American River Basin: Antelope Creek Improvement Project

Attachment 3: Work Plan

Att3_SWF_PCA_Workplan_4of4 includes the following supporting documentation:

- Antelope Creek Water Efficiency and Flood Control Project Flood Damage Reduction Analysis
- Sediment Sampling and Analysis Results
- Clover Valley Reservoir Remotely Operated Vehicle (ROV) Underwater Investigation
- Preliminary Delineation of Wetland and Other Water Bodies for the Clover Valley Reservoir Desilting and Supply Pipeline Project
- Miners Ravine Off-Channel Detention Basin Facility Mitigation Monitoring Plan
- Letter of Support from City of Roseville

Antelope Creek Water Efficiency and Flood Control Project Flood Damage Reduction Analysis

December 23, 2010 JN 60-100771

E. Brian Keating, P.E. CFM
District Manager
Placer County Flood Control and Water Conservation District
3091 County Center Drive, Suite 220
Auburn, CA 95603

Subject: Antelope Creek Water Efficiency and Flood Control Project Flood Damage Reduction Analysis

Dear Brian:

The purpose of this letter is to document the Flood Damage Reduction Analysis that was completed for the proposed Antelope Creek Water Efficiency and Flood Control Project (Project) and present the Expected Annual Damage (EAD) benefits that would result from the completion of the Project.

Background

The Draft November 2010 ***Update to the Dry Creek Flood Control Plan*** (Plan Update) produced by Civil Engineering Solutions, Inc. with RBF Consulting for the Placer County Flood Control and Water Conservation District (District) describes and recommends potential flood control improvement projects and mitigation measures to reduce peak flows at key locations through the Dry Creek watershed. One of the projects recommended by the Plan Update is a flood control project on Antelope Creek in the City of Roseville that the District included as part of a proposed Antelope Creek Water Efficiency and Flood Control Project (Project). A vicinity map showing the Dry Creek watershed and the location of the Project is included as Exhibit 1.

The multi-objective Project includes lining the Antelope and Caperton Canals with a concrete gunite lining. The canal lining portion of the Project is not expected to have any impact on flood damages and is not part of this analysis.

The District is submitting a Proposition 84 Integrated Regional Water Management (IRWM) grant application to the Department of Water Resources (DWR) to assist with funding of the Project. The IRWM application requires an economic analysis related to the flood reduction benefits of the Project.

This letter report describes the flood damage reduction analysis (FDRA) of the Project performed to identify flood damage reduction benefits in support of the grant application.

Project Description

The Project site is located adjacent to Interstate-80, north of Atlantic Street on Antelope Creek in the City of Roseville. The proposed project concept is to construct two in-channel embankments and/or weirs spanning the main channel with culverts that have capacity for low to moderate flows. The embankments and/or weirs will detain higher flows to reduce peak flow rates downstream from the

Project site. The locations of the structures are just upstream of the railroad bridge and Atlantic Street and at an existing bike path culvert, just downstream from Roseville Parkway. The project is currently at a planning level stage and design details will be developed at a later date. This evaluation assumes that arch structures would be used for the culverts to provide a natural stream bottom and that the embankment/weir at the bike path location would replace an existing culvert with one with more capacity. The structures would be designed to be overtopped.

The purpose of the Project is to reduce peak flows downstream from the Project site. The Project is separated into 2 phases: Phase 1 involves construction of a new structure near Atlantic Street and Phase 2 involves replacement of the existing bike path crossing with a flow control structure that would improve low flow conveyance and increase the volume impounded before being overtopped. Exhibits 2 and 3 attached to this letter illustrate the locations and a conceptual layout of the proposed weir/embankments.

The structure near Atlantic Street was modeled as a 10- to 12-foot high embankment on the floodplain with a Conspan Arch culvert with a span of 32 feet and a rise of 7.5 feet. The second weir will replace the existing bike bridge, raising the bridge deck about 4 to 6 feet. An embankment or wall will tie in the crest of the new structure to existing ground to limit overtopping to the desired area. The model assumed that the two existing 6.5-foot diameter culverts will be replaced with a Conspan Arch with a span of 20 feet and a rise of 7 feet.

Hydrology and Hydraulic Analysis

Detailed hydrology and hydraulic models were developed for the Plan Update. Hydrology models were developed for various levels of build-out in the Dry Creek watershed. This analysis used the 2007 existing conditions hydrology. As stipulated in the IRWM grant application (IRWM Grant Application, Exhibit E, page 56, note 1), both without project and with project conditions are assessed based on existing conditions hydrology.

The Plan Update hydrology uses cloudburst centering per the District's hydrology procedures. The centerings are based on various locations and angle combinations. The Plan Update identified 7 critical storm centerings that produced nearly all peak flows at key locations throughout the watershed. Three of the critical storm centerings, centered at locations in the Antelope Creek and Secret Ravine watersheds, produce the peak flows at locations downstream from the Project site. The three critical storm centerings are AC5I at 0°, SE40M at 30°, and SE40N at 0°. Details related to the hydrology are available in the Plan Update.

An extensive unsteady-state HEC-RAS model was created for the Plan Update using existing models. The model datum is NGVD 29. Peak stages and flows for each of the three centerings for the 10-year, 25-year, 50-year, and 100-year flow conditions were generated for the Without Project flow conditions, Project Phase 1 flow conditions, and Project Phase 2 flow conditions. Project Phase 2 flow conditions reflect both Phase 1 and Phase 2 being complete. For each recurrence interval and Project condition scenario, the peak stage produced by the maximum of the three critical centerings was tabulated for use in the FDRA.

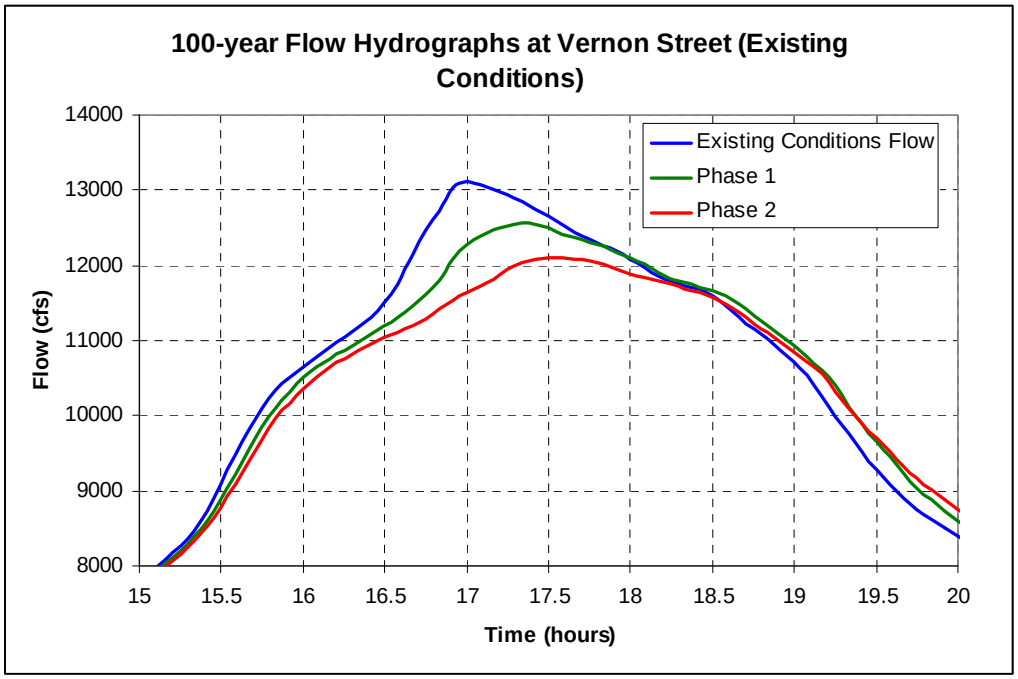
The Table 1 lists peak stages at 5 example locations on Dry Creek, downstream of the Project site for each of the 5 recurrence intervals for the Without Project, Phase 1, and Phase 2 flow conditions.

Table 1: Peak flood stage at sample locations for various scenarios

Without Project					
Recurrence Interval		**10**	**25**	**50**	**100**
Location	**HEC-RAS River Station**	**Peak Stage (ft)**	**Peak Stage (ft)**	**Peak Stage (ft)**	**Peak Stage (ft)**
Near Bernice Avenue	81041.20	145.2	147.1	148.4	150.0
Royer Park	77943	136.9	139.9	140.9	142.0
Near Earl Avenue	74433.10	131.1	133.2	134.4	135.3
Near Riverside Avenue	73756.6	129.7	131.7	132.8	133.4
Vernon Street	70071.60	124.0	126.1	127.2	129.2
Near Billy Mitchell Blvd	52140	93.9	95.7	96.5	97.3
Phase 1					
Recurrence Interval		**10**	**25**	**50**	**100**
Location	**HEC-RAS River Station**	**Peak Stage (ft)**	**Peak Stage (ft)**	**Peak Stage (ft)**	**Peak Stage (ft)**
Near Bernice Avenue	81041.20	145.1	147.0	148.2	149.8
Royer Park	77943	136.8	139.5	140.7	141.8
Near Earl Avenue	74433.10	131.0	133.1	134.3	135.1
Near Riverside Avenue	73756.6	129.6	131.6	132.7	133.3
Vernon Street	70071.60	124.0	126.0	127.1	129.1
Near Billy Mitchell Blvd	52140	93.9	95.6	96.5	97.2
Phase 2					
Recurrence Interval		**10**	**25**	**50**	**100**
Location	**HEC-RAS River Station**	**Peak Stage (ft)**	**Peak Stage (ft)**	**Peak Stage (ft)**	**Peak Stage (ft)**
Near Bernice Avenue	81041.20	145.0	146.8	148.0	149.6
Royer Park	77943	136.7	139.2	140.6	141.4
Near Earl Avenue	74433.10	130.9	133.0	134.2	135.0
Near Riverside Avenue	73756.6	129.6	131.5	132.6	133.2
Vernon Street	70071.60	123.9	125.9	126.9	129.1
Near Billy Mitchell Blvd	52140	93.9	95.6	96.4	97.1

Due to it being proximate to locations of flood prone properties, Dry Creek at Vernon Street became, and continues to be used, as a reference location for flood impacts in the Dry Creek watershed. Exhibits 4 and 5 illustrate the location of flood prone properties that could benefit from the proposed project, and Vernon Street at Dry Creek. Figure 1 presents the 100-year flow hydrographs for the existing conditions, Phase 1, and Phase 2 scenarios for the SE40N° 0 centering that generates peak flow rates at Vernon Street. The peak flow rate is reduced by about 530 cfs for Phase 1 and about 1000 cfs for Phase 2.

Figure 1: Flow hydrographs for Vernon Street.



Flood Prone Properties

Information about parcels that have experienced flood damage was provided by the District and included separate databases for parcels within the City of Roseville and parcels in unincorporated Placer County. The Placer County database contains high water marks for the 1995 flood event and flood depths for the 1983, 1986, and 1995 flood events.

The District also provided 2008 LiDAR data (from DWR) in NAVD 88. By using the databases provided by the District and the LiDAR data, a total of 128 flood prone parcels were identified downstream of the Project

Finished floor or lowest living area elevations were available for most parcels from the City of Roseville and Placer County flood prone parcel databases. Finished floor elevations were estimated from 2008 LiDAR and converted to the model datum the elevations were not available in the databases. Google Earth street view was also used to determine if finished floor elevations appeared to be close to ground elevations, or if the structure was raised. Finished floor elevations for 13 parcels were estimated in this manner.

The building size was also available from the databases for most buildings. For 21 buildings without a building size available, an estimate was obtained from Zillow.com, which acquires building size from publicly available records. For properties where the building size could not be acquired, the size was estimated using aerial imagery.

The database from the City of Roseville listed an estimated 1997 property value of $83.90 per square foot for living space and $22.10 per square foot for garage space. For the 2010 estimate, the property values were estimated to be $130 per square foot of living space and $30 per square foot of garage space.

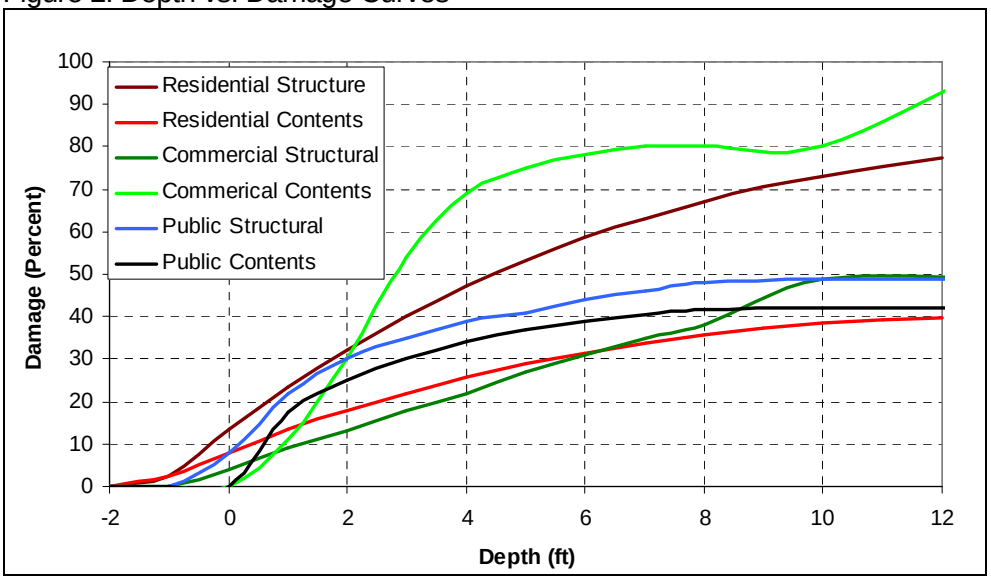
Flood Damage Analysis

The flood damage analysis (FDA) was completed using HEC-FDA, a computer program developed by the US Army Corps of Engineers (USACE). HEC-FDA uses the stage and discharge data produced in HEC-RAS and structure information to develop damage-stage relationships and combines the damage-stage functions with discharge-exceedance probability and stage-discharge relationships, and then applies a Monte Carlo simulation process to compute expected annual damage while accounting for uncertainty (See HEC-FDA User's Manual).

Depth damage curves published by both USACE and FEMA were used in the FDA (See USACE Economic Guidance Memorandum—EGM 04-01, ***Generic Depth-Damage Relationships***, October 2003).

The depth damage curves for residential, commercial, and public buildings are presented in Figure 2. All residential buildings are assumed to be 1-story without a basement.

Figure 2: Depth vs. Damage Curves



The structure value to content value ratio was assumed to be 0.50 for residential, commercial, and public buildings. Contents of structures may include equipment, furnishings, raw materials, and commercial inventory.

A factor of plus or minus 0.25 feet was applied to the 100-year stage data to account for uncertainty.

HEC-FDA produced an expected annual damage results based on the structural damage curves and flood model described in this memo. The EAD based on structural damage only is presented in Table 2.

Table 2: Expected Annual Damage based on structural damage curves

Scenario	Expected Annual Damage	Expected Annual Damage Reduced
Without Project	$ 101,000	--
Phase 1	$ 97,000	$ 4,000
Phase 2	$ 89,000	$ 12,000

The event damage for structural damage only for the 2, 10, 25, 50, and 100-year recurrence intervals is presented in Table 3.

Table 3: Event Damage for Structural Damage Only

Hydrologic Event	Event Probability	Event Damage Without Project	Event Damage With Project Phase 1	Phase 1 Event Benefit	Event Damage With Project Phase 2	Phase 2 Event Benefit
10-year	0.10	$179,000	$176,000	$3,000	$172,000	$7,000
25-year	0.04	$745,000	$718,000	$27,000	$656,000	$89,000
50-year	0.02	$1,689,000	$1,679,000	$10,000	$1,527,000	$162,000
100-year	0.01	$2,505,000	$2,415,000	$90,000	$2,202,000	$303,000

The Figure 3 presents the loss-probability curves. The expected annual damage reduction is the area between the curves.

Figure 3: Loss vs. Probability Curves

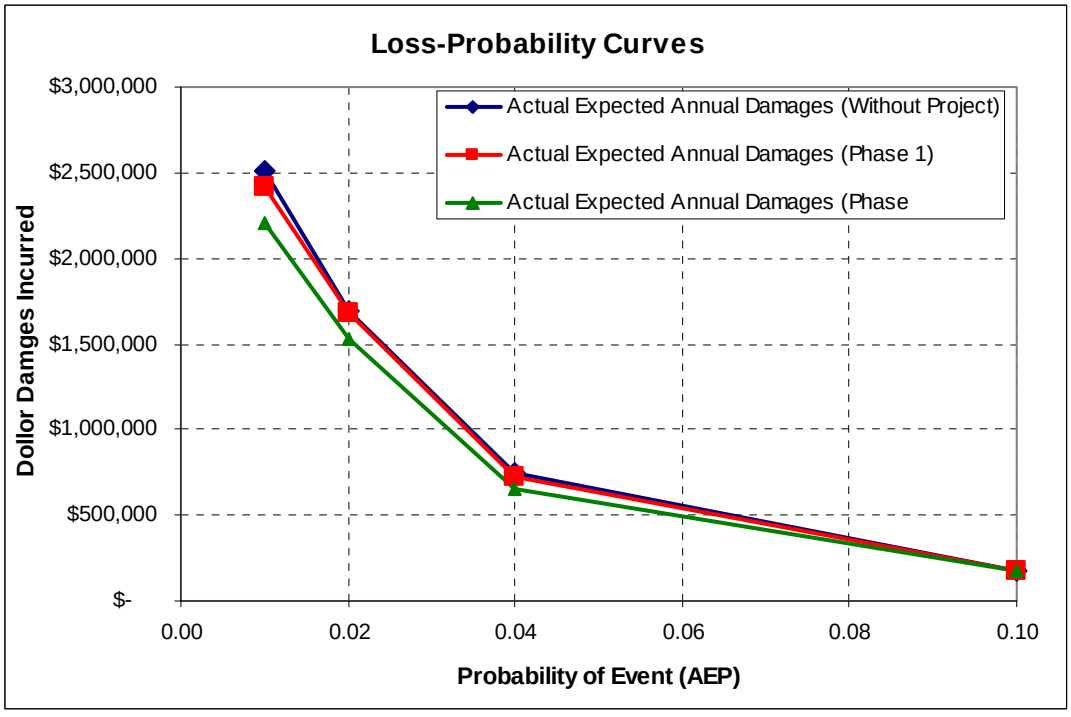


Table 4 presents the present value of future benefits of the Project, assuming an analysis period of 50 year with a 6% discount rate, consistent with DWR standard practice. The results are presented in the following tables:

Table 4: Present Value of Expected Annual Damage Benefits (structural damage only)

Expected Annual Damage Without Project	$101,000
Expected Annual Damage with Phase 1	$97,000
Expected Damage Benefit	$4,000
Expected Annual Damage with Phase 1+2	$89,000
Expected Damage Benefit	$12,000
Present Value Coefficient	15.76
Present Value of Future Benefits (Phase 1)	***$64,000***
Present Value of Future Benefits (Phase 2)	***$190,000***

Adjustments to Flood Damage Analysis Results

Several adjustments were made to the EAD values to account for various non-building damages, such as clean-up and other non-structural costs that can be considered to be proportional to structural damage. Some of the additional adjustment factors were taken from DWR ***Flood Rapid Assessment Model Development***, November 2008 (F-RAM). These adjustments include:

- ***Vehicle damage***: Street flooding can cause vehicle damage as flood waters rise above the vehicle floorboards. There is a used car lot on Riverside Avenue that has the potential for flood damage and other vehicles would likely be damaged in the event of a flood. A small reduction in peak flood stage in a given event could cause a major reduction in automobile damage if flows remain below automobile floorboards. Assuming 100 vehicles would be damaged during a 100-year flood event with the vehicles experiencing 30% damage, and assuming an average vehicle value of $10,000, an estimate of $300,000 in vehicle damage may be expected for the 100-year flow event. This represents 12% of the estimated 100-year event structural damage.

- ***Roadway inundation damage:*** A value of $30,000 per mile of inundated minor road is assumed in F-RAM. Using a conservative assumption of 2 miles of inundated minor roads (in the areas that would receive benefit from the Project) for the 100-year flood event, about $60,000 of damage to minor roads is expected. This is about 2% of the estimated 100-year event structural damage and damage reduction benefit can be assumed to be proportional to structural damage reduction benefit.

- ***Bridge overtopping:*** Seven bridges are overtopped in the existing condition 100-year flood event downstream from the Project. While the Project does not prevent any of these bridges to be overtopped in the existing conditions 100-year flood event, the height of overtopping may be reduced. Also, the new Cook Riolo Road bridge is not indicated as being overtopped in the existing condition 100-year flood event, but the Plan Update does indicate that it would be overtopped in the 100-year flood event based on unmitigated build-out in the Dry Creek watershed. The Project may prevent the bridge from being overtopped for the 100-year build-out conditions, however, this study is based on existing hydrology and no bridge related damage

reduction was included for Cook Riolo Road. Furthermore, the benefit due to reduced overtopping of the other bridges is assumed to be negligible.

- ***Other Factors***: Costs related to other factors include: emergency response services, loss of business income, temporary relocation, transportation system disruptions, loss of public services, damage to landscaping, and damage to other infrastructure such as sewer and power are not included in the structural damage estimates. Based on F-RAM documentation, indirect damages can be estimated as 25% of the direct damages to residential and commercial structures.

Factors for non-structural damage indicate that total damage can be expected to be at least 37% higher than structural damage based on property damage alone, not including loss of business to commercial and industrial enterprises, costs of flooding disruption to utilities (gas, electricity, water, sewerage, telecommunications and postal services), and costs imposed on public services, such as education and health services. To provide a reasonable comprehensive estimate for the flood reduction benefit of the project, the EAD for each scenario was increased by 50%. Table 5 presents the EAD adjusted by 50% to account for non-structural and indirect damages.

Table 5: Expected Annual Damage Adjusted for Non-Structural Factors

Scenario	Expected Annual Damage	Expected Annual Damage Reduced
Without Project	$ 151,000	--
Phase 1	$ 145,000	$ 6,000
Phase 2	$ 134,000	$ 17,000

Table 6 presents the present value of future benefits of the Project, assuming an analysis period of 50 years with a 6% discount rate, consistent with DWR standard practice.

Table 6: Expected Annual Damage Adjusted for Non-Structural Factors

Expected Annual Damage Without Project	$151,000
Expected Annual Damage with Phase 1	$145,000
Expected Damage Benefit	$6,000
Expected Annual Damage with Phase 2	$134,000
Expected Damage Benefit	$17,000
Present Value Coefficient	15.76
Present Value of Future Benefits (Phase 1)	***$95,000***
Present Value of Future Benefits (Phase 2)	***$268,000***

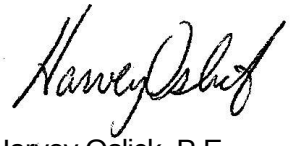
Conclusion

Even though Phases 1 and 2 of the Project would provide a significant flow reduction in a 100-year storm event, this reduction corresponds to only a relatively small (less than one-half foot) reduction in peak flood stage at key locations. Based on the HEC-FDA results multiplied by 1.5 to account for

non-structural and indirect damages, the present value of the expected benefit of Phase 1 is $95,000 and the expected benefit of the complete Project with Phase 2 is $268,000.

Though these results alone do not provide justification for the cost of the proposed project, other factors, such as increased benefit of other potential future regional projects and reducing measures necessary to provide 100-year protection to properties may help justify the cost. Additionally, there are few potentially feasible regional flood reduction projects in the Dry Creek watershed and the Antelope Creek Project was identified as being the most cost effective of the options available.

Sincerely,



Harvey Oslick, P.E.
Senior Associate

Cc: Rob Swartz, RWA
Leslie Dumas, RMC

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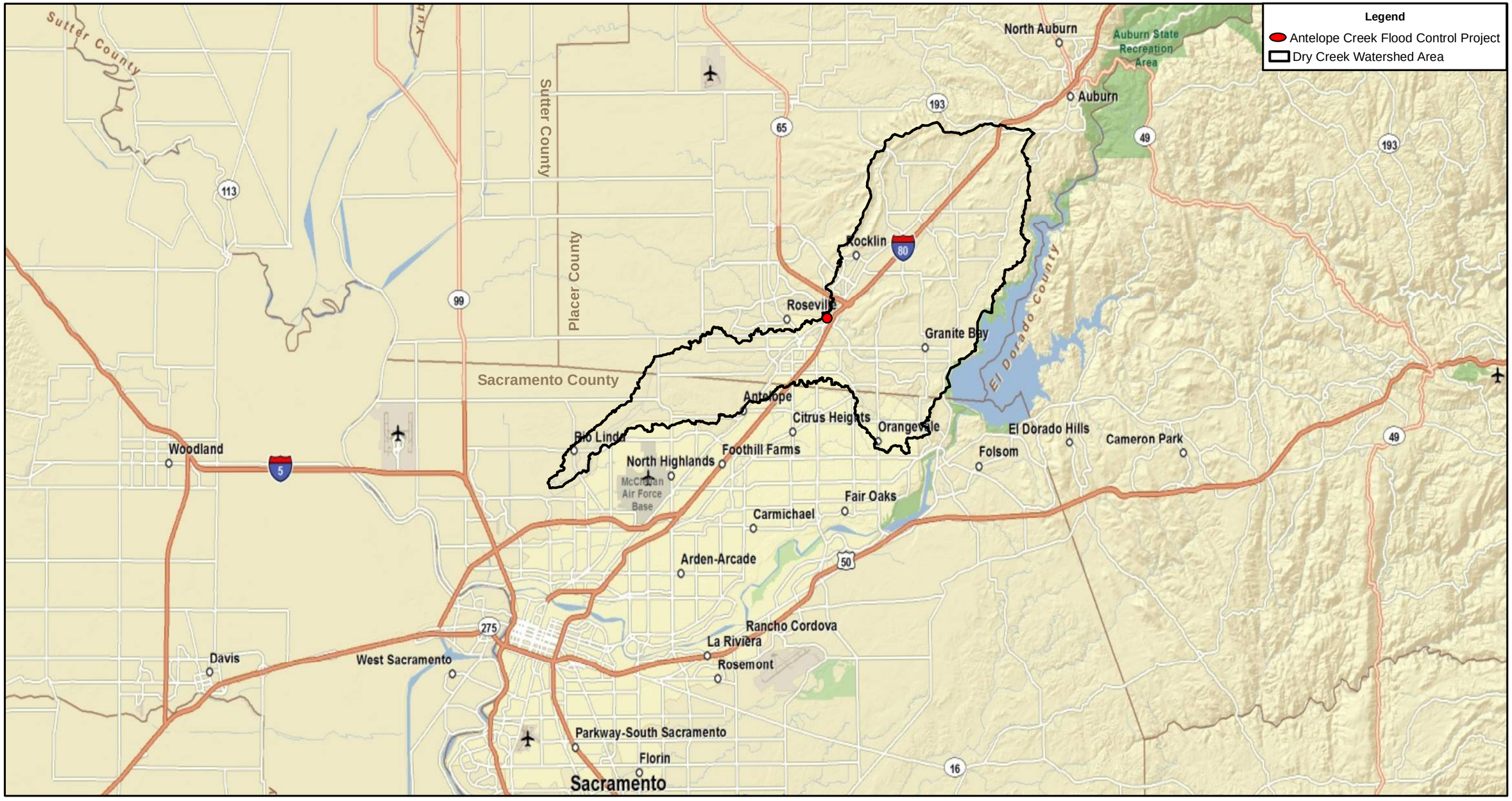
DRY CREEK WATERSHED VICINITY MAP AND ANTELOPE CREEK FLOOD CONTROL PROJECT



PLACER COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT	RBF CONSULTING December 2010	ANTELOPE CREEK FLOOD CONTROL PROJECT FLOOD DAMAGE REDUCTION ANALYSIS	Exhibit 1

ANTELOPE CREEK FLOOD CONTROL PROJECT - PHASE 1

PLACER COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

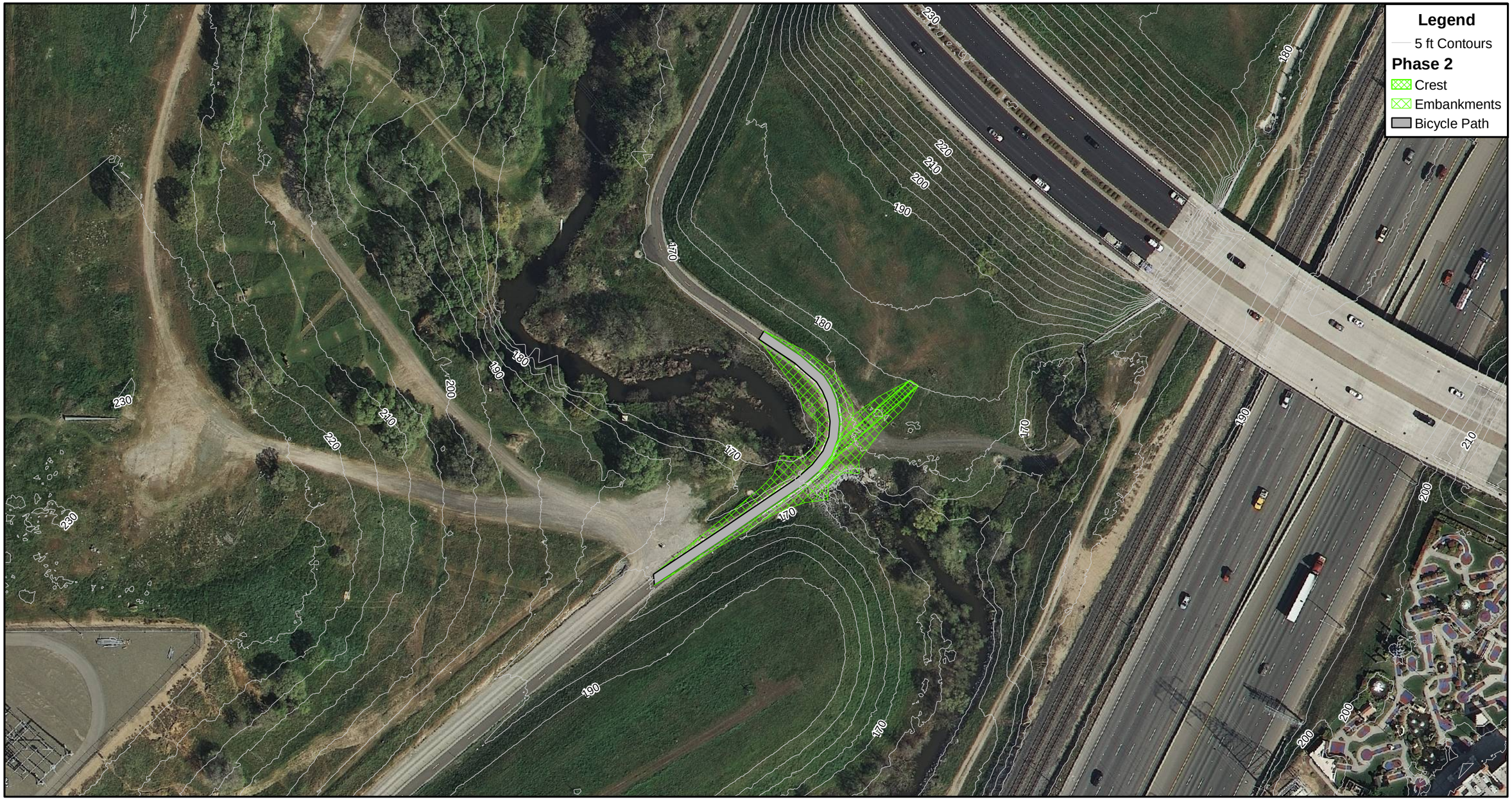
RBF CONSULTING

ANTELOPE CREEK FLOOD CONTROL PROJECT
FLOOD DAMAGE REDUCTION ANALYSIS

December 2010

Exhibit 2

ANTELOPE CREEK FLOOD CONTROL PROJECT - PHASE 2



PLACER COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

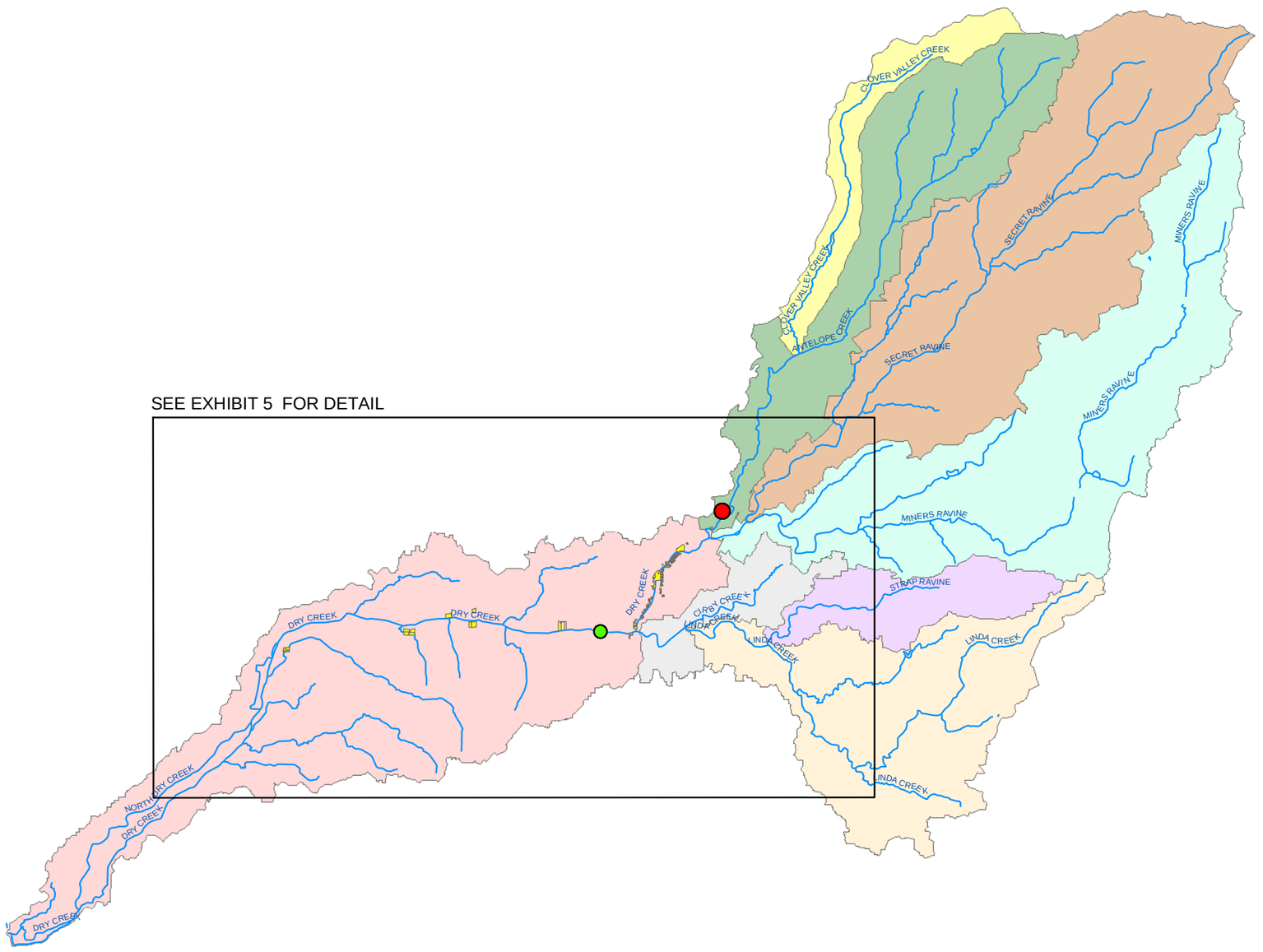
RBF CONSULTING

December 2010

ANTELOPE CREEK FLOOD CONTROL PROJECT
FLOOD DAMAGE REDUCTION ANALYSIS

Exhibit 3

DRY CREEK WATERSHED GROUPS AND FLOOD PRONE PROPERTIES WITH POTENTIAL BENEFITS



Legend

- Antelope Creek Project Location
- Vernon Street Dry Creek Crossing
- Properties With Potential Benefits
- STREAM

Watershed Groups

- Antelope Creek
- Cirby Creek
- Clover Valley
- Dry Creek
- Linda Creek
- Miners Ravine
- Secret Ravine
- Strap Ravine

Miles
0 1 2 4

PLACER COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

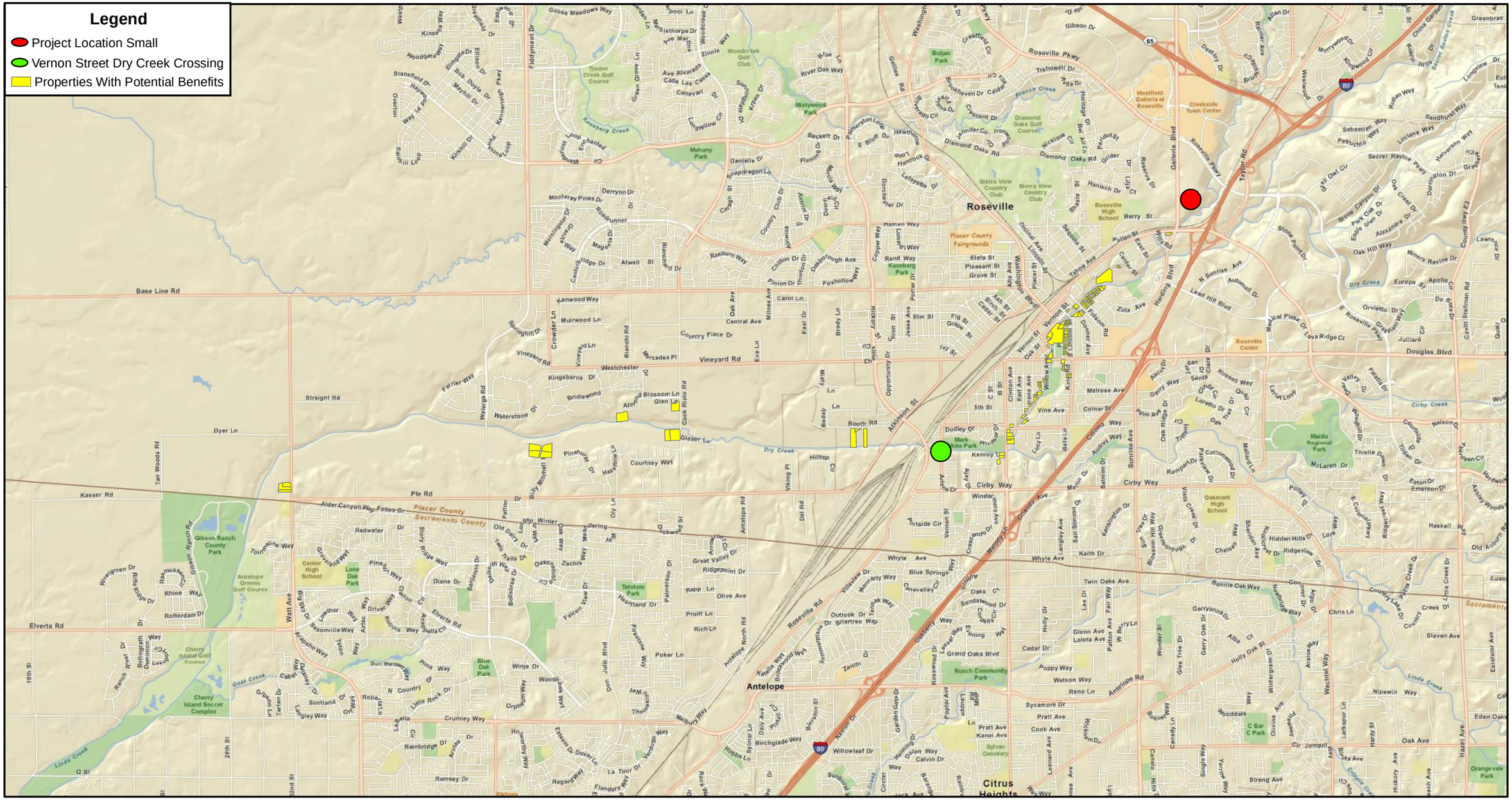
RBF CONSULTING

December 2010

ANTELOPE CREEK FLOOD CONTROL PROJECT
FLOOD DAMAGE REDUCTION ANALYSIS

Exhibit 4

DETAIL OF PROJECT AREA AND FLOOD PRONE PROPERTIES WITH POTENTIAL BENEFITS



PLACER COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RBF CONSULTING

December 2010

ANTELOPE CREEK FLOOD CONTROL PROJECT
FLOOD DAMAGE REDUCTION ANALYSIS

Exhibit 5

Sediment Sampling and Analysis Results

GEOCON
CONSULTANTS, INC.
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. S9455-06-01
September 9, 2010

Steve Ainsworth, PE
Bennett Engineering Services
1082 Sunrise Avenue, Suite 100
Roseville, California 95661

Subject: PLACER COUNTY WATER AGENCY
CLOVER VALLEY RESERVOIR DESILTING PROJECT
PLACER COUNTY, CALIFORNIA
SEDIMENT SAMPLING AND ANALYSIS RESULTS

Dear Mr. Ainsworth:

This letter summarizes the results of sediment sampling and analysis performed for the Placer County Water Agency's (PCWA) Clover Valley Reservoir located in south Placer County, California. The approximate location of the site is depicted on the Vicinity Map, Figure 1.

BACKGROUND AND PURPOSE

Clover Valley Reservoir is an approximate 2.2-acre impoundment that receives water from PCWA's Antelope Canal. The reservoir was constructed in the early 1900s and is located adjacent to the north side of the Union Pacific Railroad (UPRR) tracks approximately one mile east of English Colony Way (Vicinity Map, Figure 1). The reservoir is located within the canyon of Clover Valley Creek which, upstream of the reservoir, is an ephemeral drainage that originates near Clark Tunnel (UPRR track tunnel) less than one mile from the reservoir inlet. Due to the relatively small size of the watershed and intermittent condition, Clover Valley Creek likely does not contribute significant water or sediment to the reservoir.

Upstream of the reservoir, Antelope Canal is gunite-lined to the last customer service intake, approximately 600 feet upstream of the reservoir inlet. Downstream from here, the gunite lining ends and the canal consists of a natural channel that has eroded and down-cut a deeply incised "canyon" with near-vertical walls on the order of 20 to 25 feet deep with respect to surrounding grade. This portion of the canal is referred to as the "Random Channel" and extends approximately 400 feet from the end of the gunite lining to the culvert under the UPRR tracks. PCWA has indicated that the Random Channel has existed for at least the past 20 years and is likely a significant source of impounded sediment in Clover Valley Reservoir which has reduced water storage capacity. Therefore, PCWA plans to remove sediment ("desilting") to restore capacity. Based on the comparison of the original 1906 topographic survey of the reservoir area and the current bathymetric survey, approximate sediment thickness ranges from a few inches to approximately 6 feet. Approximate sediment thickness is shown on the Site Plan, Figure 2.

The purpose of our services was to evaluate the general physical and environmental characteristics of the sediment to be removed from the reservoir. We collected sediment samples from various locations within the reservoir and submitted selected samples for laboratory analysis. The results will be used to evaluate appropriate contractor health and safety measures during desilting operations and proper disposal alternatives.

INVESTIGATIVE METHODS

Sample Location Rationale

We reviewed the *Sampling Exhibit* prepared by Bennett Engineering Services (January 14, 2010), which shows approximate sediment distribution and thickness in the reservoir. We selected our sediment sampling locations in areas of both thick and thin sediment accumulation near the reservoir inlet and the dam. We recorded our sampling locations with a portable GPS unit with an approximate precision of +/- 20 feet. Approximate sampling locations are shown on Figure 2.

Field Sampling

On January 28, we collected five sediment samples (VC1 through VC5) using a boat-mounted electric Vibrocore® sampler as shown on Photo 1, Figure 3. The sampler, equipped with various lengths of dedicated acrylic core tubes, was lowered into the water and vibrated until refusal conditions were encountered. Upon recovery, we capped the cores to reduce disturbance of subsequent handling and transport. We transported the cores to our office for subsequent logging and submittal for physical and chemical testing. Photographs of the sediment samples are presented as Photos 2 through 4 on Figures 3 and 4.

At each sediment sample location, we recorded the approximate water depth, time, GPS coordinates (latitude/longitude), and core lengths. Pertinent information at each sample location is summarized below:

Sediment Core (Sample ID)	Collection Date and Time	Latitude (degrees)	Longitude (degrees)	Approx. Water Depth (ft)	Core Length (ft)
VC1	01/28/10 at 1210	38.86903	-121.19645	1.5	3.25
VC2	01/28/10 at 1240	38.86844	-121.19672	2	4.25
VC3	01/28/10 at 1320	38.86871	-121.19665	4	5.33
VC4	01/28/10 at 1340	38.86835	-121.19732	7	1.16
VC5	01/28/10 at 1410	38.86879	-121.19726	8	1.50

Logs of the sediment cores are presented as Figures 5 through 9.

Sample Preparation

From the individual sediment cores (with the exception of VC5), we created one four-part composite sample to represent each sediment core location. The composite samples were delivered to California Laboratory Services (CLS) using standard chain-of-custody (COC) documentation for chemical analysis. CLS is a California-certified environmental laboratory (CA DOHS ELAP Accreditation/Registration No. 1233). We also submitted selected portions of the sediment samples to our in-house geotechnical laboratory for physical property (geotechnical) testing.

Environmental Laboratory Analysis

The composite sediment samples were analyzed by CLS on standard five-day turn-around for the following constituents:

- Total petroleum hydrocarbons as gasoline by Environmental Protection Agency (EPA) Test Method 8015M,
- Extractable petroleum hydrocarbons as diesel and motor oil by EPA Test Method 8015M,
- California Title 22 (CAM 17) metals by EPA Test Methods 6010B, 6020, 7000, and 7141A,
- Organochlorine pesticides by EPA Test Method 8081A,
- Organophosphorous pesticides by EPA Test Method 8141A, and
- pH by EPA 9045C.

Quality assurance/quality control (QA/QC) procedures were performed for each method of analysis with specificity for each analyte listed in the test method's QA/QC. Prior to submitting the samples to the laboratory, we reviewed the COC documentation for accuracy and completeness. The results of the environmental laboratory analyses are summarized in Tables 1 and 2. Reproductions of the laboratory report and COC documentation are included as an attachment.

Geotechnical Laboratory Analysis

We analyzed selected portions of the sediment samples for the following:

- Moisture content by American Society for Testing and Materials (ASTM) D2216
- Grain size distribution, including hydrometer, by ASTM D422
- Atterberg limits by ASTM D4316
- Organic content by ASTM D2974

Results are presented on Figures 10 and 11.

INVESTIGATIVE RESULTS AND DISCUSSION

Geotechnical (Physical) Properties

The sediment generally consists of interbedded layers of silt and sand with minor amounts of gravel. The silt consists of clayey elastic silt (MH) with moderate to high organic content, ranging from approximately 2 to 10 percent. The sand consists of silty, clayey, fine to coarse sand. The sediment has distinct bedding (e.g. silt, sand, silt) but variable bedding thicknesses (see photos and logs) ranging from a few inches to several inches. Measured water content in the sediment samples ranged from approximately 36 to 129 percent. Liquid Limit ranged from 66 to 88 and Plasticity Index ranged from 32 to 44.

Because of the predominant sediment soil type, we anticipate that this material will likely "run" as the reservoir is drained and as the material is excavated. Therefore, consideration should be given to using an excavation technique that will allow water to remain in the reservoir such as suction or dragline dredging. Dewatering of the dredged sediment will likely be required to reduce water content prior to offsite transport. Treatment (filtration/settling) of the water will likely be required to reduce turbidity prior to discharge.

Because of the predominant sediment soil type, high in-situ moisture content, and high organic content, the sediment, in its current condition, is generally unsuitable for use as engineered fill (e.g. backfilling the "Random Channel"), but it may be suitable for non-structural or landscaping/agricultural purposes. In order for this material to be suitable for engineered fill, significant drying and blending with suitable soils would be required to reduce overall moisture and organic content. We recognize that portions of the sediment are more granular (sandy) and may be suitable for re-use as engineered fill; however, due to the highly variable lateral and vertical distribution of the material, segregation during dredging would likely be very difficult and not cost-effective.

Alternatively, it may be possible to improve the physical characteristics of the sediment by using a chemical admixture, such as Portland cement. In this case, Portland cement could be mixed with the dredged sediment to create a controlled low-strength material (CLSM). CLSM is a commercially available, cementitious material (typically sand, cement, and water) used primarily as a backfill in lieu of compacted soil (note: CLSM is also known as flowable fill, controlled density fill, soil-cement, and soil cement slurry). CLSM is typically designed to remain excavatable after curing with typical compressive strengths of approximately 35 to 200 pounds per square inch (psi). For excavatable CLSM, typical cement content varies from approximately 5 to 15% by dry unit weight with a water-cement ratio ranging from 1.0 to 1.5. In order to create CLSM out of the sediment, the dredging contractor would need to determine the existing moisture content of the sediment and adjust appropriately (by drying) prior to adding cement such that the appropriate water-cement ratio is maintained.

To evaluate the feasibility of creating a CLSM with the dredged sediment, we prepared two composite samples by homogenizing the material collected from the entire sediment core length at sample locations VC2 and VC3. We performed sieve analysis with hydrometer and in-situ moisture content on the two composite samples. Results are summarized in the following table.

Sediment Sample ID	% Gravel	% Sand	% Silt	% Clay	In-Situ Moisture Content
VC2 Composite (0-60")	1.4	59.3	22.6	16.7	60.9
VC3 Composite (0-60")	2.5	63.0	17.1	17.4	34.5

As shown above, VC2 Composite has a higher in-situ moisture content and greater percent fines (silt and clay). Therefore, to model a "worst case" sediment material, we prepared a trial mix using the VC2 Composite material by blending 10% cement by dry weight with the sediment at existing moisture content. This resulted in a water-cement ratio of approximately 6.9. We fabricated three test cylinders of the trial mix and performed compressive strength testing at 7 and 28 days age. Results are summarized in the following table.

Sediment Sample ID	Compressive Strength (psi)			
	7-day	28-day	28-day	28-day (Average)
VC2 Composite (0-60")	20	30	20	25

We note that the water-cement ratio (6.9) is much higher than typical CLSM and, therefore, the strength test results are conservatively low. If the water-cement ratio was lower, the compressive strength would be higher. On this basis, provided the contractor can develop a cost-effective procedure to mix the sediment with cement at the appropriate proportions, creating CLSM out of the sediment is a possible solution for the project.

Environmental Properties

The results of the environmental laboratory analyses are summarized in Tables 1 and 2. Results of the geotechnical laboratory analyses are presented on Figure 10.

- Gasoline, diesel, motor oil, and pesticides (organochlorine and organophosphorous) were not detected at concentrations exceeding laboratory reporting limits.
- CAM 17 total metals concentrations were less than their respective Total Threshold Limit Concentration (TTLC) values and less than ten times their respective Soluble Threshold Limit Concentration (STLC) values. On that basis, no samples were analyzed for soluble metals using waste extraction test (WET) methods.
- pH of the samples ranged from 6.45 to 6.73 which is generally neutral.

Because of the proposed offsite disposal and/or reuse of the removed sediment, it is appropriate to compare the detected CAM 17 metals concentrations to California Human Health Screening Levels (CHHSLs) for residential land use as established by the California Office of Environmental Health Hazard Assessment. The CHHSLs are not enforceable cleanup levels, but are health risk-based screening levels, which if exceeded suggests that further assessment may be warranted. With the exception of arsenic, detected metals concentrations in the sediment are less than their respective residential CHHSLs. The detected arsenic concentrations in the four sediment samples tested ranged from 2.5 to 16 milligrams per kilogram (mg/kg) with three samples having concentrations equal or less than 5.0 mg/kg. The reported arsenic concentrations are greater than the residential CHHSL of 0.07 mg/kg. The reported arsenic concentration of 16 mg/kg for sample VC3 was considered to be anomalous; therefore, we instructed the laboratory to re-analyze the sample. The result of the reanalysis was 4.1 mg/kg, which is similar to the other sample results.

We performed a site reconnaissance of the immediate area surrounding the reservoir to assess whether the detected arsenic concentrations may be attributed to anthropogenic activities (i.e. mining waste or a chemical release). We did not observe overt indicators of past mining activities (such as shafts, adits, or tailing piles). In addition, we did not observe slag material within the adjacent UPRR track ballast material, which can also be a potential source of metals including arsenic. Based on our field observations and the analytical laboratory results, the detected concentrations of arsenic appear to be within the range of naturally occurring background concentrations typically found in Sierra Nevada foothills soils and do not appear to be indicative of anthropogenic activities.

Therefore, sediment to be removed from the reservoir should not be classified as a hazardous waste and should be able to be disposed of at an accepting facility. Regulatory approval of offsite disposal may be required if land disposal options other than an approved landfill are being considered.

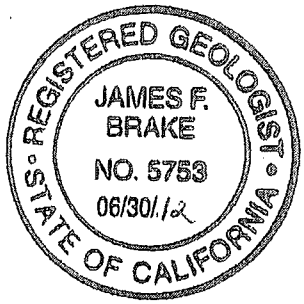
LIMITATIONS

The information contained herein is only valid as of the date of this report and will require an update to reflect any additional information obtained. This report is not a comprehensive site characterization and should not be construed as such. The findings as presented in this report are predicated on the results of the limited sampling and laboratory testing performed. In addition, the information obtained is not intended to address potential impacts related to sources other than those specified herein. Therefore, the report should be deemed conclusive with respect to only the information obtained. We make no warranty, express or implied, with respect to the content of this report or any subsequent reports, correspondence or consultation. We strived to perform the services summarized herein in accordance with the local standard of care in the geographic region at the time the services were rendered.

Please contact us if you have any questions regarding this letter report, or if we may be of further service.

Sincerely,

GEOCON CONSULTANTS, INC.

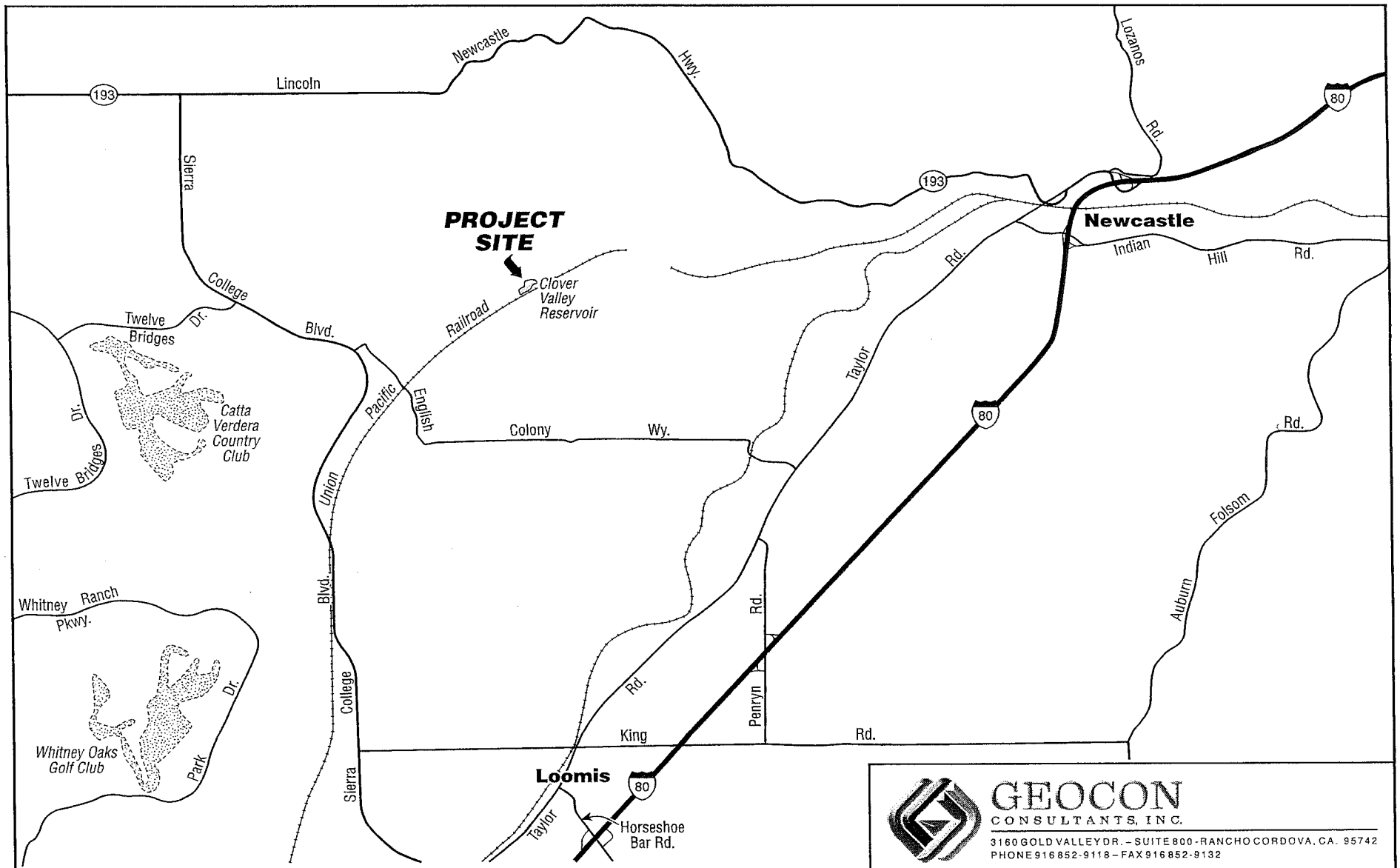


Jeremy J. Zorne, PE, GE
Senior Engineer

Jim Brake, PG
Senior Geologist

(3) Addressee

Attachments: Figure 1, Vicinity Map
Figure 2, Site Plan
Figure 3, Site Photos 1 and 2
Figure 4, Site Photos 3 and 4
Figures 5 through 9, Logs of Sediment Cores
Figure 10, Summary of Geotechnical Laboratory Results
Figures 11 and 12, Grain Size Distribution
Figure 13, Atterberg Limits
Table 1, Soil Analytical Results – Petroleum Hydrocarbons and Pesticides
Table 2, Soil Analytical Results – Title 22 Metals
Environmental Laboratory Reports and COC Documentation



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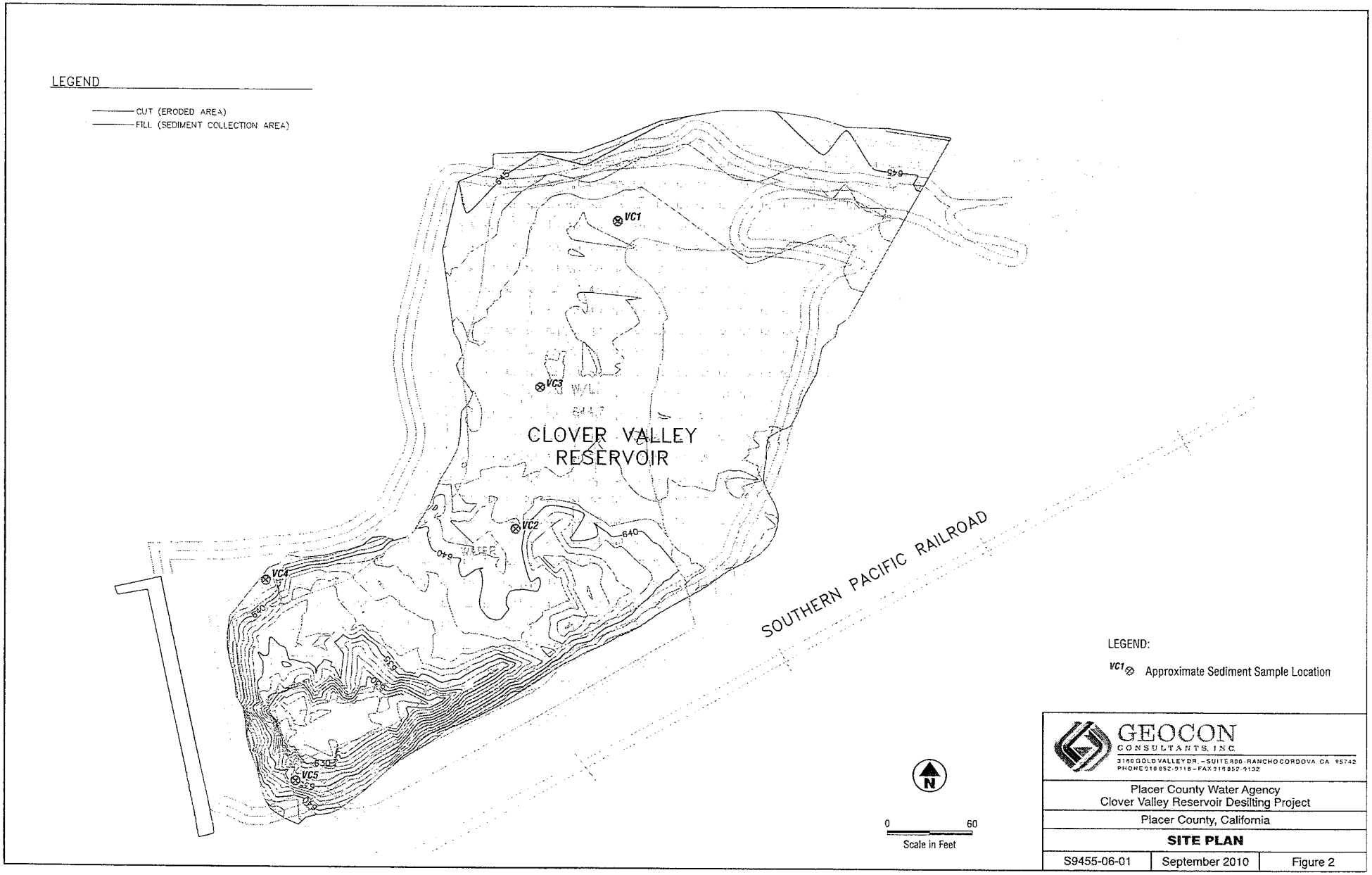
Placer County Water Agency
Clover Valley Reservoir Desilting Project

Placer County, California

VICINITY MAP

S9455-06-01	September 2010	Figure 1



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Clover Valley Reservoir Desilting Project
Placer County, California

SITE PLAN

S9455-06-01	September 2010	Figure 2

Photo No. 1 Sediment Sampling Operation at Clover Valley Reservoir

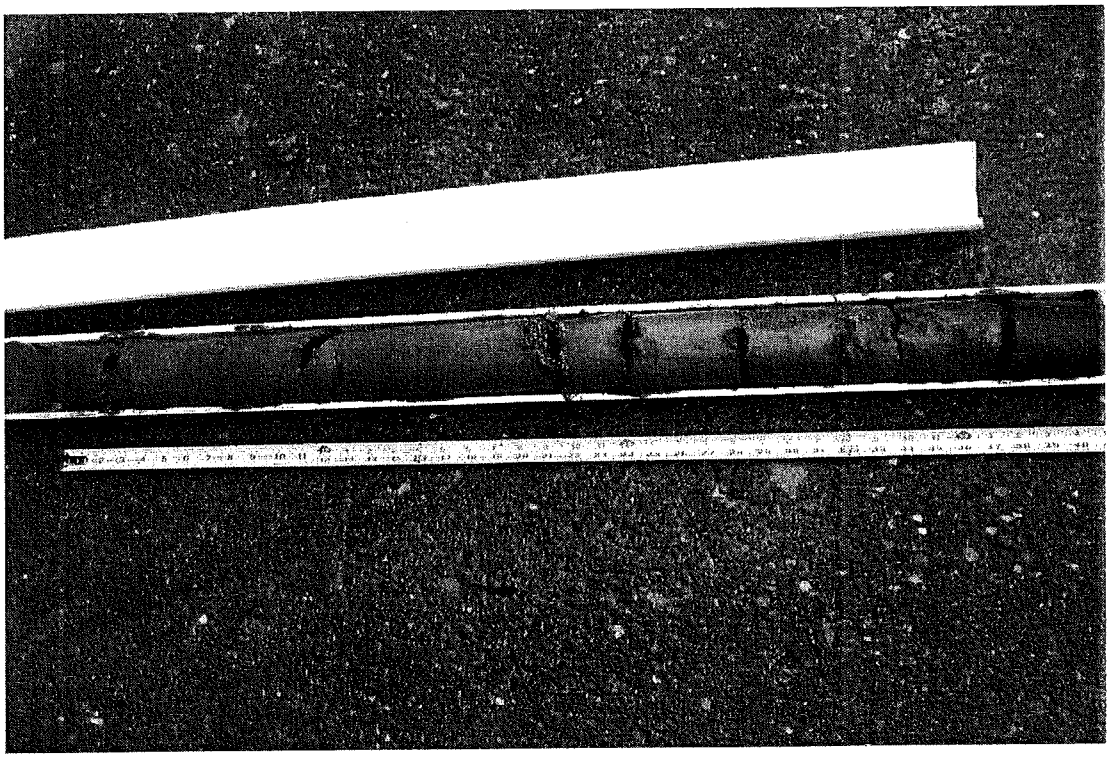

Photo No. 2 Sediment Sample VC1

SITE PHOTOS NO. 1 & 2

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Placer County Water Agency Clover Valley Reservoir Desilting Project		
Placer County, California		
S9455-06-01	September 2010	Figure 3

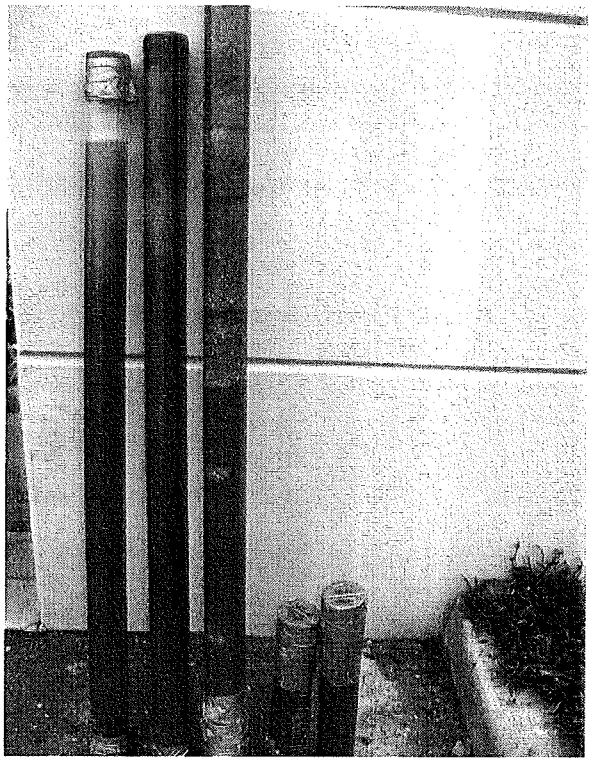

Photo No. 3 Sediment Samples VC1 - VC5 (Left to Right)

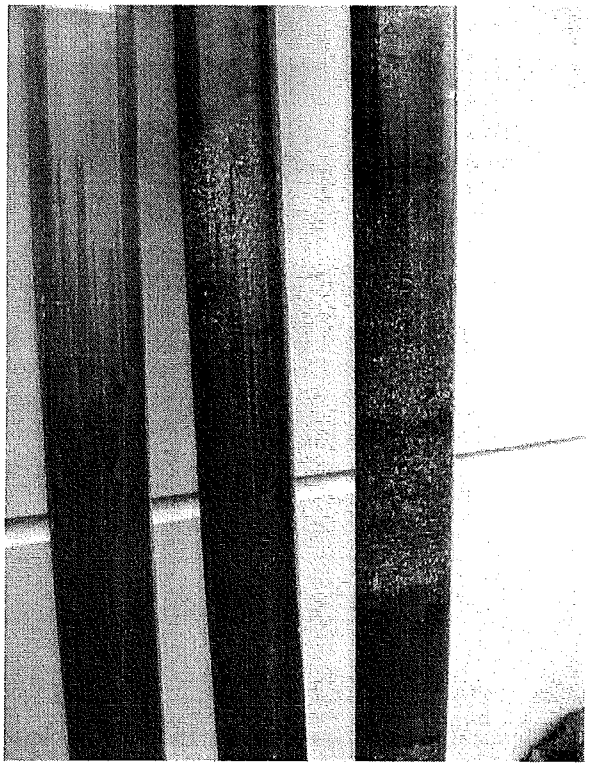

Photo No. 4 Close-up View of Sediment Samples

SITE PHOTOS NO. 3 & 4

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Placer County Water Agency Clover Valley Reservoir Desilting Project		
Placer County, California		
S9455-06-01	September 2010	Figure 4

PROJECT NO. **S9455-06-01**

BORING VC1

ELEV. (MSL.) **N/A** DATE COMPLETED **1-28-10**

EQUIPMENT **Boat Mounted Vibra-core**

DEPTH IN INCHES	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				MH	Grayish brown to medium green Elastic SILT			
				ML	Medium brown Clayey SILT			
5								
				SC	Medium gray, clayey fine to medium grained SAND			
10								66.1
15								
20				CL-ML	Medium gray to grayish brown Sandy Clayey SILT			
25								
30								
35								
					TOTAL CORE LENGTH = 39 INCHES			

Figure 5, Log of Boring, page 1 of 1

GEO LOG NO WELL COPY IN INCHES PCWA CLOVER VALLEY RESERVOIR.GPJ 03/01/10

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S9455-06-01**

BORING VC2

ELEV. (MSL.) **N/A** DATE COMPLETED **1-28-10**

EQUIPMENT **Boat Mounted Vibra-core**

DEPTH IN INCHES	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				OL	Grayish brown to medium gray Organic fine SILT			
5				SP	Black and white Medium to coarse grained poorly graded SAND, granitic sands, fine downward sequence			
10				ML	Dark gray medium grained poorly graded SAND with silt, fine downward sequence			
15								
20				ML	Grayish brown Clayey Sandy SILT			
25								
30								
35				SP	Grayish brown medium grained SAND			
				ML	Grayish brown Sandy Clayey SILT			35.5
40				SP	Black and white fine to medium grained poorly graded SAND, granitic sands			
45								
				ML	Mottled gray Clayey SILT			
50					TOTAL CORE LENGTH = 51 INCHES			

Figure 6, Log of Boring, page 1 of 1

GEO LOG NO WELL COPY IN INCHES PCWA CLOVER VALLEY RESERVOIR.GPJ 03/01/10

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▯ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S9455-06-01**

BORING VC3

ELEV. (MSL.) **N/A** DATE COMPLETED **1-28-10**

EQUIPMENT **Boat Mounted Vibra-core**

DEPTH IN INCHES	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				OL	Medium brown Organic Clayey SILT			
5				SP	Black and white medium to coarse grained poorly graded SAND, granitic sands			
10				SM	Medium gray Organic Silty SAND			
				SP-SM	Black and white fine to medium grained poorly graded SAND with silt			
15				SP	Black and white medium to coarse grained poorly graded SAND, granitic sands			
				CL-ML	Brown to gray Sandy Clayey SILT			
20				SM	Black and white Silty SAND, coarsening downward sequence, granitic sands			
25								
30								
				CL-ML	Brown to gray Sandy Clayey SILT			73.4
35				SP	Black and white coarse grained poorly graded sand			
40				SP	Black and white fine to medium grained poorly graded SAND, coarsening downward sequence			
45				ML	Brown to gray Clayey Sandy SILT			
50				SP	Black and white medium to coarse grained poorly graded SAND			
				ML	Mottled brown to brownish gray Clayey SILT			
55								
60								
					TOTAL CORE LENGTH = 64 INCHES			

Figure 7, Log of Boring, page 1 of 1

GEO LOG NO WELL COPY IN INCHES PCWA CLOVER VALLEY RESERVOIR.GPJ 03/01/10

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S9455-06-01**

DEPTH IN INCHES	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**BORING VC4** ELEV. (MSL.) **N/A** DATE COMPLETED **1-28-10** EQUIPMENT **Boat Mounted Vibra-core**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				MH	Mottled gray and brown Sandy Clayey Elastic SILT			129.3
5								
10								
					TOTAL CORE LENGTH = 14 INCHES			

Figure 8, Log of Boring, page 1 of 1

GEO LOG NO WELL COPY IN INCHES PCWA CLOVER VALLEY RESERVOIR.GPJ 03/01/10

SAMPLE SYMBOLS			
	☐ ... SAMPLING UNSUCCESSFUL	◧ ... STANDARD PENETRATION TEST	■ ... DRIVE SAMPLE (UNDISTURBED)
	⊠ ... DISTURBED OR BAG SAMPLE	◣ ... CHUNK SAMPLE	▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S9455-06-01**

DEPTH IN INCHES	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**BORING VC5** ELEV. (MSL.) **N/A** DATE COMPLETED **1-28-10** EQUIPMENT **Boat Mounted Vibra-core**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				MH	Mottled gray and brown Sandy Elastic SILT			
5								
10								
15								
					TOTAL CORE LENGTH = 18 INCHES			

Figure 9, Log of Boring, page 1 of 1

GEO LOG NO WELL COPY IN INCHES PCWA CLOVER VALLEY RESERVOIR.GPJ 03/01/10

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

Sample ID	Depth (inches)	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Water Content (%)	Organic Content (%)
VC1	0-12	66	34	32	---			4.7
VC1	12 -24				---	76.9	66.1	
VC1	0-12				---			10.0
VC2	36-51				---	24.6	35.5	
VC2 composite	0-60				---	39.3	60.9	
VC3	36-48				---	30.0	73.4	
VC3	45-60				---			3.9
VC3 composite	0-68				---	34.5	34.5	
VC4	0-14	88	44	44	---	82.4	129.3	
VC4	48-60				---			8.1
VC5	0-18				---			2.3

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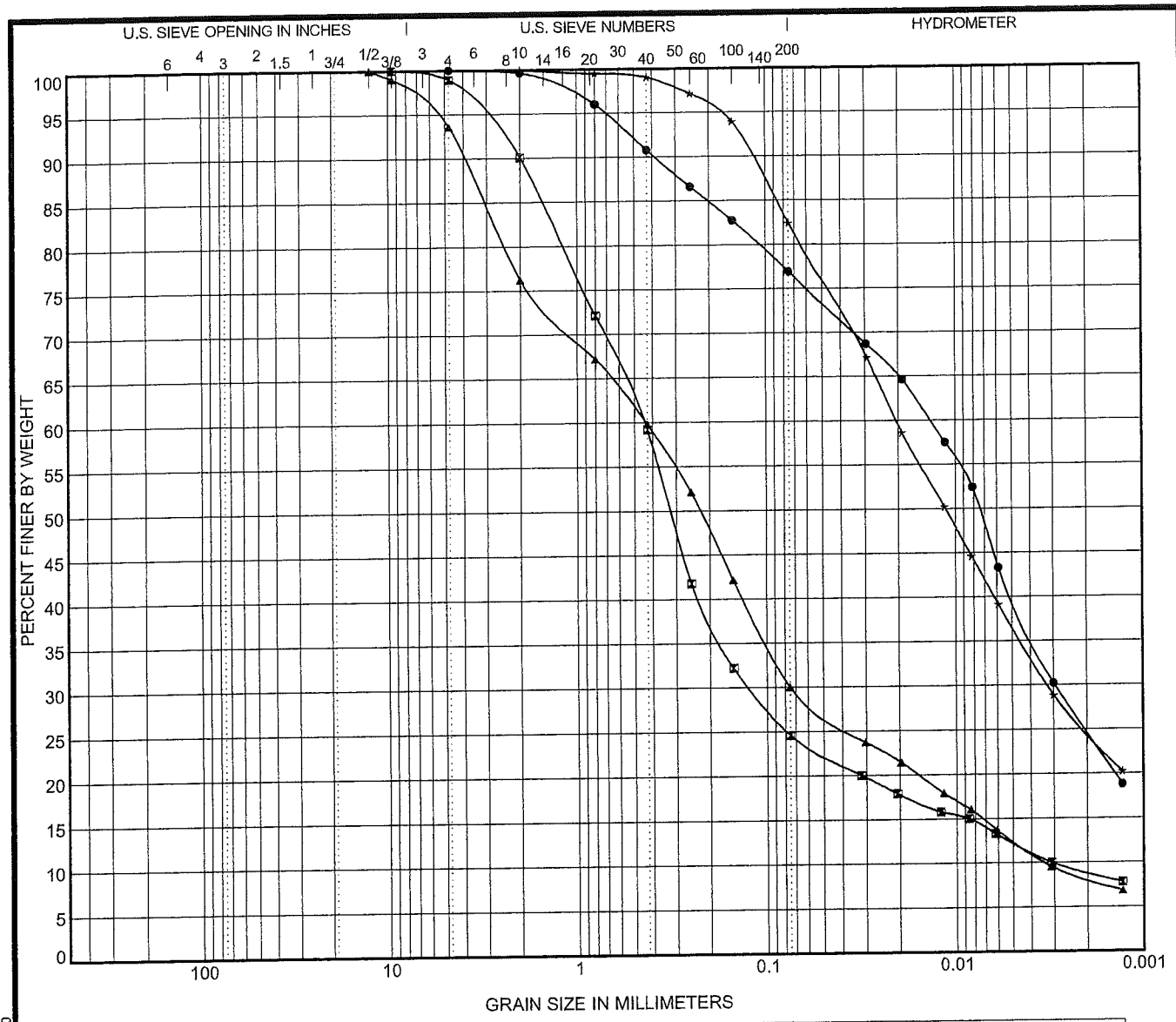
Summary of Geotechnical Laboratory Results

Project: PCWA Clover Valley Reservoir
Location: Placer County. CA
Number: S9455-06-01
Figure: 10



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample No. & Depth (in)		Classification	LL	PL	PI	Cc	Cu
●	VC1 12 -24	Sandy Elastic SILT (MH)					
⊠	VC2 36-51	Silty, Clayey SAND (SC-SM)				11.05	142.76
▲	VC3 36-48	Silty, Clayey SAND (SC-SM)				3.87	128.88
★	VC4 0-14	Sandy Clayey Elastic SILT (MH)	88	44	44		

Sample No. & Depth (in)		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	VC1 12 -24	4.75	0.014	0.003		0.0	23.1	36.8	40.1
⊠	VC2 36-51	9.5	0.443	0.123	0.003	1.1	74.4	12.3	12.3
▲	VC3 36-48	12.5	0.433	0.075	0.003	6.4	63.6	17.5	12.5
★	VC4 0-14	2	0.02	0.003		0.0	17.6	45.8	36.6

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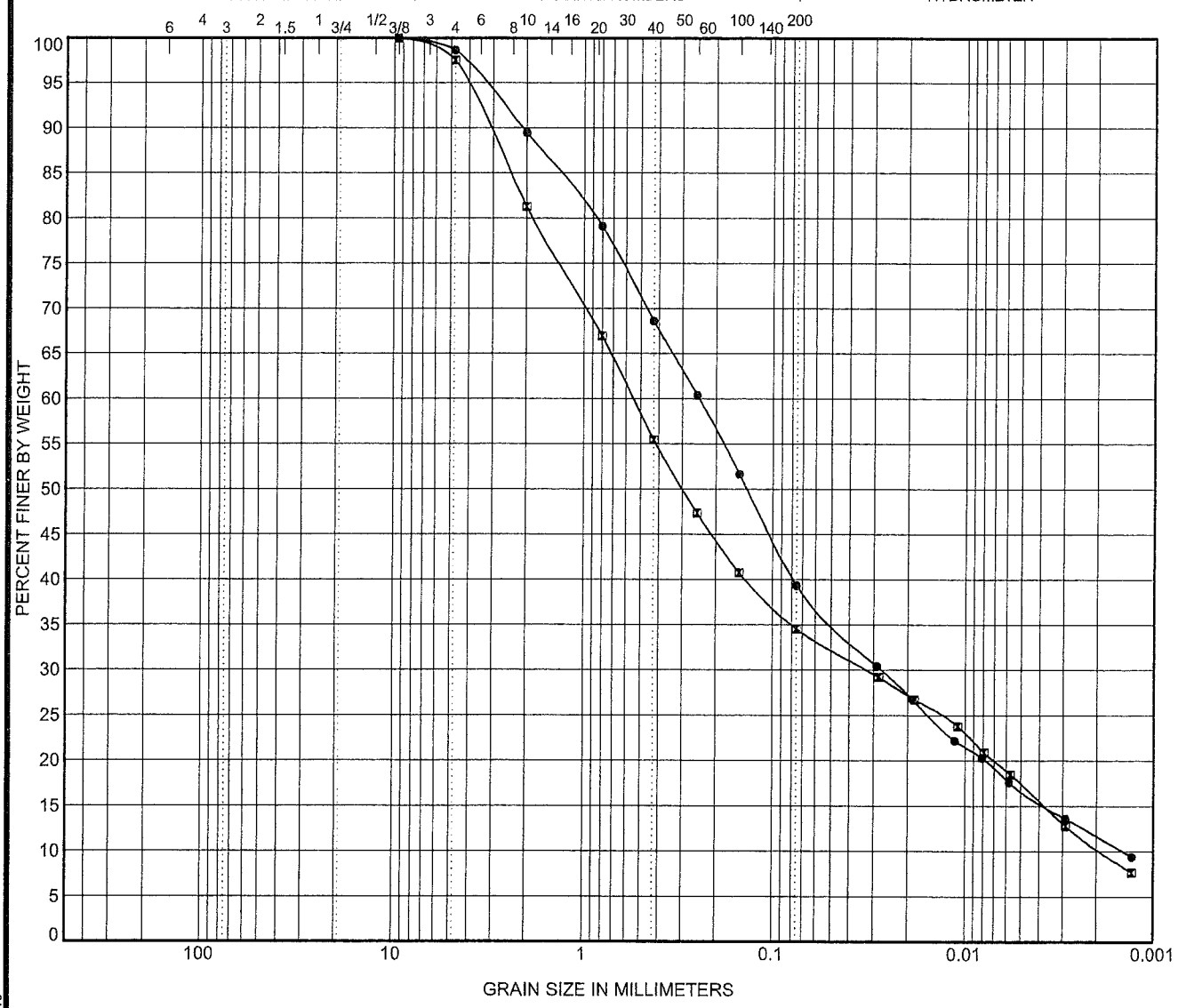
GRAIN SIZE DISTRIBUTION

Project: PCWA Clover Valley Reservoir
Location: Placer County. CA
Number: S9455-06-01
Figure: 11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample No. & Depth (in)	Classification	LL	PL	PI	Cc	Cu
●	VC2 composite 0-60	Silty, Clayey SAND (SC-SM)				2.12	167.71
⊠	VC3 composite 0-68	Silty, Clayey SAND (SC-SM)				1.05	292.35

	Sample No. & Depth (in)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	VC2 composite 0-60	9.5	0.245	0.028	0.001	1.4	59.3	22.6	16.7
⊠	VC3 composite 0-68	9.5	0.546	0.033	0.002	2.5	63.0	17.1	17.4

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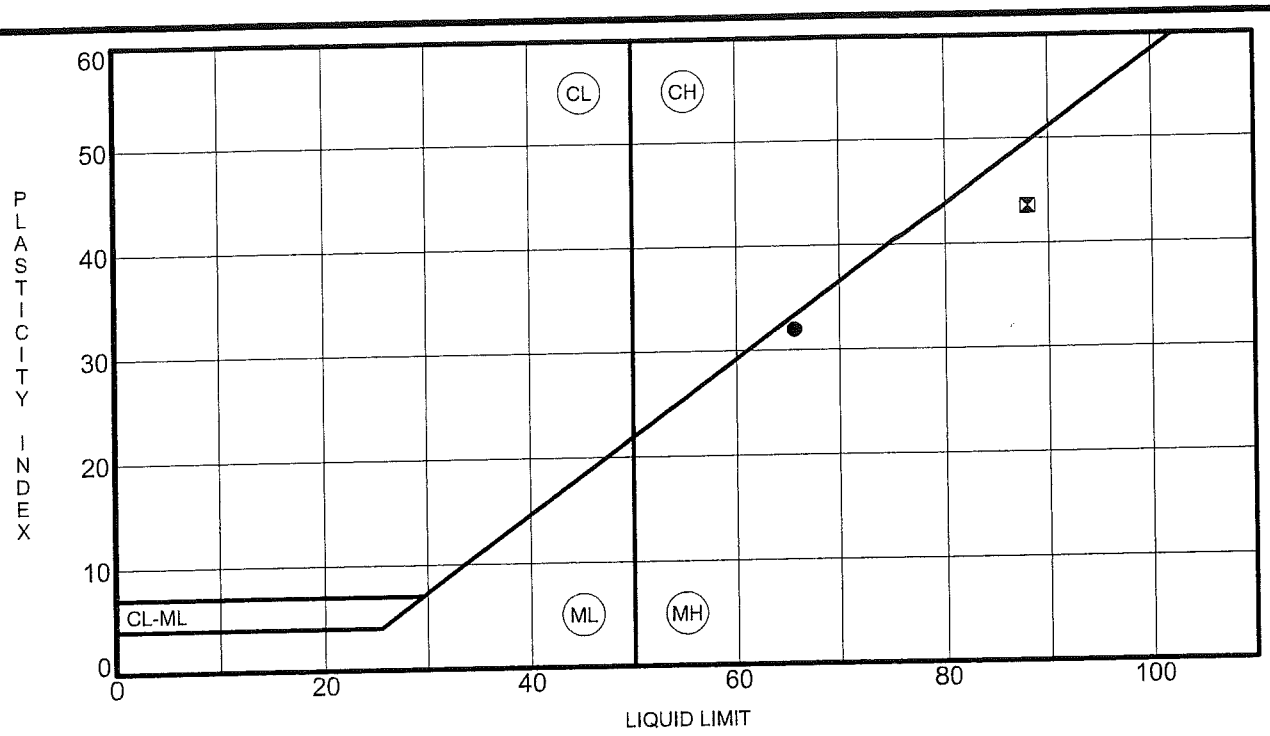
GRAIN SIZE DISTRIBUTION

Project: PCWA Clover Valley Reservoir
Location: Placer County. CA
Number: S9455-06-01
Figure: 12



	Sample No.	Liquid Limit	Plastic Limit	Plasticity Index	% Pass #200 Sieve	Unified Soil Classification Description
●	**VC1-0-12**	**66**	**34**	**32**		**Elastic SILT (MH)**
⊠	**VC4-0-14**	**88**	**44**	**44**	**82**	**Sandy Clayey Elastic SILT (MH)**

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ATTERBERG LIMITS

Project: PCWA Clover Valley Reservoir
Location: Placer County. CA
Number: S9455-06-01
Figure: 13

TABLE 1
SOIL ANALYTICAL RESULTS - PETROLEUM HYDROCARBONS AND PESTICIDES
CLOVER VALLEY RESERVOIR, PLACER COUNTY, CALIFORNIA

	EXTRACTABLE PETROLEUM HYDROCARBONS					
	GASOLINE (mg/kg)	DIESEL (mg/kg)	MOTOR OIL (mg/kg)	ORGANOCHLORINE PESTICIDES (mg/kg)	ORGANOPHOSPHOROUS PESTICIDES (mg/kg)	PH
VC1	<1.0	<1.0	<1.0	ND	ND	6.73
VC2	<1.0	<1.0	<1.0	ND	ND	6.45
VC3	<1.0	<1.0	<1.0	ND	ND	6.64
VC4	<1.0	<1.0	<1.0	ND	ND	6.48

Notes:

mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
< = Not detected above laboratory reporting limit
ND = Not detected

TABLE 2
SOIL ANALYTICAL RESULTS - TITLE 22 METALS
CLOVER VALLEY RESERVOIR, PLACER COUNTY, CALIFORNIA

	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
VC1	<2.5	2.5	150	<0.50	<0.50	31	14	33	13	0.11	1.7	35	<2.5	0.59	<1.0	54	38
VC2	<2.5	5.0	95	<0.50	<0.50	26	7.8	82	14	<0.10	1.0	20	<2.5	0.58	<1.0	41	39
VC3	<2.5	16 / 4.1 (1)	96	<0.50	<0.50	39	8.3	29	13	<0.10	1.2	26	<2.5	0.90	<1.0	45	41
VC4	<2.5	4.5	120	<0.50	<0.50	31	9.6	96	21	<0.10	1.3	26	<2.5	0.67	<1.0	48	49
TTLC	500	500	10,000	75	100	2,500	8,000	2,500	1,000	20	3,500	2,000	100	500	700	2,400	5,000
10 x STLC	150	50	1,000	7.5	10	50	800	250	50	2.0	3,500	200	10	50	70	240	2,500
CHHSLs (mg/kg)	30	0.070	5,200	150	1.7	100,000/17 (2)	660	3,000	150	18	380	1,600	380	380	5.0	530	23,000
Published Background [1]	0.6	0.6 (min) 11.0 (max) 3.5 (mean) (3)	509	1.28	0.36	122	14.9	28.7	23.9	0.26	1.3	57	0.058	0.8	0.56	112	149

Notes:

Concentrations reported in milligrams per kilogram

TTLC = Total Threshold Limit Concentrations

STLC = Soluble Threshold Limit Concentrations

CHHSLs = California Human Health Screening Levels. Ref: California Environmental Protection Agency, "Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties," January 2005

[1]Background: Mean Concentration - Background Concentrations of Trace and Major Elements in California Soils, Kearney Foundation of Soil Science, University of California, March 1996

< = not detected above laboratory reporting limit

(1) = Re-Analysis Result

(2) = Chromium III/Chromium IV

(3) = Min/Max/Mean from Kearney Foundation Special Report which includes soils throughout California. Background arsenic concentrations in Sierra Nevada foothills soils can typically exceed 20 mg/kg.

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

February 05, 2010

CLS Work Order #: CTA0949
COC #: 97842

Jeremy Zorne
Geocon Consultants
3160 Gold Valley Dr. Suite #800
Rancho Cordova, CA 95742

Project Name: Clover Valley Reservoir

Enclosed are the results of analyses for samples received by the laboratory on 01/29/10 12:10. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

02/05/10 10:44

Geocon Consultants	Project: Clover Valley Reservoir	
3160 Gold Valley Dr. Suite #800	Project Number: S9455-06-01	**CLS Work Order #: CTA0949**
Rancho Cordova, CA 95742	Project Manager: Jeremy Zorne	COC #: 97842

CLS - Labs CHAIN OF CUSTODY CLS ID No.: CTA 0949 LOG NO. 97842

REPORT TO: CLIENT JOB NUMBER ANALYSIS REQUESTED GEOTRACKER:

EDF REPORT YES NO

GLOBAL ID:

CLS (916) 638-7301

OTHER

PRESERVATIVES

TURN AROUND TIME SPECIAL INSTRUCTIONS

OR

ALT ID:

DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER #	CONTAINER TYPE

RELINQUISHED BY (SIGN) PRINT NAME - COMPANY DATE - TIME RECEIVED BY (SIGN) PRINT NAME - COMPANY

Geocon Consultants
3160 Gold Valley Dr. Suite #800
Rancho Cordova, CA 95742

Project: Clover Valley Reservoir
Project Number: S9455-06-01
Project Manager: Jeremy Zorne

CLS Work Order #: CTA0949
COC #: 97842

CAM 17 Metals

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC1 (CTA0949-01) Soil Sampled: 01/28/10 12:10 Received: 01/29/10 12:10									
Arsenic	**2.5**	1.0	mg/kg	10	CT00644	02/01/10	02/01/10	EPA 6020/7000	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	1.0	"	"	"	"	"	"	
Antimony	ND	2.5	"	1	CT00645	02/01/10	02/03/10	EPA 6010B	
Barium	**150**	1.0	"	"	"	"	"	"	
Beryllium	ND	0.50	"	"	"	"	"	"	
Cadmium	ND	0.50	"	"	"	"	"	"	
Cobalt	**14**	1.0	"	"	"	"	"	"	
Chromium	**31**	1.0	"	"	"	"	"	"	
Copper	**33**	1.0	"	"	"	"	"	"	
Lead	**13**	2.5	"	"	"	"	"	"	
Molybdenum	**1.7**	1.0	"	"	"	"	"	"	
Nickel	**35**	1.0	"	"	"	"	"	"	
Silver	**0.59**	0.50	"	"	"	"	"	"	
Vanadium	**54**	1.0	"	"	"	"	"	"	
Zinc	**38**	1.0	"	"	"	"	"	"	
Mercury	**0.11**	0.10	"	"	CT00747	02/04/10	02/04/10	EPA 7471A	
VC2 (CTA0949-02) Soil Sampled: 01/28/10 12:40 Received: 01/29/10 12:10									
Arsenic	**5.0**	1.0	mg/kg	10	CT00644	02/01/10	02/01/10	EPA 6020/7000	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	1.0	"	"	"	"	"	"	
Antimony	ND	2.5	"	1	CT00645	02/01/10	02/03/10	EPA 6010B	
Barium	**95**	1.0	"	"	"	"	"	"	
Beryllium	ND	0.50	"	"	"	"	"	"	
Cadmium	ND	0.50	"	"	"	"	"	"	
Cobalt	**7.8**	1.0	"	"	"	"	"	"	
Chromium	**26**	1.0	"	"	"	"	"	"	
Copper	**82**	1.0	"	"	"	"	"	"	
Lead	**14**	2.5	"	"	"	"	"	"	
Molybdenum	**1.0**	1.0	"	"	"	"	"	"	

Geocon Consultants
3160 Gold Valley Dr. Suite #800
Rancho Cordova, CA 95742

Project: Clover Valley Reservoir
Project Number: S9455-06-01
Project Manager: Jeremy Zorne

CLS Work Order #: CTA0949
COC #: 97842

CAM 17 Metals

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC2 (CTA0949-02) Soil Sampled: 01/28/10 12:40 Received: 01/29/10 12:10									
Nickel	**20**	1.0	mg/kg	1	CT00645	"	02/03/10	EPA 6010B	
Silver	**0.58**	0.50	"	"	"	"	"	"	
Vanadium	**41**	1.0	"	"	"	"	"	"	
Zinc	**39**	1.0	"	"	"	"	"	"	
Mercury	ND	0.10	"	"	CT00747	02/04/10	02/04/10	EPA 7471A	
VC3 (CTA0949-03) Soil Sampled: 01/28/10 13:20 Received: 01/29/10 12:10									
Arsenic	**16**	1.0	mg/kg	10	CT00644	02/01/10	02/01/10	EPA 6020/7000	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	1.0	"	"	"	"	"	"	
Antimony	ND	2.5	"	1	CT00645	02/01/10	02/03/10	EPA 6010B	
Barium	**96**	1.0	"	"	"	"	"	"	
Beryllium	ND	0.50	"	"	"	"	"	"	
Cadmium	ND	0.50	"	"	"	"	"	"	
Cobalt	**8.3**	1.0	"	"	"	"	"	"	
Chromium	**39**	1.0	"	"	"	"	"	"	
Copper	**29**	1.0	"	"	"	"	"	"	
Lead	**13**	2.5	"	"	"	"	"	"	
Molybdenum	**1.2**	1.0	"	"	"	"	"	"	
Nickel	**26**	1.0	"	"	"	"	"	"	
Silver	**0.90**	0.50	"	"	"	"	"	"	
Vanadium	**45**	1.0	"	"	"	"	"	"	
Zinc	**41**	1.0	"	"	"	"	"	"	
Mercury	ND	0.10	"	"	CT00747	02/04/10	02/04/10	EPA 7471A	

CALIFORNIA LABORATORY SERVICES

02/05/10 10:44

Geocon Consultants	Project: Clover Valley Reservoir	
3160 Gold Valley Dr. Suite #800	Project Number: S9455-06-01	**CLS Work Order #: CTA0949**
Rancho Cordova, CA 95742	Project Manager: Jeremy Zorne	COC #: 97842

CAM 17 Metals

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC4 (CTA0949-04) Soil Sampled: 01/28/10 13:40 Received: 01/29/10 12:10									
Arsenic	**4.5**	1.0	mg/kg	10	CT00644	02/01/10	02/01/10	EPA 6020/7000	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	1.0	"	"	"	"	"	"	
Antimony	ND	2.5	"	1	CT00645	02/01/10	02/03/10	EPA 6010B	
Barium	**120**	1.0	"	"	"	"	"	"	
Beryllium	ND	0.50	"	"	"	"	"	"	
Cadmium	ND	0.50	"	"	"	"	"	"	
Cobalt	**9.6**	1.0	"	"	"	"	"	"	
Chromium	**31**	1.0	"	"	"	"	"	"	
Copper	**96**	1.0	"	"	"	"	"	"	
Lead	**21**	2.5	"	"	"	"	"	"	
Molybdenum	**1.3**	1.0	"	"	"	"	"	"	
Nickel	**26**	1.0	"	"	"	"	"	"	
Silver	**0.67**	0.50	"	"	"	"	"	"	
Vanadium	**48**	1.0	"	"	"	"	"	"	
Zinc	**49**	1.0	"	"	"	"	"	"	
Mercury	ND	0.10	"	"	CT00747	02/04/10	02/04/10	EPA 7471A	

CALIFORNIA LABORATORY SERVICES

02/05/10 10:44

Geocon Consultants	Project: Clover Valley Reservoir	
3160 Gold Valley Dr. Suite #800	Project Number: S9455-06-01	**CLS Work Order #: CTA0949**
Rancho Cordova, CA 95742	Project Manager: Jeremy Zorne	COC #: 97842

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC1 (CTA0949-01) Soil Sampled: 01/28/10 12:10 Received: 01/29/10 12:10									
pH	**6.73**	1.00	pH Units	1	CT00630	01/29/10	01/29/10	EPA 9045C	
VC2 (CTA0949-02) Soil Sampled: 01/28/10 12:40 Received: 01/29/10 12:10									
pH	**6.45**	1.00	pH Units	1	CT00630	01/29/10	01/29/10	EPA 9045C	
VC3 (CTA0949-03) Soil Sampled: 01/28/10 13:20 Received: 01/29/10 12:10									
pH	**6.64**	1.00	pH Units	1	CT00630	01/29/10	01/29/10	EPA 9045C	
VC4 (CTA0949-04) Soil Sampled: 01/28/10 13:40 Received: 01/29/10 12:10									
pH	**6.48**	1.00	pH Units	1	CT00630	01/29/10	01/29/10	EPA 9045C	

Geocon Consultants
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Rancho Cordova, CA 95742

Project: Clover Valley Reservoir
Project Number: S9455-06-01
Project Manager: Jeremy Zorne

CLS Work Order #: CTA0949
COC #: 97842

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC1 (CTA0949-01) Soil Sampled: 01/28/10 12:10 Received: 01/29/10 12:10									
Diesel	ND	1.0	mg/kg	1	CT00705	02/03/10	02/03/10	EPA 8015M	
Motor Oil	ND	1.0	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*122 %*	*65-135*		"	"	"	"	
VC2 (CTA0949-02) Soil Sampled: 01/28/10 12:40 Received: 01/29/10 12:10									
Diesel	ND	1.0	mg/kg	1	CT00705	02/03/10	02/03/10	EPA 8015M	
Motor Oil	ND	1.0	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*105 %*	*65-135*		"	"	"	"	
VC3 (CTA0949-03) Soil Sampled: 01/28/10 13:20 Received: 01/29/10 12:10									
Diesel	ND	1.0	mg/kg	1	CT00705	02/03/10	02/03/10	EPA 8015M	
Motor Oil	ND	1.0	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*140 %*	*65-135*		"	"	"	"	*QS-HI*
VC4 (CTA0949-04) Soil Sampled: 01/28/10 13:40 Received: 01/29/10 12:10									
Diesel	ND	1.0	mg/kg	1	CT00705	02/03/10	02/04/10	EPA 8015M	
Motor Oil	ND	1.0	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*69 %*	*65-135*		"	"	"	"	

Geocon Consultants
3160 Gold Valley Dr. Suite #800
Rancho Cordova, CA 95742

Project: Clover Valley Reservoir
Project Number: S9455-06-01
Project Manager: Jeremy Zorne

CLS Work Order #: CTA0949
COC #: 97842

Organochlorine Pesticides by EPA Method 8081A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC1 (CTA0949-01) Soil Sampled: 01/28/10 12:10 Received: 01/29/10 12:10									
Aldrin	ND	10	µg/kg	10	CT00649	02/01/10	02/02/10	EPA 8081A	
alpha-BHC	ND	20	"	"	"	"	"	"	
beta-BHC	ND	100	"	"	"	"	"	"	
delta-BHC	ND	100	"	"	"	"	"	"	
gamma-BHC (Lindane)	ND	100	"	"	"	"	"	"	
Chlordane-technical	ND	200	"	"	"	"	"	"	
4,4'-DDD	ND	150	"	"	"	"	"	"	
4,4'-DDE	ND	150	"	"	"	"	"	"	
4,4'-DDT	ND	150	"	"	"	"	"	"	
Dieldrin	ND	10	"	"	"	"	"	"	
Endosulfan I	ND	150	"	"	"	"	"	"	
Endosulfan II	ND	150	"	"	"	"	"	"	
Endosulfan sulfate	ND	150	"	"	"	"	"	"	
Endrin	ND	150	"	"	"	"	"	"	
Endrin aldehyde	ND	150	"	"	"	"	"	"	
Heptachlor	ND	50	"	"	"	"	"	"	
Heptachlor epoxide	ND	20	"	"	"	"	"	"	
Methoxychlor	ND	150	"	"	"	"	"	"	
Mirex	ND	100	"	"	"	"	"	"	
Toxaphene	ND	200	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*19 %*	*46-139*		"	"	"	"	*QS-4*
Surrogate: Decachlorobiphenyl		*75 %*	*52-141*		"	"	"	"	
VC2 (CTA0949-02) Soil Sampled: 01/28/10 12:40 Received: 01/29/10 12:10									
Aldrin	ND	10	µg/kg	10	CT00649	02/01/10	02/02/10	EPA 8081A	
alpha-BHC	ND	20	"	"	"	"	"	"	
beta-BHC	ND	100	"	"	"	"	"	"	
delta-BHC	ND	100	"	"	"	"	"	"	
gamma-BHC (Lindane)	ND	100	"	"	"	"	"	"	
Chlordane-technical	ND	200	"	"	"	"	"	"	

Geocon Consultants
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Rancho Cordova, CA 95742

Project: Clover Valley Reservoir
Project Number: S9455-06-01
Project Manager: Jeremy Zorne

CLS Work Order #: CTA0949
COC #: 97842

Organochlorine Pesticides by EPA Method 8081A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC2 (CTA0949-02) Soil Sampled: 01/28/10 12:40 Received: 01/29/10 12:10									
4,4'-DDD	ND	150	µg/kg	10	CT00649	"	02/02/10	EPA 8081A	
4,4'-DDE	ND	150	"	"	"	"	"	"	
4,4'-DDT	ND	150	"	"	"	"	"	"	
Dieldrin	ND	10	"	"	"	"	"	"	
Endosulfan I	ND	150	"	"	"	"	"	"	
Endosulfan II	ND	150	"	"	"	"	"	"	
Endosulfan sulfate	ND	150	"	"	"	"	"	"	
Endrin	ND	150	"	"	"	"	"	"	
Endrin aldehyde	ND	150	"	"	"	"	"	"	
Heptachlor	ND	50	"	"	"	"	"	"	
Heptachlor epoxide	ND	20	"	"	"	"	"	"	
Methoxychlor	ND	150	"	"	"	"	"	"	
Mirex	ND	100	"	"	"	"	"	"	
Toxaphene	ND	200	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*33 %*	*46-139*		"	"	"	"	*QS-4*
Surrogate: Decachlorobiphenyl		*56 %*	*52-141*		"	"	"	"	
VC3 (CTA0949-03) Soil Sampled: 01/28/10 13:20 Received: 01/29/10 12:10									
Aldrin	ND	10	µg/kg	10	CT00649	02/01/10	02/02/10	EPA 8081A	
alpha-BHC	ND	20	"	"	"	"	"	"	
beta-BHC	ND	100	"	"	"	"	"	"	
delta-BHC	ND	100	"	"	"	"	"	"	
gamma-BHC (Lindane)	ND	100	"	"	"	"	"	"	
Chlordane-technical	ND	200	"	"	"	"	"	"	
4,4'-DDD	ND	150	"	"	"	"	"	"	
4,4'-DDE	ND	150	"	"	"	"	"	"	
4,4'-DDT	ND	150	"	"	"	"	"	"	
Dieldrin	ND	10	"	"	"	"	"	"	
Endosulfan I	ND	150	"	"	"	"	"	"	
Endosulfan II	ND	150	"	"	"	"	"	"	

Geocon Consultants
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Project: Clover Valley Reservoir
Project Number: S9455-06-01
Project Manager: Jeremy Zorne

CLS Work Order #: CTA0949
COC #: 97842

Organochlorine Pesticides by EPA Method 8081A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC3 (CTA0949-03) Soil Sampled: 01/28/10 13:20 Received: 01/29/10 12:10									
Endosulfan sulfate	ND	150	µg/kg	10	CT00649	"	02/02/10	EPA 8081A	
Endrin	ND	150	"	"	"	"	"	"	
Endrin aldehyde	ND	150	"	"	"	"	"	"	
Heptachlor	ND	50	"	"	"	"	"	"	
Heptachlor epoxide	ND	20	"	"	"	"	"	"	
Methoxychlor	ND	150	"	"	"	"	"	"	
Mirex	ND	100	"	"	"	"	"	"	
Toxaphene	ND	200	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*31 %*	*46-139*		"	"	"	"	*QS-4*
Surrogate: Decachlorobiphenyl		*82 %*	*52-141*		"	"	"	"	
VC4 (CTA0949-04) Soil Sampled: 01/28/10 13:40 Received: 01/29/10 12:10									
Aldrin	ND	10	µg/kg	10	CT00649	02/01/10	02/02/10	EPA 8081A	
alpha-BHC	ND	20	"	"	"	"	"	"	
beta-BHC	ND	100	"	"	"	"	"	"	
delta-BHC	ND	100	"	"	"	"	"	"	
gamma-BHC (Lindane)	ND	100	"	"	"	"	"	"	
Chlordane-technical	ND	200	"	"	"	"	"	"	
4,4′-DDD	ND	150	"	"	"	"	"	"	
4,4′-DDE	ND	150	"	"	"	"	"	"	
4,4′-DDT	ND	150	"	"	"	"	"	"	
Dieldrin	ND	10	"	"	"	"	"	"	
Endosulfan I	ND	150	"	"	"	"	"	"	
Endosulfan II	ND	150	"	"	"	"	"	"	
Endosulfan sulfate	ND	150	"	"	"	"	"	"	
Endrin	ND	150	"	"	"	"	"	"	
Endrin aldehyde	ND	150	"	"	"	"	"	"	
Heptachlor	ND	50	"	"	"	"	"	"	
Heptachlor epoxide	ND	20	"	"	"	"	"	"	
Methoxychlor	ND	150	"	"	"	"	"	"	

Geocon Consultants
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Project: Clover Valley Reservoir
Project Number: S9455-06-01
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COC #: 97842

Organochlorine Pesticides by EPA Method 8081A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC4 (CTA0949-04) Soil Sampled: 01/28/10 13:40 Received: 01/29/10 12:10									
Mirex	ND	100	µg/kg	10	CT00649	"	02/02/10	EPA 8081A	
Toxaphene	ND	200	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*27 %*	*46-139*		"	"	"	"	*QS-4*
Surrogate: Decachlorobiphenyl		*56 %*	*52-141*		"	"	"	"	

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Rancho Cordova, CA 95742

Project: Clover Valley Reservoir
Project Number: S9455-06-01
Project Manager: Jeremy Zorne

CLS Work Order #: CTA0949
COC #: 97842

Organophosphorus Pesticides by EPA Method 8141A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC1 (CTA0949-01) Soil Sampled: 01/28/10 12:10 Received: 01/29/10 12:10									
Bolstar	ND	2.0	µg/kg	1	CT00650	02/01/10	02/04/10	EPA 8141A	
Chlorpyrifos	ND	2.0	"	"	"	"	"	"	
Coumaphos	ND	5.0	"	"	"	"	"	"	
Demeton	ND	5.0	"	"	"	"	"	"	
Diazinon	ND	2.0	"	"	"	"	"	"	
Dichlorvos	ND	5.0	"	"	"	"	"	"	
Disulfoton	ND	2.0	"	"	"	"	"	"	
Ethoprop	ND	2.0	"	"	"	"	"	"	
Fensulfothion	ND	2.0	"	"	"	"	"	"	
Fenthion	ND	2.0	"	"	"	"	"	"	
Guthion	ND	5.0	"	"	"	"	"	"	
Malathion	ND	2.0	"	"	"	"	"	"	
Merphos	ND	2.0	"	"	"	"	"	"	
Methyl parathion	ND	2.0	"	"	"	"	"	"	
Mevinphos	ND	2.0	"	"	"	"	"	"	
Phorate	ND	2.0	"	"	"	"	"	"	
Prothiofos	ND	2.0	"	"	"	"	"	"	
Ronnel	ND	2.0	"	"	"	"	"	"	
Stirophos	ND	2.0	"	"	"	"	"	"	
Trichloronate	ND	2.0	"	"	"	"	"	"	
Surrogate: EPN		*52 %*		*50-150*		"	"	"	"
VC2 (CTA0949-02) Soil Sampled: 01/28/10 12:40 Received: 01/29/10 12:10									
Bolstar	ND	2.0	µg/kg	1	CT00650	02/01/10	02/04/10	EPA 8141A	
Chlorpyrifos	ND	2.0	"	"	"	"	"	"	
Coumaphos	ND	5.0	"	"	"	"	"	"	
Demeton	ND	5.0	"	"	"	"	"	"	
Diazinon	ND	2.0	"	"	"	"	"	"	
Dichlorvos	ND	5.0	"	"	"	"	"	"	
Disulfoton	ND	2.0	"	"	"	"	"	"	

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Project: Clover Valley Reservoir
Project Number: S9455-06-01
Project Manager: Jeremy Zorne

CLS Work Order #: CTA0949
COC #: 97842

Organophosphorus Pesticides by EPA Method 8141A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC2 (CTA0949-02) Soil Sampled: 01/28/10 12:40 Received: 01/29/10 12:10									
Ethoprop	ND	2.0	µg/kg	1	CT00650	"	02/04/10	EPA 8141A	
Fensulfothion	ND	2.0	"	"	"	"	"	"	
Fenthion	ND	2.0	"	"	"	"	"	"	
Guthion	ND	5.0	"	"	"	"	"	"	
Malathion	ND	2.0	"	"	"	"	"	"	
Merphos	ND	2.0	"	"	"	"	"	"	
Methyl parathion	ND	2.0	"	"	"	"	"	"	
Mevinphos	ND	2.0	"	"	"	"	"	"	
Phorate	ND	2.0	"	"	"	"	"	"	
Prothiofos	ND	2.0	"	"	"	"	"	"	
Ronnel	ND	2.0	"	"	"	"	"	"	
Stirophos	ND	2.0	"	"	"	"	"	"	
Trichloronate	ND	2.0	"	"	"	"	"	"	
Surrogate: EPN		*51 %*	*50-150*		"	"	"	"	
VC3 (CTA0949-03) Soil Sampled: 01/28/10 13:20 Received: 01/29/10 12:10									
Bolstar	ND	2.0	µg/kg	1	CT00650	02/01/10	02/04/10	EPA 8141A	
Chlorpyrifos	ND	2.0	"	"	"	"	"	"	
Coumaphos	ND	5.0	"	"	"	"	"	"	
Demeton	ND	5.0	"	"	"	"	"	"	
Diazinon	ND	2.0	"	"	"	"	"	"	
Dichlorvos	ND	5.0	"	"	"	"	"	"	
Disulfoton	ND	2.0	"	"	"	"	"	"	
Ethoprop	ND	2.0	"	"	"	"	"	"	
Fensulfothion	ND	2.0	"	"	"	"	"	"	
Fenthion	ND	2.0	"	"	"	"	"	"	
Guthion	ND	5.0	"	"	"	"	"	"	
Malathion	ND	2.0	"	"	"	"	"	"	
Merphos	ND	2.0	"	"	"	"	"	"	
Methyl parathion	ND	2.0	"	"	"	"	"	"	

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COC #: 97842

Organophosphorus Pesticides by EPA Method 8141A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC3 (CTA0949-03) Soil Sampled: 01/28/10 13:20 Received: 01/29/10 12:10									
Mevinphos	ND	2.0	µg/kg	1	CT00650	"	02/04/10	EPA 8141A	
Phorate	ND	2.0	"	"	"	"	"	"	
Prothiofos	ND	2.0	"	"	"	"	"	"	
Ronnel	ND	2.0	"	"	"	"	"	"	
Stirophos	ND	2.0	"	"	"	"	"	"	
Trichloronate	ND	2.0	"	"	"	"	"	"	
Surrogate: EPN		*53 %*	*50-150*		"	"	"	"	
VC4 (CTA0949-04) Soil Sampled: 01/28/10 13:40 Received: 01/29/10 12:10									
Bolstar	ND	2.0	µg/kg	1	CT00650	02/01/10	02/04/10	EPA 8141A	
Chlorpyrifos	ND	2.0	"	"	"	"	"	"	
Coumaphos	ND	5.0	"	"	"	"	"	"	
Demeton	ND	5.0	"	"	"	"	"	"	
Diazinon	ND	2.0	"	"	"	"	"	"	
Dichlorvos	ND	5.0	"	"	"	"	"	"	
Disulfoton	ND	2.0	"	"	"	"	"	"	
Ethoprop	ND	2.0	"	"	"	"	"	"	
Fensulfothion	ND	2.0	"	"	"	"	"	"	
Fenthion	ND	2.0	"	"	"	"	"	"	
Guthion	ND	5.0	"	"	"	"	"	"	
Malathion	ND	2.0	"	"	"	"	"	"	
Merphos	ND	2.0	"	"	"	"	"	"	
Methyl parathion	ND	2.0	"	"	"	"	"	"	
Mevinphos	ND	2.0	"	"	"	"	"	"	
Phorate	ND	2.0	"	"	"	"	"	"	
Prothiofos	ND	2.0	"	"	"	"	"	"	
Ronnel	ND	2.0	"	"	"	"	"	"	
Stirophos	ND	2.0	"	"	"	"	"	"	
Trichloronate	ND	2.0	"	"	"	"	"	"	

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COC #: 97842

Organophosphorus Pesticides by EPA Method 8141A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC4 (CTA0949-04) Soil Sampled: 01/28/10 13:40 Received: 01/29/10 12:10									
Surrogate: EPN		*50 %*		*50-150*	*CT00650*	"	*02/04/10*	*EPA 8141A*	

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COC #: 97842

TPH-Gasoline by GC FID

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC1 (CTA0949-01) Soil Sampled: 01/28/10 12:10 Received: 01/29/10 12:10									
Gasoline	ND	1.0	mg/kg	1	CT00700	02/03/10	02/03/10	EPA 8015M	
Surrogate: o-Chlorotoluene (Gas)		*76 %*	*65-135*		"	"	"	"	
VC2 (CTA0949-02) Soil Sampled: 01/28/10 12:40 Received: 01/29/10 12:10									
Gasoline	ND	1.0	mg/kg	1	CT00700	02/03/10	02/03/10	EPA 8015M	
Surrogate: o-Chlorotoluene (Gas)		*77 %*	*65-135*		"	"	"	"	
VC3 (CTA0949-03) Soil Sampled: 01/28/10 13:20 Received: 01/29/10 12:10									
Gasoline	ND	1.0	mg/kg	1	CT00700	02/03/10	02/03/10	EPA 8015M	
Surrogate: o-Chlorotoluene (Gas)		*81 %*	*65-135*		"	"	"	"	
VC4 (CTA0949-04) Soil Sampled: 01/28/10 13:40 Received: 01/29/10 12:10									
Gasoline	ND	1.0	mg/kg	1	CT00700	02/03/10	02/03/10	EPA 8015M	
Surrogate: o-Chlorotoluene (Gas)		*81 %*	*65-135*		"	"	"	"	

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CAM 17 Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT00644 - EPA 3050B										
Blank (CT00644-BLK1)				Prepared & Analyzed: 02/01/10						
Arsenic	ND	0.10	mg/kg							
Selenium	ND	0.25	"							
Thallium	ND	0.10	"							
LCS (CT00644-BS1)				Prepared & Analyzed: 02/01/10						
Arsenic	4.40	0.10	mg/kg	5.00		88	75-125			
Selenium	4.20	0.25	"	5.00		84	75-125			
Thallium	5.10	0.10	"	5.00		102	75-125			
LCS Dup (CT00644-BSD1)				Prepared & Analyzed: 02/01/10						
Arsenic	4.38	0.10	mg/kg	5.00		88	75-125	0.4	25	
Selenium	4.17	0.25	"	5.00		83	75-125	0.8	25	
Thallium	5.19	0.10	"	5.00		104	75-125	2	25	
Matrix Spike (CT00644-MS1)		**Source: CTA0949-01**		Prepared & Analyzed: 02/01/10						
Arsenic	10.6	1.0	mg/kg	5.00	2.50	162	75-125			QM-5
Selenium	4.68	2.5	"	5.00	ND	94	75-125			
Thallium	5.91	1.0	"	5.00	ND	118	75-125			
Matrix Spike Dup (CT0O644-MSD1)		**Source: CTA0949-01**		Prepared & Analyzed: 02/01/10						
Arsenic	8.03	1.0	mg/kg	5.00	2.50	111	75-125	27	30	
Selenium	4.55	2.5	"	5.00	ND	91	75-125	3	30	
Thallium	5.94	1.0	"	5.00	ND	119	75-125	0.6	30	
Batch CT00645 - EPA 3050B										
Blank (CT00645-BLK1)				Prepared: 02/01/10 Analyzed: 02/03/10						
Antimony	ND	2.5	mg/kg							
Barium	ND	1.0	"							
Beryllium	ND	0.50	"							
Cadmium	ND	0.50	"							
Cobalt	ND	1.0	"							
Chromium	ND	1.0	"							

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CAM 17 Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT00645 - EPA 3050B										
Blank (CT00645-BLK1)				Prepared: 02/01/10 Analyzed: 02/03/10						
Copper	ND	1.0	mg/kg							
Lead	ND	2.5	"							
Molybdenum	ND	1.0	"							
Nickel	ND	1.0	"							
Silver	ND	0.50	"							
Vanadium	ND	1.0	"							
Zinc	ND	1.0	"							
LCS (CT00645-BS1)				Prepared: 02/01/10 Analyzed: 02/03/10						
Antimony	22.4	2.5	mg/kg	25.0		90	75-125			
Barium	98.7	1.0	"	100		99	75-125			
Beryllium	2.16	0.50	"	2.50		86	75-125			
Cadmium	2.18	0.50	"	2.50		87	75-125			
Cobalt	21.8	1.0	"	25.0		87	75-125			
Chromium	8.56	1.0	"	10.0		86	75-125			
Copper	11.9	1.0	"	12.5		95	75-125			
Lead	20.7	2.5	"	25.0		83	75-125			
Molybdenum	22.5	1.0	"	25.0		90	75-125			
Nickel	21.8	1.0	"	25.0		87	75-125			
Silver	1.51	0.50	"	1.50		100	75-125			
Vanadium	22.8	1.0	"	25.0		91	75-125			
Zinc	21.1	1.0	"	25.0		84	75-125			
LCS Dup (CT00645-BSD1)				Prepared: 02/01/10 Analyzed: 02/03/10						
Antimony	22.3	2.5	mg/kg	25.0		89	75-125	0.4	25	
Barium	98.4	1.0	"	100		98	75-125	0.3	25	
Beryllium	2.16	0.50	"	2.50		86	75-125	0	25	
Cadmium	2.33	0.50	"	2.50		93	75-125	7	25	
Cobalt	21.8	1.0	"	25.0		87	75-125	0.3	25	
Chromium	8.92	1.0	"	10.0		89	75-125	4	25	
Copper	12.0	1.0	"	12.5		96	75-125	0.2	25	
Lead	21.2	2.5	"	25.0		85	75-125	3	25	

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CAM 17 Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT00645 - EPA 3050B										
LCS Dup (CT00645-BSD1)				Prepared: 02/01/10 Analyzed: 02/03/10						
Molybdenum	22.8	1.0	mg/kg	25.0		91	75-125	1	25	
Nickel	21.7	1.0	"	25.0		87	75-125	0.6	25	
Silver	1.48	0.50	"	1.50		98	75-125	2	25	
Vanadium	22.9	1.0	"	25.0		91	75-125	0.4	25	
Zinc	21.0	1.0	"	25.0		84	75-125	0.5	25	
Matrix Spike (CT00645-MS1)		**Source: CTA0949-01**		Prepared: 02/01/10 Analyzed: 02/03/10						
Antimony	7.21	2.5	mg/kg	25.0	ND	29	75-125			QM-5
Barium	217	1.0	"	100	151	66	75-125			QM-5
Beryllium	2.45	0.50	"	2.50	0.226	89	75-125			
Cadmium	2.35	0.50	"	2.50	0.155	88	75-125			
Cobalt	30.9	1.0	"	25.0	13.8	68	75-125			QM-5
Chromium	45.4	1.0	"	10.0	31.3	141	75-125			QM-5
Copper	43.2	1.0	"	12.5	32.8	83	75-125			
Lead	34.1	2.5	"	25.0	12.8	85	75-125			
Molybdenum	19.3	1.0	"	25.0	1.70	70	75-125			QM-5
Nickel	51.5	1.0	"	25.0	34.6	67	75-125			QM-4X
Silver	2.19	0.50	"	1.50	0.585	107	75-125			
Vanadium	72.3	1.0	"	25.0	53.8	74	75-125			QM-5
Zinc	57.2	1.0	"	25.0	37.9	77	75-125			
Matrix Spike Dup (CT00645-MSD1)		**Source: CTA0949-01**		Prepared: 02/01/10 Analyzed: 02/03/10						
Antimony	7.85	2.5	mg/kg	25.0	ND	31	75-125	8	30	QM-5
Barium	216	1.0	"	100	151	65	75-125	0.7	30	QM-5
Beryllium	2.48	0.50	"	2.50	0.226	90	75-125	1	30	
Cadmium	2.37	0.50	"	2.50	0.155	88	75-125	0.6	30	
Cobalt	30.9	1.0	"	25.0	13.8	68	75-125	0.06	30	QM-5
Chromium	56.1	1.0	"	10.0	31.3	248	75-125	21	30	QM-5
Copper	42.8	1.0	"	12.5	32.8	80	75-125	0.9	30	
Lead	34.8	2.5	"	25.0	12.8	88	75-125	2	30	
Molybdenum	19.7	1.0	"	25.0	1.70	72	75-125	2	30	QM-5
Nickel	52.5	1.0	"	25.0	34.6	71	75-125	2	30	QM-4X

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CAM 17 Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT00645 - EPA 3050B										
Matrix Spike Dup (CT00645-MSD1)		**Source: CTA0949-01**		Prepared: 02/01/10 Analyzed: 02/03/10						
Silver	2.16	0.50	mg/kg	1.50	0.585	105	75-125	2	30	
Vanadium	77.8	1.0	"	25.0	53.8	96	75-125	7	30	
Zinc	58.7	1.0	"	25.0	37.9	83	75-125	3	30	
Batch CT00747 - EPA 7471A										
Blank (CT00747-BLK1)				Prepared & Analyzed: 02/04/10						
Mercury	ND	0.10	mg/kg							
LCS (CT00747-BS1)				Prepared & Analyzed: 02/04/10						
Mercury	0.284	0.10	mg/kg	0.250		114	75-125			
LCS Dup (CT00747-BSD1)				Prepared & Analyzed: 02/04/10						
Mercury	0.246	0.10	mg/kg	0.250		98	75-125	15	25	
Matrix Spike (CT00747-MS1)		**Source: CTA0949-01**		Prepared & Analyzed: 02/04/10						
Mercury	0.339	0.10	mg/kg	0.250	0.109	92	75-125			
Matrix Spike Dup (CT00747-MSD1)		**Source: CTA0949-01**		Prepared & Analyzed: 02/04/10						
Mercury	0.413	0.10	mg/kg	0.250	0.109	122	75-125	20	25	

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Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT00705 - LUFT-DHS GCNV										
Blank (CT00705-BLK1)				Prepared & Analyzed: 02/03/10						
Diesel	ND	1.0	mg/kg							
Motor Oil	ND	1.0	"							
Surrogate: o-Terphenyl	*0.411*		"	*0.500*		*82*	*65-135*			
LCS (CT00705-BS1)				Prepared & Analyzed: 02/03/10						
Diesel	46.4	1.0	mg/kg	50.0		93	65-135			
Surrogate: o-Terphenyl	*0.399*		"	*0.500*		*80*	*65-135*			
LCS Dup (CT00705-BSD1)				Prepared & Analyzed: 02/03/10						
Diesel	53.9	1.0	mg/kg	50.0		108	65-135	15	30	
Surrogate: o-Terphenyl	*0.435*		"	*0.500*		*87*	*65-135*			

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COC #: 97842

Organochlorine Pesticides by EPA Method 8081A - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT00649 - LUFT-DHS GCNV										
Blank (CT00649-BLK1)				Prepared: 02/01/10 Analyzed: 02/02/10						
Aldrin	ND	1.0	µg/kg							
alpha-BHC	ND	2.0	"							
beta-BHC	ND	10	"							
delta-BHC	ND	10	"							
gamma-BHC (Lindane)	ND	10	"							
Chlordane-technical	ND	20	"							
4,4'-DDD	ND	15	"							
4,4'-DDE	ND	15	"							
4,4'-DDT	ND	15	"							
Dieldrin	ND	1.0	"							
Endosulfan I	ND	15	"							
Endosulfan II	ND	15	"							
Endosulfan sulfate	ND	15	"							
Endrin	ND	15	"							
Endrin aldehyde	ND	15	"							
Heptachlor	ND	5.0	"							
Heptachlor epoxide	ND	2.0	"							
Methoxychlor	ND	15	"							
Mirex	ND	10	"							
Toxaphene	ND	20	"							
Surrogate: Tetrachloro-meta-xylene	*6.07*		"	*8.33*		*73*	*46-139*			
Surrogate: Decachlorobiphenyl	*6.65*		"	*8.33*		*80*	*52-141*			
LCS (CT00649-BS1)				Prepared: 02/01/10 Analyzed: 02/02/10						
Aldrin	12.8	1.0	µg/kg	16.7		77	47-132			
gamma-BHC (Lindane)	12.1	10	"	16.7		73	56-133			
4,4'-DDT	13.4	15	"	16.7		81	46-137			
Dieldrin	13.7	1.0	"	16.7		82	44-143			
Endrin	15.7	15	"	16.7		94	30-147			
Heptachlor	12.9	5.0	"	16.7		77	33-148			
Surrogate: Tetrachloro-meta-xylene	*6.16*		"	*8.33*		*74*	*46-139*			

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Organochlorine Pesticides by EPA Method 8081A - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT00649 - LUFT-DHS GCNV										
LCS (CT00649-BS1)				Prepared: 02/01/10 Analyzed: 02/02/10						
Surrogate: Decachlorobiphenyl	*7.01*		*µg/kg*	*8.33*		*84*	*52-141*			
LCS Dup (CT00649-BSD1)				Prepared: 02/01/10 Analyzed: 02/02/10						
Aldrin	12.7	1.0	µg/kg	16.7		76	47-132	1	30	
gamma-BHC (Lindane)	12.0	10	"	16.7		72	56-133	1	30	
4,4'-DDT	14.3	15	"	16.7		86	46-137	6	30	
Dieldrin	13.9	1.0	"	16.7		84	44-143	2	30	
Endrin	16.2	15	"	16.7		97	30-147	3	30	
Heptachlor	12.6	5.0	"	16.7		76	33-148	2	30	
Surrogate: Tetrachloro-meta-xylene	*5.09*		*"*	*8.33*		*61*	*46-139*			
Surrogate: Decachlorobiphenyl	*6.34*		*"*	*8.33*		*76*	*52-141*			
Matrix Spike (CT00649-MS1)		**Source: CTA0949-03**		Prepared: 02/01/10 Analyzed: 02/02/10						
Aldrin	13.7	10	µg/kg	16.7	ND	82	47-138			
gamma-BHC (Lindane)	13.8	100	"	16.7	ND	83	38-144			
4,4'-DDT	13.8	150	"	16.7	ND	83	41-157			
Dieldrin	14.5	10	"	16.7	ND	87	46-155			
Endrin	16.4	150	"	16.7	ND	98	34-149			
Heptachlor	13.8	50	"	16.7	ND	83	36-155			
Surrogate: Tetrachloro-meta-xylene	*9.18*		*"*	*20.8*		*44*	*46-139*			*QS-4*
Surrogate: Decachlorobiphenyl	*17.9*		*"*	*20.8*		*86*	*52-141*			
Matrix Spike Dup (CT00649-MSD1)		**Source: CTA0949-03**		Prepared: 02/01/10 Analyzed: 02/02/10						
Aldrin	12.6	10	µg/kg	16.7	ND	76	47-138	8	35	
gamma-BHC (Lindane)	13.0	100	"	16.7	ND	78	38-144	6	35	
4,4'-DDT	12.0	150	"	16.7	ND	72	41-157	13	35	
Dieldrin	13.0	10	"	16.7	ND	78	46-155	11	35	
Endrin	15.4	150	"	16.7	ND	92	34-149	7	35	
Heptachlor	12.8	50	"	16.7	ND	77	36-155	8	35	
Surrogate: Tetrachloro-meta-xylene	*8.36*		*"*	*20.8*		*40*	*46-139*			*QS-4*
Surrogate: Decachlorobiphenyl	*15.3*		*"*	*20.8*		*73*	*52-141*			

Geocon Consultants
3160 Gold Valley Dr. Suite #800
Rancho Cordova, CA 95742

Project: Clover Valley Reservoir
Project Number: S9455-06-01
Project Manager: Jeremy Zorne

CLS Work Order #: CTA0949
COC #: 97842

Organophosphorus Pesticides by EPA Method 8141A - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT00650 - LUFT-DHS GCNV										
Blank (CT00650-BLK1)				Prepared: 02/01/10 Analyzed: 02/04/10						
Bolstar	ND	2.0	µg/kg							
Chlorpyrifos	ND	2.0	"							
Coumaphos	ND	5.0	"							
Demeton	ND	5.0	"							
Diazinon	ND	2.0	"							
Dichlorvos	ND	5.0	"							
Disulfoton	ND	2.0	"							
Ethoprop	ND	2.0	"							
Fensulfothion	ND	2.0	"							
Fenthion	ND	2.0	"							
Guthion	ND	5.0	"							
Malathion	ND	2.0	"							
Merphos	ND	2.0	"							
Methyl parathion	ND	2.0	"							
Mevinphos	ND	2.0	"							
Phorate	ND	2.0	"							
Prothiofos	ND	2.0	"							
Ronnel	ND	2.0	"							
Stirophos	ND	2.0	"							
Trichloronate	ND	2.0	"							
Surrogate: EPN	*44.2*		"	*83.3*		*53*	*50-150*			
LCS (CT00650-BS1)				Prepared: 02/01/10 Analyzed: 02/04/10						
Methyl parathion	5.03	2.0	µg/kg	8.33		60	50-150			
Ronnel	5.12	2.0	"	8.33		61	50-150			
Stirophos	6.06	2.0	"	8.33		73	50-150			
Trichloronate	6.87	2.0	"	8.33		82	50-150			
Surrogate: EPN	*44.8*		"	*83.3*		*54*	*50-150*			

Geocon Consultants	Project: Clover Valley Reservoir	
3160 Gold Valley Dr. Suite #800	Project Number: S9455-06-01	**CLS Work Order #: CTA0949**
Rancho Cordova, CA 95742	Project Manager: Jeremy Zorne	COC #: 97842

Organophosphorus Pesticides by EPA Method 8141A - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT00650 - LUFT-DHS GCNV										
LCS Dup (CT00650-BSD1)				Prepared: 02/01/10 Analyzed: 02/04/10						
Methyl parathion	4.26	2.0	µg/kg	8.33		51	50-150	17	30	
Ronnel	4.88	2.0	"	8.33		59	50-150	5	30	
Stirophos	4.21	2.0	"	8.33		50	50-150	36	30	QR-2
Trichloronate	4.51	2.0	"	8.33		54	50-150	41	30	QR-2
Surrogate: EPN	*47.4*		"	*83.3*		*57*	*50-150*			
Matrix Spike (CT00650-MS1)		**Source: CTA0949-04**		Prepared: 02/01/10 Analyzed: 02/04/10						
Methyl parathion	2.79	2.0	µg/kg	8.33	ND	33	50-150			QM-5
Ronnel	4.30	2.0	"	8.33	ND	52	50-150			
Stirophos	2.62	2.0	"	8.33	ND	31	50-150			QM-5
Trichloronate	2.76	2.0	"	8.33	ND	33	50-150			QM-5
Surrogate: EPN	*24.0*		"	*83.3*		*29*	*50-150*			*QM-5*
Matrix Spike Dup (CT00650-MSD1)		**Source: CTA0949-04**		Prepared: 02/01/10 Analyzed: 02/04/10						
Methyl parathion	2.54	2.0	µg/kg	8.33	ND	30	50-150	9	30	QM-5
Ronnel	4.41	2.0	"	8.33	ND	53	50-150	2	30	
Stirophos	2.65	2.0	"	8.33	ND	32	50-150	1	30	QM-5
Trichloronate	2.40	2.0	"	8.33	ND	29	50-150	14	30	QM-5
Surrogate: EPN	*25.9*		"	*83.3*		*31*	*50-150*			*QM-5*

Geocon Consultants
3160 Gold Valley Dr. Suite #800
Rancho Cordova, CA 95742

Project: Clover Valley Reservoir
Project Number: S9455-06-01
Project Manager: Jeremy Zorne

CLS Work Order #: CTA0949
COC #: 97842

TPH-Gasoline by GC FID - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT00700 - EPA 5030 Soil GC										
Blank (CT00700-BLK1)				Prepared & Analyzed: 02/03/10						
Gasoline	ND	1.0	mg/kg							
Surrogate: o-Chlorotoluene (Gas)	*0.0756*		"	*0.100*		*76*	*65-135*			
LCS (CT00700-BS1)				Prepared & Analyzed: 02/03/10						
Gasoline	2.64	1.0	mg/kg	2.50		105	65-135			
Surrogate: o-Chlorotoluene (Gas)	*0.0951*		"	*0.100*		*95*	*65-135*			
LCS Dup (CT00700-BSD1)				Prepared & Analyzed: 02/03/10						
Gasoline	2.39	1.0	mg/kg	2.50		96	65-135	10	30	
Surrogate: o-Chlorotoluene (Gas)	*0.0898*		"	*0.100*		*90*	*65-135*			
Matrix Spike (CT00700-MS1)		**Source: CTA0949-04**		Prepared & Analyzed: 02/03/10						
Gasoline	2.68	1.0	mg/kg	2.50	0.0857	104	63-124			
Surrogate: o-Chlorotoluene (Gas)	*0.0943*		"	*0.100*		*94*	*65-135*			
Matrix Spike Dup (CT00700-MSD1)		**Source: CTA0949-04**		Prepared & Analyzed: 02/03/10						
Gasoline	2.56	1.0	mg/kg	2.50	0.0857	99	63-124	5	35	
Surrogate: o-Chlorotoluene (Gas)	*0.0895*		"	*0.100*		*89*	*65-135*			

Geocon Consultants	Project: Clover Valley Reservoir	
3160 Gold Valley Dr. Suite #800	Project Number: S9455-06-01	**CLS Work Order #: CTA0949**
Rancho Cordova, CA 95742	Project Manager: Jeremy Zorne	COC #: 97842

Notes and Definitions

QS-HI	Surrogate recovery was greater than the upper control limit. A reanalysis was not performed since the analytes associated with the surrogate were not detected.
QS-4	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QR-2	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
QM-5	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

February 22, 2010

CLS Work Order #: CTB0590
COC #: 97842

Jeremy Zorne
Geocon Consultants
3160 Gold Valley Dr. Suite #800
Rancho Cordova, CA 95742

Project Name: Clover Valley Reservoir

Enclosed are the results of analyses for samples received by the laboratory on 02/15/10 10:06. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

Geocon Consultants	Project: Clover Valley Reservoir	
3160 Gold Valley Dr. Suite #800	Project Number: S9455-06-01	**CLS Work Order #: CTB0590**
Rancho Cordova, CA 95742	Project Manager: Jeremy Zorne	COC #: 97842

CHANGE OF STATUS

CLS Labs Job # CT20949 CTB 0590

Project Name: Clover Valley

Date Sample(s) Were Received: 1/29 **Original Date** 2/1-

Jeremy Zorne (Client Contacted) of Geocon (Company) called

on 2/12/10 (Date) at — (Time),

... and requested the following:

please re-digest & re-run VC3 (#3) for total As.

Turnaround time requested for additional work: 5 day

(Signature) 2/15/10 (Date)

Updated lab job database and file folder by:

Cc:

H:\Will\Zellana\ChangeOfStatus.Doc

CALIFORNIA LABORATORY SERVICES

02/22/10 10:21

Geocon Consultants	Project: Clover Valley Reservoir	
3160 Gold Valley Dr. Suite #800	Project Number: S9455-06-01	**CLS Work Order #: CTB0590**
Rancho Cordova, CA 95742	Project Manager: Jeremy Zorne	COC #: 97842

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VC3 (CTB0590-03) Soil Sampled: 01/28/10 13:20 Received: 02/15/10 10:06									
Arsenic	**4.1**	1.0	mg/kg	10	CT01130	02/18/10	02/18/10	EPA 6020	

Geocon Consultants
3160 Gold Valley Dr. Suite #800
Rancho Cordova, CA 95742

Project: Clover Valley Reservoir
Project Number: S9455-06-01
Project Manager: Jeremy Zorne

CLS Work Order #: CTB0590
COC #: 97842

Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT01130 - EPA 3050B										
Blank (CT01130-BLK1)				Prepared & Analyzed: 02/18/10						
Arsenic	ND	0.10	mg/kg							
LCS (CT01130-BS1)				Prepared & Analyzed: 02/18/10						
Arsenic	8.92	0.10	mg/kg	10.0		89	75-125			
LCS Dup (CT01130-BSD1)				Prepared & Analyzed: 02/18/10						
Arsenic	8.50	0.10	mg/kg	10.0		85	75-125	5	25	
Matrix Spike (CT01130-MS1)		Source: CTB0685-06		Prepared & Analyzed: 02/18/10						
Arsenic	22.8	1.0	mg/kg	10.0	13.2	96	75-125			
Matrix Spike Dup (CT01130-MSD1)		Source: CTB0685-06		Prepared & Analyzed: 02/18/10						
Arsenic	23.4	1.0	mg/kg	10.0	13.2	102	75-125	3	30	

CALIFORNIA LABORATORY SERVICES

02/22/10 10:21

Geocon Consultants	Project: Clover Valley Reservoir	
3160 Gold Valley Dr. Suite #800	Project Number: S9455-06-01	**CLS Work Order #: CTB0590**
Rancho Cordova, CA 95742	Project Manager: Jeremy Zorne	COC #: 97842

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Clover Valley Reservoir Remotely Operated Vehicle (ROV) Underwater Investigation

Clover Valley Reservoir
Remotely Operated Vehicle (ROV) Underwater Investigation
Daily Job Report

Above & Below the H_2O a remotely operated vehicle (ROV) service provider and operator was contacted by Steve Anisworth from *Bennett Engineering* to conduct an underwater investigation of the outlet gate structure and to locate a concrete culvert located in the Clover Valley Reservoir. The Clover Valley Reservoir is owned and operated by the *Placer County Water Agency (PCWA).*

January 19, 2010: *Above & Below the H_2O* ROV team met Steve Ainsworth at 7:30am and then drove to the access gate. The weather for the day was strong winds and rain. A blown down tree across the access road required a detour to the reservoir. Once at the site and a check of the reservoir water clarity and weather conditions it was decided to cancel the operation for the day and we would return when the weather and water have cleared. The client was billed the standard Stand Down or No Work Order rate of $750.00

February 11, 2010: *Above & Below the H_2O* ROV team was to meet Steve Ainsworth at 7:30am, but to do to weather and water conditions the days effort was canceled again. Because we were notified before we left the office we did not charge mobilization or stand down charges. $00.00

March 18, 2010: *Above & Below the H_2O* ROV team met Steve Ainsworth at 7:30am at the access gate and drove to the reservoir. While our team set up for the investigation, both Steve Ainsworth and Richard Faulk conducted a site survey and reviewed the photographs and site maps to establish a general location for the culvert. We were joined by a second engineer Stacey Bennett from *Bennett Engineering* that was also working on this project and wanted to view the underwater footage on site. 8:30am we started the investigation on the Dam where the actuator shaft was exposed. The ROV followed the shaft down to a wooden outlet structure. The ROV moved around the structure and it was agreed that the condition of the wood was fair and intact. We then moved to the east side of the reservoir where we observed a wooden post on the side of the reservoir and a growth of reeds that were present in one section of the reservoir and also in the standing water on the other side of the rail road tracks. Using a grid pattern for our search of the culvert we were able to locate the concrete structure. Using the photos from a similar culvert we determined that this was what they were looking for. We were able to penetrate the culvert for approximately 10 feet before the sediment and debris block any further forward movement. The required tasks were completed within the half day rate of $1,250.00 for three hours or less on site. All the ROV underwater video footage was captured to a DVD format and given to Steve Ainsworth on site. The fees for our services have been paid in full.

This job log was written by Richard Faulk the owner of *Above & Below the H_2O* and the ROV pilot who conducted the investigation at the reservoir.

Preliminary Delineation of Wetland and Other Water Bodies for the Clover Valley Reservoir Desilting and Supply Pipeline Project

PRELIMINARY DELINEATION OF WETLANDS AND OTHER WATER BODIES FOR THE CLOVER VALLEY RESERVOIR DESILTING AND SUPPLY PIPELINE PROJECT

PREPARED FOR:

Placer County Water Agency
144 Ferguson Road
Auburn, CA 95604
Contact: Heather Trejo
530.823.4905

PREPARED BY:

ICF International
630 K Street, Suite 400
Sacramento, CA 95814
Contact: Sue Bushnell
916.737.3000

June 2010

ICF
INTERNATIONAL

ICF International. 2010. *Preliminary Delineation of Wetlands and Other Water Bodies for the Clover Valley Reservoir Desilting and Supply Pipeline Project.* June. (ICF 00271.10). Sacramento, CA. Prepared for: Placer County Water Agency, Auburn, CA.

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Acronyms and Abbreviations

CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
GPS	global positioning system
OHWM	ordinary high water mark
PCWA	Placer County Water Agency
proposed project	Clover Valley Reservoir Desilting and Supply Pipeline Project
RGL	Regulatory Guidance Letter
Western Mountains Supplement	Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region

Preliminary Delineation of Wetlands and Other Water Bodies for the Clover Valley Reservoir Desilting and Supply Pipeline Project

Summary

This report presents the results of a preliminary delineation of wetlands and other water bodies conducted for the proposed Clover Valley Reservoir Desilting and Supply Pipeline Project (proposed project) in Placer County, California. The delineation was conducted to assist the Placer County Water Agency (PCWA) in determining the type and extent of wetlands and other water bodies in the delineation study area that may be waters of the United States and subject to regulation by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act (CWA).

Wetlands and other water bodies were delineated using the routine onsite determination method described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and, where applicable, the criteria specified in the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (U.S. Army Corps of Engineers 2008). Data were gathered during a field survey on March 29, 2010.

The delineation study area encompasses 18.123 acres and includes all areas that could be directly or indirectly disturbed during implementation of the proposed project, including the Clover Valley Reservoir, adjoining slopes, and an area at the toe of the reservoir dam; Clover Valley Creek; the Antelope Canal; staging/laydown areas; and spoils disposal areas.

Based on the data gathered during the field survey, the delineation study area contains 3.814 acres of wetlands and other water bodies. Jurisdictional area types include freshwater marsh, seasonal wetland, pond/reservoir, ephemeral stream, perennial stream (Clover Valley Creek), and irrigation ditch (Antelope Canal). The combined acreage of the wetlands and other water bodies is shown in Table 1.

Table 1. Summary of Wetlands and Other Water Bodies

Feature	Acreage
Freshwater Marsh (FWM)	0.495
Seasonal Wetland (SW)	0.014
Pond/Reservoir (Pond)	3.057
Perennial Stream (Clover Valley Creek) (PS)	0.084
Ephemeral Stream (ES)	0.015
Irrigation Ditch (Antelope Canal) (ID)	0.149
Total	**3.814**

A description of the wetland and other water body features mapped in the delineation study area is provided in the *Results* section of this report, and their locations are shown on Figure 2. All

jurisdictional area boundaries presented in this report are preliminary and subject to verification by the Corps Sacramento District.

Introduction

This report presents the results of ICF International's preliminary delineation of wetlands and other water bodies conducted for the proposed project in Placer County, California (Figure 1). The project consists of the desiltation of the Clover Valley Reservoir spillway, outlet improvements below the reservoir dam on Clover Valley Creek, installation of a supply line from the Antelope Canal to the reservoir, and installation of a temporary bypass pipeline through the reservoir. Associated with the desiltation component of the project will be the disposal of dredged material at an upland site within the delineation study area.

The project applicant is the Placer County Water Agency. The contact person for the project applicant is as follows:

Heather Trejo
Environmental Specialist
Placer County Water Agency
144 Ferguson Road
Auburn, CA 95604
Direct: (530) 823-4905
Cell: (530) 308-4821

Site Location and Driving Directions

The delineation study area is located in southwestern Placer County, California, approximately 1.5 miles northwest of Penryn. Figure 1 shows the location of the delineation study area and its relationship to the surrounding towns and highways.

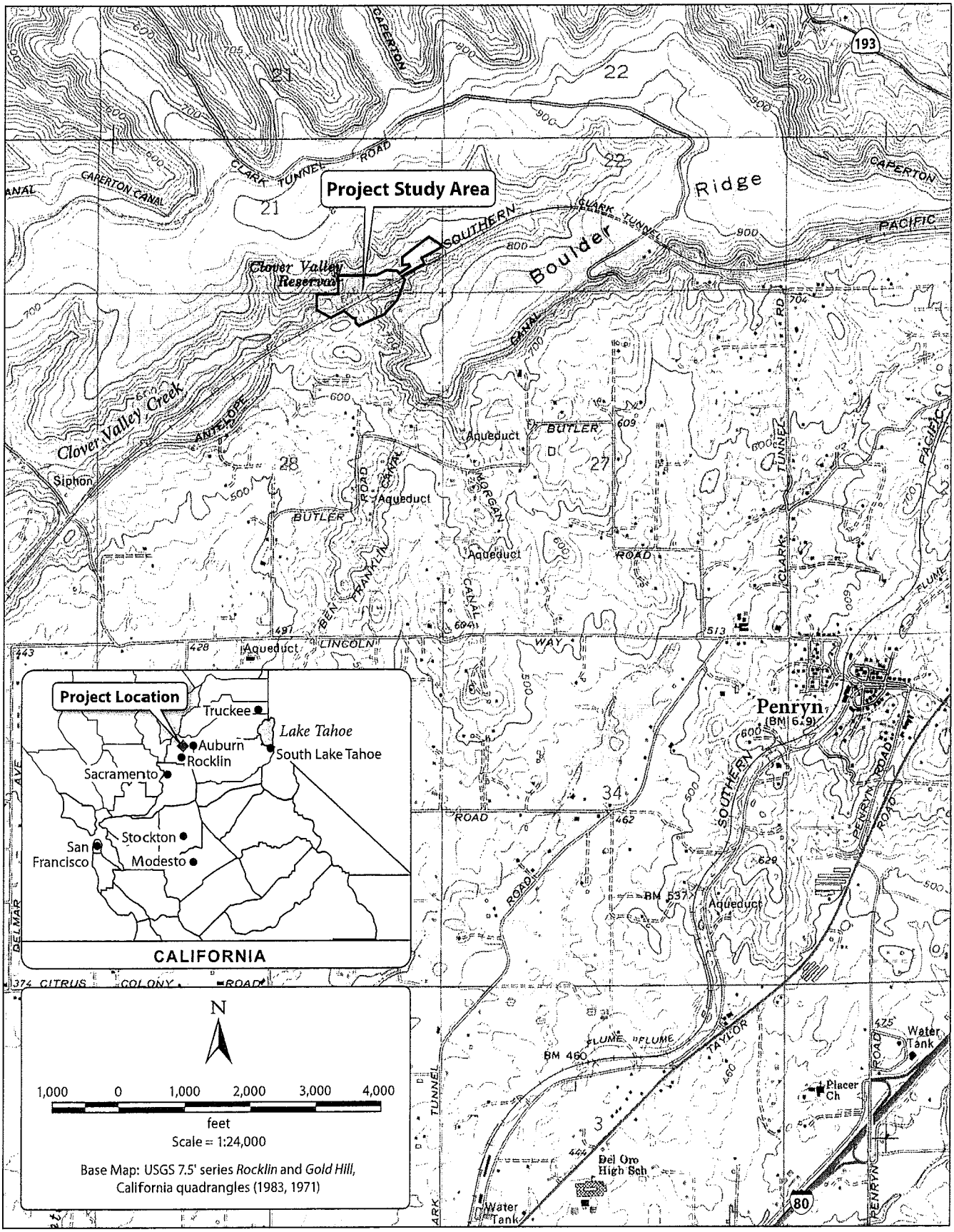
The delineation study area is located on the Rocklin U.S. Geological Survey 7.5-minute quadrangle. The center of the delineation study area is approximately at 38.86927° north latitude and 121.19549° west longitude.

To reach the dirt access road to the delineation study area from downtown Sacramento, travel east on Interstate 80. Take the Sierra College Boulevard exit and proceed north on Sierra College Boulevard. After approximately 3.5 miles, turn right onto English Colony Way. Continue on English Colony Way approximately 1/3 mile, then turn left through the gate to the access road. The access road gate is approximately 150 feet east of the Union Pacific Railroad tracks.

Site Description

General

The 18.123-acre delineation study area is situated in a canyon-like area that is bisected by the Union Pacific Railroad.



ICF INTERNATIONAL

Figure 1
Project Location

Elevations in the delineation study area range from approximately 620 feet below the Clover Valley Reservoir dam to approximately 705 feet at the eastern corner. Slopes range from nearly level to approximately 100 percent along parts of the railroad embankment.

In the past, parts of the delineation study area were disturbed as a result of railroad and dam construction. Cut and fill slopes and possibly borrow areas are evident along the railroad corridor.

Hydrology

The delineation study area is located in the Upper Coon-Upper Auburn hydrologic unit (HUC 18020127) (U.S. Geological Survey 2007).

Clover Valley Creek flows in a southwesterly direction through the delineation study area beginning at the dam of Clover Valley Reservoir. The creek and reservoir also receive flow inputs from three small, unnamed tributaries on the southeastern side of the delineation study area, which pass under the railroad embankment in culverts.

The Antelope Canal enters the delineation study area in the southeastern part and discharges into the Clover Valley Reservoir (Figure 2). The canal is lined for its first (upstream) 300 feet within the delineation study area. The remainder is unlined, with the section between the lined part and the Union Pacific Railroad tracks being deeply incised.

No evidence of "leaky ditch" wetlands (U.S. Army Corps of Engineers 2004), which are caused by seepage of water from canals and ditches, were observed during the delineation field survey.

From the delineation study area, Clover Valley Creek flows southwesterly then southerly approximately eight stream-miles into Antelope Creek. Antelope Creek flows southerly into Dry Creek near Roseville, which in turn flows into Steelhead Creek (also known as the Natomas East Main Drainage Canal) in Sacramento County. Steelhead Creek flows south and then west into the Sacramento River. The Sacramento River is considered a navigable water by the Corps (2010).

Soils

The U.S. Department of Agriculture, Soil Conservation Service (Rogers 1980) has mapped the delineation study area as being underlain by Auburn and Exchequer series soils. The Auburn soils have coarse sandy loam surface layers and subsoils that are underlain by weathered granitic rocks. The Exchequer soil is a very stony loam that is underlain by hard andesitic breccia. Rock outcrops also occur in the map unit. Other salient characteristics of the soil map units are summarized in Table 2.

Table 2. Summary of Characteristics of the Soils in the Delineation Area

Soil Map Symbol	Soil Map Unit Name	Landform	Natural Drainage Class	Hydric Status of Primary Component and Inclusions of Map Unit*
107	Andregg coarse sandy loam, 9 to 15 percent slopes	Low hills	Well	Primary component: non-hydric Inclusions: non-hydric
111	Andregg coarse sandy loam, rocky, 30 to 50 percent slopes	Foothills	Well	Primary component: non-hydric Inclusions: non-hydric
145	Exchequer-Rock outcrop complex, 2 to 30 percent slopes	Broad volcanic ridges and side slopes	Somewhat excessive	Primary component: non-hydric Inclusions: non-hydric and hydric (unnamed, in drainageways and depressions)

Source: Rogers 1980; Soil Conservation Service 1992; Soil Survey Staff 2010.

* "Primary Component" refers to the soil that makes up approximately 85% or more of the map unit. The remaining soils in the map unit are inclusions.

A map of the soils in the delineation study area and associated hydric soil information are provided in Appendix A.

Precipitation and Growing Season

The climate in the delineation study area is characterized by hot, dry summers and cool, moist winters. National Weather Service cooperative weather station number CA 0383 (Auburn) is the closest weather station to the delineation study area, located approximately five miles to the northeast. Average annual precipitation at this weather station is 41.8 inches, with most falling as rain between the months of November and March (U.S. Department of Agriculture, Natural Resources Conservation Service 2010) (See WETS tables in Appendix B). However, Rogers (1980) shows the average annual rainfall in the vicinity of the delineation study area in particular to be approximately 31 inches.

As of the date of the delineation field survey on March 29, 2010, rainfall for the July 1, 2009–June 30, 2010 precipitation year was roughly 100% of the average in the region.

The length of the growing season at the Auburn weather station in 5 years out of 10 at 28 degrees air temperature averages 365 days (Natural Resources Conservation Service 2010).

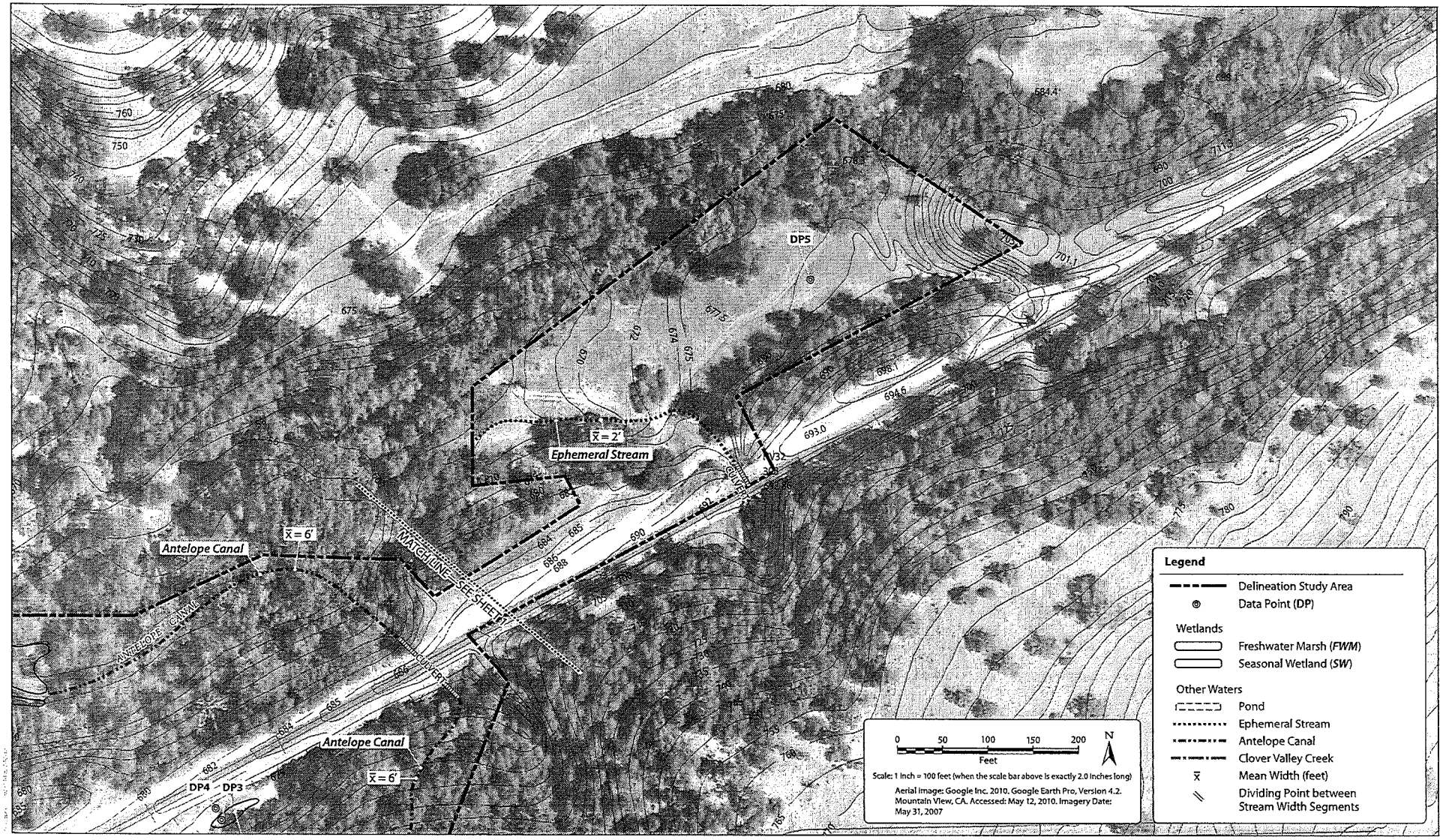
Vegetation

The delineation study area is within the Northern Sierra Nevada Foothills subregion of the Sierra Nevada region in the California Floristic Province (Hickman 1993).

In addition to the aquatic habitats described in the *Results* section below, the delineation study area also supports chaparral, interior live oak woodland, willow riparian, annual grassland, and ruderal habitats.

ICF INTERNATIONAL

Figure 2a
Wetland Delineation Map
Sheet 1 of 2



ICF INTERNATIONAL

Figure 2b
Wetland Delineation Map
Sheet 2 of 2

A list of the plant species observed while conducting delineation field surveys and their wetland indicator status is provided in Appendix C. The wetland plant communities found in the delineation study area are described in the *Results* section of this report.

Methods

The fieldwork for the delineation was conducted by a soil and wetland scientist on March 29, 2010, using the routine onsite determination method described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and, where applicable, the criteria specified in the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Western Mountains Supplement)(U.S. Army Corps of Engineers 2008).

As detailed in the Western Mountains Supplement, data on vegetation, soil, and hydrology characteristics used as the basis for wetland boundary determinations were collected and recorded on Western Mountains Supplement data forms (Appendix D). Data forms were completed at nine sample plots (data points).

The wetland indicator status of each plant species was based on the *National List of Plant Species that Occur in Wetlands: California* (Reed 1988). Common and scientific plant names are taken from the *Jepson Manual of Higher Plants of California* (Hickman 1993), supplemented by the Jepson Online Interchange for California Floristics (University of California 2007).

The boundaries of non-wetland water bodies (i.e., other water bodies) were mapped at the ordinary high water mark (OHWM), as defined in Title 33, section 328.3 of the Code of Federal Regulations (CFR). The OHWM represents the limit of potential Corps jurisdiction over nontidal waters (e.g., irrigation ditches, canals, and natural streams) in the absence of adjacent wetlands (*33 CFR 328.04*). The features were identified in accordance with Corps Regulatory Guidance Letter (RGL) No. 05-05 (U.S. Army Corps of Engineers 2005).

A Trimble GeoXT global positioning system (GPS) receiver, typically accurate to less than one horizontal meter, was used to record the location of the data points and certain jurisdictional area boundaries. However, where the GPS satellite geometry was insufficient or physical access to the boundary was poor, the features were mapped directly onto a 1 inch = 50 feet scale aerial photograph/topographic base map. The GPS data were plotted and overlain to the aerial photograph/topographic base map to generate the delineation map at a scale of 1 inch = 100 feet.

The resulting delineation map and this report were prepared in accordance with U.S. Army Corps of Engineers Sacramento District guidelines (U.S. Army Corps of Engineers 2001).

Results

Table 3 provides the total acreage of wetlands and other water bodies delineated in the delineation study area.

Table 3. Acreage of Wetlands and Other Water Bodies

Feature	Acreage
Wetlands	
Freshwater Marsh (FWM)	0.495
Seasonal Wetland (SW)	0.014
Wetlands Subtotal	*0.509*
Other Water Bodies	
Pond/Reservoir (Pond)	3.057
Perennial Stream (Clover Valley Creek) (PS)	0.084
Ephemeral Stream (ES)	0.015
Irrigation Ditch (Antelope Canal) (ID)	0.149
Other Water Bodies Subtotal	*3.305*
Total	**3.814**

Representative photographs of select wetlands and other water bodies and of the delineation study area in general are provided in Appendix E.

Wetlands

Freshwater Marsh

Freshwater marsh habitat totaling 0.495 acre was mapped within the delineation study area (Figure 2a). The freshwater marshes occur along the upper shorelines of Clover Valley Reservoir (FWM-2, 3, and 4) and along the eastern shoreline of the smaller pond (FWM-1) in the southwestern part of the delineation study area (see discussion under Other Water Bodies below). Paired data points, DP-1 and DP-2, DP-6 and DP-7, and DP-8 and DP-9 were established in the freshwater marshes to confirm the presence of all three wetland indicators (hydrophytic vegetation, hydric soil, and wetland hydrology) used by the Corps to identify wetlands.

The mapped freshwater marshes can be divided into three vegetative subtypes within the delineation study area: cattail (*Typha* sp.) (OBL), tule (*Scirpus* sp.) (OBL), and annual bluegrass (*Poa annua*) (FACW), with the cattail and tule subtypes lying at a slightly higher elevation than the annual bluegrass subtype. Because the annual bluegrass subtype (which occurs on recently-deposited sediments in the Clover Valley Reservoir) appears to have been recently submerged, it is expected that cattails, tules, or other emergent species may establish in this subtype later in the season. Additionally, included in the mapping of the freshwater marsh wetlands along the upper fringe of the Clover Valley Reservoir are individual specimens of willow (*Salix* sp.) (FACW or OBL).

Because of annual variations in sediment deposition and scour in Clover Valley Reservoir, the arrangement and extent of the freshwater marshes, particularly areas presently dominated by annual bluegrass, are expected to change from year to year.

Wetland hydrology was documented based on saturation (A3) and surface water (A1). Hydric soil was identified by the presence of the indicator Loamy Gleyed Matrix (F2) and Hydrogen Sulfide Odor (C1).

The freshwater marshes appear to occur from just below to approximately six inches above the OHWM of the reservoir/pond.

The freshwater marshes in the Clover Valley Reservoir are primarily supported by inflows from the Antelope Canal, with lesser inputs from runoff from the watershed of the reservoir. The freshwater marsh in Pond 1 is primarily supported by runoff from the watershed of the pond.

Seasonal Wetland

One 0.014-acre seasonal wetland was mapped within the delineation study area (Figure 2a). This feature exists in a depression that appears to be a borrow area. Paired data points (DP-3 and DP-4) were established at the wetland to confirm the presence of all three wetland indicators (hydrophytic vegetation, hydric soil, and wetland hydrology) used by the Corps to identify wetlands.

Spikerush (*Eleocharis macrostachya*) (OBL) was the only dominant species identifiable at the data point located within the wetland. The other dominant species was an unidentifiable grass. Associate species were pennyroyal (*Mentha pulegium*) (OBL) and umbrella sedge (*Cyperus eragrostis*) (FACW). Wetland hydrology was documented based on the indicator Saturation (A3). Hydric soil was identified by the presence of the indicator Depleted Matrix (F3).

The seasonal wetland appears to be supported by incident precipitation and local runoff inputs into the depressional area.

Other Water Bodies

Pond/Reservoir

Two ponds (Pond 1 and Pond 2, the latter being Clover Valley Reservoir) were mapped in the delineation study area and comprise 3.057 acres. Because they are less than five percent vegetated, they qualify as other water bodies (Figure 2a).

The Clover Valley Reservoir is primarily supported by inflows from the Antelope Canal, with lesser inputs from runoff from its watershed. Pond 1 is primarily supported by runoff from its watershed.

Perennial Stream

Two segments of Clover Valley Creek were mapped below Clover Valley Reservoir dam, comprising 0.084 acre (Figure 2a). The creek is a perennial stream that carries released flows from Clover Valley Reservoir. The channels have an average width of 12 to 20 feet between OHWMs. Because the perennial stream segments are less than five percent vegetated, they qualify as other water bodies.

Ephemeral Stream

One ephemeral stream was mapped in the delineation study area, comprising 0.015 acre (Figure 2b). Because it is less than five percent vegetated, it qualifies as an other water body. This feature emerges from a box culvert under the Union Pacific Railroad tracks, and continues as a narrow and shallow channel that becomes indistinct as the flow percolates into an alluvial fan. Because the flow appears to percolate into permeable sediments, it does not appear to connect to any other wetland or other water body. The stream has an average width of two feet between OHWMs.

Irrigation Ditch

One irrigation ditch (Antelope Canal) was mapped in the delineation study area (Figures 2a and 2b). The canal is an artificially-created feature that was excavated in an upland for the purposes of conveying irrigation water. The canal lined with gunite from where it enters the southeastern part of the delineation study area to approximately 300 feet downstream. The remainder is unlined. The canal has an average width of six feet between OHWMs.

Because the canal appears to meet the definition of an "irrigation ditch" under RGL 07-02 (U.S. Army Corps of Engineers 2007), the canal would not be subject to regulation under CWA Section 404. As defined in Corps RGL 07-02, irrigation ditches include the distribution system or parts thereof, consisting of manmade canals, laterals, ditches, siphons, and pump systems. Antelope Canal is a man-made feature that conveys water to an ultimate irrigation use or place of use.

According to Section 404 (f)(1)(C) of the CWA, discharges of fill material associated with construction or maintenance of irrigation ditches are not subject to regulation. Ditch construction activities are defined in RGL 07-02 and include new work or work that result in an extension or expansion of an existing structure (including ditch relocation, ditch conversion into pipe, ditch lining, and placement of new control structures). Ditch maintenance is also defined under RGL 07-02 and includes excavation, re-shaping, bank stabilization, armoring, lining, and piping, and replacement of existing control structures.

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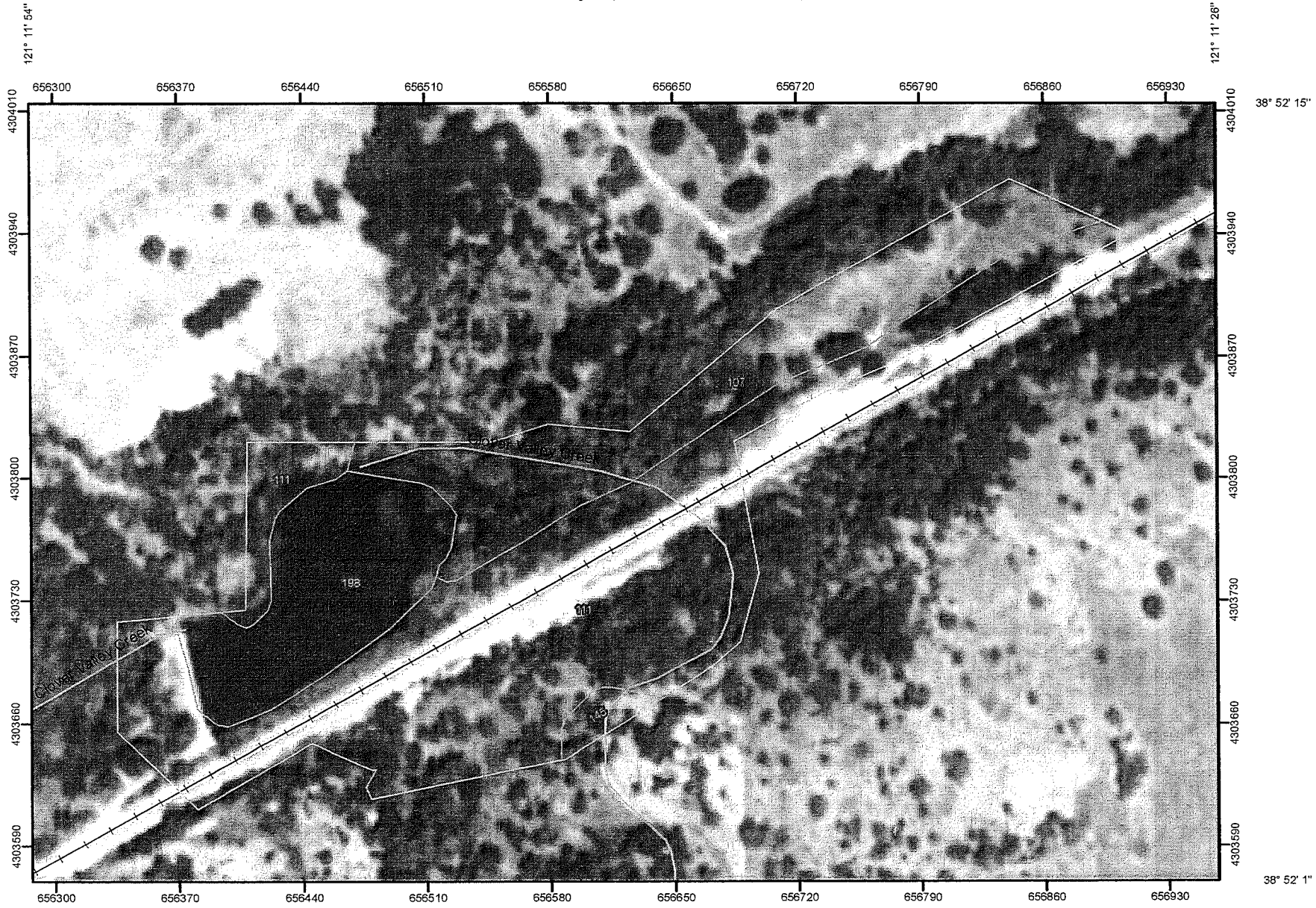
Appendix A

Map of Soils in the Delineation Study Area

Soil Map—Placer County, California, Western Part
(Soil Survey Map of Delineation Area)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:3,180 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Placer County, California, Western Part
Survey Area Data: Version 5, Dec 14, 2007

Date(s) aerial images were photographed: 6/29/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Placer County, California, Western Part (CA620)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
107	Andregg coarse sandy loam, 9 to 15 percent slopes	4.3	24.5%
111	Andregg coarse sandy loam, rocky, 30 to 50 percent slopes	10.0	57.0%
145	Exchequer-Rock outcrop complex, 2 to 30 percent slopes	0.3	1.5%
198	Water	3.0	16.9%
Totals for Area of Interest		**17.5**	**100.0%**

Hydric Soils (CA)

This table lists the map unit components and their hydric status in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2B3). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
   B. are poorly drained or very poorly drained and have either:
      i. a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
      ii. a water table at a depth of 0.5 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
      iii. a water table at a depth of 1.0 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for long or very long duration during the growing season.
4. Soils that are frequently flooded for long or very long duration during the growing season.

Hydric Condition: Food Security Act information regarding the ability to grow a commodity crop without removing woody vegetation or manipulating hydrology.

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Report—Hydric Soils (CA)

Hydric Soils (CA)– CA620 - Placer County, California, Western Part							
Map symbol and map unit name	**Component/ Local Phase**	**Hydric status**	**Landform**	**Hydric criteria met (code)**	**Farmable condition**	**Comp. pct.**	**Altered hydrology notes**
107: Andregg coarse sandy loam, 9 to 15 percent slopes	(C) - Andregg-	No	Hills	—	—	85	—
	(I) - Andregg-	No	—	—	—	0-5	—
	(I) - Caperton Coarse Sandy Loam-	No	—	—	—	0-5	—
	(I) - Sierra Sandy Loam-	No	—	—	—	0-3	—
	(I) - Unnamed-	No	—	—	—	0-2	—
111: Andregg coarse sandy loam, rocky, 30 to 50 percent slopes	(C) - Andregg-	No	Hills	—	—	85	—
	(I) - Caperton Coarse Sandy Loam-	No	—	—	—	0-10	—
	(I) - Unnamed-	No	—	—	—	0-3	—
	(I) - Sierra Sandy Loam-	No	—	—	—	0-2	—
145: Exchequer-Rock outcrop complex, 2 to 30 percent slopes	(C) - Exchequer-	No	Ridges	—	—	60	—
	(C) - Rock Outcrop-	No	—	—	—	15	—
	(I) - Inks-	No	—	—	—	0-10	—
	(I) - Unnamed-	Yes	Depressions	3	Neither wooded nor farmable under natural conditions	0-10	—
	(I) - Unnamed-	No	—	—	—	0-3	—
	(I) - Unnamed-	Yes	Drainageways	4	Neither wooded nor farmable under natural conditions	0-2	—
198: Water	(C) - Water-	No	—	—	—	100	—

Data Source Information

Soil Survey Area: Placer County, California, Western Part
Survey Area Data: Version 5, Dec 14, 2007

Appendix B

WETS Table

WETS Station : AUBURN, CA0383
Latitude: 3855 Longitude: 12105 Elevation: 01290
State FIPS/County(FIPS): 06061 County Name: Placer
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.)			Precipitation (Inches)				
					30% chance will have		avg # of days w/.1 or more	avg total snow fall
	avg daily max	avg daily min	avg	avg	less than	more than		
January	54.2	37.0	45.6	6.68	3.21	8.16	8	0.4
February	58.2	40.0	49.1	6.28	3.02	7.67	8	0.1
March	61.6	42.0	51.8	6.16	3.20	7.53	8	0.2
April	67.7	45.2	56.4	2.50	1.12	3.05	4	0.2
May	75.9	50.7	63.3	1.30	0.31	1.63	2	0.0
June	84.8	57.3	71.0	0.36	0.06	0.45	0	0.0
July	91.3	62.6	76.9	0.14	0.00	0.00	0	0.0
August	90.7	61.7	76.2	0.14	0.00	0.08	0	0.0
September	85.2	58.3	71.7	0.76	0.01	0.82	1	0.0
October	75.6	51.6	63.6	1.93	0.61	2.36	2	0.0
November	61.4	42.5	51.9	4.89	2.16	5.96	6	0.2
December	54.6	37.0	45.8	5.35	2.66	6.63	7	0.2
Annual	-----	-----	-----	------	29.12	41.82	--	----
Average	71.8	48.8	60.3	------	------	------	--	----
Total	-----	-----	-----	36.49	------	------	46	1.4

GROWING SEASON DATES

Probability	Temperature		
	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	12/29 to 12/29 > 365 days	> 365 days > 365 days	2/17 to 12/ 2 290 days
70 percent *	12/29 to 12/29 > 365 days	> 365 days > 365 days	2/ 5 to 12/13 312 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1948-2002 prcp

Station : CA0383, AUBURN
Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
48							0.00	0.00	0.00	0.22	2.74	7.47	10.43
49	2.96	3.87	11.51	0.00	0.84	0.00	0.00	0.11	0.11	0.09	2.35	2.23	24.07
50	10.61	4.82	5.88	2.39	1.33	0.21	0.00	0.00	0.91	4.23	13.92	9.67	53.97
51	9.59	4.04	4.07	1.85	3.27	0.00	0.00	0.00	0.04	3.60	6.05	10.10	42.61
52	15.56	5.11	7.81	1.12	0.55	0.67	0.05	M0.00	M0.38	0.05	3.06	9.45	43.81
53	8.82	0.07	4.23	5.58	1.06	1.28	0.00	0.00	0.00	0.81	4.66	2.43	28.94
54	6.90	4.98	7.09	3.22	0.37	0.55	0.00	0.27	0.00	0.28	3.60	9.10	36.36
55	6.59	2.71	0.62	4.60	1.06	0.03	0.00	0.00	M0.00	0.85	2.86	M18.78	38.10
56	13.78	3.96	0.18	3.03	3.41	0.03	0.00	0.00	0.67	3.68	0.06	0.97	29.77
57	4.17	6.13	5.87	2.97	5.15	0.00	0.00	0.00	1.03	1.91	2.15	4.64	34.02
58	7.67	10.54	10.22	7.22	1.18	0.88	0.00	0.00	M0.40	0.41	0.83	1.32	40.67
59	7.48	6.39	2.04	1.85	0.11	0.00	0.00	0.01	2.47	0.00	0.00	1.94	22.29
60	M6.93	8.34	4.50	2.20	0.87	0.00	0.00	0.00	0.28	0.14	6.86	1.97	32.09
61	2.50	3.33	5.06	2.21	0.71	0.39	0.00	0.04	0.31	0.68	3.10	3.38	21.71
62	3.19	13.64	3.37	1.91	0.23	0.01	0.02	0.24	0.14	13.86	1.44	4.31	42.36
63	4.11	4.82	5.81	7.70	2.25	0.04	0.00	0.00	0.34	2.76	8.77	0	

Appendix C

Plant Species Observed in the Delineation Area

Scientific Name	Common Name	Wetland Indicator Status‡
Trees		
Aesculus californica	California buckeye	NL
Alnus rhombifolia	white alder	FACW
Quercus lobata	valley oak	FAC
Quercus wislizenii	interior live oak	NL
Salix sp.	willow	OBL
Shrubs and Woody Vines		
Rubus discolor	Himalayan blackberry	FACW*
Rubus ursinus	California blackberry	FACW
Sambucus mexicana	blue elderberry	FAC
Toxicodendron diversilobum	poison-oak	UPL
Forbs		
Centaurea solstitialis	yellow star-thistle	UPL
Cirsium vulgare	bull thistle	FACU
Claytonia perfoliata	miners lettuce	FAC
Geranium dissectum	cut-leaf geranium	NL
Hypochaeris glabra	smooth cat'-s ear	NL
Lupinus sp.	lupine	undetermined
Mentha pulegium	pennyroyal	OBL
Polygonum sp.	knotweed	prob. FACW or OBL
Trifolium sp.	clover	undetermined
Vicia sativa	spring vetch	FACU
Grasses & Grass-like Plants		
Avena barbata	slender wild oat	UPL
Bromus diandrus	ripgut brome	UPL
Bromus hordeaceus [B. mollis]	soft chess	FACU-
Cyperus eragrostis	umbrella sedge	FACW
Eleocharis sp.	spikerush	FACW or OBL
Juncus balticus	Baltic rush	FACW
Lolium multiflorum [L. perenne]	Italian ryegrass	FAC
Poa annua	annual bluegrass	FACW-
Scirpus sp.	tule	UPL
Typha sp.	cattail	OBL

Notes: Wetland indicator status follows Reed (1988); nomenclature follows Reed (1988) and *The Jepson Manual* (Hickman 1993) and online updates.

* indicates that the species is not native

‡ Wetland Indicator Status for Region 0, California:

OBL (obligate)—almost always occurs in wetlands (99% probability of occurrence in wetlands).

FAC (facultative)—equally likely to occur in wetlands or nonwetlands (34–66% probability).

FACU (facultative upland)—usually occurs in nonwetlands but occasionally occurs in wetlands (1–33% probability).

FACW (facultative wetland)—usually occurs in wetlands (67–99% probability).

UPL (obligate upland)—almost never occurs in wetlands (1% probability); in general, species that are not listed on the wetland plant list are assumed to be obligate upland species.

NI (no indicator)—no indicator status assigned because regional status information is lacking; the indicator status assigned to the species in the nearest adjacent region is applied, in this case, Region 9 (Northwest).

Undetermined—cannot be assigned an indicator status because plant could not be identified to species.

A plus (+) modifier indicates more frequently found in wetlands, a minus (-) modifier indicates less frequently found in wetlands; however, although these modifiers are used in Reed (1988), **they are not used in the Regional Supplements.** For example, FAC–, FAC, and FAC+ plants are all considered to be FAC.

Appendix D

Data Forms

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Clover Valley Reservoir City/County: Penryn/Placer Sampling Date: 3-29-10
Applicant/Owner: Placer County Water Agency State: CA Sampling Point: DP1
Investigator(s): Butterworth Section, Township, Range:
Landform (hillslope, terrace, etc.): Reservoir in hilly area Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Andregg coarse sandy loam, rocky, 30 to 50% slopes (map symbol 111) NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐			
Hydric Soil Present?	Yes ☒	No ☐	**Is the Sampling Area within a Wetland?**	**Yes ☒**	**No ☐**
Wetland Hydrology Present?	Yes ☒	No ☐			

Remarks: Freshwater marsh along reservoir shoreline, mostly below OHWM.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: 5 ft)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: 5 ft)			
10. Typha sp.	70	Y	OBL
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	70	= Total Cover	
Woody Vine Stratum (Plot Size: 5 ft)			
1. Rubus discolor	10	N	FACW
2.			
	10	= Total Cover	
% Bare Ground in Herb Stratum - 30			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(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:

x Dominance Test is >50%

Prevalence Index is ≤3.0[1]

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

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:

Project Site: Clover Valley Reservoir

SOIL

Sampling Point: DP1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR4/3	100					cols	Recent overwash (see below)
10-19	10YR4/1	80	7.5YR3/2	20	C	M	sl	Abg

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ 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 MLRA 1)**
- ☐ 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)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? Yes ☒ No ☐

Remarks: Upper 10 inches appears to consist of sediment recently deposited as a result of erosion of slopes to the east.

H2S odor at approx. 10 inches. Most roots (as a "mat") are in top part of Abg horizon (buried soil). Hydric soil determination based Abg horizon and H2S odor.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ 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 MLRA 1, 2, 4A, and 4B)**
- ☐ 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 Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ 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):	13
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	9

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Surface water present 3 feet from pit.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Clover Valley Reservoir City/County: Penryn/Placer Sampling Date: 3-29-10
Applicant/Owner: Placer County Water Agency State: CA Sampling Point: DP2
Investigator(s): Butterworth Section, Township, Range:
Landform (hillslope, terrace, etc.): Hilly area Local relief (concave, convex, none): planar Slope (%): 15
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Andregg coarse sandy loam, rocky, 30-50% slopes (map symbol 111) NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☐	No ☒			
Hydric Soil Present?	Yes ☐	No ☒	**Is the Sampling Area within a Wetland?**	**Yes ☐**	**No ☒**
Wetland Hydrology Present?	Yes ☐	No ☒			

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus wislizenii	30	Y	NL
2.			
3.			
4.			
	30	= Total Cover	
Sapling/Shrub Stratum (Plot Size: 5 ft)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: 5 ft)			
10. Bromus diandrus	75	Y	NL
11. Cirsium vulgare	5	N	FACU
12. Geranium dissectum	5	N	NL
13. Claytonia perfoliata	5	N	FAC
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	90	= Total Cover	
Woody Vine Stratum (Plot Size: 5 ft)			
1. Rubus discolor	10	N	FACW
2.			
	10	= Total Cover	

% Bare Ground in Herb Stratum - 10

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

Project Site: Clover Valley Reservoir

SOIL

Sampling Point: DP2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-13	10YR3/2	100					sl	A
13-21	7.5YR3/3	100					sl	Bw

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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 MLRA 1)**
- ☐ 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)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ 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 MLRA 1, 2, 4A, and 4B)**
- ☐ 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 Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ 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):	None to 21
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	None to 21

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Clover Valley Reservoir City/County: Penryn/Placer Sampling Date: 3-29-10

Applicant/Owner: Placer County Water Agency State: CA Sampling Point: DP3

Investigator(s): Butterworth Section, Township, Range:

Landform (hillslope, terrace, etc.): Artificial depression in hilly area Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Andregg coarse sandy loam, rocky, 30-50% slopes (map symbol 111) NWI classification:

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

Are Vegetation ☐, Soil ☒, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐			
Hydric Soil Present?	Yes ☒	No ☐	**Is the Sampling Area within a Wetland?**	**Yes ☒**	**No ☐**
Wetland Hydrology Present?	Yes ☒	No ☐			

Remarks: Former borrow pit(?); soil profile truncated.

Seasonal wetland.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: 5 ft)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: 5 ft)			
10. Unidentifiable grass	50	Y	?
11. Eleocharis sp.	20	Y	OBL
12. Mentha pulegium	10	N	OBL
13. Cyperus eragrostis	5	N	FACW
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	85	= Total Cover	
Woody Vine Stratum (Plot Size: 5 ft)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum - 15

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(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:

x Dominance Test is >50%

Prevalence Index is ≤3.0[1]

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

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:

Project Site: Clover Valley Reservoir

SOIL

Sampling Point: DP3

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR4/2	70	7.5YR4/6	30	C	M	cbsl	A/C
5-11	10YR4/4	100					cosl	C

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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 MLRA 1)**
- ☐ 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)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? Yes ☒ No ☐

Remarks: Native profile has been truncated as a result of excavation. Compacted.

Excavation refusal at 11 inches because of cobbles.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ 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 MLRA 1, 2, 4A, and 4B)**
- ☐ 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 Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ 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):	See below
Water Table Present?	Yes	☐	No	☒	Depth (inches):	None to 11
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	0-5

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: Up to 4 inches of surface water in wetland.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Clover Valley Reservoir City/County: Penryn/Placer Sampling Date: 3-29-10
Applicant/Owner: Placer County Water Agency State: CA Sampling Point: DP4
Investigator(s): Butterworth Section, Township, Range:
Landform (hillslope, terrace, etc.): Sideslope of borrow area Local relief (concave, convex, none): planar Slope (%): 5
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Andregg coarse sandy loam, rocky, 30-50% slopes (map symbol 111) NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☐	No ☒			
Hydric Soil Present?	Yes ☐	No ☒	**Is the Sampling Area within a Wetland?**	**Yes ☐**	**No ☒**
Wetland Hydrology Present?	Yes ☐	No ☒			

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: 5 ft)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: 5 ft)			
10. Bromus diandrus	75	Y	NL
11. Vicia sativa	8	N	FACU
12. Lupinus sp.	5	N	?
13. Trifolium sp.	4	N	?
14. Hypochaeris glabra	43	N	NL
15.			
16.			
17.			
18.			
19.			
20.			
	95	= Total Cover	
Woody Vine Stratum (Plot Size: 5 ft)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum - 5

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent 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:

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

Project Site: Clover Valley Reservoir

SOIL

Sampling Point: DP4

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	7.5YR4/4	100					cbscl	A /C

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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 MLRA 1)**
- ☐ 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)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ 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 MLRA 1, 2, 4A, and 4B)**
- ☐ 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 Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ 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):	None to 20
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	None to 20

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Clover Valley Reservoir City/County: Penryn/Placer Sampling Date: 3-29-10
Applicant/Owner: Placer County Water Agency State: CA Sampling Point: DP5
Investigator(s): Butterworth Section, Township, Range:
Landform (hillslope, terrace, etc.): Alluvial fan Local relief (concave, convex, none): Planar to convex Slope (%): 2-3
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Andregg coarse sandy loam, 9-15% slopes (map symbol 107) NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☐	No ☒			
Hydric Soil Present?	Yes ☐	No ☒	**Is the Sampling Area within a Wetland?**	**Yes ☐**	**No ☒**
Wetland Hydrology Present?	Yes ☐	No ☒			

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: 5 ft)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: 5 ft)			
10. Bromus diandrus	90	Y	NL
11. Claytonia perfoliata	10	N	FAC
12. Centaurea solstitialis	5	N	NL
13. Vicia sativa	5	N	FACU
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	110	= Total Cover	
Woody Vine Stratum (Plot Size: 5 ft)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum - 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent 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:

Dominance Test is >50%

Prevalence Index is ≤3.0[1]

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

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:

Project Site: Clover Valley Reservoir

SOIL

Sampling Point: DP5

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	7.5YR3/1	100					cosl	A
14-21	7.5YR3/2	100					sl	Bw

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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 MLRA 1)**
- ☐ 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)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ 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 MLRA 1, 2, 4A, and 4B)**
- ☐ 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 Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ 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):	None to 21
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	None to 21

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Clover Valley Reservoir City/County: Penryn/Placer Sampling Date: 3-29-10
Applicant/Owner: Placer County Water Agency State: CA Sampling Point: DP6
Investigator(s): Butterworth Section, Township, Range:
Landform (hillslope, terrace, etc.): Reservoir in hilly area Local relief (concave, convex, none): conave Slope (%): 0
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Water NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	☒	No	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: Freshwater marsh below OHWM.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: 5 ft)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: 5 ft)			
10. Poa annua	80	Y	FACW
11. Eleocharis sp.	15	Y	OBL
12. Polygonum sp.	3	N	=>FAC
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	98	= Total Cover	
Woody Vine Stratum (Plot Size: 5 ft)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum - 2

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(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:

x Dominance Test is >50%

Prevalence Index is $\leq 3.0^1$

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

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:

Project Site: Clover Valley Reservoir

SOIL

Sampling Point: DP6

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR4/2	70	7.5YR3/4	30	C	M	sil	Recent sediment; many fine roots
5-18	Gley 1 4/1	100					cols	Recent sediment

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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 MLRA 1)**
- ☒ 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)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (If present):

Type:

Depth (Inches):

Hydric Soils Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ 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 MLRA 1, 2, 4A, and 4B)**
- ☐ 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 Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ 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):	13
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	0-6

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Clover Valley Reservoir City/County: Penryn/Placer Sampling Date: 3-29-10
Applicant/Owner: Placer County Water Agency State: CA Sampling Point: DP7
Investigator(s): Butterworth Section, Township, Range:
Landform (hillslope, terrace, etc.): Cutslope in hilly area Local relief (concave, convex, none): planar Slope (%): 60
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Water NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☒, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐		
Hydric Soil Present?	Yes ☐	No ☒	**Is the Sampling Area within a Wetland?**	**Yes ☐ No ☒**
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: At base of cutslope of reservoir; soil profile truncated. Wetland-nonwetland boundary very well defined.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: 5 ft)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: 5 ft)			
10. Juncus sp.	25	Y	=>FACW
11. Lupinus sp	5	N	?
12. Rubus discolor	5	N	FACW
13. Trifolium sp.	10	N	?
14. Eleocharis sp.	10	N	OBL
15.			
16.			
17.			
18.			
19.			
20.			
	55	= Total Cover	
Woody Vine Stratum (Plot Size: 5 ft)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum - 45

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(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:

x Dominance Test is >50%

Prevalence Index is ≤3.0[1]

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

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:

Project Site: Clover Valley Reservoir

SOIL

Sampling Point: DP7

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR4/2	100					cls	Colluvium at base of cutslope
17+							cols	Cr (decomposed granite)

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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 MLRA 1)**
- ☐ 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)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? Yes ☐ No ☒

Remarks: Native profile has been truncated as a result of excavation.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ 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 MLRA 1, 2, 4A, and 4B)**
- ☐ 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 Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ 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):	None to 18
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	None to 18

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Clover Valley Reservoir City/County: Penryn/Placer Sampling Date: 3-29-10
Applicant/Owner: Placer County Water Agency State: CA Sampling Point: DP8
Investigator(s): Butterworth Section, Township, Range:
Landform (hillslope, terrace, etc.): Reservoir in hilly area Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Water NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☒, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampling Area within a Wetland?**	**Yes ☒**	**No ☐**
Hydric Soil Present?	Yes ☒	No ☐			
Wetland Hydrology Present?	Yes ☒	No ☐			

Remarks: Freshwater marsh along reservoir shoreline, mostly below OHWM.
Recently deposited sediment.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: 5 ft)			
5. Salix sp.	20	Y	=>FACW
6.			
7.			
8.			
9.			
	20	= Total Cover	
Herb Stratum (Plot Size: 5 ft)			
10. Typha sp.	65	Y	OBL
11. Scirpus sp.	5	N	OBL
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	70	= Total Cover	
Woody Vine Stratum (Plot Size: 5 ft)			
1. Rubus discolor	25	N	FACW
2.			
	25	= Total Cover	

% Bare Ground in Herb Stratum - 15

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(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:

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

Project Site: Clover Valley Reservoir

SOIL

Sampling Point: DP8

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
								See Remarks below.

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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 MLRA 1)**
- ☐ 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)
- ☒ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? Yes ☒ No ☐

Remarks: Did not excavate pit: 100% of herbaceous stratum FACW or OBL. Assume hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ 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 MLRA 1, 2, 4A, and 4B)**
- ☐ 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 Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ 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):	2
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 gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Clover Valley Reservoir City/County: Penryn/Placer Sampling Date: 3-29-10
Applicant/Owner: Placer County Water Agency State: CA Sampling Point: DP9
Investigator(s): Butterworth Section, Township, Range:
Landform (hillslope, terrace, etc.): Rocky cutslope in hilly area Local relief (concave, convex, none): Irregular Slope (%): 60
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Andregg coarse sandy loam, 9 to 15% slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☒, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☐	No ☒			
Hydric Soil Present?	Yes ☐	No ☒	**Is the Sampling Area within a Wetland?**	**Yes ☐**	**No ☒**
Wetland Hydrology Present?	Yes ☐	No ☒			

Remarks: At cutslope of reservoir; soil profile truncated.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: 5 ft)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: 5 ft)			
10. Bromus diandrus	40	Y	NL
11. Unidentifiable grass	15	N	?
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	55	= Total Cover	
Woody Vine Stratum (Plot Size: 5 ft)			
1. Rubus discolor	10	N	FACW
2.			
	10	= Total Cover	

% Bare Ground in Herb Stratum - 45

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent 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:

x Dominance Test is >50%

Prevalence Index is $\leq 3.0^1$

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

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:

Project Site: Clover Valley Reservoir

SOIL

Sampling Point: DP9

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-19	10YR3/2	100					csl	Cr (decomposed granite and colluvium)

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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 MLRA 1)**
- ☐ 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)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? Yes ☐ No ☒

Remarks: Native profile has been truncated as a result of reservoir excavation.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ 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 MLRA 1, 2, 4A, and 4B)**
- ☐ 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 Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ 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):	None to 18
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	None to 18

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

Appendix E

Representative Photographs

Photo 1 – Clover Valley Reservoir (Pond 2). Facing upstream from dam.

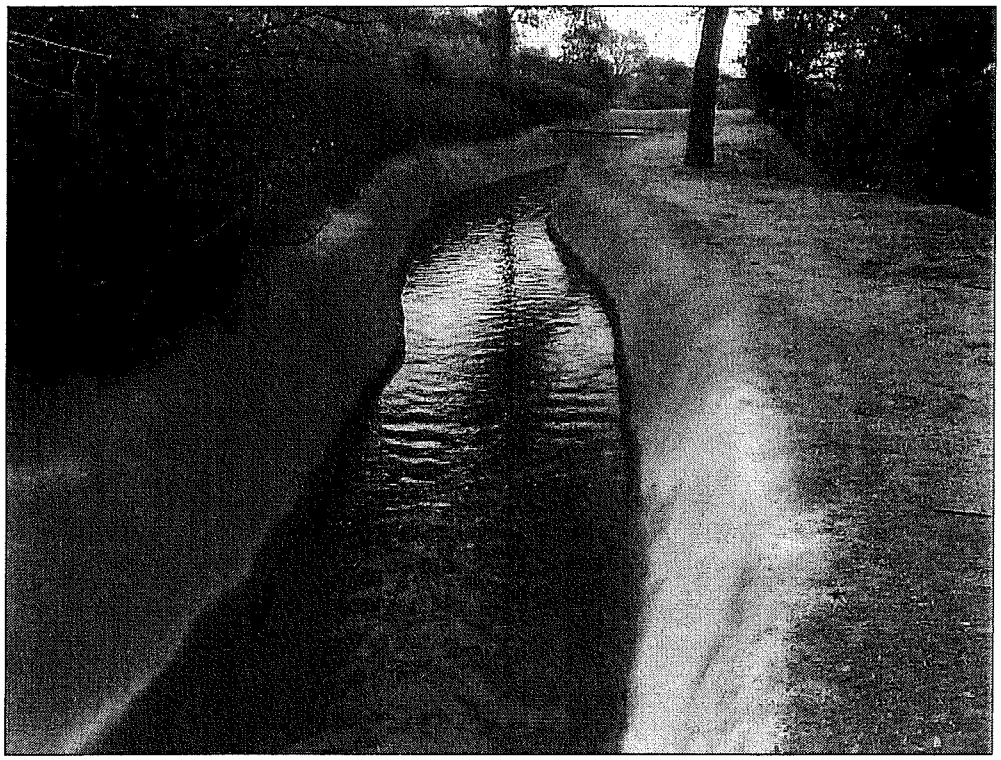

Photo 2 – Antelope Canal. Facing upstream along lined portion of canal.

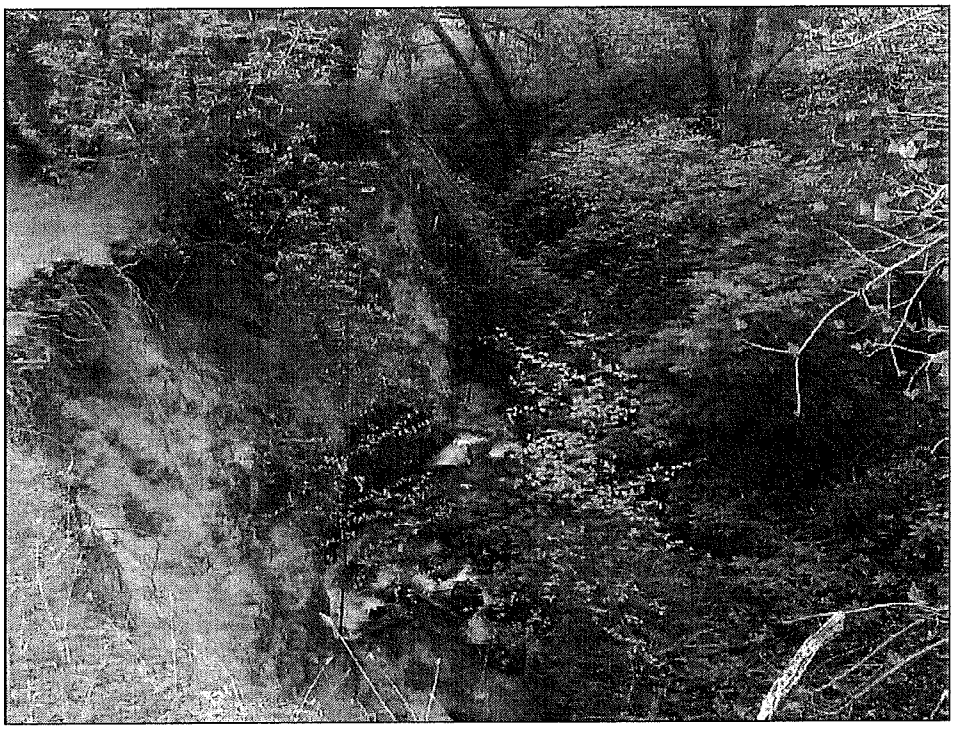

Photo 3 – Antelope Canal.
Facing downstream between unlined portion of canal and railroad tracks.

Photo 4 – Freshwater marsh FWM 1.
Facing north at Data Point 1 along shoreline of Pond 1.

Photo 5 – Seasonal wetland SW 1. Facing east at Data Point 3.

Photo 6 – Ephemeral stream ES 1. Facing downstream.

Photo 7 – Data Point 5 (non-wetland). Facing northeast.

Photo 8 – Cattail-dominated freshwater marsh (FWM 4) (left) and tule-dominated freshwater marsh (FWM 3) (right) at upstream fringe of Clover Valley Reservoir. Facing downstream along Clover Valley Creek.

Photo 9 – Clover Valley Creek. Facing downstream, with spillway of dam in foreground.

Miners Ravine Off-Channel Detention Basin Facility Mitigation Monitoring Plan

Mitigation Monitoring Program

Project Title:	Miners Ravine Off-Channel Detention Basin Facility
Lead Agency Name and Address:	Placer County Flood Control and Water Conservation District 11444 B Avenue Auburn, CA 95603
Contact Person and Phone Number:	E. Brian Keating, District Engineer 530-889-7592
Project Location:	The project site is located along Miners Ravine on the west and east sides of Sierra College Boulevard in the City of Roseville and Placer County. The western portion of the site is within the Roseville City limits; the eastern portion is on unincorporated Placer County lands. The project site is located in Section 32, Township 11 north, Range 7 east on the Rocklin 7.5-minute quadrangle.
Project Sponsor's Name and Address:	Placer County Flood Control and Water Conservation District 11444 B Avenue Auburn, CA 95603

Description of Project: The District is proposing to construct a multi-objective flood control and creek restoration project that will provide regional flood control benefits through off-channel detention, as well as habitat restoration and enhancement and a recreational trail system. The purpose of the project is to provide flood damage reduction in the 101-square-mile Dry Creek watershed by increasing the off-channel storage capacity available at the project site while providing environmental and recreational enhancements in the corridor. The project is intended to achieve the following objectives.

- Reduce flood flows through off-channel detention and increase floodplain capacity immediately adjacent to the creek.
- Reduce the likelihood of Sierra College Boulevard (a major thoroughfare) being overtopped during flooding events.
- Maintain the existing 100-year floodplain footprint.
- Minimize the potential for fish stranding in the floodplain and detention pond.
- Enhance rearing habitat for anadromous fish in Miners Ravine.
- Restore and enhance wetland habitat at the project site (in the eastern basin).
- Restore riparian habitat and oak woodland at the project site (on the floodplain adjacent to Miners Ravine)
- Provide a multi-use recreation trail and trailhead parking.
- Provide improved public access to recreational and educational opportunities along Miners Ravine.

Introduction: The District prepared an Initial Study/Proposed Mitigated Negative Declaration (IS/ Proposed MND) (December 2005) for the proposed project that identifies potential impacts and mitigation measures to reduce significant impacts to a less-than-significant level. Seven mitigation measures were identified as a result of the impact analysis conducted for the project. The IS/Proposed MND concluded that implementation of these mitigation measures would reduce all potentially significant impacts to a less-than-significant level.

This mitigation monitoring and reporting program has been prepared to comply with Section 21081.6(a)(1) of the Public Resources Code which requires the following:

> The public agency shall adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment. The reporting or monitoring program shall be designed to ensure compliance during project implementation.

Mitigation Monitoring Program: This Mitigation Monitoring Program (summarized in Table 1) lists all the mitigation measures identified in the District's IS/Proposed MND. In general, monitoring becomes effective at the time the action is taken on the project. Timing of monitoring is organized as follows:

1. *Prior to Construction:* The monitoring activity consists of insuring that a particular mitigation action has taken place prior to the beginning of any construction or grading activities.

2. *During Construction:* The monitoring activity consists of active monitoring while grading or construction is occurring on the project site.

3. *Ongoing:* The monitoring activity consists of monitoring after the grading and construction phase of the project has been completed and relates to ongoing operation of the project.

Table 1. Mitigation Monitoring Program

Mitigation Measure	Funding Source	Monitoring Agency	Timing	Monitoring Program	Standards for Success
Mitigation Measure B-1: Install Construction Barrier Fencing to Protect Sensitive Biological Resources Adjacent to the Construction Zone:	District	District	Prior to construction	Construction contractor, project engineer, and resource specialist will identify locations for fencing and stake around sensitive resource sites	Avoidance of designated sensitive biological resources adjacent to the construction zone
Mitigation Measure B-2: Retain a Biologist to Monitor Construction Activities	District	District	Weekly during construction	Biological monitor will assist construction crew in compliance with project implementation restrictions and guidelines and be responsible for ensuring that contractor maintains marked perimeter of the construction and staging areas adjacent to sensitive biological resources	Adherence by construction contractor to construction restrictions and guidelines and avoidance of specified sensitive biological resources
Mitigation Measure B-3: Conduct a Preconstruction Survey for Northwestern Pond Turtles Preconstruction surveys	District	District	Within 48 hours prior to the initiation of ground disturbance	Qualified wildlife biologist to be retained by the District	Avoidance of active pond turtle nest
Mitigation Measure B-4: Conduct Preconstruction Surveys for Swainson's Hawk Nests and Implement Appropriate Restrictions and Compensation	District	District	Prior to construction	Qualified wildlife biologist will conduct surveys of suitable habitat within 0.25 mile of the project area during the breeding season before project activities begin	Avoidance of impacts on nesting Swainson's Hawk and minimization of disturbance on their foraging habitat

Mitigation Measure	Funding Source	Monitoring Agency	Timing	Monitoring Program	Standards for Success
Mitigation Measure B-5: Conduct Preconstruction Nesting Bird and Raptor Surveys and Implement Appropriate Restrictions	District	District	Prior to construction	Tree removal will occur prior to February 28 to avoid the breeding season and discourage birds from nesting near construction area All trees within 350 feet of potential construction activity will be surveyed No construction vehicles will be permitted within restricted areas unless directly related to management or protection of legally protected species	Avoidance of nesting migratory birds and raptors
Mitigation Measure CR-1: Implement a Plan to Address the Discovery of Unanticipated Cultural and Paleontological Resources	District	District	During construction	If the contractor unearths buried cultural or paleontological resources during construction, work will stop in that area and within 100 ft. of the find until a qualified archaeologist or paleontologist can assess significance of the find, and if necessary, develop appropriate treatment measures in consultation with the District and any other appropriate agencies	Avoidance of buried cultural or paleontological resources

Mitigation Measure	Funding Source	Monitoring Agency	Timing	Monitoring Program	Standards for Success
Mitigation Measure CR-2: Implement a Plan to Address the Discovery of Human Remains	District	District	During construction	If any human remains are discovered or recognized in any location other than a dedicated cemetery, no further excavation or disturbance of the site or nearby area will occur until: 1. the Placer County coroner is informed and has determined that investigation of the cause of death is not required; and 2. if the remains are of Native American origin, the descendants of the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC 5097.98; or the NAHC has been unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the commission	Avoidance of human remains

Letter of Support from City of Roseville

CITY OF ROSEVILLE CALIFORNIA

Public Works
Administration
311 Vernon Street
Roseville, California 95678-2649

April 14, 2011

Mr. Ken Grehm
Executive Director
Placer County Flood Control and Water Conservation District
3091 County Center Drive, Suite 220
Auburn, CA 95603

RE: Proposed Antelope Creek Improvement Project

Mr. Grehm:

The City of Roseville Department of Public Works would like to express its support of the on-going efforts by the Placer County Flood Control and Water Conservation District (District) to prepare and submit a grant application for the Antelope Creek Improvement Project under the California Department of Water Resources' Proposition 1E Integrated Regional Water Management program for Stormwater Flood Management (SWFM).

As a member agency of the District, the City has coordinated with the District in development of this project from concept to its current preliminary design phases, as identified within the Updated Dry Creek Watershed Flood Control Plan. We understand the project will provide significant flood control and flood damage reduction benefits to areas within downtown Roseville.

The project will reduce peak flood flows over a wide range of flood events, improve the timing of flood flows, enhance existing riparian corridor ecosystems, and improve water quality through groundwater recharge and the natural treatment of temporarily-stored flood waters within the floodplain. Both ecosystem restoration along Antelope Creek and public recreational opportunities will be enhanced as well. We look forward to working with both the District and DWR should the project be awarded under the Prop 1E program and thank you for the opportunity to comment.

Sincerely,

FOR Rhon Herndon
Acting Director of Public Works/City Engineer