST - - - - - Underground Storage Tank Listing

State and tribal voluntary cleanup sites

VCP - - - - - Voluntary Cleanup Program Properties
INDIAN VCP - - - - - Voluntary Cleanup Priority Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS - - - - - A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

ODI - - - - - Open Dump Inventory
DEBRIS REGION 9 - - - - - Torres Martinez Reservation Illegal Dump Site Locations
WMUDS/SWAT - - - - - Waste Management Unit Database
SWRCY - - - - - Recycler Database
HAULERS - - - - - Registered Waste Tire Haulers Listing
INDIAN ODI - - - - - Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL - - - - - Clandestine Drug Labs
HIST Cal-Sites - - - - - Historical Calsites Database
SCH - - - - - School Property Evaluation Program
Toxic Pits - - - - - Toxic Pits Cleanup Act Sites
CDL - - - - - Clandestine Drug Labs
US HIST CDL - - - - - National Clandestine Laboratory Register

Local Lists of Registered Storage Tanks

CA FID UST - - - - - Facility Inventory Database
HIST UST - - - - - Hazardous Substance Storage Container Database
SWEEPS UST - - - - - SWEEPS UST Listing

Local Land Records

LIENS 2 - - - - - CERCLA Lien Information
LIENS - - - - - Environmental Liens Listing
DEED - - - - - Deed Restriction Listing

Records of Emergency Release Reports

HMIRS - - - - - Hazardous Materials Information Reporting System
CHMIRS - - - - - California Hazardous Material Incident Report System

LDS	Land Disposal Sites Listing
MCS	Military Cleanup Sites Listing
SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR	RCRA - Non Generators
DOT OPS	Incident and Accident Data
DOD	Department of Defense Sites
FUDS	Formerly Used Defense Sites
CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
US MINES	Mines Master Index File
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems
ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
RADINFO	Radiation Information Database
FINDS	Facility Index System/Facility Registry System
RAATS	RCRA Administrative Action Tracking System
RMP	Risk Management Plans
CA BOND EXP. PLAN	Bond Expenditure Plan
NPDES	NPDES Permits Listing
UIC	UIC Listing
Cortese	"Cortese" Hazardous Waste & Substances Sites List
HIST CORTESE	Hazardous Waste & Substance Site List
CUPA Listings	CUPA Resources List
Notify 65	Proposition 65 Records
DRYCLEANERS	Cleaner Facilities
WIP	Well Investigation Program Case List
ENF	Enforcement Action Listing
HAZNET	Facility and Manifest Data
EMI	Emissions Inventory Data
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
2020 COR ACTION	2020 Corrective Action Program List
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
WDS	Waste Discharge System
PRP	Potentially Responsible Parties
MWMP	Medical Waste Management Program Listing
COAL ASH DOE	Steam-Electric Plant Operation Data
HWT	Registered Hazardous Waste Transporter Database
HWP	EnviroStor Permitted Facilities Listing
US FIN ASSUR	Financial Assurance Information
Financial Assurance	Financial Assurance Information Listing
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
PROC	Certified Processors Database

EXECUTIVE SUMMARY

EPA WATCH LIST - - - - - - - - - - - EPA WATCH LIST

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP - EDR Proprietary Manufactured Gas Plants
EDR US Hist Cleaners - - - - - - - - EDR Exclusive Historic Dry Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF - Recovered Government Archive Solid Waste Facilities List
RGA LUST - - - - - - - - - - - - - - - - - - - Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS list

CERCLIS: The Comprehensive Environmental Response, Compensation and Liability Information System contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

A review of the CERCLIS list, as provided by EDR, and dated 10/25/2013 has revealed that there is 1 CERCLIS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PARLIN FORK/CA DEPT OF FORESTR	11M E. OF FORT BRAGG ON	E 1/4 - 1/2 (0.324 mi.)	2	8

EXECUTIVE SUMMARY

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR US Hist Auto Stat: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR US Hist Auto Stat list, as provided by EDR, has revealed that there is 1 EDR US Hist Auto Stat site within approximately 0.25 miles of the target property.

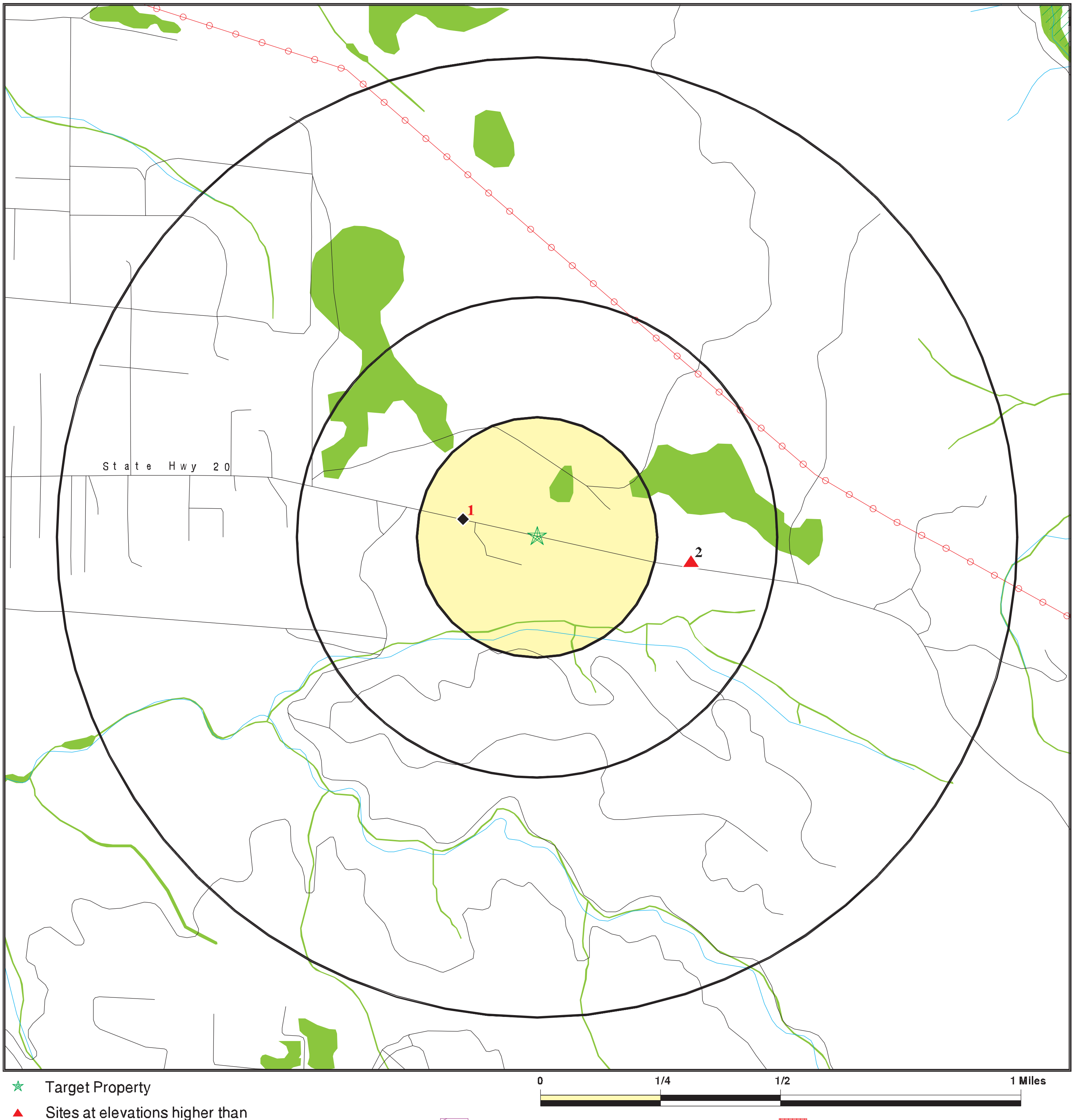
Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	30520 HIGHWAY 20	WNW 1/8 - 1/4 (0.159 mi.)	1	8

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 20 records.

Site Name	Database(s)
CDF PARLIN FORK CONS. CAM	HIST CORTESE, WDS
MENDOCINO CO CASPAR SWDS	HIST CORTESE
SAVINGS BANK OF MENDOCINO	HIST CORTESE
FORT BRAGG OIL COMPANY	HIST CORTESE
PINE BEACH INN/STAR CROSS ENTERPRI	SWEEPS UST
LP BIG RIVER WWDS	WMUDS/SWAT, Notify 65
GLASS BEACH	CERC-NFRAP
PARKS ESTATES PROP-GUN CLUB	CERC-NFRAP
PACIFIC BELL	RCRA-SQG, FINDS
PACIFIC BELL	RCRA NonGen / NLR
MENDOCINO COAST DISTRICT HOSPITAL	FINDS
BED ROCK, INC.	US MINES
KEN MCCUTCHAN	US MINES
NORTHERN AGGREGATES, INC.	US MINES
GRANITE CONSTRUCTION CO	US MINES
PARLIN FORK CONSERVATION CAMP, CDF	ENVIROSTOR
UNION OIL	ENVIROSTOR
SHELL OIL	ENVIROSTOR
STANDARD OIL	ENVIROSTOR
REDWOOD WRECKERS & SALVAGE	ENVIROSTOR

OVERVIEW MAP - 3925512.2s



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

Indian Reservations BIA

Power transmission lines

Oil & Gas pipelines from USGS

100-year flood zone

500-year flood zone

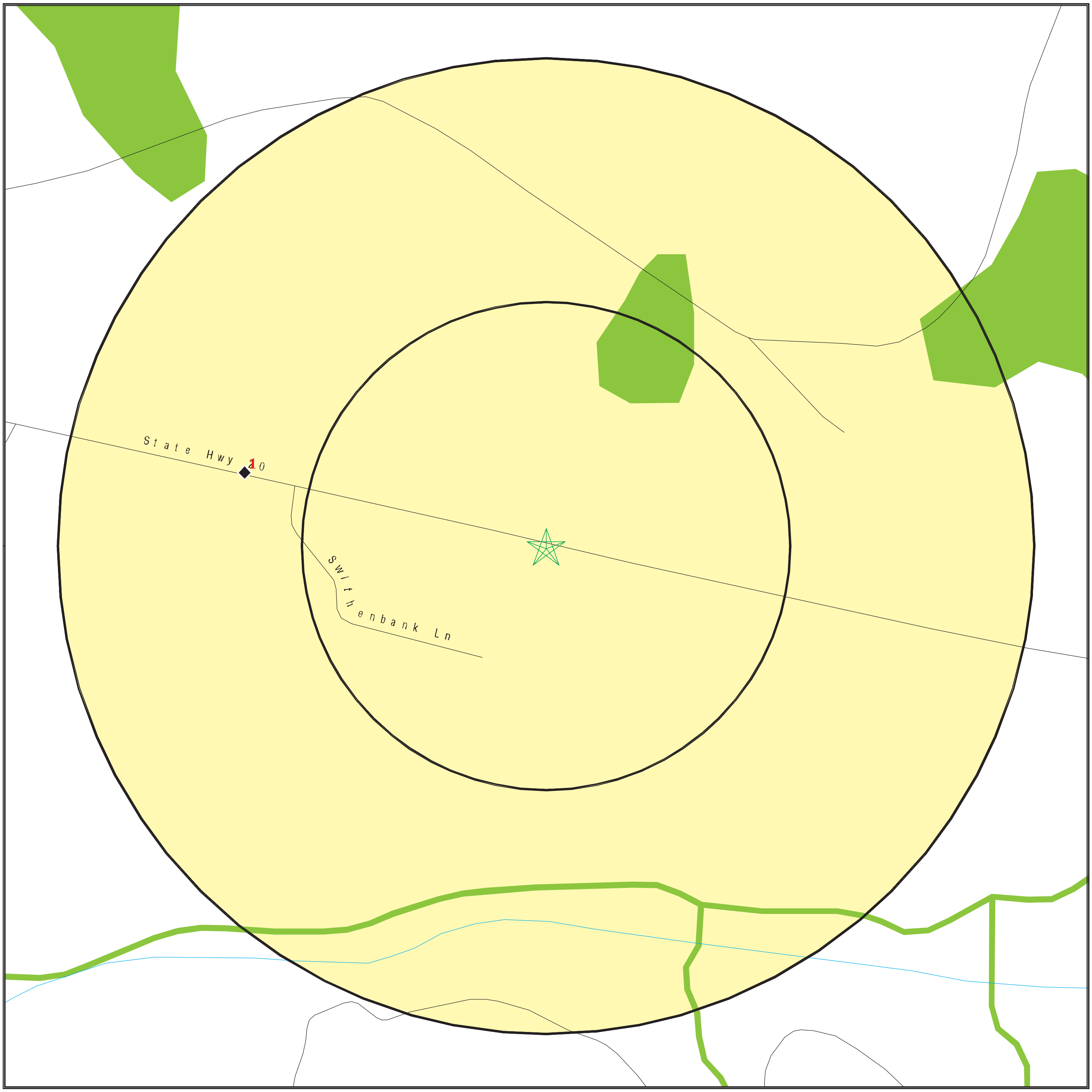
National Wetland Inventory

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Potential Central Coast Transfer Station	CLIENT: GHD Inc.
ADDRESS: 30075 Highway 20	CONTACT: Anna Gower
Fort Bragg CA 95437	INQUIRY #: 3925512.2s
LAT/LONG: 39.4136 / 123.7621	DATE: April 28, 2014 8:15 pm

DETAIL MAP - 3925512.2s



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Potential Central Coast Transfer Station	CLIENT:	GHD Inc.
ADDRESS:	30075 Highway 20 Fort Bragg CA 95437	CONTACT:	Anna Gower
		INQUIRY #:	3925512.2s
LAT/LONG:	39.4136 / 123.7621	DATE:	April 28, 2014 8:18 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS	0.500		0	0	1	NR	NR	1
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SLIC	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
CA FID UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250		0	0	NR	NR	NR	0
SWEEPS UST	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
LIENS	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	0	0	NR	0
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
Cortese	0.500		0	0	0	NR	NR	0
HIST CORTESE	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
WDS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
HWT	0.250		0	0	NR	NR	NR	0
HWP	1.000		0	0	0	0	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
PROC	0.500		0	0	0	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR US Hist Auto Stat	0.250		0	1	NR	NR	NR	1
EDR US Hist Cleaners	0.250		0	0	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1 WNW 1/8-1/4 0.159 mi. 839 ft.	**30520 HIGHWAY 20 FORT BRAGG, CA 95437**	**EDR US Hist Auto Stat**	**1015408095 N/A**

Relative: **Lower**

Actual: **363 ft.**

EDR Historical Auto Stations:

Name:	JOHN MEDLENS AUTO REPAIR
Year:	2001
Address:	30520 HIGHWAY 20
Name:	JOHN MEDLENS AUTO REPAIR
Year:	2002
Address:	30520 HIGHWAY 20
Name:	JOHN MEDLENS AUTO REPAIR
Year:	2003
Address:	30520 HIGHWAY 20
Name:	JOHN MEDLENS AUTO REPAIR
Year:	2005
Address:	30520 HIGHWAY 20
Name:	JOHN MEDLENS AUTO REPAIR
Year:	2006
Address:	30520 HIGHWAY 20
Name:	JOHN MEDLENS AUTO REPAIR
Year:	2007
Address:	30520 HIGHWAY 20
Name:	JOHN MEDLENS AUTO REPAIR
Year:	2008
Address:	30520 HIGHWAY 20
Name:	JOHN MEDLENS AUTO REPAIR
Year:	2009
Address:	30520 HIGHWAY 20

2 East 1/4-1/2 0.324 mi. 1713 ft.	**PARLIN FORK/CA DEPT OF FORESTRY 11M E. OF FORT BRAGG ON HWY 20 FORT BRAGG, CA 95437**	**CERCLIS**	**1000707602 CAD983645193**

Relative: **Higher**

Actual: **406 ft.**

CERCLIS:

Site ID:	0904538
EPA ID:	CAD983645193
Facility County:	MENDOCINO
Short Name:	PARLIN FORK/CA DEPT OF FO
Congressional District:	01
IFMS ID:	Not reported
SMSA Number:	Not reported
USGC Hydro Unit:	18010108
Federal Facility:	Not a Federal Facility
DMNSN Number:	0.00000
Site Orphan Flag:	N
RCRA ID:	Not reported
USGS Quadrangle:	Not reported
Site Init By Prog:	Not reported

PARLIN FORK/CA DEPT OF FORESTRY (Continued) **1000707602**

NFRAP Flag:	Not reported
Parent ID:	Not reported
RST Code:	Not reported
EPA Region:	09
Classification:	Not reported
Site Settings Code:	Not reported
NPL Status:	Not on the NPL
DMNSN Unit Code:	Not reported
RBRAC Code:	Not reported
RResp Fed Agency Code:	Not reported
Non NPL Status:	Site Reassessment Start Needed
Non NPL Status Date:	07/24/06
Site Fips Code:	06045
CC Concurrence Date:	/ /
CC Concurrence FY:	Not reported
Alias EPA ID:	Not reported
Site FUDS Flag:	Not reported

CERCLIS Site Contact Name(s):

Contact ID:	13003854.00000
Contact Name:	Leslie Ramirez
Contact Tel:	(415) 972-3978
Contact Title:	Site Assessment Manager (SAM)
Contact Email:	Not reported

Contact ID:	13003858.00000
Contact Name:	Sharon Murray
Contact Tel:	(415) 972-4250
Contact Title:	Site Assessment Manager (SAM)
Contact Email:	Not reported

Contact ID:	13004003.00000
Contact Name:	Carl Brickner
Contact Tel:	Not reported
Contact Title:	Site Assessment Manager (SAM)
Contact Email:	Not reported

CERCLIS Site Alias Name(s):

Alias ID:	101
Alias Name:	PARLIN FORK CONSERVATION CAMP
Alias Address:	Not reported FORT BRAGG, CA
Alias Comments:	Not reported

Site Description: Not reported

CERCLIS Assessment History:

Action Code:	001
Action:	DISCOVERY
Date Started:	/ /
Date Completed:	06/22/92
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

PARLIN FORK/CA DEPT OF FORESTRY (Continued) **1000707602**

Action Code:	001
Action:	PRELIMINARY ASSESSMENT
Date Started:	/ /
Date Completed:	09/01/94
Priority Level:	Higher priority for further assessment
Operable Unit:	SITEWIDE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

Action Code:	001
Action:	SITE INSPECTION
Date Started:	12/10/93
Date Completed:	10/09/96
Priority Level:	Higher priority for further assessment
Operable Unit:	SITEWIDE
Primary Responsibility:	State, Fund Financed
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

Count: 20 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
FORT BRAGG	S106930705	PINE BEACH INN/STAR CROSS ENTERPRI	HIGHWAY 1	95437	SWEEPS UST
FORT BRAGG	S103341520	CDF PARLIN FORK CONS. CAM	HWY 20 E. 10 MI FM FORT B	95437	HIST CORTESE, WDS
FORT BRAGG	S100453843	PARLIN FORK CONSERVATION CAMP, CDF	2300 HIGHWAY 20	95437	ENVIROSTOR
FORT BRAGG	S105023782	MENDOCINO CO CASPAR SWDS	COUNTY RD 409	95437	HIST CORTESE
FORT BRAGG	1000251693	PACIFIC BELL	9 MI E/O FORT BRAGG	95437	RCRA-SQG, FINDS
FORT BRAGG	1003878564	GLASS BEACH	END OF ELM ST	95437	CERC-NFRAP
FORT BRAGG	S103661826	SAVINGS BANK OF MENDOCINO	490 FRANKLIN	95437	HIST CORTESE
FORT BRAGG	S101481189	UNION OIL	FRANKLIN	95437	ENVIROSTOR
FORT BRAGG	S101481188	SHELL OIL	FRANKLIN	95437	ENVIROSTOR
FORT BRAGG	S100181647	STANDARD OIL	FRANKLIN	95437	ENVIROSTOR
FORT BRAGG	S101481182	REDWOOD WRECKERS & SALVAGE	GEORGES LANE	95437	ENVIROSTOR
FORT BRAGG	1004654690	PARKS ESTATES PROP-GUN CLUB	N OF FT BRAGG & E OF HWY 1	95437	CERC-NFRAP
FORT BRAGG	S105023785	FORT BRAGG OIL COMPANY	18770 ONE	95437	HIST CORTESE
FORT BRAGG	1000251692	PACIFIC BELL	S/W SIDE WESTERN RAILROAD	95437	RCRA NonGen / NLR
FORT BRAGG	1014673956	MENDOCINO COAST DISTRICT HOSPITAL	UNKNOWN		FINDS
FORT BRAGG CA	S101612113	LP BIG RIVER WWDS	HIGHWAY 20 15MI. E. FORT BRAGG	95437	WMUDS/SWAT, Notify 65
MENDOCINO COUNTY	M300006780	BED ROCK, INC.	BALD HILLS QUARRY		US MINES
MENDOCINO COUNTY	M300006781	KEN MCCUTCHAN	BLUE RIDGE ROCK PRODUCTS		US MINES
MENDOCINO COUNTY	M300006779	NORTHERN AGGREGATES, INC.	HARRIS QUARRY		US MINES
MENDOCINO COUNTY	M300003108	GRANITE CONSTRUCTION CO	SHUSTER QUARRY		US MINES

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 04/08/2014
Next Scheduled EDR Contact: 07/21/2014
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 04/08/2014
Next Scheduled EDR Contact: 07/21/2014
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 04/08/2014
Next Scheduled EDR Contact: 07/21/2014
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 02/28/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 05/31/2013
Date Data Arrived at EDR: 07/08/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 151

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/11/2014
Next Scheduled EDR Contact: 07/21/2014
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 02/28/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/11/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 27

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/11/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/11/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/11/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/11/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 12/17/2013
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 12/17/2013
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 02/26/2014
Date Data Arrived at EDR: 02/28/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 55

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/30/2013
Date Data Arrived at EDR: 10/01/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 66

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 04/04/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Annually

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 03/12/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/10/2014
Number of Days to Update: 28

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 03/12/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/10/2014
Number of Days to Update: 28

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 02/14/2014
Date Data Arrived at EDR: 02/18/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 28

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 02/18/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST: Geotracker's Leaking Underground Fuel Tank Report

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 03/17/2014
Date Data Arrived at EDR: 03/19/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 36

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 03/19/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Quarterly

SLIC: Statewide SLIC Cases

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 12/16/2013
Date Data Arrived at EDR: 12/17/2013
Date Made Active in Reports: 01/16/2014
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/19/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 02/20/2014
Date Data Arrived at EDR: 02/21/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 62

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 59

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 02/21/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 11/21/2013
Date Data Arrived at EDR: 11/26/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/22/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 184

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2013
Date Data Arrived at EDR: 03/01/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Quarterly

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 02/13/2014
Date Data Arrived at EDR: 02/14/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 10

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/06/2013
Date Data Arrived at EDR: 11/07/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 29

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Quarterly

State and tribal registered storage tank lists

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 03/17/2014
Date Data Arrived at EDR: 03/19/2014
Date Made Active in Reports: 04/25/2014
Number of Days to Update: 37

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 03/19/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 08/01/2009
Date Data Arrived at EDR: 09/10/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 21

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 04/07/2014
Next Scheduled EDR Contact: 07/21/2014
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 01/27/2014
Number of Days to Update: 271

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 11/21/2013
Date Data Arrived at EDR: 11/26/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/22/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 02/13/2014
Date Data Arrived at EDR: 02/14/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 10

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 01/29/2014
Date Data Arrived at EDR: 01/29/2014
Date Made Active in Reports: 03/12/2014
Number of Days to Update: 42

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 02/20/2014
Date Data Arrived at EDR: 02/21/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 62

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 07/29/2013
Date Data Arrived at EDR: 08/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 92

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 07/29/2013
Date Data Arrived at EDR: 07/30/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 129

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 02/05/2013
Date Data Arrived at EDR: 02/06/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 65

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Quarterly

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/15/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/17/2013
Date Data Arrived at EDR: 10/01/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 66

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 04/01/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 03/12/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/10/2014
Number of Days to Update: 28

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 03/20/2014
Date Data Arrived at EDR: 03/20/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 20

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/20/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: No Update Planned

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: No Update Planned

SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 03/17/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/18/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 02/20/2014
Date Made Active in Reports: 03/27/2014
Number of Days to Update: 35

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/04/2013
Date Data Arrived at EDR: 12/10/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 65

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/04/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Quarterly

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 03/12/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/10/2014
Number of Days to Update: 28

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/28/2014
Date Made Active in Reports: 03/20/2014
Number of Days to Update: 20

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 04/10/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/04/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: No Update Planned

Local Lists of Registered Storage Tanks

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 03/03/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Varies

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 01/17/2014
Date Data Arrived at EDR: 01/21/2014
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 21

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 03/10/2014
Date Data Arrived at EDR: 03/11/2014
Date Made Active in Reports: 04/10/2014
Number of Days to Update: 30

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 03/11/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/03/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 52

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 04/01/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Annually

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 10/14/2013
Date Data Arrived at EDR: 10/30/2013
Date Made Active in Reports: 12/03/2013
Number of Days to Update: 34

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 03/17/2014
Date Data Arrived at EDR: 03/19/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 36

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/19/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 03/17/2014
Date Data Arrived at EDR: 03/19/2014
Date Made Active in Reports: 04/25/2014
Number of Days to Update: 37

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/19/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/11/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/06/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/18/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 02/28/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 55

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/24/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 31

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/27/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 03/11/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/25/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 09/05/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 28

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/05/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/31/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 44

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/26/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/28/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems
Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/28/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 10/09/2014
Next Scheduled EDR Contact: 07/21/2014
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2013
Date Data Arrived at EDR: 07/17/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 107

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/18/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/22/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 91

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 01/09/2014
Date Data Arrived at EDR: 01/10/2014
Date Made Active in Reports: 03/12/2014
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/09/2014
Next Scheduled EDR Contact: 07/21/2014
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/18/2013
Date Data Arrived at EDR: 02/27/2014
Date Made Active in Reports: 03/12/2014
Number of Days to Update: 13

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 03/14/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/01/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/19/2013
Number of Days to Update: 52

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/28/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Biennially

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 02/17/2014
Date Data Arrived at EDR: 02/18/2014
Date Made Active in Reports: 03/27/2014
Number of Days to Update: 37

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 02/18/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Quarterly

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 01/15/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 03/18/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Varies

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 12/30/2013
Date Data Arrived at EDR: 12/31/2013
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 42

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 04/01/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List
The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 04/07/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: No Update Planned

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner’s agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/16/2013
Number of Days to Update: 35

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Annually

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 03/31/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 02/25/2014
Date Data Arrived at EDR: 02/27/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 19

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 07/16/2013
Date Made Active in Reports: 08/26/2013
Number of Days to Update: 41

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 04/18/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 06/25/2013
Date Made Active in Reports: 08/22/2013
Number of Days to Update: 58

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 03/25/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/18/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 04/21/2014
Next Scheduled EDR Contact: 08/04/2014
Data Release Frequency: Varies

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011
Date Data Arrived at EDR: 05/18/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 01/29/2013
Date Data Arrived at EDR: 02/14/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 04/04/2014
Next Scheduled EDR Contact: 07/21/2014
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 04/15/2013
Date Data Arrived at EDR: 07/03/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 72

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 04/04/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/18/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: N/A

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/23/2013
Date Data Arrived at EDR: 11/06/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 30

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 03/31/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/23/2013
Date Data Arrived at EDR: 11/06/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 30

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 03/31/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Annually

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 02/21/2014
Date Data Arrived at EDR: 03/12/2014
Date Made Active in Reports: 04/14/2014
Number of Days to Update: 33

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 04/18/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: Varies

HWT: Registered Hazardous Waste Transporter Database
A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 04/14/2014
Date Data Arrived at EDR: 04/15/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 9

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 04/15/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: Quarterly

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 02/24/2014
Date Data Arrived at EDR: 02/25/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 21

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/25/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

US FIN ASSUR: Financial Assurance Information
All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 02/25/2014
Date Data Arrived at EDR: 02/27/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 41

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Quarterly

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 02/14/2014
Date Data Arrived at EDR: 02/18/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 28

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 01/28/2014
Date Data Arrived at EDR: 01/30/2014
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 12

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/11/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 03/17/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/18/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST
EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 08/13/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Quarterly

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Proprietary Historic Dry Cleaners - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Auto Stat: EDR Proprietary Historic Gas Stations - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/22/2014
Date Data Arrived at EDR: 01/23/2014
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 19

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 03/31/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 01/22/2014
Date Data Arrived at EDR: 01/23/2014
Date Made Active in Reports: 02/12/2014
Number of Days to Update: 20

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 03/31/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List
Cupa Facility List

Date of Government Version: 12/05/2013
Date Data Arrived at EDR: 12/10/2013
Date Made Active in Reports: 01/03/2014
Number of Days to Update: 24

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 03/24/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing
Cupa facility list.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 08/22/2013
Number of Days to Update: 20

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 04/10/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 09/30/2013
Date Data Arrived at EDR: 10/01/2013
Date Made Active in Reports: 11/26/2013
Number of Days to Update: 56

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 03/31/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 12/05/2013
Date Data Arrived at EDR: 12/05/2013
Date Made Active in Reports: 01/27/2014
Number of Days to Update: 53

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Varies

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 02/24/2014
Date Data Arrived at EDR: 02/25/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 21

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 02/05/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 01/09/2013
Date Data Arrived at EDR: 01/10/2013
Date Made Active in Reports: 02/25/2013
Number of Days to Update: 46

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 02/20/2014
Date Data Arrived at EDR: 02/21/2014
Date Made Active in Reports: 03/20/2014
Number of Days to Update: 27

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 02/04/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 28

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 04/14/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: Semi-Annually

HUMBOLDT COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 12/16/2013
Date Data Arrived at EDR: 12/17/2013
Date Made Active in Reports: 01/07/2014
Number of Days to Update: 21

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

IMPERIAL COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 01/27/2014
Date Data Arrived at EDR: 01/28/2014
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 14

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List

Cupa facility list.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 33

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing

Kern County Sites and Tanks Listing.

Date of Government Version: 08/31/2010
Date Data Arrived at EDR: 09/01/2010
Date Made Active in Reports: 09/30/2010
Number of Days to Update: 29

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 02/25/2014
Date Data Arrived at EDR: 02/27/2014
Date Made Active in Reports: 03/20/2014
Number of Days to Update: 21

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 01/23/2013
Date Data Arrived at EDR: 01/25/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 33

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 04/21/2014
Next Scheduled EDR Contact: 08/04/2014
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 03/24/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 12/06/2013
Date Data Arrived at EDR: 01/28/2014
Date Made Active in Reports: 03/17/2014
Number of Days to Update: 48

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 04/02/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 01/20/2014
Date Data Arrived at EDR: 01/21/2014
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 21

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 04/22/2014
Next Scheduled EDR Contact: 08/04/2014
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 03/05/2009
Date Data Arrived at EDR: 03/10/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 29

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 04/17/2014
Next Scheduled EDR Contact: 08/04/2014
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/07/2014
Date Data Arrived at EDR: 02/25/2014
Date Made Active in Reports: 03/25/2014
Number of Days to Update: 28

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 04/17/2014
Next Scheduled EDR Contact: 08/04/2014
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 02/10/2014
Date Data Arrived at EDR: 02/12/2014
Date Made Active in Reports: 03/17/2014
Number of Days to Update: 33

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 04/21/2014
Next Scheduled EDR Contact: 08/04/2014
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 02/25/2014
Date Data Arrived at EDR: 02/27/2014
Date Made Active in Reports: 04/14/2014
Number of Days to Update: 46

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Annually

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 07/15/2013
Date Data Arrived at EDR: 07/18/2013
Date Made Active in Reports: 08/20/2013
Number of Days to Update: 33

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 04/14/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 12/09/2013
Date Data Arrived at EDR: 12/10/2013
Date Made Active in Reports: 02/20/2014
Number of Days to Update: 72

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites

Currently permitted USTs in Marin County.

Date of Government Version: 01/03/2014
Date Data Arrived at EDR: 01/09/2014
Date Made Active in Reports: 02/12/2014
Number of Days to Update: 34

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 04/07/2014
Next Scheduled EDR Contact: 07/21/2014
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 03/10/2014
Date Data Arrived at EDR: 03/11/2014
Date Made Active in Reports: 04/10/2014
Number of Days to Update: 30

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List

CUPA Facility List

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/04/2014
Date Made Active in Reports: 04/01/2014
Number of Days to Update: 28

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 03/03/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing

CUPA Program listing from the Environmental Health Division.

Date of Government Version: 03/18/2014
Date Data Arrived at EDR: 03/20/2014
Date Made Active in Reports: 04/25/2014
Number of Days to Update: 36

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

NAPA COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 12/05/2011
Date Data Arrived at EDR: 12/06/2011
Date Made Active in Reports: 02/07/2012
Number of Days to Update: 63

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 03/03/2014
Next Scheduled EDR Contact: 06/06/2014
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 03/03/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 11/06/2013
Date Data Arrived at EDR: 11/07/2013
Date Made Active in Reports: 12/04/2013
Number of Days to Update: 27

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 02/01/2014
Date Data Arrived at EDR: 02/12/2014
Date Made Active in Reports: 03/17/2014
Number of Days to Update: 33

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 02/03/2014
Date Data Arrived at EDR: 02/13/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 33

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 02/01/2014
Date Data Arrived at EDR: 02/12/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 34

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities

List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 03/10/2014
Date Data Arrived at EDR: 03/11/2014
Date Made Active in Reports: 04/10/2014
Number of Days to Update: 30

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites

Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 04/15/2014
Date Data Arrived at EDR: 04/17/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 7

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/02/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Quarterly

Underground Storage Tank Tank List

Underground storage tank sites located in Riverside county.

Date of Government Version: 01/14/2014
Date Data Arrived at EDR: 01/15/2014
Date Made Active in Reports: 02/12/2014
Number of Days to Update: 28

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/24/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List

List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 11/21/2013
Date Data Arrived at EDR: 01/09/2014
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 33

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 04/04/2014
Next Scheduled EDR Contact: 07/21/2014
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/21/2013
Date Data Arrived at EDR: 01/09/2014
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 33

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 04/04/2014
Next Scheduled EDR Contact: 07/21/2014
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 03/18/2014
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 04/25/2014
Number of Days to Update: 35

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 09/23/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 23

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2013
Date Data Arrived at EDR: 11/19/2013
Date Made Active in Reports: 12/31/2013
Number of Days to Update: 42

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Varies

Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Quarterly

Underground Storage Tank Information

Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 03/15/2011
Number of Days to Update: 5

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 12/18/2013
Date Data Arrived at EDR: 12/19/2013
Date Made Active in Reports: 01/08/2014
Number of Days to Update: 20

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 04/07/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 02/24/2014
Date Data Arrived at EDR: 02/26/2014
Date Made Active in Reports: 03/26/2014
Number of Days to Update: 28

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 01/13/2014
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 28

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/17/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/17/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/17/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 03/04/2014
Date Data Arrived at EDR: 03/06/2014
Date Made Active in Reports: 03/20/2014
Number of Days to Update: 14

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 03/03/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing

A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 03/03/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Annually

Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 02/07/2014
Date Data Arrived at EDR: 02/11/2014
Date Made Active in Reports: 03/17/2014
Number of Days to Update: 34

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List

CUPA facility listing.

Date of Government Version: 02/24/2014
Date Data Arrived at EDR: 02/25/2014
Date Made Active in Reports: 03/20/2014
Number of Days to Update: 23

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List

Cupa Facility List.

Date of Government Version: 03/17/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks

A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 12/16/2013
Date Data Arrived at EDR: 12/18/2013
Date Made Active in Reports: 01/08/2014
Number of Days to Update: 21

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 03/17/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Quarterly

Underground Storage Tanks

Underground storage tank sites located in Solano county.

Date of Government Version: 12/16/2013
Date Data Arrived at EDR: 12/19/2013
Date Made Active in Reports: 01/08/2014
Number of Days to Update: 20

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 03/17/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List

Cupa Facility list

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/02/2014
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 40

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 03/31/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites

A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 01/03/2014
Date Data Arrived at EDR: 01/03/2014
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 39

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 03/31/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks

Underground storage tank sites located in Sutter county.

Date of Government Version: 12/10/2013
Date Data Arrived at EDR: 12/11/2013
Date Made Active in Reports: 01/04/2014
Number of Days to Update: 24

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 03/24/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Semi-Annually

TUOLUMNE COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 01/27/2014
Date Data Arrived at EDR: 01/28/2014
Date Made Active in Reports: 03/17/2014
Number of Days to Update: 48

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks

The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 01/28/2014
Date Data Arrived at EDR: 02/25/2014
Date Made Active in Reports: 03/20/2014
Number of Days to Update: 23

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/18/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites

Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 04/04/2014
Next Scheduled EDR Contact: 07/21/2014
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites

Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/17/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Quarterly

Medical Waste Program List

To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 10/02/2013
Date Data Arrived at EDR: 10/30/2013
Date Made Active in Reports: 11/27/2013
Number of Days to Update: 28

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 03/21/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 11/26/2013
Date Data Arrived at EDR: 12/18/2013
Date Made Active in Reports: 01/08/2014
Number of Days to Update: 21

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/17/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 12/18/2013
Date Data Arrived at EDR: 12/24/2013
Date Made Active in Reports: 01/08/2014
Number of Days to Update: 15

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 03/24/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List

CUPA facility listing for Yuba County.

Date of Government Version: 02/11/2014
Date Data Arrived at EDR: 02/13/2014
Date Made Active in Reports: 03/17/2014
Number of Days to Update: 32

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 12/06/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/21/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 08/28/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/18/2014
Next Scheduled EDR Contact: 07/28/2014
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/07/2014
Date Made Active in Reports: 03/31/2014
Number of Days to Update: 52

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 03/12/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Annually

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 07/24/2013
Date Made Active in Reports: 08/19/2013
Number of Days to Update: 26

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/21/2014
Next Scheduled EDR Contact: 08/04/2014
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 06/21/2013
Date Made Active in Reports: 08/05/2013
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 08/09/2013
Date Made Active in Reports: 09/27/2013
Number of Days to Update: 49

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/17/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.
Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.
Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.
Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.
Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.
Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

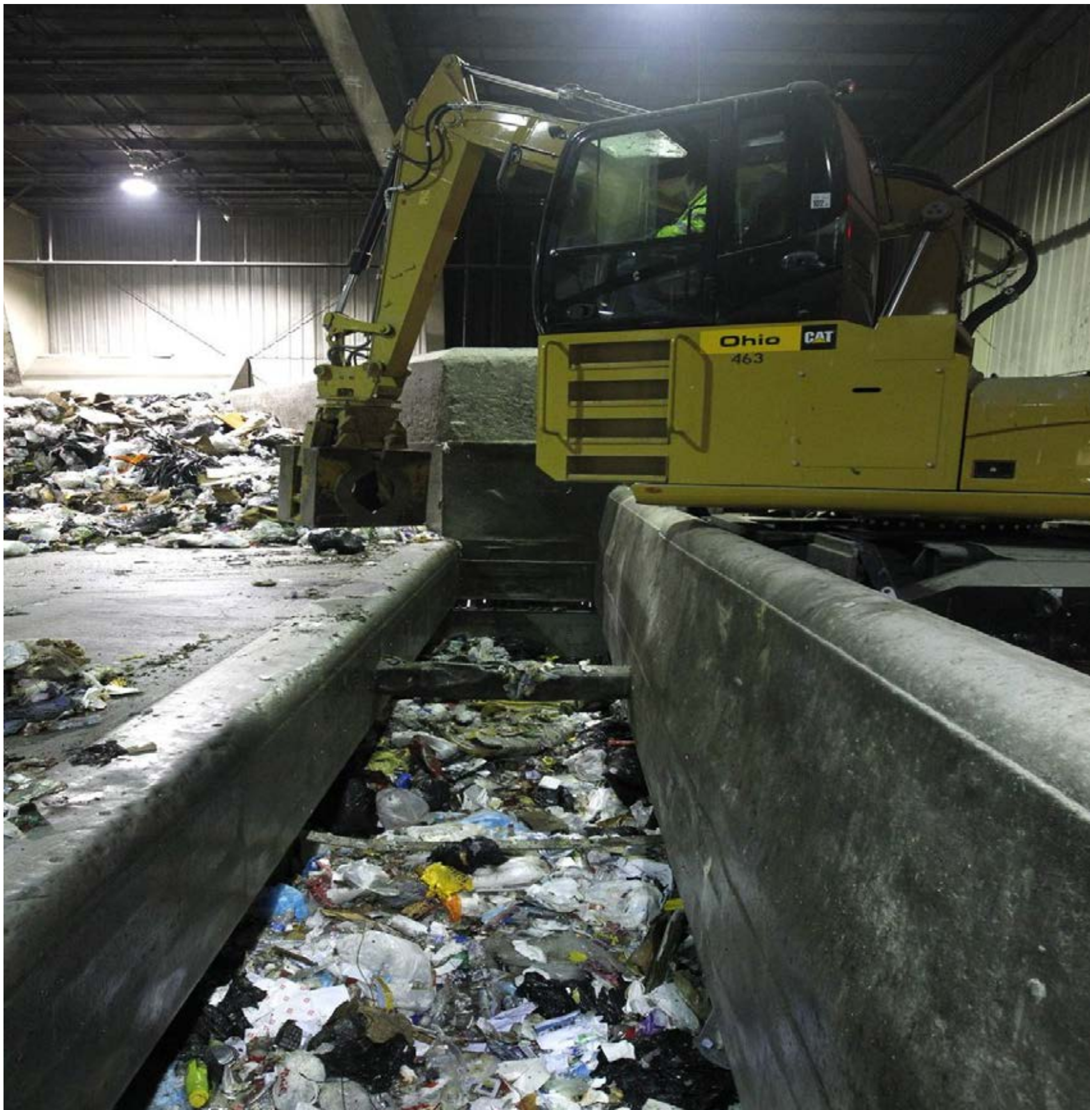
NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STREET AND ADDRESS INFORMATION

Appendix G
Hydrological Study



Mendocino Solid Waste Management Authority

Coast Central Transfer Station
Surface Water Hydrologic Study

September 2014

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1. Introduction

The Mendocino Solid Waste Management Authority (MSWMA) is proposing to construct and operate a commercial transfer station facility to serve the central coast area. The facility, known as the Central Coast Transfer Station (CCTS), will serve self-haul and commercial customers in the wasteshed which consists of the City of Fort Bragg and the surrounding unincorporated area referred to as Mendocino County Solid Waste Refuse Collection Area #2.

Solid waste disposal in the central coast region of Mendocino County has been a joint responsibility of the County of Mendocino and City of Fort Bragg for more than 40 years. When the jointly–owned Caspar Landfill closed in 1992, the site was converted to a self-haul transfer station.

Empire Waste Management, the franchised collector for the City of Fort Bragg and the surrounding unincorporated area, introduced its “WMS” or “pod” system for medium-distance waste transfer, which uses specialized collection trucks with detachable pod bodies for compacted waste. The pods are removed from the collection trucks at Empire’s Fort Bragg yard and loaded three-at-time on a flatbed semi-trailer to be hauled 37 miles to the Willits Transfer Station, where they are dumped and reloaded for transfer to the Potrero Hills Landfill in Suisun.

The inefficiency and expense of this disposal system led to a decision in 2006 to identify a site for construction of a commercial transfer station that would receive the entire wastestream and ship it directly to a destination landfill. In 2011, staff evaluated six semi-final sites, which were then narrowed down to two finalist sites, the Jackson Demonstration State Forest (JDSF) property on State Route 20 (project site) and the existing Caspar Landfill property. In June, 2013, the Mendocino County Board of Supervisors and Fort Bragg City Council designated the JDSF property on SR 20 as the preferred site.

This report summarizes the surface water hydrology study performed for the proposed project site. The intent of this hydrologic analysis is to assess the potential effects on surface water hydraulics at the site by the proposed development of the transfer station. Figure 1 (See Appendix A) is a Vicinity Map identifying the location of the project site.

2. Project Description

2.1 Project Location

The project site lies within the Jackson Demonstration State Forest (JDSF) at 30075 State Route (SR) 20, which is a portion of Assessor’s Parcel Number (APN) 019-150-05. The proposed project site is located in unincorporated Mendocino County approximately 3.5 miles southeast of downtown Fort Bragg.

2.2 Proposed Transfer Station

The proposed CCTS facility would include a solid waste transfer building (with loading bay and unloading and waste areas), an outdoor recycling drop-off area, two scales and office (scalehouse), paved driveways, parking areas for the public and transfer trailers, two stormwater detention areas, a septic tank with leachfield, and perimeter fencing. The site plan is shown in Figure 2 (see Appendix A). A single gate on SR 20 would accommodate all vehicle entry and exit. Vehicles would pull up at the scalehouse for inspection, weighing or volume measurement, and paying charges. The Transfer Building would be approximately 30,000 square feet and fully enclosed. Enclosure would reduce or prevent off-site noise, odors, and dust. In addition, the design would be compatible with installation of control measures such as negative-pressure ventilation with biofiltered exhaust, automated roll-up doors, and/or doorway air curtains.

All solid waste would be deposited inside the transfer building, along with green waste (leaves, brush, landscape trimmings, and unfinished wood). These materials would be loaded into transfer trailers using a method to be determined by the operator, such as a grapple crane. When a transfer trailer is fully loaded, it would be driven directly to a destination landfill to be specified under the operator's contract. Solid waste would typically be removed within 24 hours; however, it is possible that in some situations, such as weekends/holidays, waste could remain for up to 48 hours. Among the fully-permitted regional landfills that might receive the solid waste are Potrero Hills in Suisun City, Redwood in Novato, Sonoma Central in Petaluma, Anderson in Anderson, Ostrum Road in Wheatland, Lake County in Clearlake, Recology Hay Road in Vacaville, and Keller Canyon in Pittsburg. Green waste would be hauled to Cold Creek Compost in Potter Valley or another fully-permitted compost facility. Transfer vehicles leaving the facility would proceed east on SR 20.

The recycling drop-off area would duplicate the drop-off services presently provided at the Caspar self-haul transfer station. Cans, bottles, cardboard, paper and mixed plastics would be collected together in debris boxes (see outdoor recycling area in Figure 2). Scrap metal, appliances and concrete rubble would be received in paved bunkers or debris boxes. Used motor oil and used antifreeze would be collected in secure tanks with secondary containment (see outdoor recycling area in Figure 2). Other recyclable household hazardous waste items, including electronics, fluorescent lights, and batteries, would be collected in secure containment areas. All other hazardous wastes would be prohibited at the facility and customers would be referred to the periodic HazMobile household and small business hazardous waste mobile collection system.

A total of approximately 4.7 acres is assumed to be disturbed for the purposes of evaluation and analysis in this report, approximately 3.7 acres within the project footprint, and 0.96 acre for a 10-foot construction buffer.

3. Site Description

3.1 Topography and Soils

The proposed project site was evaluated by LACO and Associates (LACO) in June 2012 to determine soil characteristics and drainage features. The site was determined to be characterized by relatively flat (2 to 5% slopes) to gently sloping (5 to 9% slopes) terrain. Elevations at the site range from a low of approximately 400 feet above mean sea level (msl) on the western portion to a high of approximately 430 feet msl at the northeast corner. Surface drainage of the site is predominately split into two drainage areas (see Figure 3, Appendix A). Drainage Area 1, which is approximately 7.3 acres in size, drains to the north west. Drainage Area 2 drains to the south and is approximately 9.3 acres in size. The undeveloped site is predominately covered by a very dense mixed forest with the only clearings consisting of a turnout off Highway 20, and jeep trails along a portion of the north and east perimeters.

The basement rock in the project area is coastal belt Franciscan complex, composed primarily of greywacke sandstone with shale lenses. Uncomformably overlying the Franciscan complex are quaternary marine terrace deposits, including the older Lower Caspar Orchard deposits, which underlying the project site. These marine deposits typically consist of yellowish to light grey, moderately sorted, poorly consolidated, silty to clayey sand with occasional lenses or coarser sand and/or gravel. These soil types were generally encountered during the subsurface exploration (test borings) drilled at the site.

The surface and near-surface soils encountered at the site were determined to be primarily medium dense to dense sands (some of which are cemented) generally located below a surficial, highly organic topsoil and "duff" layer of up to about 12 inches in depth. LACO determined the geologic/geotechnical concerns at the project site consisted of: the existence of a relatively thin (1-foot or less) layer of organic material; the existence of expansive soils; the control of surface and subsurface drainage; and the potential for strong seismic ground shaking and related liquefaction from future moderate to major earthquakes in the region.

3.2 Surface and Groundwater

Groundwater was encountered during the site investigation performed by LACO to be on average 10 feet below the ground surface (bgs). In the upslope areas, shallow perched groundwater was encountered at depths ranging from approximately 2 to 5 feet bgs.

According to Caltrans engineer, Scott Lee, the portion of stormwater that collects on the project site and drains to SR 20 is conveyed by a drainage channel that runs parallel to SR 20 in both a easterly and westerly orientation. Stormwater that flows west along the road is discharged by a 12-inch culvert located at approximately mile marker 2.7, which is about 1,600 feet from the project site. Stormwater that flows east along SR 20 is routed to an 18-inch culvert located at approximately mile marker 4.1, which is approximately 2,600 feet to the east.

3.3 Site Vegetation

The project site is located within a bishop pine forest (predominant) and a pygmy forest which lies on the oldest and highest of five wave-cut terraces that rise from the Mendocino County coast. In this complex "ecological staircase," each terrace is approximately 100,000 years older than the one below.

4. Regulatory Setting

Hydrology-related issues are regulated at the federal, State, and local levels. For the project site, most regulation of hydrology-related issues will be conducted by local and state agencies. Relevant federal regulations are administered by the State.

4.1 Federal Regulations

Water-quality standards for drinking water are established and regulated by the Federal Safe Drinking Water Act of 1986 and Chapter 15, Title 22 of the California Code of Regulations. These documents establish Maximum Contaminant Levels that apply to many types of compounds. The levels are subject to revision, and additional compounds can be added. California Department of

Health Services Drinking Water Program is responsible for implementation of the federal Safe Drinking Water Act, as well as California statutes and regulations related to drinking water.

The Federal Environmental Protection Agency (USEPA) has granted the State of California primary responsibility for administering and enforcing the provisions of the Federal Clean Water Act (CWA) and the National Pollution Discharge Elimination System (NPDES). NPDES is the primary Federal program regulating both point- and non-point-source discharges to waters of the U.S. California has adopted water-quality standards as required by Section 303 of the CWA.

Section 404 of the CWA regulates placement of clean fill materials into the waters of the U.S., and is administered by the Army Corps of Engineers (USACE). Under the CWA, the state must issue or waive Section 401 Water Quality Certifications for a project to be permitted under Section 404. Water Quality Certifications require the evaluation of water-quality impacts associated with placement of fill into waters of the U.S.

4.2 State Regulations

Porter-Cologne Act

The Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act) established the California State Water Resources Control Board (SWRCB) which oversees nine regional areas, each with its Regional Water Quality Control Board. The SWRCB is the primary State agency responsible for protecting water quality, for surface water and to some degree for groundwater.

The Porter-Cologne Act authorizes the SWRCB to draft State policies regarding water quality and to issue Waste Discharge Requirements for various types of discharges to State waters. The Porter-Cologne Act requires the SWRCB or RWQCB to adopt Basin Plans for the protection of water quality. The North Coast RWQCB, which has jurisdiction over the project area, adopted its most recent amendments to the Basin Plan in 2001.

In addition to regional and federal regulatory guidelines presented above, the California Department of Transportation (Caltrans) and Mendocino County have developed guidelines concerning surface hydrology for the consistent and equivalent studies of drainage and flood control facilities within Mendocino County.

Given the proposed development of the transfer station, the following guidance documents were reviewed and considered in this hydrologic analysis:

1. Mendocino County Road and Development Standards;
2. Caltrans Highway Design Manual;
3. California Stormwater Quality Association Handbook; and
4. Erosion and Sediment Control Field Manual by RWQCB.

These guidelines were used as the basis for the hydrologic analysis further discussed in this report.

5. Hydrologic Analysis

The intent of the hydrologic analysis is to evaluate the size and type of stormwater controls necessary for the proposed CCTS facility.

5.1 Drainage Areas

Based on a site visit by GHD in April 2014, survey information of the site, and review of previous site studies the project area was delineated in to two discrete drainages (see Figure 3, Appendix A). The northerly drainage basin, Basin 1, is approximately 7.7 acres is size and is assumed to drain predominately to the northwest. Basin 2, the southerly drainage basin, is approximately 9.3 areas in size and is assumed to flow to the south. For this analysis, it is assumed that all the rain water collected in both Basin 1 and 2 will need to be managed by appropriate conveyance channels and detention basins. It is recognized that the boundary between the two drainage areas may not represent actual field conditions but for hydrologic modelling purposes is considered to be appropriate.

5.2 Hydrologic Model

The Santa Barbara Unit Hydrograph (SBUH) Method was used for the hydrology analyses. The SBUHM method, like the Soil Conservation Service Urban Hydrograph (SCSUH) method (developed by the Soil Conservation Service (SCS), which is now the USDA Natural Resources Conservation Service (NRCS)), is based on the curve number (CN) approach.

The SCSUH method works by converting the incremental runoff depths (precipitation excess) for a given basin and design storm hydrographs of equal time base according to basin time of concentration and adds them to form the runoff hydrograph. The SBUH method, on the other hand, converts the incremental runoff depths into instantaneous hydrographs which are then routed through a modelled reservoir with a time delay equal to the basin time of concentration.

The SBUH method was developed by the Santa Barbara County Flood Control and California Water Conservation District. The SBUH method directly computes a runoff hydrograph without going through an intermediate process (unit hydrograph) as the SCSUH method does.

The SBUH method is an accepted hydrologic model that incorporates the predominant characteristics of basins including vegetation, soils, topography and type of development. Because the drainage areas included in the model are relatively small and the characteristics relatively homogeneous, the SBUH method is considered an appropriate numerical model for this analysis. Allowances were made to account for the impact of soils and vegetative characteristics including relative absorption rates. Similarly, model parameters were adjusted to reflect the topography and density of development (e.g., impervious verses pervious areas) within the project site.

In order to analyse the stormwater discharge quantities for the various design storm events, the project area was divided into two sub-basins, each representative of a discrete small watershed (see Figure 3, Appendix A) with properties that include a mix of pervious and impervious surfaces and dimensions that limit the potential for overland flow to become channelized. It is recognized that these sub basins are not delineated as discrete watersheds. From a hydrologic perspective, the project component that impacts the hydrology of the site is the addition of impervious surfaces. Input parameters used in the SBUH Method are presented in Appendix C.

For this analysis, the 2, 10, 25, 50, and 100-year/24-hour design storms were used to generate peak flow rates for the two drainage basins. Small design storm events (e.g., 2-year/24-hour) were also considered in this analysis, in part to determine the size and discharge requirements of the detention basins. Precipitation data is presented in Appendix B and input parameters used in the SBUH Method area presented in Appendix C.

5.3 Slope Conveyance Method

Anticipated maximum channel water surface elevations and velocities resulting from each storm event analysed (2, 10, 25, 50, 100 year/24 hour), were calculated for each basin to determine the hydraulic characteristics.

The Slope Conveyance Method was used to simulate a broad range of flows through a representative channel of assumed dimension, slope, and roughness. The corresponding velocities at each flow rate were calculated, and the relationship between flow rate and channel velocity was determined by fitting a line of best fit to the data. Anticipated maximum channel velocities for each basin were determined by inputting the calculated peak flow rates predicted from the SBUH method, for each storm event.

The representative channel selected for this simulation was assumed to be trapezoidal in shape with a 2-foot wide bottom and side slopes at 2H:1V. The channel material was assumed to be silty sand, with moderate vegetative growth on the bottom and banks of the channel. A Manning's roughness coefficient of 0.030 was selected for these conditions with an assumed channel slope of one percent. Appendix F presents the calculations for the channel analyses, which were performed to estimate water surface elevations and velocities.

5.3.1 Bioswales

Stormwater conveyance channels for the transfer station will be bioswales. A bioswale is a shallow depression created in the earth to accept and convey stormwater runoff. It uses natural means, including vegetation and soil, to treat stormwater by filtering out contaminants being conveyed in the water. Bioswales lined with grass or other vegetation require channel velocities below 5 fps, in order to prevent vegetation growth and detrimental scouring of the channel. The practice of removing stormwater pollutants is generally known as a "best management practice," or BMP, which could be a requirement of the U.S. Environmental Protection Agency and the California Department of Environmental Protection.

5.4 Curve Number (CN) Determination

The USDA Natural Resources Conservation Service (NRCS) has established "curve numbers" to represent runoff characteristics. The curve numbers were established from empirical analyses of runoff from small catchments and hill slope sites monitored by USDA. This information was subsequently used in development of a hydrologic model that is widely used to estimate runoff flows and characteristics for watersheds. The major factors that determine curve numbers (CN) are the hydrologic soil group (HSG), cover type, treatment, hydrologic condition, and antecedent runoff condition. Another factor considered is whether impervious areas outlet directly to the drainage system (connected) or whether the flow spreads over pervious areas before entering the drainage system (unconnected).

When a drainage area has more than one land use or cover type, a common approach is to develop a composite curve number to be used in the analysis. By using a weighted method it is possible to develop a composite curve number that is representative of the different land uses or cover types. When using this approach, the analysis does not take into account the location of the specific land uses, but sees the drainage area as a uniform land use represented by the composite curve number. For the hydrologic analyses presented in this report, a composite curve number was developed for pervious areas using a weighted average for cover type (e.g., woodland versus forest). Appendix C shows the input parameters used in the hydrology modelling, including the type of cover material selected and associated percentages based on drainage area.

5.5 Detention Basins

Detention basins are a common BMP for managing stormwater runoff. They are used to temporarily detain sediment-laden stormwater under quiescent conditions, allowing sediment to settle out before the runoff is released.

Detention basins, when properly designed and maintained, trap a significant amount of the sediment that flows into them. However, traditional basins do not remove all inflowing sediment. Therefore, they should be used in conjunction with erosion control practices (i.e., temporary seeding, mulching, diversion dikes, etc.,) to reduce the amount of sediment flowing into the basin. According to the California Stormwater Quality Association (CASQA, 2003):

> *"When designing a sediment basin, designers should evaluate the site constraints that could affect the efficiency of the basin. Some of these constraints include: the relationship between basin capacity, anticipated sediment load, and freeboard, available footprint for the basin, maintenance frequency and access, and hydraulic capacity and efficiency of the outlet structure. Sediment basins should be designed to maximize sediment removal and to consider sediment load retained by the basin as it affects basin performance."*

The CASQA sets the following general considerations and requirements for detention basin design and siting as:

1. Basins shall be located: 1) by excavating a suitable area or where a low embankment can be constructed across a swale, 2) where post-construction (permanent) detention basins will be constructed, 3) where failure would not cause loss of life or property damage, 4) where the basins can be maintained on a year-round basis to provide access for maintenance, including sediment removal and sediment stockpiling in a protected area, and to maintain the basin to provide the required capacity.
2. Proper hydraulic design of the outlet is critical to achieving the desired performance of the basin. The outlet should be designed to drain the basin within 24 to 96 hours (also referred to as "drawdown time"). The 24-hour limit is specified to provide adequate settling time; the 96-hour limit is specified to mitigate vector control concerns.
3. Confirmation of the basin performance can be evaluated by routing the design storm through the basin based on the basin volume (stage-storage curve) and the outlet design (stage-discharge curve based on the orifice configuration or equivalent outlet design).
4. Sediment basins, regardless of size and storage volume, shall include features to accommodate overflow or bypass flows that exceed the design storm event.
5. The total depth of the sediment basin should include the depth required for sediment storage, depth required for settling zone and freeboard of at least 1-foot or as regulated by local flood control agency for a flood event.
6. The basin alignment should be designed such that the length of the basin is more than twice the width of the basin.
7. Construct an emergency spillway to accommodate flows not carried by the principal spillway. Spillway shall consist of an open channel over undisturbed material or constructed of non-erodible riprap.

8. Spillway control section, which is a level portion of the spillway channel at the highest elevation in the channel, shall be a minimum of 20 feet in length.
9. A forebay, constructed upstream of the basin may be provided to remove debris and larger particles.
10. Basin inlets shall be located to maximize travel distance to the drain outlet.
11. Rock or vegetation shall be used to protect the basin inlet and slopes against erosion.
12. The outflow from the basins shall be provided with outlet protection to prevent erosion and scouring of the embankment and channel.

5.5.1 Detention Basin Analysis

The Erosion and Sediment Control Field Manual (*Field Manual*) published by the RWQCB outlines the preliminary steps in determining the required volume of a sediment basin given increases in peak runoff rates (RWQCB, 2002). The Field Manual recommends the use of the Rational Method (Equation 1) for determining the required volume of a sediment basin:

$$Q = CiA \qquad \text{Equation 1}$$

Where:

Q	=	Peak basin influent flow rate (cfs);
C	=	Runoff coefficient (unitless);
i	=	Peak rainfall intensity for the 10-year/6-hour rain event (in/hr); and
A	=	Area draining into the sediment basin (acres).

The underlying assumption of the Rational Method is that a steady, uniform rainfall rate will produce maximum runoff when all parts of a watershed are contributing to the point of concentration outflow, a condition that is met after the time of concentration t_c has elapsed.

The roughness coefficients were determined from the Caltrans Highway Design Manual for undeveloped and developed areas using Figures 819.2A and 819.2B, respectively. For undeveloped areas, the roughness coefficient was determined from Table 1 below.

Table 1. Runoff Coefficients for Undeveloped Areas

Type	Description	C value
Rough	Relatively flat land with average slopes of 0 to 5%	0.14
Soil Infiltration	Slow to take up water, clay or shallow loam soils of low infiltration capacity, imperfectly or poorly drained	0.12
Vegetal Cover	Good to excellent about 90% of the drainage area in good grassland, woodland or equivalent cover.	0.06

Type	Description	C value
Surface Drainage	Low; well defined system of small drainage ways; no ponds or marshes	0.1
	Undeveloped C Value	0.42

The roughness coefficient for developed areas was assumed to be 0.95, for pavement and roofs. To determine a roughness coefficient for post-development, a weighted average was used to determine a composite roughness coefficient. Table 2 shows the amount of area for undeveloped and developed areas and the corresponding composite roughness coefficients used for this analysis.

Table 2. Composite Roughness Coefficients

	Basin 1		Basin 2	
Type	Pre-Development	Post-Development	Pre-Development	Post-Development
Undeveloped Area (ac)	7.7	5.6	9.3	7.7
Developed Area (ac)	0	2.1	0	1.6
Composite C	**0.42**	**0.56**	**0.42**	**0.51**

5.5.2 Time of Concentration

Time of concentration (*t_c*) is defined as the time required, with uniform rain, for 100 percent of a tract of land to contribute to the direct runoff at the outlet (Viessman, 1995). Runoff is assumed to reach maximum when the rainfall intensity lasts as long as t_c. The time of concentration for each basin was found by using the Kiprich equation (Equation 2):

$$t_c = 0.0078 L^{0.77} S^{-0.385} \qquad \text{Equation 2}$$

Where:

t_c = Time of concentration (min.)
L = Length of channel from headwater to outlet (ft.)
S = Average watershed slope (ft/ft)

5.5.3 Detention Basin Sizing

The runoff coefficient is assumed constant during a storm event. The California Stormwater BMP Handbook references using the 10-year design storm Intensity Duration Frequency (IDF) curve and the time of concentration from each individual basin to determine the rate of rainfall for each basin. Once the flow is calculated using the above equation, the surface area of the pond can be determined using Equation 3 and assuming a minimum 2-foot depth:

$$A = (1.2 * Q) / V_s \qquad \text{Equation 3}$$

Where:

A	=	Minimum surface area for trapping soil particles of a certain size (ft^2);
Q	=	Peak runoff rate calculated from Equation #1 above (cfs);
V_s	=	Settling velocity of design particles (ft/sec); and
1.2	=	Factor of safety recommended by USEPA to account for the reduction in basin efficiency caused due to turbulence and other non-ideal conditions.

The design particle size should be the smallest soil grain size determined by wet sieve analysis, or the fine silt sized (0.0004 in) particle, and the Vs used should be 100 percent of the calculated settling velocity.

The sizing basin method is dependent on the outlet structure design or the total basin length with an appropriate outlet. For this analysis, the outlet structure is assumed to control the flow duration in the basin. Therefore, the basin length should be a minimum of twice the basin width; the depth should not be less than 3 feet nor greater than 5 feet for safety reasons and for maximum efficiency (2 feet of sediment storage, 2 feet of capacity).

The settling velocities of the particles are summarized in the following table:

Table 3. Settling Velocities for various Particles Sizes (CRWQCA, 2002)

Particle Size (mm)	Particle Description	Settling Velocity (ft/sec)
0.5	Coarse sand	0.19
0.2	Medium sand	0.067
0.1	Fine sand	0.023
0.05	Coarse silt	0.0062
0.02	Medium silt	0.00096
0.01	Fine silt	0.00024
0.005	Clay	0.00006

In order to calculate an estimated sediment pond volume, a particle size of 0.02 mm was selected for the project area as a representative particle size for the soil types within the project area. The potential particle sizes presented for each soil type vary not only across the surface of the basins, but also in the vertical stratum of the soil layers.

To determine the geometry of the detention basin the following assumptions were applied:

1. Detention basin is trapezoidal in shape;
2. Side slopes of 2:1 (horizontal: vertical);
3. Maximum water height less than 5 feet;
4. Basin length is twice the width; and
5. Minimum freeboard of 1-foot.

It should be noted, the detention basin analysis presented in this report does not consider the outlet structure or the other drainage features (e.g., emergency spill way) that would be necessary for a detention basin. While this level of study is beyond the detail and scope of this analysis, the final design of the project will include these components.

5.5.4 Hydrologic Soil Groups

Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into Hydrologic Soil Groups (HSG's) to indicate the minimum rate of infiltration obtained for bare soil after prolonged wetting. The HSG's, which are classified as A, B, C, and D, are one element used in determining runoff curve numbers. The infiltration rate is assumed to be the rate at which water enters the soil at the soil surface and is controlled by surface conditions. HSG also indicates the rate at which water moves through the soil column, known as the transmission rate. This rate is considered to be controlled by the soil profile.

The soils within the project vicinity have been determined to be predominately characterized by hydrologic soil group D. The Soil Conservation Service defines HSG D as:

> *"Group D - Soils in this group have a high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Group D soils typically have a greater than 40 percent clay, less than 50 percent sand, and have clayey textures. In some areas, they also have high shrink-swell potential. All soils with a depth to a water impermeable layer less than 20 inches and all soils with a water table within 24 inches of the surface are in this group, although some may have a dual classification if they can be adequately drained."*

Most urban areas are only partially covered by impervious surfaces; therefore the soil remains an important factor in runoff estimates. Urbanization has a greater effect on runoff in watersheds with soils having high infiltration rates (sand and gravels) than in watersheds predominately of silts and clays, which generally have low infiltration rates (USDA TR-55, 1986).

5.6 Soil Hydrologic Conditions and Ground Cover

5.6.1 Ground Cover

In addition to the general HSG classification, subcategories are established to reflect ground cover characteristics within each basin. Two types of ground cover were noted to be predominate within the study area: Woods/Grass and Forest. All non-urban areas considered were judged to be in "Good Condition." With respect to SCS guidelines ground cover classified as "Good" indicates it is protected from grazing and litter, and brush adequately covers the soil.

Some applications of the SCS hydrologic model include allowances to adjust the selected Curve Numbers to reflect the dampening effect of high quality vegetative cover. In completing this analysis the published Curve Numbers were not adjusted as this would tend to decrease the estimated runoff from the site.

Appendix C shows the input parameters for the hydrologic calculations, including values pertaining to soil characteristics, overland or channel flow, and times of concentration applied to the basins.

5.7 Manning's N Values

The Manning's equation was applied to calculate flow, velocities and capacities for hydraulic channels. The Manning's N value used for the channel conveyance analyses is 0.030, which is considered representative of moderate vegetation in the channels.

5.8 Rainfall Data

Table 1 shows the amount of precipitation used in the 2, 10, 25, 50 and 100-year/24-hour design storm events. Appendix B presents the precipitation data for a range of design storm events for the project site. The data represented historic precipitation records from the NOAA Fort Bragg weather station.

Table 4. Design Storm Precipitation

Design Storm	Precipitation (inches)
2-year/24-hour	3.75
10-year/24-hour	5.65
25-year/24-hour	6.69
50-year/24-hour	7.43
100-year/24-hour	8.14

It should be noted that the precipitation from the 10-year/24-hour storm event used for the detention basin analysis (Rational Method) was 3.1 (in/hr). This was taken from the Intensity Frequency Duration curve for Fort Bragg area assuming a time of concentration of five minutes.

6. Hydrology Results

6.1 Overland Flow Analysis

The SBUH method was used to predict stormwater runoff volumes and peak flow rates for the 2, 10, 25, 50, and 100-year/24-hour design storms for pre and post development scenarios. Appendix E shows a comparison of the calculated stormwater discharges (hydrographs) for each of the design storms under existing site conditions (pre-development), and after development (post-development) has been established.

The hydrology results show that pre-development conditions produce the least amount of stormwater runoff as compared to the post-development scenario, which is expected due to the increase in impermeable area in the post-development scenario. Table 5 and 6 show the results for the two drainage areas for pre and post development scenarios, respectively. Table 7 shows the percent increase in flowrates as a result of development.

Table 5. Pre-Development Flowrates

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
Basin 1	3.8	8.3	10.9	12.8	14.7
Basin 2	4.6	10.0	13.2	15.5	17.8

Table 6. Post-Development Flowrates

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
Basin 1	5.2	9.7	12.4	14.3	16.1
Basin 2	5.5	11.0	14.1	16.4	18.7

Table 7. Percent Increase in Flowrates after Post-Development

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
Basin 1	25.9%	14.6%	11.6%	10.0%	8.8%
Basin 2	15.7%	8.3%	6.4%	5.5%	4.9%

As can be seen from the above tables, post-development conditions produce more runoff than pre-development conditions due to the increase in impermeable area. The percent difference between pre and post-development conditions decreases as the duration of the design storm events increase.

6.2 Channel Analysis Results

Based on the Slope Conveyance method, water surface depths in the representative channel were predicted to be less than 1-foot. The increase in the quantity of runoff corresponds to an increase in the flow of water through channels and swales during storm events. See Appendix E for a summary of the water surface calculations.

Channel velocities were calculated to be less than 3 feet per second (fps) under all storm conditions analysed. Although the assumed channel geometry does not reflect the entire reach of the swales and channels that shall be used on the site, it does provide a rough approximation of the typical cross sectional area associated with flow conditions. Appendix E also presents a summary of the channel velocity calculations.

6.3 Detention Basin Analysis

Two detention basins were evaluated for this analysis, assuming that all the stormwater collected in each of the drainage areas would be managed by an associated detention basin. Table 8 shows the results of the analysis, with peak flowrates and required volumes of each detention basin.

Table 8. Detention Basin Design Flowrates and Required Volumes

Basin	Rainfall Intensity (in/hr)	Runoff Coefficient	Area (acres)	Q_{10} (cfs)	Area of Basin (ft2)	Volume of Basin (ac-ft)
Basin 1	3.10	0.56	7.7	13.5	16,845	0.77
Basin 2	3.10	0.51	9.3	14.7	18,422	0.85

The largest storage volume required is for Detention Basin 2, with 0.85 acre-feet. Based on the assumptions presented in Section 5.5.3 of this Report, the required area for Basin 2 is approximately 50 by 129 feet. Basin 1 requires a smaller volume of 0.77 acre-feet, but for this analysis is assumed to be the same size of Basin 2.

7. Conclusions

The purpose of this study was to determine the hydrologic characteristics associated with the proposed transfer station project. For the purpose of this hydrologic analysis, two conditions of the project (pre and post-development) were analysed with the intent to address current regulatory guidelines associated with surface water management. The methodologies discussed in this Hydrologic Study follow acceptable standards intended to comply with local, state, and federal guidelines. The parameters used may have to be altered during a subsequent design phase and as the project evolves to accommodate current site conditions.

The results from the hydrologic analyses conducted demonstrate that the proposed transfer station project would increase the stormwater runoff rate or volume as compared to pre-development conditions. However, a properly designed detention basin and outlet structure would mitigate this increase in runoff by discharging stormwater at the pre-development flowrates to the existing drainages. Detention basins are an effective means for managing and treating stormwater and are a necessary BMP to facilitate NPDES compliance.

It should be noted that the hydrologic analysis presented in this report assumes that the proposed detention basins will collect all of the rainwater from its associated drainage area. This is a conservative assumption given that a potentially large portion of the rainwater will naturally sheet flow through the forest and off the site, not contributing to the required storage volume for the detention basins.

8. References

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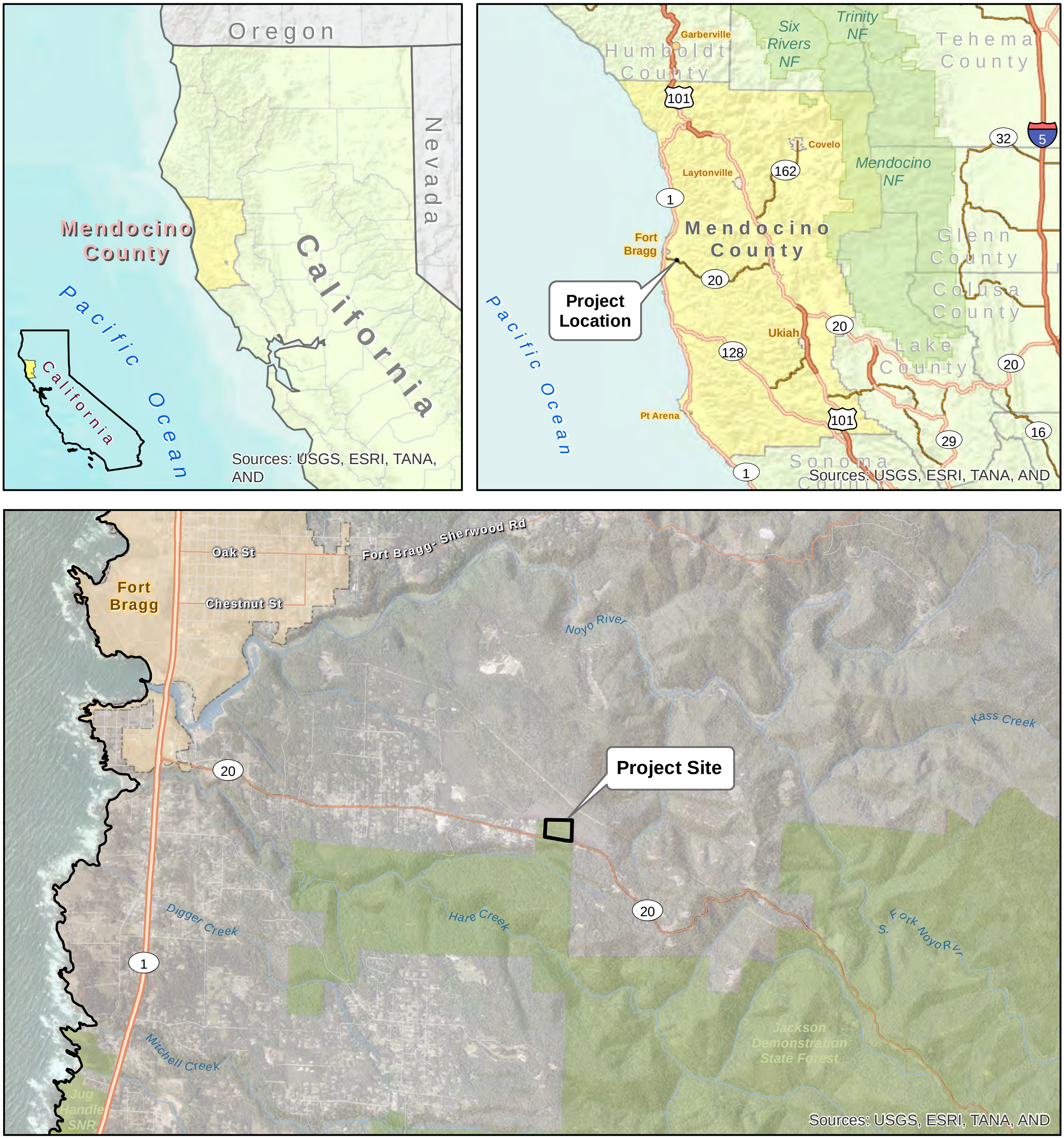
Appendices

Appendix A – Location Maps and Figures



	Project Site		Major Highways
	City Limits		Highways
	Parks/Open Space		Major Roads
			Rivers/Streams

Paper Size 8.5" x 11" (ANSI A)

0 0.25 0.5 0.75 1

Miles

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

Mendocino Solid Waste Management Authority
Central Coast Transfer Station EIR

Job Number 8411065
Revision A
Date 07 Jul 2014

Vicinity Map and Project Location

Figure 1

718 Third Street Eureka CA 95501 USA T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

G:\0016201 MendoSolidWasteMgmtAuthority\8411065 MSWMA TransferStationEIR\08-GIS\Maps\Figures\F1_Vicinity.mxd

Data source: USDA NAIP Imagery, 2010; USA Base Map, 2013; GHD data, 2013. Created by:gldavidson

Paper Size 11" x 17" (ANSI B)

0 50 100 150 200

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California II FIPS 0402 Feet

N

17 Acre Portion of APN 019-150-05

Parcels

Bio-swale

Direction of Travel

Mendocino Solid Waste Management Authority
Central Coast Transfer Station EIR

Job Number 8411065
Revision A
Date 30 Jul 2014

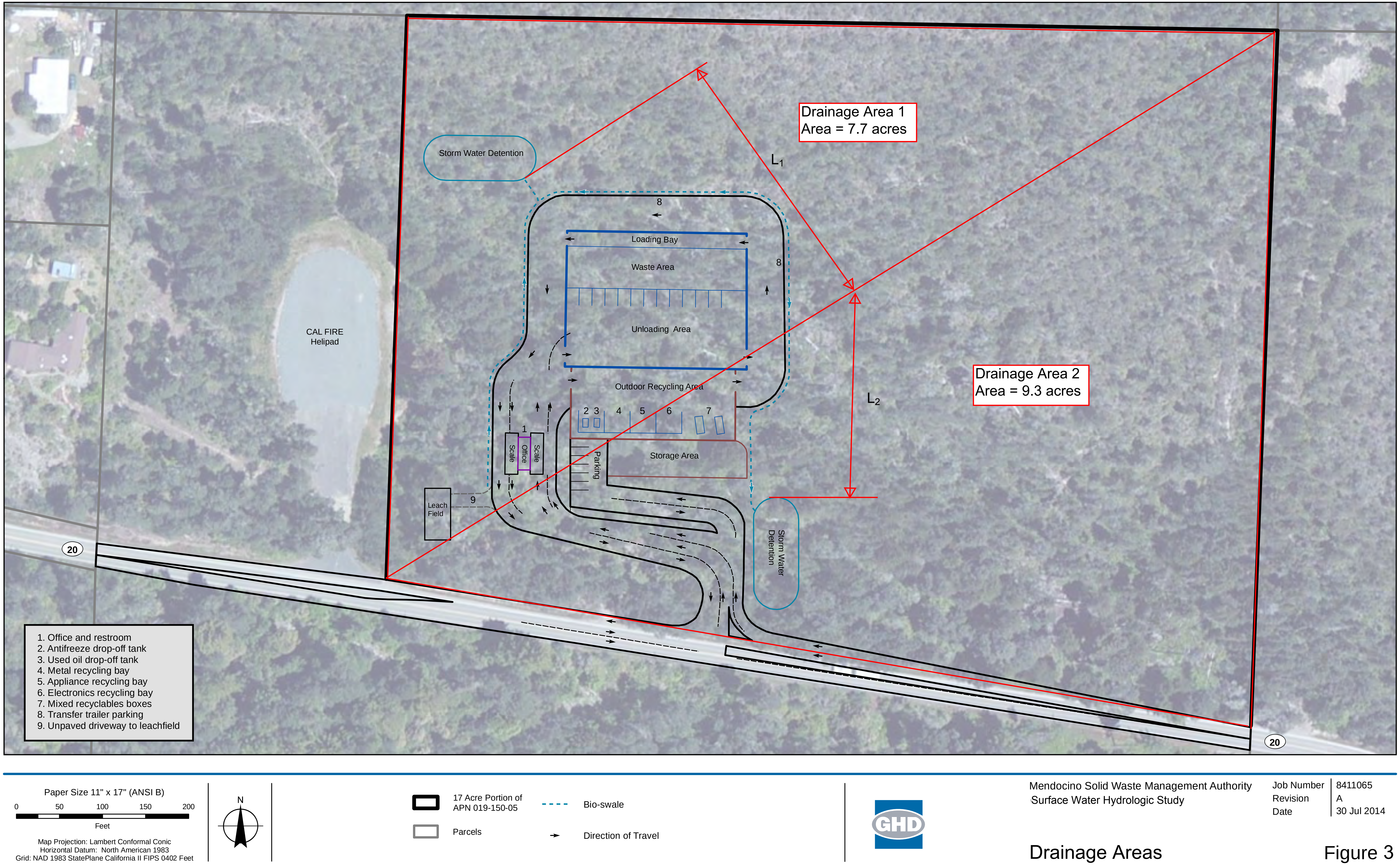
Site Plan

Figure 2

G:\0016201 MendoSolidWasteMgmtAuthority\8411065 MSWMA TransferStationEIR\08-GIS\Maps\Figures\F2_SitePlan.mxd

718 Third Street Eureka CA 95501 USA T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:jrousseau



Mendocino Solid Waste Management Authority
Surface Water Hydrologic Study

Job Number	8411065
Revision	A
Date	30 Jul 2014

Drainage Areas

Figure 3

718 Third Street Eureka CA 95501 USA T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

G:\0016201 MendoSolidWasteMgmtAuthority\8411065 MSWMA TransferStationEIR\08-GIS\Maps\Figures\F2_SitePlan.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:jrousseau

Appendix B – Precipitation Data

General Info
Homepage
Current Projects
FAQ
Glossary

Precipitation Frequency (PF)
PF Data Server
- PF in GIS Format
- PF Maps
- Temporal Distr.
- Time Series Data
- PFDS Perform.
PF Documents

Probable Maximum Precipitation (PMP)
PMP Documents

Miscellaneous
Publications
AEP Storm Analysis
Record Precipitation

Contact Us
Inquiries
List-server

NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CA

DATA DESCRIPTION

Data type: precipitation depth Units: english Time series type: partial duration

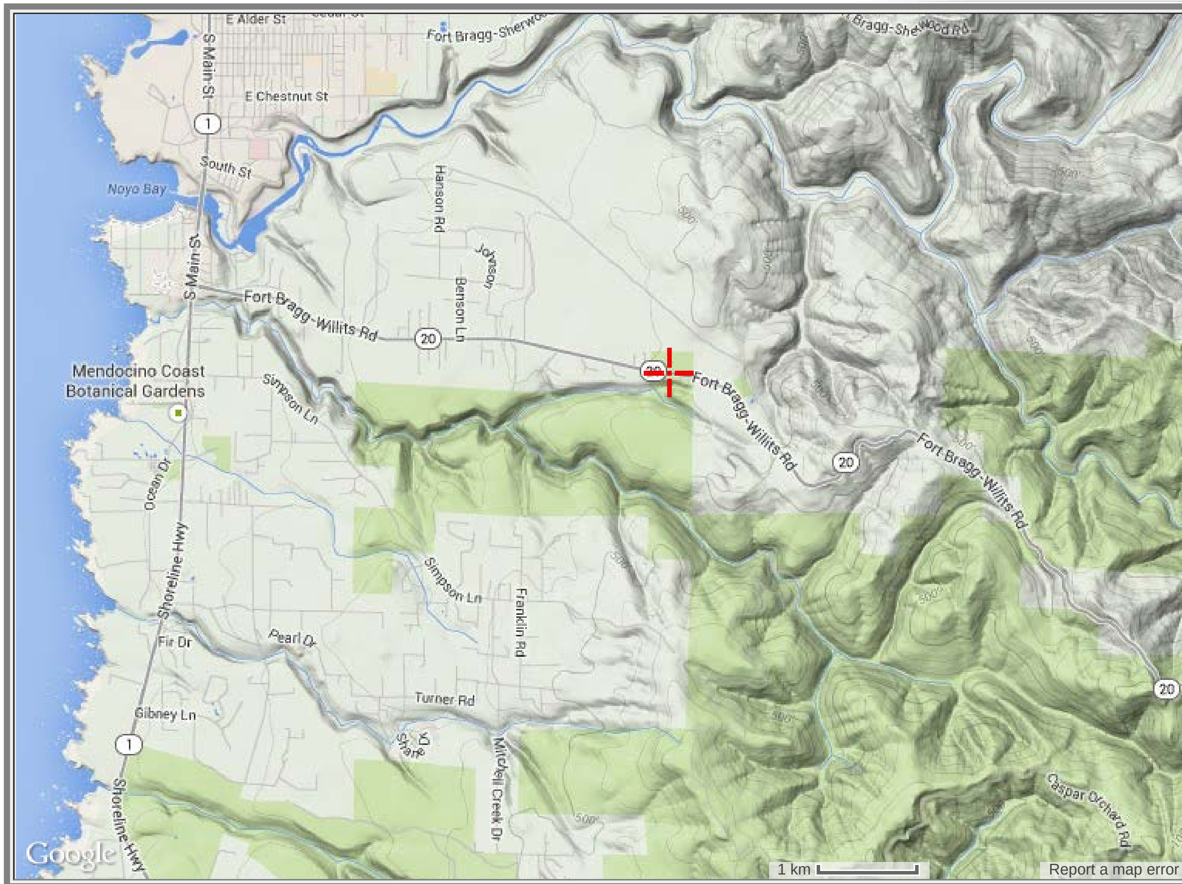
SELECT LOCATION

1. Manually:

a) Enter location (decimal degrees, use "-" for S and W): latitude: longitude: submit

b) Select station (click here for a list of stations used in frequency analysis for CA): select station

2. Use map:



a) Select location
(move crosshair or double click)
b) Click on station icon
(show stations on map)

LOCATION INFORMATION:
Name: Fort Bragg, California, US*
Latitude: 39.4126°
Longitude: -123.7548°
Elevation: 408 ft*

* source: Google Maps

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION

NOAA Atlas 14, Volume 6, Version 2

PF tabular | PF graphical | Supplementary information | Print Page

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.136 (0.120 0.155)	0.198 (0.175 0.225)	0.274 (0.242 0.314)	0.334 (0.292 0.387)	0.411 (0.345 0.496)	0.468 (0.382 0.578)	0.523 (0.415 0.666)	0.578 (0.443 0.761)	0.648 (0.473 0.897)	0.700 (0.491 1.01)
10-min	0.194 (0.172 0.221)	0.283 (0.251 0.323)	0.393 (0.347 0.451)	0.479 (0.418 0.554)	0.590 (0.494 0.711)	0.671 (0.548 0.829)	0.750 (0.595 0.955)	0.828 (0.635 1.09)	0.929 (0.678 1.29)	1.00 (0.703 1.45)
15-min	0.235 (0.208 0.268)	0.342 (0.303 0.391)	0.476 (0.420 0.545)	0.579 (0.506 0.670)	0.713 (0.598 0.859)	0.811 (0.663 1.00)	0.907 (0.719 1.15)	1.00 (0.768 1.32)	1.12 (0.820 1.56)	1.21 (0.850 1.75)
30-min	0.322 (0.286 0.367)	0.470 (0.416 0.536)	0.653 (0.576 0.748)	0.795 (0.694 0.919)	0.978 (0.820 1.18)	1.11 (0.909 1.38)	1.24 (0.987 1.58)	1.37 (1.05 1.81)	1.54 (1.13 2.13)	1.67 (1.17 2.40)
60-min	0.456 (0.404 0.519)	0.664 (0.587 0.758)	0.922 (0.813 1.06)	1.12 (0.981 1.30)	1.38 (1.16 1.67)	1.57 (1.29 1.94)	1.76 (1.39 2.24)	1.94 (1.49 2.56)	2.18 (1.59 3.02)	2.35 (1.65 3.39)
2-hr	0.705 (0.624 0.803)	0.939 (0.831 1.07)	1.24 (1.09 1.42)	1.48 (1.29 1.71)	1.80 (1.51 2.17)	2.04 (1.67 2.53)	2.29 (1.81 2.91)	2.53 (1.94 3.33)	2.86 (2.09 3.96)	3.11 (2.18 4.48)
3-hr	0.921 (0.816 1.05)	1.19 (1.05 1.36)	1.54 (1.36 1.76)	1.82 (1.59 2.11)	2.20 (1.84 2.65)	2.49 (2.03 3.07)	2.78 (2.20 3.54)	3.07 (2.36 4.05)	3.47 (2.53 4.81)	3.78 (2.65 5.45)
6-hr	1.40 (1.24 1.59)	1.75 (1.55 2.00)	2.21 (1.95 2.54)	2.58 (2.26 2.99)	3.08 (2.58 3.71)	3.46 (2.83 4.28)	3.84 (3.05 4.89)	4.23 (3.25 5.58)	4.76 (3.47 6.59)	5.17 (3.62 7.45)
12-hr	2.02 (1.79 2.30)	2.59 (2.29 2.96)	3.30 (2.91 3.78)	3.85 (3.36 4.46)	4.56 (3.82 5.50)	5.08 (4.15 6.28)	5.59 (4.43 7.12)	6.09 (4.67 8.02)	6.74 (4.92 9.33)	7.23 (5.06 10.4)
24-hr	2.85 (2.56 3.24)	3.75 (3.36 4.26)	4.83 (4.32 5.51)	5.65 (5.02 6.50)	6.69 (5.75 7.94)	7.43 (6.26 9.00)	8.14 (6.70 10.1)	8.82 (7.06 11.2)	9.69 (7.45 12.9)	10.3 (7.68 14.2)
2-day	3.81 (3.43 4.33)	4.87 (4.37 5.54)	6.18 (5.53 7.04)	7.18 (6.38 8.25)	8.47 (7.28 10.0)	9.40 (7.92 11.4)	10.3 (8.48 12.8)	11.2 (8.96 14.3)	12.3 (9.49 16.4)	13.2 (9.81 18.1)
3-day	4.53 (4.07 5.15)	5.70 (5.11 6.48)	7.15 (6.40 8.15)	8.28 (7.35 9.51)	9.75 (8.38 11.6)	10.8 (9.12 13.1)	11.9 (9.78 14.7)	12.9 (10.4 16.5)	14.3 (11.0 19.0)	15.3 (11.4 21.0)
4-day	5.15 (4.62 5.84)	6.42 (5.76 7.30)	8.01 (7.17 9.13)	9.26 (8.22 10.6)	10.9 (9.36 12.9)	12.1 (10.2 14.6)	13.3 (10.9 16.5)	14.5 (11.6 18.4)	16.0 (12.3 21.2)	17.1 (12.8 23.5)
7-day	6.49 (5.84 7.38)	8.07 (7.24 9.18)	10.0 (8.98 11.4)	11.6 (10.3 13.3)	13.6 (11.7 16.1)	15.0 (12.7 18.2)	16.5 (13.6 20.4)	17.9 (14.3 22.8)	19.8 (15.2 26.2)	21.2 (15.8 29.1)
10-day	7.55 (6.78 8.57)	9.40 (8.43 10.7)	11.7 (10.5 13.3)	13.5 (12.0 15.5)	15.8 (13.6 18.7)	17.5 (14.7 21.1)	19.1 (15.7 23.7)	20.7 (16.6 26.4)	22.8 (17.6 30.3)	24.4 (18.1 33.5)
20-day	10.2 (9.18 11.6)	12.8 (11.5 14.6)	16.0 (14.3 18.3)	18.5 (16.4 21.2)	21.6 (18.6 25.6)	23.8 (20.1 28.8)	26.0 (21.4 32.2)	28.1 (22.5 35.8)	30.8 (23.7 40.8)	32.7 (24.3 44.9)
30-day	12.5 (11.3 14.2)	15.8 (14.2 18.0)	19.8 (17.8 22.6)	22.9 (20.3 26.3)	26.7 (22.9 31.7)	29.4 (24.8 35.6)	32.0 (26.3 39.6)	34.5 (27.6 43.9)	37.6 (28.9 49.9)	39.9 (29.7 54.7)
45-day	15.7 (14.1 17.9)	20.0 (17.9 22.7)	25.1 (22.5 28.6)	28.9 (25.7 33.2)	33.6 (28.9 39.9)	36.9 (31.1 44.7)	40.1 (33.0 49.7)	43.0 (34.5 54.8)	46.8 (36.0 62.0)	49.4 (36.8 67.8)
60-day	18.6 (16.7 21.1)	23.7 (21.2 26.9)	29.7 (26.6 33.9)	34.2 (30.4 39.3)	39.7 (34.1 47.1)	43.5 (36.7 52.7)	47.1 (38.8 58.4)	50.5 (40.4 64.3)	54.7 (42.0 72.5)	57.6 (42.9 79.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

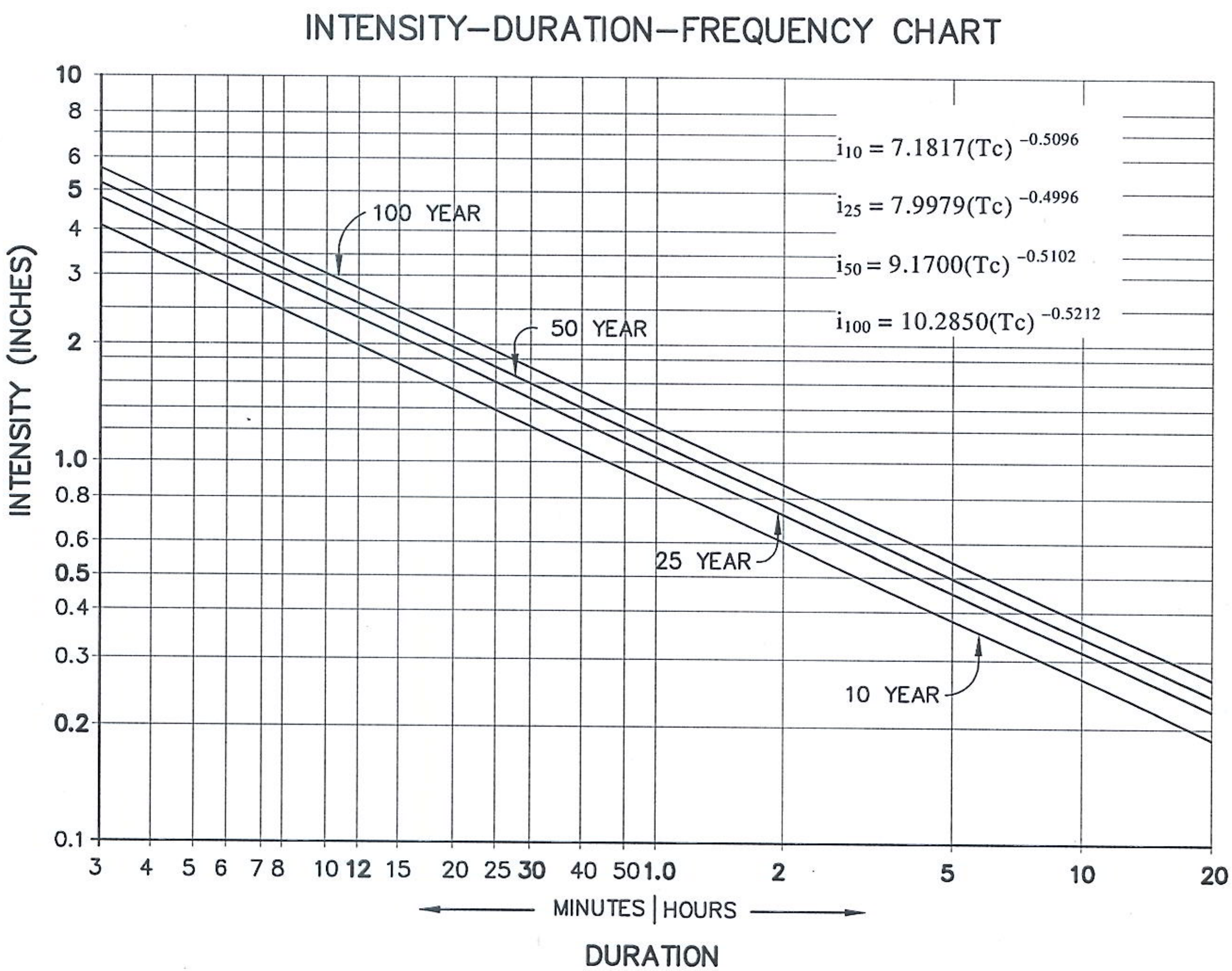
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Estimates from the table in csv format: precipitation frequency estimates Submit

Main Link Categories:
Home | OHD

Appendix C – Modeling Input Parameters



STATION DATA	
LONGITUDE:	123.807
LATITUDE:	39.446
ALTITUDE:	80
YEARS OF DATA:	1940–1985

MENDOCINO COUNTY 1850	INTENSITY/DURATION/FREQUENCY CHART FORT BRAGG			MENDOT STD. NO. D11D
SCALE: NONE	DESIGN: RCW	DRAWN: LMM	OCT. 2000	PAGE: A–54

Figure 819.2A

Runoff Coefficients for Undeveloped Areas

Watershed Types

	Extreme	High	Normal	Low
Relief	.28 -.35 Steep, rugged terrain with average slopes above 30%	.20 -.28 Hilly, with average slopes of 10 to 30%	.14 -.20 Rolling, with average slopes of 5 to 10%	.08 -.14 Relatively flat land, with average slopes of 0 to 5%
Soil Infiltration	.12 -.16 No effective soil cover, either rock or thin soil mantle of negligible infiltration capacity	.08 -.12 Slow to take up water, clay or shallow loam soils of low infiltration capacity, imperfectly or poorly drained	.06 -.08 Normal; well drained light or medium textured soils, sandy loams, silt and silt loams	.04 -.06 High; deep sand or other soil that takes up water readily, very light well drained soils
Vegetal Cover	.12 -.16 No effective plant cover, bare or very sparse cover	.08 -.12 Poor to fair; clean cultivation crops, or poor natural cover, less than 20% of drainage area over good cover	.06 -.08 Fair to good; about 50% of area in good grassland or woodland, not more than 50% of area in cultivated crops	.04 -.06 Good to excellent; about 90% of drainage area in good grassland, woodland or equivalent cover
Surface Storage	.10 -.12 Negligible surface depression few and shallow; drainageways steep and small, no marshes	.08 -.10 Low; well defined system of small drainageways; no ponds or marshes	.06 -.08 Normal; considerable surface depression storage; lakes and pond marshes	.04 -.06 High; surface storage, high; drainage system not sharply defined; large flood plain storage or large number of ponds or marshes

Given An undeveloped watershed consisting of;

1) rolling terrain with average slopes of 5%,
2) clay type soils,
3) good grassland area, and
4) normal surface depressions.

Find The runoff coefficient, C, for the above watershed.

Solution:

Relief	0.14
Soil Infiltration	0.08
Vegetal Cover	0.04
Surface Storage	0.06
C=	0.32

Table 819.2B

Runoff Coefficients for Developed Areas

Type of Drainage Area	Runoff Coefficient
Business:	
Downtown areas	0.70 - 0.95
Neighborhood areas	0.50 - 0.70
Residential:	
Single-family areas	0.30 - 0.50
Multi-units, detached	0.40 - 0.60
Multi-units, attached	0.60 - 0.75
Suburban	0.25 - 0.40
Apartment dwelling areas	0.50 - 0.70
Industrial:	
Light areas	0.50 - 0.80
Heavy areas	0.60 - 0.90
Parks, cemeteries:	0.10 - 0.25
Playgrounds:	0.20 - 0.40
Railroad yard areas:	0.20 - 0.40
Unimproved areas:	0.10 - 0.30
Lawns:	
Sandy soil, flat, 2%	0.05 - 0.10
Sandy soil, average, 2-7%	0.10 - 0.15
Sandy soil, steep, 7%	0.15 - 0.20
Heavy soil, flat, 2%	0.13 - 0.17
Heavy soil, average, 2-7%	0.18 - 0.25
Heavy soil, steep, 7%	0.25 - 0.35
Streets:	
Asphaltic	0.70 - 0.95
Concrete	0.80 - 0.95
Brick	0.70 - 0.85
Drives and walks	0.75 - 0.85
Roofs:	0.75 - 0.95

The Regional Flood-Frequency equations are applicable only to sites within the flood-frequency regions for which they were derived and on streams with virtually natural flows. For example, the equations are not generally applicable to small basins on the floor of the Sacramento and San Joaquin Valleys as the annual peak data which are the basis for the regression analysis were obtained principally in the adjacent mountain and foothill areas. Likewise, the equations are not directly applicable to streams in urban areas affected substantially by urban development. In urban areas the equations may be used to estimate peak discharge values under natural conditions and then by use of the techniques described in the publication or HDS No. 2, adjust the discharge values to compensate for urbanization. Further limitations on the use of USGS Regional Flood-Frequency equations are:

Region	Drainage Area (A) mi^2	Mean Annual Precip (P) in.	Altitude Index (H) 1000 ft.
(1)North Coast	0.2-3000	19-104	0.2-5.7
Northeast	0.2-25	all	all
Sierra	0.2-9000	7-85	0.1-9.7
Central Coast	0.2-4000	8-52	0.1-2.4
South Coast	0.2-600	7-40	all
(2)South Lahontan-Colorado Desert	0.2-90	all	all

Notes: Values shown in table have not been converted to metric system.

(1) In the North Coast region, use a minimum value of 1 for altitude index (H)
(2) Use upper limit of 25 square miles

A method for directly estimating design discharges for some gaged and ungaged streams is also provided in HDS No. 2. The method is applicable to streams on or nearby those for which study data are available.

Figure 819.2C
Regional Flood-Frequency Equations (1)

NORTH COAST REGION(3)

Q_2	$=3.52$	$A^{0.90}$	$P^{0.89}$	$H^{-0.47}$
Q_5	$=5.04$	$A^{0.89}$	$P^{0.91}$	$H^{-0.35}$
Q_{10}	$=6.21$	$A^{0.88}$	$P^{0.93}$	$H^{-0.27}$
Q_{25}	$=7.64$	$A^{0.87}$	$P^{0.94}$	$H^{-0.17}$
Q_{50}	$=8.57$	$A^{0.87}$	$P^{0.96}$	$H^{-0.08}$
Q_{100}	$=9.23$	$A^{0.87}$	$P^{0.97}$	

NORTHEAST REGION(4)

Q_2	$=22$	$A^{0.40}$
Q_5	$=46$	$A^{0.45}$
Q_{10}	$=61$	$A^{0.49}$
Q_{25}	$=84$	$A^{0.54}$
Q_{50}	$=103$	$A^{0.57}$
Q_{100}	$=125$	$A^{0.59}$

SOUTH LAHONTAN-COLORADO DESERT REGION(4)

Q_2	$=7.3$	$A^{0.30}$
Q_5	$=53.0$	$A^{0.44}$
Q_{10}	$=150$	$A^{0.53}$
Q_{25}	$=410.0$	$A^{0.63}$
Q_{50}	$=700.0$	$A^{0.68}$
Q_{100}	$=1080.0$	$A^{0.71}$

SIERRA REGION

Q_2	$=0.24$	$A^{0.88}$	$P^{1.58}$	$H^{-0.80}$
Q_5	$=1.20$	$A^{0.82}$	$P^{1.37}$	$H^{-0.64}$
Q_{10}	$=2.63$	$A^{0.80}$	$P^{1.25}$	$H^{-0.58}$
Q_{25}	$=6.55$	$A^{0.79}$	$P^{1.12}$	$H^{-0.52}$
Q_{50}	$=10.4$	$A^{0.78}$	$P^{1.06}$	$H^{-0.48}$
Q_{100}	$=15.7$	$A^{0.77}$	$P^{1.02}$	$H^{-0.43}$

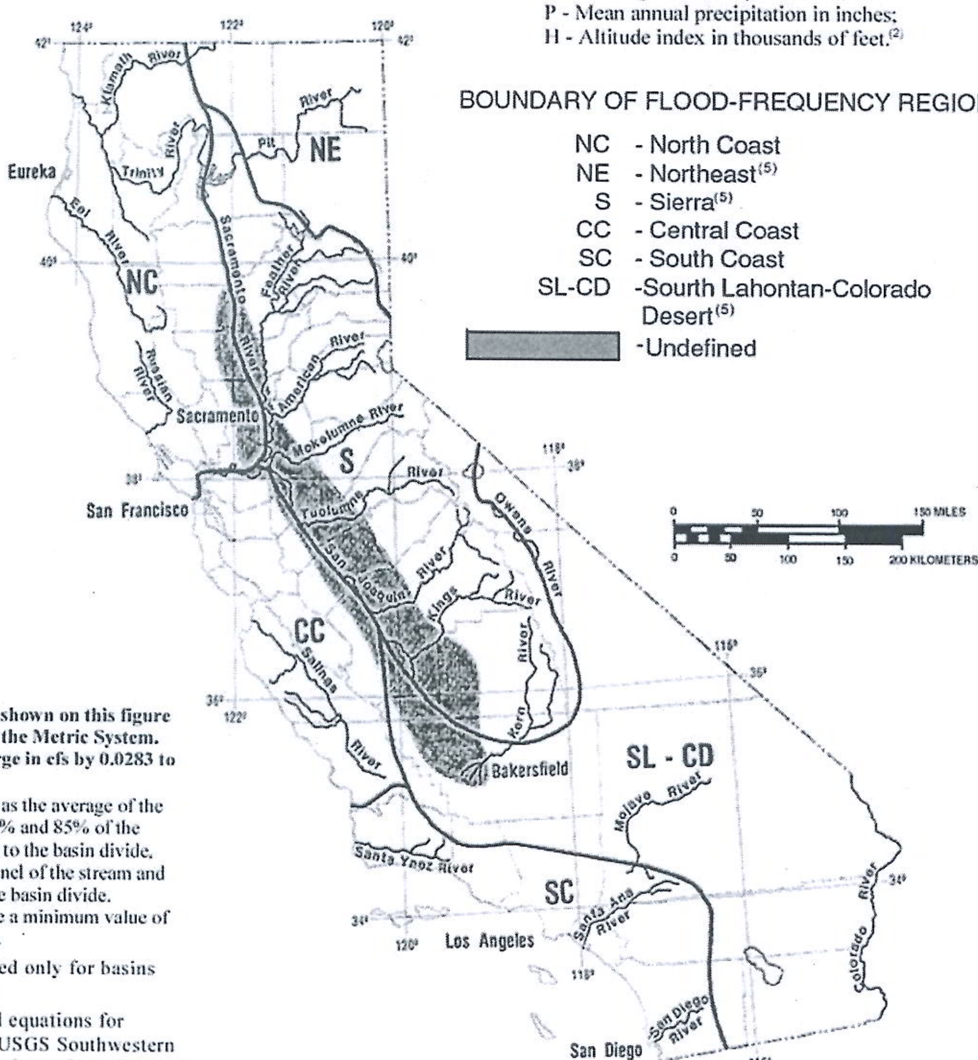
CENTRAL COAST REGION

Q_2	$=0.0061$	$A^{0.92}$	$P^{2.54}$	$H^{-1.10}$
Q_5	$=0.118$	$A^{0.91}$	$P^{1.95}$	$H^{-0.79}$
Q_{10}	$=0.583$	$A^{0.90}$	$P^{1.61}$	$H^{-0.64}$
Q_{25}	$=2.91$	$A^{0.89}$	$P^{1.26}$	$H^{-0.50}$
Q_{50}	$=8.20$	$A^{0.89}$	$P^{1.03}$	$H^{-0.41}$
Q_{100}	$=19.7$	$A^{0.88}$	$P^{0.84}$	$H^{-0.33}$

SOUTH COAST REGION

Q_2	$=0.14$	$A^{0.72}$	$P^{1.62}$
Q_5	$=0.40$	$A^{0.77}$	$P^{1.69}$
Q_{10}	$=0.63$	$A^{0.79}$	$P^{1.75}$
Q_{25}	$=1.10$	$A^{0.81}$	$P^{1.81}$
Q_{50}	$=1.50$	$A^{0.82}$	$P^{1.85}$
Q_{100}	$=1.95$	$A^{0.83}$	$P^{1.87}$

Q - Peak discharge in CFS, subscript indicates recurrence interval, in years;
A - Drainage area in square miles;
P - Mean annual precipitation in inches;
H - Altitude index in thousands of feet.(2)



BOUNDARY OF FLOOD-FREQUENCY REGION

NC - North Coast
NE - Northeast(5)
S - Sierra(5)
CC - Central Coast
SC - South Coast
SL-CD - South Lahontan-Colorado Desert(5)
-Undefined

NOTES:

(1) **Equations and parameters shown on this figure have not been converted to the Metric System. Multiply calculated discharge in cfs by 0.0283 to obtain discharge in m³/s.**

(2) Altitude index, H, is defined as the average of the elevations at the locations 10% and 85% of the distance from the project site to the basin divide, measure along the main channel of the stream and the overland travel path to the basin divide.

(3) In the North Coast region use a minimum value of 1.0 for the altitude index (H).

(4) These Equations are defined only for basins of 65 km² or less in area.

(5) See Figure 819.2D revised equations for California regions within USGS Southwestern United States Study. In regions of overlap, use equations from Figure 819.2D.

Figure 819.2D

Regional Flood Frequency Equations for California Regions within USGS Southwestern United States Study*

*USGS Open File Report 93-419 (1994)

Northern Region 2

$Q2 = 13.1AREA^{0.713}$

$Q5 = 22.4AREA^{0.723}$

$Q10 = 55.7AREA^{0.727}(ELEV/1{,}000)^{-0.353}$

$Q25 = 84.7AREA^{0.737}(ELEV/1{,}000)^{-0.438}$

$Q50 = 113AREA^{0.746}(ELEV/1{,}000)^{-0.511}$

$Q100 = 148AREA^{0.752}(ELEV/1{,}000)^{-0.584}$

Northern Great Basin Region 6

$Q2 = 0$

$Q5 = 32AREA^{0.80}(ELEV/1{,}000)^{-0.66}$

$Q10 = 590AREA^{0.62}(ELEV/1{,}000)^{-1.6}$

$Q25 = 3{,}200AREA^{0.62}(ELEV/1{,}000)^{-2.1}$

$Q50 = 5{,}300AREA^{0.64}(ELEV/1{,}000)^{-2.1}$

$Q100 = 20{,}000AREA^{0.51}(ELEV/1{,}000)^{-2.3}$

Eastern Sierras Region 5

$Q2 = 0.0333AREA^{0.853}(ELEV/1{,}000)^{2.68}[(LAT\text{-}28)/10]^{4.1}$

$Q5 = 2.42AREA^{0.823}(ELEV/1{,}000)^{1.01}[(LAT\text{-}28)/10]^{4.1}$

$Q10 = 28.0AREA^{0.826}[(LAT\text{-}28)/10]^{4.3}$

$Q25 = 426AREA^{0.812}(ELEV/1{,}000)^{-1.10}[(LAT\text{-}28)/10]^{4.3}$

$Q50 = 2{,}030AREA^{0.798}(ELEV/1{,}000)^{-1.71}[(LAT\text{-}28)/10]^{4.4}$

$Q100 = 7{,}000AREA^{0.782}(ELEV/1{,}000)^{-2.18}[(LAT\text{-}28)/10]^{4.6}$

Southern Great Basin Region 10

$Q2 = 12AREA^{0.58}$

$Q5 = 85AREA^{0.59}$

$Q10 = 200AREA^{0.62}$

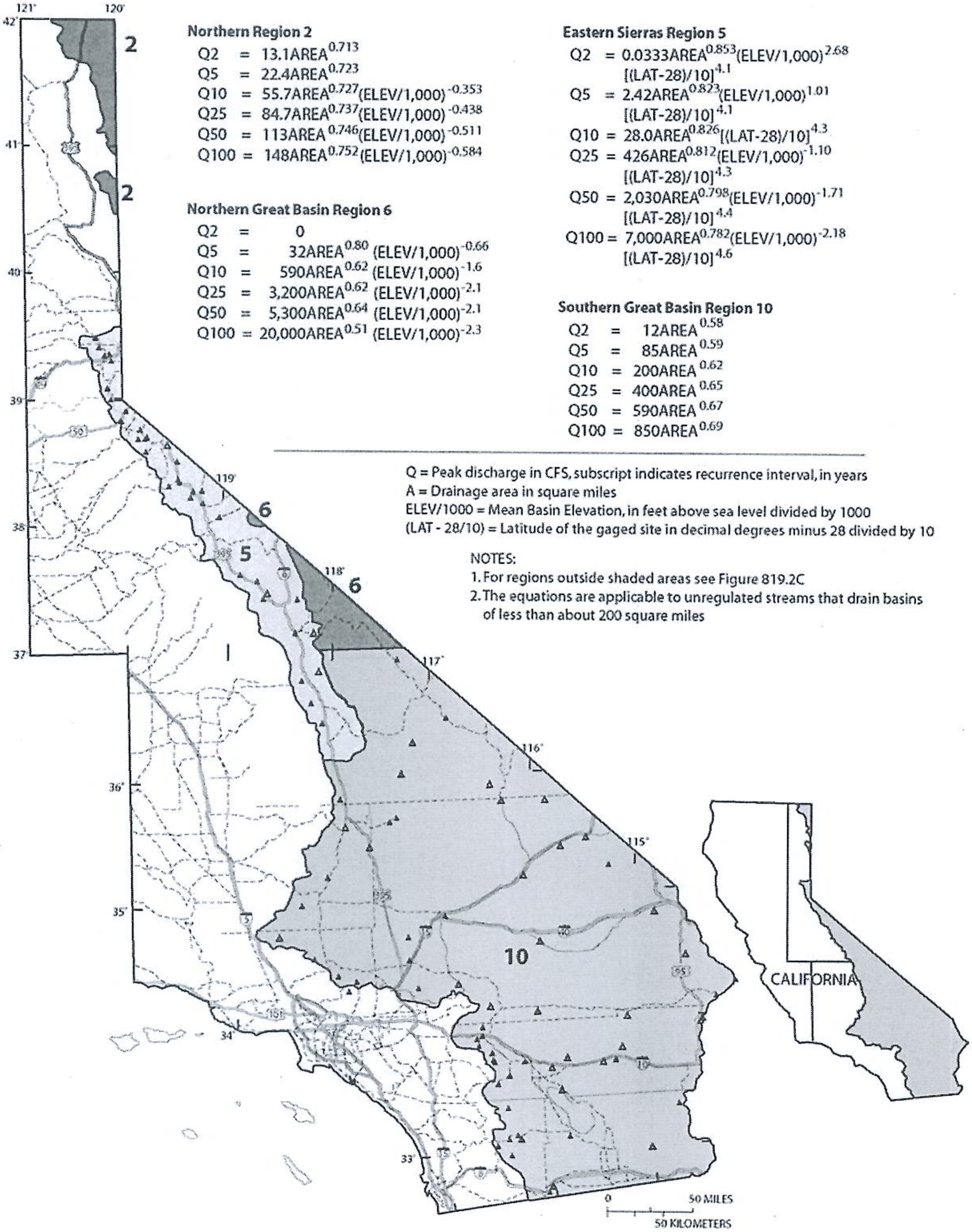
$Q25 = 400AREA^{0.65}$

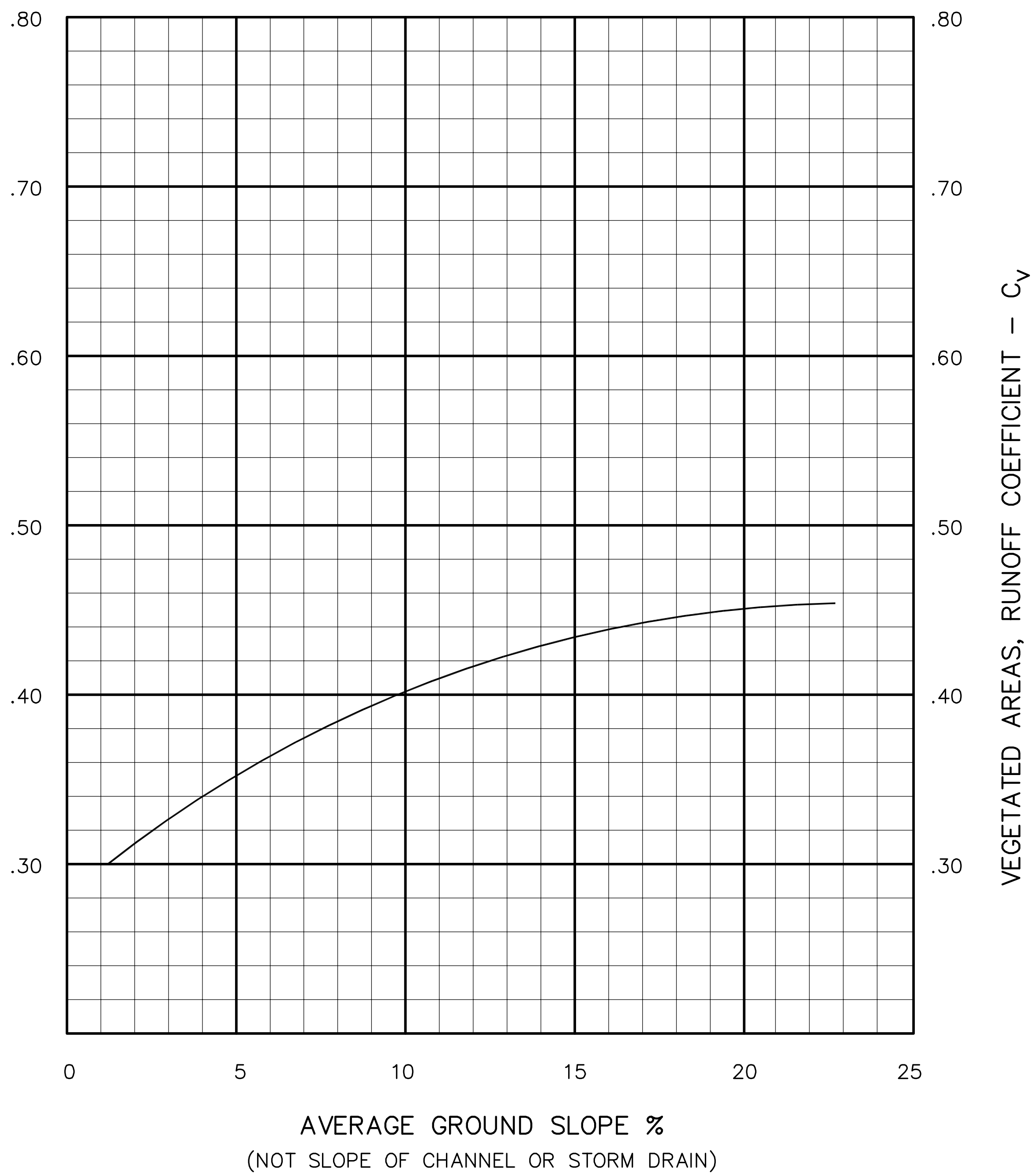
$Q50 = 590AREA^{0.67}$

$Q100 = 850AREA^{0.69}$

Q = Peak discharge in CFS, subscript indicates recurrence interval, in years
A = Drainage area in square miles
ELEV/1000 = Mean Basin Elevation, in feet above sea level divided by 1000
(LAT - 28/10) = Latitude of the gaged site in decimal degrees minus 28 divided by 10

NOTES:
1. For regions outside shaded areas see Figure 819.2C
2. The equations are applicable to unregulated streams that drain basins of less than about 200 square miles





RUNOFF COEFFICIENTS FOR RATIONAL FORMULA, VEGETATED AREAS

MENDOT STD. NO.
D12

SCALE: NONE | DESIGN: RCW | DRAWN: CLG | OCT. 2000

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2/]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.
2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.
3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.
4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.
5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands [1]

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment [2]	Hydrologic condition [3]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

1 Average runoff condition, and I_a=0.2S
2 Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.
3 Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good ≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2/]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3/]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4/]	48	65	73
Woods—grass combination (orchard or tree farm). [5/]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6/]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4/]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.
2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.
3 *Poor:* <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.
4 Actual curve number is less than 30; use CN = 30 for runoff computations.
5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.
6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Table 2-2d Runoff curve numbers for arid and semiarid rangelands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition [2/]	A [3/]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

1 Average runoff condition, and I_a, = 0.2S. For range in humid regions, use table 2-2c.
2 Poor: <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: > 70% ground cover.
3 Curve numbers for group A have been developed only for desert shrub.

Appendix D – Modeling Results

General Calculations

Subasin 1

Total Area (measured from PDF)	33.59	in^2
Scale (Measured Map Scale)	100.00	feet/inches
Total Area (using map scale)	335,900	ft^2
Total Area	7.71	acres
Drainage Length (Measured from PDF)	3.81	inches
Drainage Length	381.00	feet
Proposed Impervious Area (Measured from PDF)	8.25	in^2
Proposed Impervious Area (using map scale)	82500	ft^2
Proposed Impervious Area	1.89	acres
Pervious Area When Developed	5.82	acres

Subasin 2

Total Area (measured from PDF)	40.63	in^2
Scale (Measured Map Scale)	100.00	feet/inches
Total Area (using map scale)	406300.00	ft^2
Total Area	9.33	acres
Drainage Length (Measured from PDF)	3	inches
Drainage Length	300.00	feet
Proposed Impervious Area (Measured from PDF)	5.26	in^2
Proposed Impervious Area (using map scale)	52600.00	ft^2
Proposed Impervious Area	1.21	acres
Pervious Area When Developed	8.12	acres

Total Property Area	17.0	acres

Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Central Coast Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Purpose:

Determine the stormwater runoff volume required for: Pre-Development Conditions (Basin #1)

Assumptions:

1. Runoff volume is computed with the Santa Barbara Urban Hydrograph Method (SBUH)
2. 2-year/ 24-hour design storm event
3. 25-year/ 24-hour design storm event
4. 50-year/ 24-hour design storm event
5. 100-year/ 24-hour design storm event
6. Total Basin Area 7.7 acres
7. Design storm precipitation depths obtained using PF Data Server, lat39.4126 long-123.7548
8. Areas used for subbasins estimated using proposed site development plan
9. Slopes for time of concentration calculation assumed to be 6% based on LACO field study dated 6/7/2012
10. Soil assumed to be of soil group D, with an average antecedent soil moisture condition
11. Ground coverage for pervious area assumed to be woods in good condition
12. Drainage length assumed to originate from the center of the line which splits the parcel from the southwest corner to the northeast corner, and terminates at the drainage basin
13. Manning roughness coefficient assumed to be 0.6, which is the middle range for woods underbrush (0.4 < n < 0.8)
14. Cuve numbers determined using TR-55 Documentation

Methodology:

1. Determine the runoff volume for the design storm event using the SBUH method

References:

1. Urban Hydrology for Small Watersheds, Technical Release 55
   Natural Resource Conservation Service, USDA 1986
2. Handbook of Hydrology (1993), Maidment, D.
   McGraw-Hill Publishing, New York, NY
3. Open Channel Hydraulics
   Chow, V.T. 1959, McGraw-Hill Book Company
4. NOAA Atlas 14, Volume 6, Version 2
   http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_printpage.html

Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Central Coast Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Input Variables:

Basin Number	**=**	**1**	**Pre-Development Conditions (Basin #1)**	
Total Area	=	7.71	ac	
Precipitation (Quantity)	=	3.75	in	(2-yr. 24-hr event)
Precipitation (Quantity)	=	6.69	in	(25-yr. 24-hr event)
Precipitation (Quantity)	=	7.43	in	(50-yr. 24-hr event)
Precipitation (Quantity)	=	8.14	in	(100-yr. 24-hr event)
Time Step	=	10	min	

Pervious Area:

Area	=	7.71	ac
CN	=	77	
S	=	2.99	(1000/CN)-10
0.2S	=	0.60	

Impervious Area:

Area	=	0.0	ac
CN	=	83	
S	=	2.05	(1000/CN)-10
0.2S	=	0.41	

Time of Concentration:

Drainage Length	=	381	ft
Average Slope	=	0.060	ft/ft
Manning's n	=	0.600	

T_c = 63.2 min (minimum of 5 minutes)

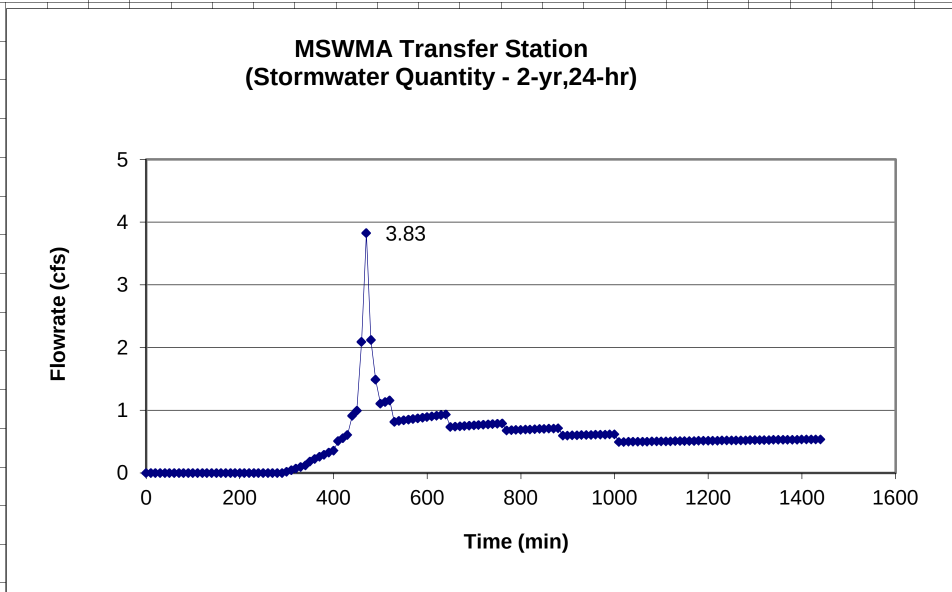
Routing Constant:

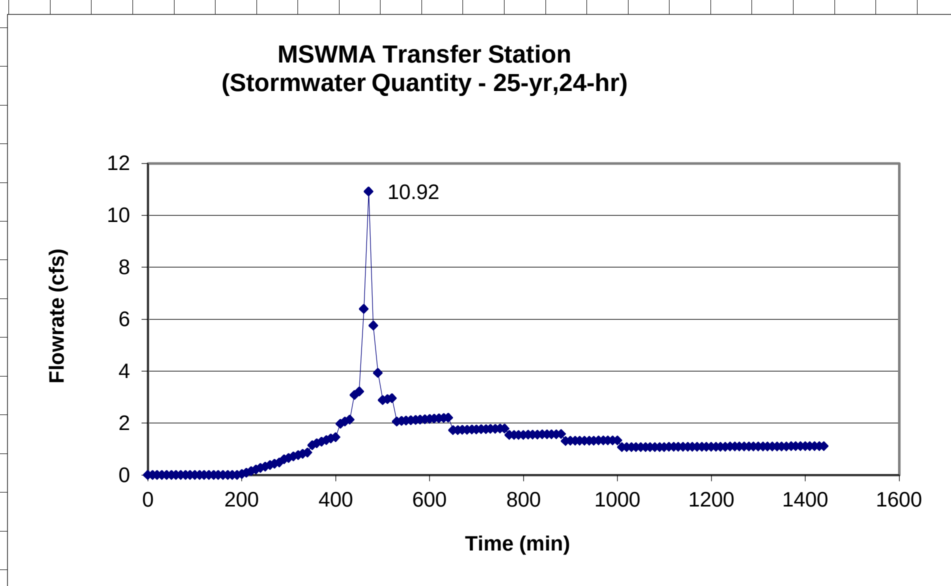
w = 0.073 dt/(2Tc+dt)

Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Central Coast Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Results: **Pre-Development Conditions (Basin #1)**

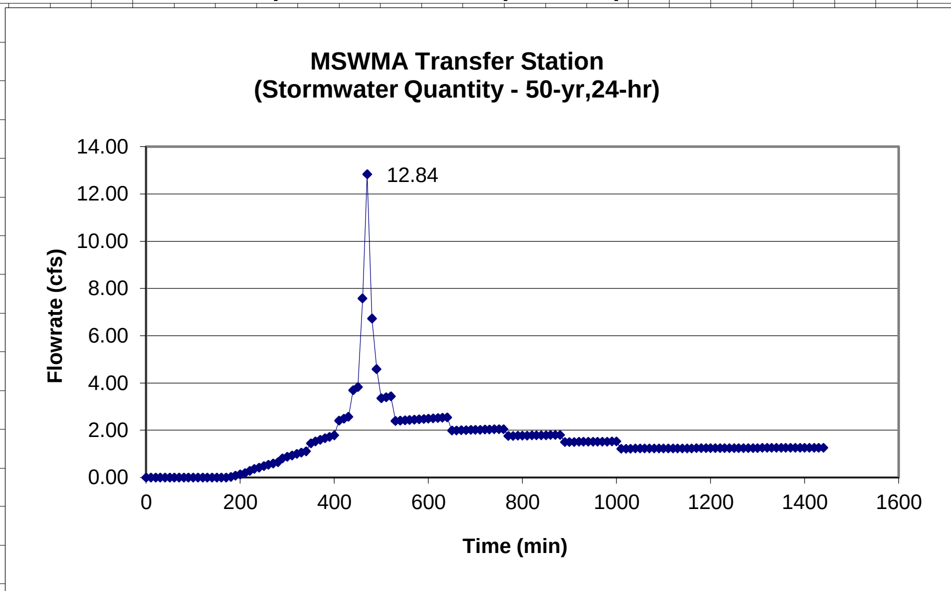


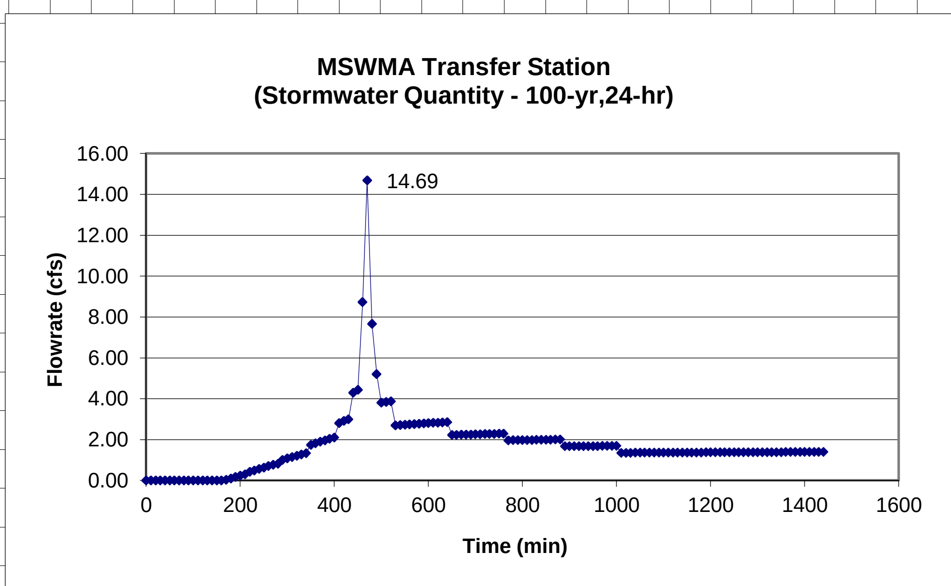


Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Central Coast Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Results: **Pre-Development Conditions (Basin #1)**





Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.015	0.015	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.015	0.030	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
4	30	0.004	0.015	0.045	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
5	40	0.004	0.015	0.060	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
6	50	0.004	0.015	0.075	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
7	60	0.004	0.015	0.090	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
8	70	0.004	0.015	0.105	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
9	80	0.004	0.015	0.120	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
10	90	0.005	0.019	0.139	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
11	100	0.005	0.019	0.158	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
12	110	0.005	0.019	0.176	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
13	120	0.005	0.019	0.195	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
14	130	0.005	0.019	0.214	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
15	140	0.005	0.019	0.233	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
16	150	0.005	0.019	0.251	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
17	160	0.006	0.023	0.274	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
18	170	0.006	0.023	0.296	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
19	180	0.006	0.023	0.319	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
20	190	0.006	0.023	0.341	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
21	200	0.006	0.023	0.364	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
22	210	0.006	0.023	0.386	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
23	220	0.007	0.026	0.413	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
24	230	0.007	0.026	0.439	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
25	240	0.007	0.026	0.465	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
26	250	0.007	0.026	0.491	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
27	260	0.007	0.026	0.518	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
28	270	0.007	0.026	0.544	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
29	280	0.007	0.026	0.570	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
30	290	0.008	0.030	0.600	0.000	0.000	0.000	0.000	0.000	0.00	0.05	0.00
31	300	0.008	0.030	0.630	0.000	0.000	0.000	0.000	0.000	0.02	7.32	0.00
32	310	0.008	0.030	0.660	0.001	0.001	0.000	0.000	0.001	0.04	19.53	0.01
33	320	0.008	0.030	0.690	0.003	0.001	0.000	0.000	0.001	0.07	31.39	0.01
34	330	0.008	0.030	0.720	0.005	0.002	0.000	0.000	0.002	0.10	42.91	0.02
35	340	0.008	0.030	0.750	0.007	0.003	0.000	0.000	0.003	0.12	54.09	0.04
36	350	0.01	0.038	0.788	0.011	0.004	0.000	0.000	0.004	0.18	82.86	0.05
37	360	0.01	0.038	0.825	0.016	0.005	0.000	0.000	0.005	0.22	99.24	0.07
38	370	0.01	0.038	0.863	0.022	0.005	0.000	0.000	0.005	0.26	115.06	0.10
39	380	0.01	0.038	0.900	0.028	0.006	0.000	0.000	0.006	0.29	130.34	0.12
40	390	0.01	0.038	0.938	0.035	0.007	0.000	0.000	0.007	0.32	145.10	0.15
41	400	0.01	0.038	0.975	0.042	0.008	0.000	0.000	0.008	0.36	159.37	0.18

Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
42	410	0.013	0.049	1.024	0.053	0.011	0.000	0.000	0.011	0.51	227.74	0.22
43	420	0.013	0.049	1.073	0.065	0.012	0.000	0.000	0.012	0.56	250.07	0.26
44	430	0.013	0.049	1.121	0.078	0.013	0.000	0.000	0.013	0.60	271.47	0.31
45	440	0.018	0.068	1.189	0.098	0.020	0.000	0.000	0.020	0.91	409.58	0.37
46	450	0.018	0.068	1.256	0.119	0.021	0.000	0.000	0.021	1.00	446.75	0.46
47	460	0.034	0.128	1.384	0.164	0.045	0.000	0.000	0.045	2.09	938.21	0.62
48	470	0.054	0.203	1.586	0.246	0.082	0.000	0.000	0.082	3.83	1718.33	0.96
49	480	0.027	0.101	1.688	0.291	0.046	0.000	0.000	0.046	2.12	953.10	1.26
50	490	0.018	0.068	1.755	0.323	0.032	0.000	0.000	0.032	1.49	667.07	1.34
51	500	0.013	0.049	1.804	0.347	0.024	0.000	0.000	0.024	1.11	496.71	1.33
52	510	0.013	0.049	1.853	0.371	0.024	0.000	0.000	0.024	1.13	508.76	1.30
53	520	0.013	0.049	1.901	0.396	0.025	0.000	0.000	0.025	1.16	520.39	1.28
54	530	0.009	0.034	1.935	0.414	0.018	0.000	0.000	0.018	0.82	366.88	1.24
55	540	0.009	0.034	1.969	0.431	0.018	0.000	0.000	0.018	0.83	372.14	1.18
56	550	0.009	0.034	2.003	0.450	0.018	0.000	0.000	0.018	0.84	377.28	1.13
57	560	0.009	0.034	2.036	0.468	0.018	0.000	0.000	0.018	0.85	382.30	1.08
58	570	0.009	0.034	2.070	0.486	0.018	0.000	0.000	0.018	0.86	387.21	1.05
59	580	0.009	0.034	2.104	0.505	0.019	0.000	0.000	0.019	0.87	392.01	1.02
60	590	0.009	0.034	2.138	0.524	0.019	0.000	0.000	0.019	0.88	396.70	1.00
61	600	0.009	0.034	2.171	0.543	0.019	0.000	0.000	0.019	0.89	401.29	0.99
62	610	0.009	0.034	2.205	0.562	0.019	0.000	0.000	0.019	0.90	405.78	0.97
63	620	0.009	0.034	2.239	0.582	0.020	0.000	0.000	0.020	0.91	410.16	0.96
64	630	0.009	0.034	2.273	0.602	0.020	0.000	0.000	0.020	0.92	414.46	0.96
65	640	0.009	0.034	2.306	0.622	0.020	0.000	0.000	0.020	0.93	418.66	0.95
66	650	0.007	0.026	2.333	0.638	0.016	0.000	0.000	0.016	0.73	328.47	0.94
67	660	0.007	0.026	2.359	0.653	0.016	0.000	0.000	0.016	0.74	330.91	0.91
68	670	0.007	0.026	2.385	0.669	0.016	0.000	0.000	0.016	0.74	333.32	0.88
69	680	0.007	0.026	2.411	0.685	0.016	0.000	0.000	0.016	0.75	335.68	0.86
70	690	0.007	0.026	2.438	0.701	0.016	0.000	0.000	0.016	0.75	338.01	0.85
71	700	0.007	0.026	2.464	0.718	0.016	0.000	0.000	0.016	0.76	340.30	0.83
72	710	0.007	0.026	2.490	0.734	0.016	0.000	0.000	0.016	0.76	342.55	0.82
73	720	0.007	0.026	2.516	0.751	0.016	0.000	0.000	0.016	0.77	344.77	0.81
74	730	0.007	0.026	2.543	0.767	0.017	0.000	0.000	0.017	0.77	346.95	0.81
75	740	0.007	0.026	2.569	0.784	0.017	0.000	0.000	0.017	0.78	349.09	0.80
76	750	0.007	0.026	2.595	0.801	0.017	0.000	0.000	0.017	0.78	351.21	0.80
77	760	0.007	0.026	2.621	0.817	0.017	0.000	0.000	0.017	0.79	353.28	0.80
78	770	0.006	0.023	2.644	0.832	0.015	0.000	0.000	0.015	0.68	304.45	0.79
79	780	0.006	0.023	2.666	0.847	0.015	0.000	0.000	0.015	0.68	305.93	0.77
80	790	0.006	0.023	2.689	0.861	0.015	0.000	0.000	0.015	0.68	307.39	0.76
81	800	0.006	0.023	2.711	0.876	0.015	0.000	0.000	0.015	0.69	308.84	0.75
82	810	0.006	0.023	2.734	0.891	0.015	0.000	0.000	0.015	0.69	310.26	0.74

Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
83	820	0.006	0.023	2.756	0.906	0.015	0.000	0.000	0.015	0.69	311.67	0.73
84	830	0.006	0.023	2.779	0.921	0.015	0.000	0.000	0.015	0.70	313.06	0.73
85	840	0.006	0.023	2.801	0.936	0.015	0.000	0.000	0.015	0.70	314.43	0.72
86	850	0.006	0.023	2.824	0.951	0.015	0.000	0.000	0.015	0.70	315.78	0.72
87	860	0.006	0.023	2.846	0.966	0.015	0.000	0.000	0.015	0.71	317.11	0.72
88	870	0.006	0.023	2.869	0.981	0.015	0.000	0.000	0.015	0.71	318.43	0.72
89	880	0.006	0.023	2.891	0.996	0.015	0.000	0.000	0.015	0.71	319.73	0.72
90	890	0.005	0.019	2.910	1.009	0.013	0.000	0.000	0.013	0.60	267.43	0.71
91	900	0.005	0.019	2.929	1.022	0.013	0.000	0.000	0.013	0.60	268.31	0.69
92	910	0.005	0.019	2.948	1.035	0.013	0.000	0.000	0.013	0.60	269.18	0.68
93	920	0.005	0.019	2.966	1.048	0.013	0.000	0.000	0.013	0.60	270.05	0.67
94	930	0.005	0.019	2.985	1.061	0.013	0.000	0.000	0.013	0.60	270.90	0.66
95	940	0.005	0.019	3.004	1.074	0.013	0.000	0.000	0.013	0.61	271.75	0.65
96	950	0.005	0.019	3.023	1.087	0.013	0.000	0.000	0.013	0.61	272.58	0.64
97	960	0.005	0.019	3.041	1.100	0.013	0.000	0.000	0.013	0.61	273.41	0.64
98	970	0.005	0.019	3.060	1.113	0.013	0.000	0.000	0.013	0.61	274.23	0.63
99	980	0.005	0.019	3.079	1.126	0.013	0.000	0.000	0.013	0.61	275.04	0.63
100	990	0.005	0.019	3.098	1.139	0.013	0.000	0.000	0.013	0.61	275.85	0.63
101	1000	0.005	0.019	3.116	1.152	0.013	0.000	0.000	0.013	0.62	276.64	0.63
102	1010	0.004	0.015	3.131	1.163	0.011	0.000	0.000	0.011	0.49	221.88	0.62
103	1020	0.004	0.015	3.146	1.174	0.011	0.000	0.000	0.011	0.50	222.38	0.60
104	1030	0.004	0.015	3.161	1.184	0.011	0.000	0.000	0.011	0.50	222.88	0.58
105	1040	0.004	0.015	3.176	1.195	0.011	0.000	0.000	0.011	0.50	223.37	0.57
106	1050	0.004	0.015	3.191	1.206	0.011	0.000	0.000	0.011	0.50	223.85	0.56
107	1060	0.004	0.015	3.206	1.216	0.011	0.000	0.000	0.011	0.50	224.34	0.55
108	1070	0.004	0.015	3.221	1.227	0.011	0.000	0.000	0.011	0.50	224.82	0.54
109	1080	0.004	0.015	3.236	1.238	0.011	0.000	0.000	0.011	0.50	225.29	0.54
110	1090	0.004	0.015	3.251	1.249	0.011	0.000	0.000	0.011	0.50	225.77	0.53
111	1100	0.004	0.015	3.266	1.259	0.011	0.000	0.000	0.011	0.50	226.23	0.53
112	1110	0.004	0.015	3.281	1.270	0.011	0.000	0.000	0.011	0.51	226.70	0.52
113	1120	0.004	0.015	3.296	1.281	0.011	0.000	0.000	0.011	0.51	227.16	0.52
114	1130	0.004	0.015	3.311	1.292	0.011	0.000	0.000	0.011	0.51	227.62	0.52
115	1140	0.004	0.015	3.326	1.303	0.011	0.000	0.000	0.011	0.51	228.07	0.52
116	1150	0.004	0.015	3.341	1.314	0.011	0.000	0.000	0.011	0.51	228.52	0.52
117	1160	0.004	0.015	3.356	1.325	0.011	0.000	0.000	0.011	0.51	228.97	0.52
118	1170	0.004	0.015	3.371	1.336	0.011	0.000	0.000	0.011	0.51	229.41	0.51
119	1180	0.004	0.015	3.386	1.347	0.011	0.000	0.000	0.011	0.51	229.85	0.51
120	1190	0.004	0.015	3.401	1.358	0.011	0.000	0.000	0.011	0.51	230.29	0.51
121	1200	0.004	0.015	3.416	1.369	0.011	0.000	0.000	0.011	0.51	230.72	0.51
122	1210	0.004	0.015	3.431	1.380	0.011	0.000	0.000	0.011	0.52	231.15	0.51
123	1220	0.004	0.015	3.446	1.391	0.011	0.000	0.000	0.011	0.52	231.58	0.51

Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
124	1230	0.004	0.015	3.461	1.402	0.011	0.000	0.000	0.011	0.52	232.00	0.51
125	1240	0.004	0.015	3.476	1.413	0.011	0.000	0.000	0.011	0.52	232.42	0.52
126	1250	0.004	0.015	3.491	1.424	0.011	0.000	0.000	0.011	0.52	232.84	0.52
127	1260	0.004	0.015	3.506	1.435	0.011	0.000	0.000	0.011	0.52	233.25	0.52
128	1270	0.004	0.015	3.521	1.446	0.011	0.000	0.000	0.011	0.52	233.66	0.52
129	1280	0.004	0.015	3.536	1.457	0.011	0.000	0.000	0.011	0.52	234.07	0.52
130	1290	0.004	0.015	3.551	1.469	0.011	0.000	0.000	0.011	0.52	234.47	0.52
131	1300	0.004	0.015	3.566	1.480	0.011	0.000	0.000	0.011	0.52	234.87	0.52
132	1310	0.004	0.015	3.581	1.491	0.011	0.000	0.000	0.011	0.52	235.27	0.52
133	1320	0.004	0.015	3.596	1.502	0.011	0.000	0.000	0.011	0.53	235.66	0.52
134	1330	0.004	0.015	3.611	1.514	0.011	0.000	0.000	0.011	0.53	236.06	0.52
135	1340	0.004	0.015	3.626	1.525	0.011	0.000	0.000	0.011	0.53	236.44	0.52
136	1350	0.004	0.015	3.641	1.536	0.011	0.000	0.000	0.011	0.53	236.83	0.52
137	1360	0.004	0.015	3.656	1.548	0.011	0.000	0.000	0.011	0.53	237.21	0.52
138	1370	0.004	0.015	3.671	1.559	0.011	0.000	0.000	0.011	0.53	237.59	0.52
139	1380	0.004	0.015	3.686	1.570	0.011	0.000	0.000	0.011	0.53	237.97	0.53
140	1390	0.004	0.015	3.701	1.582	0.011	0.000	0.000	0.011	0.53	238.35	0.53
141	1400	0.004	0.015	3.716	1.593	0.011	0.000	0.000	0.011	0.53	238.72	0.53
142	1410	0.004	0.015	3.731	1.605	0.011	0.000	0.000	0.011	0.53	239.09	0.53
143	1420	0.004	0.015	3.746	1.616	0.011	0.000	0.000	0.011	0.53	239.45	0.53
144	1430	0.004	0.015	3.761	1.627	0.011	0.000	0.000	0.011	0.53	239.82	0.53
145	1440	0.004	0.015	3.776	1.639	0.011	0.000	0.000	0.011	0.54	240.18	0.53

Peak Flow	**3.83**	**1718.33**	**1.34**

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		**Impervious**					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.027	0.054	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
4	30	0.004	0.027	0.080	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
5	40	0.004	0.027	0.107	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
6	50	0.004	0.027	0.134	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
7	60	0.004	0.027	0.161	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
8	70	0.004	0.027	0.187	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
9	80	0.004	0.027	0.214	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
10	90	0.005	0.033	0.248	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
11	100	0.005	0.033	0.281	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
12	110	0.005	0.033	0.314	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
13	120	0.005	0.033	0.348	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
14	130	0.005	0.033	0.381	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
15	140	0.005	0.033	0.415	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
16	150	0.005	0.033	0.448	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
17	160	0.006	0.040	0.488	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
18	170	0.006	0.040	0.529	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
19	180	0.006	0.040	0.569	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
20	190	0.006	0.040	0.609	0.000	0.000	0.000	0.000	0.000	0.00	0.91	0.00
21	200	0.006	0.040	0.649	0.001	0.001	0.000	0.000	0.001	0.04	17.39	0.00
22	210	0.006	0.040	0.689	0.003	0.002	0.000	0.000	0.002	0.09	38.85	0.01
23	220	0.007	0.047	0.736	0.006	0.003	0.000	0.000	0.003	0.16	71.35	0.03
24	230	0.007	0.047	0.783	0.011	0.005	0.000	0.000	0.005	0.22	98.19	0.05
25	240	0.007	0.047	0.830	0.017	0.006	0.000	0.000	0.006	0.28	123.86	0.08
26	250	0.007	0.047	0.876	0.024	0.007	0.000	0.000	0.007	0.33	148.43	0.11
27	260	0.007	0.047	0.923	0.032	0.008	0.000	0.000	0.008	0.38	171.95	0.15
28	270	0.007	0.047	0.970	0.041	0.009	0.000	0.000	0.009	0.43	194.49	0.19
29	280	0.007	0.047	1.017	0.052	0.010	0.000	0.000	0.010	0.48	216.11	0.23
30	290	0.008	0.054	1.070	0.065	0.013	0.000	0.000	0.013	0.61	272.32	0.27
31	300	0.008	0.054	1.124	0.079	0.014	0.000	0.000	0.014	0.66	298.16	0.33
32	310	0.008	0.054	1.177	0.094	0.015	0.000	0.000	0.015	0.72	322.84	0.38
33	320	0.008	0.054	1.231	0.111	0.017	0.000	0.000	0.017	0.77	346.42	0.43
34	330	0.008	0.054	1.284	0.128	0.018	0.000	0.000	0.018	0.82	368.98	0.49
35	340	0.008	0.054	1.338	0.147	0.019	0.000	0.000	0.019	0.87	390.56	0.54
36	350	0.01	0.067	1.405	0.172	0.025	0.000	0.000	0.025	1.15	517.16	0.61
37	360	0.01	0.067	1.472	0.198	0.026	0.000	0.000	0.026	1.22	547.78	0.69
38	370	0.01	0.067	1.539	0.226	0.028	0.000	0.000	0.028	1.29	576.83	0.78
39	380	0.01	0.067	1.606	0.254	0.029	0.000	0.000	0.029	1.35	604.42	0.85
40	390	0.01	0.067	1.673	0.285	0.030	0.000	0.000	0.030	1.41	630.65	0.93
41	400	0.01	0.067	1.739	0.316	0.031	0.000	0.000	0.031	1.46	655.60	1.00

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
42	410	0.013	0.087	1.826	0.358	0.042	0.000	0.000	0.042	1.98	887.64	1.11
43	420	0.013	0.087	1.913	0.402	0.044	0.000	0.000	0.044	2.06	925.37	1.24
44	430	0.013	0.087	2.000	0.448	0.046	0.000	0.000	0.046	2.14	960.85	1.37
45	440	0.018	0.120	2.121	0.514	0.066	0.000	0.000	0.066	3.09	1385.17	1.55
46	450	0.018	0.120	2.241	0.583	0.069	0.000	0.000	0.069	3.22	1444.26	1.79
47	460	0.034	0.227	2.469	0.721	0.137	0.000	0.000	0.137	6.40	2873.73	2.23
48	470	0.054	0.361	2.830	0.955	0.234	0.000	0.000	0.234	10.92	4902.52	3.17
49	480	0.027	0.181	3.011	1.078	0.123	0.000	0.000	0.123	5.76	2584.79	3.93
50	490	0.018	0.120	3.131	1.163	0.084	0.000	0.000	0.084	3.94	1766.72	4.07
51	500	0.013	0.087	3.218	1.225	0.062	0.000	0.000	0.062	2.89	1296.12	3.97
52	510	0.013	0.087	3.305	1.287	0.063	0.000	0.000	0.063	2.92	1312.15	3.81
53	520	0.013	0.087	3.392	1.351	0.063	0.000	0.000	0.063	2.96	1327.46	3.69
54	530	0.009	0.060	3.452	1.395	0.044	0.000	0.000	0.044	2.07	927.62	3.51
55	540	0.009	0.060	3.512	1.440	0.045	0.000	0.000	0.045	2.08	934.41	3.30
56	550	0.009	0.060	3.572	1.485	0.045	0.000	0.000	0.045	2.10	941.00	3.12
57	560	0.009	0.060	3.633	1.530	0.045	0.000	0.000	0.045	2.11	947.40	2.97
58	570	0.009	0.060	3.693	1.575	0.046	0.000	0.000	0.046	2.12	953.60	2.85
59	580	0.009	0.060	3.753	1.621	0.046	0.000	0.000	0.046	2.14	959.62	2.74
60	590	0.009	0.060	3.813	1.667	0.046	0.000	0.000	0.046	2.15	965.46	2.66
61	600	0.009	0.060	3.874	1.714	0.046	0.000	0.000	0.046	2.16	971.14	2.58
62	610	0.009	0.060	3.934	1.760	0.047	0.000	0.000	0.047	2.18	976.65	2.52
63	620	0.009	0.060	3.994	1.807	0.047	0.000	0.000	0.047	2.19	982.01	2.47
64	630	0.009	0.060	4.054	1.854	0.047	0.000	0.000	0.047	2.20	987.22	2.43
65	640	0.009	0.060	4.114	1.902	0.047	0.000	0.000	0.047	2.21	992.28	2.40
66	650	0.007	0.047	4.161	1.939	0.037	0.000	0.000	0.037	1.73	775.18	2.34
67	660	0.007	0.047	4.208	1.976	0.037	0.000	0.000	0.037	1.73	778.10	2.25
68	670	0.007	0.047	4.255	2.013	0.037	0.000	0.000	0.037	1.74	780.95	2.17
69	680	0.007	0.047	4.302	2.051	0.037	0.000	0.000	0.037	1.75	783.74	2.11
70	690	0.007	0.047	4.349	2.088	0.038	0.000	0.000	0.038	1.75	786.48	2.06
71	700	0.007	0.047	4.395	2.126	0.038	0.000	0.000	0.038	1.76	789.16	2.01
72	710	0.007	0.047	4.442	2.164	0.038	0.000	0.000	0.038	1.76	791.78	1.98
73	720	0.007	0.047	4.489	2.202	0.038	0.000	0.000	0.038	1.77	794.35	1.94
74	730	0.007	0.047	4.536	2.240	0.038	0.000	0.000	0.038	1.78	796.87	1.92
75	740	0.007	0.047	4.583	2.278	0.038	0.000	0.000	0.038	1.78	799.34	1.90
76	750	0.007	0.047	4.629	2.316	0.038	0.000	0.000	0.038	1.79	801.75	1.88
77	760	0.007	0.047	4.676	2.355	0.038	0.000	0.000	0.038	1.79	804.12	1.87
78	770	0.006	0.040	4.716	2.388	0.033	0.000	0.000	0.033	1.54	691.10	1.84
79	780	0.006	0.040	4.757	2.421	0.033	0.000	0.000	0.033	1.54	692.78	1.80
80	790	0.006	0.040	4.797	2.454	0.033	0.000	0.000	0.033	1.55	694.43	1.76
81	800	0.006	0.040	4.837	2.487	0.033	0.000	0.000	0.033	1.55	696.05	1.73
82	810	0.006	0.040	4.877	2.520	0.033	0.000	0.000	0.033	1.55	697.64	1.70

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
83	820	0.006	0.040	4.917	2.554	0.033	0.000	0.000	0.033	1.56	699.21	1.68
84	830	0.006	0.040	4.957	2.587	0.033	0.000	0.000	0.033	1.56	700.76	1.66
85	840	0.006	0.040	4.997	2.621	0.034	0.000	0.000	0.034	1.56	702.27	1.65
86	850	0.006	0.040	5.038	2.654	0.034	0.000	0.000	0.034	1.57	703.77	1.64
87	860	0.006	0.040	5.078	2.688	0.034	0.000	0.000	0.034	1.57	705.24	1.63
88	870	0.006	0.040	5.118	2.722	0.034	0.000	0.000	0.034	1.57	706.68	1.62
89	880	0.006	0.040	5.158	2.756	0.034	0.000	0.000	0.034	1.58	708.11	1.61
90	890	0.005	0.033	5.191	2.784	0.028	0.000	0.000	0.028	1.32	591.16	1.59
91	900	0.005	0.033	5.225	2.812	0.028	0.000	0.000	0.028	1.32	592.12	1.55
92	910	0.005	0.033	5.258	2.841	0.028	0.000	0.000	0.028	1.32	593.06	1.52
93	920	0.005	0.033	5.292	2.869	0.028	0.000	0.000	0.028	1.32	594.00	1.49
94	930	0.005	0.033	5.325	2.897	0.028	0.000	0.000	0.028	1.33	594.92	1.46
95	940	0.005	0.033	5.359	2.926	0.028	0.000	0.000	0.028	1.33	595.83	1.44
96	950	0.005	0.033	5.392	2.954	0.029	0.000	0.000	0.029	1.33	596.73	1.43
97	960	0.005	0.033	5.426	2.983	0.029	0.000	0.000	0.029	1.33	597.62	1.41
98	970	0.005	0.033	5.459	3.011	0.029	0.000	0.000	0.029	1.33	598.49	1.40
99	980	0.005	0.033	5.492	3.040	0.029	0.000	0.000	0.029	1.34	599.36	1.39
100	990	0.005	0.033	5.526	3.069	0.029	0.000	0.000	0.029	1.34	600.21	1.38
101	1000	0.005	0.033	5.559	3.097	0.029	0.000	0.000	0.029	1.34	601.06	1.38
102	1010	0.004	0.027	5.586	3.120	0.023	0.000	0.000	0.023	1.07	481.44	1.35
103	1020	0.004	0.027	5.613	3.143	0.023	0.000	0.000	0.023	1.07	481.97	1.31
104	1030	0.004	0.027	5.640	3.166	0.023	0.000	0.000	0.023	1.08	482.49	1.28
105	1040	0.004	0.027	5.666	3.190	0.023	0.000	0.000	0.023	1.08	483.01	1.25
106	1050	0.004	0.027	5.693	3.213	0.023	0.000	0.000	0.023	1.08	483.52	1.22
107	1060	0.004	0.027	5.720	3.236	0.023	0.000	0.000	0.023	1.08	484.03	1.20
108	1070	0.004	0.027	5.747	3.259	0.023	0.000	0.000	0.023	1.08	484.53	1.18
109	1080	0.004	0.027	5.773	3.282	0.023	0.000	0.000	0.023	1.08	485.03	1.17
110	1090	0.004	0.027	5.800	3.305	0.023	0.000	0.000	0.023	1.08	485.52	1.16
111	1100	0.004	0.027	5.827	3.328	0.023	0.000	0.000	0.023	1.08	486.01	1.14
112	1110	0.004	0.027	5.854	3.352	0.023	0.000	0.000	0.023	1.08	486.49	1.14
113	1120	0.004	0.027	5.881	3.375	0.023	0.000	0.000	0.023	1.09	486.97	1.13
114	1130	0.004	0.027	5.907	3.398	0.023	0.000	0.000	0.023	1.09	487.44	1.12
115	1140	0.004	0.027	5.934	3.422	0.023	0.000	0.000	0.023	1.09	487.91	1.12
116	1150	0.004	0.027	5.961	3.445	0.023	0.000	0.000	0.023	1.09	488.37	1.11
117	1160	0.004	0.027	5.988	3.468	0.023	0.000	0.000	0.023	1.09	488.83	1.11
118	1170	0.004	0.027	6.014	3.492	0.023	0.000	0.000	0.023	1.09	489.29	1.11
119	1180	0.004	0.027	6.041	3.515	0.023	0.000	0.000	0.023	1.09	489.74	1.10
120	1190	0.004	0.027	6.068	3.538	0.023	0.000	0.000	0.023	1.09	490.18	1.10
121	1200	0.004	0.027	6.095	3.562	0.023	0.000	0.000	0.023	1.09	490.63	1.10
122	1210	0.004	0.027	6.121	3.585	0.023	0.000	0.000	0.023	1.09	491.06	1.10
123	1220	0.004	0.027	6.148	3.609	0.023	0.000	0.000	0.023	1.10	491.50	1.10

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
124	1230	0.004	0.027	6.175	3.632	0.023	0.000	0.000	0.023	1.10	491.93	1.10
125	1240	0.004	0.027	6.202	3.656	0.024	0.000	0.000	0.024	1.10	492.35	1.10
126	1250	0.004	0.027	6.228	3.679	0.024	0.000	0.000	0.024	1.10	492.78	1.10
127	1260	0.004	0.027	6.255	3.703	0.024	0.000	0.000	0.024	1.10	493.19	1.10
128	1270	0.004	0.027	6.282	3.726	0.024	0.000	0.000	0.024	1.10	493.61	1.10
129	1280	0.004	0.027	6.309	3.750	0.024	0.000	0.000	0.024	1.10	494.02	1.10
130	1290	0.004	0.027	6.335	3.774	0.024	0.000	0.000	0.024	1.10	494.42	1.10
131	1300	0.004	0.027	6.362	3.797	0.024	0.000	0.000	0.024	1.10	494.83	1.10
132	1310	0.004	0.027	6.389	3.821	0.024	0.000	0.000	0.024	1.10	495.23	1.10
133	1320	0.004	0.027	6.416	3.845	0.024	0.000	0.000	0.024	1.10	495.62	1.10
134	1330	0.004	0.027	6.442	3.868	0.024	0.000	0.000	0.024	1.11	496.01	1.10
135	1340	0.004	0.027	6.469	3.892	0.024	0.000	0.000	0.024	1.11	496.40	1.10
136	1350	0.004	0.027	6.496	3.916	0.024	0.000	0.000	0.024	1.11	496.79	1.10
137	1360	0.004	0.027	6.523	3.939	0.024	0.000	0.000	0.024	1.11	497.17	1.10
138	1370	0.004	0.027	6.550	3.963	0.024	0.000	0.000	0.024	1.11	497.55	1.10
139	1380	0.004	0.027	6.576	3.987	0.024	0.000	0.000	0.024	1.11	497.92	1.10
140	1390	0.004	0.027	6.603	4.011	0.024	0.000	0.000	0.024	1.11	498.29	1.11
141	1400	0.004	0.027	6.630	4.035	0.024	0.000	0.000	0.024	1.11	498.66	1.11
142	1410	0.004	0.027	6.657	4.058	0.024	0.000	0.000	0.024	1.11	499.02	1.11
143	1420	0.004	0.027	6.683	4.082	0.024	0.000	0.000	0.024	1.11	499.39	1.11
144	1430	0.004	0.027	6.710	4.106	0.024	0.000	0.000	0.024	1.11	499.74	1.11
145	1440	0.004	0.027	6.737	4.130	0.024	0.000	0.000	0.024	1.11	500.10	1.11

Peak Flow	**10.92**	**4902.52**	**4.07**

Santa Barbara Urban Hydrograph Method

Quantity Calculations (50 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.030	0.030	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.030	0.059	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
4	30	0.004	0.030	0.089	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
5	40	0.004	0.030	0.119	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
6	50	0.004	0.030	0.149	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
7	60	0.004	0.030	0.178	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
8	70	0.004	0.030	0.208	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
9	80	0.004	0.030	0.238	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
10	90	0.005	0.037	0.275	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
11	100	0.005	0.037	0.312	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
12	110	0.005	0.037	0.349	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
13	120	0.005	0.037	0.386	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
14	130	0.005	0.037	0.424	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
15	140	0.005	0.037	0.461	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
16	150	0.005	0.037	0.498	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
17	160	0.006	0.045	0.542	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
18	170	0.006	0.045	0.587	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
19	180	0.006	0.045	0.632	0.000	0.000	0.000	0.000	0.000	0.02	8.08	0.00
20	190	0.006	0.045	0.676	0.002	0.002	0.000	0.000	0.002	0.08	34.25	0.01
21	200	0.006	0.045	0.721	0.005	0.003	0.000	0.000	0.003	0.13	60.02	0.02
22	210	0.006	0.045	0.765	0.009	0.004	0.000	0.000	0.004	0.19	84.71	0.04
23	220	0.007	0.052	0.817	0.015	0.006	0.000	0.000	0.006	0.29	128.65	0.07
24	230	0.007	0.052	0.869	0.023	0.008	0.000	0.000	0.008	0.35	159.30	0.11
25	240	0.007	0.052	0.921	0.032	0.009	0.000	0.000	0.009	0.42	188.51	0.15
26	250	0.007	0.052	0.973	0.042	0.010	0.000	0.000	0.010	0.48	216.36	0.19
27	260	0.007	0.052	1.025	0.054	0.012	0.000	0.000	0.012	0.54	242.94	0.24
28	270	0.007	0.052	1.077	0.066	0.013	0.000	0.000	0.013	0.60	268.32	0.29
29	280	0.007	0.052	1.129	0.080	0.014	0.000	0.000	0.014	0.65	292.58	0.34
30	290	0.008	0.059	1.189	0.098	0.017	0.000	0.000	0.017	0.81	362.73	0.40
31	300	0.008	0.059	1.248	0.116	0.019	0.000	0.000	0.019	0.87	391.54	0.46
32	310	0.008	0.059	1.308	0.136	0.020	0.000	0.000	0.020	0.93	418.97	0.53
33	320	0.008	0.059	1.367	0.158	0.021	0.000	0.000	0.021	0.99	445.09	0.59
34	330	0.008	0.059	1.427	0.180	0.022	0.000	0.000	0.022	1.05	470.00	0.65
35	340	0.008	0.059	1.486	0.204	0.024	0.000	0.000	0.024	1.10	493.76	0.71
36	350	0.01	0.074	1.560	0.235	0.031	0.000	0.000	0.031	1.45	648.97	0.80
37	360	0.01	0.074	1.635	0.267	0.033	0.000	0.000	0.033	1.52	682.45	0.90
38	370	0.01	0.074	1.709	0.301	0.034	0.000	0.000	0.034	1.59	714.11	0.99
39	380	0.01	0.074	1.783	0.337	0.036	0.000	0.000	0.036	1.66	744.08	1.09
40	390	0.01	0.074	1.858	0.374	0.037	0.000	0.000	0.037	1.72	772.48	1.17
41	400	0.01	0.074	1.932	0.412	0.038	0.000	0.000	0.038	1.78	799.41	1.26
42	410	0.013	0.097	2.028	0.463	0.051	0.000	0.000	0.051	2.40	1077.26	1.38
43	420	0.013	0.097	2.125	0.517	0.053	0.000	0.000	0.053	2.49	1117.70	1.54

Santa Barbara Urban Hydrograph Method

Quantity Calculations (50 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
44	430	0.013	0.097	2.222	0.572	0.055	0.000	0.000	0.055	2.57	1155.60	1.68
45	440	0.018	0.134	2.355	0.651	0.079	0.000	0.000	0.079	3.70	1658.33	1.90
46	450	0.018	0.134	2.489	0.733	0.082	0.000	0.000	0.082	3.83	1720.93	2.17
47	460	0.034	0.253	2.742	0.896	0.163	0.000	0.000	0.163	7.59	3404.15	2.69
48	470	0.054	0.401	3.143	1.171	0.275	0.000	0.000	0.275	12.84	5760.43	3.79
49	480	0.027	0.201	3.344	1.315	0.144	0.000	0.000	0.144	6.73	3018.79	4.67
50	490	0.018	0.134	3.477	1.414	0.098	0.000	0.000	0.098	4.58	2057.42	4.82
51	500	0.013	0.097	3.574	1.486	0.072	0.000	0.000	0.072	3.36	1506.63	4.69
52	510	0.013	0.097	3.670	1.558	0.073	0.000	0.000	0.073	3.39	1523.07	4.50
53	520	0.013	0.097	3.767	1.632	0.073	0.000	0.000	0.073	3.43	1538.74	4.34
54	530	0.009	0.067	3.834	1.683	0.051	0.000	0.000	0.051	2.39	1074.08	4.13
55	540	0.009	0.067	3.901	1.735	0.052	0.000	0.000	0.052	2.41	1081.01	3.88
56	550	0.009	0.067	3.968	1.787	0.052	0.000	0.000	0.052	2.42	1087.72	3.66
57	560	0.009	0.067	4.034	1.839	0.052	0.000	0.000	0.052	2.44	1094.23	3.48
58	570	0.009	0.067	4.101	1.892	0.053	0.000	0.000	0.053	2.45	1100.53	3.33
59	580	0.009	0.067	4.168	1.944	0.053	0.000	0.000	0.053	2.47	1106.64	3.20
60	590	0.009	0.067	4.235	1.997	0.053	0.000	0.000	0.053	2.48	1112.56	3.09
61	600	0.009	0.067	4.302	2.051	0.053	0.000	0.000	0.053	2.49	1118.31	3.01
62	610	0.009	0.067	4.369	2.105	0.054	0.000	0.000	0.054	2.50	1123.89	2.93
63	620	0.009	0.067	4.436	2.159	0.054	0.000	0.000	0.054	2.52	1129.30	2.87
64	630	0.009	0.067	4.503	2.213	0.054	0.000	0.000	0.054	2.53	1134.55	2.82
65	640	0.009	0.067	4.569	2.267	0.054	0.000	0.000	0.054	2.54	1139.66	2.78
66	650	0.007	0.052	4.621	2.310	0.042	0.000	0.000	0.042	1.98	889.83	2.70
67	660	0.007	0.052	4.673	2.352	0.043	0.000	0.000	0.043	1.99	892.77	2.60
68	670	0.007	0.052	4.725	2.395	0.043	0.000	0.000	0.043	2.00	895.64	2.51
69	680	0.007	0.052	4.777	2.438	0.043	0.000	0.000	0.043	2.00	898.44	2.43
70	690	0.007	0.052	4.830	2.481	0.043	0.000	0.000	0.043	2.01	901.19	2.37
71	700	0.007	0.052	4.882	2.524	0.043	0.000	0.000	0.043	2.01	903.87	2.32
72	710	0.007	0.052	4.934	2.567	0.043	0.000	0.000	0.043	2.02	906.50	2.27
73	720	0.007	0.052	4.986	2.611	0.043	0.000	0.000	0.043	2.03	909.08	2.24
74	730	0.007	0.052	5.038	2.654	0.044	0.000	0.000	0.044	2.03	911.60	2.21
75	740	0.007	0.052	5.090	2.698	0.044	0.000	0.000	0.044	2.04	914.06	2.18
76	750	0.007	0.052	5.142	2.742	0.044	0.000	0.000	0.044	2.04	916.48	2.16
77	760	0.007	0.052	5.194	2.786	0.044	0.000	0.000	0.044	2.05	918.84	2.14
78	770	0.006	0.045	5.238	2.823	0.038	0.000	0.000	0.038	1.76	789.43	2.11
79	780	0.006	0.045	5.283	2.861	0.038	0.000	0.000	0.038	1.76	791.10	2.06
80	790	0.006	0.045	5.327	2.899	0.038	0.000	0.000	0.038	1.77	792.74	2.01
81	800	0.006	0.045	5.372	2.937	0.038	0.000	0.000	0.038	1.77	794.36	1.98
82	810	0.006	0.045	5.416	2.975	0.038	0.000	0.000	0.038	1.77	795.95	1.95
83	820	0.006	0.045	5.461	3.013	0.038	0.000	0.000	0.038	1.78	797.51	1.92
84	830	0.006	0.045	5.506	3.051	0.038	0.000	0.000	0.038	1.78	799.04	1.90
85	840	0.006	0.045	5.550	3.090	0.038	0.000	0.000	0.038	1.78	800.55	1.88
86	850	0.006	0.045	5.595	3.128	0.038	0.000	0.000	0.038	1.79	802.04	1.87

Santa Barbara Urban Hydrograph Method
Quantity Calculations (50 yr / 24-hour Storm)
Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
87	860	0.006	0.045	5.639	3.166	0.038	0.000	0.000	0.038	1.79	803.50	1.86
88	870	0.006	0.045	5.684	3.205	0.038	0.000	0.000	0.038	1.79	804.93	1.85
89	880	0.006	0.045	5.729	3.243	0.039	0.000	0.000	0.039	1.80	806.34	1.84
90	890	0.005	0.037	5.766	3.275	0.032	0.000	0.000	0.032	1.50	673.01	1.81
91	900	0.005	0.037	5.803	3.307	0.032	0.000	0.000	0.032	1.50	673.96	1.77
92	910	0.005	0.037	5.840	3.340	0.032	0.000	0.000	0.032	1.50	674.90	1.73
93	920	0.005	0.037	5.877	3.372	0.032	0.000	0.000	0.032	1.51	675.83	1.70
94	930	0.005	0.037	5.914	3.404	0.032	0.000	0.000	0.032	1.51	676.74	1.67
95	940	0.005	0.037	5.951	3.437	0.032	0.000	0.000	0.032	1.51	677.64	1.64
96	950	0.005	0.037	5.989	3.469	0.032	0.000	0.000	0.032	1.51	678.53	1.62
97	960	0.005	0.037	6.026	3.502	0.032	0.000	0.000	0.032	1.51	679.40	1.61
98	970	0.005	0.037	6.063	3.534	0.032	0.000	0.000	0.032	1.52	680.27	1.59
99	980	0.005	0.037	6.100	3.567	0.033	0.000	0.000	0.033	1.52	681.12	1.58
100	990	0.005	0.037	6.137	3.599	0.033	0.000	0.000	0.033	1.52	681.97	1.57
101	1000	0.005	0.037	6.174	3.632	0.033	0.000	0.000	0.033	1.52	682.80	1.57
102	1010	0.004	0.030	6.204	3.658	0.026	0.000	0.000	0.026	1.22	546.83	1.54
103	1020	0.004	0.030	6.234	3.684	0.026	0.000	0.000	0.026	1.22	547.35	1.49
104	1030	0.004	0.030	6.263	3.710	0.026	0.000	0.000	0.026	1.22	547.87	1.45
105	1040	0.004	0.030	6.293	3.736	0.026	0.000	0.000	0.026	1.22	548.37	1.42
106	1050	0.004	0.030	6.323	3.763	0.026	0.000	0.000	0.026	1.22	548.88	1.39
107	1060	0.004	0.030	6.353	3.789	0.026	0.000	0.000	0.026	1.22	549.38	1.36
108	1070	0.004	0.030	6.382	3.815	0.026	0.000	0.000	0.026	1.23	549.87	1.34
109	1080	0.004	0.030	6.412	3.841	0.026	0.000	0.000	0.026	1.23	550.36	1.33
110	1090	0.004	0.030	6.442	3.868	0.026	0.000	0.000	0.026	1.23	550.84	1.31
111	1100	0.004	0.030	6.472	3.894	0.026	0.000	0.000	0.026	1.23	551.32	1.30
112	1110	0.004	0.030	6.501	3.920	0.026	0.000	0.000	0.026	1.23	551.80	1.29
113	1120	0.004	0.030	6.531	3.947	0.026	0.000	0.000	0.026	1.23	552.27	1.28
114	1130	0.004	0.030	6.561	3.973	0.026	0.000	0.000	0.026	1.23	552.73	1.27
115	1140	0.004	0.030	6.590	4.000	0.026	0.000	0.000	0.026	1.23	553.19	1.27
116	1150	0.004	0.030	6.620	4.026	0.026	0.000	0.000	0.026	1.23	553.65	1.26
117	1160	0.004	0.030	6.650	4.052	0.026	0.000	0.000	0.026	1.23	554.10	1.26
118	1170	0.004	0.030	6.680	4.079	0.026	0.000	0.000	0.026	1.24	554.55	1.25
119	1180	0.004	0.030	6.709	4.105	0.027	0.000	0.000	0.027	1.24	554.99	1.25
120	1190	0.004	0.030	6.739	4.132	0.027	0.000	0.000	0.027	1.24	555.43	1.25
121	1200	0.004	0.030	6.769	4.159	0.027	0.000	0.000	0.027	1.24	555.86	1.25
122	1210	0.004	0.030	6.798	4.185	0.027	0.000	0.000	0.027	1.24	556.29	1.25
123	1220	0.004	0.030	6.828	4.212	0.027	0.000	0.000	0.027	1.24	556.72	1.25
124	1230	0.004	0.030	6.858	4.238	0.027	0.000	0.000	0.027	1.24	557.14	1.25
125	1240	0.004	0.030	6.888	4.265	0.027	0.000	0.000	0.027	1.24	557.55	1.24
126	1250	0.004	0.030	6.917	4.292	0.027	0.000	0.000	0.027	1.24	557.97	1.24
127	1260	0.004	0.030	6.947	4.318	0.027	0.000	0.000	0.027	1.24	558.38	1.24
128	1270	0.004	0.030	6.977	4.345	0.027	0.000	0.000	0.027	1.25	558.78	1.24
129	1280	0.004	0.030	7.006	4.372	0.027	0.000	0.000	0.027	1.25	559.18	1.24

Santa Barbara Urban Hydrograph Method

Quantity Calculations (50 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
130	1290	0.004	0.030	7.036	4.398	0.027	0.000	0.000	0.027	1.25	559.58	1.24
131	1300	0.004	0.030	7.066	4.425	0.027	0.000	0.000	0.027	1.25	559.98	1.25
132	1310	0.004	0.030	7.096	4.452	0.027	0.000	0.000	0.027	1.25	560.37	1.25
133	1320	0.004	0.030	7.125	4.479	0.027	0.000	0.000	0.027	1.25	560.75	1.25
134	1330	0.004	0.030	7.155	4.505	0.027	0.000	0.000	0.027	1.25	561.14	1.25
135	1340	0.004	0.030	7.185	4.532	0.027	0.000	0.000	0.027	1.25	561.52	1.25
136	1350	0.004	0.030	7.215	4.559	0.027	0.000	0.000	0.027	1.25	561.89	1.25
137	1360	0.004	0.030	7.244	4.586	0.027	0.000	0.000	0.027	1.25	562.26	1.25
138	1370	0.004	0.030	7.274	4.613	0.027	0.000	0.000	0.027	1.25	562.63	1.25
139	1380	0.004	0.030	7.304	4.640	0.027	0.000	0.000	0.027	1.25	563.00	1.25
140	1390	0.004	0.030	7.333	4.667	0.027	0.000	0.000	0.027	1.26	563.36	1.25
141	1400	0.004	0.030	7.363	4.694	0.027	0.000	0.000	0.027	1.26	563.72	1.25
142	1410	0.004	0.030	7.393	4.721	0.027	0.000	0.000	0.027	1.26	564.08	1.25
143	1420	0.004	0.030	7.423	4.747	0.027	0.000	0.000	0.027	1.26	564.43	1.25
144	1430	0.004	0.030	7.452	4.774	0.027	0.000	0.000	0.027	1.26	564.78	1.25
145	1440	0.004	0.030	7.482	4.801	0.027	0.000	0.000	0.027	1.26	565.12	1.25

Peak Flow	**12.84**	**5760.43**	**4.82**

Santa Barbara Urban Hydrograph Method

Quantity Calculations (100 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.033	0.033	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.033	0.065	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
4	30	0.004	0.033	0.098	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
5	40	0.004	0.033	0.130	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
6	50	0.004	0.033	0.163	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
7	60	0.004	0.033	0.195	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
8	70	0.004	0.033	0.228	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
9	80	0.004	0.033	0.260	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
10	90	0.005	0.041	0.301	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
11	100	0.005	0.041	0.342	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
12	110	0.005	0.041	0.383	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
13	120	0.005	0.041	0.423	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
14	130	0.005	0.041	0.464	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
15	140	0.005	0.041	0.505	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
16	150	0.005	0.041	0.545	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
17	160	0.006	0.049	0.594	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
18	170	0.006	0.049	0.643	0.001	0.001	0.000	0.000	0.001	0.03	14.39	0.00
19	180	0.006	0.049	0.692	0.003	0.002	0.000	0.000	0.002	0.10	46.28	0.01
20	190	0.006	0.049	0.741	0.007	0.004	0.000	0.000	0.004	0.17	76.75	0.03
21	200	0.006	0.049	0.790	0.012	0.005	0.000	0.000	0.005	0.24	105.81	0.06
22	210	0.006	0.049	0.838	0.018	0.006	0.000	0.000	0.006	0.30	133.55	0.09
23	220	0.007	0.057	0.895	0.027	0.009	0.000	0.000	0.009	0.42	189.22	0.13
24	230	0.007	0.057	0.952	0.038	0.011	0.000	0.000	0.011	0.50	223.45	0.18
25	240	0.007	0.057	1.009	0.050	0.012	0.000	0.000	0.012	0.57	255.96	0.23
26	250	0.007	0.057	1.066	0.064	0.014	0.000	0.000	0.014	0.64	286.86	0.28
27	260	0.007	0.057	1.123	0.079	0.015	0.000	0.000	0.015	0.70	316.26	0.34
28	270	0.007	0.057	1.180	0.095	0.016	0.000	0.000	0.016	0.77	344.24	0.40
29	280	0.007	0.057	1.237	0.113	0.018	0.000	0.000	0.018	0.83	370.91	0.46
30	290	0.008	0.065	1.302	0.135	0.022	0.000	0.000	0.022	1.01	454.97	0.52
31	300	0.008	0.065	1.368	0.158	0.023	0.000	0.000	0.023	1.08	486.47	0.60
32	310	0.008	0.065	1.433	0.183	0.025	0.000	0.000	0.025	1.15	516.35	0.68
33	320	0.008	0.065	1.498	0.209	0.026	0.000	0.000	0.026	1.21	544.73	0.75
34	330	0.008	0.065	1.563	0.236	0.027	0.000	0.000	0.027	1.27	571.71	0.82
35	340	0.008	0.065	1.628	0.264	0.029	0.000	0.000	0.029	1.33	597.38	0.89
36	350	0.01	0.081	1.709	0.302	0.037	0.000	0.000	0.037	1.74	780.95	0.99
37	360	0.01	0.081	1.791	0.341	0.039	0.000	0.000	0.039	1.82	816.91	1.10
38	370	0.01	0.081	1.872	0.381	0.041	0.000	0.000	0.041	1.90	850.81	1.21
39	380	0.01	0.081	1.954	0.423	0.042	0.000	0.000	0.042	1.97	882.80	1.32
40	390	0.01	0.081	2.035	0.467	0.044	0.000	0.000	0.044	2.03	913.03	1.42
41	400	0.01	0.081	2.116	0.512	0.045	0.000	0.000	0.045	2.10	941.62	1.51
42	410	0.013	0.106	2.222	0.572	0.060	0.000	0.000	0.060	2.82	1264.36	1.65
43	420	0.013	0.106	2.328	0.635	0.062	0.000	0.000	0.062	2.91	1307.03	1.83
44	430	0.013	0.106	2.434	0.699	0.064	0.000	0.000	0.064	3.00	1346.90	2.00
45	440	0.018	0.147	2.580	0.791	0.092	0.000	0.000	0.092	4.29	1926.01	2.24

Santa Barbara Urban Hydrograph Method

Quantity Calculations (100 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Pervious Accumulated Rainfall (in)	Pervious Incremental Rainfall (in)	Impervious Accumulated Rainfall (in)	Impervious Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
46	450	0.018	0.147	2.727	0.886	0.095	0.000	0.000	0.095	4.44	1991.41	2.55
47	460	0.034	0.277	3.004	1.074	0.187	0.000	0.000	0.187	8.74	3921.11	3.14
48	470	0.054	0.440	3.443	1.388	0.315	0.000	0.000	0.315	14.69	6593.10	4.40
49	480	0.027	0.220	3.663	1.553	0.164	0.000	0.000	0.164	7.66	3438.73	5.39
50	490	0.018	0.147	3.810	1.664	0.112	0.000	0.000	0.112	5.21	2338.30	5.55
51	500	0.013	0.106	3.915	1.746	0.082	0.000	0.000	0.082	3.81	1709.86	5.39
52	510	0.013	0.106	4.021	1.829	0.082	0.000	0.000	0.082	3.85	1726.55	5.16
53	520	0.013	0.106	4.127	1.912	0.083	0.000	0.000	0.083	3.88	1742.44	4.97
54	530	0.009	0.073	4.200	1.970	0.058	0.000	0.000	0.058	2.71	1215.21	4.73
55	540	0.009	0.073	4.274	2.028	0.058	0.000	0.000	0.058	2.72	1222.21	4.43
56	550	0.009	0.073	4.347	2.087	0.059	0.000	0.000	0.059	2.74	1228.99	4.18
57	560	0.009	0.073	4.420	2.146	0.059	0.000	0.000	0.059	2.75	1235.55	3.97
58	570	0.009	0.073	4.493	2.205	0.059	0.000	0.000	0.059	2.77	1241.90	3.79
59	580	0.009	0.073	4.567	2.265	0.060	0.000	0.000	0.060	2.78	1248.06	3.64
60	590	0.009	0.073	4.640	2.325	0.060	0.000	0.000	0.060	2.79	1254.01	3.52
61	600	0.009	0.073	4.713	2.385	0.060	0.000	0.000	0.060	2.81	1259.79	3.41
62	610	0.009	0.073	4.786	2.445	0.060	0.000	0.000	0.060	2.82	1265.38	3.33
63	620	0.009	0.073	4.860	2.506	0.061	0.000	0.000	0.061	2.83	1270.81	3.25
64	630	0.009	0.073	4.933	2.567	0.061	0.000	0.000	0.061	2.84	1276.08	3.19
65	640	0.009	0.073	5.006	2.628	0.061	0.000	0.000	0.061	2.85	1281.18	3.14
66	650	0.007	0.057	5.063	2.676	0.048	0.000	0.000	0.048	2.23	999.91	3.05
67	660	0.007	0.057	5.120	2.724	0.048	0.000	0.000	0.048	2.23	1002.84	2.93
68	670	0.007	0.057	5.177	2.772	0.048	0.000	0.000	0.048	2.24	1005.71	2.83
69	680	0.007	0.057	5.234	2.820	0.048	0.000	0.000	0.048	2.25	1008.51	2.74
70	690	0.007	0.057	5.291	2.868	0.048	0.000	0.000	0.048	2.25	1011.24	2.67
71	700	0.007	0.057	5.348	2.917	0.048	0.000	0.000	0.048	2.26	1013.92	2.61
72	710	0.007	0.057	5.405	2.965	0.049	0.000	0.000	0.049	2.27	1016.54	2.56
73	720	0.007	0.057	5.462	3.014	0.049	0.000	0.000	0.049	2.27	1019.10	2.52
74	730	0.007	0.057	5.519	3.063	0.049	0.000	0.000	0.049	2.28	1021.61	2.48
75	740	0.007	0.057	5.576	3.112	0.049	0.000	0.000	0.049	2.28	1024.06	2.45
76	750	0.007	0.057	5.633	3.161	0.049	0.000	0.000	0.049	2.29	1026.46	2.43
77	760	0.007	0.057	5.690	3.210	0.049	0.000	0.000	0.049	2.29	1028.81	2.41
78	770	0.006	0.049	5.739	3.252	0.042	0.000	0.000	0.042	1.97	883.67	2.37
79	780	0.006	0.049	5.788	3.294	0.042	0.000	0.000	0.042	1.97	885.33	2.31
80	790	0.006	0.049	5.836	3.337	0.042	0.000	0.000	0.042	1.98	886.96	2.26
81	800	0.006	0.049	5.885	3.379	0.042	0.000	0.000	0.042	1.98	888.56	2.22
82	810	0.006	0.049	5.934	3.422	0.043	0.000	0.000	0.043	1.98	890.13	2.18
83	820	0.006	0.049	5.983	3.464	0.043	0.000	0.000	0.043	1.99	891.68	2.15
84	830	0.006	0.049	6.032	3.507	0.043	0.000	0.000	0.043	1.99	893.20	2.13
85	840	0.006	0.049	6.081	3.550	0.043	0.000	0.000	0.043	1.99	894.69	2.11
86	850	0.006	0.049	6.129	3.592	0.043	0.000	0.000	0.043	2.00	896.16	2.09
87	860	0.006	0.049	6.178	3.635	0.043	0.000	0.000	0.043	2.00	897.60	2.08
88	870	0.006	0.049	6.227	3.678	0.043	0.000	0.000	0.043	2.00	899.02	2.07
89	880	0.006	0.049	6.276	3.721	0.043	0.000	0.000	0.043	2.01	900.41	2.06
90	890	0.005	0.041	6.317	3.757	0.036	0.000	0.000	0.036	1.67	751.39	2.03

Santa Barbara Urban Hydrograph Method
Quantity Calculations (100 yr / 24-hour Storm)
Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
91	900	0.005	0.041	6.357	3.793	0.036	0.000	0.000	0.036	1.68	752.33	1.97
92	910	0.005	0.041	6.398	3.829	0.036	0.000	0.000	0.036	1.68	753.25	1.93
93	920	0.005	0.041	6.439	3.865	0.036	0.000	0.000	0.036	1.68	754.16	1.89
94	930	0.005	0.041	6.479	3.901	0.036	0.000	0.000	0.036	1.68	755.06	1.86
95	940	0.005	0.041	6.520	3.937	0.036	0.000	0.000	0.036	1.68	755.95	1.84
96	950	0.005	0.041	6.561	3.973	0.036	0.000	0.000	0.036	1.69	756.82	1.81
97	960	0.005	0.041	6.602	4.009	0.036	0.000	0.000	0.036	1.69	757.69	1.80
98	970	0.005	0.041	6.642	4.046	0.036	0.000	0.000	0.036	1.69	758.54	1.78
99	980	0.005	0.041	6.683	4.082	0.036	0.000	0.000	0.036	1.69	759.38	1.77
100	990	0.005	0.041	6.724	4.118	0.036	0.000	0.000	0.036	1.69	760.21	1.76
101	1000	0.005	0.041	6.764	4.155	0.036	0.000	0.000	0.036	1.70	761.03	1.75
102	1010	0.004	0.033	6.797	4.184	0.029	0.000	0.000	0.029	1.36	609.40	1.71
103	1020	0.004	0.033	6.829	4.213	0.029	0.000	0.000	0.029	1.36	609.91	1.66
104	1030	0.004	0.033	6.862	4.242	0.029	0.000	0.000	0.029	1.36	610.42	1.62
105	1040	0.004	0.033	6.895	4.271	0.029	0.000	0.000	0.029	1.36	610.92	1.58
106	1050	0.004	0.033	6.927	4.300	0.029	0.000	0.000	0.029	1.36	611.41	1.55
107	1060	0.004	0.033	6.960	4.330	0.029	0.000	0.000	0.029	1.36	611.90	1.52
108	1070	0.004	0.033	6.992	4.359	0.029	0.000	0.000	0.029	1.36	612.39	1.50
109	1080	0.004	0.033	7.025	4.388	0.029	0.000	0.000	0.029	1.37	612.87	1.48
110	1090	0.004	0.033	7.057	4.417	0.029	0.000	0.000	0.029	1.37	613.34	1.46
111	1100	0.004	0.033	7.090	4.447	0.029	0.000	0.000	0.029	1.37	613.81	1.45
112	1110	0.004	0.033	7.123	4.476	0.029	0.000	0.000	0.029	1.37	614.28	1.44
113	1120	0.004	0.033	7.155	4.505	0.029	0.000	0.000	0.029	1.37	614.74	1.43
114	1130	0.004	0.033	7.188	4.535	0.029	0.000	0.000	0.029	1.37	615.19	1.42
115	1140	0.004	0.033	7.220	4.564	0.029	0.000	0.000	0.029	1.37	615.64	1.41
116	1150	0.004	0.033	7.253	4.594	0.029	0.000	0.000	0.029	1.37	616.09	1.41
117	1160	0.004	0.033	7.285	4.623	0.029	0.000	0.000	0.029	1.37	616.53	1.40
118	1170	0.004	0.033	7.318	4.653	0.029	0.000	0.000	0.029	1.37	616.97	1.40
119	1180	0.004	0.033	7.350	4.682	0.029	0.000	0.000	0.029	1.38	617.40	1.39
120	1190	0.004	0.033	7.383	4.712	0.030	0.000	0.000	0.030	1.38	617.83	1.39
121	1200	0.004	0.033	7.416	4.741	0.030	0.000	0.000	0.030	1.38	618.26	1.39
122	1210	0.004	0.033	7.448	4.771	0.030	0.000	0.000	0.030	1.38	618.68	1.39
123	1220	0.004	0.033	7.481	4.800	0.030	0.000	0.000	0.030	1.38	619.09	1.39
124	1230	0.004	0.033	7.513	4.830	0.030	0.000	0.000	0.030	1.38	619.50	1.39
125	1240	0.004	0.033	7.546	4.859	0.030	0.000	0.000	0.030	1.38	619.91	1.38
126	1250	0.004	0.033	7.578	4.889	0.030	0.000	0.000	0.030	1.38	620.32	1.38
127	1260	0.004	0.033	7.611	4.919	0.030	0.000	0.000	0.030	1.38	620.72	1.38
128	1270	0.004	0.033	7.643	4.948	0.030	0.000	0.000	0.030	1.38	621.11	1.38
129	1280	0.004	0.033	7.676	4.978	0.030	0.000	0.000	0.030	1.38	621.50	1.38
130	1290	0.004	0.033	7.709	5.008	0.030	0.000	0.000	0.030	1.39	621.89	1.38
131	1300	0.004	0.033	7.741	5.037	0.030	0.000	0.000	0.030	1.39	622.28	1.38
132	1310	0.004	0.033	7.774	5.067	0.030	0.000	0.000	0.030	1.39	622.66	1.38
133	1320	0.004	0.033	7.806	5.097	0.030	0.000	0.000	0.030	1.39	623.03	1.39
134	1330	0.004	0.033	7.839	5.127	0.030	0.000	0.000	0.030	1.39	623.41	1.39
135	1340	0.004	0.033	7.871	5.156	0.030	0.000	0.000	0.030	1.39	623.78	1.39

Santa Barbara Urban Hydrograph Method

Quantity Calculations (100 yr / 24-hour Storm)

Pre-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
136	1350	0.004	0.033	7.904	5.186	0.030	0.000	0.000	0.030	1.39	624.15	1.39
137	1360	0.004	0.033	7.937	5.216	0.030	0.000	0.000	0.030	1.39	624.51	1.39
138	1370	0.004	0.033	7.969	5.246	0.030	0.000	0.000	0.030	1.39	624.87	1.39
139	1380	0.004	0.033	8.002	5.276	0.030	0.000	0.000	0.030	1.39	625.22	1.39
140	1390	0.004	0.033	8.034	5.306	0.030	0.000	0.000	0.030	1.39	625.58	1.39
141	1400	0.004	0.033	8.067	5.336	0.030	0.000	0.000	0.030	1.39	625.93	1.39
142	1410	0.004	0.033	8.099	5.366	0.030	0.000	0.000	0.030	1.40	626.27	1.39
143	1420	0.004	0.033	8.132	5.395	0.030	0.000	0.000	0.030	1.40	626.62	1.39
144	1430	0.004	0.033	8.164	5.425	0.030	0.000	0.000	0.030	1.40	626.96	1.39
145	1440	0.004	0.033	8.197	5.455	0.030	0.000	0.000	0.030	1.40	627.29	1.39

Peak Flow	**14.69**	**6593.10**	**5.55**

Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Purpose:

Determine the stormwater runoff volume required for: Pre-Development Conditions (Basin #2)

Assumptions:

1. Runoff volume is computed with the Santa Barbara Urban Hydrograph Method (SBUH)
2. 2-year/ 24-hour design storm event
3. 25-year/ 24-hour design storm event
4. 50-year/ 24-hour design storm event
5. 100-year/ 24-hour design storm event
6. Total Basin Area 9.3 acres
7. Design storm precipitation depths obtained using PF Data Server, lat39.4126 long-123.7548
8. Areas used for subbasins estimated using proposed site development plan
9. Slopes for time of concentration calculation assumed to be 6% based on LACO field study dated 6/7/2012
10. Soil assumed to be of soil group D, with an average antecedent soil moisture condition
11. Ground coverage for pervious area assumed to be woods in good condition
12. Drainage length assumed to originate from the center of the line which splits the parcel from the southwest corner to the northeast corner, and terminates at the drainage basin
13. Manning roughness coefficient assumed to be 0.6, which is the middle range for woods underbrush (0.4 < n < 0.8)
14. Cuve numbers determined using TR-55 Documentation

Methodology:

1. Determine the runoff volume for the design storm event using the SBUH method

References:

1. Urban Hydrology for Small Watersheds, Technical Release 55
   Natural Resource Conservation Service, USDA 1986
2. Handbook of Hydrology (1993), Maidment, D.
   McGraw-Hill Publishing, New York, NY
3. Open Channel Hydraulics
   Chow, V.T. 1959, McGraw-Hill Book Company
4. NOAA Atlas 14, Volume 6, Version 2
   http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_printpage.html

Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Input Variables:

Basin Number	=	2	**Pre-Development Conditions (Basin #2)**	
Total Area	=	9.33	ac	
Precipitation (Quantity)	=	3.75	in	(2-yr. 24-hr event)
Precipitation (Quantity)	=	6.69	in	(25-yr. 24-hr event)
Precipitation (Quantity)	=	7.43	in	(50-yr. 24-hr event)
Precipitation (Quantity)	=	8.14	in	(100-yr. 24-hr event)
Time Step	=	10	min	

Pervious Area:

Area	=	9.33	ac
CN	=	77	
S	=	2.99	(1000/CN)-10
0.2S	=	0.60	

Impervious Area:

Area	=	0.0	ac
CN	=	83	
S	=	2.05	(1000/CN)-10
0.2S	=	0.41	

Time of Concentration:

Drainage Length	=	300	ft
Average Slope	=	0.060	ft/ft
Manning's n	=	0.600	

T_c = 52.2 min (minimum of 5 minutes)

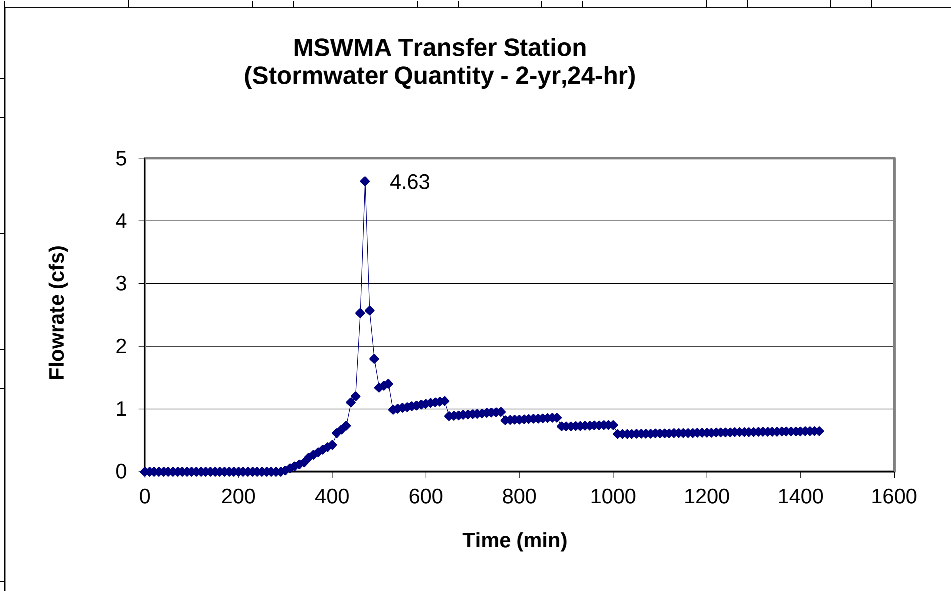
Routing Constant:

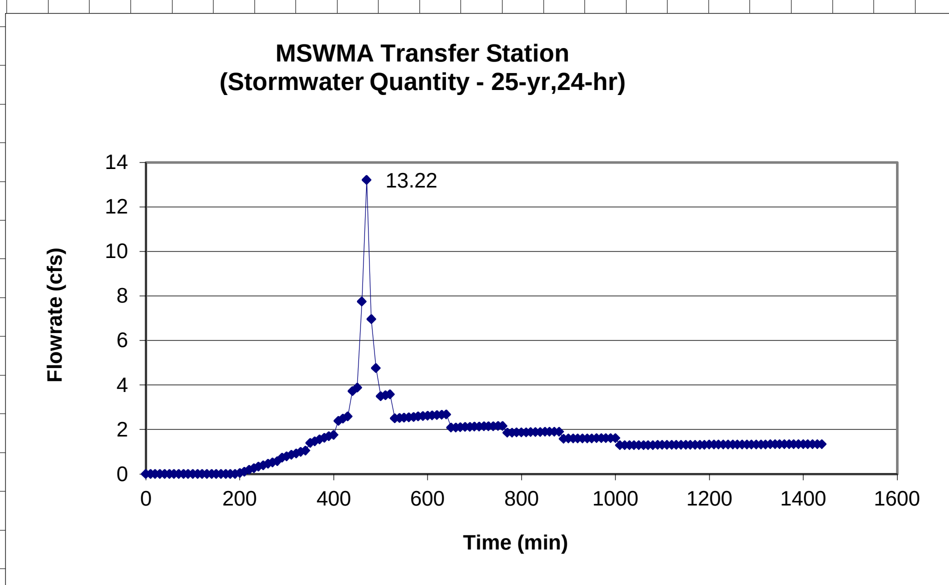
w = 0.087 dt/(2Tc+dt)

Client: Mendocino Solid Waste Management Authority Date: August 4, 2014
Project: Tranfer Station EIR Proj. # : 8411065
Prepared by: BB Checked by: DS

Santa Barbara Urban Hydrograph Method

Results: **Pre-Development Conditions (Basin #2)**

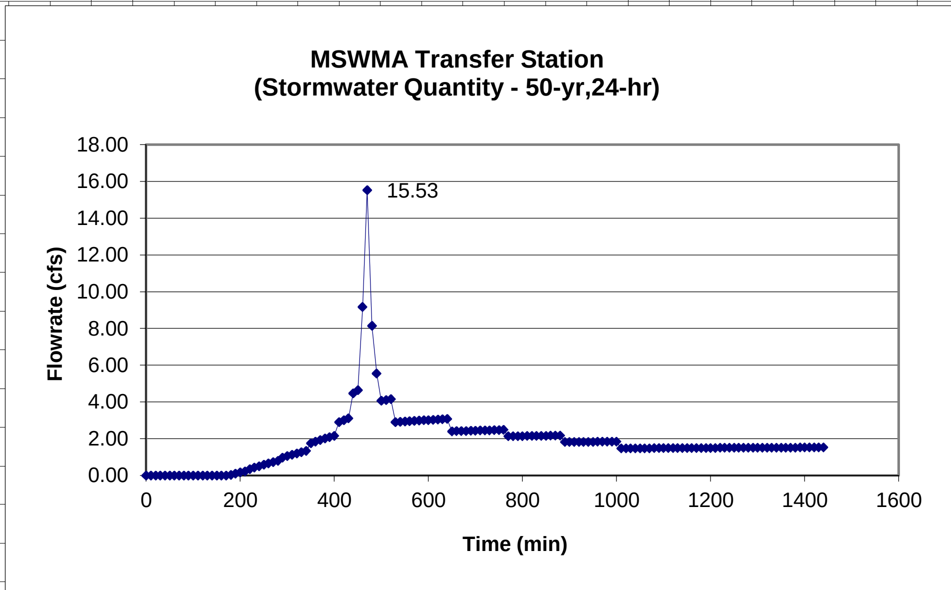


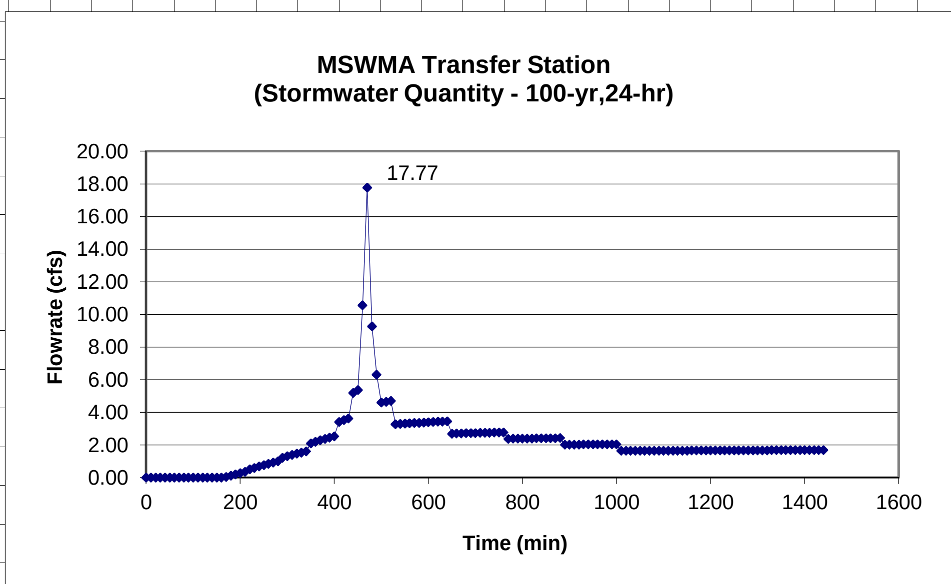


Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Results: **Pre-Development Conditions (Basin #2)**





Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.015	0.015	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.015	0.030	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
4	30	0.004	0.015	0.045	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
5	40	0.004	0.015	0.060	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
6	50	0.004	0.015	0.075	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
7	60	0.004	0.015	0.090	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
8	70	0.004	0.015	0.105	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
9	80	0.004	0.015	0.120	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
10	90	0.005	0.019	0.139	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
11	100	0.005	0.019	0.158	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
12	110	0.005	0.019	0.176	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
13	120	0.005	0.019	0.195	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
14	130	0.005	0.019	0.214	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
15	140	0.005	0.019	0.233	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
16	150	0.005	0.019	0.251	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
17	160	0.006	0.023	0.274	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
18	170	0.006	0.023	0.296	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
19	180	0.006	0.023	0.319	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
20	190	0.006	0.023	0.341	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
21	200	0.006	0.023	0.364	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
22	210	0.006	0.023	0.386	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
23	220	0.007	0.026	0.413	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
24	230	0.007	0.026	0.439	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
25	240	0.007	0.026	0.465	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
26	250	0.007	0.026	0.491	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
27	260	0.007	0.026	0.518	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
28	270	0.007	0.026	0.544	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
29	280	0.007	0.026	0.570	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
30	290	0.008	0.030	0.600	0.000	0.000	0.000	0.000	0.000	0.00	0.06	0.00
31	300	0.008	0.030	0.630	0.000	0.000	0.000	0.000	0.000	0.02	8.86	0.00
32	310	0.008	0.030	0.660	0.001	0.001	0.000	0.000	0.001	0.05	23.64	0.01
33	320	0.008	0.030	0.690	0.003	0.001	0.000	0.000	0.001	0.08	37.98	0.02
34	330	0.008	0.030	0.720	0.005	0.002	0.000	0.000	0.002	0.12	51.91	0.03
35	340	0.008	0.030	0.750	0.007	0.003	0.000	0.000	0.003	0.15	65.45	0.05
36	350	0.01	0.038	0.788	0.011	0.004	0.000	0.000	0.004	0.22	100.25	0.07
37	360	0.01	0.038	0.825	0.016	0.005	0.000	0.000	0.005	0.27	120.08	0.10
38	370	0.01	0.038	0.863	0.022	0.005	0.000	0.000	0.005	0.31	139.22	0.14
39	380	0.01	0.038	0.900	0.028	0.006	0.000	0.000	0.006	0.35	157.70	0.17
40	390	0.01	0.038	0.938	0.035	0.007	0.000	0.000	0.007	0.39	175.56	0.21
41	400	0.01	0.038	0.975	0.042	0.008	0.000	0.000	0.008	0.43	192.82	0.24

Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
42	410	0.013	0.049	1.024	0.053	0.011	0.000	0.000	0.011	0.61	275.54	0.29
43	420	0.013	0.049	1.073	0.065	0.012	0.000	0.000	0.012	0.67	302.56	0.35
44	430	0.013	0.049	1.121	0.078	0.013	0.000	0.000	0.013	0.73	328.46	0.41
45	440	0.018	0.068	1.189	0.098	0.020	0.000	0.000	0.020	1.10	495.57	0.50
46	450	0.018	0.068	1.256	0.119	0.021	0.000	0.000	0.021	1.20	540.53	0.62
47	460	0.034	0.128	1.384	0.164	0.045	0.000	0.000	0.045	2.53	1135.17	0.83
48	470	0.054	0.203	1.586	0.246	0.082	0.000	0.000	0.082	4.63	2079.06	1.31
49	480	0.027	0.101	1.688	0.291	0.046	0.000	0.000	0.046	2.57	1153.18	1.71
50	490	0.018	0.068	1.755	0.323	0.032	0.000	0.000	0.032	1.80	807.11	1.80
51	500	0.013	0.049	1.804	0.347	0.024	0.000	0.000	0.024	1.34	600.99	1.76
52	510	0.013	0.049	1.853	0.371	0.024	0.000	0.000	0.024	1.37	615.56	1.69
53	520	0.013	0.049	1.901	0.396	0.025	0.000	0.000	0.025	1.40	629.63	1.63
54	530	0.009	0.034	1.935	0.414	0.018	0.000	0.000	0.018	0.99	443.90	1.56
55	540	0.009	0.034	1.969	0.431	0.018	0.000	0.000	0.018	1.00	450.26	1.46
56	550	0.009	0.034	2.003	0.450	0.018	0.000	0.000	0.018	1.02	456.48	1.38
57	560	0.009	0.034	2.036	0.468	0.018	0.000	0.000	0.018	1.03	462.56	1.32
58	570	0.009	0.034	2.070	0.486	0.018	0.000	0.000	0.018	1.04	468.50	1.27
59	580	0.009	0.034	2.104	0.505	0.019	0.000	0.000	0.019	1.06	474.31	1.23
60	590	0.009	0.034	2.138	0.524	0.019	0.000	0.000	0.019	1.07	479.98	1.20
61	600	0.009	0.034	2.171	0.543	0.019	0.000	0.000	0.019	1.08	485.53	1.18
62	610	0.009	0.034	2.205	0.562	0.019	0.000	0.000	0.019	1.09	490.96	1.16
63	620	0.009	0.034	2.239	0.582	0.020	0.000	0.000	0.020	1.11	496.27	1.15
64	630	0.009	0.034	2.273	0.602	0.020	0.000	0.000	0.020	1.12	501.46	1.15
65	640	0.009	0.034	2.306	0.622	0.020	0.000	0.000	0.020	1.13	506.55	1.14
66	650	0.007	0.026	2.333	0.638	0.016	0.000	0.000	0.016	0.89	397.42	1.12
67	660	0.007	0.026	2.359	0.653	0.016	0.000	0.000	0.016	0.89	400.38	1.08
68	670	0.007	0.026	2.385	0.669	0.016	0.000	0.000	0.016	0.90	403.29	1.05
69	680	0.007	0.026	2.411	0.685	0.016	0.000	0.000	0.016	0.90	406.15	1.02
70	690	0.007	0.026	2.438	0.701	0.016	0.000	0.000	0.016	0.91	408.97	1.00
71	700	0.007	0.026	2.464	0.718	0.016	0.000	0.000	0.016	0.92	411.74	0.99
72	710	0.007	0.026	2.490	0.734	0.016	0.000	0.000	0.016	0.92	414.46	0.97
73	720	0.007	0.026	2.516	0.751	0.016	0.000	0.000	0.016	0.93	417.14	0.97
74	730	0.007	0.026	2.543	0.767	0.017	0.000	0.000	0.017	0.94	419.78	0.96
75	740	0.007	0.026	2.569	0.784	0.017	0.000	0.000	0.017	0.94	422.38	0.96
76	750	0.007	0.026	2.595	0.801	0.017	0.000	0.000	0.017	0.95	424.93	0.95
77	760	0.007	0.026	2.621	0.817	0.017	0.000	0.000	0.017	0.95	427.45	0.95
78	770	0.006	0.023	2.644	0.832	0.015	0.000	0.000	0.015	0.82	368.36	0.94
79	780	0.006	0.023	2.666	0.847	0.015	0.000	0.000	0.015	0.82	370.15	0.92
80	790	0.006	0.023	2.689	0.861	0.015	0.000	0.000	0.015	0.83	371.92	0.90
81	800	0.006	0.023	2.711	0.876	0.015	0.000	0.000	0.015	0.83	373.67	0.89
82	810	0.006	0.023	2.734	0.891	0.015	0.000	0.000	0.015	0.84	375.39	0.88

Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
83	820	0.006	0.023	2.756	0.906	0.015	0.000	0.000	0.015	0.84	377.10	0.87
84	830	0.006	0.023	2.779	0.921	0.015	0.000	0.000	0.015	0.84	378.78	0.87
85	840	0.006	0.023	2.801	0.936	0.015	0.000	0.000	0.015	0.85	380.43	0.86
86	850	0.006	0.023	2.824	0.951	0.015	0.000	0.000	0.015	0.85	382.07	0.86
87	860	0.006	0.023	2.846	0.966	0.015	0.000	0.000	0.015	0.85	383.68	0.86
88	870	0.006	0.023	2.869	0.981	0.015	0.000	0.000	0.015	0.86	385.28	0.86
89	880	0.006	0.023	2.891	0.996	0.015	0.000	0.000	0.015	0.86	386.85	0.86
90	890	0.005	0.019	2.910	1.009	0.013	0.000	0.000	0.013	0.72	323.57	0.85
91	900	0.005	0.019	2.929	1.022	0.013	0.000	0.000	0.013	0.72	324.63	0.83
92	910	0.005	0.019	2.948	1.035	0.013	0.000	0.000	0.013	0.73	325.69	0.81
93	920	0.005	0.019	2.966	1.048	0.013	0.000	0.000	0.013	0.73	326.74	0.79
94	930	0.005	0.019	2.985	1.061	0.013	0.000	0.000	0.013	0.73	327.77	0.78
95	940	0.005	0.019	3.004	1.074	0.013	0.000	0.000	0.013	0.73	328.79	0.77
96	950	0.005	0.019	3.023	1.087	0.013	0.000	0.000	0.013	0.73	329.81	0.77
97	960	0.005	0.019	3.041	1.100	0.013	0.000	0.000	0.013	0.74	330.81	0.76
98	970	0.005	0.019	3.060	1.113	0.013	0.000	0.000	0.013	0.74	331.80	0.76
99	980	0.005	0.019	3.079	1.126	0.013	0.000	0.000	0.013	0.74	332.78	0.75
100	990	0.005	0.019	3.098	1.139	0.013	0.000	0.000	0.013	0.74	333.76	0.75
101	1000	0.005	0.019	3.116	1.152	0.013	0.000	0.000	0.013	0.75	334.72	0.75
102	1010	0.004	0.015	3.131	1.163	0.011	0.000	0.000	0.011	0.60	268.46	0.74
103	1020	0.004	0.015	3.146	1.174	0.011	0.000	0.000	0.011	0.60	269.06	0.71
104	1030	0.004	0.015	3.161	1.184	0.011	0.000	0.000	0.011	0.60	269.66	0.69
105	1040	0.004	0.015	3.176	1.195	0.011	0.000	0.000	0.011	0.60	270.26	0.68
106	1050	0.004	0.015	3.191	1.206	0.011	0.000	0.000	0.011	0.60	270.85	0.66
107	1060	0.004	0.015	3.206	1.216	0.011	0.000	0.000	0.011	0.60	271.43	0.65
108	1070	0.004	0.015	3.221	1.227	0.011	0.000	0.000	0.011	0.61	272.01	0.65
109	1080	0.004	0.015	3.236	1.238	0.011	0.000	0.000	0.011	0.61	272.59	0.64
110	1090	0.004	0.015	3.251	1.249	0.011	0.000	0.000	0.011	0.61	273.16	0.63
111	1100	0.004	0.015	3.266	1.259	0.011	0.000	0.000	0.011	0.61	273.73	0.63
112	1110	0.004	0.015	3.281	1.270	0.011	0.000	0.000	0.011	0.61	274.29	0.63
113	1120	0.004	0.015	3.296	1.281	0.011	0.000	0.000	0.011	0.61	274.85	0.62
114	1130	0.004	0.015	3.311	1.292	0.011	0.000	0.000	0.011	0.61	275.40	0.62
115	1140	0.004	0.015	3.326	1.303	0.011	0.000	0.000	0.011	0.61	275.95	0.62
116	1150	0.004	0.015	3.341	1.314	0.011	0.000	0.000	0.011	0.62	276.49	0.62
117	1160	0.004	0.015	3.356	1.325	0.011	0.000	0.000	0.011	0.62	277.04	0.62
118	1170	0.004	0.015	3.371	1.336	0.011	0.000	0.000	0.011	0.62	277.57	0.62
119	1180	0.004	0.015	3.386	1.347	0.011	0.000	0.000	0.011	0.62	278.10	0.62
120	1190	0.004	0.015	3.401	1.358	0.011	0.000	0.000	0.011	0.62	278.63	0.62
121	1200	0.004	0.015	3.416	1.369	0.011	0.000	0.000	0.011	0.62	279.15	0.62
122	1210	0.004	0.015	3.431	1.380	0.011	0.000	0.000	0.011	0.62	279.67	0.62
123	1220	0.004	0.015	3.446	1.391	0.011	0.000	0.000	0.011	0.62	280.19	0.62

Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
124	1230	0.004	0.015	3.461	1.402	0.011	0.000	0.000	0.011	0.63	280.70	0.62
125	1240	0.004	0.015	3.476	1.413	0.011	0.000	0.000	0.011	0.63	281.21	0.62
126	1250	0.004	0.015	3.491	1.424	0.011	0.000	0.000	0.011	0.63	281.71	0.62
127	1260	0.004	0.015	3.506	1.435	0.011	0.000	0.000	0.011	0.63	282.21	0.62
128	1270	0.004	0.015	3.521	1.446	0.011	0.000	0.000	0.011	0.63	282.71	0.62
129	1280	0.004	0.015	3.536	1.457	0.011	0.000	0.000	0.011	0.63	283.20	0.63
130	1290	0.004	0.015	3.551	1.469	0.011	0.000	0.000	0.011	0.63	283.69	0.63
131	1300	0.004	0.015	3.566	1.480	0.011	0.000	0.000	0.011	0.63	284.18	0.63
132	1310	0.004	0.015	3.581	1.491	0.011	0.000	0.000	0.011	0.63	284.66	0.63
133	1320	0.004	0.015	3.596	1.502	0.011	0.000	0.000	0.011	0.64	285.14	0.63
134	1330	0.004	0.015	3.611	1.514	0.011	0.000	0.000	0.011	0.64	285.61	0.63
135	1340	0.004	0.015	3.626	1.525	0.011	0.000	0.000	0.011	0.64	286.08	0.63
136	1350	0.004	0.015	3.641	1.536	0.011	0.000	0.000	0.011	0.64	286.55	0.63
137	1360	0.004	0.015	3.656	1.548	0.011	0.000	0.000	0.011	0.64	287.01	0.63
138	1370	0.004	0.015	3.671	1.559	0.011	0.000	0.000	0.011	0.64	287.47	0.64
139	1380	0.004	0.015	3.686	1.570	0.011	0.000	0.000	0.011	0.64	287.93	0.64
140	1390	0.004	0.015	3.701	1.582	0.011	0.000	0.000	0.011	0.64	288.38	0.64
141	1400	0.004	0.015	3.716	1.593	0.011	0.000	0.000	0.011	0.64	288.83	0.64
142	1410	0.004	0.015	3.731	1.605	0.011	0.000	0.000	0.011	0.64	289.28	0.64
143	1420	0.004	0.015	3.746	1.616	0.011	0.000	0.000	0.011	0.65	289.72	0.64
144	1430	0.004	0.015	3.761	1.627	0.011	0.000	0.000	0.011	0.65	290.16	0.64
145	1440	0.004	0.015	3.776	1.639	0.011	0.000	0.000	0.011	0.65	290.60	0.64

Peak Flow	**4.63**	**2079.06**	**1.80**

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.027	0.054	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
4	30	0.004	0.027	0.080	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
5	40	0.004	0.027	0.107	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
6	50	0.004	0.027	0.134	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
7	60	0.004	0.027	0.161	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
8	70	0.004	0.027	0.187	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
9	80	0.004	0.027	0.214	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
10	90	0.005	0.033	0.248	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
11	100	0.005	0.033	0.281	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
12	110	0.005	0.033	0.314	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
13	120	0.005	0.033	0.348	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
14	130	0.005	0.033	0.381	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
15	140	0.005	0.033	0.415	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
16	150	0.005	0.033	0.448	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
17	160	0.006	0.040	0.488	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
18	170	0.006	0.040	0.529	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
19	180	0.006	0.040	0.569	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
20	190	0.006	0.040	0.609	0.000	0.000	0.000	0.000	0.000	0.00	1.10	0.00
21	200	0.006	0.040	0.649	0.001	0.001	0.000	0.000	0.001	0.05	21.04	0.00
22	210	0.006	0.040	0.689	0.003	0.002	0.000	0.000	0.002	0.10	47.01	0.02
23	220	0.007	0.047	0.736	0.006	0.003	0.000	0.000	0.003	0.19	86.33	0.04
24	230	0.007	0.047	0.783	0.011	0.005	0.000	0.000	0.005	0.26	118.80	0.07
25	240	0.007	0.047	0.830	0.017	0.006	0.000	0.000	0.006	0.33	149.86	0.11
26	250	0.007	0.047	0.876	0.024	0.007	0.000	0.000	0.007	0.40	179.59	0.16
27	260	0.007	0.047	0.923	0.032	0.008	0.000	0.000	0.008	0.46	208.05	0.21
28	270	0.007	0.047	0.970	0.041	0.009	0.000	0.000	0.009	0.52	235.32	0.26
29	280	0.007	0.047	1.017	0.052	0.010	0.000	0.000	0.010	0.58	261.47	0.31
30	290	0.008	0.054	1.070	0.065	0.013	0.000	0.000	0.013	0.73	329.48	0.37
31	300	0.008	0.054	1.124	0.079	0.014	0.000	0.000	0.014	0.80	360.75	0.44
32	310	0.008	0.054	1.177	0.094	0.015	0.000	0.000	0.015	0.87	390.61	0.51
33	320	0.008	0.054	1.231	0.111	0.017	0.000	0.000	0.017	0.93	419.15	0.58
34	330	0.008	0.054	1.284	0.128	0.018	0.000	0.000	0.018	0.99	446.44	0.65
35	340	0.008	0.054	1.338	0.147	0.019	0.000	0.000	0.019	1.05	472.55	0.71
36	350	0.01	0.067	1.405	0.172	0.025	0.000	0.000	0.025	1.39	625.73	0.80
37	360	0.01	0.067	1.472	0.198	0.026	0.000	0.000	0.026	1.48	662.77	0.91
38	370	0.01	0.067	1.539	0.226	0.028	0.000	0.000	0.028	1.56	697.92	1.02
39	380	0.01	0.067	1.606	0.254	0.029	0.000	0.000	0.029	1.63	731.31	1.12
40	390	0.01	0.067	1.673	0.285	0.030	0.000	0.000	0.030	1.70	763.04	1.21
41	400	0.01	0.067	1.739	0.316	0.031	0.000	0.000	0.031	1.77	793.23	1.30

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
42	410	0.013	0.087	1.826	0.358	0.042	0.000	0.000	0.042	2.39	1073.98	1.44
43	420	0.013	0.087	1.913	0.402	0.044	0.000	0.000	0.044	2.49	1119.63	1.62
44	430	0.013	0.087	2.000	0.448	0.046	0.000	0.000	0.046	2.59	1162.56	1.78
45	440	0.018	0.120	2.121	0.514	0.066	0.000	0.000	0.066	3.73	1675.96	2.02
46	450	0.018	0.120	2.241	0.583	0.069	0.000	0.000	0.069	3.89	1747.45	2.33
47	460	0.034	0.227	2.469	0.721	0.137	0.000	0.000	0.137	7.75	3477.01	2.94
48	470	0.054	0.361	2.830	0.955	0.234	0.000	0.000	0.234	13.22	5931.69	4.26
49	480	0.027	0.181	3.011	1.078	0.123	0.000	0.000	0.123	6.97	3127.42	5.28
50	490	0.018	0.120	3.131	1.163	0.084	0.000	0.000	0.084	4.76	2137.60	5.38
51	500	0.013	0.087	3.218	1.225	0.062	0.000	0.000	0.062	3.49	1568.21	5.16
52	510	0.013	0.087	3.305	1.287	0.063	0.000	0.000	0.063	3.54	1587.61	4.88
53	520	0.013	0.087	3.392	1.351	0.063	0.000	0.000	0.063	3.58	1606.13	4.65
54	530	0.009	0.060	3.452	1.395	0.044	0.000	0.000	0.044	2.50	1122.35	4.36
55	540	0.009	0.060	3.512	1.440	0.045	0.000	0.000	0.045	2.52	1130.57	4.04
56	550	0.009	0.060	3.572	1.485	0.045	0.000	0.000	0.045	2.54	1138.55	3.78
57	560	0.009	0.060	3.633	1.530	0.045	0.000	0.000	0.045	2.55	1146.28	3.56
58	570	0.009	0.060	3.693	1.575	0.046	0.000	0.000	0.046	2.57	1153.78	3.39
59	580	0.009	0.060	3.753	1.621	0.046	0.000	0.000	0.046	2.59	1161.07	3.24
60	590	0.009	0.060	3.813	1.667	0.046	0.000	0.000	0.046	2.60	1168.14	3.13
61	600	0.009	0.060	3.874	1.714	0.046	0.000	0.000	0.046	2.62	1175.01	3.04
62	610	0.009	0.060	3.934	1.760	0.047	0.000	0.000	0.047	2.63	1181.68	2.97
63	620	0.009	0.060	3.994	1.807	0.047	0.000	0.000	0.047	2.65	1188.16	2.91
64	630	0.009	0.060	4.054	1.854	0.047	0.000	0.000	0.047	2.66	1194.46	2.87
65	640	0.009	0.060	4.114	1.902	0.047	0.000	0.000	0.047	2.68	1200.59	2.83
66	650	0.007	0.047	4.161	1.939	0.037	0.000	0.000	0.037	2.09	937.92	2.75
67	660	0.007	0.047	4.208	1.976	0.037	0.000	0.000	0.037	2.10	941.44	2.64
68	670	0.007	0.047	4.255	2.013	0.037	0.000	0.000	0.037	2.11	944.90	2.54
69	680	0.007	0.047	4.302	2.051	0.037	0.000	0.000	0.037	2.11	948.27	2.47
70	690	0.007	0.047	4.349	2.088	0.038	0.000	0.000	0.038	2.12	951.58	2.41
71	700	0.007	0.047	4.395	2.126	0.038	0.000	0.000	0.038	2.13	954.82	2.36
72	710	0.007	0.047	4.442	2.164	0.038	0.000	0.000	0.038	2.13	958.00	2.32
73	720	0.007	0.047	4.489	2.202	0.038	0.000	0.000	0.038	2.14	961.11	2.29
74	730	0.007	0.047	4.536	2.240	0.038	0.000	0.000	0.038	2.15	964.15	2.26
75	740	0.007	0.047	4.583	2.278	0.038	0.000	0.000	0.038	2.15	967.14	2.24
76	750	0.007	0.047	4.629	2.316	0.038	0.000	0.000	0.038	2.16	970.06	2.23
77	760	0.007	0.047	4.676	2.355	0.038	0.000	0.000	0.038	2.17	972.93	2.22
78	770	0.006	0.040	4.716	2.388	0.033	0.000	0.000	0.033	1.86	836.18	2.18
79	780	0.006	0.040	4.757	2.421	0.033	0.000	0.000	0.033	1.87	838.21	2.13
80	790	0.006	0.040	4.797	2.454	0.033	0.000	0.000	0.033	1.87	840.21	2.08
81	800	0.006	0.040	4.837	2.487	0.033	0.000	0.000	0.033	1.88	842.17	2.05
82	810	0.006	0.040	4.877	2.520	0.033	0.000	0.000	0.033	1.88	844.10	2.02

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
83	820	0.006	0.040	4.917	2.554	0.033	0.000	0.000	0.033	1.89	846.00	1.99
84	830	0.006	0.040	4.957	2.587	0.033	0.000	0.000	0.033	1.89	847.86	1.97
85	840	0.006	0.040	4.997	2.621	0.034	0.000	0.000	0.034	1.89	849.70	1.96
86	850	0.006	0.040	5.038	2.654	0.034	0.000	0.000	0.034	1.90	851.51	1.95
87	860	0.006	0.040	5.078	2.688	0.034	0.000	0.000	0.034	1.90	853.29	1.94
88	870	0.006	0.040	5.118	2.722	0.034	0.000	0.000	0.034	1.91	855.04	1.93
89	880	0.006	0.040	5.158	2.756	0.034	0.000	0.000	0.034	1.91	856.76	1.93
90	890	0.005	0.033	5.191	2.784	0.028	0.000	0.000	0.028	1.59	715.26	1.90
91	900	0.005	0.033	5.225	2.812	0.028	0.000	0.000	0.028	1.60	716.42	1.84
92	910	0.005	0.033	5.258	2.841	0.028	0.000	0.000	0.028	1.60	717.57	1.80
93	920	0.005	0.033	5.292	2.869	0.028	0.000	0.000	0.028	1.60	718.70	1.77
94	930	0.005	0.033	5.325	2.897	0.028	0.000	0.000	0.028	1.60	719.81	1.74
95	940	0.005	0.033	5.359	2.926	0.028	0.000	0.000	0.028	1.61	720.91	1.71
96	950	0.005	0.033	5.392	2.954	0.029	0.000	0.000	0.029	1.61	722.00	1.70
97	960	0.005	0.033	5.426	2.983	0.029	0.000	0.000	0.029	1.61	723.07	1.68
98	970	0.005	0.033	5.459	3.011	0.029	0.000	0.000	0.029	1.61	724.13	1.67
99	980	0.005	0.033	5.492	3.040	0.029	0.000	0.000	0.029	1.62	725.18	1.66
100	990	0.005	0.033	5.526	3.069	0.029	0.000	0.000	0.029	1.62	726.21	1.65
101	1000	0.005	0.033	5.559	3.097	0.029	0.000	0.000	0.029	1.62	727.23	1.65
102	1010	0.004	0.027	5.586	3.120	0.023	0.000	0.000	0.023	1.30	582.51	1.61
103	1020	0.004	0.027	5.613	3.143	0.023	0.000	0.000	0.023	1.30	583.15	1.56
104	1030	0.004	0.027	5.640	3.166	0.023	0.000	0.000	0.023	1.30	583.78	1.51
105	1040	0.004	0.027	5.666	3.190	0.023	0.000	0.000	0.023	1.30	584.41	1.48
106	1050	0.004	0.027	5.693	3.213	0.023	0.000	0.000	0.023	1.30	585.03	1.45
107	1060	0.004	0.027	5.720	3.236	0.023	0.000	0.000	0.023	1.30	585.64	1.42
108	1070	0.004	0.027	5.747	3.259	0.023	0.000	0.000	0.023	1.31	586.25	1.40
109	1080	0.004	0.027	5.773	3.282	0.023	0.000	0.000	0.023	1.31	586.85	1.38
110	1090	0.004	0.027	5.800	3.305	0.023	0.000	0.000	0.023	1.31	587.44	1.37
111	1100	0.004	0.027	5.827	3.328	0.023	0.000	0.000	0.023	1.31	588.03	1.36
112	1110	0.004	0.027	5.854	3.352	0.023	0.000	0.000	0.023	1.31	588.62	1.35
113	1120	0.004	0.027	5.881	3.375	0.023	0.000	0.000	0.023	1.31	589.19	1.34
114	1130	0.004	0.027	5.907	3.398	0.023	0.000	0.000	0.023	1.31	589.77	1.34
115	1140	0.004	0.027	5.934	3.422	0.023	0.000	0.000	0.023	1.32	590.33	1.34
116	1150	0.004	0.027	5.961	3.445	0.023	0.000	0.000	0.023	1.32	590.89	1.33
117	1160	0.004	0.027	5.988	3.468	0.023	0.000	0.000	0.023	1.32	591.45	1.33
118	1170	0.004	0.027	6.014	3.492	0.023	0.000	0.000	0.023	1.32	592.00	1.33
119	1180	0.004	0.027	6.041	3.515	0.023	0.000	0.000	0.023	1.32	592.55	1.33
120	1190	0.004	0.027	6.068	3.538	0.023	0.000	0.000	0.023	1.32	593.09	1.33
121	1200	0.004	0.027	6.095	3.562	0.023	0.000	0.000	0.023	1.32	593.62	1.32
122	1210	0.004	0.027	6.121	3.585	0.023	0.000	0.000	0.023	1.32	594.15	1.32
123	1220	0.004	0.027	6.148	3.609	0.023	0.000	0.000	0.023	1.33	594.68	1.32

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
124	1230	0.004	0.027	6.175	3.632	0.023	0.000	0.000	0.023	1.33	595.20	1.32
125	1240	0.004	0.027	6.202	3.656	0.024	0.000	0.000	0.024	1.33	595.71	1.32
126	1250	0.004	0.027	6.228	3.679	0.024	0.000	0.000	0.024	1.33	596.22	1.33
127	1260	0.004	0.027	6.255	3.703	0.024	0.000	0.000	0.024	1.33	596.73	1.33
128	1270	0.004	0.027	6.282	3.726	0.024	0.000	0.000	0.024	1.33	597.23	1.33
129	1280	0.004	0.027	6.309	3.750	0.024	0.000	0.000	0.024	1.33	597.73	1.33
130	1290	0.004	0.027	6.335	3.774	0.024	0.000	0.000	0.024	1.33	598.22	1.33
131	1300	0.004	0.027	6.362	3.797	0.024	0.000	0.000	0.024	1.33	598.71	1.33
132	1310	0.004	0.027	6.389	3.821	0.024	0.000	0.000	0.024	1.34	599.19	1.33
133	1320	0.004	0.027	6.416	3.845	0.024	0.000	0.000	0.024	1.34	599.67	1.33
134	1330	0.004	0.027	6.442	3.868	0.024	0.000	0.000	0.024	1.34	600.14	1.33
135	1340	0.004	0.027	6.469	3.892	0.024	0.000	0.000	0.024	1.34	600.61	1.33
136	1350	0.004	0.027	6.496	3.916	0.024	0.000	0.000	0.024	1.34	601.08	1.33
137	1360	0.004	0.027	6.523	3.939	0.024	0.000	0.000	0.024	1.34	601.54	1.34
138	1370	0.004	0.027	6.550	3.963	0.024	0.000	0.000	0.024	1.34	602.00	1.34
139	1380	0.004	0.027	6.576	3.987	0.024	0.000	0.000	0.024	1.34	602.45	1.34
140	1390	0.004	0.027	6.603	4.011	0.024	0.000	0.000	0.024	1.34	602.90	1.34
141	1400	0.004	0.027	6.630	4.035	0.024	0.000	0.000	0.024	1.34	603.34	1.34
142	1410	0.004	0.027	6.657	4.058	0.024	0.000	0.000	0.024	1.35	603.78	1.34
143	1420	0.004	0.027	6.683	4.082	0.024	0.000	0.000	0.024	1.35	604.22	1.34
144	1430	0.004	0.027	6.710	4.106	0.024	0.000	0.000	0.024	1.35	604.65	1.34
145	1440	0.004	0.027	6.737	4.130	0.024	0.000	0.000	0.024	1.35	605.08	1.34

Peak Flow	**13.22**	**5931.69**	**5.38**

Santa Barbara Urban Hydrograph Method

Quantity Calculations (50 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.030	0.030	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.030	0.059	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
4	30	0.004	0.030	0.089	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
5	40	0.004	0.030	0.119	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
6	50	0.004	0.030	0.149	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
7	60	0.004	0.030	0.178	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
8	70	0.004	0.030	0.208	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
9	80	0.004	0.030	0.238	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
10	90	0.005	0.037	0.275	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
11	100	0.005	0.037	0.312	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
12	110	0.005	0.037	0.349	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
13	120	0.005	0.037	0.386	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
14	130	0.005	0.037	0.424	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
15	140	0.005	0.037	0.461	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
16	150	0.005	0.037	0.498	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
17	160	0.006	0.045	0.542	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
18	170	0.006	0.045	0.587	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
19	180	0.006	0.045	0.632	0.000	0.000	0.000	0.000	0.000	0.02	9.78	0.00
20	190	0.006	0.045	0.676	0.002	0.002	0.000	0.000	0.002	0.09	41.44	0.01
21	200	0.006	0.045	0.721	0.005	0.003	0.000	0.000	0.003	0.16	72.62	0.03
22	210	0.006	0.045	0.765	0.009	0.004	0.000	0.000	0.004	0.23	102.49	0.06
23	220	0.007	0.052	0.817	0.015	0.006	0.000	0.000	0.006	0.35	155.65	0.10
24	230	0.007	0.052	0.869	0.023	0.008	0.000	0.000	0.008	0.43	192.74	0.15
25	240	0.007	0.052	0.921	0.032	0.009	0.000	0.000	0.009	0.51	228.08	0.21
26	250	0.007	0.052	0.973	0.042	0.010	0.000	0.000	0.010	0.58	261.78	0.27
27	260	0.007	0.052	1.025	0.054	0.012	0.000	0.000	0.012	0.65	293.94	0.33
28	270	0.007	0.052	1.077	0.066	0.013	0.000	0.000	0.013	0.72	324.65	0.39
29	280	0.007	0.052	1.129	0.080	0.014	0.000	0.000	0.014	0.79	354.00	0.45
30	290	0.008	0.059	1.189	0.098	0.017	0.000	0.000	0.017	0.98	438.87	0.53
31	300	0.008	0.059	1.248	0.116	0.019	0.000	0.000	0.019	1.06	473.74	0.61
32	310	0.008	0.059	1.308	0.136	0.020	0.000	0.000	0.020	1.13	506.92	0.70
33	320	0.008	0.059	1.367	0.158	0.021	0.000	0.000	0.021	1.20	538.53	0.78
34	330	0.008	0.059	1.427	0.180	0.022	0.000	0.000	0.022	1.27	568.66	0.86
35	340	0.008	0.059	1.486	0.204	0.024	0.000	0.000	0.024	1.33	597.41	0.94
36	350	0.01	0.074	1.560	0.235	0.031	0.000	0.000	0.031	1.75	785.21	1.04
37	360	0.01	0.074	1.635	0.267	0.033	0.000	0.000	0.033	1.84	825.72	1.17
38	370	0.01	0.074	1.709	0.301	0.034	0.000	0.000	0.034	1.93	864.03	1.30
39	380	0.01	0.074	1.783	0.337	0.036	0.000	0.000	0.036	2.01	900.29	1.41
40	390	0.01	0.074	1.858	0.374	0.037	0.000	0.000	0.037	2.08	934.64	1.52
41	400	0.01	0.074	1.932	0.412	0.038	0.000	0.000	0.038	2.16	967.23	1.63
42	410	0.013	0.097	2.028	0.463	0.051	0.000	0.000	0.051	2.90	1303.41	1.79
43	420	0.013	0.097	2.125	0.517	0.053	0.000	0.000	0.053	3.01	1352.34	1.99

Santa Barbara Urban Hydrograph Method

Quantity Calculations (50 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
44	430	0.013	0.097	2.222	0.572	0.055	0.000	0.000	0.055	3.12	1398.20	2.18
45	440	0.018	0.134	2.355	0.651	0.079	0.000	0.000	0.079	4.47	2006.45	2.46
46	450	0.018	0.134	2.489	0.733	0.082	0.000	0.000	0.082	4.64	2082.20	2.83
47	460	0.034	0.253	2.742	0.896	0.163	0.000	0.000	0.163	9.18	4118.77	3.54
48	470	0.054	0.401	3.143	1.171	0.275	0.000	0.000	0.275	15.53	6969.71	5.08
49	480	0.027	0.201	3.344	1.315	0.144	0.000	0.000	0.144	8.14	3652.52	6.26
50	490	0.018	0.134	3.477	1.414	0.098	0.000	0.000	0.098	5.55	2489.33	6.36
51	500	0.013	0.097	3.574	1.486	0.072	0.000	0.000	0.072	4.06	1822.92	6.09
52	510	0.013	0.097	3.670	1.558	0.073	0.000	0.000	0.073	4.11	1842.81	5.74
53	520	0.013	0.097	3.767	1.632	0.073	0.000	0.000	0.073	4.15	1861.77	5.46
54	530	0.009	0.067	3.834	1.683	0.051	0.000	0.000	0.051	2.90	1299.56	5.12
55	540	0.009	0.067	3.901	1.735	0.052	0.000	0.000	0.052	2.91	1307.94	4.73
56	550	0.009	0.067	3.968	1.787	0.052	0.000	0.000	0.052	2.93	1316.07	4.42
57	560	0.009	0.067	4.034	1.839	0.052	0.000	0.000	0.052	2.95	1323.93	4.16
58	570	0.009	0.067	4.101	1.892	0.053	0.000	0.000	0.053	2.97	1331.56	3.95
59	580	0.009	0.067	4.168	1.944	0.053	0.000	0.000	0.053	2.98	1338.95	3.78
60	590	0.009	0.067	4.235	1.997	0.053	0.000	0.000	0.053	3.00	1346.12	3.64
61	600	0.009	0.067	4.302	2.051	0.053	0.000	0.000	0.053	3.01	1353.07	3.53
62	610	0.009	0.067	4.369	2.105	0.054	0.000	0.000	0.054	3.03	1359.82	3.44
63	620	0.009	0.067	4.436	2.159	0.054	0.000	0.000	0.054	3.04	1366.37	3.37
64	630	0.009	0.067	4.503	2.213	0.054	0.000	0.000	0.054	3.06	1372.73	3.31
65	640	0.009	0.067	4.569	2.267	0.054	0.000	0.000	0.054	3.07	1378.90	3.27
66	650	0.007	0.052	4.621	2.310	0.042	0.000	0.000	0.042	2.40	1076.64	3.18
67	660	0.007	0.052	4.673	2.352	0.043	0.000	0.000	0.043	2.41	1080.18	3.04
68	670	0.007	0.052	4.725	2.395	0.043	0.000	0.000	0.043	2.41	1083.65	2.93
69	680	0.007	0.052	4.777	2.438	0.043	0.000	0.000	0.043	2.42	1087.05	2.84
70	690	0.007	0.052	4.830	2.481	0.043	0.000	0.000	0.043	2.43	1090.37	2.77
71	700	0.007	0.052	4.882	2.524	0.043	0.000	0.000	0.043	2.44	1093.62	2.71
72	710	0.007	0.052	4.934	2.567	0.043	0.000	0.000	0.043	2.44	1096.80	2.66
73	720	0.007	0.052	4.986	2.611	0.043	0.000	0.000	0.043	2.45	1099.92	2.63
74	730	0.007	0.052	5.038	2.654	0.044	0.000	0.000	0.044	2.46	1102.96	2.60
75	740	0.007	0.052	5.090	2.698	0.044	0.000	0.000	0.044	2.46	1105.95	2.57
76	750	0.007	0.052	5.142	2.742	0.044	0.000	0.000	0.044	2.47	1108.87	2.55
77	760	0.007	0.052	5.194	2.786	0.044	0.000	0.000	0.044	2.48	1111.74	2.54
78	770	0.006	0.045	5.238	2.823	0.038	0.000	0.000	0.038	2.13	955.15	2.50
79	780	0.006	0.045	5.283	2.861	0.038	0.000	0.000	0.038	2.13	957.17	2.43
80	790	0.006	0.045	5.327	2.899	0.038	0.000	0.000	0.038	2.14	959.16	2.38
81	800	0.006	0.045	5.372	2.937	0.038	0.000	0.000	0.038	2.14	961.12	2.34
82	810	0.006	0.045	5.416	2.975	0.038	0.000	0.000	0.038	2.15	963.04	2.31
83	820	0.006	0.045	5.461	3.013	0.038	0.000	0.000	0.038	2.15	964.93	2.28
84	830	0.006	0.045	5.506	3.051	0.038	0.000	0.000	0.038	2.15	966.79	2.26
85	840	0.006	0.045	5.550	3.090	0.038	0.000	0.000	0.038	2.16	968.61	2.24
86	850	0.006	0.045	5.595	3.128	0.038	0.000	0.000	0.038	2.16	970.41	2.22

Santa Barbara Urban Hydrograph Method

Quantity Calculations (50 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
87	860	0.006	0.045	5.639	3.166	0.038	0.000	0.000	0.038	2.17	972.17	2.21
88	870	0.006	0.045	5.684	3.205	0.038	0.000	0.000	0.038	2.17	973.91	2.21
89	880	0.006	0.045	5.729	3.243	0.039	0.000	0.000	0.039	2.17	975.62	2.20
90	890	0.005	0.037	5.766	3.275	0.032	0.000	0.000	0.032	1.81	814.30	2.16
91	900	0.005	0.037	5.803	3.307	0.032	0.000	0.000	0.032	1.82	815.45	2.10
92	910	0.005	0.037	5.840	3.340	0.032	0.000	0.000	0.032	1.82	816.58	2.05
93	920	0.005	0.037	5.877	3.372	0.032	0.000	0.000	0.032	1.82	817.70	2.01
94	930	0.005	0.037	5.914	3.404	0.032	0.000	0.000	0.032	1.82	818.81	1.98
95	940	0.005	0.037	5.951	3.437	0.032	0.000	0.000	0.032	1.83	819.89	1.95
96	950	0.005	0.037	5.989	3.469	0.032	0.000	0.000	0.032	1.83	820.97	1.93
97	960	0.005	0.037	6.026	3.502	0.032	0.000	0.000	0.032	1.83	822.03	1.91
98	970	0.005	0.037	6.063	3.534	0.032	0.000	0.000	0.032	1.83	823.08	1.90
99	980	0.005	0.037	6.100	3.567	0.033	0.000	0.000	0.033	1.84	824.11	1.89
100	990	0.005	0.037	6.137	3.599	0.033	0.000	0.000	0.033	1.84	825.13	1.88
101	1000	0.005	0.037	6.174	3.632	0.033	0.000	0.000	0.033	1.84	826.14	1.87
102	1010	0.004	0.030	6.204	3.658	0.026	0.000	0.000	0.026	1.47	661.63	1.83
103	1020	0.004	0.030	6.234	3.684	0.026	0.000	0.000	0.026	1.48	662.25	1.77
104	1030	0.004	0.030	6.263	3.710	0.026	0.000	0.000	0.026	1.48	662.88	1.72
105	1040	0.004	0.030	6.293	3.736	0.026	0.000	0.000	0.026	1.48	663.49	1.68
106	1050	0.004	0.030	6.323	3.763	0.026	0.000	0.000	0.026	1.48	664.10	1.64
107	1060	0.004	0.030	6.353	3.789	0.026	0.000	0.000	0.026	1.48	664.71	1.61
108	1070	0.004	0.030	6.382	3.815	0.026	0.000	0.000	0.026	1.48	665.30	1.59
109	1080	0.004	0.030	6.412	3.841	0.026	0.000	0.000	0.026	1.48	665.90	1.57
110	1090	0.004	0.030	6.442	3.868	0.026	0.000	0.000	0.026	1.49	666.48	1.56
111	1100	0.004	0.030	6.472	3.894	0.026	0.000	0.000	0.026	1.49	667.06	1.54
112	1110	0.004	0.030	6.501	3.920	0.026	0.000	0.000	0.026	1.49	667.64	1.53
113	1120	0.004	0.030	6.531	3.947	0.026	0.000	0.000	0.026	1.49	668.20	1.53
114	1130	0.004	0.030	6.561	3.973	0.026	0.000	0.000	0.026	1.49	668.77	1.52
115	1140	0.004	0.030	6.590	4.000	0.026	0.000	0.000	0.026	1.49	669.32	1.51
116	1150	0.004	0.030	6.620	4.026	0.026	0.000	0.000	0.026	1.49	669.87	1.51
117	1160	0.004	0.030	6.650	4.052	0.026	0.000	0.000	0.026	1.49	670.42	1.51
118	1170	0.004	0.030	6.680	4.079	0.026	0.000	0.000	0.026	1.50	670.96	1.51
119	1180	0.004	0.030	6.709	4.105	0.027	0.000	0.000	0.027	1.50	671.50	1.50
120	1190	0.004	0.030	6.739	4.132	0.027	0.000	0.000	0.027	1.50	672.03	1.50
121	1200	0.004	0.030	6.769	4.159	0.027	0.000	0.000	0.027	1.50	672.55	1.50
122	1210	0.004	0.030	6.798	4.185	0.027	0.000	0.000	0.027	1.50	673.07	1.50
123	1220	0.004	0.030	6.828	4.212	0.027	0.000	0.000	0.027	1.50	673.59	1.50
124	1230	0.004	0.030	6.858	4.238	0.027	0.000	0.000	0.027	1.50	674.10	1.50
125	1240	0.004	0.030	6.888	4.265	0.027	0.000	0.000	0.027	1.50	674.60	1.50
126	1250	0.004	0.030	6.917	4.292	0.027	0.000	0.000	0.027	1.50	675.10	1.50
127	1260	0.004	0.030	6.947	4.318	0.027	0.000	0.000	0.027	1.51	675.60	1.50
128	1270	0.004	0.030	6.977	4.345	0.027	0.000	0.000	0.027	1.51	676.09	1.50
129	1280	0.004	0.030	7.006	4.372	0.027	0.000	0.000	0.027	1.51	676.57	1.50

Santa Barbara Urban Hydrograph Method

Quantity Calculations (50 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
130	1290	0.004	0.030	7.036	4.398	0.027	0.000	0.000	0.027	1.51	677.05	1.50
131	1300	0.004	0.030	7.066	4.425	0.027	0.000	0.000	0.027	1.51	677.53	1.51
132	1310	0.004	0.030	7.096	4.452	0.027	0.000	0.000	0.027	1.51	678.00	1.51
133	1320	0.004	0.030	7.125	4.479	0.027	0.000	0.000	0.027	1.51	678.47	1.51
134	1330	0.004	0.030	7.155	4.505	0.027	0.000	0.000	0.027	1.51	678.93	1.51
135	1340	0.004	0.030	7.185	4.532	0.027	0.000	0.000	0.027	1.51	679.39	1.51
136	1350	0.004	0.030	7.215	4.559	0.027	0.000	0.000	0.027	1.51	679.85	1.51
137	1360	0.004	0.030	7.244	4.586	0.027	0.000	0.000	0.027	1.52	680.30	1.51
138	1370	0.004	0.030	7.274	4.613	0.027	0.000	0.000	0.027	1.52	680.75	1.51
139	1380	0.004	0.030	7.304	4.640	0.027	0.000	0.000	0.027	1.52	681.19	1.51
140	1390	0.004	0.030	7.333	4.667	0.027	0.000	0.000	0.027	1.52	681.63	1.51
141	1400	0.004	0.030	7.363	4.694	0.027	0.000	0.000	0.027	1.52	682.06	1.51
142	1410	0.004	0.030	7.393	4.721	0.027	0.000	0.000	0.027	1.52	682.49	1.52
143	1420	0.004	0.030	7.423	4.747	0.027	0.000	0.000	0.027	1.52	682.92	1.52
144	1430	0.004	0.030	7.452	4.774	0.027	0.000	0.000	0.027	1.52	683.34	1.52
145	1440	0.004	0.030	7.482	4.801	0.027	0.000	0.000	0.027	1.52	683.76	1.52

Peak Flow	**15.53**	**6969.71**	**6.36**

Santa Barbara Urban Hydrograph Method

Quantity Calculations (100 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.033	0.033	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.033	0.065	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
4	30	0.004	0.033	0.098	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
5	40	0.004	0.033	0.130	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
6	50	0.004	0.033	0.163	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
7	60	0.004	0.033	0.195	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
8	70	0.004	0.033	0.228	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
9	80	0.004	0.033	0.260	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
10	90	0.005	0.041	0.301	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
11	100	0.005	0.041	0.342	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
12	110	0.005	0.041	0.383	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
13	120	0.005	0.041	0.423	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
14	130	0.005	0.041	0.464	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
15	140	0.005	0.041	0.505	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
16	150	0.005	0.041	0.545	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
17	160	0.006	0.049	0.594	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
18	170	0.006	0.049	0.643	0.001	0.001	0.000	0.000	0.001	0.04	17.41	0.00
19	180	0.006	0.049	0.692	0.003	0.002	0.000	0.000	0.002	0.12	56.00	0.02
20	190	0.006	0.049	0.741	0.007	0.004	0.000	0.000	0.004	0.21	92.86	0.04
21	200	0.006	0.049	0.790	0.012	0.005	0.000	0.000	0.005	0.29	128.02	0.08
22	210	0.006	0.049	0.838	0.018	0.006	0.000	0.000	0.006	0.36	161.59	0.12
23	220	0.007	0.057	0.895	0.027	0.009	0.000	0.000	0.009	0.51	228.94	0.18
24	230	0.007	0.057	0.952	0.038	0.011	0.000	0.000	0.011	0.60	270.36	0.24
25	240	0.007	0.057	1.009	0.050	0.012	0.000	0.000	0.012	0.69	309.69	0.31
26	250	0.007	0.057	1.066	0.064	0.014	0.000	0.000	0.014	0.77	347.08	0.39
27	260	0.007	0.057	1.123	0.079	0.015	0.000	0.000	0.015	0.85	382.65	0.46
28	270	0.007	0.057	1.180	0.095	0.016	0.000	0.000	0.016	0.93	416.51	0.54
29	280	0.007	0.057	1.237	0.113	0.018	0.000	0.000	0.018	1.00	448.78	0.61
30	290	0.008	0.065	1.302	0.135	0.022	0.000	0.000	0.022	1.23	550.49	0.70
31	300	0.008	0.065	1.368	0.158	0.023	0.000	0.000	0.023	1.31	588.59	0.80
32	310	0.008	0.065	1.433	0.183	0.025	0.000	0.000	0.025	1.39	624.75	0.90
33	320	0.008	0.065	1.498	0.209	0.026	0.000	0.000	0.026	1.47	659.09	0.99
34	330	0.008	0.065	1.563	0.236	0.027	0.000	0.000	0.027	1.54	691.73	1.08
35	340	0.008	0.065	1.628	0.264	0.029	0.000	0.000	0.029	1.61	722.78	1.17
36	350	0.01	0.081	1.709	0.302	0.037	0.000	0.000	0.037	2.11	944.89	1.29
37	360	0.01	0.081	1.791	0.341	0.039	0.000	0.000	0.039	2.20	988.40	1.44
38	370	0.01	0.081	1.872	0.381	0.041	0.000	0.000	0.041	2.29	1029.42	1.58
39	380	0.01	0.081	1.954	0.423	0.042	0.000	0.000	0.042	2.38	1068.13	1.71
40	390	0.01	0.081	2.035	0.467	0.044	0.000	0.000	0.044	2.46	1104.70	1.84
41	400	0.01	0.081	2.116	0.512	0.045	0.000	0.000	0.045	2.54	1139.29	1.95
42	410	0.013	0.106	2.222	0.572	0.060	0.000	0.000	0.060	3.41	1529.78	2.13
43	420	0.013	0.106	2.328	0.635	0.062	0.000	0.000	0.062	3.52	1581.42	2.36
44	430	0.013	0.106	2.434	0.699	0.064	0.000	0.000	0.064	3.63	1629.65	2.58
45	440	0.018	0.147	2.580	0.791	0.092	0.000	0.000	0.092	5.19	2330.33	2.90

Santa Barbara Urban Hydrograph Method

Quantity Calculations (100 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
46	450	0.018	0.147	2.727	0.886	0.095	0.000	0.000	0.095	5.37	2409.46	3.31
47	460	0.034	0.277	3.004	1.074	0.187	0.000	0.000	0.187	10.57	4744.27	4.13
48	470	0.054	0.440	3.443	1.388	0.315	0.000	0.000	0.315	17.77	7977.18	5.88
49	480	0.027	0.220	3.663	1.553	0.164	0.000	0.000	0.164	9.27	4160.61	7.22
50	490	0.018	0.147	3.810	1.664	0.112	0.000	0.000	0.112	6.30	2829.17	7.32
51	500	0.013	0.106	3.915	1.746	0.082	0.000	0.000	0.082	4.61	2068.80	6.99
52	510	0.013	0.106	4.021	1.829	0.082	0.000	0.000	0.082	4.65	2089.01	6.58
53	520	0.013	0.106	4.127	1.912	0.083	0.000	0.000	0.083	4.70	2108.22	6.25
54	530	0.009	0.073	4.200	1.970	0.058	0.000	0.000	0.058	3.28	1470.31	5.85
55	540	0.009	0.073	4.274	2.028	0.058	0.000	0.000	0.058	3.29	1478.79	5.40
56	550	0.009	0.073	4.347	2.087	0.059	0.000	0.000	0.059	3.31	1486.99	5.04
57	560	0.009	0.073	4.420	2.146	0.059	0.000	0.000	0.059	3.33	1494.93	4.74
58	570	0.009	0.073	4.493	2.205	0.059	0.000	0.000	0.059	3.35	1502.62	4.49
59	580	0.009	0.073	4.567	2.265	0.060	0.000	0.000	0.060	3.36	1510.06	4.29
60	590	0.009	0.073	4.640	2.325	0.060	0.000	0.000	0.060	3.38	1517.27	4.13
61	600	0.009	0.073	4.713	2.385	0.060	0.000	0.000	0.060	3.40	1524.25	4.00
62	610	0.009	0.073	4.786	2.445	0.060	0.000	0.000	0.060	3.41	1531.02	3.90
63	620	0.009	0.073	4.860	2.506	0.061	0.000	0.000	0.061	3.43	1537.59	3.81
64	630	0.009	0.073	4.933	2.567	0.061	0.000	0.000	0.061	3.44	1543.96	3.75
65	640	0.009	0.073	5.006	2.628	0.061	0.000	0.000	0.061	3.45	1550.14	3.69
66	650	0.007	0.057	5.063	2.676	0.048	0.000	0.000	0.048	2.70	1209.82	3.59
67	660	0.007	0.057	5.120	2.724	0.048	0.000	0.000	0.048	2.70	1213.37	3.43
68	670	0.007	0.057	5.177	2.772	0.048	0.000	0.000	0.048	2.71	1216.83	3.30
69	680	0.007	0.057	5.234	2.820	0.048	0.000	0.000	0.048	2.72	1220.22	3.20
70	690	0.007	0.057	5.291	2.868	0.048	0.000	0.000	0.048	2.73	1223.53	3.12
71	700	0.007	0.057	5.348	2.917	0.048	0.000	0.000	0.048	2.73	1226.77	3.05
72	710	0.007	0.057	5.405	2.965	0.049	0.000	0.000	0.049	2.74	1229.94	3.00
73	720	0.007	0.057	5.462	3.014	0.049	0.000	0.000	0.049	2.75	1233.04	2.95
74	730	0.007	0.057	5.519	3.063	0.049	0.000	0.000	0.049	2.75	1236.07	2.92
75	740	0.007	0.057	5.576	3.112	0.049	0.000	0.000	0.049	2.76	1239.04	2.89
76	750	0.007	0.057	5.633	3.161	0.049	0.000	0.000	0.049	2.77	1241.94	2.87
77	760	0.007	0.057	5.690	3.210	0.049	0.000	0.000	0.049	2.77	1244.79	2.85
78	770	0.006	0.049	5.739	3.252	0.042	0.000	0.000	0.042	2.38	1069.18	2.80
79	780	0.006	0.049	5.788	3.294	0.042	0.000	0.000	0.042	2.39	1071.19	2.73
80	790	0.006	0.049	5.836	3.337	0.042	0.000	0.000	0.042	2.39	1073.16	2.67
81	800	0.006	0.049	5.885	3.379	0.042	0.000	0.000	0.042	2.40	1075.09	2.62
82	810	0.006	0.049	5.934	3.422	0.043	0.000	0.000	0.043	2.40	1077.00	2.58
83	820	0.006	0.049	5.983	3.464	0.043	0.000	0.000	0.043	2.40	1078.87	2.55
84	830	0.006	0.049	6.032	3.507	0.043	0.000	0.000	0.043	2.41	1080.71	2.53
85	840	0.006	0.049	6.081	3.550	0.043	0.000	0.000	0.043	2.41	1082.51	2.51
86	850	0.006	0.049	6.129	3.592	0.043	0.000	0.000	0.043	2.42	1084.29	2.49
87	860	0.006	0.049	6.178	3.635	0.043	0.000	0.000	0.043	2.42	1086.03	2.48
88	870	0.006	0.049	6.227	3.678	0.043	0.000	0.000	0.043	2.42	1087.74	2.47
89	880	0.006	0.049	6.276	3.721	0.043	0.000	0.000	0.043	2.43	1089.43	2.46
90	890	0.005	0.041	6.317	3.757	0.036	0.000	0.000	0.036	2.03	909.13	2.42

Santa Barbara Urban Hydrograph Method
Quantity Calculations (100 yr / 24-hour Storm)
Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
91	900	0.005	0.041	6.357	3.793	0.036	0.000	0.000	0.036	2.03	910.26	2.35
92	910	0.005	0.041	6.398	3.829	0.036	0.000	0.000	0.036	2.03	911.38	2.29
93	920	0.005	0.041	6.439	3.865	0.036	0.000	0.000	0.036	2.03	912.48	2.25
94	930	0.005	0.041	6.479	3.901	0.036	0.000	0.000	0.036	2.04	913.57	2.21
95	940	0.005	0.041	6.520	3.937	0.036	0.000	0.000	0.036	2.04	914.64	2.18
96	950	0.005	0.041	6.561	3.973	0.036	0.000	0.000	0.036	2.04	915.70	2.16
97	960	0.005	0.041	6.602	4.009	0.036	0.000	0.000	0.036	2.04	916.75	2.14
98	970	0.005	0.041	6.642	4.046	0.036	0.000	0.000	0.036	2.04	917.78	2.12
99	980	0.005	0.041	6.683	4.082	0.036	0.000	0.000	0.036	2.05	918.79	2.11
100	990	0.005	0.041	6.724	4.118	0.036	0.000	0.000	0.036	2.05	919.80	2.10
101	1000	0.005	0.041	6.764	4.155	0.036	0.000	0.000	0.036	2.05	920.79	2.09
102	1010	0.004	0.033	6.797	4.184	0.029	0.000	0.000	0.029	1.64	737.33	2.05
103	1020	0.004	0.033	6.829	4.213	0.029	0.000	0.000	0.029	1.64	737.95	1.98
104	1030	0.004	0.033	6.862	4.242	0.029	0.000	0.000	0.029	1.65	738.56	1.92
105	1040	0.004	0.033	6.895	4.271	0.029	0.000	0.000	0.029	1.65	739.17	1.87
106	1050	0.004	0.033	6.927	4.300	0.029	0.000	0.000	0.029	1.65	739.77	1.83
107	1060	0.004	0.033	6.960	4.330	0.029	0.000	0.000	0.029	1.65	740.36	1.80
108	1070	0.004	0.033	6.992	4.359	0.029	0.000	0.000	0.029	1.65	740.95	1.77
109	1080	0.004	0.033	7.025	4.388	0.029	0.000	0.000	0.029	1.65	741.53	1.75
110	1090	0.004	0.033	7.057	4.417	0.029	0.000	0.000	0.029	1.65	742.10	1.73
111	1100	0.004	0.033	7.090	4.447	0.029	0.000	0.000	0.029	1.65	742.67	1.72
112	1110	0.004	0.033	7.123	4.476	0.029	0.000	0.000	0.029	1.66	743.23	1.71
113	1120	0.004	0.033	7.155	4.505	0.029	0.000	0.000	0.029	1.66	743.79	1.70
114	1130	0.004	0.033	7.188	4.535	0.029	0.000	0.000	0.029	1.66	744.34	1.69
115	1140	0.004	0.033	7.220	4.564	0.029	0.000	0.000	0.029	1.66	744.88	1.69
116	1150	0.004	0.033	7.253	4.594	0.029	0.000	0.000	0.029	1.66	745.42	1.68
117	1160	0.004	0.033	7.285	4.623	0.029	0.000	0.000	0.029	1.66	745.96	1.68
118	1170	0.004	0.033	7.318	4.653	0.029	0.000	0.000	0.029	1.66	746.49	1.68
119	1180	0.004	0.033	7.350	4.682	0.029	0.000	0.000	0.029	1.66	747.01	1.67
120	1190	0.004	0.033	7.383	4.712	0.030	0.000	0.000	0.030	1.67	747.53	1.67
121	1200	0.004	0.033	7.416	4.741	0.030	0.000	0.000	0.030	1.67	748.04	1.67
122	1210	0.004	0.033	7.448	4.771	0.030	0.000	0.000	0.030	1.67	748.55	1.67
123	1220	0.004	0.033	7.481	4.800	0.030	0.000	0.000	0.030	1.67	749.06	1.67
124	1230	0.004	0.033	7.513	4.830	0.030	0.000	0.000	0.030	1.67	749.55	1.67
125	1240	0.004	0.033	7.546	4.859	0.030	0.000	0.000	0.030	1.67	750.05	1.67
126	1250	0.004	0.033	7.578	4.889	0.030	0.000	0.000	0.030	1.67	750.54	1.67
127	1260	0.004	0.033	7.611	4.919	0.030	0.000	0.000	0.030	1.67	751.02	1.67
128	1270	0.004	0.033	7.643	4.948	0.030	0.000	0.000	0.030	1.67	751.50	1.67
129	1280	0.004	0.033	7.676	4.978	0.030	0.000	0.000	0.030	1.68	751.97	1.67
130	1290	0.004	0.033	7.709	5.008	0.030	0.000	0.000	0.030	1.68	752.44	1.67
131	1300	0.004	0.033	7.741	5.037	0.030	0.000	0.000	0.030	1.68	752.91	1.67
132	1310	0.004	0.033	7.774	5.067	0.030	0.000	0.000	0.030	1.68	753.37	1.67
133	1320	0.004	0.033	7.806	5.097	0.030	0.000	0.000	0.030	1.68	753.83	1.68
134	1330	0.004	0.033	7.839	5.127	0.030	0.000	0.000	0.030	1.68	754.28	1.68
135	1340	0.004	0.033	7.871	5.156	0.030	0.000	0.000	0.030	1.68	754.73	1.68

Santa Barbara Urban Hydrograph Method

Quantity Calculations (100 yr / 24-hour Storm)

Pre-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
136	1350	0.004	0.033	7.904	5.186	0.030	0.000	0.000	0.030	1.68	755.17	1.68
137	1360	0.004	0.033	7.937	5.216	0.030	0.000	0.000	0.030	1.68	755.61	1.68
138	1370	0.004	0.033	7.969	5.246	0.030	0.000	0.000	0.030	1.68	756.05	1.68
139	1380	0.004	0.033	8.002	5.276	0.030	0.000	0.000	0.030	1.69	756.48	1.68
140	1390	0.004	0.033	8.034	5.306	0.030	0.000	0.000	0.030	1.69	756.90	1.68
141	1400	0.004	0.033	8.067	5.336	0.030	0.000	0.000	0.030	1.69	757.33	1.68
142	1410	0.004	0.033	8.099	5.366	0.030	0.000	0.000	0.030	1.69	757.75	1.68
143	1420	0.004	0.033	8.132	5.395	0.030	0.000	0.000	0.030	1.69	758.16	1.68
144	1430	0.004	0.033	8.164	5.425	0.030	0.000	0.000	0.030	1.69	758.57	1.69
145	1440	0.004	0.033	8.197	5.455	0.030	0.000	0.000	0.030	1.69	758.98	1.69
												179479.906
									Peak Flow	**17.77**	**7977.18**	**7.32**

Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Central Coast Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Purpose:

Determine the stormwater runoff volume required for: Post-Development Conditions (Basin #1)

Assumptions:

1. Runoff volume is computed with the Santa Barbara Urban Hydrograph Method (SBUH)
2. 2-year/ 24-hour design storm event
3. 25-year/ 24-hour design storm event
4. 50-year/ 24-hour design storm event
5. 100-year/ 24-hour design storm event
6. Total Basin Area 7.7 acres
7. Design storm precipitation depths obtained using PF Data Server, lat39.4126 long-123.7548
8. Areas used for subbasins estimated using proposed site development plan
9. Slopes for time of concentration calculation assumed to be 6% based on LACO field study dated 6/7/2012
10. Soil assumed to be of soil group D, with an average antecedent soil moisture condition
11. Ground coverage for pervious area assumed to be woods in good condition
12. Drainage length assumed to originate from the center of the line which splits the parcel from the southwest corner to the northeast corner, and terminates at the drainage basin
13. Manning roughness coefficient assumed to be 0.6, which is the middle range for woods underbrush (0.4 < n < 0.8)
14. Cuve numbers determined using TR-55 Documentation

Methodology:

1. Determine the runoff volume for the design storm event using the SBUH method

References:

1. Urban Hydrology for Small Watersheds, Technical Release 55
   Natural Resource Conservation Service, USDA 1986
2. Handbook of Hydrology (1993), Maidment, D.
   McGraw-Hill Publishing, New York, NY
3. Open Channel Hydraulics
   Chow, V.T. 1959, McGraw-Hill Book Company
4. NOAA Atlas 14, Volume 6, Version 2
   http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_printpage.html

Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Central Coast Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Input Variables:

Basin Number	=	1	**Post-Development Conditions (Basin #1)**	
Total Area	=	7.71	ac	
Precipitation (Quantity)	=	3.75	in	(2-yr. 24-hr event)
Precipitation (Quantity)	=	6.69	in	(25-yr. 24-hr event)
Precipitation (Quantity)	=	7.43	in	(50-yr. 24-hr event)
Precipitation (Quantity)	=	8.14	in	(100-yr. 24-hr event)
Time Step	=	10	min	

Pervious Area:

Area	=	5.82	ac
CN	=	77	
S	=	2.99	(1000/CN)-10
0.2S	=	0.60	

Impervious Area:

Area	=	1.9	ac
CN	=	98	
S	=	0.20	(1000/CN)-10
0.2S	=	0.04	

Time of Concentration:

Drainage Length	=	381	ft
Average Slope	=	0.060	ft/ft
Manning's n	=	0.600	

T_c = 63.2 min (minimum of 5 minutes)

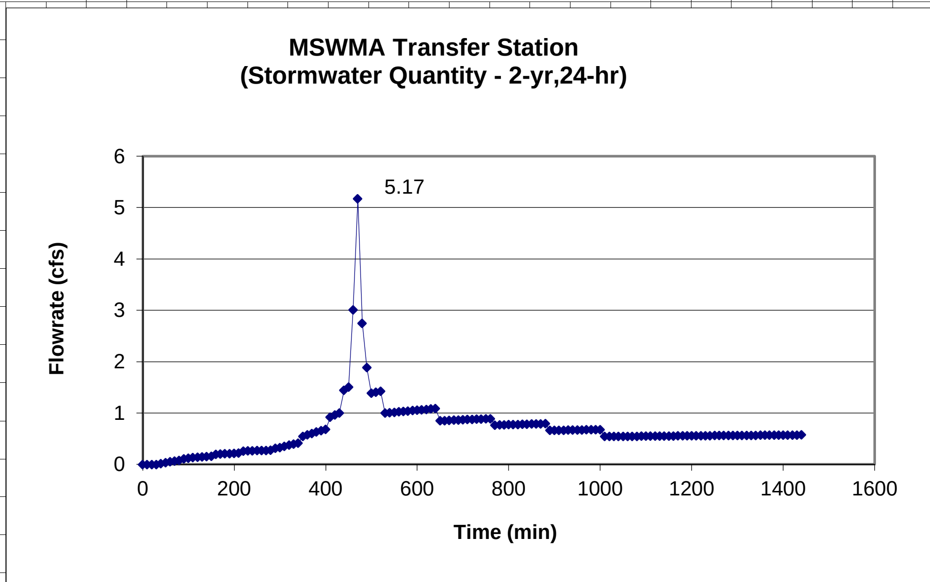
Routing Constant:

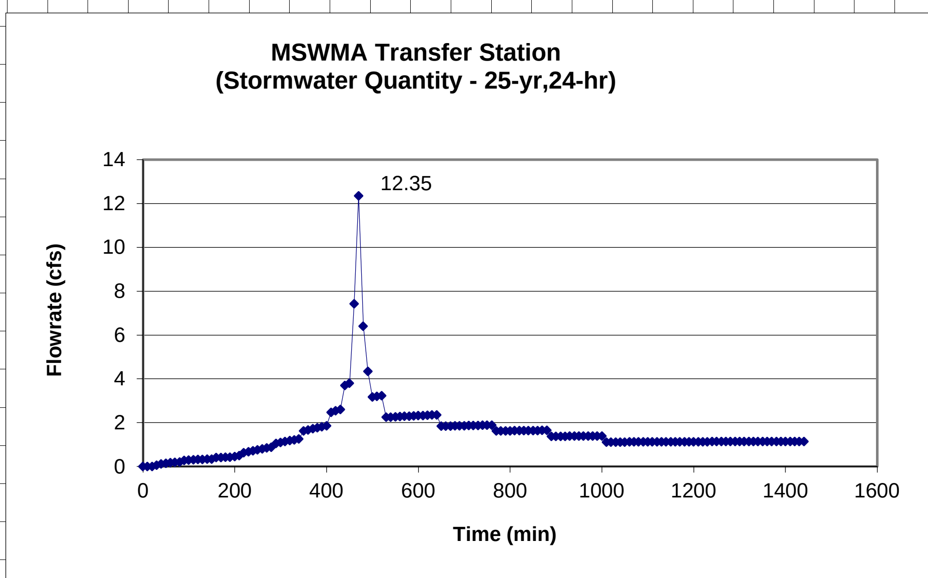
w = 0.073 dt/(2Tc+dt)

Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Central Coast Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Results: **Post-Development Conditions (Basin #1)**

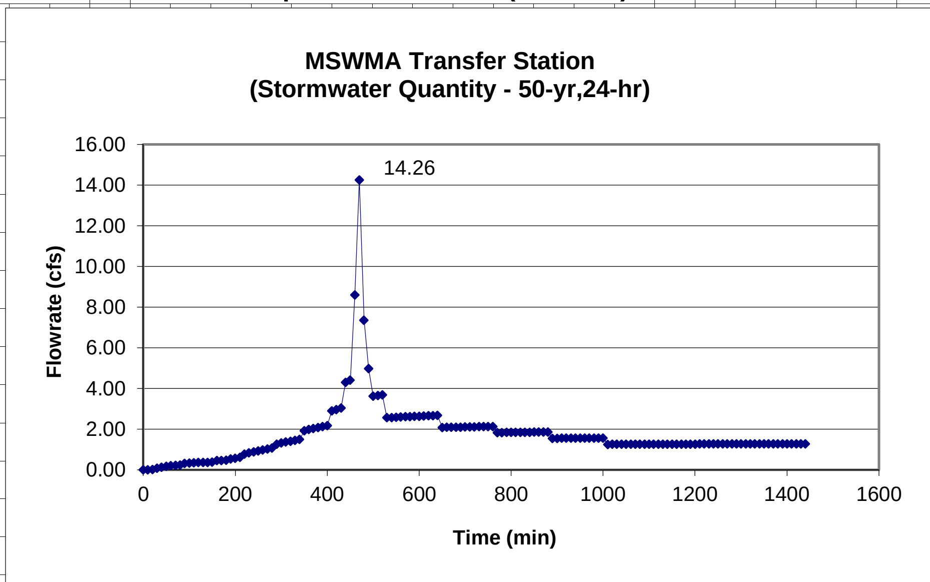


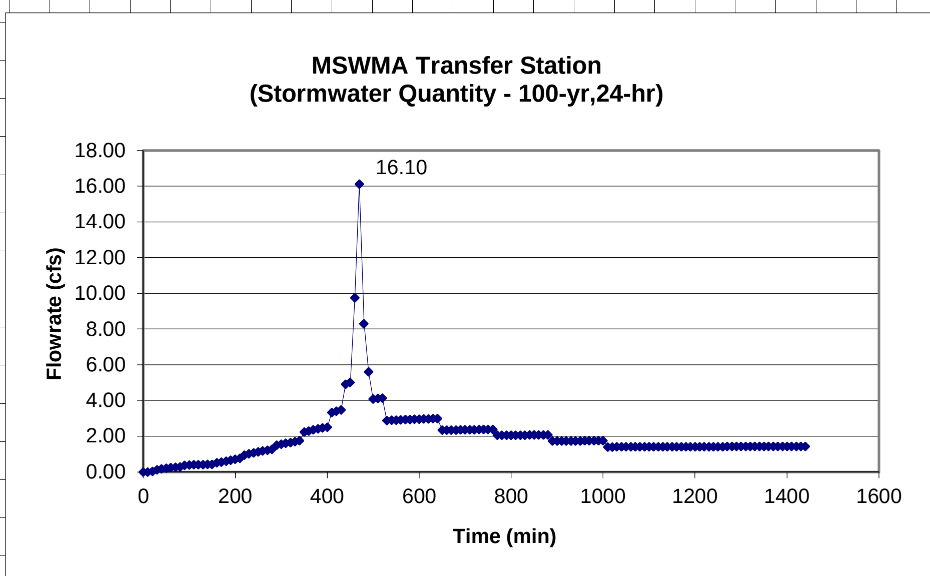


Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Central Coast Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Results: **Post-Development Conditions (Basin #1)**





Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Post-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.015	0.015	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.015	0.030	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
4	30	0.004	0.015	0.045	0.000	0.000	0.000	0.000	0.000	0.00	0.43	0.00
5	40	0.004	0.015	0.060	0.000	0.000	0.002	0.002	0.000	0.02	8.03	0.00
6	50	0.004	0.015	0.075	0.000	0.000	0.005	0.003	0.001	0.04	16.71	0.01
7	60	0.004	0.015	0.090	0.000	0.000	0.010	0.005	0.001	0.05	23.85	0.01
8	70	0.004	0.015	0.105	0.000	0.000	0.015	0.006	0.001	0.07	29.79	0.02
9	80	0.004	0.015	0.120	0.000	0.000	0.022	0.007	0.002	0.08	34.79	0.03
10	90	0.005	0.019	0.139	0.000	0.000	0.032	0.010	0.002	0.11	49.38	0.04
11	100	0.005	0.019	0.158	0.000	0.000	0.042	0.011	0.003	0.12	54.85	0.05
12	110	0.005	0.019	0.176	0.000	0.000	0.054	0.012	0.003	0.13	59.42	0.06
13	120	0.005	0.019	0.195	0.000	0.000	0.066	0.012	0.003	0.14	63.27	0.07
14	130	0.005	0.019	0.214	0.000	0.000	0.079	0.013	0.003	0.15	66.55	0.08
15	140	0.005	0.019	0.233	0.000	0.000	0.093	0.014	0.003	0.15	69.36	0.09
16	150	0.005	0.019	0.251	0.000	0.000	0.107	0.014	0.003	0.16	71.79	0.10
17	160	0.006	0.023	0.274	0.000	0.000	0.124	0.017	0.004	0.20	88.92	0.11
18	170	0.006	0.023	0.296	0.000	0.000	0.142	0.018	0.004	0.20	91.52	0.13
19	180	0.006	0.023	0.319	0.000	0.000	0.160	0.018	0.004	0.21	93.75	0.14
20	190	0.006	0.023	0.341	0.000	0.000	0.179	0.019	0.005	0.21	95.69	0.15
21	200	0.006	0.023	0.364	0.000	0.000	0.198	0.019	0.005	0.22	97.38	0.16
22	210	0.006	0.023	0.386	0.000	0.000	0.217	0.019	0.005	0.22	98.86	0.17
23	220	0.007	0.026	0.413	0.000	0.000	0.240	0.023	0.006	0.26	116.98	0.18
24	230	0.007	0.026	0.439	0.000	0.000	0.263	0.023	0.006	0.26	118.52	0.19
25	240	0.007	0.026	0.465	0.000	0.000	0.286	0.023	0.006	0.27	119.88	0.20
26	250	0.007	0.026	0.491	0.000	0.000	0.310	0.024	0.006	0.27	121.07	0.21
27	260	0.007	0.026	0.518	0.000	0.000	0.334	0.024	0.006	0.27	122.12	0.22
28	270	0.007	0.026	0.544	0.000	0.000	0.358	0.024	0.006	0.27	123.05	0.23
29	280	0.007	0.026	0.570	0.000	0.000	0.382	0.024	0.006	0.28	123.89	0.23
30	290	0.008	0.030	0.600	0.000	0.000	0.410	0.028	0.007	0.32	142.53	0.24
31	300	0.008	0.030	0.630	0.000	0.000	0.438	0.028	0.007	0.33	148.89	0.26
32	310	0.008	0.030	0.660	0.001	0.001	0.466	0.028	0.008	0.35	158.88	0.27
33	320	0.008	0.030	0.690	0.003	0.001	0.494	0.028	0.008	0.38	168.52	0.28
34	330	0.008	0.030	0.720	0.005	0.002	0.522	0.028	0.008	0.40	177.83	0.30
35	340	0.008	0.030	0.750	0.007	0.003	0.551	0.028	0.009	0.42	186.83	0.31
36	350	0.01	0.038	0.788	0.011	0.004	0.586	0.036	0.012	0.55	245.75	0.34
37	360	0.01	0.038	0.825	0.016	0.005	0.622	0.036	0.012	0.58	258.82	0.37
38	370	0.01	0.038	0.863	0.022	0.005	0.658	0.036	0.013	0.60	271.38	0.40
39	380	0.01	0.038	0.900	0.028	0.006	0.694	0.036	0.014	0.63	283.47	0.43
40	390	0.01	0.038	0.938	0.035	0.007	0.730	0.036	0.014	0.66	295.11	0.47
41	400	0.01	0.038	0.975	0.042	0.008	0.767	0.036	0.015	0.68	306.33	0.50

Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Post-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
42	410	0.013	0.049	1.024	0.053	0.011	0.814	0.047	0.020	0.92	414.35	0.54
43	420	0.013	0.049	1.073	0.065	0.012	0.861	0.047	0.021	0.96	431.81	0.60
44	430	0.013	0.049	1.121	0.078	0.013	0.909	0.047	0.021	1.00	448.50	0.66
45	440	0.018	0.068	1.189	0.098	0.020	0.975	0.066	0.031	1.44	647.22	0.74
46	450	0.018	0.068	1.256	0.119	0.021	1.041	0.066	0.032	1.51	676.06	0.85
47	460	0.034	0.128	1.384	0.164	0.045	1.166	0.125	0.064	3.01	1350.01	1.05
48	470	0.054	0.203	1.586	0.246	0.082	1.365	0.199	0.111	5.17	2320.10	1.50
49	480	0.027	0.101	1.688	0.291	0.046	1.465	0.100	0.059	2.75	1232.26	1.86
50	490	0.018	0.068	1.755	0.323	0.032	1.532	0.067	0.040	1.88	845.80	1.93
51	500	0.013	0.049	1.804	0.347	0.024	1.580	0.048	0.030	1.39	622.31	1.88
52	510	0.013	0.049	1.853	0.371	0.024	1.628	0.048	0.030	1.41	631.53	1.81
53	520	0.013	0.049	1.901	0.396	0.025	1.677	0.048	0.031	1.43	640.43	1.75
54	530	0.009	0.034	1.935	0.414	0.018	1.710	0.033	0.021	1.00	448.43	1.67
55	540	0.009	0.034	1.969	0.431	0.018	1.743	0.033	0.022	1.01	452.46	1.58
56	550	0.009	0.034	2.003	0.450	0.018	1.777	0.033	0.022	1.02	456.39	1.49
57	560	0.009	0.034	2.036	0.468	0.018	1.810	0.033	0.022	1.03	460.23	1.42
58	570	0.009	0.034	2.070	0.486	0.018	1.844	0.033	0.022	1.03	463.98	1.37
59	580	0.009	0.034	2.104	0.505	0.019	1.877	0.033	0.022	1.04	467.64	1.32
60	590	0.009	0.034	2.138	0.524	0.019	1.911	0.033	0.023	1.05	471.23	1.28
61	600	0.009	0.034	2.171	0.543	0.019	1.944	0.033	0.023	1.06	474.73	1.25
62	610	0.009	0.034	2.205	0.562	0.019	1.978	0.033	0.023	1.07	478.15	1.22
63	620	0.009	0.034	2.239	0.582	0.020	2.011	0.034	0.023	1.07	481.50	1.20
64	630	0.009	0.034	2.273	0.602	0.020	2.045	0.034	0.023	1.08	484.78	1.18
65	640	0.009	0.034	2.306	0.622	0.020	2.078	0.034	0.023	1.09	487.98	1.16
66	650	0.007	0.026	2.333	0.638	0.016	2.104	0.026	0.018	0.85	381.71	1.14
67	660	0.007	0.026	2.359	0.653	0.016	2.130	0.026	0.018	0.85	383.57	1.09
68	670	0.007	0.026	2.385	0.669	0.016	2.156	0.026	0.018	0.86	385.41	1.06
69	680	0.007	0.026	2.411	0.685	0.016	2.183	0.026	0.018	0.86	387.21	1.03
70	690	0.007	0.026	2.438	0.701	0.016	2.209	0.026	0.019	0.87	388.98	1.01
71	700	0.007	0.026	2.464	0.718	0.016	2.235	0.026	0.019	0.87	390.73	0.99
72	710	0.007	0.026	2.490	0.734	0.016	2.261	0.026	0.019	0.87	392.44	0.97
73	720	0.007	0.026	2.516	0.751	0.016	2.287	0.026	0.019	0.88	394.13	0.96
74	730	0.007	0.026	2.543	0.767	0.017	2.313	0.026	0.019	0.88	395.79	0.94
75	740	0.007	0.026	2.569	0.784	0.017	2.339	0.026	0.019	0.89	397.43	0.94
76	750	0.007	0.026	2.595	0.801	0.017	2.365	0.026	0.019	0.89	399.04	0.93
77	760	0.007	0.026	2.621	0.817	0.017	2.391	0.026	0.019	0.89	400.62	0.92
78	770	0.006	0.023	2.644	0.832	0.015	2.414	0.022	0.016	0.77	344.63	0.91
79	780	0.006	0.023	2.666	0.847	0.015	2.436	0.022	0.017	0.77	345.76	0.89
80	790	0.006	0.023	2.689	0.861	0.015	2.458	0.022	0.017	0.77	346.87	0.87
81	800	0.006	0.023	2.711	0.876	0.015	2.481	0.022	0.017	0.78	347.97	0.86
82	810	0.006	0.023	2.734	0.891	0.015	2.503	0.022	0.017	0.78	349.06	0.85

Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Post-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
83	820	0.006	0.023	2.756	0.906	0.015	2.526	0.022	0.017	0.78	350.13	0.84
84	830	0.006	0.023	2.779	0.921	0.015	2.548	0.022	0.017	0.78	351.18	0.83
85	840	0.006	0.023	2.801	0.936	0.015	2.570	0.022	0.017	0.78	352.23	0.82
86	850	0.006	0.023	2.824	0.951	0.015	2.593	0.022	0.017	0.79	353.26	0.82
87	860	0.006	0.023	2.846	0.966	0.015	2.615	0.022	0.017	0.79	354.27	0.81
88	870	0.006	0.023	2.869	0.981	0.015	2.638	0.022	0.017	0.79	355.27	0.81
89	880	0.006	0.023	2.891	0.996	0.015	2.660	0.022	0.017	0.79	356.26	0.81
90	890	0.005	0.019	2.910	1.009	0.013	2.679	0.019	0.014	0.66	297.63	0.80
91	900	0.005	0.019	2.929	1.022	0.013	2.697	0.019	0.014	0.66	298.30	0.78
92	910	0.005	0.019	2.948	1.035	0.013	2.716	0.019	0.014	0.67	298.97	0.76
93	920	0.005	0.019	2.966	1.048	0.013	2.735	0.019	0.014	0.67	299.63	0.75
94	930	0.005	0.019	2.985	1.061	0.013	2.753	0.019	0.014	0.67	300.28	0.73
95	940	0.005	0.019	3.004	1.074	0.013	2.772	0.019	0.014	0.67	300.92	0.73
96	950	0.005	0.019	3.023	1.087	0.013	2.791	0.019	0.014	0.67	301.56	0.72
97	960	0.005	0.019	3.041	1.100	0.013	2.809	0.019	0.014	0.67	302.19	0.71
98	970	0.005	0.019	3.060	1.113	0.013	2.828	0.019	0.014	0.67	302.81	0.71
99	980	0.005	0.019	3.079	1.126	0.013	2.847	0.019	0.014	0.68	303.43	0.70
100	990	0.005	0.019	3.098	1.139	0.013	2.865	0.019	0.015	0.68	304.04	0.70
101	1000	0.005	0.019	3.116	1.152	0.013	2.884	0.019	0.015	0.68	304.64	0.69
102	1010	0.004	0.015	3.131	1.163	0.011	2.899	0.015	0.012	0.54	244.14	0.68
103	1020	0.004	0.015	3.146	1.174	0.011	2.914	0.015	0.012	0.54	244.52	0.66
104	1030	0.004	0.015	3.161	1.184	0.011	2.929	0.015	0.012	0.55	244.90	0.64
105	1040	0.004	0.015	3.176	1.195	0.011	2.944	0.015	0.012	0.55	245.27	0.63
106	1050	0.004	0.015	3.191	1.206	0.011	2.959	0.015	0.012	0.55	245.64	0.62
107	1060	0.004	0.015	3.206	1.216	0.011	2.974	0.015	0.012	0.55	246.01	0.61
108	1070	0.004	0.015	3.221	1.227	0.011	2.989	0.015	0.012	0.55	246.38	0.60
109	1080	0.004	0.015	3.236	1.238	0.011	3.004	0.015	0.012	0.55	246.74	0.59
110	1090	0.004	0.015	3.251	1.249	0.011	3.019	0.015	0.012	0.55	247.10	0.59
111	1100	0.004	0.015	3.266	1.259	0.011	3.033	0.015	0.012	0.55	247.45	0.58
112	1110	0.004	0.015	3.281	1.270	0.011	3.048	0.015	0.012	0.55	247.81	0.58
113	1120	0.004	0.015	3.296	1.281	0.011	3.063	0.015	0.012	0.55	248.16	0.57
114	1130	0.004	0.015	3.311	1.292	0.011	3.078	0.015	0.012	0.55	248.50	0.57
115	1140	0.004	0.015	3.326	1.303	0.011	3.093	0.015	0.012	0.55	248.85	0.57
116	1150	0.004	0.015	3.341	1.314	0.011	3.108	0.015	0.012	0.56	249.19	0.57
117	1160	0.004	0.015	3.356	1.325	0.011	3.123	0.015	0.012	0.56	249.53	0.56
118	1170	0.004	0.015	3.371	1.336	0.011	3.138	0.015	0.012	0.56	249.87	0.56
119	1180	0.004	0.015	3.386	1.347	0.011	3.153	0.015	0.012	0.56	250.20	0.56
120	1190	0.004	0.015	3.401	1.358	0.011	3.168	0.015	0.012	0.56	250.53	0.56
121	1200	0.004	0.015	3.416	1.369	0.011	3.183	0.015	0.012	0.56	250.86	0.56
122	1210	0.004	0.015	3.431	1.380	0.011	3.198	0.015	0.012	0.56	251.19	0.56
123	1220	0.004	0.015	3.446	1.391	0.011	3.213	0.015	0.012	0.56	251.51	0.56

Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Post-Development Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
124	1230	0.004	0.015	3.461	1.402	0.011	3.228	0.015	0.012	0.56	251.83	0.56
125	1240	0.004	0.015	3.476	1.413	0.011	3.243	0.015	0.012	0.56	252.15	0.56
126	1250	0.004	0.015	3.491	1.424	0.011	3.258	0.015	0.012	0.56	252.47	0.56
127	1260	0.004	0.015	3.506	1.435	0.011	3.273	0.015	0.012	0.56	252.78	0.56
128	1270	0.004	0.015	3.521	1.446	0.011	3.288	0.015	0.012	0.56	253.09	0.56
129	1280	0.004	0.015	3.536	1.457	0.011	3.303	0.015	0.012	0.56	253.40	0.56
130	1290	0.004	0.015	3.551	1.469	0.011	3.318	0.015	0.012	0.57	253.71	0.56
131	1300	0.004	0.015	3.566	1.480	0.011	3.333	0.015	0.012	0.57	254.01	0.56
132	1310	0.004	0.015	3.581	1.491	0.011	3.347	0.015	0.012	0.57	254.32	0.56
133	1320	0.004	0.015	3.596	1.502	0.011	3.362	0.015	0.012	0.57	254.62	0.56
134	1330	0.004	0.015	3.611	1.514	0.011	3.377	0.015	0.012	0.57	254.91	0.56
135	1340	0.004	0.015	3.626	1.525	0.011	3.392	0.015	0.012	0.57	255.21	0.57
136	1350	0.004	0.015	3.641	1.536	0.011	3.407	0.015	0.012	0.57	255.50	0.57
137	1360	0.004	0.015	3.656	1.548	0.011	3.422	0.015	0.012	0.57	255.79	0.57
138	1370	0.004	0.015	3.671	1.559	0.011	3.437	0.015	0.012	0.57	256.08	0.57
139	1380	0.004	0.015	3.686	1.570	0.011	3.452	0.015	0.012	0.57	256.37	0.57
140	1390	0.004	0.015	3.701	1.582	0.011	3.467	0.015	0.012	0.57	256.65	0.57
141	1400	0.004	0.015	3.716	1.593	0.011	3.482	0.015	0.012	0.57	256.94	0.57
142	1410	0.004	0.015	3.731	1.605	0.011	3.497	0.015	0.012	0.57	257.22	0.57
143	1420	0.004	0.015	3.746	1.616	0.011	3.512	0.015	0.012	0.57	257.49	0.57
144	1430	0.004	0.015	3.761	1.627	0.011	3.527	0.015	0.012	0.57	257.77	0.57
145	1440	0.004	0.015	3.776	1.639	0.011	3.542	0.015	0.012	0.57	258.04	0.57

Peak Flow	**5.17**	**2320.10**	**1.93**

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

ment Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.027	0.054	0.000	0.000	0.001	0.001	0.000	0.01	3.82	0.00
4	30	0.004	0.027	0.080	0.000	0.000	0.006	0.006	0.001	0.06	29.00	0.01
5	40	0.004	0.027	0.107	0.000	0.000	0.016	0.010	0.002	0.11	50.45	0.02
6	50	0.004	0.027	0.134	0.000	0.000	0.029	0.013	0.003	0.15	66.10	0.03
7	60	0.004	0.027	0.161	0.000	0.000	0.044	0.015	0.004	0.17	77.87	0.05
8	70	0.004	0.027	0.187	0.000	0.000	0.061	0.017	0.004	0.19	86.95	0.07
9	80	0.004	0.027	0.214	0.000	0.000	0.080	0.018	0.004	0.21	94.09	0.09
10	90	0.005	0.033	0.248	0.000	0.000	0.104	0.024	0.006	0.28	125.54	0.11
11	100	0.005	0.033	0.281	0.000	0.000	0.130	0.026	0.006	0.30	132.48	0.14
12	110	0.005	0.033	0.314	0.000	0.000	0.157	0.027	0.007	0.31	137.97	0.16
13	120	0.005	0.033	0.348	0.000	0.000	0.184	0.028	0.007	0.32	142.38	0.18
14	130	0.005	0.033	0.381	0.000	0.000	0.213	0.028	0.007	0.33	145.98	0.20
15	140	0.005	0.033	0.415	0.000	0.000	0.242	0.029	0.007	0.33	148.95	0.22
16	150	0.005	0.033	0.448	0.000	0.000	0.271	0.030	0.007	0.34	151.43	0.24
17	160	0.006	0.040	0.488	0.000	0.000	0.307	0.036	0.009	0.41	184.46	0.26
18	170	0.006	0.040	0.529	0.000	0.000	0.344	0.036	0.009	0.42	186.96	0.28
19	180	0.006	0.040	0.569	0.000	0.000	0.381	0.037	0.009	0.42	189.05	0.30
20	190	0.006	0.040	0.609	0.000	0.000	0.418	0.037	0.009	0.43	191.49	0.32
21	200	0.006	0.040	0.649	0.001	0.001	0.455	0.037	0.010	0.46	205.43	0.34
22	210	0.006	0.040	0.689	0.003	0.002	0.493	0.038	0.011	0.50	222.92	0.36
23	220	0.007	0.047	0.736	0.006	0.003	0.537	0.044	0.013	0.63	281.11	0.39
24	230	0.007	0.047	0.783	0.011	0.005	0.582	0.045	0.014	0.67	302.67	0.43
25	240	0.007	0.047	0.830	0.017	0.006	0.627	0.045	0.015	0.72	323.15	0.47
26	250	0.007	0.047	0.876	0.024	0.007	0.672	0.045	0.016	0.76	342.65	0.51
27	260	0.007	0.047	0.923	0.032	0.008	0.717	0.045	0.017	0.80	361.24	0.55
28	270	0.007	0.047	0.970	0.041	0.009	0.762	0.045	0.018	0.84	378.99	0.59
29	280	0.007	0.047	1.017	0.052	0.010	0.807	0.045	0.019	0.88	395.94	0.63
30	290	0.008	0.054	1.070	0.065	0.013	0.859	0.052	0.023	1.05	472.33	0.68
31	300	0.008	0.054	1.124	0.079	0.014	0.911	0.052	0.024	1.10	492.48	0.74
32	310	0.008	0.054	1.177	0.094	0.015	0.964	0.052	0.024	1.14	511.69	0.79
33	320	0.008	0.054	1.231	0.111	0.017	1.016	0.052	0.025	1.18	530.00	0.85
34	330	0.008	0.054	1.284	0.128	0.018	1.068	0.052	0.026	1.22	547.47	0.90
35	340	0.008	0.054	1.338	0.147	0.019	1.121	0.052	0.027	1.26	564.16	0.95
36	350	0.01	0.067	1.405	0.172	0.025	1.187	0.066	0.035	1.62	727.57	1.02
37	360	0.01	0.067	1.472	0.198	0.026	1.252	0.066	0.036	1.67	751.17	1.11
38	370	0.01	0.067	1.539	0.226	0.028	1.318	0.066	0.037	1.72	773.54	1.20
39	380	0.01	0.067	1.606	0.254	0.029	1.384	0.066	0.038	1.77	794.75	1.28
40	390	0.01	0.067	1.673	0.285	0.030	1.450	0.066	0.039	1.82	814.90	1.35
41	400	0.01	0.067	1.739	0.316	0.031	1.516	0.066	0.040	1.86	834.04	1.43

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

ment Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
42	410	0.013	0.087	1.826	0.358	0.042	1.602	0.086	0.053	2.48	1111.35	1.53
43	420	0.013	0.087	1.913	0.402	0.044	1.688	0.086	0.054	2.54	1140.23	1.68
44	430	0.013	0.087	2.000	0.448	0.046	1.775	0.086	0.056	2.60	1167.38	1.81
45	440	0.018	0.120	2.121	0.514	0.066	1.894	0.119	0.079	3.69	1658.22	2.00
46	450	0.018	0.120	2.241	0.583	0.069	2.014	0.120	0.081	3.80	1703.34	2.26
47	460	0.034	0.227	2.469	0.721	0.137	2.240	0.226	0.159	7.42	3328.53	2.75
48	470	0.054	0.361	2.830	0.955	0.234	2.599	0.359	0.265	12.35	5544.27	3.80
49	480	0.027	0.181	3.011	1.078	0.123	2.779	0.180	0.137	6.40	2873.76	4.62
50	490	0.018	0.120	3.131	1.163	0.084	2.899	0.120	0.093	4.34	1948.94	4.73
51	500	0.013	0.087	3.218	1.225	0.062	2.985	0.087	0.068	3.17	1422.89	4.58
52	510	0.013	0.087	3.305	1.287	0.063	3.072	0.087	0.069	3.20	1435.07	4.38
53	520	0.013	0.087	3.392	1.351	0.063	3.159	0.087	0.069	3.22	1446.70	4.21
54	530	0.009	0.060	3.452	1.395	0.044	3.219	0.060	0.048	2.25	1008.10	3.99
55	540	0.009	0.060	3.512	1.440	0.045	3.279	0.060	0.048	2.26	1013.26	3.74
56	550	0.009	0.060	3.572	1.485	0.045	3.339	0.060	0.049	2.27	1018.27	3.52
57	560	0.009	0.060	3.633	1.530	0.045	3.399	0.060	0.049	2.28	1023.12	3.34
58	570	0.009	0.060	3.693	1.575	0.046	3.459	0.060	0.049	2.29	1027.83	3.18
59	580	0.009	0.060	3.753	1.621	0.046	3.519	0.060	0.049	2.30	1032.40	3.05
60	590	0.009	0.060	3.813	1.667	0.046	3.579	0.060	0.050	2.31	1036.84	2.94
61	600	0.009	0.060	3.874	1.714	0.046	3.639	0.060	0.050	2.32	1041.15	2.85
62	610	0.009	0.060	3.934	1.760	0.047	3.699	0.060	0.050	2.33	1045.33	2.77
63	620	0.009	0.060	3.994	1.807	0.047	3.759	0.060	0.050	2.34	1049.40	2.71
64	630	0.009	0.060	4.054	1.854	0.047	3.819	0.060	0.050	2.35	1053.35	2.66
65	640	0.009	0.060	4.114	1.902	0.047	3.879	0.060	0.050	2.36	1057.19	2.61
66	650	0.007	0.047	4.161	1.939	0.037	3.926	0.047	0.039	1.84	824.85	2.54
67	660	0.007	0.047	4.208	1.976	0.037	3.973	0.047	0.040	1.84	827.06	2.43
68	670	0.007	0.047	4.255	2.013	0.037	4.019	0.047	0.040	1.85	829.22	2.35
69	680	0.007	0.047	4.302	2.051	0.037	4.066	0.047	0.040	1.85	831.34	2.27
70	690	0.007	0.047	4.349	2.088	0.038	4.113	0.047	0.040	1.86	833.42	2.21
71	700	0.007	0.047	4.395	2.126	0.038	4.160	0.047	0.040	1.86	835.45	2.16
72	710	0.007	0.047	4.442	2.164	0.038	4.206	0.047	0.040	1.87	837.44	2.12
73	720	0.007	0.047	4.489	2.202	0.038	4.253	0.047	0.040	1.87	839.39	2.08
74	730	0.007	0.047	4.536	2.240	0.038	4.300	0.047	0.040	1.87	841.30	2.05
75	740	0.007	0.047	4.583	2.278	0.038	4.347	0.047	0.040	1.88	843.17	2.02
76	750	0.007	0.047	4.629	2.316	0.038	4.393	0.047	0.040	1.88	845.00	2.00
77	760	0.007	0.047	4.676	2.355	0.038	4.440	0.047	0.040	1.89	846.80	1.99
78	770	0.006	0.040	4.716	2.388	0.033	4.480	0.040	0.035	1.62	727.23	1.95
79	780	0.006	0.040	4.757	2.421	0.033	4.520	0.040	0.035	1.62	728.50	1.90
80	790	0.006	0.040	4.797	2.454	0.033	4.560	0.040	0.035	1.63	729.75	1.86
81	800	0.006	0.040	4.837	2.487	0.033	4.600	0.040	0.035	1.63	730.98	1.83
82	810	0.006	0.040	4.877	2.520	0.033	4.640	0.040	0.035	1.63	732.19	1.80

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

ment Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
83	820	0.006	0.040	4.917	2.554	0.033	4.680	0.040	0.035	1.63	733.38	1.77
84	830	0.006	0.040	4.957	2.587	0.033	4.721	0.040	0.035	1.64	734.55	1.75
85	840	0.006	0.040	4.997	2.621	0.034	4.761	0.040	0.035	1.64	735.70	1.74
86	850	0.006	0.040	5.038	2.654	0.034	4.801	0.040	0.035	1.64	736.84	1.72
87	860	0.006	0.040	5.078	2.688	0.034	4.841	0.040	0.035	1.64	737.95	1.71
88	870	0.006	0.040	5.118	2.722	0.034	4.881	0.040	0.035	1.65	739.05	1.70
89	880	0.006	0.040	5.158	2.756	0.034	4.921	0.040	0.035	1.65	740.13	1.69
90	890	0.005	0.033	5.191	2.784	0.028	4.954	0.033	0.030	1.38	617.58	1.67
91	900	0.005	0.033	5.225	2.812	0.028	4.988	0.033	0.030	1.38	618.31	1.62
92	910	0.005	0.033	5.258	2.841	0.028	5.021	0.033	0.030	1.38	619.03	1.59
93	920	0.005	0.033	5.292	2.869	0.028	5.055	0.033	0.030	1.38	619.74	1.56
94	930	0.005	0.033	5.325	2.897	0.028	5.088	0.033	0.030	1.38	620.43	1.53
95	940	0.005	0.033	5.359	2.926	0.028	5.121	0.033	0.030	1.38	621.12	1.51
96	950	0.005	0.033	5.392	2.954	0.029	5.155	0.033	0.030	1.39	621.81	1.49
97	960	0.005	0.033	5.426	2.983	0.029	5.188	0.033	0.030	1.39	622.48	1.48
98	970	0.005	0.033	5.459	3.011	0.029	5.222	0.033	0.030	1.39	623.14	1.46
99	980	0.005	0.033	5.492	3.040	0.029	5.255	0.033	0.030	1.39	623.80	1.45
100	990	0.005	0.033	5.526	3.069	0.029	5.288	0.033	0.030	1.39	624.44	1.44
101	1000	0.005	0.033	5.559	3.097	0.029	5.322	0.033	0.030	1.39	625.08	1.44
102	1010	0.004	0.027	5.586	3.120	0.023	5.348	0.027	0.024	1.12	500.52	1.41
103	1020	0.004	0.027	5.613	3.143	0.023	5.375	0.027	0.024	1.12	500.92	1.37
104	1030	0.004	0.027	5.640	3.166	0.023	5.402	0.027	0.024	1.12	501.32	1.33
105	1040	0.004	0.027	5.666	3.190	0.023	5.429	0.027	0.024	1.12	501.71	1.30
106	1050	0.004	0.027	5.693	3.213	0.023	5.455	0.027	0.024	1.12	502.10	1.27
107	1060	0.004	0.027	5.720	3.236	0.023	5.482	0.027	0.024	1.12	502.48	1.25
108	1070	0.004	0.027	5.747	3.259	0.023	5.509	0.027	0.024	1.12	502.86	1.23
109	1080	0.004	0.027	5.773	3.282	0.023	5.536	0.027	0.024	1.12	503.24	1.21
110	1090	0.004	0.027	5.800	3.305	0.023	5.562	0.027	0.024	1.12	503.61	1.20
111	1100	0.004	0.027	5.827	3.328	0.023	5.589	0.027	0.024	1.12	503.98	1.19
112	1110	0.004	0.027	5.854	3.352	0.023	5.616	0.027	0.024	1.12	504.34	1.18
113	1120	0.004	0.027	5.881	3.375	0.023	5.643	0.027	0.024	1.12	504.71	1.17
114	1130	0.004	0.027	5.907	3.398	0.023	5.669	0.027	0.024	1.13	505.06	1.16
115	1140	0.004	0.027	5.934	3.422	0.023	5.696	0.027	0.024	1.13	505.42	1.16
116	1150	0.004	0.027	5.961	3.445	0.023	5.723	0.027	0.024	1.13	505.77	1.15
117	1160	0.004	0.027	5.988	3.468	0.023	5.749	0.027	0.024	1.13	506.12	1.15
118	1170	0.004	0.027	6.014	3.492	0.023	5.776	0.027	0.024	1.13	506.46	1.15
119	1180	0.004	0.027	6.041	3.515	0.023	5.803	0.027	0.024	1.13	506.80	1.14
120	1190	0.004	0.027	6.068	3.538	0.023	5.830	0.027	0.024	1.13	507.14	1.14
121	1200	0.004	0.027	6.095	3.562	0.023	5.856	0.027	0.024	1.13	507.48	1.14
122	1210	0.004	0.027	6.121	3.585	0.023	5.883	0.027	0.024	1.13	507.81	1.14
123	1220	0.004	0.027	6.148	3.609	0.023	5.910	0.027	0.024	1.13	508.14	1.14

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

ment Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
124	1230	0.004	0.027	6.175	3.632	0.023	5.937	0.027	0.024	1.13	508.46	1.14
125	1240	0.004	0.027	6.202	3.656	0.024	5.963	0.027	0.024	1.13	508.79	1.14
126	1250	0.004	0.027	6.228	3.679	0.024	5.990	0.027	0.024	1.13	509.11	1.14
127	1260	0.004	0.027	6.255	3.703	0.024	6.017	0.027	0.024	1.14	509.42	1.14
128	1270	0.004	0.027	6.282	3.726	0.024	6.043	0.027	0.024	1.14	509.74	1.14
129	1280	0.004	0.027	6.309	3.750	0.024	6.070	0.027	0.024	1.14	510.05	1.14
130	1290	0.004	0.027	6.335	3.774	0.024	6.097	0.027	0.024	1.14	510.36	1.14
131	1300	0.004	0.027	6.362	3.797	0.024	6.124	0.027	0.024	1.14	510.66	1.14
132	1310	0.004	0.027	6.389	3.821	0.024	6.150	0.027	0.024	1.14	510.96	1.14
133	1320	0.004	0.027	6.416	3.845	0.024	6.177	0.027	0.024	1.14	511.26	1.14
134	1330	0.004	0.027	6.442	3.868	0.024	6.204	0.027	0.024	1.14	511.56	1.14
135	1340	0.004	0.027	6.469	3.892	0.024	6.231	0.027	0.024	1.14	511.85	1.14
136	1350	0.004	0.027	6.496	3.916	0.024	6.257	0.027	0.024	1.14	512.15	1.14
137	1360	0.004	0.027	6.523	3.939	0.024	6.284	0.027	0.024	1.14	512.43	1.14
138	1370	0.004	0.027	6.550	3.963	0.024	6.311	0.027	0.024	1.14	512.72	1.14
139	1380	0.004	0.027	6.576	3.987	0.024	6.338	0.027	0.025	1.14	513.00	1.14
140	1390	0.004	0.027	6.603	4.011	0.024	6.364	0.027	0.025	1.14	513.29	1.14
141	1400	0.004	0.027	6.630	4.035	0.024	6.391	0.027	0.025	1.14	513.56	1.14
142	1410	0.004	0.027	6.657	4.058	0.024	6.418	0.027	0.025	1.14	513.84	1.14
143	1420	0.004	0.027	6.683	4.082	0.024	6.444	0.027	0.025	1.15	514.11	1.14
144	1430	0.004	0.027	6.710	4.106	0.024	6.471	0.027	0.025	1.15	514.39	1.14
145	1440	0.004	0.027	6.737	4.130	0.024	6.498	0.027	0.025	1.15	514.65	1.14

Peak Flow	**12.35**	**5544.27**	**4.73**

Santa Barbara Urban Hydrograph Method

Quantity Calculations (50 yr / 24-hour Storm)

ment Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.030	0.030	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.030	0.059	0.000	0.000	0.002	0.002	0.000	0.02	7.99	0.00
4	30	0.004	0.030	0.089	0.000	0.000	0.009	0.008	0.002	0.09	39.52	0.01
5	40	0.004	0.030	0.119	0.000	0.000	0.022	0.012	0.003	0.14	63.33	0.02
6	50	0.004	0.030	0.149	0.000	0.000	0.037	0.016	0.004	0.18	80.33	0.04
7	60	0.004	0.030	0.178	0.000	0.000	0.055	0.018	0.004	0.21	92.89	0.07
8	70	0.004	0.030	0.208	0.000	0.000	0.075	0.020	0.005	0.23	102.43	0.09
9	80	0.004	0.030	0.238	0.000	0.000	0.097	0.021	0.005	0.24	109.86	0.11
10	90	0.005	0.037	0.275	0.000	0.000	0.125	0.028	0.007	0.32	145.46	0.14
11	100	0.005	0.037	0.312	0.000	0.000	0.155	0.030	0.007	0.34	152.52	0.16
12	110	0.005	0.037	0.349	0.000	0.000	0.186	0.031	0.008	0.35	158.05	0.19
13	120	0.005	0.037	0.386	0.000	0.000	0.217	0.032	0.008	0.36	162.46	0.22
14	130	0.005	0.037	0.424	0.000	0.000	0.250	0.032	0.008	0.37	166.03	0.24
15	140	0.005	0.037	0.461	0.000	0.000	0.283	0.033	0.008	0.38	168.96	0.26
16	150	0.005	0.037	0.498	0.000	0.000	0.316	0.033	0.008	0.38	171.40	0.28
17	160	0.006	0.045	0.542	0.000	0.000	0.357	0.041	0.010	0.46	208.35	0.30
18	170	0.006	0.045	0.587	0.000	0.000	0.398	0.041	0.010	0.47	210.78	0.32
19	180	0.006	0.045	0.632	0.000	0.000	0.439	0.041	0.010	0.49	218.90	0.34
20	190	0.006	0.045	0.676	0.002	0.002	0.481	0.042	0.011	0.54	240.34	0.37
21	200	0.006	0.045	0.721	0.005	0.003	0.523	0.042	0.012	0.58	261.24	0.40
22	210	0.006	0.045	0.765	0.009	0.004	0.565	0.042	0.013	0.63	281.10	0.43
23	220	0.007	0.052	0.817	0.015	0.006	0.615	0.050	0.017	0.78	351.79	0.47
24	230	0.007	0.052	0.869	0.023	0.008	0.665	0.050	0.018	0.84	376.16	0.52
25	240	0.007	0.052	0.921	0.032	0.009	0.715	0.050	0.019	0.89	399.25	0.57
26	250	0.007	0.052	0.973	0.042	0.010	0.765	0.050	0.020	0.94	421.18	0.62
27	260	0.007	0.052	1.025	0.054	0.012	0.815	0.050	0.021	0.98	442.03	0.67
28	270	0.007	0.052	1.077	0.066	0.013	0.866	0.051	0.022	1.03	461.88	0.72
29	280	0.007	0.052	1.129	0.080	0.014	0.917	0.051	0.023	1.07	480.80	0.77
30	290	0.008	0.059	1.189	0.098	0.017	0.975	0.058	0.027	1.27	571.53	0.83
31	300	0.008	0.059	1.248	0.116	0.019	1.033	0.058	0.028	1.32	593.89	0.90
32	310	0.008	0.059	1.308	0.136	0.020	1.091	0.058	0.029	1.37	615.13	0.96
33	320	0.008	0.059	1.367	0.158	0.021	1.149	0.058	0.030	1.42	635.32	1.03
34	330	0.008	0.059	1.427	0.180	0.022	1.208	0.058	0.031	1.46	654.54	1.09
35	340	0.008	0.059	1.486	0.204	0.024	1.266	0.058	0.032	1.50	672.85	1.14
36	350	0.01	0.074	1.560	0.235	0.031	1.340	0.073	0.041	1.93	865.51	1.23
37	360	0.01	0.074	1.635	0.267	0.033	1.413	0.073	0.043	1.99	891.25	1.33
38	370	0.01	0.074	1.709	0.301	0.034	1.486	0.073	0.044	2.04	915.55	1.43
39	380	0.01	0.074	1.783	0.337	0.036	1.560	0.073	0.045	2.09	938.53	1.53
40	390	0.01	0.074	1.858	0.374	0.037	1.633	0.074	0.046	2.14	960.28	1.61
41	400	0.01	0.074	1.932	0.412	0.038	1.707	0.074	0.047	2.19	980.89	1.69
42	410	0.013	0.097	2.028	0.463	0.051	1.802	0.096	0.062	2.91	1304.24	1.82
43	420	0.013	0.097	2.125	0.517	0.053	1.898	0.096	0.064	2.97	1335.15	1.98

Santa Barbara Urban Hydrograph Method

Quantity Calculations (50 yr / 24-hour Storm)

ment Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
44	430	0.013	0.097	2.222	0.572	0.055	1.994	0.096	0.065	3.04	1364.09	2.13
45	440	0.018	0.134	2.355	0.651	0.079	2.127	0.133	0.092	4.31	1933.18	2.36
46	450	0.018	0.134	2.489	0.733	0.082	2.260	0.133	0.095	4.41	1980.91	2.65
47	460	0.034	0.253	2.742	0.896	0.163	2.511	0.251	0.184	8.60	3858.66	3.22
48	470	0.054	0.401	3.143	1.171	0.275	2.911	0.399	0.306	14.26	6397.72	4.42
49	480	0.027	0.201	3.344	1.315	0.144	3.110	0.200	0.158	7.36	3304.22	5.36
50	490	0.018	0.134	3.477	1.414	0.098	3.244	0.133	0.107	4.98	2236.92	5.48
51	500	0.013	0.097	3.574	1.486	0.072	3.340	0.096	0.078	3.63	1631.29	5.31
52	510	0.013	0.097	3.670	1.558	0.073	3.436	0.096	0.079	3.66	1643.77	5.06
53	520	0.013	0.097	3.767	1.632	0.073	3.533	0.096	0.079	3.69	1655.67	4.86
54	530	0.009	0.067	3.834	1.683	0.051	3.599	0.067	0.055	2.57	1152.91	4.61
55	540	0.009	0.067	3.901	1.735	0.052	3.666	0.067	0.055	2.58	1158.17	4.31
56	550	0.009	0.067	3.968	1.787	0.052	3.733	0.067	0.056	2.59	1163.27	4.06
57	560	0.009	0.067	4.034	1.839	0.052	3.800	0.067	0.056	2.60	1168.20	3.84
58	570	0.009	0.067	4.101	1.892	0.053	3.866	0.067	0.056	2.61	1172.98	3.66
59	580	0.009	0.067	4.168	1.944	0.053	3.933	0.067	0.056	2.62	1177.62	3.51
60	590	0.009	0.067	4.235	1.997	0.053	4.000	0.067	0.056	2.63	1182.12	3.38
61	600	0.009	0.067	4.302	2.051	0.053	4.066	0.067	0.057	2.64	1186.48	3.27
62	610	0.009	0.067	4.369	2.105	0.054	4.133	0.067	0.057	2.65	1190.71	3.18
63	620	0.009	0.067	4.436	2.159	0.054	4.200	0.067	0.057	2.66	1194.81	3.10
64	630	0.009	0.067	4.503	2.213	0.054	4.267	0.067	0.057	2.67	1198.80	3.04
65	640	0.009	0.067	4.569	2.267	0.054	4.333	0.067	0.057	2.68	1202.67	2.99
66	650	0.007	0.052	4.621	2.310	0.042	4.385	0.052	0.045	2.09	938.01	2.90
67	660	0.007	0.052	4.673	2.352	0.043	4.437	0.052	0.045	2.10	940.24	2.78
68	670	0.007	0.052	4.725	2.395	0.043	4.489	0.052	0.045	2.10	942.41	2.68
69	680	0.007	0.052	4.777	2.438	0.043	4.541	0.052	0.045	2.10	944.54	2.59
70	690	0.007	0.052	4.830	2.481	0.043	4.593	0.052	0.045	2.11	946.62	2.52
71	700	0.007	0.052	4.882	2.524	0.043	4.645	0.052	0.045	2.11	948.66	2.46
72	710	0.007	0.052	4.934	2.567	0.043	4.697	0.052	0.045	2.12	950.65	2.41
73	720	0.007	0.052	4.986	2.611	0.043	4.749	0.052	0.046	2.12	952.60	2.37
74	730	0.007	0.052	5.038	2.654	0.044	4.801	0.052	0.046	2.13	954.51	2.33
75	740	0.007	0.052	5.090	2.698	0.044	4.853	0.052	0.046	2.13	956.38	2.30
76	750	0.007	0.052	5.142	2.742	0.044	4.905	0.052	0.046	2.14	958.21	2.28
77	760	0.007	0.052	5.194	2.786	0.044	4.956	0.052	0.046	2.14	960.01	2.26
78	770	0.006	0.045	5.238	2.823	0.038	5.001	0.045	0.039	1.84	824.26	2.22
79	780	0.006	0.045	5.283	2.861	0.038	5.045	0.045	0.039	1.84	825.53	2.16
80	790	0.006	0.045	5.327	2.899	0.038	5.090	0.045	0.039	1.84	826.78	2.12
81	800	0.006	0.045	5.372	2.937	0.038	5.135	0.045	0.040	1.84	828.00	2.08
82	810	0.006	0.045	5.416	2.975	0.038	5.179	0.045	0.040	1.85	829.21	2.04
83	820	0.006	0.045	5.461	3.013	0.038	5.224	0.045	0.040	1.85	830.39	2.01
84	830	0.006	0.045	5.506	3.051	0.038	5.268	0.045	0.040	1.85	831.55	1.99
85	840	0.006	0.045	5.550	3.090	0.038	5.313	0.045	0.040	1.86	832.70	1.97
86	850	0.006	0.045	5.595	3.128	0.038	5.357	0.045	0.040	1.86	833.82	1.95

Santa Barbara Urban Hydrograph Method

Quantity Calculations (50 yr / 24-hour Storm)

ment Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
87	860	0.006	0.045	5.639	3.166	0.038	5.402	0.045	0.040	1.86	834.93	1.94
88	870	0.006	0.045	5.684	3.205	0.038	5.446	0.045	0.040	1.86	836.01	1.93
89	880	0.006	0.045	5.729	3.243	0.039	5.491	0.045	0.040	1.87	837.08	1.92
90	890	0.005	0.037	5.766	3.275	0.032	5.528	0.037	0.033	1.56	698.37	1.89
91	900	0.005	0.037	5.803	3.307	0.032	5.565	0.037	0.033	1.56	699.09	1.84
92	910	0.005	0.037	5.840	3.340	0.032	5.602	0.037	0.033	1.56	699.80	1.80
93	920	0.005	0.037	5.877	3.372	0.032	5.639	0.037	0.033	1.56	700.50	1.76
94	930	0.005	0.037	5.914	3.404	0.032	5.676	0.037	0.033	1.56	701.20	1.73
95	940	0.005	0.037	5.951	3.437	0.032	5.713	0.037	0.034	1.56	701.88	1.71
96	950	0.005	0.037	5.989	3.469	0.032	5.750	0.037	0.034	1.57	702.55	1.69
97	960	0.005	0.037	6.026	3.502	0.032	5.788	0.037	0.034	1.57	703.22	1.67
98	970	0.005	0.037	6.063	3.534	0.032	5.825	0.037	0.034	1.57	703.87	1.65
99	980	0.005	0.037	6.100	3.567	0.033	5.862	0.037	0.034	1.57	704.52	1.64
100	990	0.005	0.037	6.137	3.599	0.033	5.899	0.037	0.034	1.57	705.16	1.63
101	1000	0.005	0.037	6.174	3.632	0.033	5.936	0.037	0.034	1.57	705.79	1.62
102	1010	0.004	0.030	6.204	3.658	0.026	5.966	0.030	0.027	1.26	565.08	1.59
103	1020	0.004	0.030	6.234	3.684	0.026	5.995	0.030	0.027	1.26	565.47	1.54
104	1030	0.004	0.030	6.263	3.710	0.026	6.025	0.030	0.027	1.26	565.86	1.50
105	1040	0.004	0.030	6.293	3.736	0.026	6.055	0.030	0.027	1.26	566.25	1.47
106	1050	0.004	0.030	6.323	3.763	0.026	6.084	0.030	0.027	1.26	566.63	1.44
107	1060	0.004	0.030	6.353	3.789	0.026	6.114	0.030	0.027	1.26	567.01	1.41
108	1070	0.004	0.030	6.382	3.815	0.026	6.144	0.030	0.027	1.26	567.38	1.39
109	1080	0.004	0.030	6.412	3.841	0.026	6.174	0.030	0.027	1.27	567.75	1.37
110	1090	0.004	0.030	6.442	3.868	0.026	6.203	0.030	0.027	1.27	568.12	1.36
111	1100	0.004	0.030	6.472	3.894	0.026	6.233	0.030	0.027	1.27	568.48	1.34
112	1110	0.004	0.030	6.501	3.920	0.026	6.263	0.030	0.027	1.27	568.84	1.33
113	1120	0.004	0.030	6.531	3.947	0.026	6.292	0.030	0.027	1.27	569.20	1.32
114	1130	0.004	0.030	6.561	3.973	0.026	6.322	0.030	0.027	1.27	569.55	1.31
115	1140	0.004	0.030	6.590	4.000	0.026	6.352	0.030	0.027	1.27	569.90	1.31
116	1150	0.004	0.030	6.620	4.026	0.026	6.381	0.030	0.027	1.27	570.24	1.30
117	1160	0.004	0.030	6.650	4.052	0.026	6.411	0.030	0.027	1.27	570.58	1.30
118	1170	0.004	0.030	6.680	4.079	0.026	6.441	0.030	0.027	1.27	570.92	1.29
119	1180	0.004	0.030	6.709	4.105	0.027	6.470	0.030	0.027	1.27	571.26	1.29
120	1190	0.004	0.030	6.739	4.132	0.027	6.500	0.030	0.027	1.27	571.59	1.29
121	1200	0.004	0.030	6.769	4.159	0.027	6.530	0.030	0.027	1.27	571.92	1.29
122	1210	0.004	0.030	6.798	4.185	0.027	6.560	0.030	0.027	1.28	572.24	1.28
123	1220	0.004	0.030	6.828	4.212	0.027	6.589	0.030	0.027	1.28	572.57	1.28
124	1230	0.004	0.030	6.858	4.238	0.027	6.619	0.030	0.027	1.28	572.88	1.28
125	1240	0.004	0.030	6.888	4.265	0.027	6.649	0.030	0.027	1.28	573.20	1.28
126	1250	0.004	0.030	6.917	4.292	0.027	6.678	0.030	0.027	1.28	573.51	1.28
127	1260	0.004	0.030	6.947	4.318	0.027	6.708	0.030	0.027	1.28	573.82	1.28
128	1270	0.004	0.030	6.977	4.345	0.027	6.738	0.030	0.027	1.28	574.13	1.28
129	1280	0.004	0.030	7.006	4.372	0.027	6.767	0.030	0.027	1.28	574.44	1.28

Santa Barbara Urban Hydrograph Method

Quantity Calculations (50 yr / 24-hour Storm)

ment Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
130	1290	0.004	0.030	7.036	4.398	0.027	6.797	0.030	0.027	1.28	574.74	1.28
131	1300	0.004	0.030	7.066	4.425	0.027	6.827	0.030	0.027	1.28	575.03	1.28
132	1310	0.004	0.030	7.096	4.452	0.027	6.856	0.030	0.027	1.28	575.33	1.28
133	1320	0.004	0.030	7.125	4.479	0.027	6.886	0.030	0.027	1.28	575.62	1.28
134	1330	0.004	0.030	7.155	4.505	0.027	6.916	0.030	0.028	1.28	575.91	1.28
135	1340	0.004	0.030	7.185	4.532	0.027	6.946	0.030	0.028	1.28	576.20	1.28
136	1350	0.004	0.030	7.215	4.559	0.027	6.975	0.030	0.028	1.28	576.49	1.28
137	1360	0.004	0.030	7.244	4.586	0.027	7.005	0.030	0.028	1.29	576.77	1.28
138	1370	0.004	0.030	7.274	4.613	0.027	7.035	0.030	0.028	1.29	577.05	1.28
139	1380	0.004	0.030	7.304	4.640	0.027	7.064	0.030	0.028	1.29	577.32	1.28
140	1390	0.004	0.030	7.333	4.667	0.027	7.094	0.030	0.028	1.29	577.60	1.28
141	1400	0.004	0.030	7.363	4.694	0.027	7.124	0.030	0.028	1.29	577.87	1.28
142	1410	0.004	0.030	7.393	4.721	0.027	7.153	0.030	0.028	1.29	578.14	1.28
143	1420	0.004	0.030	7.423	4.747	0.027	7.183	0.030	0.028	1.29	578.41	1.29
144	1430	0.004	0.030	7.452	4.774	0.027	7.213	0.030	0.028	1.29	578.67	1.29
145	1440	0.004	0.030	7.482	4.801	0.027	7.243	0.030	0.028	1.29	578.93	1.29

Peak Flow	**14.26**	**6397.72**	**5.48**

Santa Barbara Urban Hydrograph Method

Quantity Calculations (100 yr / 24-hour Storm)

ment Conditions (Basin #1)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.033	0.033	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.033	0.065	0.000	0.000	0.003	0.003	0.001	0.03	13.27	0.00
4	30	0.004	0.033	0.098	0.000	0.000	0.012	0.010	0.002	0.11	50.32	0.01
5	40	0.004	0.033	0.130	0.000	0.000	0.027	0.015	0.004	0.17	76.23	0.03
6	50	0.004	0.033	0.163	0.000	0.000	0.046	0.018	0.005	0.21	94.37	0.05
7	60	0.004	0.033	0.195	0.000	0.000	0.067	0.021	0.005	0.24	107.58	0.08
8	70	0.004	0.033	0.228	0.000	0.000	0.089	0.023	0.006	0.26	117.49	0.10
9	80	0.004	0.033	0.260	0.000	0.000	0.114	0.024	0.006	0.28	125.11	0.13
10	90	0.005	0.041	0.301	0.000	0.000	0.146	0.032	0.008	0.37	164.66	0.16
11	100	0.005	0.041	0.342	0.000	0.000	0.179	0.033	0.008	0.38	171.79	0.19
12	110	0.005	0.041	0.383	0.000	0.000	0.214	0.035	0.008	0.40	177.32	0.22
13	120	0.005	0.041	0.423	0.000	0.000	0.249	0.035	0.009	0.40	181.69	0.25
14	130	0.005	0.041	0.464	0.000	0.000	0.285	0.036	0.009	0.41	185.22	0.27
15	140	0.005	0.041	0.505	0.000	0.000	0.322	0.037	0.009	0.42	188.10	0.29
16	150	0.005	0.041	0.545	0.000	0.000	0.359	0.037	0.009	0.42	190.49	0.31
17	160	0.006	0.049	0.594	0.000	0.000	0.404	0.045	0.011	0.52	231.19	0.33
18	170	0.006	0.049	0.643	0.001	0.001	0.450	0.046	0.012	0.54	244.41	0.36
19	180	0.006	0.049	0.692	0.003	0.002	0.496	0.046	0.013	0.60	270.43	0.39
20	190	0.006	0.049	0.741	0.007	0.004	0.542	0.046	0.014	0.66	295.06	0.43
21	200	0.006	0.049	0.790	0.012	0.005	0.588	0.046	0.015	0.71	318.38	0.47
22	210	0.006	0.049	0.838	0.018	0.006	0.635	0.047	0.016	0.76	340.50	0.50
23	220	0.007	0.057	0.895	0.027	0.009	0.690	0.055	0.020	0.94	423.74	0.56
24	230	0.007	0.057	0.952	0.038	0.011	0.745	0.055	0.022	1.00	450.75	0.62
25	240	0.007	0.057	1.009	0.050	0.012	0.800	0.055	0.023	1.06	476.28	0.68
26	250	0.007	0.057	1.066	0.064	0.014	0.855	0.055	0.024	1.12	500.47	0.74
27	260	0.007	0.057	1.123	0.079	0.015	0.911	0.055	0.025	1.17	523.40	0.80
28	270	0.007	0.057	1.180	0.095	0.016	0.966	0.056	0.026	1.21	545.18	0.85
29	280	0.007	0.057	1.237	0.113	0.018	1.022	0.056	0.027	1.26	565.88	0.91
30	290	0.008	0.065	1.302	0.135	0.022	1.086	0.064	0.032	1.49	670.79	0.98
31	300	0.008	0.065	1.368	0.158	0.023	1.150	0.064	0.033	1.55	695.14	1.06
32	310	0.008	0.065	1.433	0.183	0.025	1.214	0.064	0.034	1.60	718.20	1.13
33	320	0.008	0.065	1.498	0.209	0.026	1.278	0.064	0.035	1.65	740.07	1.21
34	330	0.008	0.065	1.563	0.236	0.027	1.342	0.064	0.036	1.70	760.82	1.27
35	340	0.008	0.065	1.628	0.264	0.029	1.406	0.064	0.037	1.74	780.55	1.34
36	350	0.01	0.081	1.709	0.302	0.037	1.487	0.080	0.048	2.23	1001.96	1.43
37	360	0.01	0.081	1.791	0.341	0.039	1.567	0.080	0.049	2.29	1029.53	1.56
38	370	0.01	0.081	1.872	0.381	0.041	1.648	0.081	0.050	2.35	1055.50	1.67
39	380	0.01	0.081	1.954	0.423	0.042	1.728	0.081	0.052	2.41	1079.98	1.77
40	390	0.01	0.081	2.035	0.467	0.044	1.809	0.081	0.053	2.46	1103.10	1.87
41	400	0.01	0.081	2.116	0.512	0.045	1.890	0.081	0.054	2.51	1124.94	1.96
42	410	0.013	0.106	2.222	0.572	0.060	1.995	0.105	0.071	3.33	1493.16	2.10
43	420	0.013	0.106	2.328	0.635	0.062	2.100	0.105	0.073	3.40	1525.72	2.29
44	430	0.013	0.106	2.434	0.699	0.064	2.205	0.105	0.074	3.47	1556.12	2.45
45	440	0.018	0.147	2.580	0.791	0.092	2.351	0.146	0.105	4.90	2201.17	2.71

46	450	0.018	0.147	2.727	0.886	0.095	2.496	0.146	0.108	5.02	2250.97	3.04
47	460	0.034	0.277	3.004	1.074	0.187	2.772	0.276	0.209	9.74	4373.26	3.67
48	470	0.054	0.440	3.443	1.388	0.315	3.210	0.438	0.345	16.10	7223.63	5.03
49	480	0.027	0.220	3.663	1.553	0.164	3.429	0.219	0.178	8.29	3719.83	6.08
50	490	0.018	0.147	3.810	1.664	0.112	3.575	0.146	0.120	5.60	2514.67	6.21
51	500	0.013	0.106	3.915	1.746	0.082	3.681	0.106	0.088	4.08	1832.16	6.01
52	510	0.013	0.106	4.021	1.829	0.082	3.786	0.106	0.088	4.11	1844.83	5.73
53	520	0.013	0.106	4.127	1.912	0.083	3.892	0.106	0.089	4.14	1856.89	5.49
54	530	0.009	0.073	4.200	1.970	0.058	3.965	0.073	0.062	2.88	1292.29	5.20
55	540	0.009	0.073	4.274	2.028	0.058	4.038	0.073	0.062	2.89	1297.61	4.86
56	550	0.009	0.073	4.347	2.087	0.059	4.111	0.073	0.062	2.90	1302.75	4.57
57	560	0.009	0.073	4.420	2.146	0.059	4.184	0.073	0.062	2.91	1307.73	4.33
58	570	0.009	0.073	4.493	2.205	0.059	4.257	0.073	0.063	2.92	1312.54	4.12
59	580	0.009	0.073	4.567	2.265	0.060	4.330	0.073	0.063	2.93	1317.21	3.95
60	590	0.009	0.073	4.640	2.325	0.060	4.404	0.073	0.063	2.95	1321.73	3.80
61	600	0.009	0.073	4.713	2.385	0.060	4.477	0.073	0.063	2.95	1326.11	3.68
62	610	0.009	0.073	4.786	2.445	0.060	4.550	0.073	0.064	2.96	1330.35	3.57
63	620	0.009	0.073	4.860	2.506	0.061	4.623	0.073	0.064	2.97	1334.47	3.48
64	630	0.009	0.073	4.933	2.567	0.061	4.696	0.073	0.064	2.98	1338.46	3.41
65	640	0.009	0.073	5.006	2.628	0.061	4.769	0.073	0.064	2.99	1342.33	3.35
66	650	0.007	0.057	5.063	2.676	0.048	4.826	0.057	0.050	2.33	1046.64	3.25
67	660	0.007	0.057	5.120	2.724	0.048	4.883	0.057	0.050	2.34	1048.86	3.11
68	670	0.007	0.057	5.177	2.772	0.048	4.940	0.057	0.050	2.34	1051.03	3.00
69	680	0.007	0.057	5.234	2.820	0.048	4.997	0.057	0.050	2.35	1053.15	2.90
70	690	0.007	0.057	5.291	2.868	0.048	5.054	0.057	0.050	2.35	1055.23	2.82
71	700	0.007	0.057	5.348	2.917	0.048	5.111	0.057	0.051	2.36	1057.26	2.75
72	710	0.007	0.057	5.405	2.965	0.049	5.168	0.057	0.051	2.36	1059.24	2.69
73	720	0.007	0.057	5.462	3.014	0.049	5.224	0.057	0.051	2.36	1061.18	2.65
74	730	0.007	0.057	5.519	3.063	0.049	5.281	0.057	0.051	2.37	1063.08	2.61
75	740	0.007	0.057	5.576	3.112	0.049	5.338	0.057	0.051	2.37	1064.94	2.57
76	750	0.007	0.057	5.633	3.161	0.049	5.395	0.057	0.051	2.38	1066.76	2.54
77	760	0.007	0.057	5.690	3.210	0.049	5.452	0.057	0.051	2.38	1068.54	2.52
78	770	0.006	0.049	5.739	3.252	0.042	5.501	0.049	0.044	2.04	917.28	2.47
79	780	0.006	0.049	5.788	3.294	0.042	5.550	0.049	0.044	2.05	918.54	2.41
80	790	0.006	0.049	5.836	3.337	0.042	5.598	0.049	0.044	2.05	919.77	2.36
81	800	0.006	0.049	5.885	3.379	0.042	5.647	0.049	0.044	2.05	920.99	2.31
82	810	0.006	0.049	5.934	3.422	0.043	5.696	0.049	0.044	2.05	922.18	2.27
83	820	0.006	0.049	5.983	3.464	0.043	5.745	0.049	0.044	2.06	923.35	2.24
84	830	0.006	0.049	6.032	3.507	0.043	5.794	0.049	0.044	2.06	924.50	2.22
85	840	0.006	0.049	6.081	3.550	0.043	5.842	0.049	0.044	2.06	925.63	2.19
86	850	0.006	0.049	6.129	3.592	0.043	5.891	0.049	0.044	2.06	926.74	2.17
87	860	0.006	0.049	6.178	3.635	0.043	5.940	0.049	0.044	2.07	927.83	2.16
88	870	0.006	0.049	6.227	3.678	0.043	5.989	0.049	0.044	2.07	928.91	2.14
89	880	0.006	0.049	6.276	3.721	0.043	6.038	0.049	0.044	2.07	929.96	2.13
90	890	0.005	0.041	6.317	3.757	0.036	6.078	0.041	0.037	1.73	775.76	2.10
91	900	0.005	0.041	6.357	3.793	0.036	6.119	0.041	0.037	1.73	776.47	2.05
92	910	0.005	0.041	6.398	3.829	0.036	6.159	0.041	0.037	1.73	777.17	2.00
93	920	0.005	0.041	6.439	3.865	0.036	6.200	0.041	0.037	1.73	777.86	1.96
94	930	0.005	0.041	6.479	3.901	0.036	6.241	0.041	0.037	1.73	778.55	1.93
95	940	0.005	0.041	6.520	3.937	0.036	6.281	0.041	0.037	1.74	779.22	1.90
96	950	0.005	0.041	6.561	3.973	0.036	6.322	0.041	0.037	1.74	779.88	1.88
97	960	0.005	0.041	6.602	4.009	0.036	6.363	0.041	0.037	1.74	780.53	1.86
98	970	0.005	0.041	6.642	4.046	0.036	6.403	0.041	0.037	1.74	781.18	1.84

99	980	0.005	0.041	6.683	4.082	0.036	6.444	0.041	0.037	1.74	781.82	1.82
100	990	0.005	0.041	6.724	4.118	0.036	6.485	0.041	0.037	1.74	782.44	1.81
101	1000	0.005	0.041	6.764	4.155	0.036	6.525	0.041	0.037	1.74	783.06	1.80
102	1010	0.004	0.033	6.797	4.184	0.029	6.558	0.033	0.030	1.40	626.89	1.77
103	1020	0.004	0.033	6.829	4.213	0.029	6.591	0.033	0.030	1.40	627.28	1.71
104	1030	0.004	0.033	6.862	4.242	0.029	6.623	0.033	0.030	1.40	627.66	1.67
105	1040	0.004	0.033	6.895	4.271	0.029	6.656	0.033	0.030	1.40	628.04	1.63
106	1050	0.004	0.033	6.927	4.300	0.029	6.688	0.033	0.030	1.40	628.41	1.59
107	1060	0.004	0.033	6.960	4.330	0.029	6.721	0.033	0.030	1.40	628.79	1.57
108	1070	0.004	0.033	6.992	4.359	0.029	6.753	0.033	0.030	1.40	629.15	1.54
109	1080	0.004	0.033	7.025	4.388	0.029	6.786	0.033	0.030	1.40	629.52	1.52
110	1090	0.004	0.033	7.057	4.417	0.029	6.818	0.033	0.030	1.40	629.88	1.50
111	1100	0.004	0.033	7.090	4.447	0.029	6.851	0.033	0.030	1.40	630.23	1.49
112	1110	0.004	0.033	7.123	4.476	0.029	6.883	0.033	0.030	1.41	630.58	1.48
113	1120	0.004	0.033	7.155	4.505	0.029	6.916	0.033	0.030	1.41	630.93	1.47
114	1130	0.004	0.033	7.188	4.535	0.029	6.948	0.033	0.030	1.41	631.28	1.46
115	1140	0.004	0.033	7.220	4.564	0.029	6.981	0.033	0.030	1.41	631.62	1.45
116	1150	0.004	0.033	7.253	4.594	0.029	7.013	0.033	0.030	1.41	631.96	1.44
117	1160	0.004	0.033	7.285	4.623	0.029	7.046	0.033	0.030	1.41	632.29	1.44
118	1170	0.004	0.033	7.318	4.653	0.029	7.079	0.033	0.030	1.41	632.62	1.43
119	1180	0.004	0.033	7.350	4.682	0.029	7.111	0.033	0.030	1.41	632.95	1.43
120	1190	0.004	0.033	7.383	4.712	0.030	7.144	0.033	0.030	1.41	633.27	1.43
121	1200	0.004	0.033	7.416	4.741	0.030	7.176	0.033	0.030	1.41	633.60	1.43
122	1210	0.004	0.033	7.448	4.771	0.030	7.209	0.033	0.030	1.41	633.91	1.42
123	1220	0.004	0.033	7.481	4.800	0.030	7.241	0.033	0.030	1.41	634.23	1.42
124	1230	0.004	0.033	7.513	4.830	0.030	7.274	0.033	0.030	1.41	634.54	1.42
125	1240	0.004	0.033	7.546	4.859	0.030	7.306	0.033	0.030	1.41	634.85	1.42
126	1250	0.004	0.033	7.578	4.889	0.030	7.339	0.033	0.030	1.42	635.16	1.42
127	1260	0.004	0.033	7.611	4.919	0.030	7.371	0.033	0.030	1.42	635.46	1.42
128	1270	0.004	0.033	7.643	4.948	0.030	7.404	0.033	0.030	1.42	635.76	1.42
129	1280	0.004	0.033	7.676	4.978	0.030	7.436	0.033	0.030	1.42	636.06	1.42
130	1290	0.004	0.033	7.709	5.008	0.030	7.469	0.033	0.030	1.42	636.35	1.42
131	1300	0.004	0.033	7.741	5.037	0.030	7.502	0.033	0.030	1.42	636.64	1.42
132	1310	0.004	0.033	7.774	5.067	0.030	7.534	0.033	0.030	1.42	636.93	1.42
133	1320	0.004	0.033	7.806	5.097	0.030	7.567	0.033	0.030	1.42	637.21	1.42
134	1330	0.004	0.033	7.839	5.127	0.030	7.599	0.033	0.030	1.42	637.50	1.42
135	1340	0.004	0.033	7.871	5.156	0.030	7.632	0.033	0.030	1.42	637.78	1.42
136	1350	0.004	0.033	7.904	5.186	0.030	7.664	0.033	0.030	1.42	638.06	1.42
137	1360	0.004	0.033	7.937	5.216	0.030	7.697	0.033	0.030	1.42	638.33	1.42
138	1370	0.004	0.033	7.969	5.246	0.030	7.729	0.033	0.031	1.42	638.60	1.42
139	1380	0.004	0.033	8.002	5.276	0.030	7.762	0.033	0.031	1.42	638.87	1.42
140	1390	0.004	0.033	8.034	5.306	0.030	7.794	0.033	0.031	1.42	639.14	1.42
141	1400	0.004	0.033	8.067	5.336	0.030	7.827	0.033	0.031	1.42	639.40	1.42
142	1410	0.004	0.033	8.099	5.366	0.030	7.859	0.033	0.031	1.43	639.67	1.42
143	1420	0.004	0.033	8.132	5.395	0.030	7.892	0.033	0.031	1.43	639.93	1.42
144	1430	0.004	0.033	8.164	5.425	0.030	7.925	0.033	0.031	1.43	640.18	1.42
145	1440	0.004	0.033	8.197	5.455	0.030	7.957	0.033	0.031	1.43	640.44	1.42

Peak Flow	**16.10**	**7223.63**	**6.21**

Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Purpose:

Determine the stormwater runoff volume required for: Post-Development Conditions (Basin #2)

Assumptions:

1. Runoff volume is computed with the Santa Barbara Urban Hydrograph Method (SBUH)
2. 2-year/ 24-hour design storm event
3. 25-year/ 24-hour design storm event
4. 50-year/ 24-hour design storm event
5. 100-year/ 24-hour design storm event
6. Total Basin Area 9.3 acres
7. Design storm precipitation depths obtained using PF Data Server, lat39.4126 long-123.7548
8. Areas used for subbasins estimated using proposed site development plan
9. Slopes for time of concentration calculation assumed to be 6% based on LACO field study dated 6/7/2012
10. Soil assumed to be of soil group D, with an average antecedent soil moisture condition
11. Ground coverage for pervious area assumed to be woods in good condition
12. Drainage length assumed to originate from the center of the line which splits the parcel from the southwest corner to the northeast corner, and terminates at the drainage basin
13. Manning roughness coefficient assumed to be 0.6, which is the middle range for woods underbrush (0.4 < n < 0.8)
14. Cuve numbers determined using TR-55 Documentation

Methodology:

1. Determine the runoff volume for the design storm event using the SBUH method

References:

1. Urban Hydrology for Small Watersheds, Technical Release 55
   Natural Resource Conservation Service, USDA 1986
2. Handbook of Hydrology (1993), Maidment, D.
   McGraw-Hill Publishing, New York, NY
3. Open Channel Hydraulics
   Chow, V.T. 1959, McGraw-Hill Book Company
4. NOAA Atlas 14, Volume 6, Version 2
   http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_printpage.html

Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Input Variables:

Basin Number	=	2	**Post-Development Conditions (Basin #2)**	
Total Area	=	9.33	ac	
Precipitation (Quantity)	=	3.75	in	(2-yr. 24-hr event)
Precipitation (Quantity)	=	6.69	in	(25-yr. 24-hr event)
Precipitation (Quantity)	=	7.43	in	(50-yr. 24-hr event)
Precipitation (Quantity)	=	8.14	in	(100-yr. 24-hr event)
Time Step	=	10	min	

Pervious Area:

Area	=	8.12	ac
CN	=	77	
S	=	2.99	(1000/CN)-10
0.2S	=	0.60	

Impervious Area:

Area	=	1.2	ac
CN	=	98	
S	=	0.20	(1000/CN)-10
0.2S	=	0.04	

Time of Concentration:

Drainage Length	=	300	ft
Average Slope	=	0.060	ft/ft
Manning's n	=	0.600	

T_c = 52.2 min (minimum of 5 minutes)

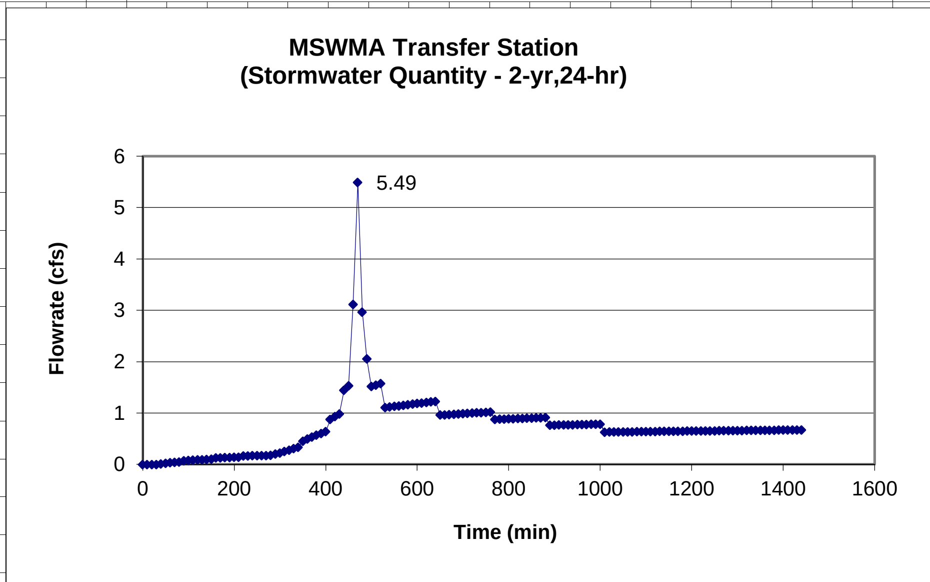
Routing Constant:

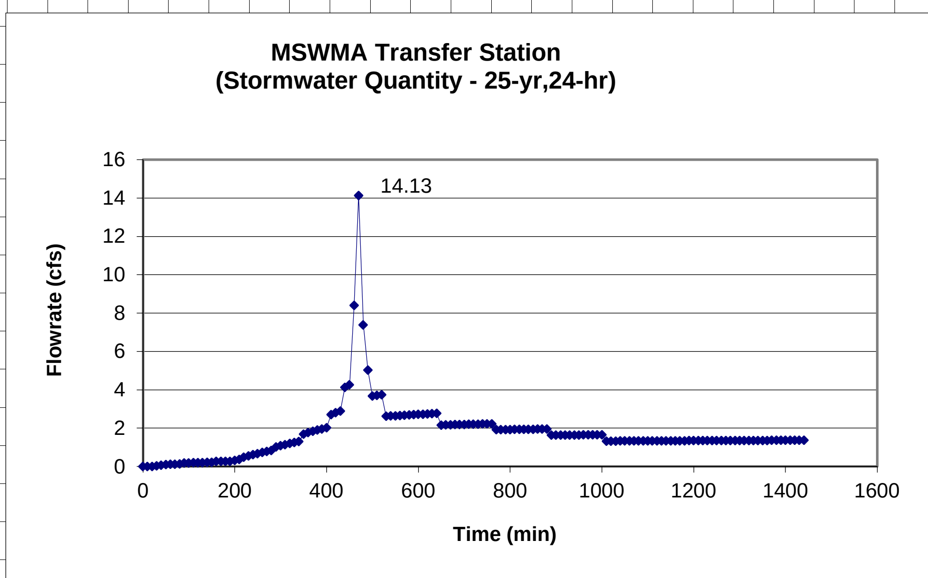
w = 0.087 dt/(2Tc+dt)

Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Results: **Post-Development Conditions (Basin #2)**

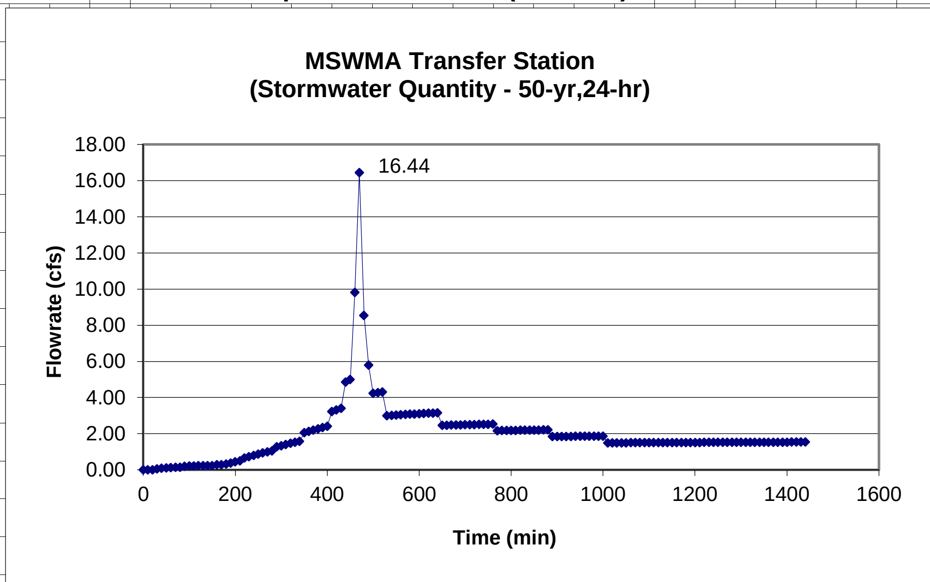


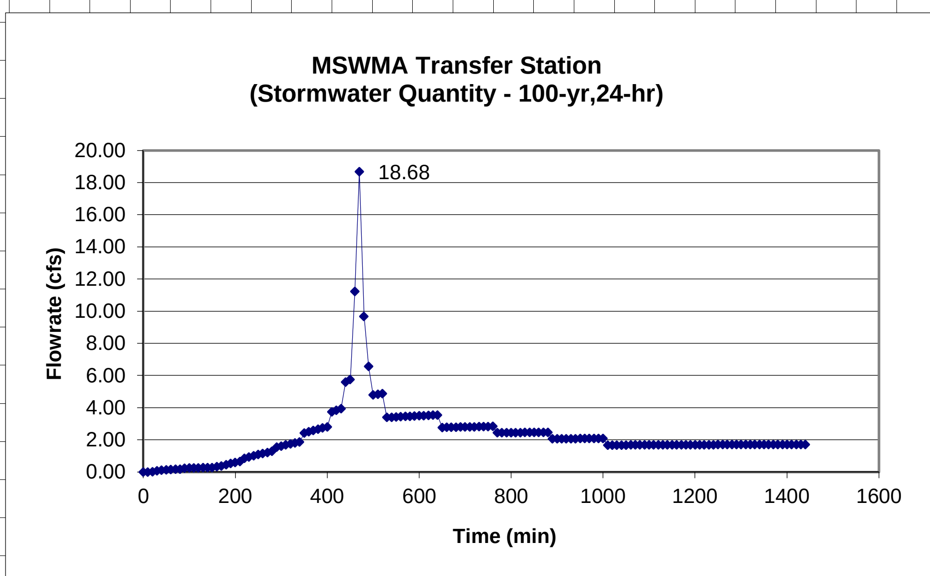


Client:	Mendocino Solid Waste Management Authority	Date:	August 4, 2014
Project:	Tranfer Station EIR	Proj. # :	8411065
Prepared by:	BB	Checked by:	DS

Santa Barbara Urban Hydrograph Method

Results: **Post-Development Conditions (Basin #2)**





Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Post-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.015	0.015	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.015	0.030	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
4	30	0.004	0.015	0.045	0.000	0.000	0.000	0.000	0.000	0.00	0.28	0.00
5	40	0.004	0.015	0.060	0.000	0.000	0.002	0.002	0.000	0.01	5.14	0.00
6	50	0.004	0.015	0.075	0.000	0.000	0.005	0.003	0.000	0.02	10.70	0.00
7	60	0.004	0.015	0.090	0.000	0.000	0.010	0.005	0.001	0.03	15.27	0.01
8	70	0.004	0.015	0.105	0.000	0.000	0.015	0.006	0.001	0.04	19.07	0.01
9	80	0.004	0.015	0.120	0.000	0.000	0.022	0.007	0.001	0.05	22.27	0.02
10	90	0.005	0.019	0.139	0.000	0.000	0.032	0.010	0.001	0.07	31.61	0.03
11	100	0.005	0.019	0.158	0.000	0.000	0.042	0.011	0.001	0.08	35.12	0.03
12	110	0.005	0.019	0.176	0.000	0.000	0.054	0.012	0.002	0.08	38.04	0.04
13	120	0.005	0.019	0.195	0.000	0.000	0.066	0.012	0.002	0.09	40.51	0.05
14	130	0.005	0.019	0.214	0.000	0.000	0.079	0.013	0.002	0.09	42.61	0.06
15	140	0.005	0.019	0.233	0.000	0.000	0.093	0.014	0.002	0.10	44.41	0.06
16	150	0.005	0.019	0.251	0.000	0.000	0.107	0.014	0.002	0.10	45.96	0.07
17	160	0.006	0.023	0.274	0.000	0.000	0.124	0.017	0.002	0.13	56.93	0.08
18	170	0.006	0.023	0.296	0.000	0.000	0.142	0.018	0.002	0.13	58.59	0.09
19	180	0.006	0.023	0.319	0.000	0.000	0.160	0.018	0.002	0.13	60.02	0.10
20	190	0.006	0.023	0.341	0.000	0.000	0.179	0.019	0.002	0.14	61.26	0.10
21	200	0.006	0.023	0.364	0.000	0.000	0.198	0.019	0.002	0.14	62.34	0.11
22	210	0.006	0.023	0.386	0.000	0.000	0.217	0.019	0.002	0.14	63.29	0.11
23	220	0.007	0.026	0.413	0.000	0.000	0.240	0.023	0.003	0.17	74.89	0.12
24	230	0.007	0.026	0.439	0.000	0.000	0.263	0.023	0.003	0.17	75.88	0.13
25	240	0.007	0.026	0.465	0.000	0.000	0.286	0.023	0.003	0.17	76.75	0.14
26	250	0.007	0.026	0.491	0.000	0.000	0.310	0.024	0.003	0.17	77.51	0.14
27	260	0.007	0.026	0.518	0.000	0.000	0.334	0.024	0.003	0.17	78.18	0.15
28	270	0.007	0.026	0.544	0.000	0.000	0.358	0.024	0.003	0.18	78.78	0.15
29	280	0.007	0.026	0.570	0.000	0.000	0.382	0.024	0.003	0.18	79.31	0.16
30	290	0.008	0.030	0.600	0.000	0.000	0.410	0.028	0.004	0.20	91.28	0.16
31	300	0.008	0.030	0.630	0.000	0.000	0.438	0.028	0.004	0.22	99.49	0.17
32	310	0.008	0.030	0.660	0.001	0.001	0.466	0.028	0.004	0.25	112.85	0.18
33	320	0.008	0.030	0.690	0.003	0.001	0.494	0.028	0.005	0.28	125.78	0.20
34	330	0.008	0.030	0.720	0.005	0.002	0.522	0.028	0.005	0.31	138.30	0.21
35	340	0.008	0.030	0.750	0.007	0.003	0.551	0.028	0.006	0.34	150.43	0.23
36	350	0.01	0.038	0.788	0.011	0.004	0.586	0.036	0.008	0.46	204.54	0.26
37	360	0.01	0.038	0.825	0.016	0.005	0.622	0.036	0.009	0.50	222.25	0.30
38	370	0.01	0.038	0.863	0.022	0.005	0.658	0.036	0.009	0.53	239.30	0.34
39	380	0.01	0.038	0.900	0.028	0.006	0.694	0.036	0.010	0.57	255.75	0.37
40	390	0.01	0.038	0.938	0.035	0.007	0.730	0.036	0.011	0.61	271.61	0.41
41	400	0.01	0.038	0.975	0.042	0.008	0.767	0.036	0.011	0.64	286.93	0.45

Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Post-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
42	410	0.013	0.049	1.024	0.053	0.011	0.814	0.047	0.016	0.88	395.04	0.50
43	420	0.013	0.049	1.073	0.065	0.012	0.861	0.047	0.017	0.93	418.94	0.57
44	430	0.013	0.049	1.121	0.078	0.013	0.909	0.047	0.017	0.98	441.82	0.64
45	440	0.018	0.068	1.189	0.098	0.020	0.975	0.066	0.026	1.44	647.75	0.74
46	450	0.018	0.068	1.256	0.119	0.021	1.041	0.066	0.027	1.53	687.39	0.87
47	460	0.034	0.128	1.384	0.164	0.045	1.166	0.125	0.055	3.12	1398.90	1.13
48	470	0.054	0.203	1.586	0.246	0.082	1.365	0.199	0.097	5.49	2464.49	1.68
49	480	0.027	0.101	1.688	0.291	0.046	1.465	0.100	0.053	2.97	1332.00	2.13
50	490	0.018	0.068	1.755	0.323	0.032	1.532	0.067	0.036	2.05	921.60	2.19
51	500	0.013	0.049	1.804	0.347	0.024	1.580	0.048	0.027	1.52	681.44	2.12
52	510	0.013	0.049	1.853	0.371	0.024	1.628	0.048	0.027	1.55	694.21	2.02
53	520	0.013	0.049	1.901	0.396	0.025	1.677	0.048	0.028	1.57	706.54	1.94
54	530	0.009	0.034	1.935	0.414	0.018	1.710	0.033	0.020	1.11	496.15	1.83
55	540	0.009	0.034	1.969	0.431	0.018	1.743	0.033	0.020	1.12	501.72	1.71
56	550	0.009	0.034	2.003	0.450	0.018	1.777	0.033	0.020	1.13	507.17	1.61
57	560	0.009	0.034	2.036	0.468	0.018	1.810	0.033	0.020	1.14	512.49	1.52
58	570	0.009	0.034	2.070	0.486	0.018	1.844	0.033	0.020	1.15	517.68	1.46
59	580	0.009	0.034	2.104	0.505	0.019	1.877	0.033	0.021	1.16	522.77	1.41
60	590	0.009	0.034	2.138	0.524	0.019	1.911	0.033	0.021	1.18	527.73	1.36
61	600	0.009	0.034	2.171	0.543	0.019	1.944	0.033	0.021	1.19	532.59	1.33
62	610	0.009	0.034	2.205	0.562	0.019	1.978	0.033	0.021	1.20	537.34	1.31
63	620	0.009	0.034	2.239	0.582	0.020	2.011	0.034	0.021	1.21	541.98	1.29
64	630	0.009	0.034	2.273	0.602	0.020	2.045	0.034	0.022	1.22	546.52	1.28
65	640	0.009	0.034	2.306	0.622	0.020	2.078	0.034	0.022	1.23	550.97	1.27
66	650	0.007	0.026	2.333	0.638	0.016	2.104	0.026	0.017	0.96	431.54	1.24
67	660	0.007	0.026	2.359	0.653	0.016	2.130	0.026	0.017	0.97	434.13	1.19
68	670	0.007	0.026	2.385	0.669	0.016	2.156	0.026	0.017	0.97	436.67	1.15
69	680	0.007	0.026	2.411	0.685	0.016	2.183	0.026	0.017	0.98	439.17	1.12
70	690	0.007	0.026	2.438	0.701	0.016	2.209	0.026	0.017	0.98	441.64	1.10
71	700	0.007	0.026	2.464	0.718	0.016	2.235	0.026	0.018	0.99	444.06	1.08
72	710	0.007	0.026	2.490	0.734	0.016	2.261	0.026	0.018	0.99	446.44	1.06
73	720	0.007	0.026	2.516	0.751	0.016	2.287	0.026	0.018	1.00	448.78	1.05
74	730	0.007	0.026	2.543	0.767	0.017	2.313	0.026	0.018	1.01	451.09	1.04
75	740	0.007	0.026	2.569	0.784	0.017	2.339	0.026	0.018	1.01	453.36	1.04
76	750	0.007	0.026	2.595	0.801	0.017	2.365	0.026	0.018	1.02	455.59	1.03
77	760	0.007	0.026	2.621	0.817	0.017	2.391	0.026	0.018	1.02	457.79	1.03
78	770	0.006	0.023	2.644	0.832	0.015	2.414	0.022	0.016	0.88	394.11	1.02
79	780	0.006	0.023	2.666	0.847	0.015	2.436	0.022	0.016	0.88	395.68	0.99
80	790	0.006	0.023	2.689	0.861	0.015	2.458	0.022	0.016	0.89	397.23	0.97
81	800	0.006	0.023	2.711	0.876	0.015	2.481	0.022	0.016	0.89	398.76	0.96
82	810	0.006	0.023	2.734	0.891	0.015	2.503	0.022	0.016	0.89	400.26	0.95

Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Post-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
83	820	0.006	0.023	2.756	0.906	0.015	2.526	0.022	0.016	0.90	401.75	0.94
84	830	0.006	0.023	2.779	0.921	0.015	2.548	0.022	0.016	0.90	403.22	0.93
85	840	0.006	0.023	2.801	0.936	0.015	2.570	0.022	0.016	0.90	404.66	0.92
86	850	0.006	0.023	2.824	0.951	0.015	2.593	0.022	0.016	0.90	406.09	0.92
87	860	0.006	0.023	2.846	0.966	0.015	2.615	0.022	0.016	0.91	407.50	0.92
88	870	0.006	0.023	2.869	0.981	0.015	2.638	0.022	0.016	0.91	408.90	0.92
89	880	0.006	0.023	2.891	0.996	0.015	2.660	0.022	0.016	0.91	410.27	0.92
90	890	0.005	0.019	2.910	1.009	0.013	2.679	0.019	0.014	0.76	342.93	0.90
91	900	0.005	0.019	2.929	1.022	0.013	2.697	0.019	0.014	0.77	343.86	0.88
92	910	0.005	0.019	2.948	1.035	0.013	2.716	0.019	0.014	0.77	344.79	0.86
93	920	0.005	0.019	2.966	1.048	0.013	2.735	0.019	0.014	0.77	345.70	0.84
94	930	0.005	0.019	2.985	1.061	0.013	2.753	0.019	0.014	0.77	346.60	0.83
95	940	0.005	0.019	3.004	1.074	0.013	2.772	0.019	0.014	0.77	347.50	0.82
96	950	0.005	0.019	3.023	1.087	0.013	2.791	0.019	0.014	0.78	348.38	0.81
97	960	0.005	0.019	3.041	1.100	0.013	2.809	0.019	0.014	0.78	349.26	0.81
98	970	0.005	0.019	3.060	1.113	0.013	2.828	0.019	0.014	0.78	350.12	0.80
99	980	0.005	0.019	3.079	1.126	0.013	2.847	0.019	0.014	0.78	350.98	0.80
100	990	0.005	0.019	3.098	1.139	0.013	2.865	0.019	0.014	0.78	351.83	0.80
101	1000	0.005	0.019	3.116	1.152	0.013	2.884	0.019	0.014	0.79	352.67	0.79
102	1010	0.004	0.015	3.131	1.163	0.011	2.899	0.015	0.011	0.63	282.74	0.78
103	1020	0.004	0.015	3.146	1.174	0.011	2.914	0.015	0.011	0.63	283.26	0.75
104	1030	0.004	0.015	3.161	1.184	0.011	2.929	0.015	0.011	0.63	283.79	0.73
105	1040	0.004	0.015	3.176	1.195	0.011	2.944	0.015	0.011	0.63	284.31	0.71
106	1050	0.004	0.015	3.191	1.206	0.011	2.959	0.015	0.011	0.63	284.82	0.70
107	1060	0.004	0.015	3.206	1.216	0.011	2.974	0.015	0.011	0.64	285.33	0.69
108	1070	0.004	0.015	3.221	1.227	0.011	2.989	0.015	0.011	0.64	285.84	0.68
109	1080	0.004	0.015	3.236	1.238	0.011	3.004	0.015	0.011	0.64	286.34	0.67
110	1090	0.004	0.015	3.251	1.249	0.011	3.019	0.015	0.011	0.64	286.84	0.67
111	1100	0.004	0.015	3.266	1.259	0.011	3.033	0.015	0.011	0.64	287.33	0.66
112	1110	0.004	0.015	3.281	1.270	0.011	3.048	0.015	0.011	0.64	287.83	0.66
113	1120	0.004	0.015	3.296	1.281	0.011	3.063	0.015	0.011	0.64	288.31	0.66
114	1130	0.004	0.015	3.311	1.292	0.011	3.078	0.015	0.011	0.64	288.80	0.65
115	1140	0.004	0.015	3.326	1.303	0.011	3.093	0.015	0.011	0.64	289.27	0.65
116	1150	0.004	0.015	3.341	1.314	0.011	3.108	0.015	0.011	0.65	289.75	0.65
117	1160	0.004	0.015	3.356	1.325	0.011	3.123	0.015	0.011	0.65	290.22	0.65
118	1170	0.004	0.015	3.371	1.336	0.011	3.138	0.015	0.011	0.65	290.69	0.65
119	1180	0.004	0.015	3.386	1.347	0.011	3.153	0.015	0.011	0.65	291.15	0.65
120	1190	0.004	0.015	3.401	1.358	0.011	3.168	0.015	0.012	0.65	291.62	0.65
121	1200	0.004	0.015	3.416	1.369	0.011	3.183	0.015	0.012	0.65	292.07	0.65
122	1210	0.004	0.015	3.431	1.380	0.011	3.198	0.015	0.012	0.65	292.53	0.65
123	1220	0.004	0.015	3.446	1.391	0.011	3.213	0.015	0.012	0.65	292.98	0.65

Santa Barbara Urban Hydrograph Method

Quantity Calculations (2 yr / 24-hour Storm)

Post-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
124	1230	0.004	0.015	3.461	1.402	0.011	3.228	0.015	0.012	0.65	293.42	0.65
125	1240	0.004	0.015	3.476	1.413	0.011	3.243	0.015	0.012	0.65	293.87	0.65
126	1250	0.004	0.015	3.491	1.424	0.011	3.258	0.015	0.012	0.66	294.31	0.65
127	1260	0.004	0.015	3.506	1.435	0.011	3.273	0.015	0.012	0.66	294.74	0.65
128	1270	0.004	0.015	3.521	1.446	0.011	3.288	0.015	0.012	0.66	295.18	0.65
129	1280	0.004	0.015	3.536	1.457	0.011	3.303	0.015	0.012	0.66	295.61	0.65
130	1290	0.004	0.015	3.551	1.469	0.011	3.318	0.015	0.012	0.66	296.03	0.66
131	1300	0.004	0.015	3.566	1.480	0.011	3.333	0.015	0.012	0.66	296.46	0.66
132	1310	0.004	0.015	3.581	1.491	0.011	3.347	0.015	0.012	0.66	296.88	0.66
133	1320	0.004	0.015	3.596	1.502	0.011	3.362	0.015	0.012	0.66	297.29	0.66
134	1330	0.004	0.015	3.611	1.514	0.011	3.377	0.015	0.012	0.66	297.71	0.66
135	1340	0.004	0.015	3.626	1.525	0.011	3.392	0.015	0.012	0.66	298.12	0.66
136	1350	0.004	0.015	3.641	1.536	0.011	3.407	0.015	0.012	0.67	298.53	0.66
137	1360	0.004	0.015	3.656	1.548	0.011	3.422	0.015	0.012	0.67	298.93	0.66
138	1370	0.004	0.015	3.671	1.559	0.011	3.437	0.015	0.012	0.67	299.33	0.66
139	1380	0.004	0.015	3.686	1.570	0.011	3.452	0.015	0.012	0.67	299.73	0.66
140	1390	0.004	0.015	3.701	1.582	0.011	3.467	0.015	0.012	0.67	300.13	0.66
141	1400	0.004	0.015	3.716	1.593	0.011	3.482	0.015	0.012	0.67	300.52	0.66
142	1410	0.004	0.015	3.731	1.605	0.011	3.497	0.015	0.012	0.67	300.91	0.67
143	1420	0.004	0.015	3.746	1.616	0.011	3.512	0.015	0.012	0.67	301.30	0.67
144	1430	0.004	0.015	3.761	1.627	0.011	3.527	0.015	0.012	0.67	301.68	0.67
145	1440	0.004	0.015	3.776	1.639	0.011	3.542	0.015	0.012	0.67	302.06	0.67

Peak Flow	**5.49**	**2464.49**	**2.19**

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

Post-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.027	0.054	0.000	0.000	0.001	0.001	0.000	0.01	2.45	0.00
4	30	0.004	0.027	0.080	0.000	0.000	0.006	0.006	0.001	0.04	18.56	0.00
5	40	0.004	0.027	0.107	0.000	0.000	0.016	0.010	0.001	0.07	32.30	0.01
6	50	0.004	0.027	0.134	0.000	0.000	0.029	0.013	0.002	0.09	42.32	0.03
7	60	0.004	0.027	0.161	0.000	0.000	0.044	0.015	0.002	0.11	49.85	0.04
8	70	0.004	0.027	0.187	0.000	0.000	0.061	0.017	0.002	0.12	55.66	0.05
9	80	0.004	0.027	0.214	0.000	0.000	0.080	0.018	0.002	0.13	60.24	0.07
10	90	0.005	0.033	0.248	0.000	0.000	0.104	0.024	0.003	0.18	80.37	0.08
11	100	0.005	0.033	0.281	0.000	0.000	0.130	0.026	0.003	0.19	84.82	0.10
12	110	0.005	0.033	0.314	0.000	0.000	0.157	0.027	0.003	0.20	88.33	0.12
13	120	0.005	0.033	0.348	0.000	0.000	0.184	0.028	0.004	0.20	91.15	0.13
14	130	0.005	0.033	0.381	0.000	0.000	0.213	0.028	0.004	0.21	93.46	0.14
15	140	0.005	0.033	0.415	0.000	0.000	0.242	0.029	0.004	0.21	95.36	0.16
16	150	0.005	0.033	0.448	0.000	0.000	0.271	0.030	0.004	0.22	96.95	0.17
17	160	0.006	0.040	0.488	0.000	0.000	0.307	0.036	0.005	0.26	118.09	0.18
18	170	0.006	0.040	0.529	0.000	0.000	0.344	0.036	0.005	0.27	119.69	0.19
19	180	0.006	0.040	0.569	0.000	0.000	0.381	0.037	0.005	0.27	121.03	0.21
20	190	0.006	0.040	0.609	0.000	0.000	0.418	0.037	0.005	0.27	123.11	0.22
21	200	0.006	0.040	0.649	0.001	0.001	0.455	0.037	0.006	0.32	141.43	0.23
22	210	0.006	0.040	0.689	0.003	0.002	0.493	0.038	0.007	0.37	164.85	0.25
23	220	0.007	0.047	0.736	0.006	0.003	0.537	0.044	0.009	0.49	220.63	0.28
24	230	0.007	0.047	0.783	0.011	0.005	0.582	0.045	0.010	0.56	249.72	0.32
25	240	0.007	0.047	0.830	0.017	0.006	0.627	0.045	0.011	0.62	277.46	0.37
26	250	0.007	0.047	0.876	0.024	0.007	0.672	0.045	0.012	0.68	303.95	0.42
27	260	0.007	0.047	0.923	0.032	0.008	0.717	0.045	0.013	0.73	329.25	0.47
28	270	0.007	0.047	0.970	0.041	0.009	0.762	0.045	0.014	0.79	353.46	0.52
29	280	0.007	0.047	1.017	0.052	0.010	0.807	0.045	0.015	0.84	376.63	0.57
30	290	0.008	0.054	1.070	0.065	0.013	0.859	0.052	0.018	1.02	457.56	0.63
31	300	0.008	0.054	1.124	0.079	0.014	0.911	0.052	0.019	1.08	485.19	0.71
32	310	0.008	0.054	1.177	0.094	0.015	0.964	0.052	0.020	1.14	511.55	0.78
33	320	0.008	0.054	1.231	0.111	0.017	1.016	0.052	0.021	1.20	536.71	0.85
34	330	0.008	0.054	1.284	0.128	0.018	1.068	0.052	0.022	1.25	560.75	0.91
35	340	0.008	0.054	1.338	0.147	0.019	1.121	0.052	0.023	1.30	583.73	0.98
36	350	0.01	0.067	1.405	0.172	0.025	1.187	0.066	0.030	1.69	760.48	1.07
37	360	0.01	0.067	1.472	0.198	0.026	1.252	0.066	0.031	1.77	793.04	1.18
38	370	0.01	0.067	1.539	0.226	0.028	1.318	0.066	0.033	1.84	823.91	1.29
39	380	0.01	0.067	1.606	0.254	0.029	1.384	0.066	0.034	1.90	853.22	1.39
40	390	0.01	0.067	1.673	0.285	0.030	1.450	0.066	0.035	1.96	881.06	1.49
41	400	0.01	0.067	1.739	0.316	0.031	1.516	0.066	0.036	2.02	907.54	1.57

Santa Barbara Urban Hydrograph Method
Quantity Calculations (25 yr / 24-hour Storm)
Post-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
42	410	0.013	0.087	1.826	0.358	0.042	1.602	0.086	0.048	2.71	1217.29	1.71
43	420	0.013	0.087	1.913	0.402	0.044	1.688	0.086	0.050	2.80	1257.28	1.90
44	430	0.013	0.087	2.000	0.448	0.046	1.775	0.086	0.051	2.89	1294.88	2.06
45	440	0.018	0.120	2.121	0.514	0.066	1.894	0.119	0.073	4.12	1850.90	2.31
46	450	0.018	0.120	2.241	0.583	0.069	2.014	0.120	0.076	4.26	1913.46	2.64
47	460	0.034	0.227	2.469	0.721	0.137	2.240	0.226	0.149	8.40	3768.46	3.29
48	470	0.054	0.361	2.830	0.955	0.234	2.599	0.359	0.250	14.13	6343.04	4.68
49	480	0.027	0.181	3.011	1.078	0.123	2.779	0.180	0.131	7.38	3312.67	5.74
50	490	0.018	0.120	3.131	1.163	0.084	2.899	0.120	0.089	5.02	2254.44	5.82
51	500	0.013	0.087	3.218	1.225	0.062	2.985	0.087	0.065	3.68	1649.50	5.57
52	510	0.013	0.087	3.305	1.287	0.063	3.072	0.087	0.066	3.71	1666.43	5.24
53	520	0.013	0.087	3.392	1.351	0.063	3.159	0.087	0.066	3.75	1682.60	4.98
54	530	0.009	0.060	3.452	1.395	0.044	3.219	0.060	0.046	2.62	1173.97	4.66
55	540	0.009	0.060	3.512	1.440	0.045	3.279	0.060	0.047	2.63	1181.15	4.31
56	550	0.009	0.060	3.572	1.485	0.045	3.339	0.060	0.047	2.65	1188.11	4.01
57	560	0.009	0.060	3.633	1.530	0.045	3.399	0.060	0.047	2.66	1194.86	3.78
58	570	0.009	0.060	3.693	1.575	0.046	3.459	0.060	0.047	2.68	1201.40	3.58
59	580	0.009	0.060	3.753	1.621	0.046	3.519	0.060	0.048	2.69	1207.76	3.43
60	590	0.009	0.060	3.813	1.667	0.046	3.579	0.060	0.048	2.70	1213.93	3.30
61	600	0.009	0.060	3.874	1.714	0.046	3.639	0.060	0.048	2.72	1219.92	3.20
62	610	0.009	0.060	3.934	1.760	0.047	3.699	0.060	0.048	2.73	1225.74	3.11
63	620	0.009	0.060	3.994	1.807	0.047	3.759	0.060	0.049	2.74	1231.40	3.05
64	630	0.009	0.060	4.054	1.854	0.047	3.819	0.060	0.049	2.76	1236.90	3.00
65	640	0.009	0.060	4.114	1.902	0.047	3.879	0.060	0.049	2.77	1242.24	2.95
66	650	0.007	0.047	4.161	1.939	0.037	3.926	0.047	0.038	2.16	969.79	2.87
67	660	0.007	0.047	4.208	1.976	0.037	3.973	0.047	0.038	2.17	972.87	2.75
68	670	0.007	0.047	4.255	2.013	0.037	4.019	0.047	0.039	2.17	975.88	2.65
69	680	0.007	0.047	4.302	2.051	0.037	4.066	0.047	0.039	2.18	978.83	2.56
70	690	0.007	0.047	4.349	2.088	0.038	4.113	0.047	0.039	2.19	981.71	2.50
71	700	0.007	0.047	4.395	2.126	0.038	4.160	0.047	0.039	2.19	984.54	2.44
72	710	0.007	0.047	4.442	2.164	0.038	4.206	0.047	0.039	2.20	987.31	2.40
73	720	0.007	0.047	4.489	2.202	0.038	4.253	0.047	0.039	2.21	990.02	2.37
74	730	0.007	0.047	4.536	2.240	0.038	4.300	0.047	0.039	2.21	992.68	2.34
75	740	0.007	0.047	4.583	2.278	0.038	4.347	0.047	0.039	2.22	995.28	2.32
76	750	0.007	0.047	4.629	2.316	0.038	4.393	0.047	0.039	2.22	997.83	2.30
77	760	0.007	0.047	4.676	2.355	0.038	4.440	0.047	0.039	2.23	1000.33	2.29
78	770	0.006	0.040	4.716	2.388	0.033	4.480	0.040	0.034	1.91	859.38	2.25
79	780	0.006	0.040	4.757	2.421	0.033	4.520	0.040	0.034	1.92	861.15	2.19
80	790	0.006	0.040	4.797	2.454	0.033	4.560	0.040	0.034	1.92	862.89	2.14
81	800	0.006	0.040	4.837	2.487	0.033	4.600	0.040	0.034	1.93	864.60	2.11
82	810	0.006	0.040	4.877	2.520	0.033	4.640	0.040	0.034	1.93	866.29	2.07

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

Post-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
83	820	0.006	0.040	4.917	2.554	0.033	4.680	0.040	0.034	1.93	867.94	2.05
84	830	0.006	0.040	4.957	2.587	0.033	4.721	0.040	0.034	1.94	869.57	2.03
85	840	0.006	0.040	4.997	2.621	0.034	4.761	0.040	0.034	1.94	871.17	2.01
86	850	0.006	0.040	5.038	2.654	0.034	4.801	0.040	0.034	1.94	872.75	2.00
87	860	0.006	0.040	5.078	2.688	0.034	4.841	0.040	0.035	1.95	874.30	1.99
88	870	0.006	0.040	5.118	2.722	0.034	4.881	0.040	0.035	1.95	875.83	1.98
89	880	0.006	0.040	5.158	2.756	0.034	4.921	0.040	0.035	1.95	877.33	1.98
90	890	0.005	0.033	5.191	2.784	0.028	4.954	0.033	0.029	1.63	732.23	1.95
91	900	0.005	0.033	5.225	2.812	0.028	4.988	0.033	0.029	1.63	733.25	1.89
92	910	0.005	0.033	5.258	2.841	0.028	5.021	0.033	0.029	1.64	734.25	1.85
93	920	0.005	0.033	5.292	2.869	0.028	5.055	0.033	0.029	1.64	735.23	1.81
94	930	0.005	0.033	5.325	2.897	0.028	5.088	0.033	0.029	1.64	736.21	1.78
95	940	0.005	0.033	5.359	2.926	0.028	5.121	0.033	0.029	1.64	737.17	1.76
96	950	0.005	0.033	5.392	2.954	0.029	5.155	0.033	0.029	1.64	738.11	1.74
97	960	0.005	0.033	5.426	2.983	0.029	5.188	0.033	0.029	1.65	739.05	1.72
98	970	0.005	0.033	5.459	3.011	0.029	5.222	0.033	0.029	1.65	739.97	1.71
99	980	0.005	0.033	5.492	3.040	0.029	5.255	0.033	0.029	1.65	740.89	1.70
100	990	0.005	0.033	5.526	3.069	0.029	5.288	0.033	0.029	1.65	741.79	1.69
101	1000	0.005	0.033	5.559	3.097	0.029	5.322	0.033	0.029	1.65	742.68	1.68
102	1010	0.004	0.027	5.586	3.120	0.023	5.348	0.027	0.023	1.33	594.77	1.65
103	1020	0.004	0.027	5.613	3.143	0.023	5.375	0.027	0.024	1.33	595.33	1.59
104	1030	0.004	0.027	5.640	3.166	0.023	5.402	0.027	0.024	1.33	595.88	1.55
105	1040	0.004	0.027	5.666	3.190	0.023	5.429	0.027	0.024	1.33	596.43	1.51
106	1050	0.004	0.027	5.693	3.213	0.023	5.455	0.027	0.024	1.33	596.97	1.48
107	1060	0.004	0.027	5.720	3.236	0.023	5.482	0.027	0.024	1.33	597.50	1.45
108	1070	0.004	0.027	5.747	3.259	0.023	5.509	0.027	0.024	1.33	598.03	1.43
109	1080	0.004	0.027	5.773	3.282	0.023	5.536	0.027	0.024	1.33	598.55	1.41
110	1090	0.004	0.027	5.800	3.305	0.023	5.562	0.027	0.024	1.33	599.07	1.40
111	1100	0.004	0.027	5.827	3.328	0.023	5.589	0.027	0.024	1.34	599.59	1.39
112	1110	0.004	0.027	5.854	3.352	0.023	5.616	0.027	0.024	1.34	600.10	1.38
113	1120	0.004	0.027	5.881	3.375	0.023	5.643	0.027	0.024	1.34	600.60	1.37
114	1130	0.004	0.027	5.907	3.398	0.023	5.669	0.027	0.024	1.34	601.10	1.37
115	1140	0.004	0.027	5.934	3.422	0.023	5.696	0.027	0.024	1.34	601.59	1.36
116	1150	0.004	0.027	5.961	3.445	0.023	5.723	0.027	0.024	1.34	602.08	1.36
117	1160	0.004	0.027	5.988	3.468	0.023	5.749	0.027	0.024	1.34	602.57	1.36
118	1170	0.004	0.027	6.014	3.492	0.023	5.776	0.027	0.024	1.34	603.05	1.35
119	1180	0.004	0.027	6.041	3.515	0.023	5.803	0.027	0.024	1.34	603.52	1.35
120	1190	0.004	0.027	6.068	3.538	0.023	5.830	0.027	0.024	1.35	603.99	1.35
121	1200	0.004	0.027	6.095	3.562	0.023	5.856	0.027	0.024	1.35	604.46	1.35
122	1210	0.004	0.027	6.121	3.585	0.023	5.883	0.027	0.024	1.35	604.92	1.35
123	1220	0.004	0.027	6.148	3.609	0.023	5.910	0.027	0.024	1.35	605.38	1.35

Santa Barbara Urban Hydrograph Method

Quantity Calculations (25 yr / 24-hour Storm)

Post-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
124	1230	0.004	0.027	6.175	3.632	0.023	5.937	0.027	0.024	1.35	605.83	1.35
125	1240	0.004	0.027	6.202	3.656	0.024	5.963	0.027	0.024	1.35	606.28	1.35
126	1250	0.004	0.027	6.228	3.679	0.024	5.990	0.027	0.024	1.35	606.73	1.35
127	1260	0.004	0.027	6.255	3.703	0.024	6.017	0.027	0.024	1.35	607.17	1.35
128	1270	0.004	0.027	6.282	3.726	0.024	6.043	0.027	0.024	1.35	607.61	1.35
129	1280	0.004	0.027	6.309	3.750	0.024	6.070	0.027	0.024	1.35	608.04	1.35
130	1290	0.004	0.027	6.335	3.774	0.024	6.097	0.027	0.024	1.36	608.47	1.35
131	1300	0.004	0.027	6.362	3.797	0.024	6.124	0.027	0.024	1.36	608.89	1.35
132	1310	0.004	0.027	6.389	3.821	0.024	6.150	0.027	0.024	1.36	609.31	1.35
133	1320	0.004	0.027	6.416	3.845	0.024	6.177	0.027	0.024	1.36	609.73	1.35
134	1330	0.004	0.027	6.442	3.868	0.024	6.204	0.027	0.024	1.36	610.14	1.36
135	1340	0.004	0.027	6.469	3.892	0.024	6.231	0.027	0.024	1.36	610.55	1.36
136	1350	0.004	0.027	6.496	3.916	0.024	6.257	0.027	0.024	1.36	610.96	1.36
137	1360	0.004	0.027	6.523	3.939	0.024	6.284	0.027	0.024	1.36	611.36	1.36
138	1370	0.004	0.027	6.550	3.963	0.024	6.311	0.027	0.024	1.36	611.76	1.36
139	1380	0.004	0.027	6.576	3.987	0.024	6.338	0.027	0.024	1.36	612.15	1.36
140	1390	0.004	0.027	6.603	4.011	0.024	6.364	0.027	0.024	1.36	612.55	1.36
141	1400	0.004	0.027	6.630	4.035	0.024	6.391	0.027	0.024	1.37	612.93	1.36
142	1410	0.004	0.027	6.657	4.058	0.024	6.418	0.027	0.024	1.37	613.32	1.36
143	1420	0.004	0.027	6.683	4.082	0.024	6.444	0.027	0.024	1.37	613.70	1.36
144	1430	0.004	0.027	6.710	4.106	0.024	6.471	0.027	0.024	1.37	614.08	1.36
145	1440	0.004	0.027	6.737	4.130	0.024	6.498	0.027	0.024	1.37	614.45	1.36

Peak Flow	**14.13**	**6343.04**	**5.82**

Santa Barbara Urban Hydrograph Method

Quantity Calculations (100 yr / 24-hour Storm)

Post-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
2	10	0.004	0.033	0.033	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
3	20	0.004	0.033	0.065	0.000	0.000	0.003	0.003	0.000	0.02	8.50	0.00
4	30	0.004	0.033	0.098	0.000	0.000	0.012	0.010	0.001	0.07	32.21	0.01
5	40	0.004	0.033	0.130	0.000	0.000	0.027	0.015	0.002	0.11	48.80	0.02
6	50	0.004	0.033	0.163	0.000	0.000	0.046	0.018	0.002	0.13	60.42	0.04
7	60	0.004	0.033	0.195	0.000	0.000	0.067	0.021	0.003	0.15	68.87	0.06
8	70	0.004	0.033	0.228	0.000	0.000	0.089	0.023	0.003	0.17	75.22	0.08
9	80	0.004	0.033	0.260	0.000	0.000	0.114	0.024	0.003	0.18	80.10	0.09
10	90	0.005	0.041	0.301	0.000	0.000	0.146	0.032	0.004	0.23	105.42	0.11
11	100	0.005	0.041	0.342	0.000	0.000	0.179	0.033	0.004	0.25	109.98	0.14
12	110	0.005	0.041	0.383	0.000	0.000	0.214	0.035	0.004	0.25	113.52	0.16
13	120	0.005	0.041	0.423	0.000	0.000	0.249	0.035	0.005	0.26	116.32	0.17
14	130	0.005	0.041	0.464	0.000	0.000	0.285	0.036	0.005	0.26	118.58	0.19
15	140	0.005	0.041	0.505	0.000	0.000	0.322	0.037	0.005	0.27	120.42	0.20
16	150	0.005	0.041	0.545	0.000	0.000	0.359	0.037	0.005	0.27	121.95	0.21
17	160	0.006	0.049	0.594	0.000	0.000	0.404	0.045	0.006	0.33	148.01	0.23
18	170	0.006	0.049	0.643	0.001	0.001	0.450	0.046	0.007	0.37	164.67	0.25
19	180	0.006	0.049	0.692	0.003	0.002	0.496	0.046	0.008	0.44	199.50	0.28
20	190	0.006	0.049	0.741	0.007	0.004	0.542	0.046	0.009	0.52	232.63	0.31
21	200	0.006	0.049	0.790	0.012	0.005	0.588	0.046	0.010	0.59	264.12	0.35
22	210	0.006	0.049	0.838	0.018	0.006	0.635	0.047	0.012	0.66	294.09	0.40
23	220	0.007	0.057	0.895	0.027	0.009	0.690	0.055	0.015	0.84	379.10	0.46
24	230	0.007	0.057	0.952	0.038	0.011	0.745	0.055	0.016	0.93	415.90	0.54
25	240	0.007	0.057	1.009	0.050	0.012	0.800	0.055	0.018	1.00	450.77	0.61
26	250	0.007	0.057	1.066	0.064	0.014	0.855	0.055	0.019	1.08	483.86	0.69
27	260	0.007	0.057	1.123	0.079	0.015	0.911	0.055	0.020	1.15	515.30	0.76
28	270	0.007	0.057	1.180	0.095	0.016	0.966	0.056	0.022	1.21	545.19	0.83
29	280	0.007	0.057	1.237	0.113	0.018	1.022	0.056	0.023	1.28	573.64	0.91
30	290	0.008	0.065	1.302	0.135	0.022	1.086	0.064	0.027	1.53	688.70	0.99
31	300	0.008	0.065	1.368	0.158	0.023	1.150	0.064	0.029	1.61	722.23	1.10
32	310	0.008	0.065	1.433	0.183	0.025	1.214	0.064	0.030	1.68	754.02	1.19
33	320	0.008	0.065	1.498	0.209	0.026	1.278	0.064	0.031	1.75	784.20	1.28
34	330	0.008	0.065	1.563	0.236	0.027	1.342	0.064	0.032	1.81	812.86	1.37
35	340	0.008	0.065	1.628	0.264	0.029	1.406	0.064	0.033	1.87	840.11	1.45
36	350	0.01	0.081	1.709	0.302	0.037	1.487	0.080	0.043	2.42	1086.47	1.57
37	360	0.01	0.081	1.791	0.341	0.039	1.567	0.080	0.044	2.51	1124.61	1.73
38	370	0.01	0.081	1.872	0.381	0.041	1.648	0.081	0.046	2.59	1160.55	1.87
39	380	0.01	0.081	1.954	0.423	0.042	1.728	0.081	0.047	2.66	1194.45	2.00
40	390	0.01	0.081	2.035	0.467	0.044	1.809	0.081	0.048	2.73	1226.47	2.12
41	400	0.01	0.081	2.116	0.512	0.045	1.890	0.081	0.050	2.80	1256.75	2.24
42	410	0.013	0.106	2.222	0.572	0.060	1.995	0.105	0.066	3.74	1676.39	2.42
43	420	0.013	0.106	2.328	0.635	0.062	2.100	0.105	0.068	3.84	1721.55	2.66
44	430	0.013	0.106	2.434	0.699	0.064	2.205	0.105	0.070	3.93	1763.73	2.87
45	440	0.018	0.147	2.580	0.791	0.092	2.351	0.146	0.099	5.59	2506.68	3.20

Santa Barbara Urban Hydrograph Method

Quantity Calculations (100 yr / 24-hour Storm)

Post-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
46	450	0.018	0.147	2.727	0.886	0.095	2.496	0.146	0.102	5.74	2575.83	3.63
47	460	0.034	0.277	3.004	1.074	0.187	2.772	0.276	0.199	11.22	5034.13	4.48
48	470	0.054	0.440	3.443	1.388	0.315	3.210	0.438	0.331	18.68	8381.50	6.31
49	480	0.027	0.220	3.663	1.553	0.164	3.429	0.219	0.171	9.67	4340.92	7.68
50	490	0.018	0.147	3.810	1.664	0.112	3.575	0.146	0.116	6.56	2942.32	7.76
51	500	0.013	0.106	3.915	1.746	0.082	3.681	0.106	0.085	4.78	2147.27	7.39
52	510	0.013	0.106	4.021	1.829	0.082	3.786	0.106	0.085	4.82	2164.90	6.94
53	520	0.013	0.106	4.127	1.912	0.083	3.892	0.106	0.086	4.86	2181.67	6.57
54	530	0.009	0.073	4.200	1.970	0.058	3.965	0.073	0.060	3.39	1519.78	6.15
55	540	0.009	0.073	4.274	2.028	0.058	4.038	0.073	0.060	3.40	1527.18	5.66
56	550	0.009	0.073	4.347	2.087	0.059	4.111	0.073	0.061	3.42	1534.34	5.27
57	560	0.009	0.073	4.420	2.146	0.059	4.184	0.073	0.061	3.43	1541.26	4.95
58	570	0.009	0.073	4.493	2.205	0.059	4.257	0.073	0.061	3.45	1547.96	4.68
59	580	0.009	0.073	4.567	2.265	0.060	4.330	0.073	0.061	3.46	1554.45	4.47
60	590	0.009	0.073	4.640	2.325	0.060	4.404	0.073	0.062	3.48	1560.74	4.30
61	600	0.009	0.073	4.713	2.385	0.060	4.477	0.073	0.062	3.49	1566.84	4.15
62	610	0.009	0.073	4.786	2.445	0.060	4.550	0.073	0.062	3.50	1572.74	4.04
63	620	0.009	0.073	4.860	2.506	0.061	4.623	0.073	0.062	3.52	1578.47	3.95
64	630	0.009	0.073	4.933	2.567	0.061	4.696	0.073	0.063	3.53	1584.02	3.87
65	640	0.009	0.073	5.006	2.628	0.061	4.769	0.073	0.063	3.54	1589.41	3.81
66	650	0.007	0.057	5.063	2.676	0.048	4.826	0.057	0.049	2.76	1239.84	3.70
67	660	0.007	0.057	5.120	2.724	0.048	4.883	0.057	0.049	2.77	1242.93	3.53
68	670	0.007	0.057	5.177	2.772	0.048	4.940	0.057	0.049	2.78	1245.95	3.40
69	680	0.007	0.057	5.234	2.820	0.048	4.997	0.057	0.049	2.78	1248.90	3.29
70	690	0.007	0.057	5.291	2.868	0.048	5.054	0.057	0.049	2.79	1251.79	3.20
71	700	0.007	0.057	5.348	2.917	0.048	5.111	0.057	0.050	2.80	1254.62	3.13
72	710	0.007	0.057	5.405	2.965	0.049	5.168	0.057	0.050	2.80	1257.38	3.07
73	720	0.007	0.057	5.462	3.014	0.049	5.224	0.057	0.050	2.81	1260.08	3.03
74	730	0.007	0.057	5.519	3.063	0.049	5.281	0.057	0.050	2.81	1262.73	2.99
75	740	0.007	0.057	5.576	3.112	0.049	5.338	0.057	0.050	2.82	1265.32	2.96
76	750	0.007	0.057	5.633	3.161	0.049	5.395	0.057	0.050	2.82	1267.85	2.93
77	760	0.007	0.057	5.690	3.210	0.049	5.452	0.057	0.050	2.83	1270.33	2.92
78	770	0.006	0.049	5.739	3.252	0.042	5.501	0.049	0.043	2.43	1090.78	2.87
79	780	0.006	0.049	5.788	3.294	0.042	5.550	0.049	0.043	2.43	1092.53	2.79
80	790	0.006	0.049	5.836	3.337	0.042	5.598	0.049	0.043	2.44	1094.25	2.73
81	800	0.006	0.049	5.885	3.379	0.042	5.647	0.049	0.043	2.44	1095.94	2.68
82	810	0.006	0.049	5.934	3.422	0.043	5.696	0.049	0.043	2.45	1097.60	2.64
83	820	0.006	0.049	5.983	3.464	0.043	5.745	0.049	0.043	2.45	1099.23	2.60
84	830	0.006	0.049	6.032	3.507	0.043	5.794	0.049	0.043	2.45	1100.83	2.58
85	840	0.006	0.049	6.081	3.550	0.043	5.842	0.049	0.044	2.46	1102.41	2.56
86	850	0.006	0.049	6.129	3.592	0.043	5.891	0.049	0.044	2.46	1103.96	2.54
87	860	0.006	0.049	6.178	3.635	0.043	5.940	0.049	0.044	2.46	1105.48	2.53
88	870	0.006	0.049	6.227	3.678	0.043	5.989	0.049	0.044	2.47	1106.97	2.51
89	880	0.006	0.049	6.276	3.721	0.043	6.038	0.049	0.044	2.47	1108.44	2.51
90	890	0.005	0.041	6.317	3.757	0.036	6.078	0.041	0.037	2.06	924.81	2.46

Santa Barbara Urban Hydrograph Method

Quantity Calculations (100 yr / 24-hour Storm)

Post-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	**Time (min)**	**Rainfall Distribution (fraction)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Accumulated Rainfall (in)**	**Incremental Rainfall (in)**	**Total Rainfall (in)**	**Instant Flowrate (cfs)**	**Instant Flowrate (gal/min)**	**Design Flowrate (cfs)**
91	900	0.005	0.041	6.357	3.793	0.036	6.119	0.041	0.037	2.06	925.79	2.39
92	910	0.005	0.041	6.398	3.829	0.036	6.159	0.041	0.037	2.06	926.77	2.34
93	920	0.005	0.041	6.439	3.865	0.036	6.200	0.041	0.037	2.07	927.73	2.29
94	930	0.005	0.041	6.479	3.901	0.036	6.241	0.041	0.037	2.07	928.68	2.25
95	940	0.005	0.041	6.520	3.937	0.036	6.281	0.041	0.037	2.07	929.62	2.22
96	950	0.005	0.041	6.561	3.973	0.036	6.322	0.041	0.037	2.07	930.54	2.19
97	960	0.005	0.041	6.602	4.009	0.036	6.363	0.041	0.037	2.08	931.45	2.17
98	970	0.005	0.041	6.642	4.046	0.036	6.403	0.041	0.037	2.08	932.35	2.16
99	980	0.005	0.041	6.683	4.082	0.036	6.444	0.041	0.037	2.08	933.23	2.14
100	990	0.005	0.041	6.724	4.118	0.036	6.485	0.041	0.037	2.08	934.11	2.13
101	1000	0.005	0.041	6.764	4.155	0.036	6.525	0.041	0.037	2.08	934.97	2.12
102	1010	0.004	0.033	6.797	4.184	0.029	6.558	0.033	0.030	1.67	748.59	2.08
103	1020	0.004	0.033	6.829	4.213	0.029	6.591	0.033	0.030	1.67	749.13	2.01
104	1030	0.004	0.033	6.862	4.242	0.029	6.623	0.033	0.030	1.67	749.66	1.95
105	1040	0.004	0.033	6.895	4.271	0.029	6.656	0.033	0.030	1.67	750.19	1.90
106	1050	0.004	0.033	6.927	4.300	0.029	6.688	0.033	0.030	1.67	750.71	1.86
107	1060	0.004	0.033	6.960	4.330	0.029	6.721	0.033	0.030	1.67	751.23	1.83
108	1070	0.004	0.033	6.992	4.359	0.029	6.753	0.033	0.030	1.67	751.74	1.80
109	1080	0.004	0.033	7.025	4.388	0.029	6.786	0.033	0.030	1.68	752.25	1.78
110	1090	0.004	0.033	7.057	4.417	0.029	6.818	0.033	0.030	1.68	752.75	1.76
111	1100	0.004	0.033	7.090	4.447	0.029	6.851	0.033	0.030	1.68	753.24	1.75
112	1110	0.004	0.033	7.123	4.476	0.029	6.883	0.033	0.030	1.68	753.73	1.73
113	1120	0.004	0.033	7.155	4.505	0.029	6.916	0.033	0.030	1.68	754.22	1.73
114	1130	0.004	0.033	7.188	4.535	0.029	6.948	0.033	0.030	1.68	754.70	1.72
115	1140	0.004	0.033	7.220	4.564	0.029	6.981	0.033	0.030	1.68	755.17	1.71
116	1150	0.004	0.033	7.253	4.594	0.029	7.013	0.033	0.030	1.68	755.64	1.71
117	1160	0.004	0.033	7.285	4.623	0.029	7.046	0.033	0.030	1.68	756.11	1.70
118	1170	0.004	0.033	7.318	4.653	0.029	7.079	0.033	0.030	1.69	756.57	1.70
119	1180	0.004	0.033	7.350	4.682	0.029	7.111	0.033	0.030	1.69	757.03	1.70
120	1190	0.004	0.033	7.383	4.712	0.030	7.144	0.033	0.030	1.69	757.48	1.70
121	1200	0.004	0.033	7.416	4.741	0.030	7.176	0.033	0.030	1.69	757.93	1.69
122	1210	0.004	0.033	7.448	4.771	0.030	7.209	0.033	0.030	1.69	758.37	1.69
123	1220	0.004	0.033	7.481	4.800	0.030	7.241	0.033	0.030	1.69	758.81	1.69
124	1230	0.004	0.033	7.513	4.830	0.030	7.274	0.033	0.030	1.69	759.24	1.69
125	1240	0.004	0.033	7.546	4.859	0.030	7.306	0.033	0.030	1.69	759.67	1.69
126	1250	0.004	0.033	7.578	4.889	0.030	7.339	0.033	0.030	1.69	760.10	1.69
127	1260	0.004	0.033	7.611	4.919	0.030	7.371	0.033	0.030	1.69	760.52	1.69
128	1270	0.004	0.033	7.643	4.948	0.030	7.404	0.033	0.030	1.70	760.94	1.69
129	1280	0.004	0.033	7.676	4.978	0.030	7.436	0.033	0.030	1.70	761.35	1.69
130	1290	0.004	0.033	7.709	5.008	0.030	7.469	0.033	0.030	1.70	761.76	1.69
131	1300	0.004	0.033	7.741	5.037	0.030	7.502	0.033	0.030	1.70	762.17	1.69
132	1310	0.004	0.033	7.774	5.067	0.030	7.534	0.033	0.030	1.70	762.57	1.70
133	1320	0.004	0.033	7.806	5.097	0.030	7.567	0.033	0.030	1.70	762.97	1.70
134	1330	0.004	0.033	7.839	5.127	0.030	7.599	0.033	0.030	1.70	763.36	1.70
135	1340	0.004	0.033	7.871	5.156	0.030	7.632	0.033	0.030	1.70	763.75	1.70

Santa Barbara Urban Hydrograph Method

Quantity Calculations (100 yr / 24-hour Storm)

Post-Development Conditions (Basin #2)

					Pervious		Impervious					
Time Increment	Time (min)	Rainfall Distribution (fraction)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Accumulated Rainfall (in)	Incremental Rainfall (in)	Total Rainfall (in)	Instant Flowrate (cfs)	Instant Flowrate (gal/min)	Design Flowrate (cfs)
136	1350	0.004	0.033	7.904	5.186	0.030	7.664	0.033	0.030	1.70	764.14	1.70
137	1360	0.004	0.033	7.937	5.216	0.030	7.697	0.033	0.030	1.70	764.52	1.70
138	1370	0.004	0.033	7.969	5.246	0.030	7.729	0.033	0.030	1.70	764.90	1.70
139	1380	0.004	0.033	8.002	5.276	0.030	7.762	0.033	0.030	1.71	765.28	1.70
140	1390	0.004	0.033	8.034	5.306	0.030	7.794	0.033	0.030	1.71	765.65	1.70
141	1400	0.004	0.033	8.067	5.336	0.030	7.827	0.033	0.030	1.71	766.02	1.70
142	1410	0.004	0.033	8.099	5.366	0.030	7.859	0.033	0.030	1.71	766.38	1.70
143	1420	0.004	0.033	8.132	5.395	0.030	7.892	0.033	0.030	1.71	766.75	1.70
144	1430	0.004	0.033	8.164	5.425	0.030	7.925	0.033	0.030	1.71	767.10	1.70
145	1440	0.004	0.033	8.197	5.455	0.030	7.957	0.033	0.030	1.71	767.46	1.71

Peak Flow	**18.68**	**8381.50**	**7.76**

Coast Central Transfer Station
SBUHM Results
Stormwater Peak Flowrates in cubic feet per second (cfs)
Channel Velocities in feet per second (fps)

Stormwater Peak Flowrates

Pre-Development - Existing Conditions (cfs)
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	3.8	8.3	10.9	12.8	14.7
2	4.6	10.0	13.2	15.5	17.8

Post-Development (cfs)
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	5.2	9.7	12.4	14.3	16.1
2	5.5	11.0	14.1	16.4	18.7

Stormwater Peak Flowrates Percent Increase

Percent Increase
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	25.9%	14.6%	11.6%	10.0%	8.8%
2	15.7%	8.3%	6.4%	5.5%	4.9%

Channel Velocities - Slope Conveyance Method

Pre-Development Channel Velocities (fps)
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	2.4	2.9	3.1	3.2	3.4
2	2.5	3.0	3.3	3.4	3.5

Post-Development Channel Velocities (fps)
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	2.6	3.0	3.2	3.3	3.4
2	2.6	3.1	3.3	3.5	3.6

Channel Water Surface Elevations - Slope Conveyance Method

Pre-Development Channel Water Surface Elevations (fps)
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	0.54	0.76	0.86	0.93	0.99
2	0.59	0.83	0.94	1.01	1.07

Post-Development Channel Water Surface Elevations (fps)
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	0.62	0.82	0.91	0.97	1.03
2	0.64	0.86	0.97	1.04	1.10

Appendix E – Channel and Detention Basin Hydraulic Analyses

Coast Central Transfer Station

Slope Conveyance Method

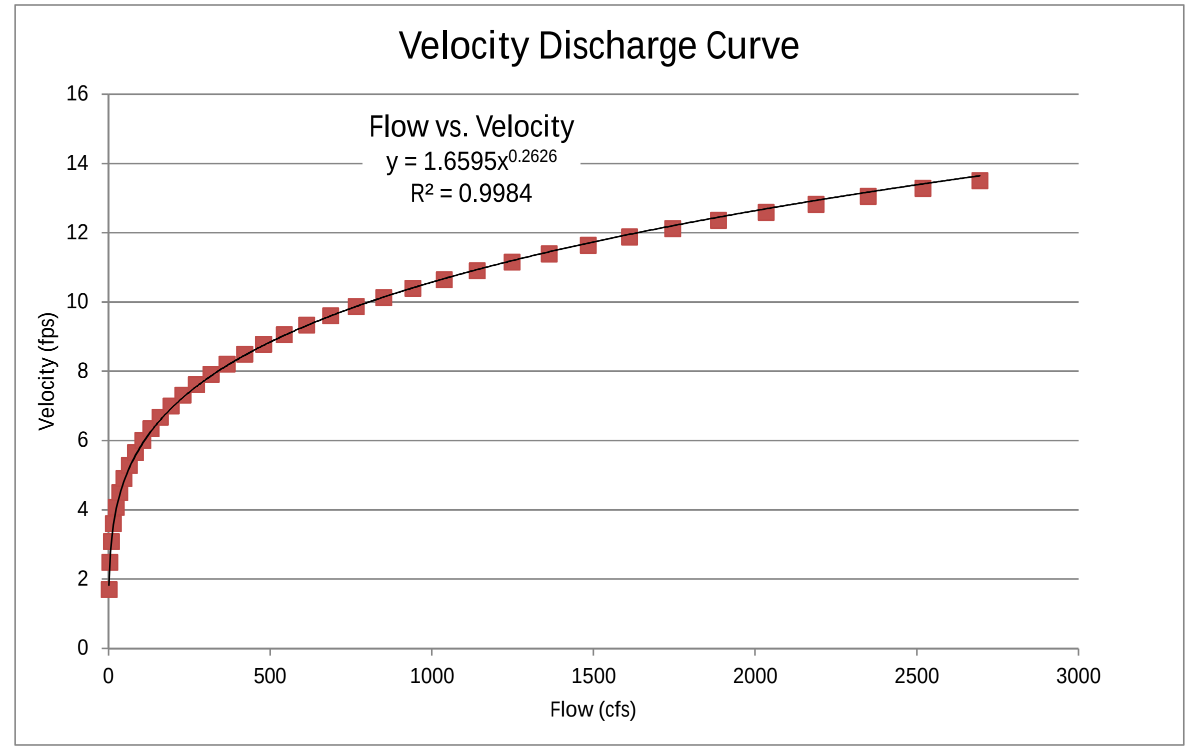
Channel Analyses

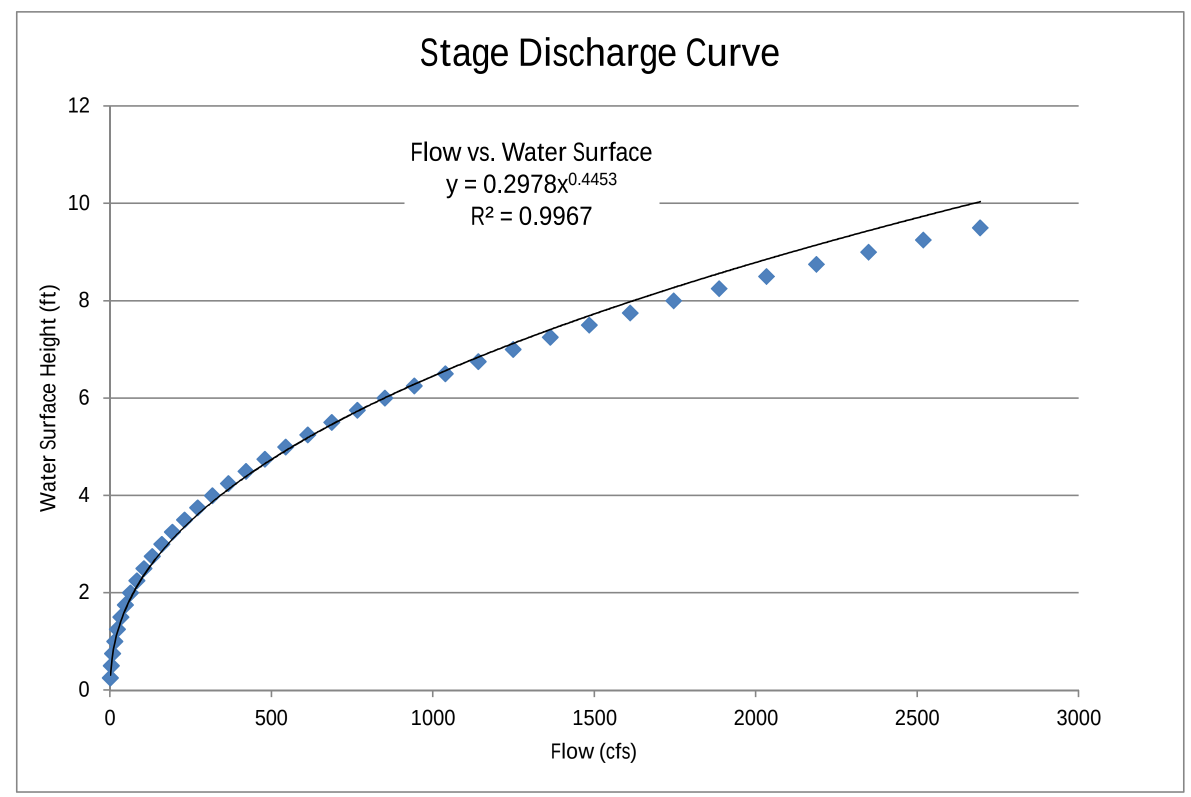
Inputs:

Channel Width (ft):	2
Channel Side Slope (1:X):	2
Slope (%):	1%
Manning's Roughness Coefficient:	0.03

Calculations:

Water Surface Elev (ft):	Hydraulic Radius (ft):	Velocity (fps):	Flow (cfs):
0.25	0.20	1.70	1.06
0.50	0.35	2.49	3.73
0.75	0.49	3.09	8.11
1.00	0.62	3.60	14.41
1.25	0.74	4.07	22.88
1.50	0.86	4.50	33.72
1.75	0.98	4.90	47.15
2.00	1.10	5.28	63.37
2.25	1.21	5.65	82.59
2.50	1.33	6.00	105.00
2.75	1.44	6.34	130.78
3.00	1.56	6.67	160.11
3.25	1.67	6.99	193.19
3.50	1.78	7.31	230.17
3.75	1.90	7.61	271.23
4.00	2.01	7.91	316.54
4.25	2.12	8.21	366.26
4.50	2.24	8.50	420.56
4.75	2.35	8.78	479.58
5.00	2.46	9.06	543.49
5.25	2.58	9.33	612.44
5.50	2.69	9.60	686.58
5.75	2.80	9.87	766.06
6.00	2.91	10.13	851.02
6.25	3.03	10.39	941.61
6.50	3.14	10.65	1037.98
6.75	3.25	10.90	1140.26
7.00	3.36	11.15	1248.60
7.25	3.48	11.39	1363.13
7.50	3.59	11.64	1483.98
7.75	3.70	11.88	1611.30
8.00	3.81	12.12	1745.22
8.25	3.92	12.36	1885.87
8.50	4.04	12.59	2033.37
8.75	4.15	12.82	2187.87
9.00	4.26	13.05	2349.49
9.25	4.37	13.28	2518.35
9.50	4.48	13.51	2694.59





Assumptions:

1. The width, side slopes, and channel slopes are assumed values, intended to be generally representative of the average conditions at the site.

References:

1. Fluid Mechanics, 6th Edition, Frank M. White, University of Rhode Island, 2008, McGraw Hill, Boston, MA.

2. Hydraulic Design Manual, Texas Department of Transporation, 2011, http://onlinemanuals.txdot.gov/txdotmanuals/hyd/index.htm

Coast Central Transfer Station
SBUHM Results
Stormwater Peak Flowrates in cubic feet per second (cfs)
Channel Velocities in feet per second (fps)

Stormwater Peak Flowrates

Pre-Development - Existing Conditions (cfs)
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	3.8	8.3	10.9	12.8	14.7
2	4.6	10.0	13.2	15.5	17.8

Post-Development (cfs)
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	5.2	9.7	12.4	14.3	16.1
2	5.5	11.0	14.1	16.4	18.7

Stormwater Peak Flowrates Percent Increase

Percent Increase
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	25.9%	14.6%	11.6%	10.0%	8.8%
2	15.7%	8.3%	6.4%	5.5%	4.9%

Channel Velocities - Slope Conveyance Method

Pre-Development Channel Velocities (fps)
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	2.4	2.9	3.1	3.2	3.4
2	2.5	3.0	3.3	3.4	3.5

Post-Development Channel Velocities (fps)
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	2.6	3.0	3.2	3.3	3.4
2	2.6	3.1	3.3	3.5	3.6

Channel Water Surface Elevations - Slope Conveyance Method

Pre-Development Channel Water Surface Elevations (fps)
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	0.54	0.76	0.86	0.93	0.99
2	0.59	0.83	0.94	1.01	1.07

Post-Development Channel Water Surface Elevations (fps)
Design Storm Events

Basin	2-year/24-hour	10-year/24-hour	25-year/24-hour	50-year/24-hour	100-year/24-hour
1	0.62	0.82	0.91	0.97	1.03
2	0.64	0.86	0.97	1.04	1.10

Modified Rational Equation

Pre-Development Runoff Coeffients
C Values

Relief	0.14	Relatively flat land with average slopes of 0 to 5%
Soil Infiltration	0.12	Slow to take up water, clay or shallow loam soils of low infiltration capacity, imperfectly or poorly drained
Vegetal Cover	0.06	Good to excellent about 90% of the drainage area in good grassland, woodland or equivalent cover.
Surface Storage	0.1	Low; well defined system of small drinageways; no ponds or marshes
Pre-Development Composite C	0.42	

source: Caltrans Highway Design Manual Figure 819.2A (http://www.dot.ca.gov/hq/oppd/hdm/pdf/chp0810.pdf)

Post Development

	Basin 1		Basin 2	
	Pre-Development	Post Development	Pre-Development	Post Development
Developed Area (ac)	0	2.1	0	1.6
Undeveloped Area (ac)	7.7	5.6	9.3	7.7
Developed Area C Value		0.95 *Assumed to be impervious surface for roofs and asphalt paving		
Post-Development Composite C	0.42	0.56	0.42	0.51

Coast Central Transfer Station
Detention Basin Sizing

Detention Basin Sizing

Post-Development Conditions
Detention Basin Volume

Basin	Rainfall Intensity (in/hr)	Runoff Coefficient	Area (acres)	Q_{10} (cfs)	Area of Pond (ft^2)	Volume of Pond (ac-ft)
1	3.10	0.56	7.7	13.5	16,845	0.77
2	3.10	0.51	9.3	14.7	18,422	0.85

Rainfall intensity assumes 5 min time of concentration
Note: Detention Volumes based on the Rational Method

Settling Velocities for Particle Sizes

	Particle Size	Settling velocity
Coarse sand	0.5	0.19
medium sand	0.2	0.067
fine sand	0.1	0.023
coarse silt	0.05	0.0062
medium silt	0.02	0.00096
fine silt	0.01	0.00024
clay	0.005	0.00006

Basin Sizing

Drainage Area		2-year/24-hour			10-year/24-hour			50-year/24-hour			100-year/24-hour		
		Pre-Project	Post-Project	% Diff.	Pre-Project	Post-Project	% Diff.	Pre-Project	Post-Project	% Diff.	Pre-Project	Post-Project	% Diff.
Basin 1	Peak Flow (cfs)	3.8	5.2	26%	8	10	15%	12.8	14.3	10%	14.7	16.1	9%
	Total Storm Volume (ac-ft)	0.22	0.30	26%	0.48	0.56	15%	0.74	0.82	10%	0.84	0.92	9%
Basin 2	Peak Flow (cfs)	4.6	5.5	16%	10.0	11.0	8%	15.5	16.4	6%	17.8	18.7	5%
	Total Storm Volume (ac-ft)	0.27	0.32	16%	0.58	0.63	8%	0.89	0.94	6%	1.02	1.07	5%

Note: Detention Volumes based on the SBUH Method

GHD Inc

718 Third Street
Eureka, CA 95501

T: 707 443 8326   F: 707 444 8330   E: eureka@ghd.com

Document1

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	Dagan Short	Misha Schwarz		Steve Allen		

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Appendix H
Traffic Impact Study

MENDOCINO SOLID WASTE MANAGEMENT AUTHORITY CENTRAL COAST TRANSFER STATION PROJECT

TRAFFIC IMPACT ANALYSIS REPORT

TRAFFIC IMPACT ANALYSIS REPORT
FOR MENDOCINO SOLID WASTE MANAGEMENT AUTHORITY CENTRAL COAST TRANSFER STATION PROJECT

Project No. 8411065

Prepared for: Mendocino Solid Waste Management Authority

Prepared by:

____
Tobin Bonnell, PE, PTOE
Project Manager

Reviewed by:

____
Frank Penry, PE, TE, PTOE
QA/QC

GHD Inc.
2235 Mercury Way, Suite 150
Santa Rosa, CA 95407
(707) 523-1010

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Appendices

1. Study Introduction

This report presents an analysis of the traffic and transportation impacts associated with the proposal to construct a new solid waste transfer station facility for the Central Coast region of Mendocino County. The new station facility, to be owned by the County of Mendocino and City of Fort Bragg, and operated by a private contractor, would allow direct haul of all solid waste to a destination landfill. The Central Coast region of Mendocino County extends from the mouth of the Navarro River north to the southern edge of the town of Westport, and inland from the Pacific Ocean to a point approximately half-way to the inland valleys. It corresponds to the Coastal Zone of Mendocino County Solid Waste Refuse Collection Area No. 2, together with the incorporated City of Fort Bragg. In 2013, this wasteshed generated 11,882 tons of solid waste, most of which is transferred by Empire Waste Management truck haul pods and debris boxes. The new waste transfer station, proposed to be located within the Jackson Demonstration State Forest (JDSF) at 30075 State Route (SR-) 20, would be held in title by the City of Fort Bragg and County of Mendocino. However, the Mendocino Solid Waste Management Authority (MSWMA), a private solid waste management company, would be retained under a long-term contract to design, build, and operate the facility.

The traffic study was completed in accordance with the County of Mendocino, Caltrans District 1, and CEQA guidelines, in coordination with MSWMA, and is consistent with previous similar analyses and standard traffic engineering techniques. The traffic impact analysis provides an evaluation of operating conditions during weekday morning (AM) and evening (PM) peak periods, and weekend mid-day peak periods. These peak period scenarios were analyzed under Existing, Existing plus Project, Cumulative, and Cumulative plus Project conditions. Cumulative scenarios are based on Caltrans District 1 20-year growth projections for State Highways, and were compared against the Mendocino Council of Governments (MCOG) Travel Demand Forecasting Model and the Mendocino County General Plan 2030 for adequacy. In addition to analysis of the operational effect of motor vehicles upon the study area roadway network, this study provides evaluation of existing bicycle and pedestrian facilities along and connecting to the proposed site, historical collisions within the study area roadway network, and existing transit service utilizing the study corridor.

2. Study Parameters

2.1 Prelude

The purpose of a traffic impact study is to provide MSWMA and policy makers such as Planning Commissioners, Supervisors, and Council members with data that they can use to make an informed decision regarding the potential traffic impacts of a proposed project, and any associated improvements that would be required in order to mitigate these impacts to below a level of significance. Traffic impacts are typically evaluated by determining the number of trips the new use would be expected to generate, distributing the new trips to the surrounding street system based on existing travel patterns or anticipated travel patterns specific to a proposed project, then analyzing the impact the new traffic would be expected to have on critical intersections included in the study.

Two (2) intersections were selected for analysis as the locations most likely to experience impacts due to project-generated traffic. These were the intersections of SR-20 and State Route (SR-) 1, and SR-20 and the proposed project access. Presently the existing study intersection of SR-20 and SR-1 is operating acceptably at LOS B or better during the Existing Condition peak periods.

2.2 Study Periods

The potential traffic and circulation impacts were analyzed during the weekday morning (AM) and evening (PM) peak hours, and during the weekend mid-day peak hours. The weekday AM peak hour is defined as the hour with the highest traffic volume within the AM peak period (7:00 to 9:00 a.m.). The weekday PM peak hour is defined as the hour with the highest traffic volume within the PM peak period (4:00 to 6:00 p.m.). The weekend midday peak hour is defined as the hour with the highest traffic volume within the midday peak period (Saturday at 11:00 a.m. to 1:00 p.m.). These periods were chosen in order to demonstrate a comprehensive analysis of the Study area, as self-haul demand could be expected to be higher during the weekend. Intersection turning movement counts are provided with Appendix A.

2.3 Study Scenarios

The Project being proposed by the MSWMA is to develop a 17-acre site in Jackson Demonstration State Forest (JDSF) along SR-20 as a solid waste transfer station. The facility would replace the existing Caspar self-haul transfer station, located at the end of Prairie Way in Casper, while also serving the compactor and roll-off trucks of Empire Waste Management, the franchised solid waste collector for the City of Fort Bragg and the County Solid Waste Refuse Collection Area #2. The transfer station would allow for the region's solid waste to be loaded for direct haul to a destination landfill, rather than being dumped and reloaded at the Willits Transfer Station, as is the current practice.

Peak period scenarios were analyzed under Existing, Existing plus Project, Cumulative, and Cumulative plus Project conditions. The Existing Condition scenarios are based on intersection turning movement collected on Thursday, August 22, 2013 and Saturday, August 24, 2013. The Cumulative Condition scenarios are based on Caltrans District 1 20-year growth projections for State Highways, and were compared against the Mendocino Council of Governments (MCOG) Travel Demand Forecasting Model and the Mendocino County General Plan 2030 for adequacy.

2.4 Measures of Effectiveness

Caltrans maintains jurisdiction over the operation of the study area highways and intersections (i.e.: Highway 20 and Highway 1). Caltrans uses measures of effectiveness (MOEs) to describe the measures best suited for analyzing State highway facilities. MOEs are calculated performance measures that reflect the operating conditions of a facility, given a set of roadway, traffic, and control conditions. Table 1 summarizes the MOEs by facility type recommended by Caltrans, and the MOEs used in this study.

Table 1 Measures of Effectiveness (MOE) by Facility Type

Type of Facility	Caltrans MOE[1]	Study MOE
Signalized Intersections	Control Delay per Vehicle (sec/veh)	Control Delay per Vehicle (sec/veh)
Un-signalized Intersections	Control Delay per Vehicle (sec/veh)	Control Delay per Vehicle (sec/veh)

[1]Source: (Caltrans, 2002).

2.5 Thresholds of Significance

Title 14, Chapter 3 Article 20 §§15382 of the California Code of Regulations defines a *significant effect on the environment* as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project. Thresholds of significance are principally used to determine whether a project may have a significant environmental effect. A threshold of significance is a quantitative or qualitative standard, or set of criteria from which the significance of a given environmental effect may be determined. In the context of traffic, levels of service based standards are typically used to establish thresholds of significance and qualify potential impacts.

2.5.1 State – California Department of Transportation

The California Department of Transportation (Caltrans) is responsible for planning, design, construction, and maintenance of all State highways. SR-20 is adjoining and south of the project site, and would provide access to the project site. SR-1 connects Fort Bragg and other coastal communities to SR-20. Specific to this study, the signalized intersection of SR-20 and SR-1 is under the jurisdiction of Caltrans.

The Caltrans Guide for the Preparation of Traffic Impact Studies (2002) includes criteria for evaluating the effects of land use development and changes to the circulation system on state highways. The Guide defines when traffic studies should be conducted to address impacts to state facilities. The Guide states that Measures of Effectiveness (MOEs) are used to evaluate Caltrans facilities, and provides a Level of Service significance threshold for signalized intersections. Specifically, the guide states that the agency strives to maintain a LOS value of C or better at signalized intersections. The Guide states, however, that the appropriate target LOS varies by facility and congestion level, and is defined differently by Caltrans depending on the analyzed facility.

2.5.2 Mendocino County General Plan

The *County of Mendocino General Plan* provides goals and policies for roadway systems and transportation corridors within the county. While the study area roadway network all falls within the limits of Mendocino County, the *General Plan* does not provide explicit threshold criteria for intersections. With State Route 20 being under the jurisdiction of Caltrans, the intersection operation threshold criteria set forth by Caltrans were the only ones considered with this study. Outside of intersection operations, the following are the goals and policies from the *General Plan* that are applicable to the project: **Goal DE-9 (Road Systems): A countywide road system that provides safe, efficient and attractive access, coordinated with interstate, state, local and area-wide systems.**

Policy DE-126: Provide for multiple transportation modes and functions within transportation corridors and rights-of-way constructed by project developers or using appropriate grants funding.

Policy DE-128: Ensure that transportation infrastructure accommodates the safety and mobility of motorists, pedestrians, bicyclists, and persons in wheelchairs.

Policy DE-136: The County will ensure that development projects which propose direct access to a state highway have legal entitlements for such access.

Policy DE-141: The County encourages development using existing roads with available capacity prior to locating development in areas that require new transportation facilities.

Policy DE-145: Maximize the compatibility of major highway and road realignments, extensions and capacity-increasing projects with community objectives, and minimize impacts on commercial areas, neighborhoods, and resources.

Policy DE-148: Land divisions and other discretionary projects shall not be approved until access and road improvements adequate for the intended uses, density or intensity are identified and constructed or funding mechanisms are in place.

Policy DE-149: Major development applications shall include traffic studies to evaluate and mitigate cumulative effects on network level of service and safety.

2.5.3 City of Fort Bragg

The *Fort Bragg Coastal General Plan* (City of Fort Bragg, 2008) establishes minimum level of service standards (per Policy C-1.1) for various roadway facilities. The following are standards that are applicable to the study area:

- Signalized and All-Way-Stop Intersections along SR-1: LOS D

Since Caltrans standards provide a more stringent significance threshold for the intersection of SR1 and SR-20 than that provided by the City of Fort Bragg, the Caltrans significance thresholds shall be the determining factors to which operations of this intersection should be compared.

2.6 Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. The LOS designation for intersections is generally accompanied by a unit of measure which indicates a level of delay.

The two study intersections were analyzed using methodologies from the *Highway Capacity Manual 2010*[i]. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

2.6.1 Signalized Intersections (SR-20/SR-1)

The signalized methodology is based on factors including traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. The ranges of delay associated with the various signalized levels of service are indicated in Table 2.

2.6.2 Unsignalized Intersections (Entrance)

The methodology for intersections with all-way or side street stop controls, those which are "unsignalized," is based on using the unsignalized intersection capacity method. For side street stop controls, the method determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. The movement with the highest level of delay is presented as the Worst Case Level of Service. The ranges of delay associated with the various unsignalized levels of service are indicated in Table 3.

2.7 Vehicle Queuing

Vehicle queuing analysis is completed for signalized study intersections to assess the capacity of intersection movements to accommodate the number of vehicles expected to wait at the intersections before being able to pass through or turn. This analysis is important because if there is not enough queuing space between intersections, in left-turn or right-turn pockets, the overflow of vehicles can obstruct the operations of the roadway.

For the signalized intersection of SR-20 and SR-1, the Synchro software program was used to determine the 50th percentile vehicle queue, which is the maximum back of queue on a typical cycle. The queue analysis determines the 50th percentile movement queue lengths based on HCM2010 methodology for movements with storage lanes.

As the Highway Capacity Manual does not provide specific guidance for the procedure to determine the length of vehicle queues at unsignalized intersections, queuing analysis at the proposed intersection of SR-20 and the project access entrance was not explicitly performed as a part of this study. However, the proposed configuration of this unsignalized intersection assumed with the associated operations analysis takes into account discussions with Caltrans regarding provisions for ingress and egress from the project site. Traffic signal warrant analysis was performed for this intersection as a part of this study in order to verify that no additional traffic control measures should be considered. Further discussion regarding the operation of this intersection, as it applies to vehicle queuing, is provided with the analysis portion of this study.

Table 2 Signalized Level of Service

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

Source: 2010 Highway Capacity Manual (Transportation Research Board, 2010)

Table 3 Unsignalized Level of Service

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Little or no delay	< 10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded (for an all-way stop), or with approach/turn movement capacity exceeded (for a side street stop controlled intersection)	> 50.0

Source: 2010 Highway Capacity Manual (Transportation Research Board, 2010).

2.8 Evaluation Criteria and Significance Thresholds

The project would cause a significant impact related to transportation, as defined by the CEQA Guidelines (Appendix G), if it would:

1. 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;

2. 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;
3. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
4. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
5. Result in inadequate emergency access; or
6. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

2.8.1 Areas of No Project Impact

Construction and operation of the project would not result in impacts related to the following significance criteria and are therefore not discussed further in the impact analysis section, for the following reasons:

- ***Would the Project 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?*** Mendocino County is considered rural and has no Congestion Management Agency. Therefore, no conflict with an applicable congestion management program would occur. The significance criterion related to a conflict with an applicable congestion management program is not applicable to the proposed project and is not discussed further.
- ***Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?*** The proposed project is not located within an airport land use plan or within two miles of a public airport. Project construction and operation would include only ground-based travel. Therefore this significance criterion is not applicable to the proposed project and is not discussed further.

3. Existing Conditions

Currently, the region's curbside solid waste is collected by Empire Waste Management and stored at Empire Waste Management's truck depot at 219 Pudding Creek Road, Fort Bragg. This waste is then hauled approximately 35 miles east on SR-20 to the Willits Transfer Station, where it is reloaded for long-haul to Potrero Hills Landfill in Suisun City, California. Empire Waste Management also collects solid waste in roll-off boxes (also known as debris boxes) which are hauled two-at-a-time to Willits Transfer Station. Solid waste from private vehicles is received at the Caspar self-haul transfer station at 14000 Prairie Way, Caspar, the site of a closed landfill. The waste is received in debris boxes and pods, which are hauled by Empire Waste Management to the Willits Transfer Station.

This section describes the existing conditions at the study intersections and roadways during both the weekday a.m. and p.m. peak hours and weekend mid-day peak hour based on peak hour traffic conditions. Also included is a discussion of transportation facilities in the project area, including the roadway network, transit services, and bicycle and pedestrian facilities.

3.1 Study Area

3.1.1 Roadways

The roadways analyzed in this study are functionally classified as state highways. Highways are high-speed limited access roadways serving primarily regional and county-wide travel.

SR-1 is a four-lane or two-lane highway in the vicinity of the proposed project site. It runs in a north/south direction and passes through the City of Fort Bragg. The proposed project site is located approximately two miles to the east of SR-1. The posted speed limit on SR-1 is currently 40 miles per hour (mph). At its intersection with SR-20, SR-1 features a dual left turn lane and one through lane in the southbound direction, and a dual through lane with a channelized right turn lane in the northbound direction.

SR-20 is a two-lane east/west highway which terminates at SR 1. SR-20 is planned to provide direct access to the proposed project site, approximately two miles east of the SR-1/SR-20 intersection. The posted speed limit on SR-20 is currently 45 mph. The westbound approach of SR-20 to SR-1 features dedicated left and right-turn lanes.

3.1.2 Transit Service

The Mendocino Transit Authority (MTA) provides regional transit service on a daily scheduled basis to the City of Fort Bragg Monday through Saturday. Transit Route 5 (BraggAbout) provides local service in and around the City of Fort Bragg. There are two bus stops for Transit Line 5 in the study area, one at College of the Redwoods off of Ocean View Drive and one at the Boatyard Shopping Center off of Boatyard Drive. Transit Route 60 (The Coaster) provides regional service between Fort Bragg and Mendocino/Navarro River. Transit Line 60 connects with Transit Lines 5 and 65 at the College of the Redwoods and Boatyard Shopping Center stops. Transit Line 65 (CC Rider) provides regional service between Fort Bragg, Willits, Ukiah and Santa Rosa. In the immediate vicinity of the project frontage there are no transit facilities or stops.

MTA service connects with Greyhound bus service, Amtrak train service, Sonoma County Transit, Golden Gate Transit, Lake Transit, and Santa Rosa CityBus.

3.1.3 Rail Service

The Skunk Train is a scenic tourist train that runs between Willits and Fort Bragg seven days a week. Trains depart daily in the morning, with the trip taking approximately 3.5 hours. This rail line is not a commuter rail. In the immediate vicinity of the project there are no rail facilities or stops.

3.1.4 Bicycle and Pedestrian Facilities

SR-1 makes up part of the designated Pacific Coast Bike Route (PCBR), an interstate bike route that extends along the Pacific Coast. The current PCBR alignment remains on SR-1 through the study area. Class II bike lanes are present in various locations along both sides of SR-1 and SR-20 as a paved shoulder separated from vehicular traffic by a striped edge of travel way line. The bike lane is generally between 4 feet and 6 feet wide. There are no existing bicycle facilities along the frontage of the project site, with Class II lanes having terminated approximately 1 mile west.

Pedestrian facilities in the study area are limited, with no existing sidewalks along SR-20 or in the vicinity of the intersection of SR-1 and SR-20. Although crosswalks are present at the intersection of SR-1 and SR-20, existing curb ramps are not compliant with Americans with Disabilities Act (ADA) standards. This appears to be a result of the age of the constructed facilities, and the lack of contiguous compliant facilities to adjacent land uses. At the intersection and adjacent corridor, pedestrians walk directly in the roadway, on paved or gravel shoulders where they exist, or off the pavement adjacent to the roadway. Pedestrian traffic in the vicinity of the project is limited, as the area is at the edge of the rural residential development and nearly 3 miles from any commercial facilities.

3.1.5 Collision Analysis

Caltrans District 1 performed a safety analysis for a half mile segment of SR-20 in the vicinity proposed for the waste transfer station project access. The analysis covered a 3-year time period encompassing the years 2009 through 2011. The analysis concluded that the three year period only saw two total collisions, with no collisions occurring within an intersection, and that the total collision rate within this corridor is 48% less than the statewide average. The Caltrans memorandum summarizing the details of this analysis is included with Appendix B.

Additional queries on the California Highway Patrol Statewide Integrated Traffic Records System (SWITRS) were performed as a part of this study for the years 2012 and 2013. These records show that ten accidents have occurred at the intersection of SR-20 and SR-1 over the two year period, with four of these collisions resulting in injury. In addition, the records show that the corridor of SR-20 between SR-1 and the proposed MSWMA entrance has seen five collisions over the two year period, three of which resulted in injury. The records do not show any over-riding trends among the collisions that indicate sight distance or other design-related issues within the corridors. These records are included with Appendix B.

3.1.6 Emergency Services

Fire protection in Mendocino County is provided by local districts, the cities of Ukiah and Fort Bragg, the CAL FIRE and the U.S. Forest Service. The project site is within the Fort Bragg Rural Fire Protection

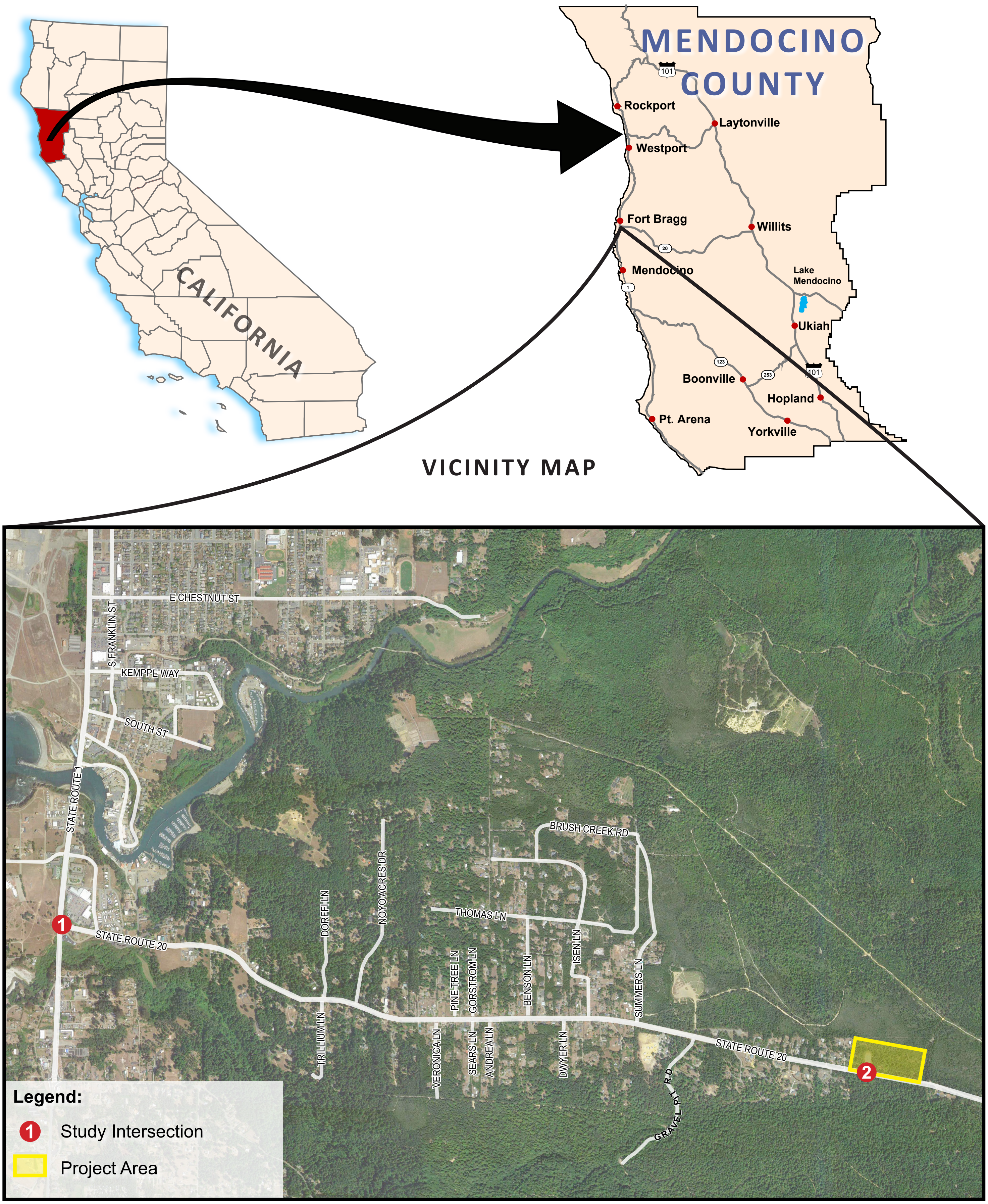
District. CAL FIRE identifies fire hazard severity zones in State Responsibility Areas (SRA) throughout California. The project site is located in a very high fire hazard severity zone (CAL FIRE 2007). The County of Mendocino Office of Emergency Services coordinates emergency response in Mendocino County through the Fire and Rescue Mutual Aid Coordinator. The Fire and Rescue Mutual Aid Coordinator functions within the California Fire Service and Rescue Emergency Mutual Aid System (PMC 2009).

3.2 Study Intersections

The following intersections were selected for analysis as the locations most likely to experience impacts due to the project-generated traffic. The intersections and study area context map are provided in Figure 1.

1.	State Route 1 / State Route 20	Existing Signalized
2.	State Route 20 / Proposed MSWMA Entrance	Proposed Two-Way Stop Control

Existing and proposed intersection geometrics are shown on Figure 2.



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GHD

Mendocino Solid Waste Management Authority
Central Coast Transfer Station Project
Traffic Impact Analysis

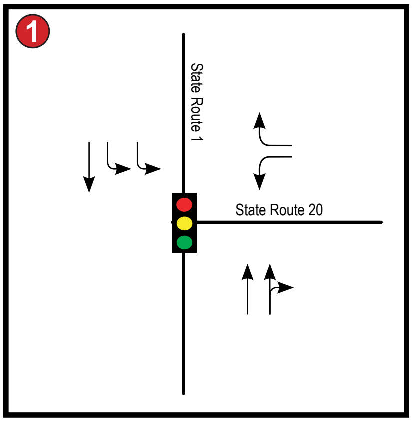
Job Number	8411065
Revision	
Date	Aug 2014

Project Vicinity & Location Map

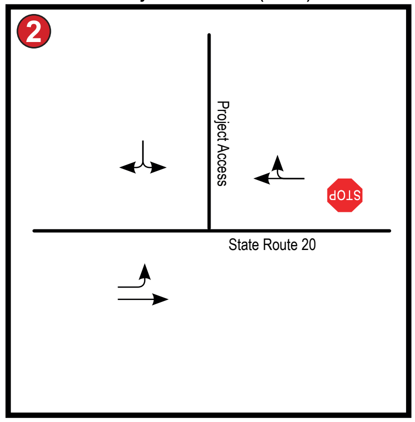
Figure 1

718 Third Street Eureka California 95501 USA **T** 1 707 443 8326 **F** 1 707 444 8330 **W** www.ghd.com

State Route 1/
State Route 20*



State Route 20/
Project Access (E+P)



Legend:

1 Study Intersection

(E+P) Existing Plus Project

Signalized Intersection

STOP Stop Sign

* Intersection Lane Geometry and Traffic Control that remains unaltered in all scenarios

3.3 Existing Traffic Volumes

As noted previously in the *Study Parameters* section, vehicular turning movement counts were performed during each of the specified peak periods. To determine the peak hour within each peak period, turning movement vehicle counts were performed in the field at each of the study area intersections. Existing peak-hour traffic volumes are indicated in Figure 3.

3.4 Existing Conditions Intersection Level of Service Analysis

The analysis finds that the existing intersection of SR-20 and SR-1 is operating acceptably based on the applicable Caltranssignificance threshold of level of service C. The Existing Conditions level of service calculations are summarized in Table 4, and full results are provided in Appendix C.

Table 4 Summary of Existing Peak Hour Intersection Level of Service Calculations

Intersection		Existing Conditions		
		Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak
		Delay/LOS	Delay/LOS	Delay/LOS
1.	SR-20 / SR-1[1]	10.2/B	15.1/B	13.0/B
2.	SR-20 / Project Access[2]			
	Eastbound Left Turn	*N/A*	*N/A*	*N/A*
	Southbound Approach	*N/A*	*N/A*	*N/A*

Notes: *Italics* = results for minor movements at unsignalized intersections Results are indicated in Delay (average seconds per vehicle)/LOS (Level of Service)
[1]LOS based on HCM2010 method of analysis for signalized intersections.
[2]LOS based on HCM2010 method of analysis for TWSC intersections.

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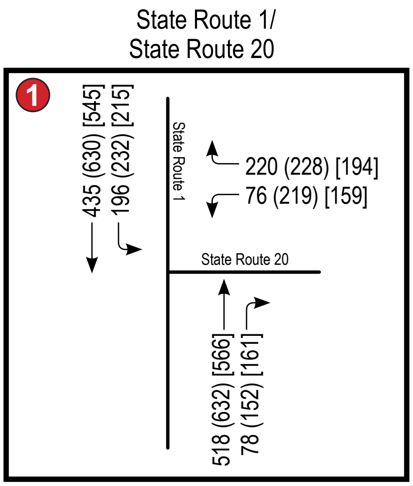

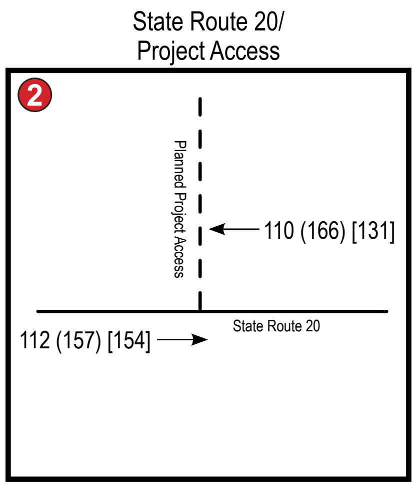

Legend:

1 Study Intersection

xxx Weekday AM Peak Hour Volume

(xxx) Weekday PM Peak Hour Volume

[xxx] Weekend Midday Peak Hour Volume

3.5 Existing Conditions Signalized Intersections Queue Analysis

Existing traffic volumes were applied to signalized study intersections and the peak hour demand 50th percentile queue lengths were reviewed against the existing lane storage capacity at the intersection.

The Existing Peak Hour Intersection Queue Analysis is summarized in Table 5. Detailed results are provided in Appendix C.

Peak hour 50th percentile queue lengths are within existing storage lane capacity at all signalized intersections.

Table 5 Summary of Existing Peak Hour Intersection Queue Analysis

Movement	Lanes / Available Storage	Queue Length - 50th (feet)		
		a.m.	p.m.	midday
SR-1 / SR-20				
Westbound Right Turn	1 / 120 ft	0	0	0
Northbound Through	1 / 170 ft	60	94	82
Northbound Right Turn	1 / 120 ft	0	0	0
Southbound Left Turn	2 / 320 ft	26	48	35

Notes: Queue shown is maximum after two cycles

Bold = results where available storage is exceeded by more than one standard vehicle, 25 ft.

4. Existing plus Project Analysis

4.1 Proposed Project

Access to the project site would be controlled by gate with security fencing surrounding the perimeter of the facility. The site will include two queuing lanes for ingress and one queuing lane for egress. Vehicles would enter and exit the facility directly from SR-20, which would be improved with deceleration and acceleration lanes as illustrated in the proposed site plan provided with Figure 4. For purposes of this study, it was assumed that SR-20 would be widened from the roadway centerline north to accommodate the acceleration and deceleration lanes, and for the new eastbound left-turn pocket and westbound right-turn pockets at the proposed project access point. Left turn warrants common to standard engineering practice would not be met at this intersection based on the anticipated traffic volumes, but is being provided based on preliminary discourse with Caltrans, in which concerns for the allowance of heavy vehicle turning movements was discussed. Based on Caltrans Highway Design Manual, the minimum storage length for a left turn lane shall be 50 feet. The eastbound left turn lane storage length at the proposed site was assumed to be approximately 100 feet long, in order to address Caltrans concerns over the ability to accommodate the truck turning volumes expected during the peak hours. In order to further verify that the assumptions would be appropriate per Caltrans standards and no additional traffic control measures would be required, the proposed intersection was analyzed for traffic signal warrants with this study.

Based on the location of fully permitted landfills within the region, all waste transfer vehicles leaving the facility are expected to proceed to the east on SR-20, while most self-haul traffic is expected to arrive or depart to/from the west. This section explores the traffic impacts, as well as transit, pedestrian, and bicycle impacts, associated with the construction of the proposed commercial waste transfer station facility.

4.1.1 Proposed Project Assumptions

With the replacement of the existing solid waste transfer and disposal system, the nature of the traffic patterns within the region would be expected to change. Specifically, all new vehicular trips generated by the new transfer facility would utilize SR-20 for both entrance and exit access. The project trips are expected to consist of self-haul trash and recyclables, franchised hauler traffic, outhaul traffic for recyclables, and transfer truck traffic. In a memorandum dated September 24, 2013, the MSWMA provides estimates of the projected daily traffic, based on current demand, that would utilize the new facility. The traffic impact study associated with this report assumes that the projected peak hour project trips will be consistent with the projected daily volumes provided with the MSWMA memorandum. It was assumed that 10% of the weekday and weekend daily traffic volumes would occur during peak hour traffic. Table 6 shows the projected peak hour project-generated traffic, with respect to the different types of project trips. A copy of the MSWMA memorandum is included in Appendix D.

Table 6 Summary of Projected Peak Hour Project Trips

	Weekday Daily Traffic (Total Trips)	Weekday Peak Hour Traffic (Total Trips)	Weekend Daily Traffic (Total Trips)	Weekend Peak Hour Traffic (Total Trips)
Self-Haul Customers	91	10	138	14
Franchise Hauler Collection Trucks	20	2	0	0
Recycling Outhaul	1	0	0	0
Transfer Truck Outhaul	2	2	2	2
Employee Commute	4	4	4	0

The total peak hour trips shown in Table 6 represent trips that will arrive and depart within the peak hour of operations. Employee trips were not included with the weekend midday peak hour trips because these trips were assumed to occur outside of this peak hour. Therefore, in order to depict the arrival and departure of these trips, the total number of project trip ends during the peak hour will be double the peak hour volumes shown in Table 6. For purposes of this study, the distribution of project-generated trips was performed based on probable origins and destinations of these trips. Trip origins and destinations were based on the location of existing facilities which will be supplanted by the new facility, the existing traffic patterns established from existing turning movement counts, and knowledge of the population distribution of the region. Specifically, self-haul customers were assumed to arrive/depart from the west of the project site and rural areas outside of the City of Fort Bragg. Franchise hauler collection trucks were assumed to arrive/depart from the west of the project site and within the City of Fort Bragg. Recycling outhaul traffic is minimal, and it was assumed to not affect the peak hour of operations. Transfer truck outhaul traffic was assumed to arrive/depart from the east of the project site.

The stop control and lane configurations that exist at the study area intersection of SR-20 and SR-1 in the existing condition were assumed to remain the same under future scenarios. Assumed project trip distribution, as it applies to the study area intersections, is shown graphically in Figure 5. It was assumed that all of franchise hauler collection and transfer outhaul traffic would consist of heavy vehicles, while self-haul traffic would be composed of minimal heavy vehicle traffic. No proposed pedestrian, bicycle, or public transit improvements were assumed as a part of the Existing plus Project analysis, and no associated modal shift away from motor vehicle use was assumed.

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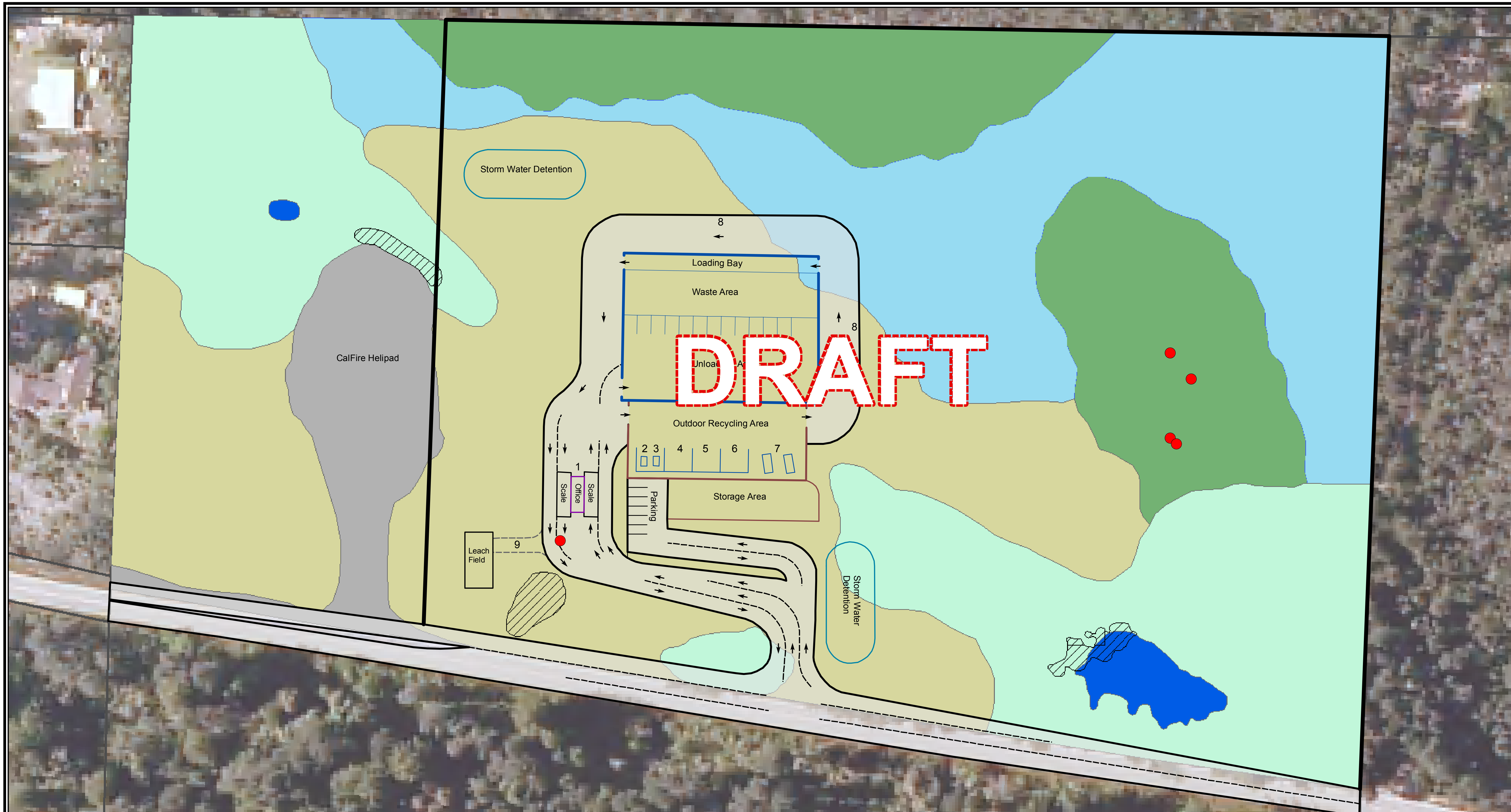
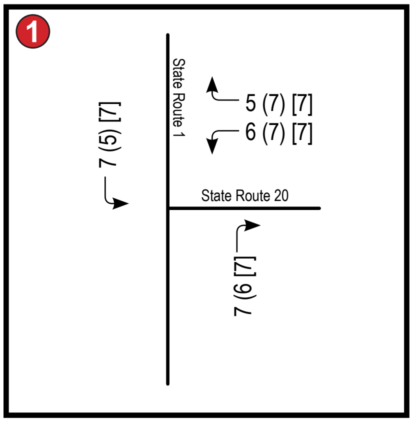
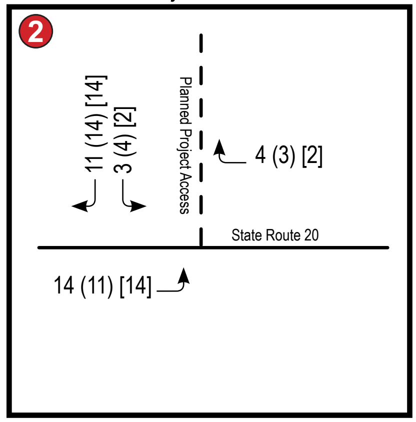


Draft Site Plan

State Route 1/
State Route 20



State Route 20/
Project Access



Legend:

1 Study Intersection

xxx Weekday AM Peak Hour Volume

(xxx) Weekday PM Peak Hour Volume

[xxx] Weekend Midday Peak Hour Volume

N

Mendocino Solid Waste Management Authority
Central Coast Transfer Station Project
Traffic Impact Analysis
Project Trip Assignment
Traffic Volumes

Job Number	8411065
Revision	
Date	Aug 2014

Figure 5

4.1.2 Traffic Volumes- Existing plus Project

Existing plus Project traffic volumes are represented by existing traffic volumes, as shown with Figure 3, with the addition of project-related trips, as shown with Figure 5, assigned accordingly to the study area roadway network. Based on this methodology, Existing plus Project traffic volumes are indicated in Figure 6.

4.1.3 Study Intersections and Roadway Segment Level of Service – Existing plus Project

With the addition of project-related traffic volumes to the study area intersections, all of the movements within the study intersections are expected to operate at acceptable levels of service with respect to Caltrans, county, and city significance thresholds. The intersection of SR-20 and SR-1 remains at the same level of service when compared to the existing scenarios. The Existing plus Project level of service calculations are summarized in Table 7, and full results are provided in Appendix E.

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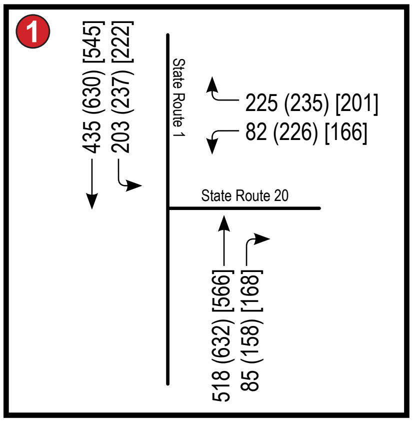
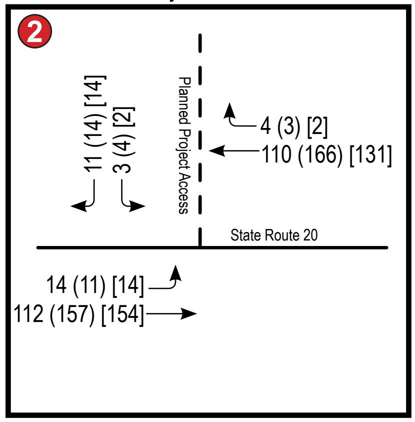
State Route 1/
State Route 20



State Route 20/
Project Access



Legend:

1	Study Intersection
xxx	Weekday AM Peak Hour Volume
(xxx)	Weekday PM Peak Hour Volume
[xxx]	Weekend Midday Peak Hour Volume

Table 7 Summary of Peak Hour Intersection Level of Service Calculations – Existing plus Project

Intersection		Existing plus Project		
		Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak
		Delay/LOS	Delay/LOS	Delay/LOS
1.	SR-20 / SR-1[1]	10.4/B	15.6/B	13.3/B
2.	SR-20 / Project Access[2]			
	Eastbound Left Turn	*0.8/A*	*0.5/A*	*0.6/A*
	Southbound Approach	*9.6/A*	*10.1/B*	*9.5/A*

Notes: *Italics* = results for minor movements at unsignalized intersections
Results are indicated in Delay (average seconds per vehicle)/LOS (Level of Service)
[1]LOS based on HCM2010 method of analysis for Signalized intersections.
[2]LOS based on HCM2010 method of analysis for TWSC intersections.

4.1.4 Existing plus Project Conditions Signalized Intersections Queue Analysis

Existing plus Project traffic volumes were applied to the study area signalized intersection of SR-20 and SR-1, and the peak hour demand 50th percentile queue lengths were reviewed against the existing lane storage capacity at the intersection.

The Existing plus Project peak hour intersection queue analysis is summarized in Table 8. Detailed results are provided in Appendix E.

Table 8 shows that peak hour 50th percentile queue lengths are within existing storage lane capacities at the SR-20 and SR-1 intersection.

Table 8 Summary of Existing plus Project Peak Hour Intersection Queue Analysis

Movement	Lanes / Avail. Storage	Queue Length - 50th / 95th (feet/feet)		
		a.m.	p.m.	midday
SR-1 / SR-20				
WBR	1 / 120 ft	0	0	0
NBT	1/ 170 ft	60	95	83
NBR	1 / 120 ft	0	0	0
SBL	2 / 320 ft	27	50	36

Notes: Queue shown is maximum after two cycles
Bold = results where available storage is exceeded by more than one standard vehicle, 25 ft.

4.1.5 Transit Service – Existing plus Project

No proposed transit improvements were proposed or assumed to be implemented to the study area roadway area as a part of this project. Because level of service analyses determined that the maximum peak hour increase in average control delay experienced as a result of this project would be less than one second, it is safe to assume that transit operations and headways within the study area would not be significantly affected by the impact of this project. Due to the location and type of operations proposed, it is not expected that transit would be a viable mode of access, nor is ridership expected to increase as a result of the proposed project.

4.1.6 Pedestrians and Bicycles – Existing plus Project

As mentioned, no proposed pedestrian and bicycle improvements are proposed or assumed as a part of this study, and traffic models used signal timing that allows for sufficient pedestrian crossing times at the intersection of SR-1 and SR-20. As the analyses determined that the existing signal timing, which accommodates pedestrians and bicycles, could be used and not result in decreases in levels of service beyond the applicable significance thresholds, it is safe to assume that pedestrian and bicycle operations within the study area would not be significantly affected by the impact of this project. Due to the location and type of operations proposed, it is not expected that pedestrian or bicycle traffic would increase as a result of the proposed project.

4.2 On-Site Circulation/Queuing

Because of the nature of the proposed site, which features a weigh station at which incoming vehicles must stop, this study evaluated the on-site circulation of vehicles to determine whether the basic functions of the facility could impact SR-20. The conceptual site plan, as shown with Figure 4, was utilized to evaluate how the proposed geometrics affect the adjacent roadway. Most critical to this evaluation is distance provided between the proposed ingress lanes and the scale at which arriving vehicles must stop to be weighed. This is because of the potential queuing effect that the scale could have, and the potential for the length of queue to “back-up” onto the left and right-turn lanes proposed for SR-20.

Evaluation of the proposed geometrics of the conceptual site plan determined that the weigh station for incoming vehicles is proposed to be approximately 350 feet from the proposed point of ingress. Assuming a standard passenger vehicle or pickup truck would be the typical type of vehicle to utilize the weigh station, this distance provides room for approximately 14 vehicles in queue. Looking at the anticipated traffic volumes to be generated by the project site, the maximum traffic flow coming into the site would be expected to be 18 vehicles per hour. Using an assumed service rate of approximately two minutes per vehicle at the weigh station, the average queue at the weigh station during a peak hour would be approximately one vehicle. Based on probable arrival rates during the peak hour, it is not anticipated that any maximum queue lengths will surpass the amount of distance provided with the proposed site entrance geometrics.

Also critical to the evaluation of on-site circulation relates to the movements of emergency vehicles within the site. While the site was not evaluated for all anticipated turning movements as a part of this study, the functionality of the site will depend upon the appropriate consideration of these movements. Specifically, the site shall be designed to accommodate the turning movements of the type of heavy vehicles associated with the waste transfer and hauling activities. In designing for the turning movements of these heavy vehicles, it is anticipated that the turning movements for large emergency vehicles would also be sufficiently provided. With the detail design of this site, coordination with the appropriate fire and emergency service officials shall be undertaken to ensure that the circulation of vehicles on site will not prevent emergency services from being provided to the site and surrounding area in the most efficient manner.

4.3 CEQA Evaluation – Existing plus Project

Impact TR-1: Would the Project 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?

Based on the analysis and discussion provided with this study, it is not anticipated that the project would cause a conflict with plans, ordinances, or policies established by Caltrans, Mendocino County, or the City of Fort Bragg.

Level of Significance: Less than Significant

Impact TR-2: Would the Project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Based on the description of the proposed project site and the improvements associated with providing an access entrance compliant with Caltrans design standards, it is not anticipated that the project would cause anyincrease in safety hazards or introduce features that are incompatible with current or anticipated roadway users. This is based on the fact that the new improvements provide an adequate line of sight, and the existing roadway features a lower-than-average number of accidents reported.

Level of Significance: Not Significant

Impact TR-3: Would the Project result in inadequate emergency access?

Because the proposed project is essentially reallocating existing trips amongst the region, it is not anticipated that the project would result in decreased accessibility to the region’s critical emergency services. Looking at the level of service analyses performed as a part of this study, the maximum increase in average control delay experienced as a result of this project would be less than one second. Therefore, emergency vehicles would move through the area with nearly the same ability as under existing conditions. Furthermore, it is not anticipated that any entrances or exits of nearby emergency facilities would be blocked or impeded by the proposed roadway improvements and project-generated traffic.

Level of Significance: Less than Significant

Impact TR-4: Would the Project conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

The project would not result in any conflict with the applicable goals and policies regarding bicycle and pedestrian facilities set forth in the *Mendocino County General Plan*, as it would not prevent the future extension of the existing Class II bike lanes on State Route 20. Also, the project would not conflict with the designated Pacific Coast Bike Route on State Route 1. Furthermore, because level of service analyses determined that the maximum peak hour increase in average control delay experienced as a result of this project would be less than one second, it is not anticipated that the project would result in significant effects upon headways and functionality of regional public transit, also consistent with *General Plan* policy.

Level of Significance: Less than Significant

5. Cumulative Conditions

5.1 Study Area Cumulative Condition

In order to provide a 20-year forecast for the study area roadway network, the forecast year of 2034 was chosen to represent cumulative conditions in this study. Because the critical corridors of the study area are designated state routes, 20-year forecast conditions were estimated using Caltrans District 1 20-year growth factors, as established in the February 2014 memorandum. Consistent with these established rates for the applicable sections of state routes, a 20-year growth factor of 1.05 was applied to the existing turning movement volumes for SR-20 and a factor of 1.15 was applied to the existing turning movement volumes for SR-1.

5.1.1 Cumulative Traffic Volumes

Cumulative traffic volumes in the noted peak hours are indicated in Figure 7.

5.1.2 Study Intersections Cumulative Level of Service

Based on the analysis of Cumulative Conditions traffic volumes, the study intersection of SR-20 and SR-1 is not expected to experience decreases in levels of service during the analyzed peak periods when compared to Existing Conditions. This intersection in this scenario operates at LOS B in both the Existing and Cumulative Conditions scenarios. The Cumulative Conditions scenario level of service calculations are summarized in Table 9, and full results are provided in Appendix F.

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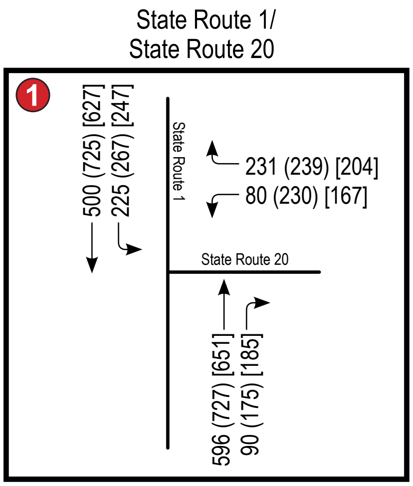

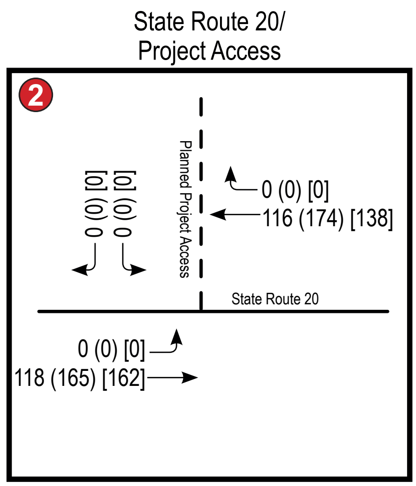

Legend:

1 Study Intersection

xxx Weekday AM Peak Hour Volume

(xxx) Weekday PM Peak Hour Volume

[xxx] Weekend Midday Peak Hour Volume

Table 9 Summary of Cumulative Peak Hour Intersection Level of Service Calculations

Intersection		Cumulative Condition		
		Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak
		Delay/LOS	Delay/LOS	Delay/LOS
1.	SR-20 / SR-1[1]	10.6/B	18.9/B	14.2/B
2.	SR-20 / Project Access[2]			
	Eastbound Left Turn	*N/A*	*N/A*	*N/A*
	Southbound Approach	*N/A*	*N/A*	*N/A*

Notes: *Italics* = results for minor movements at unsignalized intersections
* = Intersection in downtown, no LOS threshold
Results are indicated in Delay (average seconds per vehicle)/LOS (Level of Service)
[1]LOS based on HCM2010 method of analysis for Signalized intersections.
[2]LOS based on HCM2010 method of analysis for TWSC intersections.

5.1.3 Cumulative Conditions Signalized Intersections Queue Analysis

Cumulative traffic volumes were applied to the study area signalized intersection of SR-20 and SR-1, and the peak hour demand 50th percentile queue lengths were reviewed against the existing lane storage capacity at the intersection.

The Cumulative Conditions peak hour intersection queue analysis is summarized in Table 10. Table 10 shows that peak hour 50th percentile queue lengths are within existing storage lane capacities at SR-20 and SR-1. Detailed results are provided in Appendix F.

Table 10 Summary of Cumulative Project Peak Hour Intersection Queue Analysis

Movement	Lanes / Available Storage	Queue Length - 50th (feet)		
		a.m.	p.m.	midday
SR-1 / SR-20				
Westbound Right Turn	1 / 120 ft	0	3	0
Northbound Through	1/ 170 ft	72	115	102
Northbound right Turn	1 / 120 ft	0	0	0
Southbound Left Turn	2 / 320 ft	31	75	45

Notes: Queue shown is maximum after two cycles
Bold = results where available storage is exceeded by more than one standard vehicle, 25 ft.

5.1.4 Transit Service – Cumulative Condition

Most future plans for regional public transit agencies involve achieving a more sustainable multi-modal system for the region and increasing the promotion of transit to the public. This will primarily be achieved by replacement of the current fleets with hybrid and/or electric vehicles, and by making real-time passenger information systems more reliable and available.

Despite planned efforts to promote the increased use of public transit, the Cumulative Condition scenarios analyzed with this study do not reflect any shifts in the regional use of public transit or any associated modal shift that would potentially lower the number of motor vehicles being used by commuters. Because the analysis of the Cumulative Condition does not result in significant decreases in the intersection levels of service when compared to the Existing Condition, it is not anticipated that significant effects upon headways and functionality of regional public transit would occur in the future.

5.1.5 Pedestrians and Bicycles - Cumulative Condition

As mentioned with the description of the existing pedestrian and bicycle facilities, while Class II Bike Lanes are marked along SR-20 from the Fort Bragg City Limit to Summers Lane (~1 mile from project), the portion of SR-20 fronting the proposed project site does not currently feature paved shoulders for separation of bicycle traffic from motor vehicle traffic. The Cumulative Condition scenarios analyzed with this study do not reflect any shifts in the regional use of bicycles or any associated modal shift that would potentially lower the number of motor vehicles being used by commuters. Likewise, no sidewalk or ADA improvements to the intersection of SR-20 and SR-1 were assumed to be implemented with the Cumulative Condition scenario.

The Cumulative Condition scenarios at the intersection of SR-20 and SR-1 were analyzed using the existing signal timing, which accommodates pedestrians and bicycles. Since these timings were used for analysis and no decreases in level of service beyond the applicable significance thresholds were reported, it could be concluded that pedestrian and bicycle operations within the study area would not be significantly affected by the impact of regional cumulative growth anticipated in the future.

5.2 Cumulative plus Project

This section explores the traffic impacts, as well as transit, pedestrian, and bicycle impacts, that could be expected in the future with the construction of the proposed commercial waste transfer station facility. All of the assumptions that were used with the Existing plus Project conditions scenario were similarly used for this scenario.

5.2.1 Traffic Volumes - Cumulative plus Project

Cumulative plus Project traffic volumes are represented by cumulative traffic volumes, as shown with Figure 7, with the addition of project-related trips, as shown with Figure 5, assigned accordingly to the study area roadway network. Cumulative plus Project traffic volumes are indicated in Figure 8.

5.2.2 Study Intersections and Roadway Segment Level of Service - Cumulative plus Project

With the addition of project-related traffic volumes to the projected cumulative traffic volumes, all of the movements within the study intersections are expected to operate at acceptable levels of service with respect to Caltrans, County, and City significance thresholds. The intersection of SR-20 and SR-1 goes from LOS B in the cumulative condition to LOS C in the weekday PM peak hour. The Cumulative plus Project Scenario Level of Service calculations are summarized in Table 11, and full results are provided in Appendix G.

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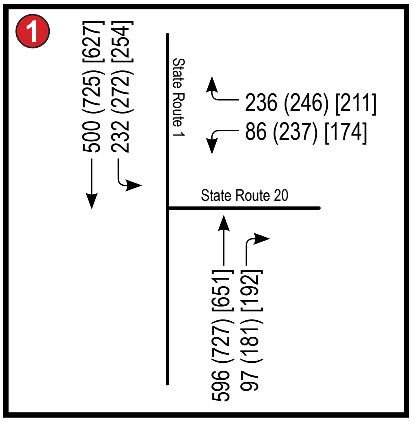

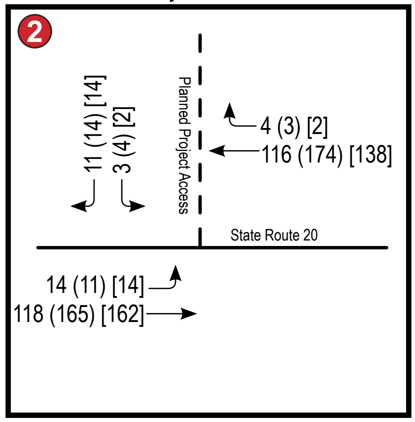

Legend:

1 Study Intersection

xxx Weekday AM Peak Hour Volume

(xxx) Weekday PM Peak Hour Volume

[xxx] Weekend Midday Peak Hour Volume

Table 11 Summary of Peak Hour Intersection Level of Service Calculations - Cumulative plus Project

Intersection		Cumulative plus Project		
		Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak
		Delay/LOS	Delay/LOS	Delay/LOS
1.	SR- 20 / SR-1[1]	10.9/B	20.0/C	14.7/B
2.	SR-20 / Project Access[2]			
	Eastbound Left Turn	*0.8/A*	*0.5/A*	*0.6/A*
	Southbound Approach	*9.6/A*	*10.2/B*	*9.6/A*

Notes: *Italics* = results for minor movements at unsignalized intersections
* = Intersection in downtown, no LOS threshold
Results are indicated in Delay (average seconds per vehicle)/LOS (Level of Service)
[1]LOS based on HCM2010 method of analysis for Signalized intersections.
[2]LOS based on HCM2010 method of analysis for TWSC intersections.

5.2.3 Cumulative plus Project Signalized Intersections Queue Analysis

Cumulative plus Project traffic volumes were applied to the study area signalized intersection of SR-20 and SR-1, and the peak hour demand 50th percentile queue lengths were reviewed against the existing lane storage capacity at the intersection.

The Cumulative plus Project peak hour intersection queue analysis is summarized in Table 12. Detailed results are provided in Appendix G. Table 12 shows that peak hour 50th percentile queue lengths are within existing storage lane capacities at SR-20 and SR-1.

Table 12 Summary of Cumulative plus Project Peak Hour Intersection Queue Analysis

Movement	Lanes / Available Storage	Queue Length - 50th (feet)		
		a.m.	p.m.	midday
SR-1 / SR-20				
Westbound Right Turn	1 / 120 ft	0	6	0
Northbound Through	1 / 170 ft	72	116	102
Northbound Right Turn	1 / 120 ft	0	0	0
Southbound Left Turn	2 / 320 ft	32	80	46

Notes: Queue shown is maximum after two cycles
Bold = results where available storage is exceeded by more than one standard vehicle, 25 ft.

5.2.4 Transit Service – Cumulative plus Project

No future planned transit improvements were assumed to be implemented to the study area roadways in the Cumulative plus Project scenario. Because cumulative level of service analyses determined that the maximum peak hour increase in average control delay experienced as a result of this project would be approximately one second, it is safe to assume that transit operations and headways within the study area would not be significantly affected by the cumulative impact of this project.

5.2.5 Pedestrians and Bicycles – Cumulative plus Project

Like the Cumulative Condition scenarios, the Cumulative plus Project scenarios analyzed with this study do not reflect any shifts in the regional use of bicycles or any associated modal shift that would potentially lower the number of motor vehicles being used by commuters. Likewise, no sidewalk or ADA improvements to the intersection of SR-20 and SR-1 were assumed to be implemented with the Cumulative plus project scenarios.

The Cumulative plus Project scenarios at the intersection of SR-20 and SR-1 were analyzed using the existing signal timing, which accommodates pedestrians and bicycles. Since no decreases in level of service beyond the applicable significance thresholds were reported with the Cumulative plus Project scenarios, it could be concluded that pedestrian and bicycle operations within the study area would not be significantly affected by the impact of regional cumulative growth anticipated in the future.

5.3 CEQA Evaluation – Cumulative plus Project

Impact TR-1: Would the Project 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?

Based on the analysis and discussion provided in this study, the project would not contribute to a cumulative impact as all study intersections would operate acceptably in the Cumulative plus Project scenario.

Level of Significance: Less than Significant

Impact TR-2: Would the Project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Based on the fact that the new improvements provide an adequate line of sight, and the existing roadway features a lower-than-average number of accidents reported, it is not anticipated that the project would cause anyincrease in safety hazards or introduce features that are incompatible with anticipated roadway users in the cumulative condition.

Level of Significance: Not Significant

Impact TR-3: Would the Project result in inadequate emergency access?

Because the proposed project is essentially reallocating existing trips amongst the region, it is not anticipated that the project would result in decreased accessibility for the region's critical emergency services. The project does not result in inadequate mobility for emergency vehicles as compared to existing conditions. Furthermore, no entrances or exits of nearby emergency facilities would be blocked or impeded by the proposed roadway improvements and project-generated traffic. Therefore, the project won't provide a significant contribution to any cumulative condition regarding emergency access.

Level of Significance: Less than Significant

Impact TR-4: Would the Project conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

The project would not result in any conflict with the current applicable goals and policies regarding bicycle and pedestrian facilities set forth in the *Mendocino County General Plan*, as it would not prevent the future extension of the existing Class II bike lanes on State Route 20, and not conflict with the designated Pacific Coast Bike Route on State Route 1. Furthermore, it is not anticipated that the project would result in significant effects upon headways and functionality of regional public transit, also consistent with current *General Plan* policy. Therefore, the project cannot be seen as contributing to any conflict with the applicable policies and plans in the cumulative condition.

Level of Significance: Less than Significant

6. Peak Hour Traffic Signal Warrant 3

The section presents an evaluation of “rural” Signal Warrant 3 for the peak hour for unsignalized intersections in all scenarios to determine if the warrant is met. The evaluation of Signal Warrant 3 was performed in order to verify that the assumptions regarding ingress/egress at the proposed intersection of SR-20/Project Access, which were based on preliminary discussions with Caltrans, were appropriate, and no further traffic control measures should be considered.

6.1 Peak Hour Signal Warrant 3 Methodology

Traffic Signal Warrant 3 is based on the latest edition of the *California Manual on Uniform Traffic Control Devices* (CAMUTCD) (Caltrans, 2012a). It is noted that Warrant 3 should only be applied in unusual cases, such as at facilities that attract or discharge large amounts of vehicles over short periods of time.

Warrant 3 has two Parts, A and B, which must be met to justify the potential need for a signal based on the peak hour. Part A contains three conditions, which are:

1. The total delay experience by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for one lane approach, or five vehicle-hours for a two-lane approach; AND
2. The volume on the same minor street approach (one direction only) equals or exceeds 75 vph for one moving lane of traffic or 100 vph for two moving lanes (base on City of Ft. Bragg population and speed limit on major street approaches); AND
3. The total entering volume serviced during the hour equals or exceeds 800 vph for the intersection with four or more approaches or 650 vph for intersections with three approaches.

Part B of the Traffic Signal Warrant 3 contains figures that plot minor street versus major street approaches for urban and rural areas. The entire Signal Warrant 3 is included in Appendix H.

Intersection No. 2 meets the definition of “rural.”

The satisfaction of a traffic signal warrant or warrants does not in itself require the installation of a traffic signal, however, the City General Plan Policy C-1.1 states:

> *If volumes at an unsignalized intersection are increased to meet or exceed Caltrans rural peak hour signal Warrant [3] criteria levels and the intersection is operating at an unacceptable level of service, then signalization of the intersection is warranted.*

6.2 Peak Hour Signal Warrant 3 Analysis

Table 13 summarizes the results of the Warrant 3 analysis. Part B is evaluated under “rural” conditions.

Intersection No. 2 – SR-20 / Project Access is not met presently and will not be met in the cumulative scenario, with or without the addition of project trips. Because the Warrant 3 is not met under any of the project conditions, there are no project impacts.

Table 13 Summary of Traffic Signal Warrant 3 for Various Conditions Scenarios

Conditions	Part A				Part B
	1	2	3		
Intersection	Total Delay (veh-hrs)	Highest Minor Appr. Volume (veh)	Total Entering Volume (veh)	Met (Y/N)	Met (Y/N)
Existing Plus Project Conditions Scenario					
No. 2 – SR-20 / Project Access	0.05	18	355	N	N
Cumulative Plus Project Conditions Scenario					
No. 2 – SR-20 / Project Access	0.05	18	371	N	N

Notes: **Bold** = results where Part A and Part B are met; Warrant 3 met.

7. Conclusions

This section summarizes the conclusions regarding the proposed project and its potential traffic impacts.

7.1 Existing plus Project

7.1.1 Intersection Operations

With the addition of project-related traffic volumes to the study area intersections, all of the movements within the study area intersections are expected to operate at acceptable levels of service with respect to Caltrans, county, and city significance thresholds.

7.1.2 Vehicle Queuing

The peak hour 50th percentile queue lengths are within existing storage lane capacities at SR-20 and SR-1.

7.1.3 Transit Service

Based on the traffic volumes and assumptions utilized with this study, transit operations and headways within the study area would not be significantly affected by the impact of this project.

7.1.4 Pedestrians and Bicycles

Based on the traffic volumes and assumptions utilized with this study, pedestrian and bicycle operations within the study area would not be significantly affected by the impact of this project. However, the existing facilities are limited, and future pedestrian improvements should be considered for the study area with development of associated land uses.

7.2 Cumulative plus Project

7.2.1 Intersection Operations

With the addition of project-related traffic volumes to the projected cumulative traffic volumes, all of the movements within the study intersections are expected to operate at acceptable levels of service with respect to Caltrans, county, and city significance thresholds. The intersection of SR-20 and SR-1 goes from LOS B in the cumulative condition to LOS C in the weekday PM peak hour.

7.2.2 Vehicle Queuing

The peak hour 50th percentile queue lengths are within existing storage lane capacities at SR-20 and SR-1.

7.2.3 Transit Service

Based on the traffic volumes and assumptions utilized with this study, cumulative transit operations and headways within the study area would not be significantly affected by the impact of this project in the future.

7.2.4 Pedestrians and Bicycles

Based on the traffic volumes and assumptions utilized with this study, pedestrian and bicycle operations within the study area would not be significantly affected in the cumulative condition by the impact of this project.

7.3 Summary

Table 14 summarizes the level of service calculation results for the study roadway network with and without project-generated trips. In conclusion, this study finds that the proposed Project would not be expected to contribute significantly to the potential deterioration of traffic operations, queuing levels, transit service, or non-motorized transportation in the study area for the conditions analyzed in this study.

Table 14 Summary of Peak Hour Intersection Level of Service Calculations

Intersection	Existing			Existing plus Project			Cumulative			Cumulative plus Project		
	Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak	Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak	Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak	Weekday AM Peak	Weekday PM Peak	Weekend Midday Peak
	Delay/LOS	Delay/LOS	Delay/LOS	Delay/LOS	Delay/LOS	Delay/LOS	Delay/LOS	Delay/LOS	Delay/LOS	Delay/LOS	Delay/LOS	Delay/LOS
1. SR- 20 / SR-1[1]	10.2/B	15.1/B	13.0/B	10.4/B	15.6/B	13.3/B	10.6/B	18.9/B	14.2/B	10.9/B	20.0/C	14.7/B
2. SR-20 / Project Access[2]												
Eastbound Left Turn	*N/A*	*N/A*	*N/A*	*0.8/A*	*0.5/A*	*0.6/A*	*N/A*	*N/A*	*N/A*	*0.8/A*	*0.5/A*	*0.6/A*
Southbound Approach	*N/A*	*N/A*	*N/A*	*9.6/A*	*10.1/B*	*9.5/A*	*N/A*	*N/A*	*N/A*	*9.6/A*	*10.2/B*	*9.6/A*

Notes: *Italics* = results for minor movements at unsignalized intersections
Bold = results exceed acceptable level of service
* = Intersection in downtown, no LOS threshold
Results are indicated in Delay (average seconds per vehicle)/LOS (Level of Service)
[1]LOS based on HCM2010 method of analysis for Signalized intersections.
[2]LOS based on HCM2010 method of analysis for TWSC intersections.

8. References

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HCM2010 (2010). *Highway Capacity Manual 2010*, Transportation Research Board, Washington, D.C. 2012.

Mendocino County (2012). *2012 Mendocino County Regional Bikeway Plan,* Mendocino Council of Governments, Adopted June 2012.

MSWMA (2013). *Memorandum regarding Projected Traffic, Highway 20 Transfer Station,* Mendocino Solid Waste Management Authority, September 2013.

Appendices

Appendix A - Intersection Turning Movement Count Data

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Fort Bragg
N/S: State Route 1
E/W: State Route 20
Weather: Sunny

File Name : FBG_SR-1_SR-20 AM
Site Code : 99913282
Start Date : 8/22/2013
Page No : 1

Groups Printed- Total Volume

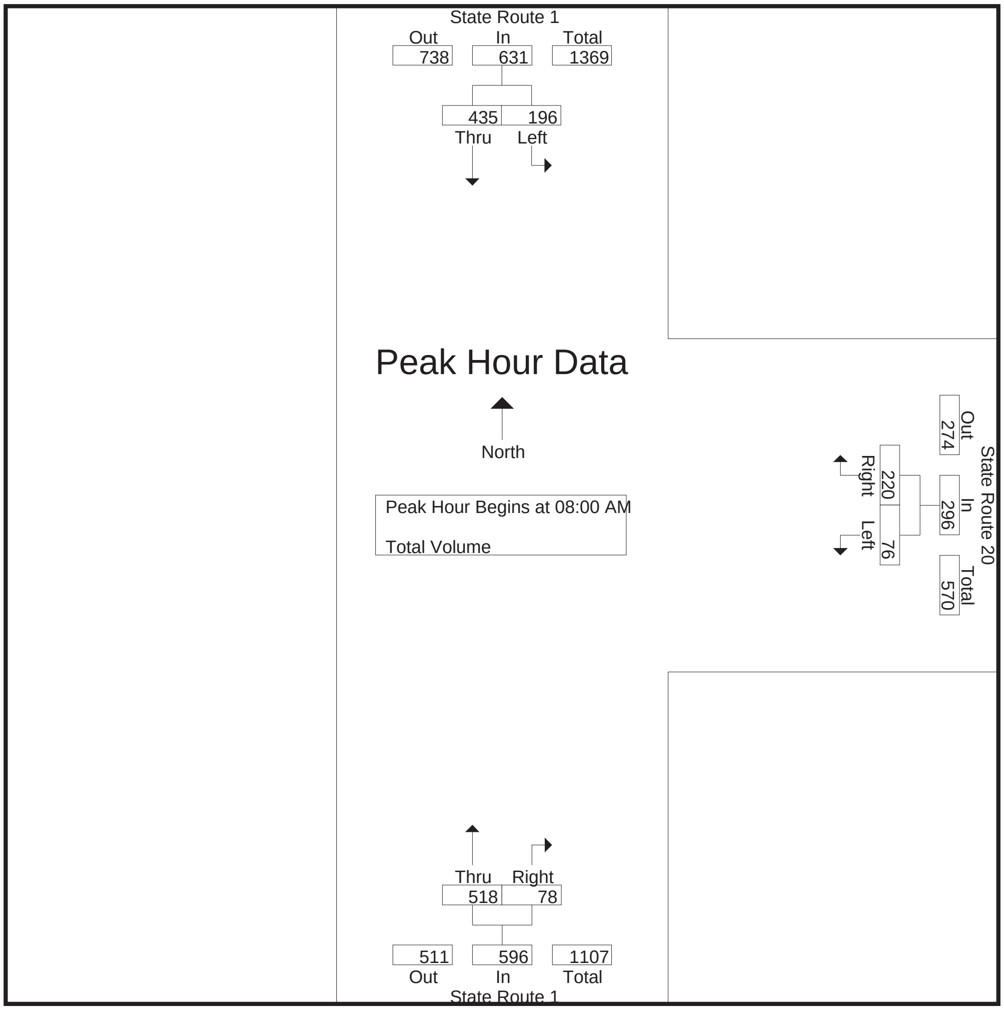
	State Route 1 Southbound			State Route 20 Westbound			State Route 1 Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	29	47	76	8	21	29	56	11	67	172
07:15 AM	30	55	85	8	37	45	83	13	96	226
07:30 AM	21	80	101	14	62	76	111	16	127	304
07:45 AM	34	89	123	14	54	68	139	19	158	349
Total	114	271	385	44	174	218	389	59	448	1051
08:00 AM	52	96	148	15	65	80	134	17	151	379
08:15 AM	42	110	152	17	63	80	130	23	153	385
08:30 AM	58	110	168	18	49	67	123	15	138	373
08:45 AM	44	119	163	26	43	69	131	23	154	386
Total	196	435	631	76	220	296	518	78	596	1523
Grand Total	310	706	1016	120	394	514	907	137	1044	2574
Apprch %	30.5	69.5		23.3	76.7		86.9	13.1		
Total %	12	27.4	39.5	4.7	15.3	20	35.2	5.3	40.6	

	State Route 1 Southbound			State Route 20 Westbound			State Route 1 Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	52	96	148	15	**65**	**80**	**134**	17	151	379
08:15 AM	42	110	152	17	63	80	130	**23**	153	385
08:30 AM	**58**	110	**168**	18	49	67	123	15	138	373
08:45 AM	44	**119**	163	**26**	43	69	131	23	**154**	**386**
Total Volume	196	435	631	76	220	296	518	78	596	1523
% App. Total	31.1	68.9		25.7	74.3		86.9	13.1		
PHF	.845	.914	.939	.731	.846	.925	.966	.848	.968	.986

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Fort Bragg
N/S: State Route 1
E/W: State Route 20
Weather: Sunny

File Name : FBG_SR-1_SR-20 AM
Site Code : 99913282
Start Date : 8/22/2013
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM			07:30 AM			07:45 AM		
+0 mins.	52	96	148	14	62	76	**139**	19	**158**
+15 mins.	42	110	152	14	54	68	134	17	151
+30 mins.	**58**	110	**168**	15	**65**	**80**	130	**23**	153
+45 mins.	44	**119**	163	**17**	63	80	123	15	138
Total Volume	196	435	631	60	244	304	526	74	600
% App. Total	31.1	68.9		19.7	80.3		87.7	12.3	
PHF	.845	.914	.939	.882	.938	.950	.946	.804	.949

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Fort Bragg
N/S: State Route 1
E/W: State Route 20
Weather: Sunny

File Name : FBG_SR-1_SR-20 PM
Site Code : 99913282
Start Date : 8/22/2013
Page No : 1

Groups Printed- Total Volume

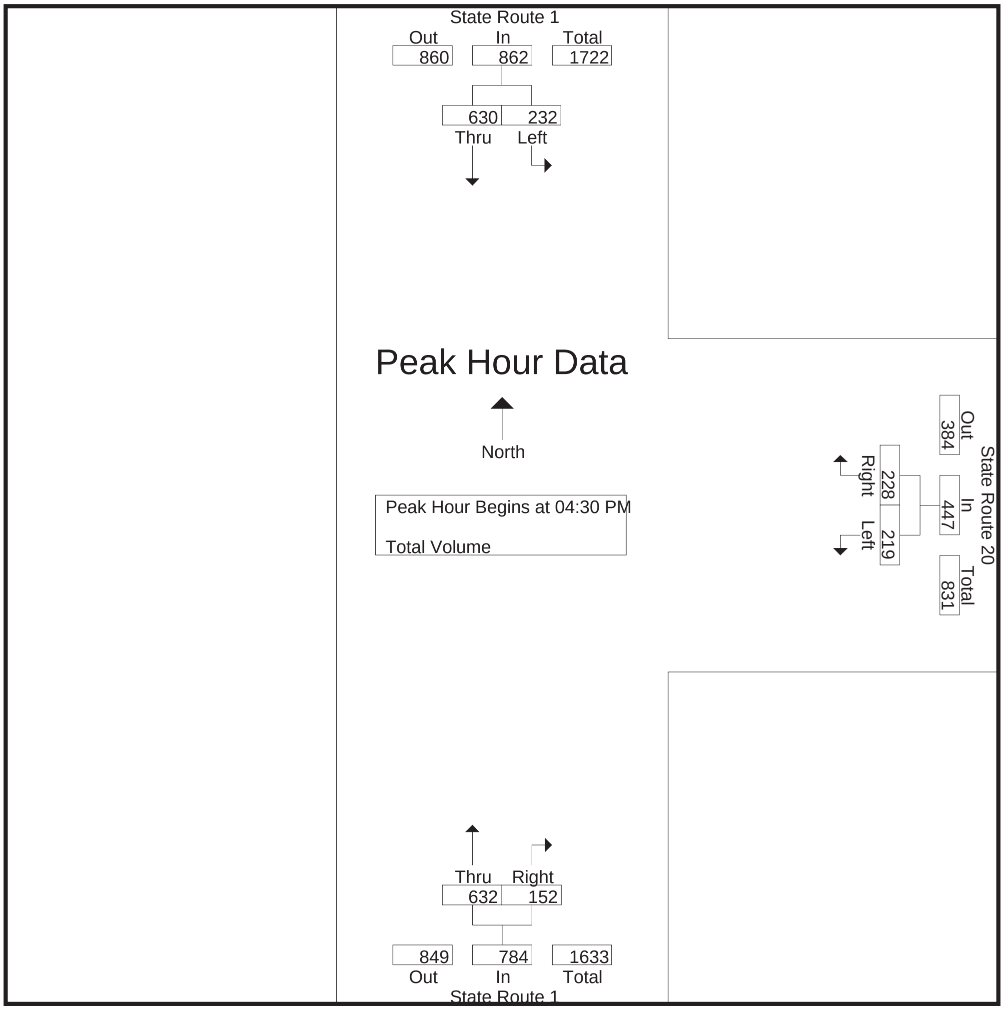
	State Route 1 Southbound			State Route 20 Westbound			State Route 1 Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	75	156	231	54	65	119	138	38	176	526
04:15 PM	37	177	214	43	72	115	144	42	186	515
04:30 PM	64	153	217	71	39	110	160	35	195	522
04:45 PM	48	144	192	51	62	113	162	37	199	504
Total	224	630	854	219	238	457	604	152	756	2067
05:00 PM	56	148	204	44	69	113	154	35	189	506
05:15 PM	64	185	249	53	58	111	156	45	201	561
05:30 PM	45	128	173	45	61	106	113	32	145	424
05:45 PM	52	131	183	41	44	85	109	31	140	408
Total	217	592	809	183	232	415	532	143	675	1899
Grand Total	441	1222	1663	402	470	872	1136	295	1431	3966
Apprch %	26.5	73.5		46.1	53.9		79.4	20.6		
Total %	11.1	30.8	41.9	10.1	11.9	22	28.6	7.4	36.1	

	State Route 1 Southbound			State Route 20 Westbound			State Route 1 Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	**64**	153	217	**71**	39	110	160	35	195	522
04:45 PM	48	144	192	51	62	**113**	**162**	37	199	504
05:00 PM	56	148	204	44	**69**	113	154	35	189	506
05:15 PM	64	**185**	**249**	53	58	111	156	**45**	**201**	**561**
Total Volume	232	630	862	219	228	447	632	152	784	2093
% App. Total	26.9	73.1		49	51		80.6	19.4		
PHF	.906	.851	.865	.771	.826	.989	.975	.844	.975	.933

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Fort Bragg
N/S: State Route 1
E/W: State Route 20
Weather: Sunny

File Name : FBG_SR-1_SR-20 PM
Site Code : 99913282
Start Date : 8/22/2013
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			04:00 PM			04:30 PM		
+0 mins.	**64**	153	217	54	65	**119**	160	35	195
+15 mins.	48	144	192	43	**72**	115	**162**	37	199
+30 mins.	56	148	204	**71**	39	110	154	35	189
+45 mins.	64	**185**	**249**	51	62	113	156	**45**	**201**
Total Volume	232	630	862	219	238	457	632	152	784
% App. Total	26.9	73.1		47.9	52.1		80.6	19.4	
PHF	.906	.851	.865	.771	.826	.960	.975	.844	.975

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Fort Bragg
N/S: State Route 1
E/W: State Route 20
Weather: Sunny

File Name : FBG_SR-1_SR-20 MD
Site Code : 99913282
Start Date : 8/24/2013
Page No : 1

Groups Printed- Total Volume

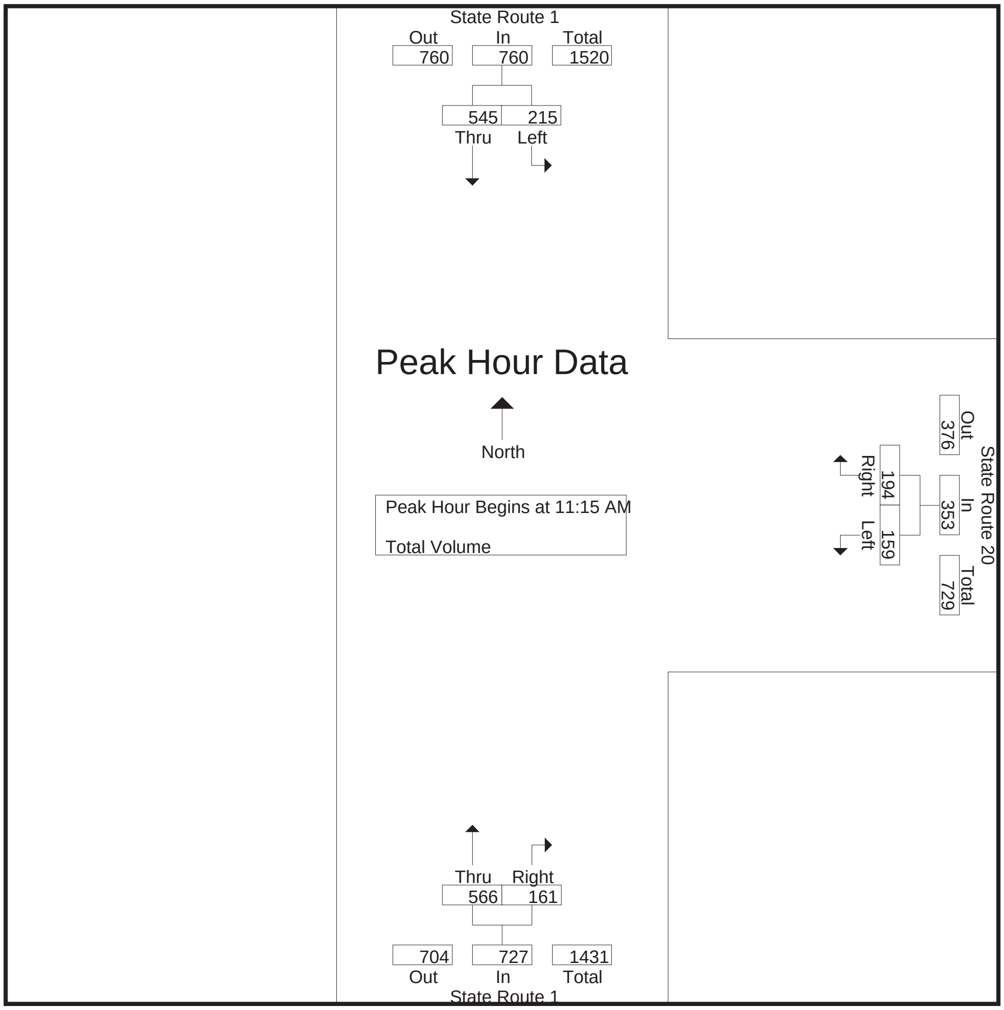
	State Route 1 Southbound			State Route 20 Westbound			State Route 1 Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
11:00 AM	52	142	194	49	49	98	99	23	122	414
11:15 AM	54	120	174	31	41	72	157	37	194	440
11:30 AM	52	139	191	43	55	98	120	34	154	443
11:45 AM	50	143	193	50	53	103	138	44	182	478
Total	208	544	752	173	198	371	514	138	652	1775
12:00 PM	59	143	202	35	45	80	151	46	197	479
12:15 PM	56	123	179	45	55	100	133	24	157	436
12:30 PM	49	110	159	44	49	93	135	35	170	422
12:45 PM	54	141	195	44	71	115	133	43	176	486
Total	218	517	735	168	220	388	552	148	700	1823
Grand Total	426	1061	1487	341	418	759	1066	286	1352	3598
Apprch %	28.6	71.4		44.9	55.1		78.8	21.2		
Total %	11.8	29.5	41.3	9.5	11.6	21.1	29.6	7.9	37.6	

	State Route 1 Southbound			State Route 20 Westbound			State Route 1 Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:15 AM										
11:15 AM	54	120	174	31	41	72	**157**	37	194	440
11:30 AM	52	139	191	43	**55**	98	120	34	154	443
11:45 AM	50	**143**	193	**50**	53	**103**	138	44	182	478
12:00 PM	**59**	143	**202**	35	45	80	151	**46**	**197**	**479**
Total Volume	215	545	760	159	194	353	566	161	727	1840
% App. Total	28.3	71.7		45	55		77.9	22.1		
PHF	.911	.953	.941	.795	.882	.857	.901	.875	.923	.960

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Fort Bragg
N/S: State Route 1
E/W: State Route 20
Weather: Sunny

File Name : FBG_SR-1_SR-20 MD
Site Code : 99913282
Start Date : 8/24/2013
Page No : 2



Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:30 AM			12:00 PM			11:15 AM		
+0 mins.	52	139	191	35	45	80	**157**	37	194
+15 mins.	50	**143**	193	**45**	55	100	120	34	154
+30 mins.	**59**	143	**202**	44	49	93	138	44	182
+45 mins.	56	123	179	44	**71**	**115**	151	**46**	**197**
Total Volume	217	548	765	168	220	388	566	161	727
% App. Total	28.4	71.6		43.3	56.7		77.9	22.1	
PHF	.919	.958	.947	.933	.775	.843	.901	.875	.923

Location: Fort Bragg
N/S: State Route 1
E/W: State Route 20

Date: 8/22/2013
File : FBGSR1SR20

WEEKDAY

	North Leg State Route 20	East Leg State Route 1	South Leg State Route 20	West Leg State Route 1	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	1	0	0	1
7:30 AM	0	0	0	0	0
7:45 AM	0	1	0	0	1
8:00 AM	0	0	0	0	0
8:15 AM	2	0	0	0	2
8:30 AM	0	0	0	0	0
8:45 AM	1	1	0	0	2
TOTAL VOLUMES:	3	3	0	0	6

	North Leg State Route 20	East Leg State Route 1	South Leg State Route 20	West Leg State Route 1	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	1	1	0	1	3
4:45 PM	0	2	0	0	2
5:00 PM	0	0	0	0	0
5:15 PM	1	1	0	1	3
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	2	4	0	2	8

SATURDAY

Date: 8/24/2013

	North Leg State Route 20	East Leg State Route 1	South Leg State Route 20	West Leg State Route 1	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
11:00 AM	2	1	0	3	6
11:15 AM	0	0	1	0	1
11:30 AM	0	0	0	0	0
11:45 AM	1	0	0	1	2
12:00 PM	0	1	0	0	1
12:15 PM	0	3	0	0	3
12:30 PM	2	0	0	2	4
12:45 PM	0	0	0	0	0
TOTAL VOLUMES:	5	5	1	6	17

Location: Fort Bragg
N/S: State Route 1
E/W: State Route 20

Date: 8/22/2013
File : FBGSR1SR20

	North Leg State Route 20	East Leg State Route 1	South Leg State Route 20	West Leg State Route 1	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
7:00 AM	0	1	0	0	1
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	3	0	0	3
8:00 AM	0	2	0	0	2
8:15 AM	0	2	0	6	8
8:30 AM	0	0	0	3	3
8:45 AM	1	0	0	0	1
TOTAL VOLUMES:	1	8	0	9	18

	North Leg State Route 20	East Leg State Route 1	South Leg State Route 20	West Leg State Route 1	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
4:00 PM	0	1	0	1	2
4:15 PM	2	3	0	3	8
4:30 PM	0	4	0	0	4
4:45 PM	2	0	0	2	4
5:00 PM	0	1	0	1	2
5:15 PM	0	1	0	0	1
5:30 PM	0	0	0	0	0
5:45 PM	0	2	0	3	5
TOTAL VOLUMES:	4	12	0	10	26

SATURDAY

Date: 8/24/2013

	North Leg State Route 20	East Leg State Route 1	South Leg State Route 20	West Leg State Route 1	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
11:00 AM	0	0	0	1	1
11:15 AM	0	1	0	0	1
11:30 AM	0	1	0	0	1
11:45 AM	0	0	0	0	0
12:00 PM	0	0	0	0	0
12:15 PM	0	0	0	3	3
12:30 PM	0	0	0	2	2
12:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	2	0	6	8

Appendix B – Historic Collision Analysis

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: JOHN THURSTON
Transportation Planning
District 1

Date: November 8, 2013

File: Ft Bragg Transfer Station

From: DARRON HILL
Asst Traffic Safety Engineer
District 1 Office of Traffic Safety

Subject: Request for 3-Year Traffic Collision Analysis

Per your request dated November 7, 2013, a safety analysis has been conducted for the most recent 3 year time period between 01/01/2009 and 12/31/2011. The segment reviewed was 0.25 miles either side of the proposed Transfer Station entrance at PM 2.90. Exact PM limits were PM 2.65 through PM 3.15.

According to the TASAS Table B this segment has an actual total collision rate which is 48% less than the state average. The actual fatal collision rate is 0% and the actual fatal plus injury collision rate is 48% less than the statewide average.

Of the 2 Total Collisions, there was 1 Injury and 1 Property Damage Only Collisions. There was 1 multi-vehicle collisions, no collisions occurred during periods of darkness and no collisions occurred on wet pavement. There was not a predominant Primary Collision Factor with one collision listed as "Other" and one collision listed as "Speeding." The Type of Collision was listed as "Hit Object" in one collision and as "Sideswipe" in the other collision. 2 of 2 collisions were eastbound and no collisions occurred within an intersection. Both collisions occurred in the early afternoon on a week day during the summer months.

If you have any questions please contact me at (707) 964-0974.

cc:
1 – ML SUCHANEK
2 – TAARSENEAU
3 – DLHill
4 – FILE

Appendix C – Existing Conditions Scenario Level of Service and Queue Calculations

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	82	237	534	80	209	463
v/c Ratio	0.29	0.53	0.56	0.16	0.47	0.48
Control Delay	20.0	8.2	16.3	2.8	23.7	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	8.2	16.3	2.8	23.7	8.5
Queue Length 50th (ft)	19	0	60	0	26	62
Queue Length 95th (ft)	52	46	106	15	60	136
Internal Link Dist (ft)	305		167			496
Turn Bay Length (ft)					320	
Base Capacity (vph)	1286	1182	2170	993	445	1596
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.20	0.25	0.08	0.47	0.29

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	76	220	518	78	196	435
Number	3	18	2	12	1	6
Initial Queue, veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking, Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow Rate	1696	1696	1712	1712	1759	1759
Lanes	1	1	2	1	2	1
Capacity, veh/h	123	110	1122	502	339	1063
Arriving On Green	0.08	0.00	0.34	0.00	0.10	0.60
Sat Flow, veh/h	1615.6	1442.0	3337.8	1455.0	3250.4	1759.3
Grp Volume(v), veh/h	81.7	0.0	534.0	0.0	208.5	462.8
Grp Sat Flow(s),veh/h/ln	1615.6	1442.0	1626.1	1455.0	1625.2	1759.3
Q Serve(g_s), s	1.9	0.0	4.9	0.0	2.3	5.4
Cycle Q Clear(g_c), s	1.9	0.0	4.9	0.0	2.3	5.4
Proportion In Lane	1.000	1.000		1.000	1.000	
Lane Grp Cap(c), veh/h	122.7	109.5	1121.9	501.9	338.7	1062.5
V/C Ratio(X)	0.666	0.000	0.476	0.000	0.616	0.436
Avail Cap(c_a), veh/h	1526.0	1362.0	2568.4	1149.0	528.7	1929.4
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.000	0.000	1.000	0.000	1.000	1.000
Uniform Delay (d), s/veh	17.1	0.0	9.8	0.0	16.3	4.1
Incr Delay (d2), s/veh	6.1	0.0	0.3	0.0	1.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Delay (d), s/veh	23.2	0.0	10.1	0.0	18.2	4.3
Lane Group LOS	C		B		B	A
Approach Volume, veh/h	82		534			671
Approach Delay, s/veh	23.2		10.1			8.6
Approach LOS	C		B			A

Timer						
Assigned Phase			2		1	6
Phase Duration (G+Y+Rc), s			19.05		9.87	28.92
Change Period (Y+Rc), s			5.90		5.90	5.90
Max Green Setting (Gmax), s			30.10		6.20	41.80
Max Q Clear Time (g_c+I1), s			6.90		4.34	7.39
Green Extension Time (p_c)			6.55		0.12	7.23

Intersection Summary						
HCM 2010 Control Delay			10.2			
HCM 2010 Level of Service			B			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	221	230	645	155	267	724
v/c Ratio	0.57	0.44	0.59	0.27	0.76	0.76
Control Delay	27.3	6.5	18.4	4.1	46.7	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	6.5	18.4	4.1	46.7	17.3
Queue Length 50th (ft)	68	0	94	0	48	177
Queue Length 95th (ft)	150	49	160	33	#132	344
Internal Link Dist (ft)	305		167			496
Turn Bay Length (ft)					320	
Base Capacity (vph)	1027	989	1739	835	350	1295
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.23	0.37	0.19	0.76	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	219	228	632	152	232	630
Number	3	18	2	12	1	6
Initial Queue, veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking, Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow Rate	1696	1696	1712	1712	1759	1759
Lanes	1	1	2	1	2	1
Capacity, veh/h	280	250	1195	535	373	1046
Arriving On Green	0.17	0.00	0.37	0.00	0.11	0.59
Sat Flow, veh/h	1615.6	1442.0	3337.8	1455.0	3250.4	1759.3
Grp Volume(v), veh/h	221.2	0.0	644.9	0.0	266.7	724.1
Grp Sat Flow(s),veh/h/ln	1615.6	1442.0	1626.1	1455.0	1625.2	1759.3
Q Serve(g_s), s	6.9	0.0	8.2	0.0	4.2	14.9
Cycle Q Clear(g_c), s	6.9	0.0	8.2	0.0	4.2	14.9
Proportion In Lane	1.000	1.000		1.000	1.000	
Lane Grp Cap(c), veh/h	280.3	250.2	1195.2	534.7	373.0	1045.8
V/C Ratio(X)	0.789	0.000	0.540	0.000	0.715	0.692
Avail Cap(c_a), veh/h	1106.1	987.2	1867.9	835.6	377.1	1398.5
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.000	0.000	1.000	0.000	1.000	1.000
Uniform Delay (d), s/veh	20.8	0.0	13.1	0.0	22.4	7.3
Incr Delay (d2), s/veh	4.9	0.0	0.4	0.0	6.2	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Delay (d), s/veh	25.7	0.0	13.5	0.0	28.7	8.3
Lane Group LOS	C		B		C	A
Approach Volume, veh/h	221		645			991
Approach Delay, s/veh	25.7		13.5			13.8
Approach LOS	C		B			B
Timer						
Assigned Phase			2		1	6
Phase Duration (G+Y+Rc), s			25.22		11.93	37.16
Change Period (Y+Rc), s			5.90		5.90	5.90
Max Green Setting (Gmax), s			30.20		6.10	41.80
Max Q Clear Time (g_c+I1), s			10.23		6.16	16.92
Green Extension Time (p_c)			9.19		0.00	10.20
Intersection Summary						
HCM 2010 Control Delay			15.1			
HCM 2010 Level of Service			B			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	185	226	615	175	229	580
v/c Ratio	0.51	0.46	0.60	0.31	0.58	0.61
Control Delay	24.5	6.6	18.4	4.5	32.7	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	6.6	18.4	4.5	32.7	12.4
Queue Length 50th (ft)	50	0	82	0	35	108
Queue Length 95th (ft)	109	40	145	35	#97	240
Internal Link Dist (ft)	305		167			496
Turn Bay Length (ft)					320	
Base Capacity (vph)	1117	1056	1879	902	393	1409
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.21	0.33	0.19	0.58	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	159	194	566	161	215	545
Number	3	18	2	12	1	6
Initial Queue, veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking, Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow Rate	1696	1696	1712	1712	1759	1759
Lanes	1	1	2	1	2	1
Capacity, veh/h	240	214	1158	518	347	1037
Arriving On Green	0.15	0.00	0.36	0.00	0.11	0.59
Sat Flow, veh/h	1615.6	1442.0	3337.8	1455.0	3250.4	1759.3
Grp Volume(v), veh/h	184.9	0.0	615.2	0.0	228.7	579.8
Grp Sat Flow(s),veh/h/ln	1615.6	1442.0	1626.1	1455.0	1625.2	1759.3
Q Serve(g_s), s	5.1	0.0	7.0	0.0	3.1	9.4
Cycle Q Clear(g_c), s	5.1	0.0	7.0	0.0	3.1	9.4
Proportion In Lane	1.000	1.000		1.000	1.000	
Lane Grp Cap(c), veh/h	240.2	214.4	1157.9	518.0	346.6	1036.8
V/C Ratio(X)	0.770	0.000	0.531	0.000	0.660	0.559
Avail Cap(c_a), veh/h	1248.9	1114.6	2095.0	937.2	439.7	1579.0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.000	0.000	1.000	0.000	1.000	1.000
Uniform Delay (d), s/veh	19.1	0.0	11.9	0.0	20.0	5.9
Incr Delay (d2), s/veh	5.2	0.0	0.4	0.0	2.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Delay (d), s/veh	24.2	0.0	12.3	0.0	22.4	6.3
Lane Group LOS	C		B		C	A
Approach Volume, veh/h	185		615			809
Approach Delay, s/veh	24.2		12.3			10.9
Approach LOS	C		B			B

Timer						
Assigned Phase			2		1	6
Phase Duration (G+Y+Rc), s			22.48		10.87	33.35
Change Period (Y+Rc), s			5.90		5.90	5.90
Max Green Setting (Gmax), s			30.00		6.30	41.80
Max Q Clear Time (g_c+I1), s			9.00		5.15	11.40
Green Extension Time (p_c)			7.90		0.09	9.01

Intersection Summary						
HCM 2010 Control Delay			13.0			
HCM 2010 Level of Service			B			

Appendix D – Mendocino Solid Waste Management Authority Memorandum – Projected Traffic, Highway 20 Transfer Station

Mendocino Solid Waste Management Authority

A joint powers public agency

Michael E. Sweeney
General Manager
101 W. Church St. #9
Ukiah, CA 95482

(707) 468-9710
sweeney@pacific.net

September 24, 2013

Projected traffic, Highway 20 Transfer Station

Facility operation will be Saturday through Wednesday, 9 a.m. to 4 p.m. (same as current Caspar self-haul transfer station) for all customers and Monday through Friday, 9 a.m. to 4 p.m. for the franchised hauler trucks only.

The project trips would consist of the following components:

1. Self-haul trash & recyclables. This component can be projected using the historical data for the existing Caspar self-haul transfer station, which would be replaced by the new facility. Records are available showing the daily self-haul traffic at Caspar. The peak month for self-haul is July. The daily traffic for July, 2013 appears in Table 1 below.

2. Franchised hauler. This component can be projected data on the current trips of Empire Waste Management which now terminate at Empire's truck yard at 219 Pudding Creek Road, Fort Bragg where they are mobilized for long-haul to Willits Transfer Station. These trucks will dump instead at the new facility.

3. Recycle outhauls. This component can be projected from current experience of Caspar self-haul transfer station, which has one roll-off pickup per week on average for mixed recyclables and occasional additional trips for metal and other segregated commodities.

4. Transfer truck. During the peak month of July, 2013, there were 1,129 tons of solid waste generated in the wasteshed. If transfer trucks operated 24 days in

the month (Mon-Sat), there would an average of 47 tons per day, requiring an average of 2 trips per day.

Table 1. Caspar self-haul traffic, July 2013

Week	Sunday	Monday	Tuesday	Wed.	Thursday	Friday	Saturday
1		63	**82**	**91**	-	-	129
2	101	76	70	84	-	-	**138**
3	105	73	54	84	-	-	121
4	**112**	**76**	55	80	-	-	126
5	111	59	62	90			

bold face = highest for day of week

Table 2. Projected peak traffic under current demand

	Sunday	Monday	Tuesday	Wed.	Thursday	Friday	Saturday
Self-haul customers	112	76	82	91	0	0	138
Franchise hauler collection trucks	0	10	15	9	20	9	0
Recycling outhaul	0	0	0	0	1	1	0
Transfer truck outhaul	0	2	2	2	2	2	2
Total traffic	112	88	99	102	23	12	140

Assumptions:

1. Continue Caspar self-haul schedule Saturday-Wednesday.
2. Self-haul traffic equals highest per day of week in July 2013.
3. Franchise hauler access Monday-Friday.

Appendix E – Existing plus Project Conditions Scenario Level of Service and Queue Calculations

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	88	242	534	88	216	463
v/c Ratio	0.31	0.54	0.56	0.18	0.49	0.48
Control Delay	20.4	8.3	16.2	3.2	24.7	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	8.3	16.2	3.2	24.7	8.5
Queue Length 50th (ft)	20	0	60	0	27	63
Queue Length 95th (ft)	57	48	107	18	#66	137
Internal Link Dist (ft)	305		167			496
Turn Bay Length (ft)					320	
Base Capacity (vph)	1278	1166	2156	987	438	1585
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.21	0.25	0.09	0.49	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 2010 Signalized Intersection Summary — Existing plus Project AM Peak Hour

3: Hwy 1 & Hwy 20

8/21/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	82	225	518	85	203	435
Number	3	18	2	12	1	6
Initial Queue, veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking, Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow Rate	1696	1681	1712	1712	1743	1759
Lanes	1	1	2	1	2	1
Capacity, veh/h	128	113	1116	499	346	1062
Arriving On Green	0.08	0.00	0.34	0.00	0.11	0.60
Sat Flow, veh/h	1615.6	1429.2	3337.8	1455.0	3220.6	1759.3
Grp Volume(v), veh/h	88.2	0.0	534.0	0.0	216.0	462.8
Grp Sat Flow(s),veh/h/ln	1615.6	1429.2	1626.1	1455.0	1610.3	1759.3
Q Serve(g_s), s	2.0	0.0	5.0	0.0	2.5	5.4
Cycle Q Clear(g_c), s	2.0	0.0	5.0	0.0	2.5	5.4
Proportion In Lane	1.000	1.000		1.000	1.000	
Lane Grp Cap(c), veh/h	128.1	113.3	1115.8	499.2	345.8	1062.1
V/C Ratio(X)	0.688	0.000	0.479	0.000	0.624	0.436
Avail Cap(c_a), veh/h	1511.1	1336.7	2543.3	1137.8	518.8	1910.5
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.000	0.000	1.000	0.000	1.000	1.000
Uniform Delay (d), s/veh	17.3	0.0	9.9	0.0	16.4	4.1
Incr Delay (d2), s/veh	6.4	0.0	0.3	0.0	1.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Delay (d), s/veh	23.7	0.0	10.3	0.0	18.3	4.4
Lane Group LOS	C		B		B	A
Approach Volume, veh/h	88		534			679
Approach Delay, s/veh	23.7		10.3			8.8
Approach LOS	C		B			A

Timer						
Assigned Phase			2		1	6
Phase Duration (G+Y+Rc), s			19.11		10.03	29.14
Change Period (Y+Rc), s			5.90		5.90	5.90
Max Green Setting (Gmax), s			30.10		6.20	41.80
Max Q Clear Time (g_c+I1), s			6.97		4.47	7.44
Green Extension Time (p_c)			6.55		0.12	7.23

Intersection Summary		
HCM 2010 Control Delay		10.4
HCM 2010 Level of Service		B

Intersection	
Intersection Delay (sec/veh):	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Volume (vph)	14	112	110	4	3	11
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	Free	Free	None	None
Storage Length	200			0	0	0
Median Width		12	12		12	
Grade (%)		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	12	12	100	100	2
Movement Flow Rate	15	122	120	4	3	12
Number of Lanes	1	1	1	0	1	0

Major/Minor		Major 1	Major 2			
Conflicting Flow Rate - All	124	0	0	0	274	122
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	152	-
Follow-up Headway	2.218	-	-	-	4.4	3.318
Pot Capacity-1 Maneuver	1463	-	-	-	548	929
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	684	-
Time blocked-Platoon(%)	0	-	-	-	0	0
Mov Capacity-1 Maneuver	1463	-	-	-	542	929
Mov Capacity-2 Maneuver	-	-	-	-	542	-
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	677	-

Approach	EB	WB	SB
HCM Control Delay (s)	0.8	0	9.6
HCM LOS	A	A	A

Lane	EBL	EBT	WBT	WBR	SBLn1
Capacity (vph)					806
HCM Control Delay (s)	7.487	-	-	-	9.6
HCM Lane VC Ratio	0.01	-	-	-	0.019
HCM Lane LOS	A	-	-	-	A
HCM 95th Percentile Queue (veh)	0.032	-	-	-	0.058

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	228	237	645	161	272	724
v/c Ratio	0.58	0.45	0.59	0.27	0.79	0.76
Control Delay	27.6	6.5	18.5	4.2	49.4	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	6.5	18.5	4.2	49.4	17.6
Queue Length 50th (ft)	71	0	95	0	50	180
Queue Length 95th (ft)	155	49	161	34	#137	349
Internal Link Dist (ft)	305		167			496
Turn Bay Length (ft)					320	
Base Capacity (vph)	1020	978	1727	833	344	1286
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.24	0.37	0.19	0.79	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	226	235	632	158	237	630
Number	3	18	2	12	1	6
Initial Queue, veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking, Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow Rate	1696	1681	1712	1712	1743	1759
Lanes	1	1	2	1	2	1
Capacity, veh/h	288	255	1189	532	370	1041
Arriving On Green	0.18	0.00	0.37	0.00	0.11	0.59
Sat Flow, veh/h	1615.6	1429.2	3337.8	1455.0	3220.6	1759.3
Grp Volume(v), veh/h	228.3	0.0	644.9	0.0	272.4	724.1
Grp Sat Flow(s),veh/h/ln	1615.6	1429.2	1626.1	1455.0	1610.3	1759.3
Q Serve(g_s), s	7.2	0.0	8.3	0.0	4.3	15.2
Cycle Q Clear(g_c), s	7.2	0.0	8.3	0.0	4.3	15.2
Proportion In Lane	1.000	1.000		1.000	1.000	
Lane Grp Cap(c), veh/h	288.1	254.9	1189.0	531.9	370.2	1041.1
V/C Ratio(X)	0.792	0.000	0.542	0.000	0.736	0.696
Avail Cap(c_a), veh/h	1096.1	969.7	1851.0	828.1	370.2	1385.9
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.000	0.000	1.000	0.000	1.000	1.000
Uniform Delay (d), s/veh	20.9	0.0	13.3	0.0	22.7	7.5
Incr Delay (d2), s/veh	4.9	0.0	0.4	0.0	7.5	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Delay (d), s/veh	25.8	0.0	13.7	0.0	30.2	8.5
Lane Group LOS	C		B		C	A
Approach Volume, veh/h	228		645			997
Approach Delay, s/veh	25.8		13.7			14.4
Approach LOS	C		B			B

Timer						
Assigned Phase			2		1	6
Phase Duration (G+Y+Rc), s			25.30		12.00	37.30
Change Period (Y+Rc), s			5.90		5.90	5.90
Max Green Setting (Gmax), s			30.20		6.10	41.80
Max Q Clear Time (g_c+I1), s			10.33		6.34	17.15
Green Extension Time (p_c)			9.16		0.00	10.16

Intersection Summary			
HCM 2010 Control Delay			15.6
HCM 2010 Level of Service			B

Intersection						
Intersection Delay (sec/veh):	0.7					
Movement	**EBL**	**EBT**	**WBT**	**WBR**	**SBL**	**SBR**
Volume (vph)	11	157	166	3	4	14
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	Free	Free	None	None
Storage Length	200			0	0	0
Median Width		12	12		12	
Grade (%)		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	12	12	100	100	2
Movement Flow Rate	12	171	180	3	4	15
Number of Lanes	1	1	1	0	1	0
Major/Minor		**Major 1**	**Major 2**			
Conflicting Flow Rate - All	183	0	0	0	377	182
Stage 1	-	-	-	-	182	-
Stage 2	-	-	-	-	195	-
Follow-up Headway	2.218	-	-	-	4.4	3.318
Pot Capacity-1 Maneuver	1392	-	-	-	470	861
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	650	-
Time blocked-Platoon(%)	0	-	-	-	0	0
Mov Capacity-1 Maneuver	1392	-	-	-	466	861
Mov Capacity-2 Maneuver	-	-	-	-	466	-
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	644	-

Approach	EB		WB		SB	
HCM Control Delay (s)	0.5		0		10.1	
HCM LOS	A		A		B	

Lane	EBL	EBT	WBT	WBR	SBLn1
Capacity (vph)					725
HCM Control Delay (s)	7.609	-	-	-	10.1
HCM Lane VC Ratio	0.009	-	-	-	0.027
HCM Lane LOS	A	-	-	-	B
HCM 95th Percentile Queue (veh)	0.026	-	-	-	0.083

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	193	234	615	183	236	580
v/c Ratio	0.52	0.47	0.61	0.32	0.61	0.62
Control Delay	24.6	6.6	18.6	4.5	34.1	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	6.6	18.6	4.5	34.1	12.6
Queue Length 50th (ft)	53	0	83	0	36	110
Queue Length 95th (ft)	114	41	147	36	#103	246
Internal Link Dist (ft)	305		167			496
Turn Bay Length (ft)					320	
Base Capacity (vph)	1110	1044	1866	900	387	1399
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.22	0.33	0.20	0.61	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	166	201	566	168	222	545
Number	3	18	2	12	1	6
Initial Queue, veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking, Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow Rate	1696	1681	1712	1712	1743	1759
Lanes	1	1	2	1	2	1
Capacity, veh/h	250	221	1149	514	352	1033
Arriving On Green	0.15	0.00	0.35	0.00	0.11	0.59
Sat Flow, veh/h	1615.6	1429.2	3337.8	1455.0	3220.6	1759.3
Grp Volume(v), veh/h	193.0	0.0	615.2	0.0	236.2	579.8
Grp Sat Flow(s),veh/h/ln	1615.6	1429.2	1626.1	1455.0	1610.3	1759.3
Q Serve(g_s), s	5.4	0.0	7.1	0.0	3.3	9.6
Cycle Q Clear(g_c), s	5.4	0.0	7.1	0.0	3.3	9.6
Proportion In Lane	1.000	1.000		1.000	1.000	
Lane Grp Cap(c), veh/h	250.0	221.1	1148.6	513.8	352.1	1033.1
V/C Ratio(X)	0.772	0.000	0.536	0.000	0.671	0.561
Avail Cap(c_a), veh/h	1230.1	1088.2	2063.5	923.2	429.1	1555.3
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.000	0.000	1.000	0.000	1.000	1.000
Uniform Delay (d), s/veh	19.2	0.0	12.2	0.0	20.2	6.0
Incr Delay (d2), s/veh	5.0	0.0	0.4	0.0	3.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Delay (d), s/veh	24.2	0.0	12.6	0.0	23.3	6.5
Lane Group LOS	C		B		C	A
Approach Volume, veh/h	193		615			816
Approach Delay, s/veh	24.2		12.6			11.3
Approach LOS	C		B			B

Timer						
Assigned Phase			2		1	6
Phase Duration (G+Y+Rc), s			22.60		11.07	33.67
Change Period (Y+Rc), s			5.90		5.90	5.90
Max Green Setting (Gmax), s			30.00		6.30	41.80
Max Q Clear Time (g_c+I1), s			9.14		5.33	11.59
Green Extension Time (p_c)			7.88		0.08	9.00

Intersection Summary		
HCM 2010 Control Delay		13.3
HCM 2010 Level of Service		B

Appendix F - Cumulative Conditions Scenario Level of Service and Queue Calculations

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	86	248	614	93	239	532
v/c Ratio	0.30	0.55	0.60	0.18	0.56	0.54
Control Delay	21.2	8.5	16.6	3.4	28.1	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	8.5	16.6	3.4	28.1	9.2
Queue Length 50th (ft)	21	0	72	0	31	76
Queue Length 95th (ft)	57	49	125	19	#85	169
Internal Link Dist (ft)	305		167			496
Turn Bay Length (ft)					320	
Base Capacity (vph)	1235	1147	2084	958	428	1539
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.22	0.29	0.10	0.56	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	80	231	596	90	225	500
Number	3	18	2	12	1	6
Initial Queue, veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking, Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow Rate	1696	1696	1712	1712	1759	1759
Lanes	1	1	2	1	2	1
Capacity, veh/h	123	110	1210	541	369	1106
Arriving On Green	0.08	0.00	0.37	0.00	0.11	0.63
Sat Flow, veh/h	1615.6	1442.0	3337.8	1455.0	3250.4	1759.3
Grp Volume(v), veh/h	86.0	0.0	614.4	0.0	239.4	531.9
Grp Sat Flow(s),veh/h/ln	1615.6	1442.0	1626.1	1455.0	1625.2	1759.3
Q Serve(g_s), s	2.1	0.0	6.0	0.0	2.9	6.6
Cycle Q Clear(g_c), s	2.1	0.0	6.0	0.0	2.9	6.6
Proportion In Lane	1.000	1.000		1.000	1.000	
Lane Grp Cap(c), veh/h	122.7	109.5	1210.2	541.4	369.4	1105.9
V/C Ratio(X)	0.701	0.000	0.508	0.000	0.648	0.481
Avail Cap(c_a), veh/h	1408.4	1257.0	2370.5	1060.5	488.0	1780.7
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.000	0.000	1.000	0.000	1.000	1.000
Uniform Delay (d), s/veh	18.6	0.0	10.0	0.0	17.5	4.1
Incr Delay (d2), s/veh	7.1	0.0	0.3	0.0	1.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Delay (d), s/veh	25.7	0.0	10.4	0.0	19.4	4.4
Lane Group LOS	C		B		B	A
Approach Volume, veh/h	86		614			771
Approach Delay, s/veh	25.7		10.4			9.1
Approach LOS	C		B			A

Timer						
Assigned Phase			2		1	6
Phase Duration (G+Y+Rc), s			21.27		10.59	31.86
Change Period (Y+Rc), s			5.90		5.90	5.90
Max Green Setting (Gmax), s			30.10		6.20	41.80
Max Q Clear Time (g_c+I1), s			8.04		4.91	8.65
Green Extension Time (p_c)			7.64		0.11	8.68

Intersection Summary			
HCM 2010 Control Delay			10.6
HCM 2010 Level of Service			B

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	232	241	742	179	307	833
v/c Ratio	0.66	0.49	0.52	0.25	1.07	0.79
Control Delay	34.4	7.7	16.5	3.5	108.5	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	7.7	16.5	3.5	108.5	18.7
Queue Length 50th (ft)	90	3	115	0	~75	233
Queue Length 95th (ft)	158	53	191	35	#158	#521
Internal Link Dist (ft)	305		167			496
Turn Bay Length (ft)					320	
Base Capacity (vph)	841	852	1424	725	286	1061
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.28	0.52	0.25	1.07	0.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	230	239	727	175	267	725
Number	3	18	2	12	1	6
Initial Queue, veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking, Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow Rate	1696	1696	1712	1712	1759	1759
Lanes	1	1	2	1	2	1
Capacity, veh/h	290	259	1277	571	350	1064
Arriving On Green	0.18	0.00	0.39	0.00	0.11	0.60
Sat Flow, veh/h	1615.6	1442.0	3337.8	1455.0	3250.4	1759.3
Grp Volume(v), veh/h	232.3	0.0	741.8	0.0	306.9	833.3
Grp Sat Flow(s),veh/h/ln	1615.6	1442.0	1626.1	1455.0	1625.2	1759.3
Q Serve(g_s), s	7.8	0.0	10.2	0.0	5.3	20.1
Cycle Q Clear(g_c), s	7.8	0.0	10.2	0.0	5.3	20.1
Proportion In Lane	1.000	1.000		1.000	1.000	
Lane Grp Cap(c), veh/h	290.2	259.0	1277.4	571.4	350.4	1064.0
V/C Ratio(X)	0.801	0.000	0.581	0.000	0.876	0.783
Avail Cap(c_a), veh/h	1027.8	917.3	1735.6	776.5	350.4	1299.5
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.000	0.000	1.000	0.000	1.000	1.000
Uniform Delay (d), s/veh	22.2	0.0	13.5	0.0	24.9	8.4
Incr Delay (d2), s/veh	5.1	0.0	0.4	0.0	21.2	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Delay (d), s/veh	27.3	0.0	13.9	0.0	46.0	11.0
Lane Group LOS	C		B		D	B
Approach Volume, veh/h	232		742			1140
Approach Delay, s/veh	27.3		13.9			20.4
Approach LOS	C		B			C

Timer						
Assigned Phase			2		1	6
Phase Duration (G+Y+Rc), s			28.13		12.00	40.13
Change Period (Y+Rc), s			5.90		5.90	5.90
Max Green Setting (Gmax), s			30.20		6.10	41.80
Max Q Clear Time (g_c+I1), s			12.15		7.26	22.13
Green Extension Time (p_c)			10.23		0.00	10.79

Intersection Summary		
HCM 2010 Control Delay		18.9
HCM 2010 Level of Service		B

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	194	237	708	201	263	667
v/c Ratio	0.54	0.47	0.63	0.32	0.72	0.68
Control Delay	26.9	6.9	18.6	4.0	41.1	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	6.9	18.6	4.0	41.1	13.9
Queue Length 50th (ft)	58	0	102	0	45	142
Queue Length 95th (ft)	124	43	171	36	#128	300
Internal Link Dist (ft)	305		167			496
Turn Bay Length (ft)					320	
Base Capacity (vph)	1043	1005	1754	866	367	1315
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.24	0.40	0.23	0.72	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	167	204	651	185	247	627
Number	3	18	2	12	1	6
Initial Queue, veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking, Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow Rate	1696	1696	1712	1712	1759	1759
Lanes	1	1	2	1	2	1
Capacity, veh/h	249	223	1233	551	372	1070
Arriving On Green	0.15	0.00	0.38	0.00	0.11	0.61
Sat Flow, veh/h	1615.6	1442.0	3337.8	1455.0	3250.4	1759.3
Grp Volume(v), veh/h	194.2	0.0	707.6	0.0	262.8	667.0
Grp Sat Flow(s),veh/h/ln	1615.6	1442.0	1626.1	1455.0	1625.2	1759.3
Q Serve(g_s), s	5.9	0.0	8.9	0.0	4.0	12.3
Cycle Q Clear(g_c), s	5.9	0.0	8.9	0.0	4.0	12.3
Proportion In Lane	1.000	1.000		1.000	1.000	
Lane Grp Cap(c), veh/h	249.4	222.6	1232.7	551.5	372.5	1070.3
V/C Ratio(X)	0.779	0.000	0.574	0.000	0.705	0.623
Avail Cap(c_a), veh/h	1131.3	1009.7	1897.7	849.0	398.3	1430.3
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.000	0.000	1.000	0.000	1.000	1.000
Uniform Delay (d), s/veh	20.9	0.0	12.7	0.0	21.9	6.4
Incr Delay (d2), s/veh	5.2	0.0	0.4	0.0	5.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Delay (d), s/veh	26.1	0.0	13.1	0.0	27.1	6.9
Lane Group LOS	C		B		C	A
Approach Volume, veh/h	194		708			930
Approach Delay, s/veh	26.1		13.1			12.7
Approach LOS	C		B			B

Timer						
Assigned Phase			2		1	6
Phase Duration (G+Y+Rc), s			25.39		11.79	37.18
Change Period (Y+Rc), s			5.90		5.90	5.90
Max Green Setting (Gmax), s			30.00		6.30	41.80
Max Q Clear Time (g_c+I1), s			10.88		6.00	14.30
Green Extension Time (p_c)			8.94		0.03	10.57

Intersection Summary		
HCM 2010 Control Delay		14.2
HCM 2010 Level of Service		B

Appendix G - Cumulative plus Project Conditions Scenario Level of Service and Queue Calculations

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	92	254	614	100	247	532
v/c Ratio	0.32	0.55	0.60	0.19	0.59	0.54
Control Delay	21.4	8.4	16.7	3.7	29.3	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	8.4	16.7	3.7	29.3	9.4
Queue Length 50th (ft)	22	0	72	0	32	77
Queue Length 95th (ft)	60	50	126	22	#90	171
Internal Link Dist (ft)	305		167			496
Turn Bay Length (ft)					320	
Base Capacity (vph)	1229	1133	2073	953	421	1532
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.22	0.30	0.10	0.59	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	86	236	596	97	232	500
Number	3	18	2	12	1	6
Initial Queue, veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking, Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow Rate	1696	1681	1712	1712	1743	1759
Lanes	1	1	2	1	2	1
Capacity, veh/h	127	113	1204	539	375	1106
Arriving On Green	0.08	0.00	0.37	0.00	0.12	0.63
Sat Flow, veh/h	1615.6	1429.2	3337.8	1455.0	3220.6	1759.3
Grp Volume(v), veh/h	92.5	0.0	614.4	0.0	246.8	531.9
Grp Sat Flow(s),veh/h/ln	1615.6	1429.2	1626.1	1455.0	1610.3	1759.3
Q Serve(g_s), s	2.3	0.0	6.1	0.0	3.1	6.7
Cycle Q Clear(g_c), s	2.3	0.0	6.1	0.0	3.1	6.7
Proportion In Lane	1.000	1.000		1.000	1.000	
Lane Grp Cap(c), veh/h	127.4	112.7	1204.2	538.7	375.5	1105.5
V/C Ratio(X)	0.726	0.000	0.510	0.000	0.657	0.481
Avail Cap(c_a), veh/h	1395.6	1234.6	2348.9	1050.8	479.1	1764.5
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.000	0.000	1.000	0.000	1.000	1.000
Uniform Delay (d), s/veh	18.8	0.0	10.2	0.0	17.6	4.1
Incr Delay (d2), s/veh	7.6	0.0	0.3	0.0	2.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Delay (d), s/veh	26.4	0.0	10.5	0.0	19.8	4.4
Lane Group LOS	C		B		B	A
Approach Volume, veh/h	92		614			779
Approach Delay, s/veh	26.4		10.5			9.3
Approach LOS	C		B			A

Timer						
Assigned Phase			2		1	6
Phase Duration (G+Y+Rc), s			21.33		10.76	32.09
Change Period (Y+Rc), s			5.90		5.90	5.90
Max Green Setting (Gmax), s			30.10		6.20	41.80
Max Q Clear Time (g_c+I1), s			8.11		5.06	8.71
Green Extension Time (p_c)			7.63		0.10	8.68

Intersection Summary			
HCM 2010 Control Delay			10.9
HCM 2010 Level of Service			B

Intersection	
Intersection Delay (sec/veh):	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Volume (vph)	14	118	116	4	3	11
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	Free	Free	None	None
Storage Length	200			0	0	0
Median Width		12	12		12	
Grade (%)		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	12	12	100	100	2
Movement Flow Rate	15	128	126	4	3	12
Number of Lanes	1	1	1	0	1	0

Major/Minor		Major 1	Major 2			
Conflicting Flow Rate - All	130	0	0	0	286	128
Stage 1	-	-	-	-	128	-
Stage 2	-	-	-	-	158	-
Follow-up Headway	2.218	-	-	-	4.4	3.318
Pot Capacity-1 Maneuver	1455	-	-	-	539	922
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	679	-
Time blocked-Platoon(%)	0	-	-	-	0	0
Mov Capacity-1 Maneuver	1455	-	-	-	533	922
Mov Capacity-2 Maneuver	-	-	-	-	533	-
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	672	-

Approach	EB	WB	SB
HCM Control Delay (s)	0.8	0	9.6
HCM LOS	A	A	A

Lane	EBL	EBT	WBT	WBR	SBLn1
Capacity (vph)					797
HCM Control Delay (s)	7.5	-	-	-	9.6
HCM Lane VC Ratio	0.01	-	-	-	0.019
HCM Lane LOS	A	-	-	-	A
HCM 95th Percentile Queue (veh)	0.032	-	-	-	0.058

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	239	248	742	185	313	833
v/c Ratio	0.67	0.51	0.52	0.25	1.11	0.79
Control Delay	34.6	8.2	16.7	3.5	120.4	19.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	8.2	16.7	3.5	120.4	19.1
Queue Length 50th (ft)	94	6	116	0	~80	237
Queue Length 95th (ft)	162	57	193	36	#163	#527
Internal Link Dist (ft)	305		167			496
Turn Bay Length (ft)					320	
Base Capacity (vph)	837	842	1417	726	282	1055
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.29	0.52	0.25	1.11	0.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	237	246	727	181	272	725
Number	3	18	2	12	1	6
Initial Queue, veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking, Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow Rate	1696	1681	1712	1712	1743	1759
Lanes	1	1	2	1	2	1
Capacity, veh/h	298	263	1272	569	345	1058
Arriving On Green	0.18	0.00	0.39	0.00	0.11	0.60
Sat Flow, veh/h	1615.6	1429.2	3337.8	1455.0	3220.6	1759.3
Grp Volume(v), veh/h	239.4	0.0	741.8	0.0	312.6	833.3
Grp Sat Flow(s),veh/h/ln	1615.6	1429.2	1626.1	1455.0	1610.3	1759.3
Q Serve(g_s), s	8.1	0.0	10.3	0.0	5.5	20.4
Cycle Q Clear(g_c), s	8.1	0.0	10.3	0.0	5.5	20.4
Proportion In Lane	1.000	1.000		1.000	1.000	
Lane Grp Cap(c), veh/h	297.7	263.4	1272.0	569.0	344.7	1058.5
V/C Ratio(X)	0.804	0.000	0.583	0.000	0.907	0.787
Avail Cap(c_a), veh/h	1020.6	902.8	1723.4	771.0	344.7	1290.3
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.000	0.000	1.000	0.000	1.000	1.000
Uniform Delay (d), s/veh	22.3	0.0	13.7	0.0	25.2	8.6
Incr Delay (d2), s/veh	5.1	0.0	0.4	0.0	26.6	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Delay (d), s/veh	27.3	0.0	14.1	0.0	51.8	11.3
Lane Group LOS	C		B		D	B
Approach Volume, veh/h	239		742			1146
Approach Delay, s/veh	27.3		14.1			22.3
Approach LOS	C		B			C

Timer						
Assigned Phase			2		1	6
Phase Duration (G+Y+Rc), s			28.19		12.00	40.19
Change Period (Y+Rc), s			5.90		5.90	5.90
Max Green Setting (Gmax), s			30.20		6.10	41.80
Max Q Clear Time (g_c+I1), s			12.25		7.47	22.43
Green Extension Time (p_c)			10.20		0.00	10.69

Intersection Summary			
HCM 2010 Control Delay			20.0
HCM 2010 Level of Service			C

Intersection	
Intersection Delay (sec/veh):	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Volume (vph)	11	165	174	3	4	14
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	Free	Free	None	None
Storage Length	200			0	0	0
Median Width		12	12		12	
Grade (%)		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	12	12	100	100	2
Movement Flow Rate	12	179	189	3	4	15
Number of Lanes	1	1	1	0	1	0

Major/Minor		Major 1	Major 2			
Conflicting Flow Rate - All	192	0	0	0	394	191
Stage 1	-	-	-	-	191	-
Stage 2	-	-	-	-	203	-
Follow-up Headway	2.218	-	-	-	4.4	3.318
Pot Capacity-1 Maneuver	1381	-	-	-	459	851
Stage 1	-	-	-	-	653	-
Stage 2	-	-	-	-	644	-
Time blocked-Platoon(%)	0	-	-	-	0	0
Mov Capacity-1 Maneuver	1381	-	-	-	455	851
Mov Capacity-2 Maneuver	-	-	-	-	455	-
Stage 1	-	-	-	-	653	-
Stage 2	-	-	-	-	638	-

Approach	EB	WB	SB
HCM Control Delay (s)	0.5	0	10.2
HCM LOS	A	A	B

Lane	EBL	EBT	WBT	WBR	SBLn1
Capacity (vph)					713
HCM Control Delay (s)	7.63	-	-	-	10.2
HCM Lane VC Ratio	0.009	-	-	-	0.027
HCM Lane LOS	A	-	-	-	B
HCM 95th Percentile Queue (veh)	0.026	-	-	-	0.085

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	202	245	708	209	270	667
v/c Ratio	0.55	0.48	0.63	0.33	0.75	0.69
Control Delay	27.1	7.0	18.7	4.0	43.8	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	7.0	18.7	4.0	43.8	14.2
Queue Length 50th (ft)	60	0	102	0	46	145
Queue Length 95th (ft)	130	44	173	37	#136	306
Internal Link Dist (ft)	305		167			496
Turn Bay Length (ft)					320	
Base Capacity (vph)	1035	993	1740	864	361	1305
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.25	0.41	0.24	0.75	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	174	211	651	192	254	627
Number	3	18	2	12	1	6
Initial Queue, veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking, Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow Rate	1696	1681	1712	1712	1743	1759
Lanes	1	1	2	1	2	1
Capacity, veh/h	259	229	1223	547	377	1066
Arriving On Green	0.16	0.00	0.38	0.00	0.12	0.61
Sat Flow, veh/h	1615.6	1429.2	3337.8	1455.0	3220.6	1759.3
Grp Volume(v), veh/h	202.3	0.0	707.6	0.0	270.2	667.0
Grp Sat Flow(s),veh/h/ln	1615.6	1429.2	1626.1	1455.0	1610.3	1759.3
Q Serve(g_s), s	6.3	0.0	9.1	0.0	4.2	12.6
Cycle Q Clear(g_c), s	6.3	0.0	9.1	0.0	4.2	12.6
Proportion In Lane	1.000	1.000		1.000	1.000	
Lane Grp Cap(c), veh/h	258.6	228.8	1222.9	547.1	376.8	1066.3
V/C Ratio(X)	0.782	0.000	0.579	0.000	0.717	0.626
Avail Cap(c_a), veh/h	1114.8	986.1	1870.0	836.6	388.9	1409.4
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.000	0.000	1.000	0.000	1.000	1.000
Uniform Delay (d), s/veh	21.0	0.0	13.0	0.0	22.2	6.5
Incr Delay (d2), s/veh	5.1	0.0	0.4	0.0	6.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Delay (d), s/veh	26.2	0.0	13.4	0.0	28.2	7.1
Lane Group LOS	C		B		C	A
Approach Volume, veh/h	202		708			937
Approach Delay, s/veh	26.2		13.4			13.2
Approach LOS	C		B			B

Timer						
Assigned Phase			2		1	6
Phase Duration (G+Y+Rc), s			25.52		12.00	37.52
Change Period (Y+Rc), s			5.90		5.90	5.90
Max Green Setting (Gmax), s			30.00		6.30	41.80
Max Q Clear Time (g_c+I1), s			11.05		6.22	14.55
Green Extension Time (p_c)			8.89		0.01	10.53

Intersection Summary						
HCM 2010 Control Delay			14.7			
HCM 2010 Level of Service			B			

Intersection	
Intersection Delay (sec/veh):	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Volume (vph)	14	162	138	2	2	14
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	Free	Free	None	None
Storage Length	200			0	0	0
Median Width		12	12		12	
Grade (%)		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	12	12	100	100	2
Movement Flow Rate	15	176	150	2	2	15
Number of Lanes	1	1	1	0	1	0

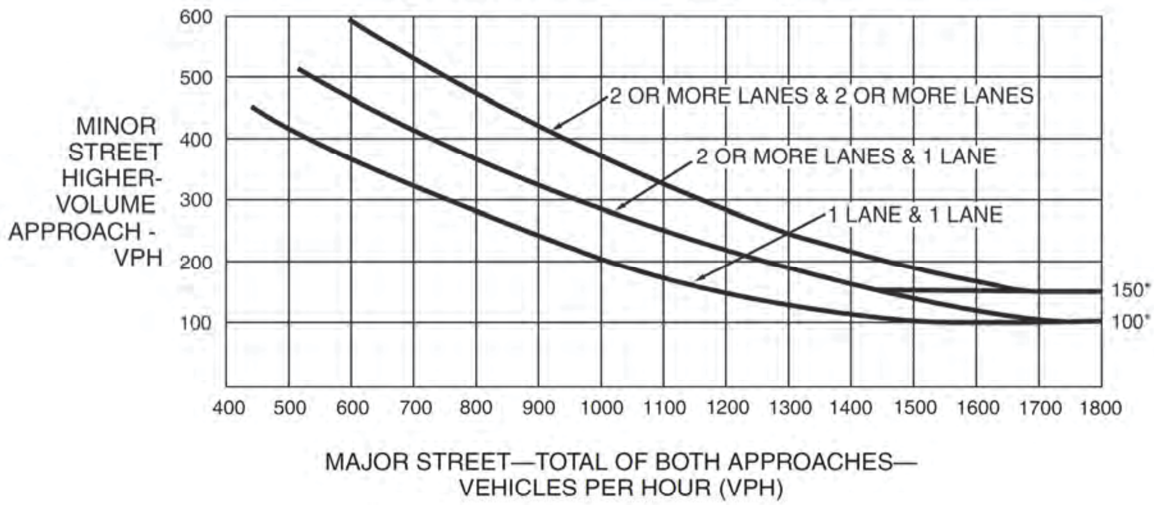
Major/Minor		Major 1	Major 2			
Conflicting Flow Rate - All	152	0	0	0	357	151
Stage 1	-	-	-	-	151	-
Stage 2	-	-	-	-	206	-
Follow-up Headway	2.218	-	-	-	4.4	3.318
Pot Capacity-1 Maneuver	1429	-	-	-	485	895
Stage 1	-	-	-	-	685	-
Stage 2	-	-	-	-	642	-
Time blocked-Platoon(%)	0	-	-	-	0	0
Mov Capacity-1 Maneuver	1429	-	-	-	480	895
Mov Capacity-2 Maneuver	-	-	-	-	480	-
Stage 1	-	-	-	-	685	-
Stage 2	-	-	-	-	635	-

Approach	EB	WB	SB
HCM Control Delay (s)	0.6	0	9.6
HCM LOS	A	A	A

Lane	EBL	EBT	WBT	WBR	SBLn1
Capacity (vph)					808
HCM Control Delay (s)	7.546	-	-	-	9.6
HCM Lane VC Ratio	0.011	-	-	-	0.022
HCM Lane LOS	A	-	-	-	A
HCM 95th Percentile Queue (veh)	0.032	-	-	-	0.066

Appendix H – Traffic Signal Warrant No. 3 Worksheets

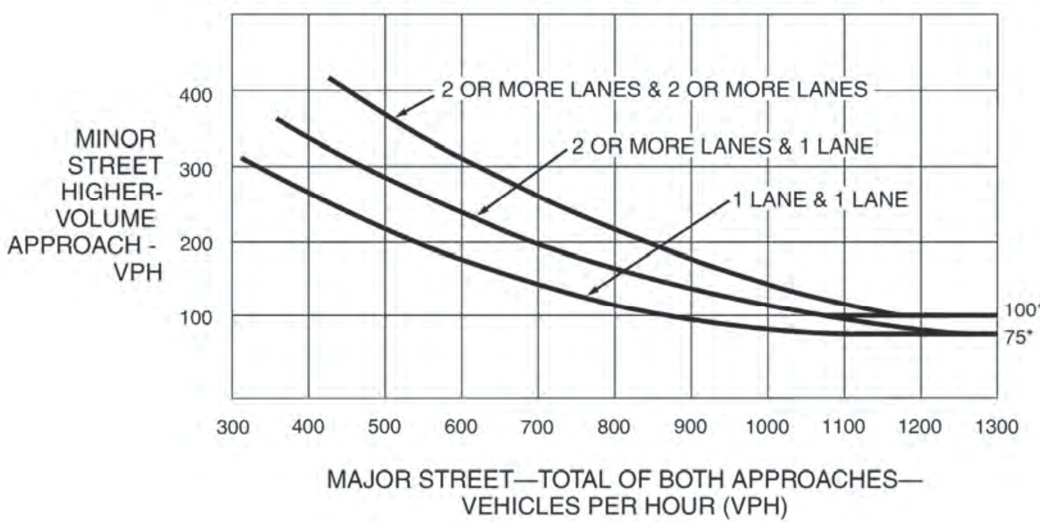
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

EXISTING PLUS PROJECT
SR-20 & PROJECT ACCESS

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume SATISFIED* YES ☐ NO ☐

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	Hour	Hour	Hour	Hour
Both Approaches - Major Street						
Higher Approach - Minor Street						

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐	No ☐
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☐	No ☐

WARRANT 3 - Peak Hour SATISFIED YES ☐ NO ☒
(Part A or Part B must be satisfied)

PART A SATISFIED YES ☐ NO ☒
(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐	No ☒
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☐	No ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☐	No ☒

PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	One	2 or More	WEEKDAY PM PEAK Hour
Both Approaches - Major Street	✓		337
Higher Approach - Minor Street	✓		18

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☐	No ☐
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☐	No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

CUMULATIVE PLUS PROJECT

SR-20 & PROJECT ACCESS

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume SATISFIED* YES ☐ NO ☐

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More				Hour
Both Approaches - Major Street						
Higher Approach - Minor Street						

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐ No ☐
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☐ No ☐

WARRANT 3 - Peak Hour SATISFIED YES ☐ NO ☒
(Part A or Part B must be satisfied)

PART A SATISFIED YES ☐ NO ☒
(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☒
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☐ No ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☐ No ☒

PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	One	2 or More	WEEKDAY PM PEAK Hour
Both Approaches - Major Street	✓		353
Higher Approach - Minor Street	✓		18

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☐ No ☐
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

GHD Inc

2235 Mercury Way
Suite 150
Santa Rosa CA 95407-5472

T: 1 707 523 1010   F: 1 707 527 8679   E: santarosa@ghd.com

E:\Jennings TIA\trial appendix.docx

www.ghd.com

Appendix I
Assembly Bill #384

Assembly Bill No. 384

CHAPTER 173

An act to add Section 4659 to the Public Resources Code, relating to state forest land.

[Approved by Governor August 4, 2011. Filed with Secretary of State August 4, 2011.]

LEGISLATIVE COUNSEL'S DIGEST

AB 384, Chesbro. State forest land: Jackson Demonstration State Forest.

Existing law authorizes the Department of Forestry and Fire Protection to engage in the management, protection, and reforestation of state forests and requires the Department of Parks and Recreation to have control of the state park system.

This bill would authorize the Director of General Services, subject to the approval of the Department of Forestry and Fire Protection, to grant an option to the City of Fort Bragg and the County of Mendocino for either entity to acquire title to certain property for the purpose of developing a solid waste transfer station. The bill would require, if this option is exercised, that the entity acquiring title to the property execute and record in favor of the Department of Parks and Recreation a covenant restricting the uses and activities at a specified Caspar Landfill property and an option to purchase a specified portion of the Caspar Landfill property. The bill would authorize the Department of Forestry and Fire Protection and the Department of Parks and Recreation to be compensated for the loss of certain property, as provided.

The bill would also authorize the Department of Parks and Recreation, with the approval of the Director of General Services, to transfer a certain portion of Russian Gulch State Park to the Department of Forestry and Fire Protection, to be included as a part of the Jackson Demonstration State Forest, if the City of Fort Bragg or the County of Mendocino exercises that option.

The bill would provide that if successful development and operation of a solid waste transfer station does not occur 10 years from the date of recordation of the transfer document, the title to the property would revert back to the Department of Forestry and Fire Protection and the entity acquiring title would be required to reimburse the state for the administrative costs incurred by the state to process the reversionary documents.

The bill would also require the city or county to indemnify the state against liability that arises from any injury caused by, or any remediation required by, any contamination on the landfill. The bill would require the Department of Parks and Recreation to authorize access to the landfill property to the county in order for the county to perform monitoring, as specified.

The people of the State of California do enact as follows:

SECTION 1. The Legislature finds and declares all of the following:

(a) The City of Fort Bragg and the County of Mendocino seek to improve solid waste management in the greater Fort Bragg area by developing a commercial transfer station capable of efficiently managing all solid waste generated in the vicinity.

(b) Following a comprehensive siting study, a potential site of up to 17 acres was identified for a transfer station located within a portion of the Jackson Demonstration State Forest, on its northern boundary.

(c) The State Board of Forestry and Fire Protection adopted a resolution on April 7, 2010, that stated that transfer of this site to the city or county would not cause significant adverse programmatic impacts to the Jackson Demonstration State Forest.

(d) The Department of Forestry and Fire Protection, on behalf of the state, may be compensated for loss of the up to 17-acre site by transfer from the Department of Parks and Recreation, on behalf of the state of 12.6 acres in Russian Gulch State Park, which is separated from the remainder of the state park by a county road.

(e) The Department of Parks and Recreation, on behalf of the state, may be compensated, in turn, for loss of the 12.6 acres in Russian Gulch State Park specified in subdivision (d) by the grant of a restrictive covenant on 60 acres of city and county property on the north boundary of the state park, which is currently a closed landfill and small volume transfer station, whose continued operation causes undesirable impacts on the state park, and by an option to buy 35 acres of the city and county property.

(f) The interests and welfare of the state will be advanced by granting an option to the city and the county to take title to the Jackson Demonstration State Forest site, subject to the additional terms described in subdivisions (d) and (e), if the city and the county complete a site selection process and environmental review that finds that this site shall be the selected alternative.

SEC. 2. Section 4659 is added to the Public Resources Code, to read:

4659. (a) For purpose of this section, the following definitions shall apply:

(1) "City" means the City of Fort Bragg.

(2) "County" means the County of Mendocino.

(3) "Entity acquiring title" means either the city or the county, whichever exercises the option specified in subdivision (c) to take title to the property.

(4) "Property" means the certain real property described as the easterly 17 acres, more or less, of that portion of Mendocino County Assessor's Parcel Number 019-150-05 which is north of State Highway 20, located in a portion of the Jackson Demonstration State Forest.

(5) "Solid waste transfer station" has the same meaning as transfer station, as defined in Section 40200.

(b) Notwithstanding any other law, the Director of General Services, subject to the approval of the Department of Forestry and Fire Protection, may grant an option to the city or to the county, for either entity to acquire title to the property for the purpose of developing a solid waste transfer station.

(c) The option agreement shall have a term of five years, from the date of execution, for the city or county to exercise the option and take title to the site.

(d) Following the transfer of title, the entity acquiring title shall complete the development of, and open, a solid waste transfer station no later than 10 years from the date of recordation of the transfer document or the title to the property shall revert back to the Department of Forestry and Fire Protection and the entity shall reimburse the state for the administrative costs incurred by the state to process the reversionary documents.

(e) If the entity acquiring title to the property is successful in opening a solid waste transfer station on the site, all delivery and acceptance of solid waste shall cease at the existing Caspar Landfill property, also known as Mendocino County Assessor's Parcel Numbers 118-500-10 and 118-500-11.

(f) The Department of Forestry and Fire Protection, on behalf of the state, may be compensated for loss of up to 17 acres of the Jackson Demonstration State Forest by transfer from the Department of Parks and Recreation, on behalf of the state, of 12.6 acres in Russian Gulch State Park, which is separated from the remainder of the state park by a county road.

(g) The Department of Parks and Recreation, on behalf of the state, may be compensated, in turn, for loss of the 12.6 acres in Russian Gulch State Park specified in subdivision (f) by the grant of a restrictive covenant on 60 acres of city and county property on the northern boundary of the state park, which is currently a closed landfill and small volume transfer station, and by an option to buy 35 acres of the city and county property.

(h) If the city or county exercises the option to take title to the property pursuant to this section, the Department of Parks and Recreation, with the approval of the Director of General Services, may transfer to the Department of Forestry and Fire Protection jurisdiction over that portion of Russian Gulch State Park northeast of Mendocino County Road 409, being 12.6 acres, more or less, and being a portion of Mendocino County Assessor's Parcel Number 118-520-02, to be included as a part of the Jackson Demonstration State Forest under the direction of the Department of Forestry and Fire Protection.

(i) If the option to acquire the property is exercised, the entity acquiring title to the property shall execute and record in favor of the Department of Parks and Recreation both of the following:

(1) A covenant restricting the uses and activities at the Caspar Landfill property to prevent any significant nuisance impacts on Russian Gulch State Park. The form of this restrictive covenant shall be approved, prior to recordation, by the Department of Parks and Recreation.

(2) An option with a term of 99 years and a price of one dollar ($1) to purchase the westernmost 35 acres of the Caspar Landfill property, described in subdivision (e), with road access to that property.

(j) The entity acquiring title to the property shall reimburse the state for the difference in the appraised value of the assets that are to be exchanged, if the state is found to be receiving less value, and for reasonable administrative costs incurred to complete the transfer of title.

(k) The entity acquiring title of the property shall be solely responsible for compliance with the California Environmental Quality Act (Division 13 (commencing with Section 21000) in connection with the transfer of property ownership and development of the solid waste transfer station.

(*l*) The exchange of lands carried out pursuant to this section shall be based on current fair market value and subject to the terms and conditions, and with the reservations, restrictions, and exceptions that the Director of General Services determines are in the best interests of the state, including the condition that the exchange shall result in no net cost or loss to the state.

(m) (1) If the state exercises the option to purchase the westernmost 35 acres of the Caspar Landfill property, pursuant to paragraph (2) of subdivision (i), the city or county shall indemnify the state against any liability that arises from any injury caused by, or any remediation required by, any contamination on the Caspar Landfill property that is transferred to the state.

(2) The Department of Parks and Recreation shall authorize access to the property described in paragraph (1) to the county in order for the county to perform monitoring, including monitoring of groundwater to ensure that there is no leakage or contamination from the landfill.

O

Appendix J

Forester: Jere Melo, Letter May 9, 2010

Jere Melo, *Forester*
120 Jewett Street
Fort Bragg, CA 95437
Phone: 707 964-0676
Cell Phone: 707 357-1671
FAX: 707 964-4407
E-Mail: jlmelo@mcn.org

March 9, 2010

Linda Ruffing, City Manager
City of Fort Bragg
416 North Franklin Street
Fort Bragg, CA 95437

Mike Sweeney, Executive Director
Mendocino Solid Waste Management Authority
101 West Church Street
Ukiah, CA 95482

RE: Forest Inventory, Jackson Demonstration State Forest and Department of Parks and Recreation Parcels, Solid Waste Transfer Station Re-Location.

Dear Linda and Mike:

You have requested that I provide some data for a comparison between the state-owned parcels that are under consideration for the three-way exchange of property to relocate the coastal solid waste transfer station about three miles east of Fort Bragg. On Monday, March 8, I conducted an inventory of both parcels, and I have completed the data input and calculations this morning. Based on the bottom line inventory, following is a comparison:

Owner	Acres	Number of Trees	Gross MBF*	Net MBF*
JDSF, Highway 20	17	419	82	66
DPR, Graveyard Road	13	1,365	1,119	942

- Gross MBF is the calculated "thousands of board feet (MBF)" in the trees, as if there are no defects in the trees. Net MBF is the calculated "thousands of board feet (MBF)" in the trees, after allowance for defects such as fire scars, rot, broken pieces, etc. It is important to note that the "Number of Trees" includes trees 12-inches or larger in diameter, as measured at 4.5 feet above ground level. Smaller trees are not included.

JDSF, Highway 20 Parcel

This parcel is about 3 miles east of Fort Bragg. The forest tree cover is composed of Bishop Pine and Cypress, primarily I did see one Redwood tree that was not on my sample, and there are some Beach Pine trees in the southwest corner. Under the trees is a dense cover of brush from 2 feet to 8 feet tall, and composed of huckleberry, salal, rhododendron and manzanita. There is a lot of down, dead wood on the ground, and in the current condition, the parcel is an excellent location for a hot, fast-spreading fire on some warm summer day. It was very difficult to walk through the area on a straight line for the inventory.

The inventory shows all trees as "Pine", but about 15% are actually Cypress. My inventory program does not have Cypress as a separate species, so I simply included Cypress trees over 12-inches in diameter as pine trees. Thus, only one species is shown for this parcel.

DPR, Graveyard Road Parcel

This parcel is the far northeast portion of Russian Gulch State Park, and it is adjacent to Jackson Demonstration State Forest at the top of the ridge for the South Fork Caspar Creek Watershed Study. There is a very dense stand of young growth timber composed of Redwood, Douglas-fir, White Fir, Western Hemlock and a few Bishop Pine. Western Hemlock and White Fir are combined as a single species. The age is at a point where the Douglas-fir, White Fir and Western Hemlock trees in the larger diameter classes are showing lots of defects from rot. A number of trees have died or fallen in the past few years.

Due to the stand density, the forest floor has very little brush, and walking the parcel is easy. There is a well-used but unimproved trail that ties to the Graveyard Road that meanders through the parcel.

Detail Inventory Sheets

Attached are detail inventory sheets that show the results. For the JDSF –Highway 20 – parcel, there is a single sheet. For the DPR –Graveyard Road- parcel, there are five sheets, one for each species and a total page, labeled, "zTotal". The header title, DBH, indicates 2-inch diameter classes, a standard for timber inventories. In the field, trees were tallied by DBH, 20-feet log heights, and a defect estimate was applied to defective or broken trees. The computer program provides a weighted value for gross and net MBF for each DBH class, based on the various tree heights recorded.

You may distribute this inventory as you see fit.

Sincerely,

Jere Melo

Stand & Stock Table: 'DSF - Highway 20

All Harvest Units Combined — Acres: 17

Cruise Date: 3/8/2010

Pine

DBH	Trees	Gross MBF	Net MBF	% Defect
12	119	5	4	1%
14	68	6	6	8%
16	45	5	4	16%
18	68	14	11	20%
20	34	11	10	12%
22	34	13	10	23%
24	28	13	9	29%
26	17	10	7	36%
28	6	5	5	10%
Total	419	82	66	20%

zTotal

DBH	Trees	Gross MBF	Net MBF	% Defect
12	119	5	4	1%
14	68	6	6	8%
16	45	5	4	16%
18	68	14	11	20%
20	34	11	10	12%
22	34	13	10	23%
24	28	13	9	29%
26	17	10	7	36%
28	6	5	5	10%
Total	419	82	66	20%

Stand & Stock Table: 2 - Graveyard Road

All Harvest Units Combined *Acres:* *13*

Cruise Date: *3/8/2010*

Douglas Fir

DBH	*Trees*	*Gross MBF*	*Net MBF*	*% Defect*
14	5	1	1	0%
16	5	1	1	0%
18	11	4	3	6%
20	5	3	3	10%
22	5	4	3	10%
24	16	12	11	12%
26	33	33	29	10%
28	22	25	22	13%
30	5	8	7	10%
32	22	37	29	21%
34	16	31	24	22%
36	22	47	39	17%
38	22	51	40	21%
40	5	13	9	30%
44	11	32	21	35%
46	5	17	13	20%
48	5	18	15	20%
50	11	45	35	23%
Total	228	381	305	20%

Stand & Stock Table: 2 - Graveyard Road

All Harvest Units Combined *Acres:* 13

Cruise Date: 3/8/2010

Pine

DBH	Trees	Gross MBF	Net MBF	% Defect
16	11	1	1	0%
18	6	2	2	0%
20	6	2	2	10%
22	11	6	5	13%
24	11	7	6	13%
26	11	10	8	20%
Total	54	28	24	14%

Stand & Stock Table: 2 - Graveyard Road

All Harvest Units Combined *Acres:* 13

Cruise Date: 3/8/2010

Redwood

DBH	Trees	Gross MBF	Net MBF	% Defect
12	49	2	2	0%
14	60	4	4	0%
16	60	9	9	0%
18	49	12	12	3%
20	76	28	27	2%
22	87	38	37	1%
24	22	13	13	3%
26	43	33	31	6%
28	33	33	26	20%
30	43	48	42	13%
32	5	8	7	10%
34	11	17	11	35%
36	33	58	45	23%
38	22	45	37	18%
40	5	14	12	10%
42	11	27	21	20%
44	5	16	15	10%
46	6	18	16	10%
48	5	20	18	10%
50	5	22	19	10%
Total	828	463	404	13%

Stand & Stock Table: 2 - Graveyard Road

All Harvest Units Combined *Acres:* 13

Cruise Date: 3/8/2010

White Fir

DBH	*Trees*	*Gross MBF*	*Net MBF*	*% Defect*
12	22	2	1	13%
14	33	3	3	7%
16	49	8	8	0%
18	65	18	17	6%
20	65	28	24	14%
22	98	49	43	12%
24	33	22	19	18%
26	33	29	23	21%
28	22	23	19	15%
30	16	20	16	19%
34	11	21	17	18%
38	5	13	9	30%
40	5	13	10	25%
Total	455	248	209	16%

Stand & Stock Table: 2 - Graveyard Road

All Harvest Units Combined *Acres:* 13
Cruise Date: 3/8/2010

zTotal

DBH	Trees	Gross MBF	Net MBF	% Defect
12	70	3	3	6%
14	98	8	8	3%
16	126	19	19	0%
18	130	35	34	5%
20	152	61	56	8%
22	200	96	89	8%
24	81	54	48	12%
26	119	104	91	13%
28	76	81	68	16%
30	65	77	66	14%
32	27	44	36	19%
34	38	68	52	24%
36	54	105	84	20%
38	49	109	86	21%
40	16	40	31	21%
42	11	27	21	20%
44	16	48	36	27%
46	11	34	29	15%
48	11	38	32	15%
50	16	67	54	18%
Total	1,365	1,119	942	16%

Appendix K
Noise Data Sheets and RCNM Model Output

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

1 Willowbrook Court Petaluma, CA 94954 (707) 794-0400

ENVIRONMENTAL NOISE DATA SHEET

LOCATION: ENTRANCE TO HELI PAD SITE.

JOB NO. 14-016
SITE NO. LT-1
TECHNICIAN JM
SLM IR-6 CAL 114

DATE 8/13/14 DAY OF WEEK WED TIME BEGIN 1615 DURATION 24

WEATHER CONDITIONS SKY: WIND: 0-1 TEMP: 65°

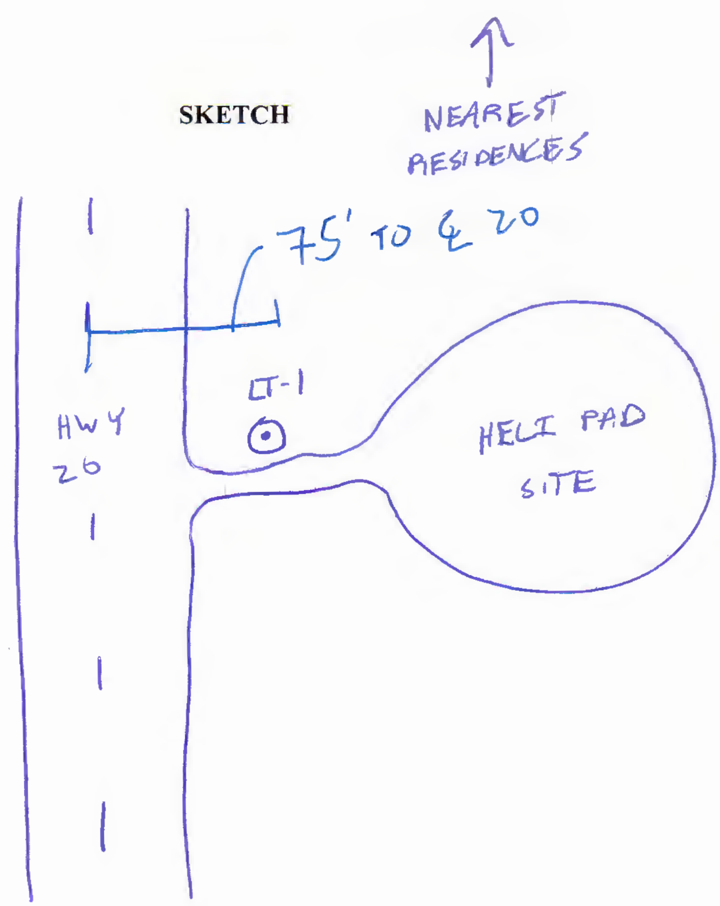
Maj.	Min.	Noise Source	Typical Noise Levels	5 min.	10 min.	15 min.
☐	☑	Trucks				
☑	☐	Cars				
☐	☐	Buses				
☐	☐	Motorcycles				
☐	☐	Emerg. Veh.				
☐	☐	Jets				
☐	☐	Gen. Av.				
☐	☐	Trains				
☐	☐	Constr.				
☐	☐	Industrial				
☐	☐	Other				

COMMENTS

~75' TO ℄ OF HWY 20

MEASUREMENT	1	2
L_{max}		
L_{min}		
$L_{(1)}$		
$L_{(10)}$		
$L_{(50)}$		
$L_{(90)}$		
L_{eq} (5)		
L_{eq} (10)		
L_{eq} (15)		

SKETCH



ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

1 Willowbrook Court Petaluma, CA 94954 (707) 794-0400

ENVIRONMENTAL NOISE DATA SHEET

ST-1:
LOCATION: 47m FROM ℄ OF 20, MIDDLE OF SITE.
ST-2:

JOB NO. 14-016
SITE NO. ST-1 | ST-2
TECHNICIAN JM
SLM CT-1 CAL 114

DATE 8/13/14 DAY OF WEEK WED TIME BEGIN 1620/1630 DURATION 10min

WEATHER CONDITIONS SKY: CLOUDY WIND: 0-1 TEMP: 65

Maj.	Min.	Noise Source	Typical Noise Levels	5 min.	10 min.	15 min.
☐	☑	Trucks			m: || H:	
☑	☐	Cars	63-65 | 51-58		𝍸𝍸 𝍸 𝍸 𝍸	
☐	☐	Buses			42	
☐	☐	Motorcycles				
☐	☐	Emerg. Veh.				
☐	☐	Jets				
☐	☐	Gen. Av.				
☐	☐	Trains				
☐	☐	Constr.				
☐	☐	Industrial				
☐	☐	Other				

COMMENTS

~~A~~

ST-1: 47m TO ℄ OF 20

ST-2: 107m TO ℄ OF 20

1630

A 46

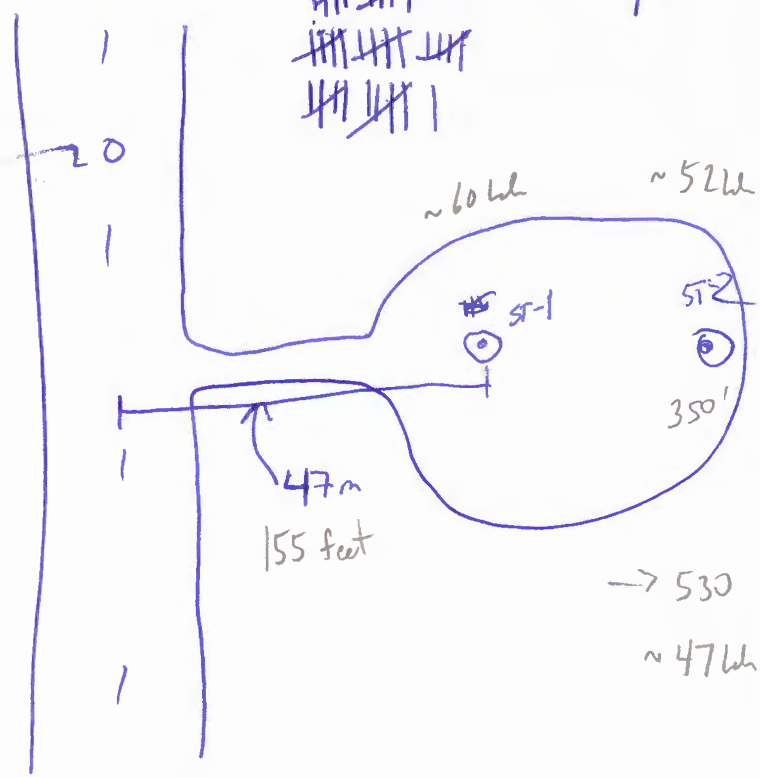
H | m
 | 1

MEASUREMENT	1 1620 ST-1	2 1630 ST-2
L_{max}	69.9	56.3
L_{min}	31.3	30.7
$L_{(1)}$	66.5	55.8
$L_{(10)}$	62.6	53.6
$L_{(50)}$	48.4	48.2
$L_{(90)}$	37.4	35.7
L_{eq} (5)		
L_{eq} (10)	57.2	49.6
L_{eq} (15)	66.9	67.1

Δ = -9.7 -17.5

69.3 ldn = 59.6 = 51.8

SKETCH



Roadway Construction Noise Model Outputs

RCNM Version 1.1

Report date: 01/08/2015
Case Description: Exteriors

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	50.0	0.0
Gradall	No	40		83.4	50.0	0.0
Generator	No	50		80.6	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Welder / Torch	No	40		74.0	50.0	0.0
Flat Bed Truck	No	40		74.3	50.0	0.0
All Other Equipment > 5 HP	No	50	85.0		50.0	0.0
Drum Mixer	No	50		80.0	50.0	0.0
Dump Truck	No	40		76.5	50.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	80.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	83.4	79.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	80.6	77.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	74.0	70.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	74.3	70.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	85.0	82.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	80.0	77.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	76.5	72.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	86.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A