Los Padres Dam and Reservoir Alternatives and Sediment Management Study Revised Sediment Characterization Technical Memorandum

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List of Acronyms and Abbreviations

AF	acre-feet
bgs	below ground surface
Cal-Am	California American Water
Corps	United States Army Corps of Engineers
CSUMB	California State University, Monterey Bay
ER-L	Effects Range Low
ER-M	Effects Range Median
EPA	United States Environmental Protection Agency
ESL	Environmental Screening Level
HDR	HDR Engineering Inc.
µg/kg	micrograms per kilogram
mg/kg	milligram per kilogram
MPWMD	Monterey Peninsula Water Management District
NAVD88	North American Vertical Datum of 1988
NGVD 1929	National Geodetic Vertical Datum of 1929
NMWS	normal maximum water surface
NOAA	National Oceanic and Atmospheric Administration
PAH	polycyclic aromatic hydrocarbon
pcf	pounds per cubic foot
PEC	Probable Effect Concentration
PEL	Probable Effects Level
SF Bay RWQCB	San Francisco Bay Regional Water Quality Control Board
STLC	Soluble Threshold Limit Concentration
TEC	Threshold Effect Concentration
TEL	Threshold Effects Level
TKN	Total Kjeldahl Nitrogen
TTLC	Total Threshold Limit Concentration
UET	Upper Effects Threshold
USFS	United States Forest Service
USCS	Unified Soil Classification System
USDA	United States Department of Agriculture
USGS	United States Geological Survey

1. Introduction

A team of engineering and fisheries science consultants led by AECOM has been retained by the Monterey Peninsula Water Management District (MPWMD) to perform a study that investigates the technical, biological, and economic feasibility of a suite of alternatives for Los Padres Dam and Reservoir that includes dam removal, retention of the existing reservoir with the addition of fish passage and sediment management, and reservoir expansion. This technical memorandum presents the results of the geotechnical investigation and characterization of sediment accumulated in Los Padres Reservoir.

1.1 Purpose and Scope

The purpose of this sediment investigation study was to obtain, analyze, and characterize sediment accumulated in Los Padres Reservoir. The scope of the study was:

- Drill, log, and sample seven soil borings in Los Padres Reservoir;
- Perform geotechnical and chemical laboratory testing of selected sediment samples obtained during the field exploration;
- Perform an upstream reconnaissance “pedestrian” survey (not completed at the time of this draft);
- Characterize the particle-size distribution and stratigraphy present in the impounded reservoir sediments;
- Estimate the volumes of interpreted sediment classes (organics, fines, sands, gravel, and cobble); and
- Present the results of subsurface explorations, laboratory testing, and sediment characterization in this technical memorandum.

The sediment characterization will evaluate the stratigraphy, sedimentology, and volume of alluvial sediment deposited behind Los Padres Dam and farther upstream. This will inform the development of alternatives for Los Padres Dam and Reservoir, and more specifically will inform sediment transport analyses and sediment management alternatives.

1.2 Document Organization

This Technical Memorandum is organized into the following sections:

- Section 1 is the introduction, including purpose and scope;
- Section 2 describes the background information about the site and available data used for this study;
- Section 3 describes the results of the field investigation, including laboratory test results;
- Section 4 describes the methods and results of the sediment volume estimates and stratigraphic characterization;
- Section 5 gives the conclusions from this study;
- Section 6 is a statement of limitations for this technical memorandum; and
- Section 7 lists references used to prepare this technical memorandum.

2. Background

2.1 Geologic Setting

Los Padres Dam is located in the Santa Lucia Mountains along the western margins of the Coast Ranges province of California. This province is characterized by a general northwest-trending structural grain, including mountains, valleys, and regional faults. Geologically, the project site is within the Salinian block, which is a north-northwest trending strip of heterogeneous plutonic, meta-igneous and sedimentary rock formed during the Mesozoic collision of the North American and Pacific tectonic plates. Cenozoic faulting along major faults such as the San Andreas, Rinconada, and the Nacimiento faults have displaced these units.

2.2 Los Padres Contributing Watershed

The contributing watershed drains a 44.8-square-mile area that is partly National Forest and includes a portion of the Ventana Wilderness (Cal-Am and MPWMD 2016). The watershed is rural in nature, with approximately 0.3 percent of the watershed classified as developed and 39.6 percent of the watershed covered by forest. The elevations in the watershed range from 920 to 5,050 feet, with a mean basin elevation of approximately 3,000 feet. The mean annual precipitation is 39.1 inches.

The upper watershed is steep and prone to episodes of erosion; periodic large wildfires can be followed by very wet periods, producing high rates of erosion. The United States Forest Service (USFS) manages virtually the entire contributing watershed. USFS land management policies—particularly for fire management—can have a direct effect on the volume of sediment and large wood that enters the reservoir.

Most of the Carmel River watershed contributing to Los Padres Reservoir has been burned several times in the past few decades (Cal-Am and MPWMD 2016). The watershed above Los Padres Dam was burned severely in the 1977 Marble-Cone fire. Subsequent fires that have occupied the footprint of the Marble Cone fire include the 1999 Kirk Complex fire, 2008 Basin Complex fire, and 2016 Soberanes fire. An initial assessment of the 2016 fire impacts was completed in late September 2016. The highest proportions of moderate and high soil burn severity in the 2016 Soberanes fire were southwest of the river and outside of the Los Padres Dam sub-watershed. By mid-October 2016, approximately 50 percent of the Los Padres Dam contributing watershed was burned; however, it appears that most of the burned areas that are considered high risk for debris and increased runoff are outside of the watershed contributing to Los Padres Dam (CALFIRE 2016). Inside the Los Padres Dam sub-watershed, the Basin Area Emergency Response team estimated that up to 80 acre-feet (AF) of debris could flow to Los Padres Reservoir as a result of a 10-year-magnitude storm. The 2017 water year was extremely wet (AECOM 2017), resulting in significant sediment transport into the reservoir as further discussed later in this report.

2.3 Bathymetric and Topographic Data

The following data sets were available and used for volumetric and morphologic analysis as part of this investigation:

1. 1947 Topographic Map: Pre-dam topography was surveyed in 1947 and was available as a scanned as-built drawing sheet depicting 10-foot elevation contours, thalweg lines of Carmel River and Danish Creek, section lines, and a graph of area and capacity curves. The area covered by this survey extends from approximately 500 feet downstream of Los Padres Dam with a lower elevation of 900 feet (National Geodetic Vertical Datum of 1929 [NGVD 1929]) to approximately 3,600 feet upstream of the original pool extent. This survey extends to an upper elevation of 1,150 feet (NGVD 1929).

2. 2010 LiDAR Topography: United States Geological Survey (USGS) Coastal California LiDAR. The minimum contour interval, based on the vertical accuracy of the survey, is approximately 1 foot in areas not obscured by vegetation.

3. 2016 Bathymetric/Topographic Survey: HDR Engineering Inc. (HDR). The 2016 bathymetric survey indicates sediment elevations that are greater than the 2017 California State University, Monterey Bay (CSUMB) bathymetric survey (below) for reasons that have not yet been determined, and therefore was not used for this study. The 2016 HDR topographic survey is the publically available 2010 USGS LiDAR reprocessed by HDR from the reservoir level up to elevation 1,092.9 feet to address extensive classification errors (HDR 2016).

4. Preliminary 2017 Bathymetric Survey: CSUMB. Data obtained June 3, 2017.

5. Preliminary Difference between CSUMB 2008 and 2017 Bathymetric surveys provided by CSUMB.

6. 2017 UAS Survey: United States Geological Survey (USGS) Pacific Coastal and Marine Science Center. Data obtained November 1, 2017 by unmanned aerial system (UAS) structure-from-motion (SfM) photogrammetry. Starting at roughly Station 30+50, this survey captures the segment of the shallow upper reservoir, above elevation 1040 feet, that the 2017 Bathymetric survey vessel could not reach at the time of data collection. The UAS survey also captures an additional 2,100-foot segment of upland topography along the Carmel River before terminating roughly 500 feet downstream of the confluence with Danish Creek.

For this investigation, the 1947 topographic map was georeferenced using ArcGIS and the 10-foot elevation contour lines and creek and river thalweg lines were digitized as vectors. The comparison of this data to the 2016 LiDAR topography and 2017 bathymetry indicated significant, nonsystematic errors in the 1947 topography. In several locations, the mapped thalweg of the pre-1947 river was shown under a steep canyon wall on the modern bathymetry, or the canyon widths measured at equal elevations on both sets of topography were inconsistent. The observed errors in the 1947 topography are not consistent with a simple shift, rescale, or rotation of the data, or any combination of these. The observed inconsistencies are very unlikely to be the result of either basin infilling with sediment, or large-scale erosion of bedrock canyon slopes, and are most readily explained by survey error. The errors generally indicate that the original reservoir capacity may be somewhat less than previously understood. Using the modern topography and bathymetry as a guide, the 1947 thalweg lines and locally adjacent contours were adjusted to what are likely more accurate positions, for the purpose of targeting boring locations to the pre-dam thalweg.

2.4 Previous Investigations of Reservoir Sediment

A previous investigation of the reservoir sediment was performed in 2015 for the Downstream Fish Passage Project (Pacific Crest Engineering, Inc. 2015). Four borings (VC-1, VC-2, VC-3, and VC-4) were drilled 14 to 18 feet (bottom elevation range of 950.5 to 958 feet) into the reservoir sediment using vibrocore sampling methods at the location shown on Figure 1. Two of the borings, VC-1 and VC-2, encountered 2 to 3 feet of organics at the top of the sediment. The four borings encountered 12.5 to 17.5 feet of very soft silt with organics overlying 0.5 to 6 feet of interbedded silt, and silty sand and sand with gravel. The bottom of the silt with organics ranged between elevations 954 and 958 feet. Based on the 1947 pre-dam topography, it is judged that these borings did not penetrate through the reservoir sediment into the pre-dam alluvium. The shear strength of the sediments ranged from 70 to 260 pounds per square foot, and the dry unit weight and moisture content of sediment ranged from 27.4 to 50.9 pounds per cubic foot (pcf) and 41.2 to 177.5 percent, respectively. The logs of borings VC-1 through VC-4 are included in this report in Appendix A.

3. Field Investigation

3.1 Borings

A total of seven soil borings were performed by Taber Drilling of West Sacramento between July 11 and 17, 2017, to investigate subsurface conditions of submarine sediment in Los Padres Reservoir. The borings were advanced using a CME-45 drill rig mounted on a small platform barge that was launched from the narrow boat ramp on the upstream face of the dam crest (Photo 1, Appendix B-2). The horizontal locations of the borings were recorded with a Trimble GPS unit. The elevations of the borings were derived from the lake level at the time of drilling (1042.9 feet, North American Vertical Datum of 1988 [NAVD88]). These locations are shown on Figure 1, and the boring depths and surface elevations are summarized in Table 1. Coordinate locations of the borings are included on the boring logs presented in Appendix A. Photographs of the sediment samples are presented in Appendix B-1 and laboratory test results are presented in Appendix C.

The sample interval for the borings was generally 5 feet or less, with a typical sample length of 2 feet. The following samplers were used:

- 2.8-inch I.D. thin-walled Osterberg piston sampler (2.5-foot-long Shelby tubes);
- 2.5-inch I.D. split-barrel modified California drive sampler;
- 2.75-inch I.D. split-barrel drive sampler (modified California type); an
- 1.375-inch I.D. standard penetration test sampler.

In one case, a 5-foot-long, 2.5-inch I.D. split-barrel push sampler was employed. Due to poor recovery and generally unsuitable conditions, this sampler was not subsequently used. When the automatic trip hammer (140 pounds, 30-inch drop) was used to advance drive samples, blow counts per 6 inches were recorded. Most samples were extruded from thin-walled tubes or samplers for logging and subsequently bagged and retained for laboratory analysis. Several samples were retained in Shelby tubes for laboratory tests. These samples were not photographed and were logged based on material at the top and bottom of the tubes prior to capping and sealing.

Based on bathymetric survey data, the reservoir sediment has three general submarine morphologies:

- Basin area in the lowest portion of the reservoir where sediments are deposited relatively flat;
- Pro-delta that forms the front face of the sediment delta; and
- Delta in the upper portion of the reservoir, which is the interface between flowing river water and relatively still reservoir water, where coarser material is generally trapped.

Two borings, B-1 and B-2, were advanced into the basin and pro-delta area. Three borings, B-3, B-4, and B-7, were advanced near the downstream edge and upper slope of the sediment delta. Two borings, B-5 and B-6, were advanced further upstream in the delta. With the exception of boring B-3, all borings were located with the intent to target the pre-dam river channel thalweg, as interpreted from the 1947 topography.

The locations of borings B-6 and B-7 were adjusted from the planned locations due to sediment aggradation during the 2017 water year at the upstream end of the reservoir. Boring B-6 was relocated as far upstream as possible. The planned location for boring B-7 was not accessible with the barge due to sediment infilling during the past precipitation season (Appendix B, Photos 2 and 3). Boring B-7 was moved to downstream of borings B-3 and B-4, to an area on the downstream edge of the delta slope where preliminary data from the 2017 bathymetric survey (compared to 2008 bathymetry) indicated several feet of recent sediment deposition.

Table 1 2017 Boring Summary

Boring Number	Water Depth (feet)	Boring Depth (feet)	Sediment Thickness (feet)	Lake Bed Elevation (2017 Bathymetry, feet)	Lake Bed Elevation (Boring, feet)	Original Ground Elevation (Boring, feet)	Original Ground Elevation (1947 Topo, feet)
B-1	74.5	33.5	29.5	969.5	968.4	939	933 – 943
B-2	65.0	23.0	21.0	978.3	977.9	957	946 – 956
B-3	25.0	36.5	27.0	1,018.7	1,017.9	991	983 – 993
B-4	24.5	31.5	> 31.5	1,018.7	1,018.4	< 986	965 – 970
B-5	16.5	47.0	46.5	1,026.6	1,026.4	980	970 – 980
B-6	7.0	52.4	46.0	NA	1,035.9	990	980 – 985
B-7	30.0	56.0	45.0	1,012.8	1,012.9	968	965 – 975

Notes:
Water Surface elevation at time of drilling: 1,042.9 feet
All elevations in NAVD 88

3.1.1 Subsurface Conditions

The borings drilled for the project encountered fine- to coarse-grained reservoir sediments overlying pre-dam alluvium and bedrock.

Borings B-1 and B-2, located within the low-gradient, downstream basin portion of the reservoir, encountered primarily fine-grained, organic-rich sediments. These borings encountered 30 feet (B-1) and 20 feet (B-2) of soft to very soft, black, clayey silt with organics and trace to 10 percent very fine-grained sand. These sediments have medium to high plasticity, and occasionally coarse organic/vegetative mats consisting of woody debris, leaf litter, and grass. Boring B-2 encountered an approximately 3-foot-thick poorly graded, fine- to medium-grained sand lens 5 feet below ground surface (bgs). Both borings terminated in medium to very dense sand interpreted as pre-dam alluvium.

Borings B-3, B-4, and B-7 were located on the downstream end of the delta slope. Borings B-5 and B-6 were located on the upstream end of the delta slope and were intended to target the pre-dam thalweg of Carmel River. Except for boring B-6, these borings encountered a 2- to 5-foot-thick surface layer of very soft, organic-rich sandy silt with lenses of coarse organic debris and frequent voids. Sediments encountered below this layer (at surface in boring B-6) down to an approximate 30-foot depth consist primarily of loose to medium dense, fine-to medium-grained sand, which is locally silty, occasionally containing coarse sand and gravel up to 2 inches. Fines content in this zone is generally 5 to 15 percent, except in the upper 12 feet of borings B-3 and B-6, where the fines content is 26 to 36 percent. There are occasional fine-grained interbeds in this zone, typically less than 2 feet thick, consisting of organic-rich sandy silt with coarse organic debris.

Below approximately 30 feet, borings B-5, B-6, and B-7 encountered a 10- to 13-foot zone of soft to very soft, fine-grained, thinly interbedded to laminated lake sediments that appear to be stratigraphically consistent between borings. These sediments consist of sandy silt to silty sand, or interbedded fine-grained sand and silt, locally with coarse organic debris mats.

Boring B-3 was terminated at 36.5 feet bgs, in medium dense, silty sand with gravel interpreted to be pre-dam alluvium. Boring B-4 was terminated at 31.5 feet bgs in fine- to medium-grained sand with silt with local lenses of coarse sand and gravel that was interpreted in the field to be pre-dam alluvium based on coarse sand and gravel content, but is now considered impounded alluvial lake sediment based on interpretation of subsequent borings. Borings B-5 and B-6 were terminated at 47 and 52.4 feet bgs, respectively, in dense to very dense, fine- to coarse-grained sand and gravel, consistent with pre-dam alluvium. Boring B-7 was terminated in very dense gravel and weathered boulder that may be bedrock.

3.2 Upstream Reconnaissance

Reconnaissance of the river channel and surficial sediments stored upstream of the pool was performed on three occasions. The first trip was performed on December 7, 2016, during the proposal phase of this project and extended from the top of reservoir upstream to the confluence of Danish Creek. The reservoir level was approximately 10 feet below spillway crest during this visit. The second trip took place during the drilling investigation (July 2017) and extended upstream to the planned boring B-7 location (Figure 1). The third upstream reconnaissance was performed on November 1 and 2, 2017, when the reservoir level was approximately 22 feet below NMWS. This survey extended upstream to Sta 91+00, and included the identification of several surficial deposits, six Wolman pebble counts, and photo documentation of surficial sediments. The low water level in the reservoir allowed boat access to Sta 29+00, from which upstream access required foot travel over very soft, recently deposited lake sediment. Due to this limited access and extended foot travel, bulk samples (5-gallon) of coarse-grained alluvial sediments (3-inch-minus) were not obtained. The locations of surficial deposits, pebble counts and photo observations are presented on Figure 2. Pebble count data is presented in Table 2. Photographs of upstream surficial deposits are presented in Appendix B-2.

Surficial alluvial terrace deposits in the December 2016 reservoir from Sta 50+00 to Sta 60+00 (Figures 1 and 2) were observed to be generally sandy, dominated by fine- to medium-grained sand with some coarse sand and gravel (Appendix B-2, Photos 4 and 5). These deposits have planar, horizontal surfaces that are generally even with or just above the reservoir high-water mark (Photo 6). A generally broad river channel, approximately 10-12 feet below the high water line is present within this reach with some gravel and occasional small cobble armor on the channel surface. At one location, a recently eroded terrace riser exposed an organic-rich deposit consisting of several feet of silty, fine-grained sand with abundant leaf and stick litter (Photo 9). The vegetation in parts of the reservoir terrace deposits was partially burned over. Upstream of Sta 60+00 to the confluence of Danish Creek (Sta 75+00), a generally shallow river channel is eroded into alluvial terrace deposits, and a coarse-grained surface armor layer is present in much of the channel and on terrace margins and bars. The grain size of the armor layer varies from gravel to large cobble, mostly in discrete size packages that coarsen upstream (Photos 7 and 8).

During the July, 2017 upstream reconnaissance, it was observed that the river channel from Sta 46+00 to Sta 60+00 had been infilled up to within 0.5 feet of the NMWS to form a broad, flat reservoir surface with no river channel (Photo 10). Surficial observation and material encountered in the upper 10 feet of boring B-6 indicate this recently deposited sediment is predominantly fine to coarse grained sand. This deposit was subsequently eroded by the Carmel river as reservoir levels dropped to form an up to 8-foot deep and 30-foot wide channel exposing the recently deposited sand (Photo 11).

Upstream of Sta 58+00, the surficial sediments and landforms are consistent with alluvial deposition. The active channel and low channel bars are armored with gravel, cobbles and small boulders that coarsen in the upstream direction. Adjacent to the channel are several large overbank or flood plain deposits, consisting of mostly sand at the surface. These deposits are vegetated with grass and trees suggesting that they are more stable, older deposits. Photos 12 to 20 in Appendix B-2 depict representative deposits and pebble count locations within this reach. The approximate locations of these photos and the approximate extents of the pebble counts are shown on Figure 2.

Table 2 Wolman Pebble Count Data

Description	Size (mm)	Pebble Count Number					
		1	2	3	4	5	6
Fines	<0.06	-	-	-	6	-	-
Fine sand	0.06-0.25	18	11	2	36	2	9
Coarse sand	0.25-2	22	31	25	9	33	44
Fine gravel	2-12	28	36	43	21	55	41
Coarse gravel	12-64	30	22	37	23	10	20

Description	Size (mm)	Pebble Count Number					
		1	2	3	4	5	6
Small cobble	64-128	16	8	9	10	2	1
Large cobble	128-255	-	-	-	-	-	-
Boulder	>255	1	-	-	-	-	-
Total Count		115	108	116	105	102	115

4. Sediment Characterization

4.1 Sediment Types and Distribution

For the purposes of this characterization, the sediment stored in Los Padres Reservoir is divided into three zones based on stratigraphy and depositional environment:

- Zone 1, the downstream pro-delta basin;
- Zone 2, the main delta body; and
- Zone 3, upstream alluvial deposits.

These zones are depicted in longitudinal and transverse section in Figures 3 and 4. Also shown on these sections are the boring locations and extents, the 1947 adjusted thalweg and interpreted average flood plain surfaces, the 2017 bathymetric surface, the 2017 UAS survey that extends upstream to about Station 71+00, the topographic surface from the 2016 LiDAR that extends to about Station 85+00, and the topographic surface from the 2010 LiDAR upstream of Station 85+00. The alignment of the longitudinal section follows the adjusted 1947 thalweg from the dam to Station 55+00, and the 2010/2016 thalweg upstream of Station 55+00.

4.1.1 Zone 1 Sediment

Zone 1 sediments were encountered in borings B-1 and B-2 and at the bottom of borings B-5, B-6, and B-7 at elevations ranging from approximately 940 to 1,000 feet NAVD88 (Figures 3 and 4). Zone 1 is composed of primarily of fine-grained recent lake sediment consisting of very soft to soft silts and organic materials (ML-OL and MH-OH) that grade to include more very loose to medium dense silts and fine sand (MH, ML, SP-SM, SW, SM, and SP) in the upstream direction. Local lenses of fine- to medium-grained sand are likely present in the upstream part of Zone 1, similar to the approximately 3-foot-thick sand lens encountered in boring B-2 at 5.5 foot depth. This deposit is interpreted to be a turbidite or delta slope failure deposit. The Zone 1 deposit is discussed in terms of the downstream portion, seen in borings B-1 and B-2; and the upstream portion, seen at the bottoms of borings B-5, B-6, and B-7. Upstream Zone 1 sediments, under the main delta (Zone 2) are thinly interbedded fine-grained sand and silt. The transition between Zone 1 upstream and downstream deposits was not encountered, and the stratigraphic relationship is not well understood. Table 3 presents the variation in classification in accordance with the Unified Soil Classification System (USCS) for the sediment, as shown on the 2017 boring logs (see Appendix A) in Zone 1.

Table 3 Zone 1 Variation in USCS Classification of Sediment

Boring	Length (feet)						
	Zone 1	Gravel	Sand	Silt	Silt/Organic	Organic	Clay
B-1	30.0	0.0	0.0	0.0	30.0	0.0	0.0
B-2	19.5	0.0	2.5	0.0	17.0	0.0	0.0
B-5	14.5	0.0	1.0	13.5	0.0	0.0	0.0
B-6	11.0	0.0	7.5	3.5	0.0	0.0	0.0
B-7	20.0	0.0	11.0	6.0	0.0	3.0	0.0
Total Length	**95.0**	**0.0**	**22.0**	**23.0**	**47.0**	**3.0**	**0.0**
Percent Total	**100%**	**0%**	**23%**	**24%**	**50%**	**3%**	**0%**

Atterberg limits tests of four samples of Zone 1 sediment found that the liquid limit and plasticity index ranged from 53 to 67 and from 16 to 20, respectively. The dry unit weights determined for two undisturbed samples from boring B-1 were 29 and 35 pcf.

4.1.2 Zone 2 Sediment

Zone 2 sediments were encountered in borings B-3, B-4, B-5, B-6, and B-7 at elevations ranging from approximately 980 to 1,035 feet NAVD88 (Figures 3 and 4). Zone 2 is composed of crudely stratified layers of mostly sandy, post-dam alluvium with some fine-grained lake sediments, likely deposited as reservoir levels fluctuated. The recent lake sediments interbedded in Zone 2 are similar to the lake sediments described in Zone 1, except with lower clay content and higher fine-grained sand content. The alluvial sediments are primarily medium loose to medium dense, fine- to medium-grained sands (SW, SP, and SP-SM), with minor amounts of coarse sand and trace amounts of gravels in some layers. Table 4 presents the variation in USCS classification for the sediment as shown on the 2017 boring logs (see Appendix A) in Zone 2.

Table 4 Zone 2 Variation in USCS Classification of Sediment

Boring	Length (feet)							
	Zone 2	Gravel	Sand	Sand-Organic	Silt	Silt-Organic	Organic	Clay
B-3	34.0	1.0	25.5	2.5	0.0	0.0	2.0	3.0
B-4	31.5	0.0	23.0	1.5	2.0	0.0	5.0	0.0
B-5	31.0	0.0	24.0	3.5	0.0	0.0	3.5	0.0
B-6	35.0	0.0	35.0	0.0	0.0	0.0	0.0	0.0
B-7	34.5	0.0	26.0	0.0	4.5	4.0	0.0	0.0
Total Length	**166.0**	**1.0**	**133.5**	**7.5**	**6.5**	**4.0**	**10.5**	**3.0**
Percent Total	**100%**	**1%**	**80%**	**5%**	**4%**	**2%**	**6%**	**2%**

Atterberg limits tests of four samples of the fine-grained layers within Zone 2 sediment found two samples that were nonplastic and two samples with liquid limits of 56 and 69 and plasticity index of 14. The dry unit weight determined for one undisturbed sample of silty sand from boring B-3 was 31 pcf.

4.1.3 Zone 3 Sediment

No borings were conducted in Zone 3. Observations of surficial deposits from upstream reconnaissance suggest that much of the sediment in the lower portion of Zone 3 has sand proportions similar to those of Zone 2, but with less fine-grained lake sediment and more coarse alluvium likely associated with transport from upstream during storm flows that occur during early winter reservoir filling. A significant portion of Zone 3 lies above the high reservoir pool level. This portion of Zone 3 is likely to have a higher proportion of gravel and cobble size sediment than the part of the zone in the original reservoir pool.

4.1.4 Other Sediment Deposits

The majority of sediment that has been deposited in Los Padres Reservoir and delineated into Zone 1, Zone 2, and Zone 3 sediment as described above was transported into the reservoir by the Carmel River. Much smaller volumes of sediment have also been transported into the reservoir from drainages along the reservoir rim. Figure 5, which shows a preliminary comparison of the 2008 and 2017 bathymetry prepared by CSUMB, indicates two areas that appear to be sediment fans that have formed at the base of drainages. The 2008 to 2017 comparison also includes one area of accumulation on the downstream right bank that appears to be indicative of activity of a debris slide area. Our review of the bathymetric data indicates that these types of deposits are very small in comparison to the sediment transported into the reservoir by the Carmel River.

4.2 Sediment Volumes

4.2.1 Volume Calculation

The volumes of Zone 1, Zone 2, and Zone 3 sediment described in Section 4.1 were estimated using two approaches. The initial approach started with determining the volume of sediment below the normal maximum water surface (NMWS) elevation (spillway crest elevation 1,042.9 feet NAVD88) by subtracting the remaining reservoir capacity (based on 2017 bathymetry) from the original reservoir capacity and then subdividing the sediment volume into the three zones based on the longitudinal profile shown on Figure 3. Sediment above the NMWS was estimated using end areas of sediment between the NMWS and the 2016 LiDAR. While checking the initial results, the original capacity of the reservoir was checked based on the surface developed from digitized pre-dam 1947 contours. The original capacity of the reservoir was found to be 3,022 AF, which compares very well with the original storage capacity of 3,030 AF (AECOM 2017) being used for this study. The digitized pre-dam 1947 surface and the 2016 LiDAR and 2017 bathymetry were also compared by cutting a number of cross sections through the reservoir area. The results of the comparison indicated that there are errors in the 1947 contours that make the original reservoir capacity appear to be larger than it actually is. The 1947 survey appears to depict a valley wider than ever existed. Thus, the sediment volumes below the NMWS surface using this initial approach are not correct.

An alternate approach using end areas was then undertaken to account for discrepancies in the 1947 contours. Sections were cut through the reservoir area from upstream to downstream approximately every 200 feet. The sections included the 1947 contours, 2016 LiDAR, the 2017 bathymetry, and the 2017 UAS survey. A representative section at Station 24+00 (Figure 1) cut perpendicular to the canyon is shown on Figure 6. For each section, the section through the 1947 contours was then shifted so that the right bank of the 1947 section was matched up to the right bank of the 2016 LiDAR and 2017 bathymetry/UAS surveys. For sections within the extents of the 2017 bathymetry and 2017 UAS survey, the 2017 UAS took precedence in determining an appropriate shift. The slope of the left bank of the 2016 LiDAR and 2017 bathymetry/UAS surveys was then projected down through the accumulated sediment to the 1947 section. The area bounded by the projected left bank, the left bank of 1947 section, and the NMWS represents an original reservoir capacity loss if located to the left of the project left bank or an original reservoir capacity gain if located to the right of the project left bank (see Figure 6). The sediment in the sections was subdivided into Zones 1, 2, and 3, based on the longitudinal profile shown on Figure 3. Volumes of actual reservoir capacity; change in original reservoir capacity; and Zone 1, Zone 2, and Zone 3 sediment were then calculated using end area methods. Sediment above the NMWS was estimated using end areas of sediment between the NMWS and the 2016 LiDAR. The sections used for the volume calculations are included in Appendix D.

The volumes of reservoir capacity and sediment using the two approaches are summarized in Table 5. Table 5 also includes an adjustment to the end area approach to account for the reduced accuracy of the end area method due to the spacing of the sections used for the volume calculations. Increasing the number of section by reducing the spacing between sections would result in volumes that are closer to the actual volumes. Infinite cross sections would result in calculation of a “new original reservoir capacity” and “reservoir capacity that did not exist,” that when summed together, would equal the originally calculated reservoir capacity. Therefore, the calculated end area values were adjusted used the following ratio:

$$1.0243 = original\ reservoir\ capacity/(new, original\ reservoir\ capacity + capacity\ that\ did\ not\ exist)$$

Table 5 Estimated Sediment Volume Summary

Description	Initial Approach Quantity (acre-feet)	End Area Approach Quantity (acre-feet)	Adjusted[1] End Area Approach Quantity (acre-feet)
Reservoir capacity at NMWS (1947)	3,030	2,958	
New original reservoir capacity	—	2,655	2,720
Reservoir capacity that did not exist	—	303	310
Reservoir capacity at NMWS (2017)	1,598	1,546	1,584
Sediment volume below NMWS	1,472	1,083	1,120
Sediment volume above NMWS	160	135	138
Total sediment volume	1,632	1,249	1,258
Volume of Zone 1	385	332	340
Volume of Zone 2	816	684	701
Volume of Zone 3 below NMWS	271	77	79
Volume of Zone 3 above NMWS	160	135	138

Note:

[1] Adjustment = 1.0247 × End Area Approach Quantity

4.2.2 Estimated Grain-Size Class by Zone

Using the USCS classification sediment distribution data (Tables 3 and 4), laboratory gradation results, and engineering judgment, the proportion of different grain-size classes composing the sediments in Zone 1 and Zone 2 were estimated as shown in Table 6. Estimates for Zone 3 are based on a correlation to the coarsening upstream Zone 2 deposits and surficial observations, not on subsurface data or quantitative surface data, and are approximate.

Table 6 Estimated Sediment Size-Class Amounts

Area	Percent				
	Cobble /Gravel (4.75 – 300 mm)	Sand (0.075 – 4.75 mm	Silt (< 0.075 mm)	Clay (< 0.075 mm)	Organics (n/a)
Zone 1	2 – 5	25 – 35	50 – 60	8 – 15	5 – 10
Zone 2	5 – 10	65 – 75	15 – 25	2 – 5	<2
Zone 3 (Below NMWS)	25 – 35	60 – 70	5 – 15	0 – 5	<2
Zone 3 (Above NMWS)	35 – 45	55 – 65	0 – 10	0 – 5	<2

4.2.3 Estimated Tonnage of Grain-Size Class by Zone

An estimate was made of the tons of clay, silt, sand, and gravel/cobble materials using the volumes of Zone 1, Zone 2, and Zone 3, based on the adjusted end-area approach shown in Table 5. The percent of grain-size classes in each zone is shown in Table 6, and the range and basis of dry unit weight assumed for each zone is summarized in Table 7. The estimated range of tonnage of each grain-size class is summarized in Table 8. Organics have not been included in the tonnage calculations because of their low unit weight compared to the soil particles.

Table 7 Range of Dry Unit Weight by Zone

Area	Range of Dry Unit Weight (pcf)	Basis of Range of Dry Unit Weight
Zone 1	30 – 50	Laboratory tests on borings VC-1 through 4 and B-1
Zone 2	60 – 75	Blow count data, published correlations, and judgment
Zone 3 (Below NMWS)	90 – 110	Published literature and engineering judgment
Zone 3 (Above NMWS)	90 – 110	Published literature and engineering judgment

Table 8 Estimated Tonnage of Sediment by Grain-Size-Class

Area	Tons							
	Finer – Low Unit Weight				Coarser – Higher Unit Weight			
	Gravel +	Sand	Silt	Clay	Gravel +	Sand	Silt	Clay
Zone 1	4,400	55,600	133,300	28,900	18,500	129,600	185,200	37,000
Zone 2	45,800	595,100	228,900	45,800	103,000	846,900	171,700	22,900
Zone 3 (Below NMWS)	38,700	92,800	23,200	0	56,700	122,800	9,400	0
Zone 3 (Above NMWS)	94,900	149,100	27,100	0	132,500	198,800	0	0
Total	**183,800**	**892,600**	**412,500**	**74,700**	**310,700**	**1,298,100**	**366,300**	**59,900**

As shown in Table 8, the total tonnage of sediment trapped behind the dam is estimated to be in the range of 1,600,000 tons and 2,040,000 tons. The tonnage of fines (silt and clay) in the reservoir is estimated to be between 430,000 to 490,000 tons. The tonnage of coarse materials (sand, gravel, and cobbles) is estimated to be between 1,080,000 to 1,610,000 tons.

4.3 Sediment Chemistry

Samples of reservoir sediments collected during the July 2017 investigation were analyzed for chemical constituents to understand potential effects to fish and other downstream uses.

4.3.1 Background

Although there is no development or industry in the watershed, there is concern that the wildfire-dominated landscape contributes sediment to the reservoir that could pose a water quality problem if released into the river downstream, either through dam removal with sediment release or through sediment management releases.

There have been several fires in the Los Padres watershed since the Los Padres Dam was built. The Marble-Cone Fire burned for 3 weeks in August 1977 after a 61-year period without fire in the Los Padres watershed. About 42 percent of the watershed experienced a severe burn-down of vegetation; this was immediately followed by a season of above-normal rainfall. An estimated 950,000 cubic yards of sediment was mobilized during the following winter. The winters of 1978 and 1979 had average precipitation, and erosion/siltation and sediment transport was minimal (MWH 2013). The Kirk Complex Fire burned for nearly 2 months in September and October 1999, affecting approximately 57 percent of the watershed. The following winter had average precipitation, and the fire did not markedly influence the rate of reservoir infilling despite the significant acreage of burned areas (MWH 2013). The Basin Complex Fire burned for

5 weeks in June and July 2008, affecting approximately 48 percent of the watershed with burns of moderate or greater severity. About 11 percent of the burn area experienced high-severity burns. The following winter had slightly below to average precipitation. Cross-section surveys in 2009 and 2011 found no signs of abnormal sediment build-up associated with the Basin Complex Fire. The Soberanes Fire burned during June and July 2016, affecting approximately half of the Los Padres watershed with primarily low and moderate severity burns (Rutten and Anderson 2016). It is likely that the combination of the severe fire intensity and above-normal rainfall following the Marble-Cone fire contributed to its disproportionate sediment effects in the Los Padres Reservoir.

High-severity fires that cause substantial heating at the soil surface can cause a wide range of changes in the physical and chemical properties of the soil. These include breakdown in soil structure, reduced moisture retention and capacity, development of water repellency, changes in nutrient cycling, atmospheric losses of elements, erosion, reduced soil organic matter, and decomposition of plant roots (USDA 2005).

Wildfires can affect water quality through increased sedimentation. The structure of the soil can be affected by fire at relatively low temperatures when the organic matter component is lost. Loss of organic matter increases the bulk density of the soil and reduces its porosity, making the soil more vulnerable to post-fire runoff and erosion. When organic compounds are moved downward in the soil by vaporization and condensation, they can cause the soil to become water-repellent, increasing post-fire runoff and erosion, and causing surface rill erosion. The greatest change in physical soil properties occurs when smoldering fires burn for long periods (USDA 2005). High temperatures can also cause clays in the first couple of centimeters of the soil profile to become less cohesive.

When organic matter is combusted, the stored nutrients are either volatilized or are changed into highly available forms that can be readily taken up by microbial organisms and vegetation. Nutrients that are not immobilized are easily lost by leaching or surface runoff and erosion. The amount of change in organic matter and soil nitrogen is directly related to the magnitude of soil heating and the severity of the fire. Nitrogen is easily volatilized and lost from the site at relatively low temperatures. Cations (calcium, magnesium, potassium, sodium, and ammonia) are not easily volatilized and usually remain on the site in a highly available form. An abundance of cations can be found in the thick ash layers (or ash-bed) remaining on the soil surface following high-severity fires (USDA 2005).

Post-fire water quality can be affected by increased sediment, increased nitrates, and the possible introduction of heavy metals from soils. Effects to water quality are often associated with fire severity; the more severe the fire, the greater the amount of fuel consumed and nutrients released, which can potentially affect water quality. As plant material is combusted, some metals are volatized (copper, iron, manganese, and zinc) and others are converted into oxides and deposited in ash (calcium, magnesium, and potassium). Oxides have low solubility until they react with carbon dioxide and water and become vulnerable to loss through leaching and overland flow. Sediment transport can also move relatively high levels of nutrients and heavy metals to downstream areas (USDA 2005).

4.3.2 Methods

Nineteen samples were collected during the sediment investigation at a variety of depths and soil types from the seven borings (Figure 1) drilled in July 2017. They were analyzed for polycyclic aromatic hydrocarbons (PAHs), metals, and nutrients, to characterize sediment quality. Some of the sediment had lenses of black organic matter or leaf litter and debris, even at depth. These samples may be associated with erosion that occurred after major fires in the watershed (such as Marble Cone). Table 9 provides the boring number, the depth, and a description of the soil type for each sample tested.

Analyses of sediment samples were performed for metals using method 6010B, PAHs using method 8270-SIM, and nutrients and pH using wet chemistry methods (ammonia, Total Kjeldahl Nitrogen [TKN],

total phosphate, sulfide, and total organic carbon). Chemical analyses were performed at Curtis & Tompkins Laboratories in Berkeley, California.

Table 9 Samples Analyzed for Sediment Quality

Sample ID	Boring	Depth (feet)	General Soil Type
B-1-S01A	B-1	6.75	Organic soil, fines, trace sand, with wood fragments
B-1-S02A	B-1	21.25	Organic soil, fines, trace sand
B-2-S01A	B-2	2	Organic soil, fines, with small sticks
B-2-S02A	B-2	10	Organic soil, fines, with black organic lenses
B-2-S03A	B-2	19.75	Organic soil, fines, silty sand lenses with leaf litter
B-3-S01A	B-3	1.4	Organic soil, with vegetative debris
B-3-S02A	B-3	21.7	Silty sand to sand silt, with charcoal lens and leaf/stick debris
B-4-S01A	B-4	1.75	Organic soil, sandy silt, with grass and leaves
B-4-S02A	B-4	11.25	Sandy silt, sand, fines, with organic debris and leaf mat
B-5-S01A	B-5	1.75	Silty sand to sand silt with organic soil, sand, fines, with organic debris
B-5-S02A	B-5	23.7	Well-graded sand, trace gravel
B-5-S03A	B-5	33.6	Silty sand to sand silt, sand, fines, with lens of black organics
B-5-S04A	B-5	39	Silty sand, sand lens, gravel, with silt and charcoal
B-6-S01A	B-6	24.5	Silty sand, sand, fines, with trace organic debris
B-6-S02A	B-6	33	Silty sand, sand, fines, with trace organic debris and occasional black beds
B-6-S03A	B-6	43	Silt and sand, with minor organic debris
B-7-S01A	B-7	25.5	Silty sand, sand, fines, with organic debris
B-7-S02A	B-7	35.75	Sandy silt, sand
B-7-S03A	B-7	44.5	Poorly graded sand with silt, sand, fines, with black silt lens

4.3.3 Results

As a general rule, the total amount of chemical elements is not increased by fire, but instead a fire changes the form of different elements, and in many cases, makes them more available to plants and other biological organisms. Wildfires increase available organic carbon and nitrogen, but high-intensity burns can volatize these constituents (USDA 2005). Table 10 shows nutrients, pH, and major cations from the sediment samples collected for analysis—many of which show physical characteristics consistent with fire-impacted watersheds.

Organic carbon can be produced in situ from biological activity or can be transported from upland areas in the form of organic debris (leaves, stems, and twigs) or ashy and unburned materials. Higher concentrations of organic carbon were found in both surface layers and in samples collected at depth. Although concentrations were generally above the lowest effect level, concentrations were below screening levels associated with severe effects (see Table 10). Buried deposits are likely associated with the transport of upland material during large storm events.

Bioavailable nitrogen (organic nitrogen and ammonia) can be produced in the reservoir or be transported with organic materials from upland areas. Available nitrogen can increase in soils post-fire, particularly ammonia, but is often used by plants within the first few years after burning (USDA 2005). Ammonia concentrations were higher in sediments collected from boring B-1, and in samples B-2-S02A, B-2-S03A, B-5-S04A, and B-6-S03A. TKN, which is the combination of ammonia and organic nitrogen, was also high in samples B-1-S02A, B-5-S04A, and B-6-S03A. Many of these samples were above moderate effect concentrations, but only the highest sample for ammonia was above screening levels for severe effects

(see Table 10). Higher ammonia concentrations at depth could be associated with post-fire inputs or the breakdown of organic debris.

The combustion of organic matter leaves a relatively large amount of available phosphorus in surface ash immediately following fires. However, under the high pH conditions typically found after fires, phosphorus is immobilized if calcium carbonate is also present in ash (USDA 2005). At low pH, phosphorus can also form insoluble compounds with iron. Higher levels of phosphorus were found in samples B-1-S01A, B-2-S02A, B-3-S01A, and B-5-S02A. These concentrations were below screening levels (see Table 10).

In many cases, soil cation concentrations (calcium, magnesium, sodium, and potassium) also increase following wildfires. Monovalent cations, such as sodium and potassium, are largely present as chlorides and carbonates that are readily mobilized. Divalent ions, such as calcium and magnesium, are less mobile and are commonly present as oxides and carbonates (USDA 2005).

Combustion of plants and natural materials also releases metals and PAHs, which can be lost the environment. However, atmospheric deposition rates of copper, lead, and zinc can also increase post-fire due to smoke and ash, with ash having high pH (Stein and Brown, 2009).

Table 10 Nutrients, pH, and Major Cations

Sample ID	Total Organic Carbon (%)	Ammonia (mg/kg)	TKN (mg/kg)	Total Phosphorus (mg/kg)	pH	Calcium (mg/kg)	Magnesium (mg/kg)	Potassium (mg/kg)	Sodium (mg/kg)
B-1-S01A	3.2	120	<100	120	6.5	6,400	9,100	4,400	190
B-1-S02A	5	280	3,400	3.6	6.7	9,400	8,600	3,700	150
B-2-S01A	2.1	56	1,700	40	6.6	3,600	3,900	1,700	130
B-2-S02A	3.3	84	1,500	130	6.6	6,000	8,600	4,400	150
B-2-S03A	2.4	74	1,200	2.4	6.9	4,400	8,400	5,500	170
B-3-S01A	4.8	11	2,300	100	6.2	4,700	5,300	2,800	150
B-3-S02A	1.3	15	990	48	6.3	2,300	7,400	5,100	150
B-4-S01A	4.3	21	2,300	4.4	7	5,000	5,500	2,800	120
B-4-S02A	0.66	18	440	4.7	6.2	2,300	8,400	6,000	180
B-5-S01A	4.5	28	1,600	13	6.93	6,800	7,700	3,900	170
B-5-S02A	0.05	<9.3	250	130	7.1	1,500	5,700	4,500	150
B-5-S03A	3.7	49	1,500	18	7	5,600	9,000	5,800	190
B-5-S04A	3	90	2,300	2.1	7	8,400	11,000	5,500	170
B-6-S01A	0.96	14	660	56	6.4	2,900	9,100	6,700	150
B-6-S02A	1.5	25	1,100	2.2	6.9	4,600	9,300	6,100	190
B-6-S03A	4.1	74	2,400	5.1	7.1	7,100	6,900	3,900	130
B-7-S01A	0.61	15	750	8.5	6.2	2,500	8,600	6,400	200
B-7-S02A	2.5	51	1,600	4.1	6.8	5,200	9,600	5,100	190
B-7-S03A	0.29	13	230	9.2	6.4	2,800	4,400	2,900	290
Effect Thresholds[1]									
None	—	0-40	—	—	—	—	—	—	—
Moderate	1	40-200	550	600	—	—	—	—	—
High	10	>200	4,800	2,000	—	—	—	—	—

Note:

mg/kg = milligrams per kilogram

[1] Source: Washington State Department of Ecology 1995

4.3.4 Sediment Quality Guidelines

Tables 11 and 12 provide results for the metals, mercury, and PAHs and compare these results to aquatic health and human health thresholds for freshwater sediments. PAHs are a class of compounds consisting of two or more fused aromatic rings. PAHs are produced from both petrogenic (e.g., crude oil) and pyrogenic (e.g., incomplete combustion of organic substances such as fuels or wood) sources.

4.3.4.1 Biological Effects

The biological effects-based concentrations shown in Tables 11 and 12 include freshwater sediment thresholds below which effects to aquatic species are unlikely and thresholds above which effects to aquatic species are likely. The lower range effect levels are described in scientific literature under a variety of names, including “threshold effects levels” or TELs, “effects range low” or ER-L, and “threshold effect concentrations” or TECs. The upper range effect levels include “probable effects levels” or PELs, “range effects median” or ER-M, “probable effect concentrations” or PECs, and “upper effects thresholds” or UETs (EPA 2002, Corps 2007).

A no effect or lower range effect threshold was exceeded for chromium, nickel, and zinc in at least one sample. This indicates a potential risk to sensitive and special-status aquatic species from these sediments. If reservoir sediments are similar to creek background concentrations, there could be little to no additional risk from these sediments. Background concentrations in the creek downstream of the dam are not well characterized; however, given that the sediment in the reservoir is derived from the same geologic units as the sediment that passes the reservoir, there may be no additional risk posed by the reservoir sediment to sensitive and special-status aquatic species.

4.3.4.2 Material Handling Considerations

The environmental screening levels shown in Tables 11 and 12 are for human-health based effects. The Tier 1 environmental screening level is the threshold for unrestricted exposure to soils. The shallow soil exposure threshold for nonresidential areas applies where contamination is only found in the first few inches of the soil. The threshold for exposure of construction workers to “any land use/any soil depth” is also included and would be applicable to construction work that includes deep excavations (SF Bay RWQCB 2016).

Two samples had detections for arsenic above all three of these thresholds, and three samples had naphthalene detections above the Tier 1 screening level. The arsenic concentrations were within typical background levels for California (<11 mg/kg; Duvergé 2011) and were also within risk management levels for construction. The Tier 1 screening level for naphthalene is based on groundwater leaching to drinking water sources, not direct exposures to workers.

When these environmental screening levels are exceeded, a more comprehensive risk-based analysis is recommended based on the ultimate use of these sediments. A risk analysis considers the nature of the construction activity, the basis of the risk, the duration of contact, and variations in the soil profile. The results of the risk analysis would provide information on whether specific protection measures, such as personal protection equipment or limited work hours, are needed.

4.3.4.3 Sediment Disposal

The hazardous waste characterization criteria shown in Table 11 provide a general indication of whether additional waste characterization would be needed for offsite disposal of the reservoir sediments. Wet leaching procedures are required prior to analysis of sediment samples to allow for direct comparison to

the hazardous waste thresholds; the total metals results represent the upper limit of possible concentrations in leachate after wet leaching procedures.

Although there are three metals that could be above sediment quality guidelines for aquatic toxicity (chromium, nickel, and zinc), these elements typically are not enriched during wildfires. Other constituents which are enriched post-fire, such as nutrients and cations, do not cause aquatic toxicity at concentrations found in the sediments. Increased nutrients could cause biostimulatory effects, but low to moderate levels of nutrients are unlikely to cause eutrophication or depress dissolved oxygen levels in downstream areas. Based on the results of the chemical testing, it is anticipated that there would not be any issues associated with the release of the sediment during flooding events, disposal of the sediment in upland locations, or placement of the sediment in locations along the Carmel River that could distribute the sediment into the river during flooding events.

Table 2 Metals in Reservoir Sediments

Sample ID	Sample Concentration (mg/kg)																		
	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
Metals Concentration in Reservoir Sediments[1]																				
B-1-S01A	20,000	<2	**1.7**	220	0.83	0.45	**39**	13	21	26,000	6	500	0.25	**32**	<2	<0.25	<0.5	55	100	0.029
B-1-S02A	21,000	<2	<1.5	230	0.92	0.47	37	12	19	24,000	6.3	650	<0.26	**24**	<2	<0.26	<0.53	56	79	0.037
B-2-S01A	9,400	<1.9	<1.4	92	0.45	0.32	17	5.6	9.4	14,000	2.9	270	0.31	15	<1.9	<0.24	<0.47	27	41	0.023
B-2-S02A	19,000	<2	<1.5	210	0.83	0.45	34	10	14	24,000	4	600	<0.25	**21**	<2	<0.25	<0.49	53	70	0.022
B-2-S03A	13,000	<2	<1.5	160	0.66	0.32	34	8.6	9.9	22,000	1.8	310	<0.26	**19**	<2	<0.26	<0.51	52	65	0.018
B-3-S01A	11,000	<2	<1.5	110	0.55	0.31	23	6.3	9.4	14,000	2.3	210	<0.28	15	<2	<0.28	<0.56	34	**130**	0.017
B-3-S02A	12,000	<1.9	<1.5	140	0.61	0.3	29	6.7	9.5	20,000	1.5	220	<0.24	17	<1.9	<0.24	<0.49	45	54	<0.017
B-4-S01A	12,000	<1.9	<1.4	150	0.55	0.27	20	5.1	8.5	14,000	2.5	370	<0.23	17	<1.9	<0.23	<0.47	29	45	<0.017
B-4-S02A	13,000	<1.9	<1.4	140	0.63	0.28	29	7	8.2	22,000	<0.94	220	<0.24	18	<1.9	<0.24	<0.47	47	66	<0.016
B-5-S01A	16,000	<2	<1.5	200	0.71	0.31	33	7.7	13	19,000	3.2	430	<0.26	**20**	<2	<0.26	<0.53	44	83	0.039
B-5-S02A	9,400	<2	<1.5	110	0.42	<0.27	18	4.5	13	15,000	<1	140	<0.27	12	<2	<0.27	<0.53	31	40	<0.015
B-5-S03A	17,000	<2	<1.5	200	0.78	0.38	35	8.2	13	24,000	2.7	430	<0.26	**21**	<2	<0.26	<0.52	53	65	0.022
B-5-S04A	22,000	<2	<1.5	240	0.99	0.45	**42**	10	13	28,000	4.2	490	<0.27	**22**	<2	<0.27	<0.55	64	78	0.025
B-6-S01A	15,000	<2	<1.5	180	0.73	0.34	36	7.1	11	23,000	1.4	310	<0.26	**19**	<2	<0.26	<0.53	55	110	<0.016
B-6-S02A	16,000	<2	<1.5	200	0.72	0.29	33	7.5	9.1	24,000	1.9	400	<0.27	18	<2	<0.27	<0.54	51	65	<0.016
B-6-S03A	14,000	<2	<1.5	190	0.7	0.33	28	6.5	11	18,000	4	400	0.32	14	<2	<0.25	<0.51	43	54	0.018
B-7-S01A	14,000	<1.8	<1.4	150	0.67	0.33	33	7.2	10	23,000	1.2	260	<0.23	**19**	<1.8	<0.23	<0.45	50	61	<0.018
B-7-S02A	19,000	<1.9	**1.7**	190	0.93	0.5	**38**	10	19	27,000	3.9	530	0.53	**31**	<1.9	<0.24	<0.48	56	75	0.023
B-7-S03A	8,600	<2	<1.5	77	0.38	<0.25	15	4.2	4.9	12,000	1	130	<0.25	9.5	<2	<0.25	<0.5	25	32	<0.018
Biological Effects Based Concentrations for Freshwater Sediments[2,3]																				
TEL	25,500	—	5.9	—	—	0.596	**37.3**	—	35.7	—	35	—	—	**18**	—	—	—	—	**123**	0.174
ER-L	—	—	33	—	—	5	80	—	70	—	35	—	—	**30**	—	—	—	—	**120**	0.15
TEC	—	—	9.79	—	—	0.99	43.4	—	31.6	—	35.8	—	—	**22.7**	—	—	—	—	**121**	0.18
PEL	—	—	17	—	—	3.53	90	—	197	—	91.3	—	—	36	—	—	—	—	315	0.486
ER-M	—	—	85	—	—	9	145	—	390	—	110	—	—	50	—	—	—	—	270	1.3
PEC	—	—	33.0	—	—	4.98	111	—	149	—	128	—	—	48.6	—	—	—	—	459	1.06
UET	—	3	17	—	—	3	95	—	86	40,000	127	1,100	—	43	—	4.5	—	—	520	0.56
Environmental Screening Levels for Soils (Human Health)[3]																				
Tier 1 ESL	—	31	**0.067**	3,000	42	39	120K	23	3,100	—	80	—	390	86	390	390	0.78	390	23,000	13
Construction Worker	—	142	**0.98**	3,000	42	43	530K	28	14,000	—	160	—	1,800	86	1,700	1,800	3.5	470	110k	44
Shallow Soil Exposure	—	467	**0.31**	220K	2,200	580	1.8M	350	47,000	—	320	—	5,800	11,000	5,800	5,800	12	5,800	350K	190
Hazardous Waste Characterization for Soils[4]																				
STLC x10	—	150	50	1,000	7.5	10	50	800	250	—	50	—	3,500	200	10	50	70	240	2,500	2
TTLC	—	500	500	10,000	75	100	2,500	8,000	2,500	—	1,000	—	3,500	2,00	100	500	700	2,400	5,000	20

Notes:

1. Red numbers indicate an exceedance of biological effects or human health screening levels.
2. Biological effects are ***unlikely*** when concentrations are below the TEL, ER-L, or consensus-based TEC. Biological effects are ***likely*** when concentrations are above the PEL, ER-M, consensus-based PEC or UET.
3. Bold numbers indicate the criteria that have been exceeded by at least one sample.
4. The STLC procedure (wet leachate) is recommended when soil/sediment concentrations are greater than the 10x Factor shown. STLC procedures characterize WET soluble concentrations (mg/L), not total metals (mg/kg).

Key:
ER-L = Effects Range Low
ER-M = Effects Range Median
ESL = Environmental Screening Level
mg/kg = milligrams per kilogram
PEC = Probable Effect Concentration
PEL = Probable Effects Level
STLC = Soluble Threshold Limit Concentration
TEC = Threshold Effect Concentration
TEL = Threshold Effects Level
TTLC = Total Threshold Limit Concentration
UET = Upper Effects Threshold

Sources: EPA 2002; Corps 2007; NOAA 2008; SF Bay RWQCB 2016

Table 12. PAHs in Reservoir Sediments

Sample ID	Sample Concentration (µg/kg)															
	Acenaphthene	**Acenaphthylene**	**Anthracene**	**Benzo(a) anthracene**	**Benzo(a) pyrene**	**Benzo(b) fluoranthene**	**Benzo(g,h,i) perylene**	**Benzo(k) fluoranthene**	**Chrysene**	**Dibenz(a,h) anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(1,2,3-cd) pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
PAH Concentration in Reservoir Sediments[1]																
B-1-S01A	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31
B-1-S02A	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	**14**	<10	<10
B-2-S01A	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500
B-2-S02A	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	6	<5	**7.9**	<5	<5
B-2-S03A	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5.2	<5	<5	<5	<5
B-3-S01A	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250
B-3-S02A	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
B-4-S01A	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130
B-4-S02A	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
B-5-S01A	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
B-5-S02A	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
B-5-S03A	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
B-5-S04A	<42	<42	<42	<42	<42	<42	<42	<42	<42	<42	<42	<42	<42	<42	<42	<42
B-6-S01A	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15
B-6-S02A	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	8.8	<5	**8.4**	<5	<5
B-6-S03A	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
B-7-S01A	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15
B-7-S02A	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
B-7-S03A	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Biological Effects Based Concentrations for Freshwater Sediments																
TEL	—	—	—	31.7	31.9	—	—	—	57.1	—	111	21.2	—	34.6	41.9	53
ER-L	—	—	85	230	400	—	—	—	400	60	600	35	—	340	225	350
TEC	—	—	57.2	108	150	—	—	—	166	33.0	423	77.4	—	176	204	195
PEL	—	—	—	385	782	—	—	—	862	—	2,355	114	—	391	515	875
ER-M	—	—	960	1,600	2,500	—	—	—	2,800	—	3,600	640	—	2,100	1,380	2,200
PEC	—	—	845	1,050	1,450	—	—	—	1,290	—	2,230	536	—	561	1,170	1,520
UET	290	160	260	500	700	—	300	13,400	800	100	1,500	300	330	600	800	1,000
Environmental Screening Levels for Soils (Human Health)[2]																
Tier 1 ESL	16.3	12.7	2.85	0.16	0.16	1.57	2.50	0.016	3.84	0.016	60.4	8.94	0.16	**0.033**	10.7	85.1
Construction Worker	10,000	—	50,000	16.0	16.0	155	—	1.60	1,500	1.60	6,700	6,700	16.0	348	—	5,000
Shallow Soil Exposure	45,000	—	226,000	2.89	2.89	28.9	—	0.29	262	0.29	30,000	30,000	2.89	14.3	—	23,000

Notes:

1. Red numbers indicate an exceedance of human health screening levels.
2. Bold numbers indicate the criteria that have been exceeded by at least one sample.
3. The STLC procedure (wet leachate) is recommended when soil/sediment concentrations are greater than the 10x Factor shown. TCLP and STLC procedures characterize WET soluble concentrations (mg/L), not total metals (mg/kg).

Key:
ER-L = Effects Range Low
ER-M = Effects Range Median
ESL = Environmental Screening Level
µg/kg = micrograms per kilogram
PEC = Probable Effect Concentration
PEL = Probable Effects Level
STLC = Soluble Threshold Limit Concentration
TEC = Threshold Effect Concentration
TEL = Threshold Effects Level
UET = Upper Effects Threshold

Sources: EPA 2002; Corps 2007; NOAA 2008; SF Bay RWQCB 2016

5. Conclusions

The sediment that has been trapped behind Los Padres Dam has been generally characterized into three zones: Zone 1 (basin and pro-delta), Zone 2 (delta), and Zone 3 (delta top).The boundary between the zones is complex due to variations in the reservoir level at the beginning of each water year, the rate at which the reservoir filled each water year, the wetness of each water year, and other factors such as soil availability for erosion following fires in the watershed.

Characterization of the sediment was based on three borings drilled during a previous investigation in 2015, seven borings drilled in July 2017 for the current study, and two pedestrian surveys of the sediment in the upstream reaches of the reservoir area. Zone 1 is primarily silt and organic materials grading to fine-grained sand in the upstream direction. Zone 2 is primarily fine- to medium-grained sand with layers of silt and fine-grained sand that are similar to Zone 1. Zone 3 is coarser than Zone 2 and increases in coarseness in the upstream direction, with higher proportions of gravel and cobble being observed at the upstream end of the reservoir.

Based on the most current bathymetric and terrestrial surveys, the reservoir capacity in 2017 is about 1,600 AF at NMWS. The study found discrepancies between the pre-dam 1947 contours and current LiDAR and bathymetric surveys that indicate that the reservoir is narrower and has less original capacity than had previously been assumed. The current study estimates that the original capacity of the reservoir is 2,720 AF, about 310 AF less than the previously assumed capacity of 3,030 AF. The total volume of sediment trapped by the reservoir is estimated to be 1,258 AF, 1,120 AF below NMWS and 138 AF above NMWS. The total tonnage of sediment trapped behind the dam is estimated to be in the range of 1,600,000 tons and 2,040,000 tons. The tonnage of fines (silt and clay) in the reservoir is estimated to be between 430,000 to 490,000 tons. The tonnage of coarse materials (sand, gravel, and cobbles) is estimated to be between 1,080,000 to 1,610,000 tons.

Chemical analyses of the sediment samples collected during the 2017 investigation are indicative of being impacted by wildfires that have occurred in the watershed above the reservoir. However, metal and PAH concentrations were found to be at or below the lowest range of the aquatic effect thresholds. The metals found at the threshold levels (chromium, nickel, and zinc) are typically not enriched during wildfires, and concentrations likely reflect natural background levels in the watershed. Overall, the results do not indicate any significant issues for sensitive and special-status aquatic species.

Based on the results of the chemical testing, it is anticipated that there would not be any atypical issues with protection of workers during handling of reservoir sediment or any issues associated with the release of the sediment during flooding events, disposal of the sediment in upland locations, or placement of the sediment in locations along the Carmel River that could distribute the sediment into the river during flooding events.

6. Limitations

AECOM represents that our services were conducted in a manner consistent with the standard of care ordinarily applied as the state of practice in the profession within the limits prescribed by our client. No other warranties, either expressed or implied, are included or intended in this technical memorandum.

Background information, design bases, and other data have been furnished to AECOM by MPWMD and/or third parties, which AECOM has used in preparing this technical memorandum. AECOM has relied on this information as furnished, and is neither responsible for nor has confirmed the accuracy of this information.

The analyses and results presented in this report are for the current study only and should not be extended or used for any other purposes.

7. References

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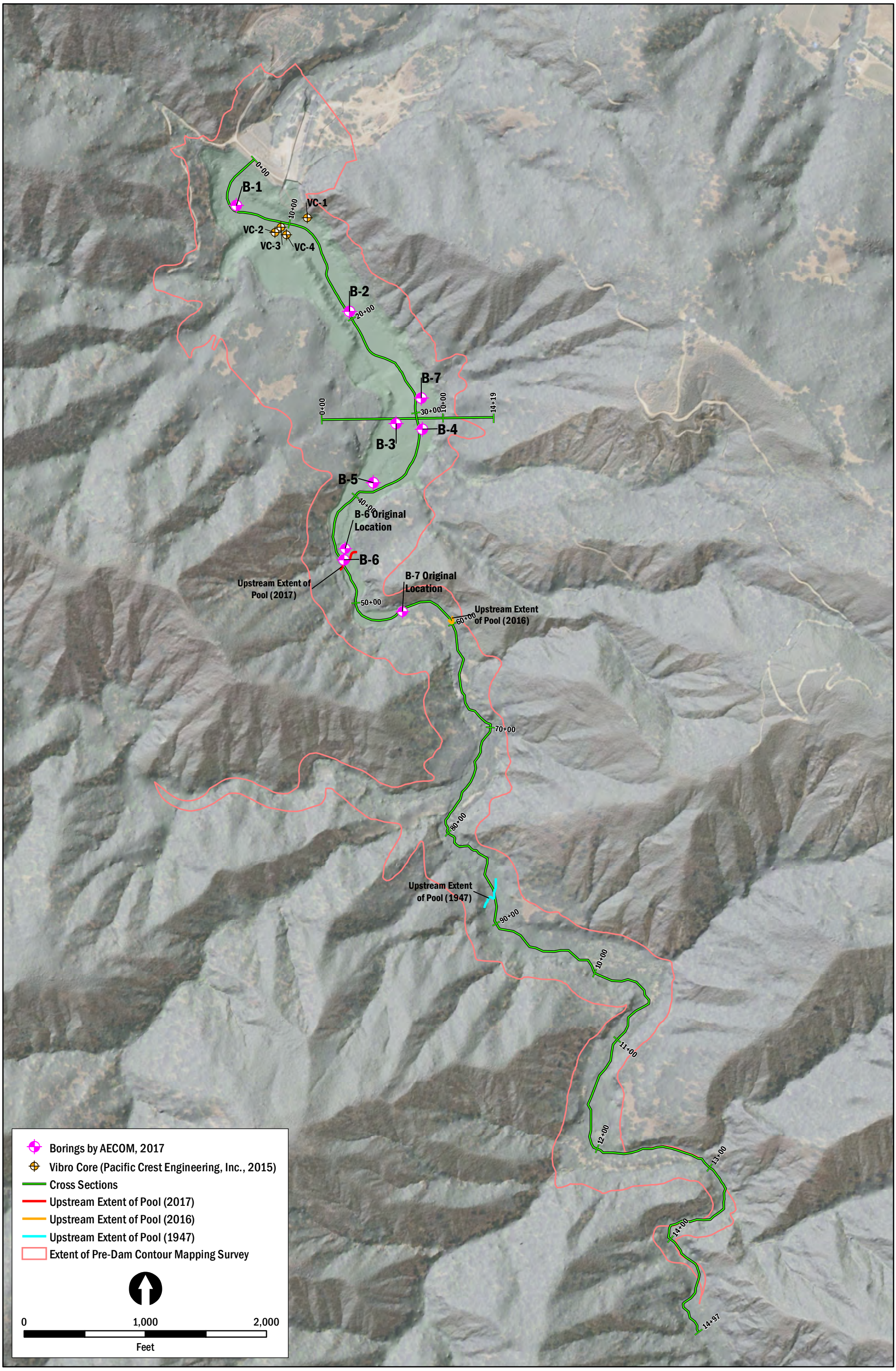
Figures

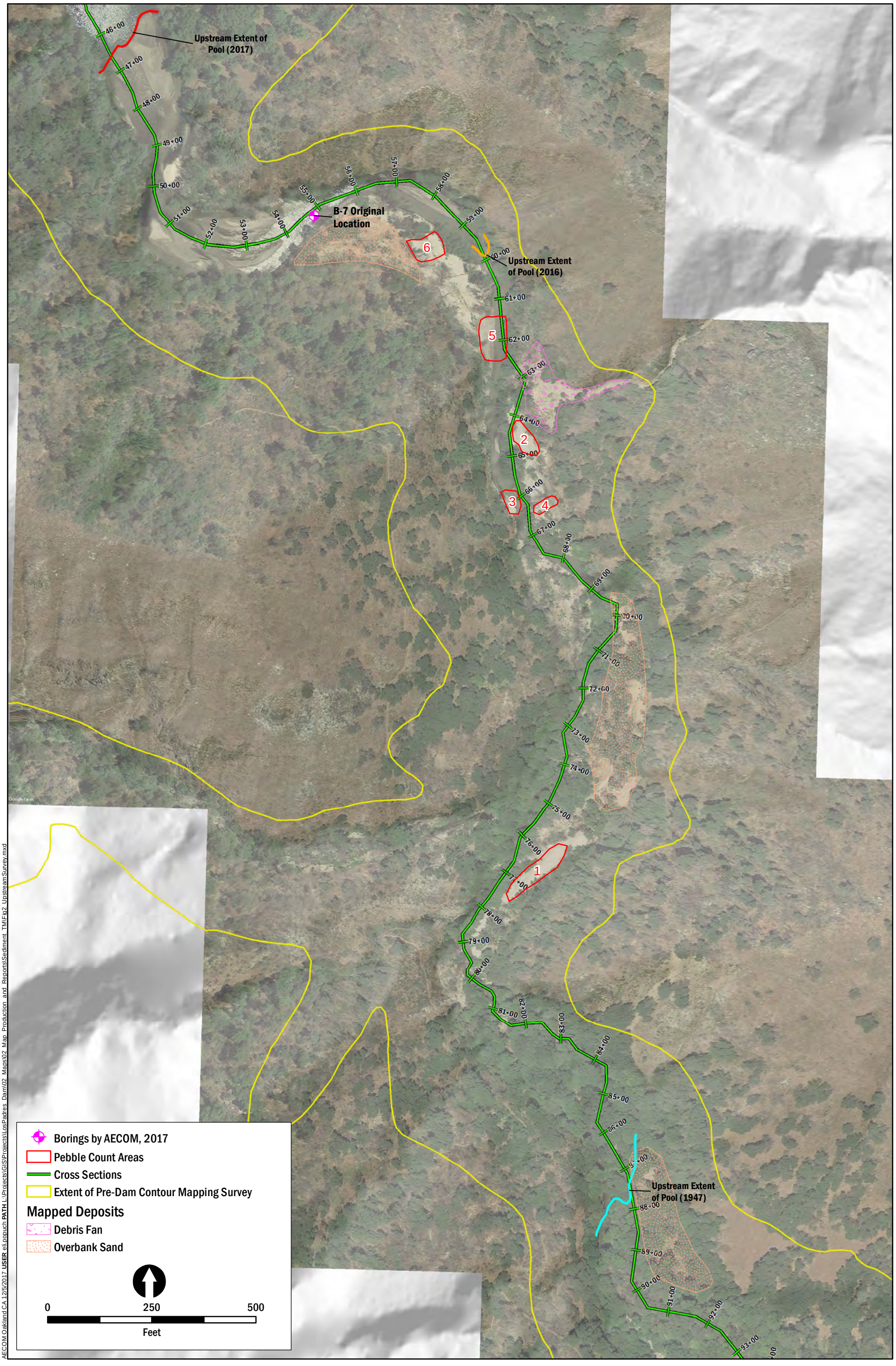


AECOM

Los Padres Dam Alternatives Study

Figure 1

Location of Reservoir Borings



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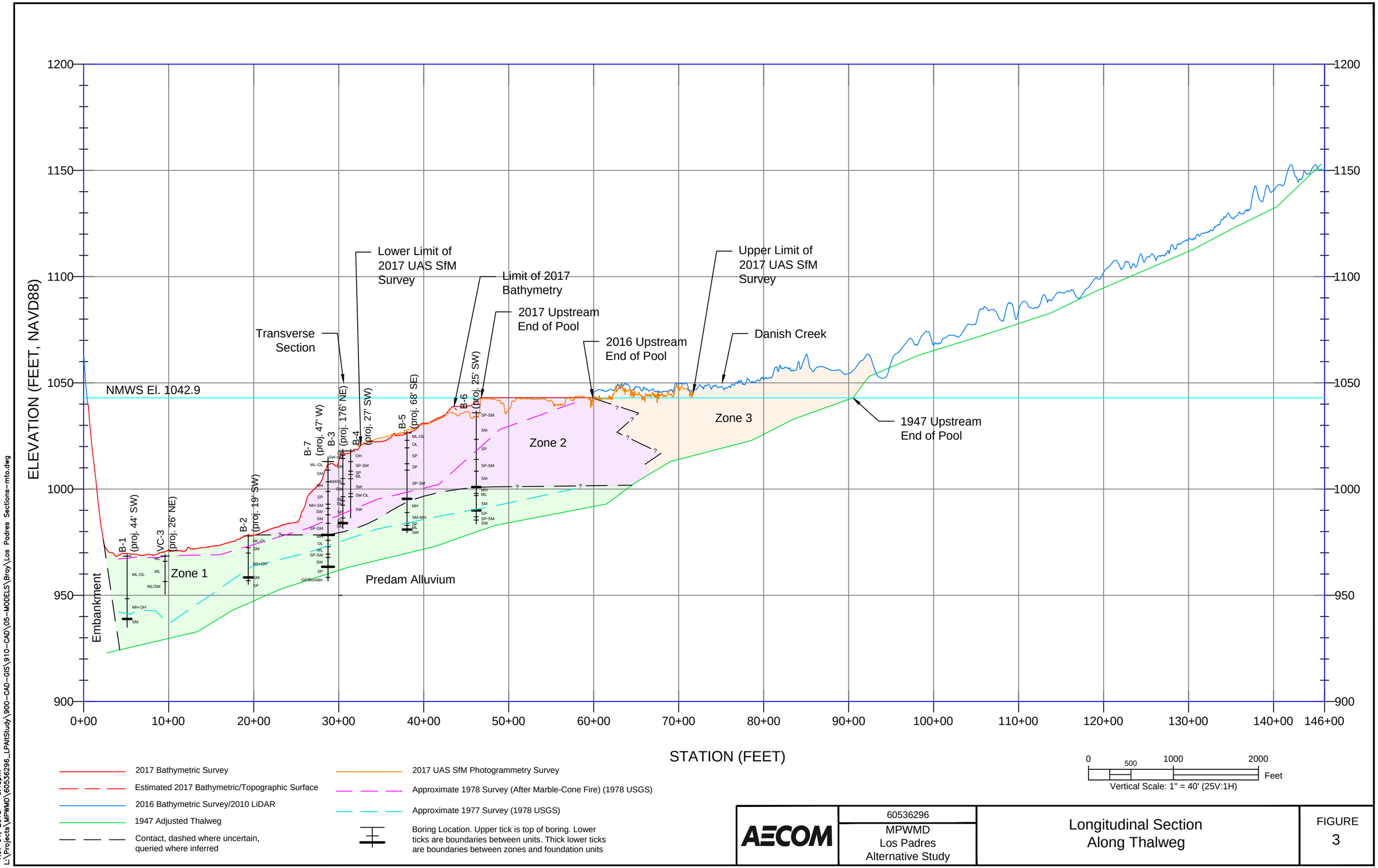
AECOM

Los Padres Dam Alternatives Study

Figure 2

Upstream Survey



AECOM	60536296 MPWMD Los Padres Alternative Study	Longitudinal Section Along Thalweg	FIGURE 3

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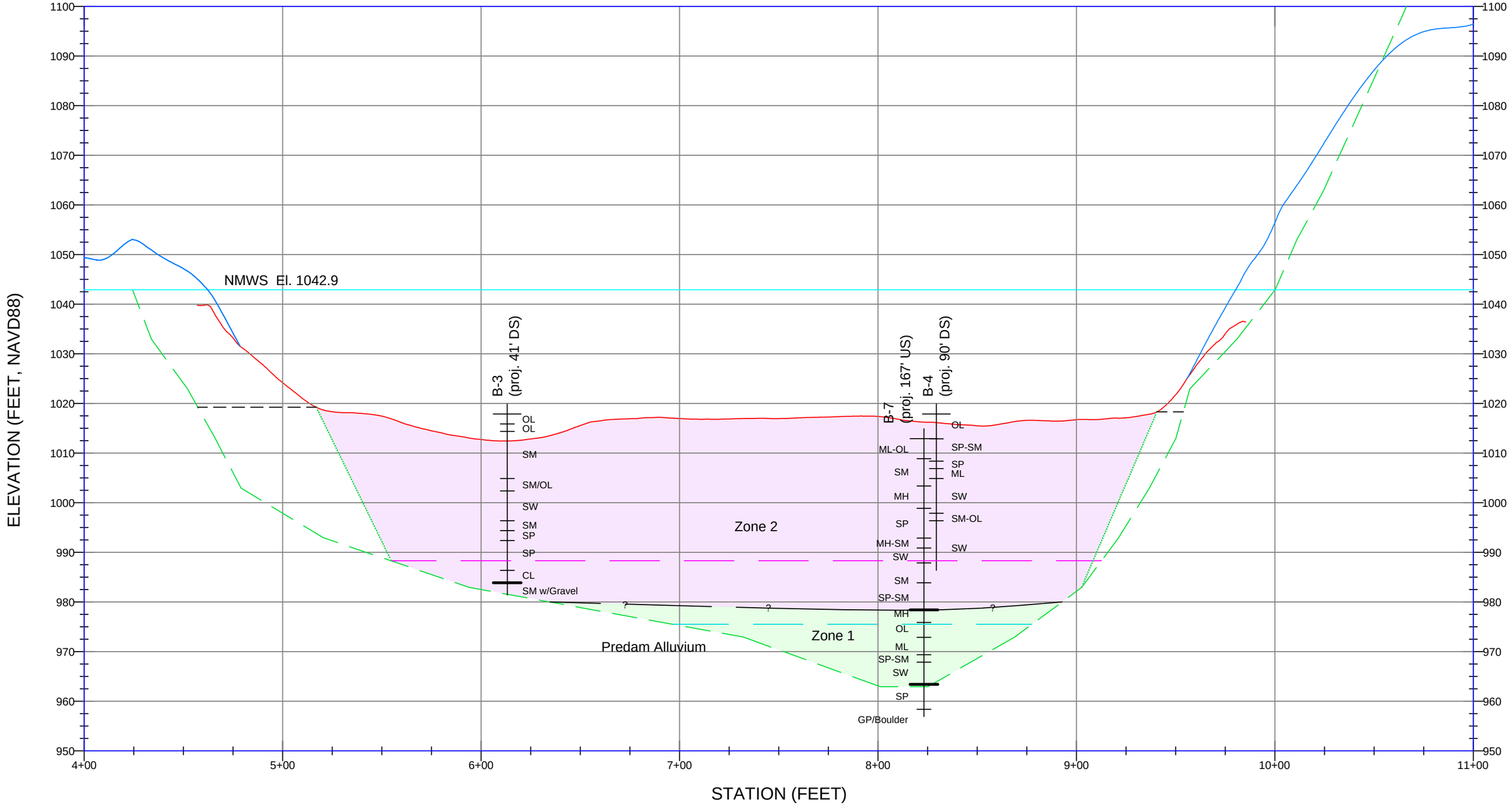

2017 Bathymetric Survey

2016 Bathymetric Survey

Estimated 1949 Surface

Contact, dashed where uncertain, queried where inferred

Projected canyon walls based on 2017 bathymetric survey.

Approximate 1978 Survey (After Marble-Cone Fire) (1978 USGS)

Approximate 1977 Survey (1978 USGS)

Boring Location. Upper tick is top of boring. Lower ticks are boundaries between units. Thick lower ticks are boundaries between zones and foundation units

0 25 50 100 Feet

Vertical Scale: 1" = 20' (2.5V:1H)

AECOM	60536296 MPWMD Los Padres Alternative Study	Transverse Section At Station 30+40	FIGURE 4

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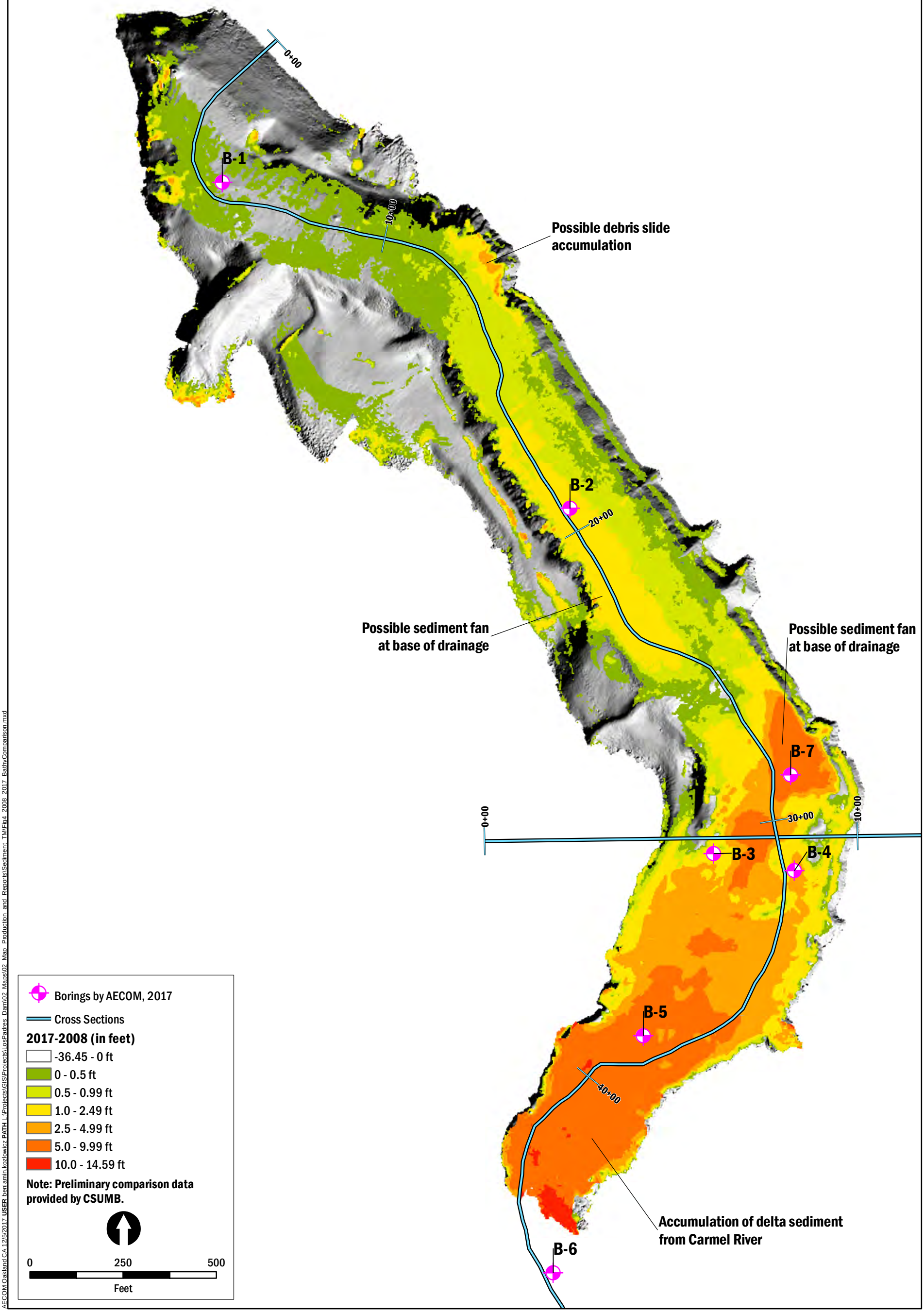
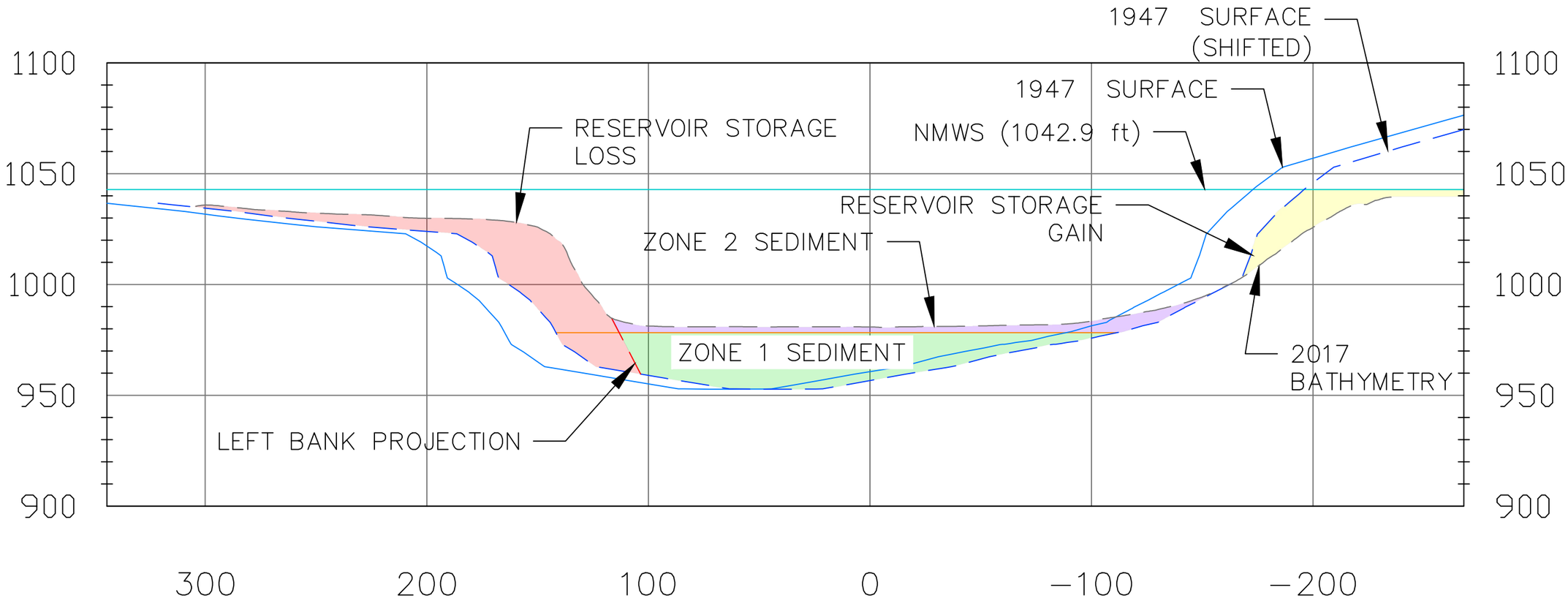


AECOM

Los Padres Dam Alternatives Study

Figure 5

Preliminary Comparison of 2008 Bathymetric Survey and Preliminary 2017 Bathymetric Survey



0 50 100 200 Feet

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AECOM	60536296 MPWMD Los Padres Alternative Study	Example Section of End Area Approach	FIGURE 6

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Appendix A Boring Logs

Appendix A-1 Previous Boring Logs

LOGGED BY EMM DATE DRILLED 7/29/15 CORE DIAMETER 4" BORING NO. VC-1

Core Length, (feet)	Sample No. and Type	Symbol	Soil Description ~ 60' SW of Anchor Location #1, Water Depth 60'	Unified Soil Classification	SPT "N" Value	Plasticity Index	Dry Density (pcf)	Moisture % of Dry Wt.	Misc. Lab Results
1			Organic layer 2 to 3 inches thick, small sub-angular shaped gravels 1/2 to 2 inches in diameter, little or no consistency, saturated						
2	1-1 L		Dark gray SILT, very soft consistency, trace organics, wet	ML			45.2	95.3	Qu= 70 psf
3									
4									
5	1-2		Very compressible, wet, very soft				44.1	96.3	Qu= 80 psf
6									
7	1-3		Very compressible, wet, very soft						
8									
9									
10	1-4		Wet, very soft				44.7	97.9	Qu= 230 psf
11									
12									
13	1-5		Slight increase in consistency, wet, very soft				42.5	102.5	Qu= 260 psf
14			6 inch sand lense, very fine grained Silty SAND, mica, trace organics						
15	1-6 L		Less moisture, moist to wet, very soft						Gravel: 0.0% Sand: 1.9% Silt: 82.0% Clay: 16.1%
16									
17									
18	1-7		Dark gray Silty SAND, very fine grained, clayey, moist	SM			50.1	84.3	
19			Boring terminated at 18 feet. All samples were highly disturbed during the retrieval process.						
20									
21									
22									
23									
24									

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Log of Core Run
Los Padres Dam Fish Passage
Carmel Valley, California

Figure No. 2
Project No. 1101.1
Date: 8/20/15

LOGGED BY EMM DATE DRILLED 7/29/15 CORE DIAMETER 4" BORING NO. VC-2

Core Length, (feet)	Sample No. and Type	Symbol	Soil Description Anchor Location #5, Water Depth 61'	Unified Soil Classification	SPT "N" Value	Plasticity Index	Dry Density (pcf)	Moisture % of Dry Wt.	Misc. Lab Results
1			Dark gray decomposed organics, liquid consistency, no shape, saturated						
2									
3			No sample retrieved, too soft Grades to SILT with organics, saturated, very soft	ML					
4									
5	2-1 L		Compressible, wet, very soft,				44.8	91.9	Qu= 80 psf
6									
7									
8	2-2 L		Slight increase in consistency, less moisture, very soft				43.1	98.4	Qu= 110 psf
9									
10	2-3 L		Wet, very soft				47.7	81.3	Qu= 180 psf
11									
12	2-4 L		Wet, very soft				42.4	91.6	Qu= 170 psf
13	2-5 B		Dark brown well graded SAND with Gravel, wet, loose	SW					Gravel: 32.3% Sand: 63.9% Fines: 3.8%
14			Boring terminated at 13 feet. All samples were highly disturbed during the retrieval process.						
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

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Log of Core Run
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Carmel Valley, California

Figure No. 3
Project No. 1101.1
Date: 8/20/15

LOGGED BY EMM DATE DRILLED 7/29/15 CORE DIAMETER 4" BORING NO. VC-3

Core Length, (feet)	Sample No. and Type	Symbol	Soil Description Anchor Location #3, Water Depth 63'	Unified Soil Classification	SPT "N" Value	Plasticity Index	Dry Density (pcf)	Moisture % of Dry Wt.	Misc. Lab Results
1			Dark gray SILT, very soft, decomposed organics, saturated	ML					
	3-1 L						27.4	177.5	
2			Sand lens, trace organics, very loose						47% Passing
	3-2 B							41.2	#200 Sieve
3	3-3 L		Dark gray SILT, trace sand scattered throughout the sample, wet, very soft	ML			39.5	110.8	94% Passing #200 Sieve
4									
5	3-4 L		Very compressible, sand has diminished, slight clay binder				45.1	82.3	Qu= 70 psf
6									
7									
8	3-5 L		Wet, very soft				45.1	86.9	Qu= 130 psf
9									
10	3-6		Less moisture, slightly higher in consistency but still very soft				40.2	106.5	Qu= 260 psf
11									
12	3-7		Interbedded layers of dark brown SILT and Silty SAND, sand is well graded, trace coarse gravels scattered throughout the sample, compressible, wet, soft	ML/ SM			47.7	80.0	Qu= 320 psf
13									
14									
15	3-8 L		Sand lens, micaceous, wet, soft				50.9	77.4	Qu= 400 psf
16									
17									
18	3-9 L		Highly disturbed sample, wet, soft				43.1	93.0	Qu= 450 psf
			Boring terminated at 18 feet. All samples were highly disturbed during the retrieval process.						
19									
20									
21									
22									
23									
24									

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Log of Core Runs
Los Padres Dam Fish Passage
Carmel Valley, California

Figure No. 4
Project No. 1101.1
Date: 8/20/15

LOGGED BY EMM DATE DRILLED 7/29/15 CORE DIAMETER 4" BORING NO. VC-4

Core Length, (feet)	Sample No. and Type	Symbol	Soil Description Anchor Location #2, Water Depth 62'	Unified Soil Classification	SPT "N" Value	Plasticity Index	Dry Density (pcf)	Moisture % of Dry Wt.	Misc. Lab Results
1-2	4-1 B		Dark brown SILT, very soft consistency, trace organics scattered throughout the sample, organic odor, wet	ML					Gravel: 0.0% Sand: 4.6 % Silt: 81.8% Clay: 13.6%
3-4	4-1 L		Very compressible, wet, soft					129.3	
6-7	4-2 L		Very soft consistency, tree bark up to 2 1/2 inches and segment of tree branch up to 1/2 inch in diameter, slight binder, wet				43.9	91.4	Qu= 110 psf
9	4-3 L		Very compressible, wet, very soft				45.8	84.8	Qu= 190 psf
11-12	4-4 L		Wet, very soft				45.9	86.2	Qu= 300 psf
13	4-5 L		Wet, very soft				42.3	91.9	Qu= 200 psf
14-15	4-6 B		Dark gray Silty SAND with Gravel, trace organics, fractured gravels up to 2 inches in diameter, gravels are rounded to sub-angular and granitic, lenses of silt, micaceous, wet	SM					Gravel: 18.9% Sand: 63.6 % Fines: 17.5%
16	4-7 B		Boring terminated at 16 feet.						

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Log of Core Runs
Los Padres Dam Fish Passage
Carmel Valley, California

Figure No. 5
Project No. 1101.1
Date: 8/20/15

Appendix A-2 Recent Boring Logs

Project: Los Padres Dam Removal Project
Project Location: Monterey County
Project Number: 60536296

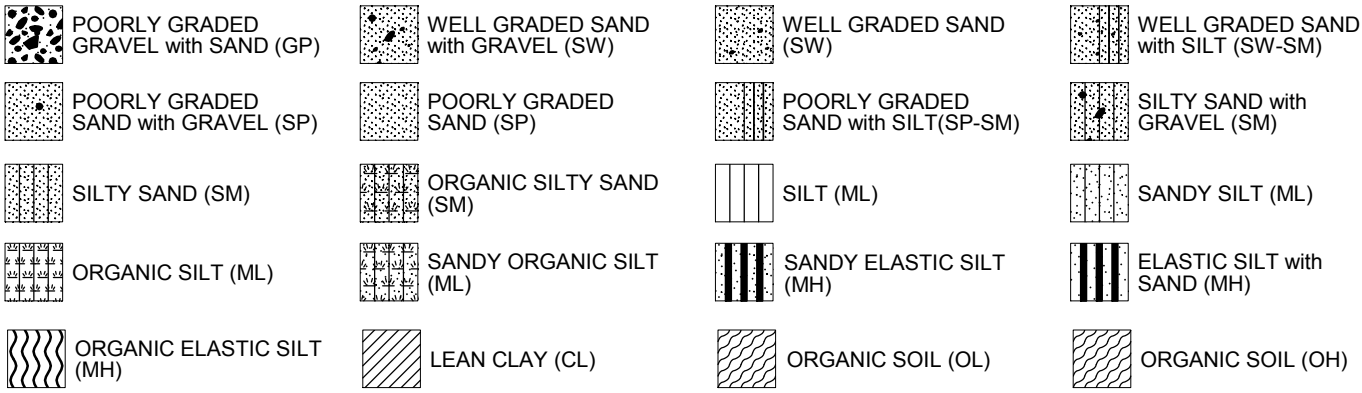
Key to Log of Soil Boring

Elevation feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Sampling Resistance	SAMPLES: Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10	11	12

COLUMN DESCRIPTIONS

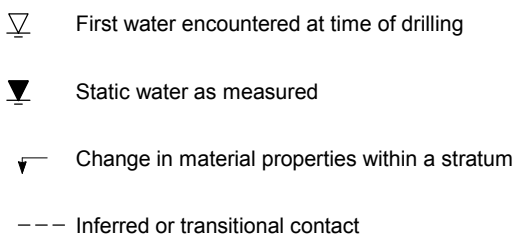
1. **Elevation:** Elevation in feet referenced to specified datum.
2. **Depth:** Depth in feet below the ground surface.
3. **Sample Type:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.
4. **Sample Number:** Sample identification number.
5. **Sampling Resistance:** Number of blows required to advance driven sampler each 6-inch drive interval, or distance noted, using a 140-lb hammer with a 30-inch drop; or down-pressure for pushed sampler.
6. **Recovery:** Percentage of driven or pushed sample length recovered; "NA" indicates data not recorded.
7. **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.
8. **Material Description:** Description of material encountered; may include density/consistency, moisture, color, and grain size.
9. **Dry Unit Weight (pcf):** Dry density of soil sample measured in laboratory, expressed as pounds per cubic foot.
10. **Plasticity Index:** The difference between Liquid Limit (%) and Plastic Limit (%), as measured in the laboratory.
11. **Fines Content, %:** Percent finer than #200 sieve, as measured in the laboratory
12. **Remarks and Other Tests:** Comments and observations regarding drilling or sampling made by driller or field personnel. Other field and lab test results, using the following abbreviations:

TYPICAL MATERIAL GRAPHIC SYMBOLS



TYPICAL SAMPLER GRAPHIC SYMBOLS

OTHER GRAPHIC SYMBOLS



GENERAL NOTES

1. Soil descriptions and contact lines are interpretive. Field descriptions may have been modified to reflect results of lab tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced.

Project: Los Padres Dam Removal Project
Project Location: Monterey County
Project Number: 60536296

Log of Soil Boring B-1

Date(s) Drilled	**7/12/17**	Logged By	**B. Kozlowicz**	Checked By	**D. Simspon**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**N/A**	Total Depth of Borehole	**33.5 feet**
Drill Rig Type	**Barge-mounted CME 45**	Drilling Contractor	**Taber Drilling Company**	NAVD 88 Ground Surface Elevation	**968.4-ft**
Groundwater Level(s)	**Lake elevation at 1042.9-ft NAVD88**	Sampling Method(s)	**1.375" ID SPT, 2.5" ID MC, 2.8" ID Osterberg**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**None**	Borehole Location	**Los Padres Reservoir**	Coordinate Location	**N 2034363.5 E 5775940.0**

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
	0						CLAYEY SILT/ORGANIC SOIL (ML-OL); very soft; black (5Y 2.5/1); 4% fine-grained SAND with mica flakes; 96% low to medium plasticity FINES; with wood fragments --RECENT LAKE SEDIMENT--				S01 acquired with 2.5" I.D. 5-foot long split barrel drive/push tube sampler
			S01		26						
965											
	5						without wood fragments			96	
			S02		100						S02 extracted 6.4-6.9' S01A (analytical sample)
960											
	10						~10% fine- to medium-grained SAND	29			
			S03		100						
955											
	15		S04		40		becomes soft to medium stiff, with trace fine-grained SAND				Osterberg refusal or sampler failure; S04 not retained 4" casing to 14.5'
			S05	25 psi	100		becomes soft; low plasticity FINES; 5% very fine SAND and mica flakes				
950											
	20						CLAYEY SILT/ORGANIC SOIL (MH-OH); soft; black (5Y 2.5/1); 2% fine-grained SAND with mica flakes; 98% high plasticity FINES --RECENT LAKE SEDIMENT--		18	98	
			S06		80						21.0-21.5' S02A (analytical sample)
945											
	25		S07		90			35			
940											
	30			3			SILTY SAND (SM)				Osterberg refusal at 29.5'; 4" casing to 29.5'

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Report: GEO_10B1_OAK; File: LOSPADRES.DAM.GPJ; 9/28/2017 B-1

Project: Los Padres Dam Removal Project
Project Location: Monterey County
Project Number: 60536296

Log of Soil Boring B-1

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
	30										
			S08	14 24 31 31	100		SILTY SAND (SM); dense to very dense; dark grey; fine- to medium-grained SAND; with trace rootlets. Becomes medium- to coarse-grained SAND; with black organic SILT lenses; and angular rock fragments in shoe at 31'				
935							--PREDAM ALLUVIUM-- *(continued)*				
			S09	10 7 10	80		Without organic SILT lenses				S09 not retained
							TOTAL DEPTH = 33.5 FEET				
	35										
930											
	40										
925											
	45										
920											
	50										
915											
	55										
910											
	60										
905											
	65										

Report: GEO_10B1_OAK; File: LOSPADRES.DAM.GPJ; 9/28/2017 B-1

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Project: Los Padres Dam Removal Project
Project Location: Monterey County
Project Number: 60536296

Log of Soil Boring B-2

Sheet 1 of 1

Date(s) Drilled	**7/13/17**	Logged By	**B. Kozlowicz**	Checked By	**D. Simspon**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**N/A**	Total Depth of Borehole	**22.8 feet**
Drill Rig Type	**Barge-mounted CME 45**	Drilling Contractor	**Taber Drilling Company**	NAVD 88 Ground Surface Elevation	**977.9-ft**
Groundwater Level(s)	**Lake elevation at 1042.9-ft NAVD88**	Sampling Method(s)	**2.5" ID MC, 2.75" ID Split Spoon Sampler, 2.8" ID Osterberg**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**None**	Borehole Location	**Los Padres Reservoir**	Coordinate Location	**N 2033479.0 E 5776864.0**

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
	0						CLAYEY SILT/ORGANIC SOIL (ML-OL); very soft; black (2.5/N); low plasticity FINES; with small sticks --RECENT LAKE SEDIMENT--				
975			S01		65		becomes dark olive grey (5Y 3/2) to black (5Y 2.5/2) with fine rootlets				1.6-2.4' S01A (analytical sample)
	5						Very soft to very loose, SANDY ORGANIC SOIL with 30% fine-grained SAND			6	
			S02		65		POORLY GRADED SAND with SILT (SP-SM); very loose; dark grey (4/N); coarsening downward to contain 9% subrounded to subanguluar gravel; 85% fine- to medium-grained SAND; 6% FINES -- RECENT LAKE SEDIMENT/DELTAIC FRONT SLOPE FAILURE/TURBIDITE (?)--				
970							CLAYEY SILT/ORGANIC SOIL (MH-OH); very soft; black (2.5/N) to dark olive gray (5Y 3/2); 4% fine-grained SAND; 96% high plasticity FINES --RECENT LAKE SEDIMENT--		20	96	
	10		S03		100		with no plasticity black organic lenses and fine rootlets				9.8-10.3' S02A (analytical sample)
965											
	15						with organic zones (up to 0.5") with leaf litter (up to 0.75")				
			S04		25		0.1" thick veneer of dark grey, fine-grained SILTY SAND				
							with trace (5%) fine-grained SAND lenses; trace GRAVEL up to 1.5"; abundant woody debris up to 1.5"				
960			S05		20						19.5-20.0' S03A (analytical sample)
	20		S06	25 psi	100		SILTY SAND (SM); very loose; black to very dark grey; 3% fine GRAVEL; 54% fine- to coarse-grained SAND; 43% low plasticity FINES; with abundant wood/leaf litter --PREDAM ALLUVIUM--			43	4" casing to 20'
			S07	18 7 4	0		POORLY GRADED SAND (SP); medium dense; dark grey (4/N); medium- to coarse-grained; subrounded to subangular GRAVEL --PREDAM ALLUVIUM--				4" casing to 21' (refusal) Resampled S07 with SPT w/ catcher blow counts 8-5-5
955							**TOTAL DEPTH = 22.8 FEET**				
	25										
950											
	30										

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Report: GEO_10B1_OAK; File: LOSPADRES.DAM.GPJ; 9/28/2017 B-2

Project: Los Padres Dam Removal Project
Project Location: Monterey County
Project Number: 60536296

Log of Soil Boring B-3

Sheet 1 of 2

Date(s) Drilled	**7/13-7/14/17**	Logged By	**B. Kozlowicz**	Checked By	**D. Simspon**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**N/A**	Total Depth of Borehole	**36.5 feet**
Drill Rig Type	**Barge-mounted CME 45**	Drilling Contractor	**Taber Drilling Company**	NAVD 88 Ground Surface Elevation	**1017.9-ft**
Groundwater Level(s)	**Lake elevation at 1042.9-ft NAVD88**	Sampling Method(s)	**1.375" ID SPT, 2.5" ID MC, 2.75" ID Split Spoon Sampler, 2.8" ID Osterberg**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**None**	Borehole Location	**Los Padres Reservoir**	Coordinate Location	**N 2032559.1 E 5777255.1**

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
	0						ORGANIC SOIL (OL); very soft/loose; very dark grey to black; 80% coarse vegetative debris --2017 LAKE SEDIMENT--				
			S01		80						1.2-1.7' S01A (analytical sample)
1015							WELL GRADED SAND with SILT (SW-SM); very loose; dark grey; fine- to coarse-grained SAND; 5% low plasticity FINES --2017 (?) LAKE SEDIMENT--				
	5		S02		95		SILTY SAND (SM); very loose; very dark grey to black; fine GRAVEL; fine- to coarse-grained SAND; low to no plasticity FINES; with abundant vegetation and interspersed debris; some 1" lenses of vegetation and 2" woody debris --RECENT LAKE SEDIMENT--		NP	31	
1010			S03		100		with coarse-grained SAND lens			29	
	10										
1005			S04		100			31		36	
							SANDY SILT/ORGANIC SOIL (SM/OL); very soft; black; very fine-grained SAND; with 3" leaf mat --RECENT LAKE SEDIMENT--				4" casing to 14'
	15		S05		68		WELL GRADED SAND (SW); loose; dark grey; fine- to coarse-grained SAND; with angular GRAVEL up to 2"; with trace (<5%) no plasticity FINES --ALLUVIUM?--				Rods dropped in hole with sampler. Sand present from 11-12' in casing. Casing cleaned out with tricone.
1000			S06	5 3 4 4	70						4" casing to 18' EOD 7/13/17 BOD 7/14/17
	20						becomes very loose; medium to dark grey; coarsening downward to coarse grained				
			S07	2 1 1	100						4" casing to 20.5'
							2" extra black charcoal lens SILTY SAND with GRAVEL (SM); very loose/very soft; black; 26% fine to coarse GRAVEL; 55% fine-grained SAND; 19% no to low plasticity FINES; with trace rootlets. At 21.5, ~0.5" leaf/stick debris --RECENT LAKE SEDIMENT--				21.3-22.0' S02A (analytical sample)
995			S08		100					19	4" casing to 22.5'; USCS S08 lab test: SM
	25						POORLY GRADED SAND (SP); loose; dark grey; fine-grained SAND; trace no plasticity FINES --RECENT LAKE SEDIMENT--				4" casing to 26'; loose clean sand flowing into casing after cleaning out. Drilled casing with water to 27'.
				10			POORLY GRADED SAND (SP); loose to medium dense; medium grey; trace to 5% rounded GRAVEL; ~90% fine- to medium-grained SAND --ALLUVIUM--				
990			S09	7 8	15		subrounded GRAVEL and COBBLES				
			S10	8 12 12	100					1	S10 28.0-30.0': S09 resampled as 2.75" ID ModCal blow counts 22-10-12-12
	30						occastional small GRAVEL; subangular SAND; disurbed sample				

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Report: GEO_10B1_OAK; File: LOSPADRES.DAM.GPJ; 9/28/2017 B-3

Project: Los Padres Dam Removal Project
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Log of Soil Boring B-3

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
	30						POORLY GRADED SAND (SP); loose to medium dense; medium grey; 1% GRAVEL; 98% fine- to medium-grained SAND --ALLUVIUM-- *(continued)*				
985			S11	4 2 4	27		SILTY LEAN CLAY (CL); very soft; black (5Y 2.5/2); low to medium plasticity FINES; trace fine-grained SAND --LAKE SEDIMENT?/ALLUVIUM--				S11 with sand catcher
	35		S12		90		SILTY SAND WITH GRAVEL (SM); loose to medium dense; very dark greyish brown (2.5Y 3/2); 30% rounded GRAVEL to 2.5"; 40% fine- to coarse-grained SAND; 30% low to no plasticity FINES --PREDAM ALLUVIUM--				
			S13	8 9 18	80						
980							**TOTAL DEPTH = 36.5 FEET**				
	40										
975											
	45										
970											
	50										
965											
	55										
960											
	60										
955											
	65										

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Project: Los Padres Dam Removal Project
Project Location: Monterey County
Project Number: 60536296

Log of Soil Boring B-4

Date(s) Drilled	**7/14/17**	Logged By	**B. Kozlowicz**	Checked By	**D. Simspon**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**N/A**	Total Depth of Borehole	**31.5 feet**
Drill Rig Type	**Barge-mounted CME 45**	Drilling Contractor	**Taber Drilling Company**	NAVD 88 Ground Surface Elevation	**1017.9-ft**
Groundwater Level(s)	**Lake elevation at 1042.9-ft NAVD88**	Sampling Method(s)	**2.5" ID MC, 2.75" ID Split Spoon Sampler, 2.8" ID Osterberg**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**None**	Borehole Location	**Los Padres Reservoir**	Coordinate Location	**N 2032515.0 E 5777474.1**

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
	0						ORGANIC SOIL (OH); very soft; black (10 YR 2/1); with SANDY SILT; high plasticity FINES; grass, leaves; and fine organics --2017 LAKE SEDIMENT--		14		
1015			S01		100						1.5-2.0' S01A (analytical sample)
	5		S02		95		POORLY GRADED SAND with SILT (SP-SM); very loose; dark grey; 3% GRAVEL; 92% medium- to coarse-grained SAND; 5% no plasticity FINES; fines upward with occasional, large woody debris --2017 (?) LAKE SEDIMENT--			5	4" Casing to 4.5'
1010											
	10		S03		100		Coarse-grained, subrounded, clean SAND; 9.8-10.4': log with organic debris POORLY GRADED SAND (SP); very loose; fine- to medium-grained SAND; trace low plasticity FINES; occasional small wood SANDY SILT (ML); very soft; black; fine-grained SAND; no to low plasticity FINES; abundant organic debris; leaf mat --RECENT LAKE SEDIMENT--				10.9-11.5' S02A (analytical sample) 4" Casing to 14.5'
1005											4' of sand into casing; driller pulled casing up reinserted to 14.5'; pumped water and sand out
	15		S04	25 to 150 psi	90		POORLY GRADED SAND (SP); loose; dark grey to black; with SILTY SAND to SANDY SILT organic interbeds and minor organic debris --ALLUVIUM/LAKE SEDIMENT--			23	
1000											
	20		S05	5 4 4 5	40		SILTY SAND/ORGANIC SOIL (SM-OL); loose; dark grey to black; with abundant organic debris and 0.3' leaf mat; angular COBBLES up to 3" --ALLUVIUM/LAKE SEDIMENT--				
			S06	3 4 5 6	90					6	
995							WELL GRADED SAND (SW); loose to medium dense; dark grey; fine- to coarse-grained SAND; up to 12% subangular to subrounded GRAVEL and COBBLES; locally fine- to medium-grained SAND with SILT --ALLUVIUM/LAKE SEDIMENT--				
	25		S07	8 6 6 8	70						4" Casing to 24.5'
990											
	30			6							

Report: GEO_10B1_OAK; File: LOSPADRES.DAM.GPJ; 9/28/2017 B-4

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Project: Los Padres Dam Removal Project
Project Location: Monterey County
Project Number: 60536296

Log of Soil Boring B-4

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
	30		S08	7 10 12	75		WELL GRADED SAND (SW); loose to medium dense; dark grey; fine- to coarse-grained SAND; up to 12% subangular to subrounded GRAVEL and COBBLES; locally fine- to medium-grained SAND with SILT --ALLUVIUM/LAKE SEDIMENT-- *(continued)* **TOTAL DEPTH = 31.5 FEET**				
985	35										
980	40										
975	45										
970	50										
965	55										
960	60										
955	65										

Report: GEO_10B1_OAK; File: LOSPADRES.DAM.GPJ; 9/28/2017 B-4

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Project: Los Padres Dam Removal Project
Project Location: Monterey County
Project Number: 60536296

Log of Soil Boring B-5

Sheet 1 of 2

Date(s) Drilled	**7/15/17**	Logged By	**B. Kozlowicz**	Checked By	**D. Simspon**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**N/A**	Total Depth of Borehole	**47.0 feet**
Drill Rig Type	**Barge-mounted CME 45**	Drilling Contractor	**Taber Drilling Company**	NAVD 88 Ground Surface Elevation	**1026.4-ft**
Groundwater Level(s)	**Lake elevation at 1042.9-ft NAVD88**	Sampling Method(s)	**1.375" ID SPT, 2.5" ID MC, 2.75" ID Split Spoon Sampler, 2.8" ID Osterberg**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**None**	Borehole Location	**Los Padres Reservoir**	Coordinate Location	**N 2032070.1 E 5777065.2**

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
1025	0		S01		90		SANDY SILT with ORGANIC SOIL (ML-OL); very loose to very soft; black (10 YR 2/1); 2% fine GRAVEL; 40% fine-grained SAND; 58% no plasticity FINES; abundant coarse-grained organic debris; air voids --2017 LAKE SEDIMENT--		NP	58	Lake bubbling around B-5 site 1.6-2.1' S01A (analytical sample)
	5		S02		85		ORGANIC SOIL (OL); with SILTY fine-grained SAND; mostly organic debris with some grass and leaves --2017 (?) LAKE SEDIMENT-- with less organic debris				
1020							POORLY GRADED SAND (SP); very loose; dark grey; 13% rounded GRAVEL; 85% fine- to medium-grained SAND --2017 (?) LAKE SEDIMENT--			2	
	10		S03		70		top of leaf mat and/or organic zone (bottom portion slipped out of tube); possible base of 2017 sediment				
1015			S04	8 6 7 6	0						May have pushed rock at tip of sampler 4" casing to 12.5'
	15		S05	4 4 7 6	65		POORLY GRADED SAND (SP); medium dense; dark grey; medium- to coarse-grained SAND; trace, rounded GRAVEL to 1" --ALLUVIUM--				
1010			S06	7 7 8 9	50		POORLY GRADED SAND with SILT (SP-SM); medium dense; dark grey; 16% rounded GRAVEL to 1.5"; 79% fine- to coarse-grained SAND --ALLUVIUM--			5	4" casing to 17.5'
	20										
1005			S07	9 10 9 9	50		gravel becomes subrounded				4" casing to 22.5' 23.2-24.4' S02A (analytical sample)
	25										
1000			S08 S09	7 9 6 3 5	5 50		with broken, angular rock fragments up to 2"				4" casing to 27.5' S09 28.0-30.0': S08 resampled as 2.5" ID MC blow counts 12-7-6-5
	30										

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Report: GEO_10B1_OAK; File: LOSPADRES.DAM.GPJ; 9/28/2017 B-5

Project: Los Padres Dam Removal Project
Project Location: Monterey County
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Log of Soil Boring B-5

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
	30						POORLY GRADED SAND with SILT (SP-SM); medium dense; dark grey; 16% subrounded to angular GRAVEL to 2"; 79% fine- to coarse-grained SAND				
995							--ALLUVIUM-- *(continued)*				
				2			SANDY SILT (MH); medium dense; very dark grey to black; 27% fine-grained SAND; 73% high plasticity FINES; with 1-2" beds of silts and 0.05-.2" laminations of fine sand and black organics		16	73	4" casing to 32.5'
			S10	3 5 10	100		--RECENT LAKE SEDIMENT--				32.8-34.5' S03A (analytical sample)
	35						black bed with organic debris				
990											
				3			SILTY SAND to SANDY SILT (SM-MH); with coarse-grained SAND lenses; trace angular GRAVEL to 2" in a fine-grained SAND matrix. 38.7'-38.9' black SILT and coarse-grained wood, charcoal, and leaf mat with organic debris				4" casing to 37.5'
			S11	3 5 9	100		--ALLUVIUM/RECENT LAKE SEDIMENT--				38.6-39.3' S04A (analytical sample)
	40		S12		15						
985											
				6			POORLY GRADED SAND (SP); medium dense; very dark grey; medium- to coarse-grained SAND; trace, small rounded GRAVEL				4" casing to 42.5'
			S13	3 5 4	100		--ALLUVIUM/RECENT LAKE SEDIMENT--				
	45						SANDY SILT (ML); black; 30% very fine-grained SAND; 70% low plasticity FINES. 44.0-44.2' coarse leaf mat				
							--RECENT LAKE SEDIMENT--				
980							WELL GRADED SAND (SW); very dark grey; fine- to coarse-grained SAND; trace, broken, angular GRAVEL to 2"; trace black, no plasticity FINES				
			S14	50/5"	100		--PREDAM ALLUVIUM?--				4" casing refusal at 46.5'
							TOTAL DEPTH = 47.0 FEET				
	50										
975											
	55										
970											
	60										
965											
	65										

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Project: Los Padres Dam Removal Project
Project Location: Monterey County
Project Number: 60536296

Log of Soil Boring B-6

Sheet 1 of 2

Date(s) Drilled	**7/15/17**	Logged By	**B. Kozlowicz**	Checked By	**D. Simspon**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**N/A**	Total Depth of Borehole	**52.4 feet**
Drill Rig Type	**Barge-mounted CME 45**	Drilling Contractor	**Taber Drilling Company**	NAVD 88 Ground Surface Elevation	**1035.9-ft**
Groundwater Level(s)	**Lake elevation at 1042.9-ft NAVD88**	Sampling Method(s)	**2.5" ID MC, 2.75" ID Split Spoon Sampler, 2.8" ID Osterberg**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**None**	Borehole Location	**Los Padres Reservoir**	Coordinate Location	**N 2031443.1 E 5776823.2**

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
1035	0		S01		90		POORLY GRADED SAND with SILT (SP-SM); very loose; very dark grey to dark olive grey; 1% GRAVEL; 94% fine-grained SAND; 5% no plasticity FINES; with occasional black irregular organic lenses up to 0.2"			5	
							--ALLUVIUM/2017 LAKE SEDIMENT--				
			S02		15		SILTY SAND (SM); 12% fine to coarse GRAVEL; 62% fine-grained SAND; 26% low plasticity FINES; with abundant coarse-grained organic debris				
							--ALLUVIUM/2017 LAKE SEDIMENT--				
1030	5		S03		50					26	
1025	10		S04	10 10 8 6	45		with large, woody debris up to 3" POORLY GRADED SAND with GRAVEL (SP); loose; dark grey; 40% subrounded GRAVEL to 2"; 60% medium- to coarse-grained SAND				4"casing to 12'
							--ALLUVIUM--				
1020	15		S05	6 8 5 5	0						4" casing to 17'; increased resistance at 14'
1015	20		S07	8 10 6 4	70						S06 not retained (disturbed); redrove S07 (2.75" ID SS) 19'-21'
			S06	25 psi	10						
			S08	10 8 8 10	20		POORLY GRADED SAND with SILT (SP-SM); very dark grey; 88% fine-grained SAND; 12% no plasticity FINES; trace fine organic debris			12	4" casing to 22'
							--RECENT LAKE SEDIMENT--				
1010	25		S09		100		with some woody debris				24.0-24.9' S01A (analytical sample)
			S10	8 7 8 10	90		SILTY SAND (SM); very soft/very loose; very dark grey to black; with some laminations of black SANDY SILT				
	30						--RECENT LAKE SEDIMENT--				

Report: GEO_10B1_OAK; File: LOSPADRES.DAM.GPJ; 9/28/2017 B-6

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Project: Los Padres Dam Removal Project
Project Location: Monterey County
Project Number: 60536296

Log of Soil Boring B-6

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
1005	30						SILTY SAND (SM); very soft/very loose; very dark grey to black; with some laminations of black SANDY SILT --RECENT LAKE SEDIMENT-- *(continued)*				
							without woody debris/organics; with occasional 0.2" black beds				
			S11		85						4" casing to 32' 32.3-33.6' S02A (analytical sample)
1000	35						SANDY SILT (MH); very dark grey to black; 0.05 to 0.5" beds of SAND and SILT with some fine-grained organic debris in sand beds --RECENT LAKE SEDIMENT--				
			S12	5 5 5 10	100				20	78	
							SILT (ML); very dark grey to black --RECENT LAKE SEDIMENT--				
995	40						SILTY SAND (SM); loose to medium dense; very dark grey to black; with some SAND with SILT and POORLY GRADED SAND; fine-grained SAND; low plasticity FINES; minor organic debris --RECENT LAKE SEDIMENT/ALLUVIUM--				
			S13	4 5 7 8	100						4" casing to 42' 42.3-43.6' S03A (analytical sample)
990	45						POORLY GRADED GRAVEL with SAND (GP); medium dense; dark grey and black; broken, rounded GRAVEL to 2"; fine- to coarse-grained SAND; fining upwards --PREDAM ALLUVIUM?--				4" casing to 46'
			S14	18 15 12 8	35						
			S15	4 6 5 5	90		POORLY GRADED SAND with SILT (SP-SM); medium dense; very dark grey; fine-grained SAND; no plasticity FINES. 1" silt bed at 50.5'. --ALLUVIUM/LAKE SEDIMENT?--				
985	50		S16	30 50/5.5"	33		WELL GRADED SAND with GRAVEL (SW); dense; 40% broken, rounded GRAVEL to 2"; 55% fine- to corase-grained SAND; trace no plasticity FINES --PREDAM ALLUVIUM--				4" casing to 51.5'
							TOTAL DEPTH = 52.4 FEET				
980	55										
975	60										
	65										

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Project: Los Padres Dam Removal Project
Project Location: Monterey County
Project Number: 60536296

Log of Soil Boring B-7

Sheet 1 of 2

Date(s) Drilled	**7/16/17**	Logged By	**B. Kozlowicz**	Checked By	**D. Simspon**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**N/A**	Total Depth of Borehole	**56.0 feet**
Drill Rig Type	**Barge-mounted CME 45**	Drilling Contractor	**Taber Drilling Company**	NAVD 88 Ground Surface Elevation	**1012.9-ft**
Groundwater Level(s)	**Lake elevation at 1042.9-ft NAVD88**	Sampling Method(s)	**1.375" ID SPT, 2.5" ID MC, 2.75" ID Split Spoon Sampler, 2.8" ID Osterberg**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**None**	Borehole Location	**Los Padres Reservoir**	Coordinate Location	**N 2032773.3 E 5777459.9**

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
	0						SANDY SILT to ORGANIC SOIL (ML-OL); very soft; very dark brown (10YR 2/2) to black (10YR 3/1); very fine-grained SAND; no to low plasticity FINES; abundant coarse vegetative debris; voids --2017 LAKE SEDIMENT--				
1010			S01		90						
	5		S02		25		SILTY SAND (SM); very loose; 1% GRAVEL; 82% fine- to medium-grained SAND; 17% high plasticity FINES; some coarse vegetative debris --ALLUVIUM/2017 (?) LAKE SEDIMENT--			17	
1005							with fine- to coarse-grained SAND				4" casing to 10'; increased resistance at 8'
	10		S03		100		SILT with SAND (MH); very soft; very dark greyish brown to black; 22% fine-grained SAND; 78% high plasticity FINES -- RECENT LAKE SEDIMENT-- becomes SANDY SILT with 0.2" black, fine-grained laminations		14	78	
1000											
	15		S04		10		POORLY GRADED SAND (SP); very loose; very dark grey; fine-grained wih trace medium- to coarse-grained SAND; trace low plasticity FINES; with base of leafy debris at top of sample at 14.0 --ALLUVIUM/RECENT LAKE SEDIMENT--				4" casing to 15'
995											
	20		S05	8 4 2 2	60		with medium- to coarse-grained, angular to subangular SAND; trace organic debris SANDY SILT to SILTY SAND (MH-SM); very soft; very dark grey to black; very fine-grained SAND; low to medium plasticity FINES --RECENT LAKE SEDIMENT--				4" casing to 20'
990							WELL GRADED SAND (SW); very loose; dark grey; trace fine, rounded GRAVEL to 1"; fine- to coarse-grained SAND; trace woody debris --ALLUVIUM/RECENT LAKE SEDIMENT--				
	25		S06 S07	5 3 3 7	90		SILTY SAND (SM); very dark grey; very fine- to fine-grained SAND; low to no plasticity FINES; with organic debris --ALLUVIUM/RECENT LAKE SEDIMENT--				S06 no recovery; resampled as S07 2.5" ID MC blow counts 3-3-2-3 4" casing to 25' 25.2-25.8' S01A (analytical sample)
985											
	30			4 8			POORLY GRADED SAND with SILT (SP-SM) SILT WITH SAND (ML); very fine-grained SAND			5	

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Project: Los Padres Dam Removal Project
Project Location: Monterey County
Project Number: 60536296

Log of Soil Boring B-7

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Dry Unit Weight, pcf	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
	30		S08	7 7	85		POORLY GRADED SAND with SILT (SP-SM); dark grey; 1% fine, subrounded GRAVEL; 94% fine- to medium-grained with trace coarse-grained SAND; 5% no plasticity FINES --ALLUVIUM/RECENT LAKE SEDIMENT-- *(continued)*				4" casing to 30'
980											
	35		S09	6 3 2 3	95		SANDY SILT (MH); very soft; very dark grey to black; with laminated fine-grained SAND 0.5-.5" thick. At 35.1' 0.5: grey, very fine-grained SAND bed --RECENT LAKE SEDIMENT--				24.5-36.0' S02A (analytical sample) 4" casing to 35'
975							ORGANIC SOIL (OL); very dark grey and dark brown; 80% coarse-grained leaf litter and woody debris; 20% fine-grained SAND and SILT --RECENT LAKE SEDIMENT--				
	40		S10	10 4 5 9	100		SANDY SILT (ML); very loose/very soft; black; 36% fine-grained SAND; 64% low plasticity FINES; some coarse-grained organic debris --RECENT LAKE SEDIMENT--			64	4" casing to 40'
970											
	45		S11	8 10 12 12	95		POORLY GRADED SAND with SILT (SP-SM); loose to medium dense; dark grey; fine- to medium-grained SAND; no plasticity FINES; with trace organic debris; black silt lens at 44.8' --ALLUVIUM/RECENT LAKE SEDIMENT-- WELL GRADED SAND (SW); medium dense; medium grey; fine- to corase-grained SAND; trace rounded GRAVEL up to 1" --ALLUVIUM--				44.0-45.0' S03A (analytical sample) 4" casing to 75'
965											
	50		S12	9 7 7 7	65		POORLY GRADED SAND (SP); loose; very dark grey; fine-grained SAND; thinnly bedded/laminated --POSSIBLE LAKE SEDIMENT/PREDAM ALLUVIUM--				4" casing to 50'
960											
	55		S13	7 18 27 41	45		SANDY SILT; black; with wood POORLY GRADED GRAVEL with SAND (GP); very dense; rounded, sheared GRAVEL up to 1.5" --PREDAM ALLUVIUM-- BOULDER; dark greenish grey; highly weathered; moderately strong --BEDROCK?-- **TOTAL DEPTH = 56.0 FEET**				4" casing to 55'
955											
	60										
950											
	65										

Report: GEO_10B1_OAK; File: LOSPADRES.DAM.GPJ; 9/28/2017 B-7

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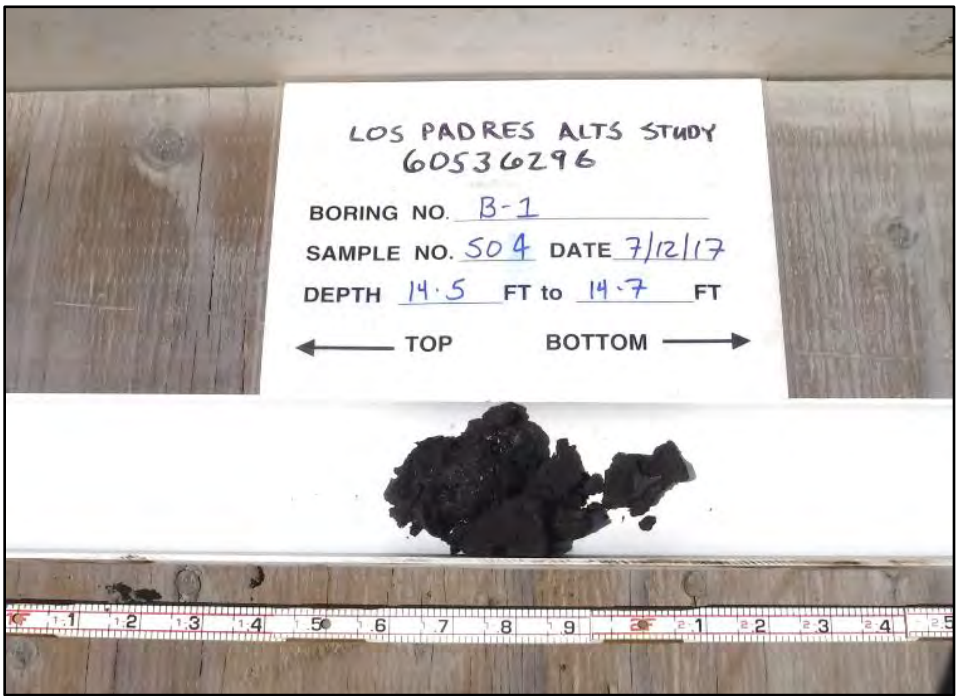
Appendix B Photographs and Sediment Photographs

Boring No. 1


LOS PADRES ALTS STUDY
60536296
BORING NO. B-1
SAMPLE NO. S01 DATE 7/12/17
DEPTH 0 FT to 5.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-1
SAMPLE NO. S02 DATE 7/12/17
DEPTH 5.0 FT to 7.0 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-1
SAMPLE NO. S04 DATE 7/12/17
DEPTH 14.5 FT to 14.7 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-1
SAMPLE NO. 505 DATE 7/12/17
DEPTH 16.5 FT to 18.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-1
SAMPLE NO. 506 DATE 7/12/17
DEPTH 20.5 FT to 22.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-1
SAMPLE NO. 508 DATE 7/12/17
DEPTH 29.5 FT to 31.5 FT
TOP
BOTTOM

Boring No. 2

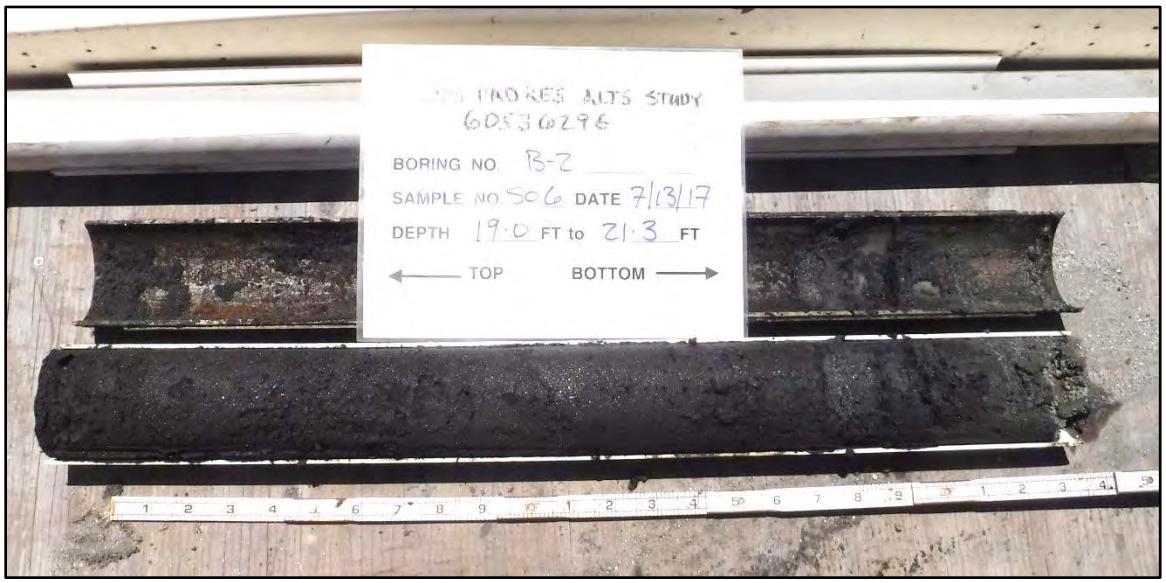

LOS PADRES ALTS STUDY
60536296
BORING NO. B-2
SAMPLE NO. S01 DATE 7/13/17
DEPTH 1.0 FT to 3.0 FT
TOP
BOTTOM

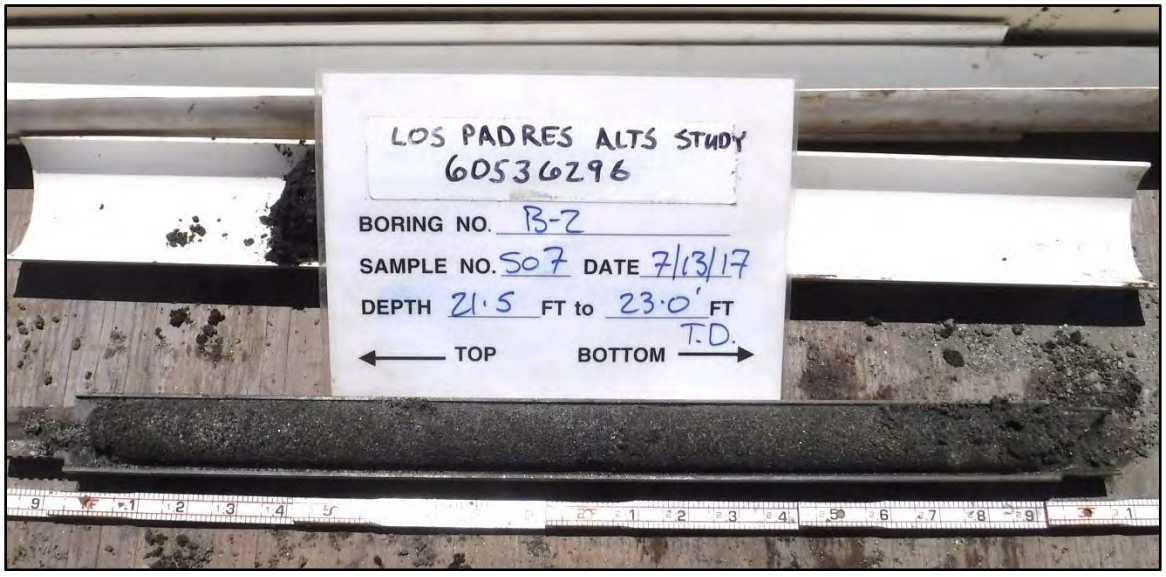

LOS PADRES ALTS STUDY
60536296
BORING NO. B-2
SAMPLE NO. S02 DATE 7/13/17
DEPTH 5.0 FT to 7.0 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-2
SAMPLE NO. 503 DATE 7/13/17
DEPTH 9.0 FT to 11.0 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-2
SAMPLE NO. 504 DATE 7/13/17
DEPTH 15.0 FT to 17.0 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-2
SAMPLE NO. 505 DATE 7/13/17
DEPTH 17.0 FT to 19.0 FT
BOTTOM

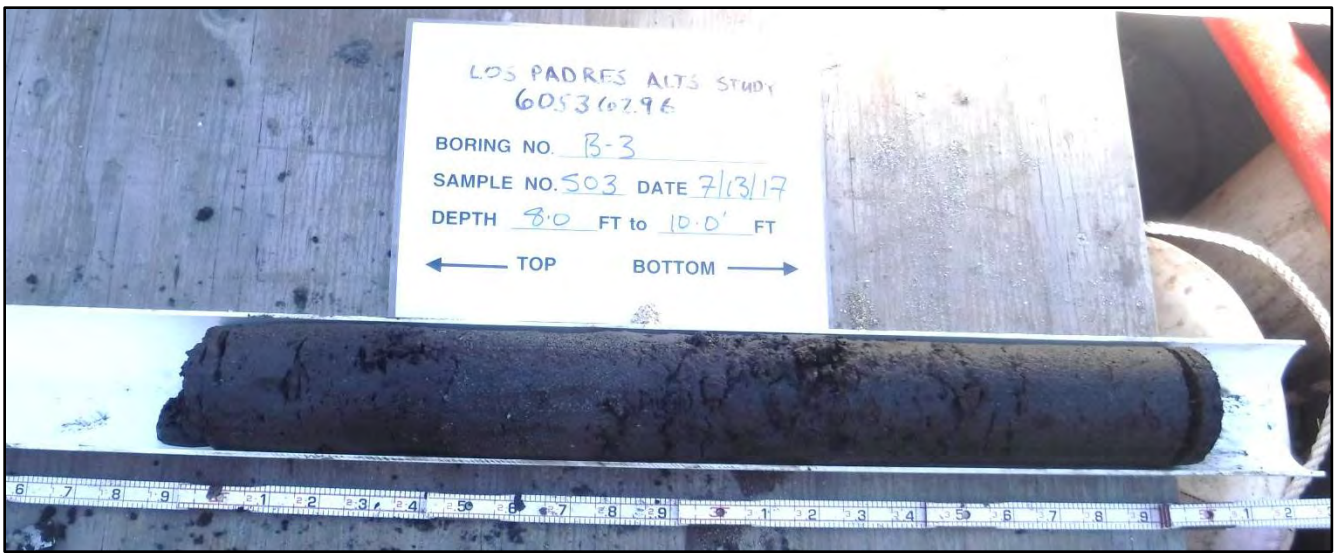

PADRES ALTS STUDY
60536296
BORING NO. B-2
SAMPLE NO. 506 DATE 7/13/17
DEPTH 19.0 FT to 21.3 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-2
SAMPLE NO. 507 DATE 7/13/17
DEPTH 21.5 FT to 23.0' FT
T.D.
TOP
BOTTOM

Boring No. 3


LOS PADRES ALTS STUDY
BORING NO. B-3
SAMPLE NO. S01 DATE 7/13/17
DEPTH 1.0 FT to 3.0 FT
TOP
BOTTOM


BORING NO. B-3
SAMPLE NO. S02 DATE 7/13/17
DEPTH 4.0 FT to 6.0 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
605316.96
BORING NO. B-3
SAMPLE NO. 503 DATE 7/13/17
DEPTH 8.0 FT to 10.0' FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
605316.96
BORING NO. B-3
SAMPLE NO. 505 DATE 7/13/17
DEPTH 14.5 FT to 16.5 FT
TOP
BOTTOM

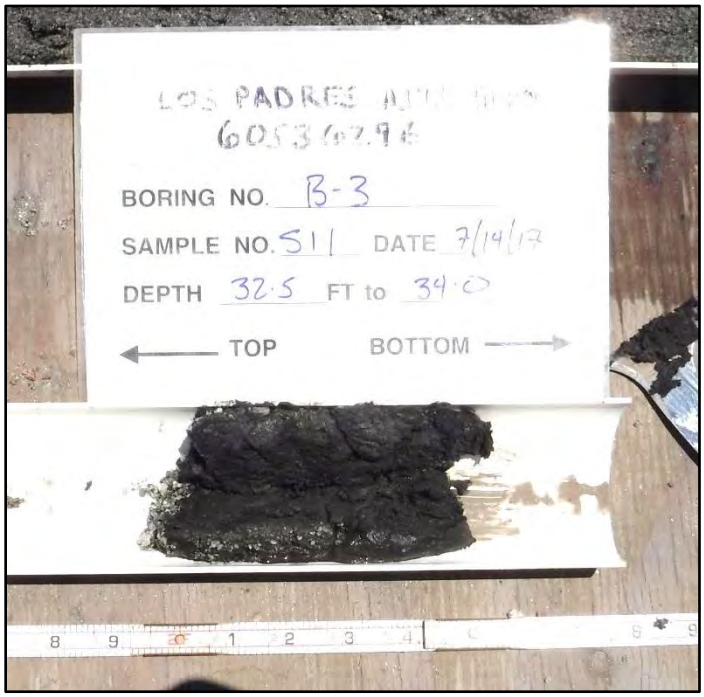

LOS PADRES ALTS STUDY
605360796
BORING NO. B-3
SAMPLE NO. 506 DATE 7/14/17
DEPTH 18.0 FT to 20.0 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
605360796
BORING NO. B-3
SAMPLE NO. 507 DATE 7/14/17
DEPTH 20.5 FT to 22.0' FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-3
SAMPLE NO. 508 DATE 7/14/17
DEPTH 22.5 FT to 24.0 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-3
SAMPLE NO. 509 DATE 7/14/17
DEPTH 27 FT to 29 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-3
SAMPLE NO. S10 DATE 7/14/17
DEPTH 28 FT to 30 FT
Possibly Disturbed.
TOP
BOTTOM


BORING NO. B-3
SAMPLE NO. S11 DATE 7/14/17
DEPTH 32.5 FT to 34.0
TOP
BOTTOM


LOS PADRES ALTS STUDY
605360.96
BORING NO. B-3
SAMPLE NO. S12 DATE 7/14/17
DEPTH 34.0 FT to 35.0 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
605360.96
BORING NO. B-3
SAMPLE NO. S13 DATE 7/14/17
DEPTH 35.0 FT to 36.5' FT
T.D.
TOP
BOTTOM

Boring No. 4


LOS PADRES ALTS STUDY
BORING NO B-4
SAMPLE NO. S01 DATE 7/14/17
DEPTH 0.5 FT to 2.5 FT
TOP
BOTTOM

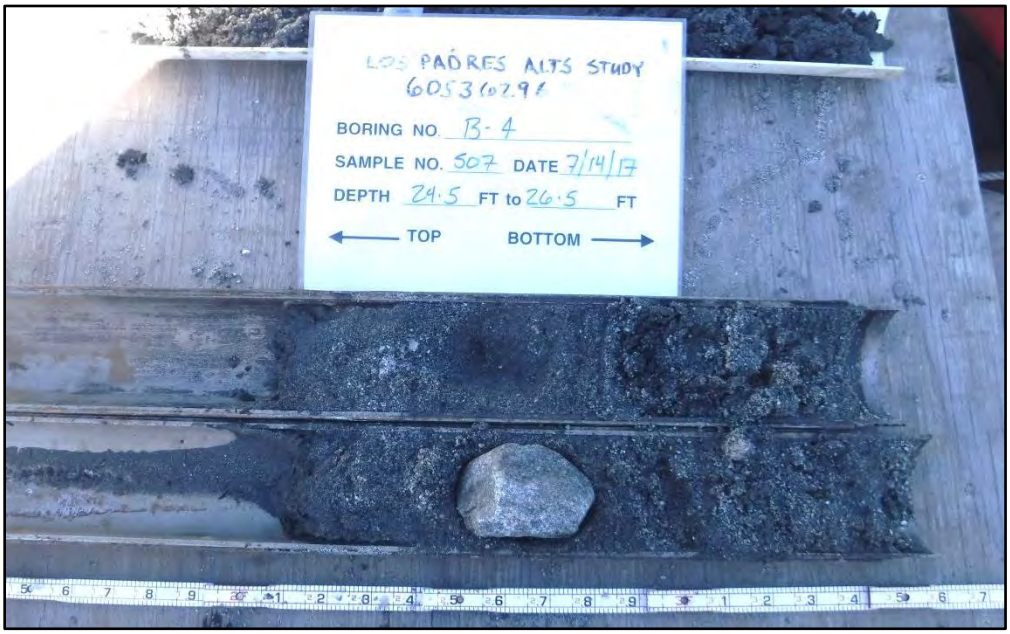

LOS PADRES ALTS STUDY
BORING NO. B-4
SAMPLE NO. S02 DATE 7/14/17
DEPTH 4.5 FT to 6.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
BORING NO B-4
SAMPLE NO. S03 DATE 7/14/17
DEPTH 9.5 FT to 11.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
BORING NO. B-4
SAMPLE NO. 504 DATE 7/14/17
DEPTH 14.5 FT to 16.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
BORING NO. B-4
SAMPLE NO. 505 DATE 7/14/17
DEPTH 19.5 FT to 21.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
605360.9
BORING NO. B-4
SAMPLE NO. 506 DATE 7/14/17
DEPTH 21.5 FT to 23.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
605360.9
BORING NO. B-4
SAMPLE NO. 507 DATE 7/14/17
DEPTH 24.5 FT to 26.5 FT
TOP
BOTTOM

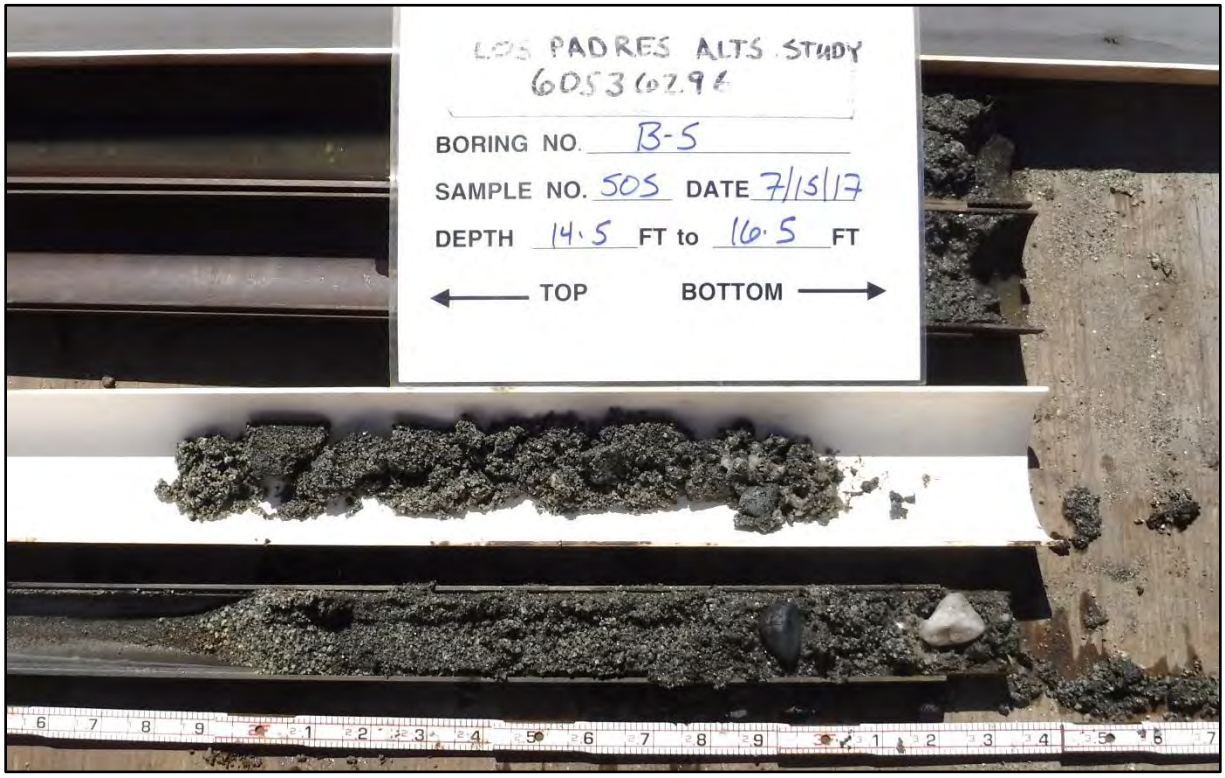

LOS PADRES ALTS STUDY
BORING NO. B-4
SAMPLE NO. 508 DATE 7/14/17
DEPTH 29.5 FT to 31.5 FT
TOP
BOTTOM

Boring No. 5


LOS PADRES ALTS STUDY
60536079
BORING NO. B-5
SAMPLE NO. S01 DATE 7/15/17
DEPTH .5 FT to 2.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536079
BORING NO. B-5
SAMPLE NO. S02 DATE 7/15/17
DEPTH 3.5 FT to 5.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
6053602.9
BORING NO. B-5
SAMPLE NO. 503 DATE 7/15/17
DEPTH 8.5 FT to 9.9 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
6053602.9
BORING NO. B-5
SAMPLE NO. 505 DATE 7/15/17
DEPTH 14.5 FT to 16.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
BORING NO. B-5
SAMPLE NO. 506 DATE 7/15/17
DEPTH 17.5 FT to 19.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
BORING NO. B-5
SAMPLE NO. 507 DATE 7/15/17
DEPTH 22.5 FT to 24.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536291
BORING NO. B-5
SAMPLE NO. 508/9 DATE 7/15/17
DEPTH 27.5 FT to 30.0 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536291
BORING NO. B-5
SAMPLE NO. 510 DATE 7/15/17
DEPTH 32.5 FT to 34.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60053607.91
BORING NO. B-5
SAMPLE NO. S11 DATE 7/15/17
DEPTH 37.5 FT to 39.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60053607.91
BORING NO. B-5
SAMPLE NO. S13 DATE 7/15/17
DEPTH 42.5 FT to 44.5 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
BORING NO. B-5
SAMPLE NO. S14 DATE 7/15/17
DEPTH 46.5 FT to 47.0 FT
TOP
BOT

Boring No. 6


LOS PADRES ALTS STUDY
BORING NO. B-6
SAMPLE NO. S01 DATE 7/15/17
DEPTH 0 FT to 2.0' FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
BORING NO. B-6
SAMPLE NO. S02 DATE 7/15/17
DEPTH 2.0 FT to 4.0 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536291
BORING NO. B-6
SAMPLE NO. 503 DATE 7/15/17
DEPTH 7.0 FT to 9.0 FT
TOP
BOTTOM


PADRES ALTS STUDY
60536291
BORING NO. B-6
SAMPLE NO. 504 DATE 7/15/17
DEPTH 12.0 FT to 14.0 FT
TOP
BOTTOM


PADRES ALTS STUDY
BORING NO. B-6
SAMPLE NO. 506 DATE 7/15/17
DEPTH 19.0 FT to 22.0 FT
TOP
BOTTOM


PADRES ALTS STUDY
BORING NO. B-6
SAMPLE NO. 507 DATE 7/15/17
DEPTH 19.0 FT to 21.0 FT
Disturbed
TOP
BOTTOM


PADRES ALTS STUDY
BORING NO. B-6
SAMPLE NO. 508 DATE 7/15/17
DEPTH 22 FT to 24 FT
TOP
BOTTOM


PADRES ALTS STUDY
BORING NO. B-6
SAMPLE NO. 509 DATE 7/15/17
DEPTH 24.0 FT to 24.7 FT
TOP
BOTTOM


BORING NO. B-6
SAMPLE NO. S10 DATE 7/15/17
DEPTH 27 FT to 29 FT
TOP
BOTTOM


BORING NO. B-6
SAMPLE NO. S11 DATE 7/15/17
DEPTH 32 FT to 33.7 FT
TOP
BOTTOM


BORING NO B-6
SAMPLE NO. S12 DATE 7/15/17
DEPTH 37.0 FT to 39.0 FT
TOP
BOTTOM


BORING NO B-6
SAMPLE NO. S13 DATE 7/15/17
DEPTH 42.0 FT to 44.0 FT
TOP
BOTTOM


PADRES ALT STUDY
BORING NO. B-6
SAMPLE NO. 514 DATE 7/15/17
DEPTH 47 FT to 49 FT
TOP
BOTTOM


PADRES ALT STUDY
BORING NO. B-6
SAMPLE NO. 515 DATE 7/15/17
DEPTH 49 FT to 50.8 FT
TOP
BOTTOM

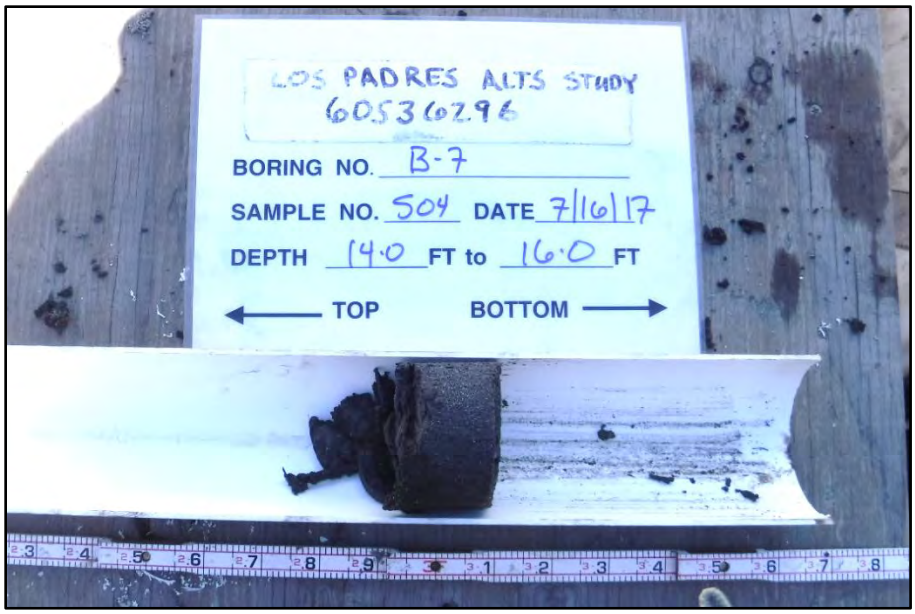

LOS PADRES ALTS STUDY
60536296
BORING NO. B-6
SAMPLE NO. S16 DATE 7/15/17
DEPTH 51.5 FT to 52.4 FT
TOP
BOTTOM

Boring No. 7


LOS PADRES ALTS STUDY
6053602.9E
BORING NO. B-7
SAMPLE NO. S01 DATE 7/16/17
DEPTH 1.0 FT to 3.0 FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
6053602.9E
BORING NO. B-7
SAMPLE NO. S02 DATE 7/16/17
DEPTH 5.0 FT to 7.0 FT
TOP
BOTTOM


BORING NO.
SAMPLE NO. 503 DATE
DEPTH FT to FT
TOP
BOTTOM


LOS PADRES ALTS STUDY
60536296
BORING NO. B-7
SAMPLE NO. 504 DATE 7/16/17
DEPTH 14.0 FT to 16.0 FT
TOP
BOTTOM


PADRES ALTS STUDY
BORING NO. B-7
SAMPLE NO. 505 DATE 7/16/17
DEPTH 19.0 FT to 21.0 FT
TOP
BOTTOM


BORING NO. B-7
SAMPLE NO. 507 DATE 7/16/17
DEPTH 24.0 FT to 26.0 FT
DISTURBED
TOP
BOTTOM


BORING NO. B-7
SAMPLE NO. 508 DATE 7/16/17
DEPTH 29.0 FT to 31.0 FT
TOP
BOTTOM


BORING NO B-7
FT to 36.0 FT
BOTTOM


BORING NO B-7
SAMPLE NO 510 DATE 7/16/17
DEPTH 39.0 FT to 41.5 FT
TOP
BOTTOM


BORING NO. B-7
SAMPLE NO. S11 DATE 7/16/17
DEPTH 44.0 FT to 46.0 FT
TOP
BOTTOM


BORING NO. B-7
SAMPLE NO. S12
DEPTH 49.0 FT to
TOP
ACE


BORING NO. B-7
SAMPLE NO. S13 DATE 7/16/17
DEPTH 54.0 FT to 56.0 FT
T.D.
TOP
BOTTOM

Photo 1. Drill Rig Mounted on Small Platform Barge

Photo 2. Proposed original Site location of boring B-7 in December, 2016

Photo 3. Proposed original Site location of boring B-7 in 2017

Photo 4. Upstream Sandy Deposits

Photo 5. Upstream Sandy Deposits with Gravel

Photo 6. Terrace Deposits Approximately at the High Water Mark

Photo 7. River Channel Armor Layer Consisting of Large Cobles

Photo 8. River Channel Gravel Surface Armor

Photo 9. Silty, Fine Grained Sand with Leaf and Stick Litter

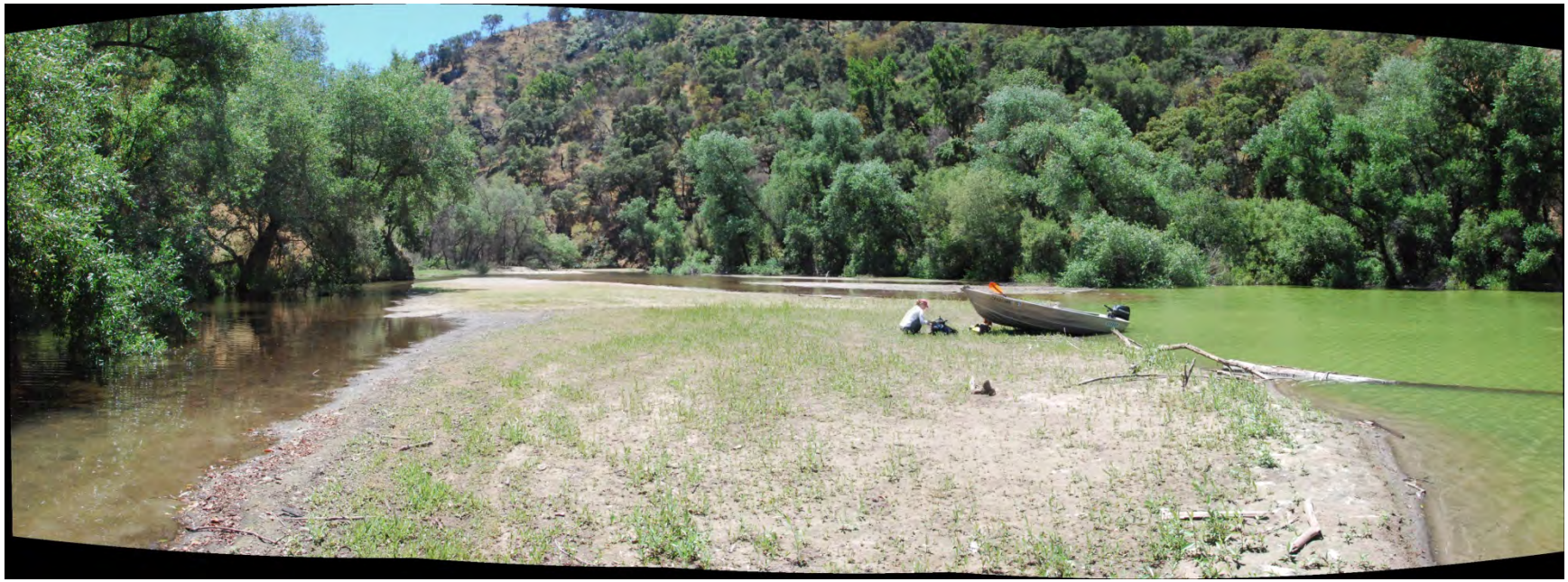


Photo 10. Recent sand deposit at upstream end of reservoir, July, 2017

Photo 11. Recently eroded upstream sediment, November, 2017

Photo 12. Channel bank at approx. Sta 90+00

Photo 13. Sandy floodplain deposit, Sta 87+00

Photo 14. River channel, Sta 85+00

Photo 15. Pebble Count 1 Location, Sta 77+00

Photo 16. Confluence of Danish Ck and Carmel River, looking upstream at Sta 74+00

Photo 17. Right bank sandy floodplain deposit, approx. Sta 72+00

Photo 18. Left bank sand and gravel bar, Sta 67+00

Photo 19. Pebble Count 3 location, Sta 66+00

Photo 20. Pebble Count 4 location, Sta 66+50

Photo 21. Pebble Count 2 location, Sta 64+50

Photo 22. Pebble Count 5 location, Sta 62+00

Photo 23. Pebble Count 6 location, Sta 58+50

Photo 24. Right bank sandy floodplain deposit, Sta 57+00

Appendix C Laboratory Test Results

Appendix C-1 Geotechnical Lab Test Results

SUMMARY OF GEOTECHNICAL LABORATORY TESTS ON SOIL
Los Padres Dam Removal Project

Sample Information					Initial Conditions		Gradation			Atterberg Limits			
Borehole Number	Sample Number	Sample Interval (feet)	USCS	Formation Name	Moisture Content (%)	Dry Unit Weight (pcf)	Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI	Notes
B-1	S02	5.0-7.0	ML	CLAYEY SILT			0	4	96				
B-1	S03	9.5-11.5	ML	SILT	112	29							
B-1	S06	20.5-22.5	MH	CLAYEY SILT			0	2	98	61	43	18	
B-1	S07	24.7-26.5	MH	CLAYEY SILT	107	35							
B-2	S02	5-7	SP-SM	POORLY GRADED SAND with SILT			9	85	6				
B-2	S03	9-11	MH	CLAYEY SILT			0	4	96	67	47	20	
B-2	S06	19-21	SM	SILTY SAND			3	54	43				
B-3	S02	4-6	SM	SILTY SAND			4	65	31	NP	NP	NP	
B-3	S03	8-10	SM	SILTY SAND			8	63	29				
B-3	S04	12-14	SM	SILTY SAND	81	31	1	63	36				
B-3	S08	22.5-24	SM	SILTY SAND with GRAVEL			26	55	19				
B-3	S10	28-30	SP	POORLY GRADED SAND			1	98	1				
B-4	S01	0.5-2.5	OH	ORGANIC SOIL						69	55	14	
B-4	S02	4.5-6.5	SP-SM	POORLY GRADED SAND with SILT			3	92	5				
B-4	S04	14.5-16.5	SM	SILTY SAND			1	76	23				
B-4	S06	21.5-23.5	SP-SM	POORLY GRADED SAND with SILT			12	82	6				
B-5	S01	0.5-2.5	ML	SANDY SILT			2	40	58	NP	NP	NP	
B-5	S03	8.5-10.5	SP	POORLY GRADED SAND			13	85	2				
B-5	S06	17.5-19.5	SP-SM	POORLY GRADED SAND with SILT			16	79	5				
B-5	S10	32.5-34.5	MH	SILT with SAND			0	27	73	53	37	16	

AECOM

SUMMARY OF GEOTECHNICAL LABORATORY TESTS ON SOIL
Los Padres Dam Removal Project

Sample Information					Initial Conditions		Gradation			Atterberg Limits			
Borehole Number	Sample Number	Sample Interval (feet)	USCS	Formation Name	Moisture Content (%)	Dry Unit Weight (pcf)	Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI	Notes
B-6	S01	0-2	SP-SM	POORLY GRADED SAND with SILT			1	94	5				
B-6	S03	7-9	SM	SILTY SAND			12	62	26				
B-6	S08	22-24	SP-SM	POORLY GRADED SAND with SILT			0	88	12				
B-6	S12	37-39	MH	SILT with SAND			0	22	78	61	41	20	
B-7	S02	5-7	SM	SILTY SAND			1	82	17				
B-7	S03	9-11	MH	SILT with SAND			0	22	78	56	42	14	
B-7	S08	29-31	SP-SM	POORLY GRADED SAND with SILT			1	94	5				
B-7	S10	39-41.5	ML	SANDY SILT			0	36	64				

AECOM

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	4	76	20

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100		
#20	100		
#40	100		
#60	99		
#140	98		
#200	96		

* (no specification provided)

Material Description

Gray silt with clay

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.0527 D_{85}= 0.0438 D_{60}= 0.0217
D_{50}= 0.0166 D_{30}= 0.0086 D_{15}= 0.0032
D_{10}= 0.0020 C_u= 11.10 C_c= 1.75

Classification

USCS= AASHTO=

Remarks

Source of Sample: B-1 **Depth:** 5-7
Sample Number: S02 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	2	71	27

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100		
#20	100		
#40	100		
#60	100		
#140	98		
#200	98		

* (no specification provided)

Material Description

Dark gray silt with clay

Atterberg Limits

PL= 43 LL= 61 PI= 18

Coefficients

D_{90}= 0.0470 D_{85}= 0.0387 D_{60}= 0.0165
D_{50}= 0.0119 D_{30}= 0.0057 D_{15}= 0.0026
D_{10}= 0.0018 C_u= 9.39 C_c= 1.13

Classification

USCS= MH AASHTO= A-7-5(26)

Remarks

Source of Sample: B-1 **Depth:** 20.5-22.5
Sample Number: S06

Date: 8-11-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	4	5	4	18	63	6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100		
3/4	96		
3/8	94		
#4	91		
#10	87		
#20	80		
#40	69		
#60	48		
#140	12		
#200	5.9		

* (no specification provided)

Material Description

Gray sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 3.6206 D_{85}= 1.5450 D_{60}= 0.3323
D_{50}= 0.2637 D_{30}= 0.1731 D_{15}= 0.1190
D_{10}= 0.0981 C_u= 3.39 C_c= 0.92

Classification

USCS= AASHTO=

Remarks

Source of Sample: B-2 **Depth:** 5-7
Sample Number: S02 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	4	71	25

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100		
#20	100		
#40	100		
#60	99		
#140	97		
#200	96		

* (no specification provided)

Material Description

Dark gray silt with clay

Atterberg Limits

PL= 47 LL= 67 PI= 20

Coefficients

D_{90}= 0.0543 D_{85}= 0.0454 D_{60}= 0.0186
D_{50}= 0.0125 D_{30}= 0.0064 D_{15}= 0.0026
D_{10}= 0.0017 C_u= 10.86 C_c= 1.27

Classification

USCS= MH AASHTO= A-7-5(29)

Remarks

Source of Sample: B-2 **Depth:** 9-11
Sample Number: S03

Date: 8-11-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	3	10	3	41	36	7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100		
#4	97		
#10	87		
#20	86		
#40	84		
#60	80		
#140	55		
#200	43		

* (no specification provided)

Material Description

Gray silty sand with organics

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 2.7934 D_{85}= 0.5479 D_{60}= 0.1221
D_{50}= 0.0920 D_{30}= 0.0432 D_{15}= 0.0135
D_{10}= 0.0079 C_u= 15.51 C_c= 1.94

Classification

USCS= AASHTO=

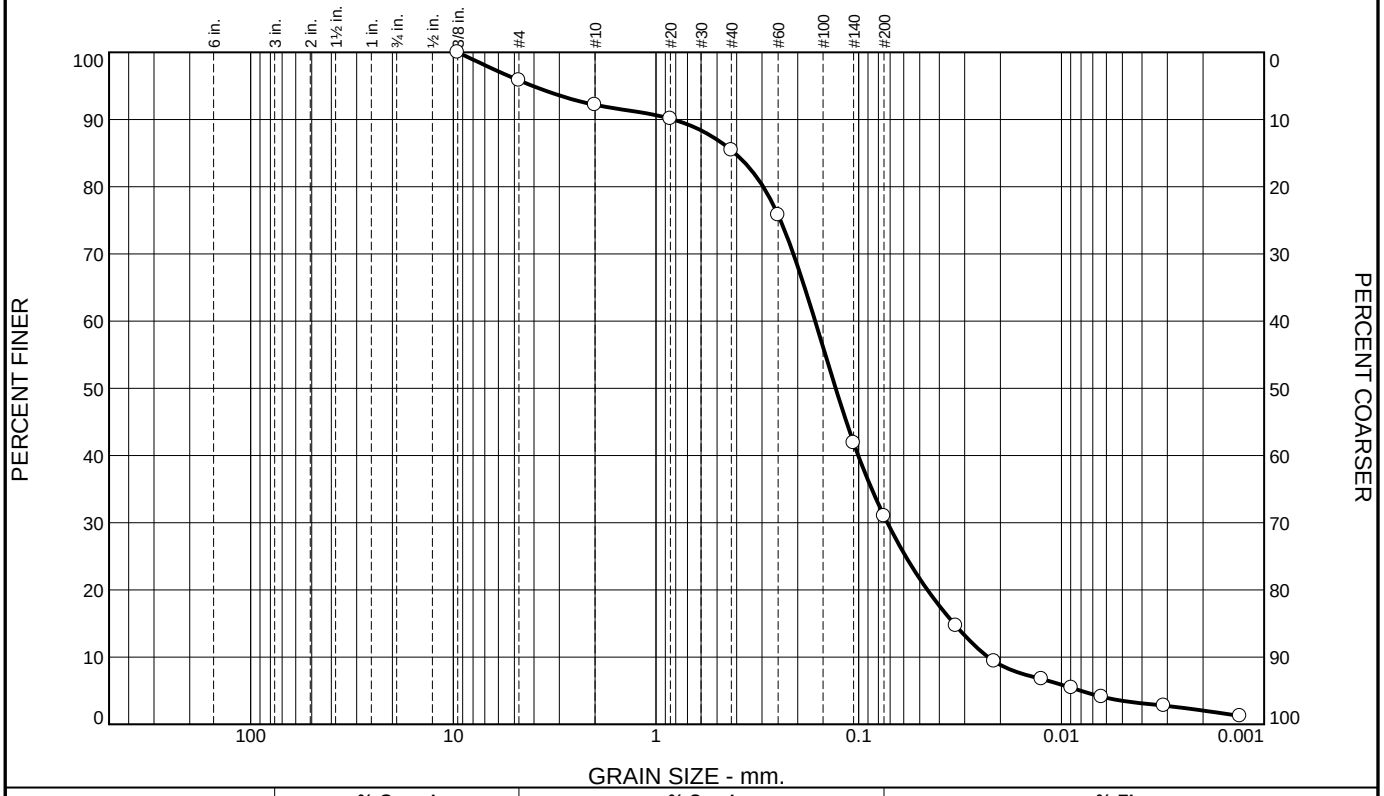
Remarks

Source of Sample: B-2 **Depth:** 19.2-21.3
Sample Number: S06 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	4	4	7	54	28	3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100		
#4	96		
#10	92		
#20	90		
#40	85		
#60	76		
#140	42		
#200	31		

* (no specification provided)

Material Description

Dark gray sand with silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 0.8224 D_{85}= 0.4091 D_{60}= 0.1640
D_{50}= 0.1299 D_{30}= 0.0722 D_{15}= 0.0339
D_{10}= 0.0230 C_u= 7.14 C_c= 1.38

Classification

USCS= SM AASHTO= A-2-4(0)

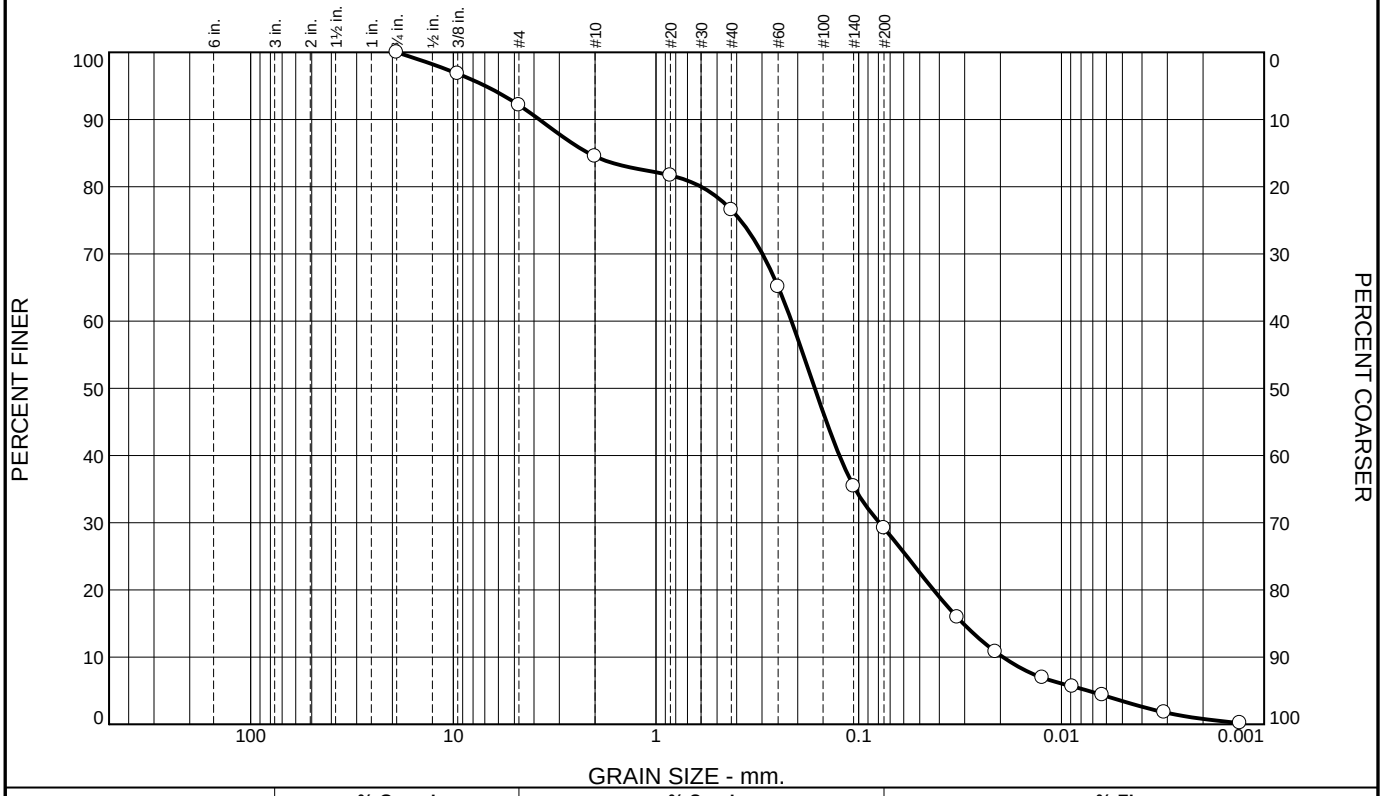
Remarks

Source of Sample: B-3 **Depth:** 4-6
Sample Number: S02 **Date:** 8-11-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	8	7	8	48	26	3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100		
3/8	97		
#4	92		
#10	85		
#20	82		
#40	77		
#60	65		
#140	35		
#200	29		

* (no specification provided)

Material Description

Gray sand with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 3.7706 D_{85}= 2.1535 D_{60}= 0.2147
D_{50}= 0.1647 D_{30}= 0.0791 D_{15}= 0.0305
D_{10}= 0.0194 C_u= 11.04 C_c= 1.50

Classification

USCS= AASHTO=

Remarks

Source of Sample: B-3 **Depth:** 8-10
Sample Number: S03

Date: 8-11-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	1	17	45	36	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100		
#4	99		
#10	98		
#20	93		
#40	81		
#60	65		
#140	43		
#200	36		

* (no specification provided)

Material Description

Gray silty sand with organics

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.6529 D_{85}= 0.4944 D_{60}= 0.2085
D_{50}= 0.1431 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

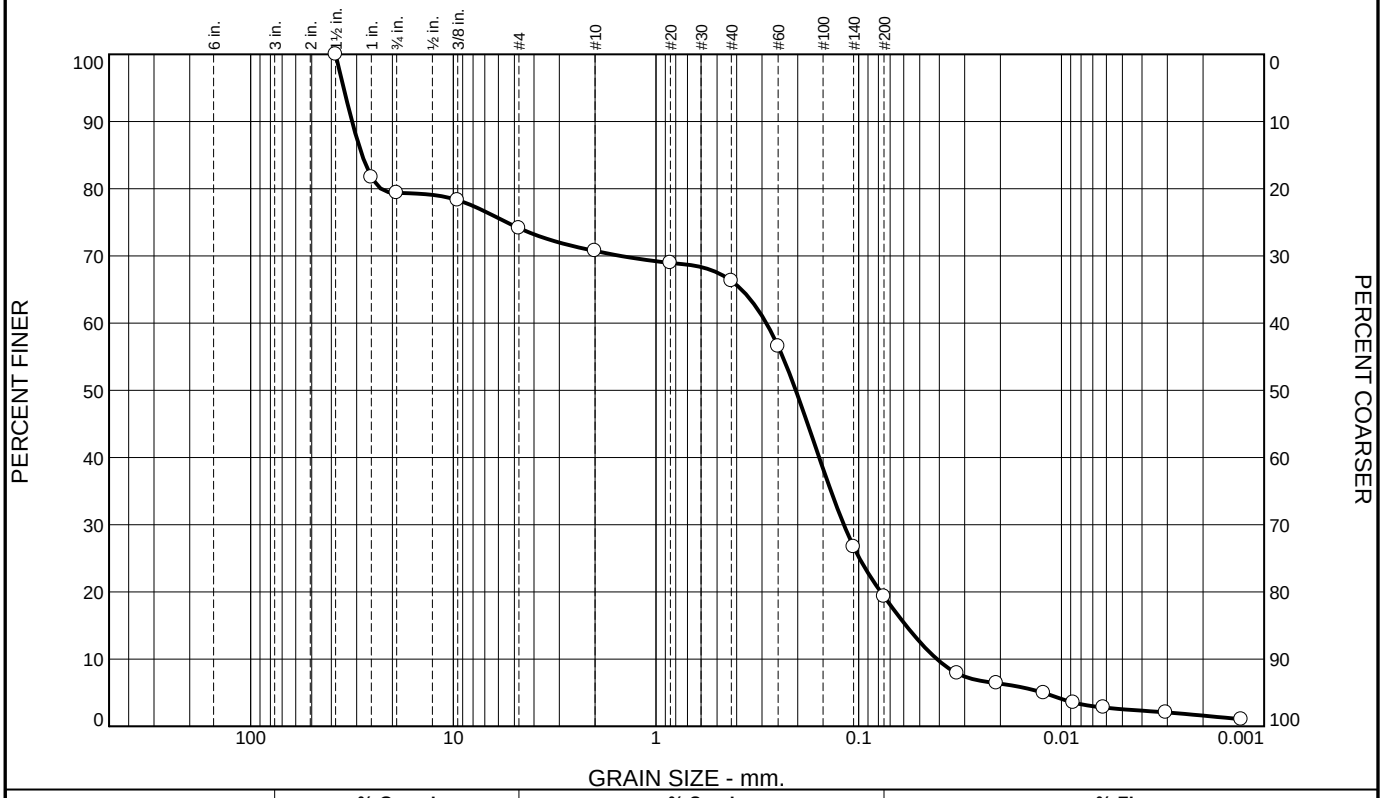
Remarks

Source of Sample: B-3 **Depth:** 12-14
Sample Number: S04 **Date:** 9-1-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	21	5	3	5	47	16	3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100		
1"	82		
3/4	79		
3/8	78		
#4	74		
#10	71		
#20	69		
#40	66		
#60	57		
#140	27		
#200	19		

* (no specification provided)

Material Description

Grayish brown silty sand with gravel and organics

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 31.6179 D_{85}= 28.2234 D_{60}= 0.2857
D_{50}= 0.2045 D_{30}= 0.1185 D_{15}= 0.0585
D_{10}= 0.0411 C_u= 6.95 C_c= 1.19

Classification

USCS= AASHTO=

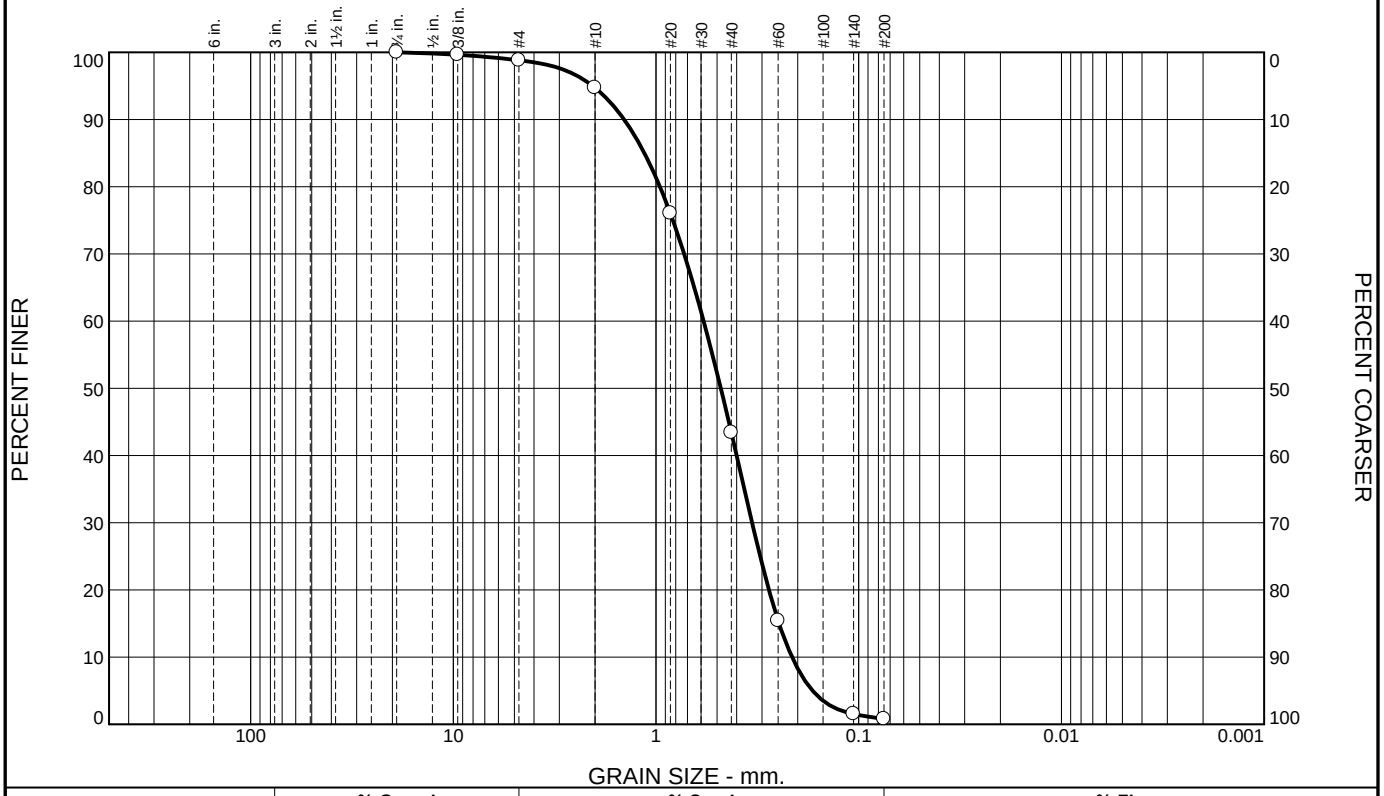
Remarks

Source of Sample: B-3 **Depth:** 22.5-24
Sample Number: S08 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	4	52	42	1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100		
3/8	100		
#4	99		
#10	95		
#20	76		
#40	43		
#60	15		
#140	2		
#200	0.8		

* (no specification provided)

Material Description

Gray sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.4375 D_{85}= 1.1419 D_{60}= 0.5824
D_{50}= 0.4790 D_{30}= 0.3358 D_{15}= 0.2474
D_{10}= 0.2134 C_u= 2.73 C_c= 0.91

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: B-3 **Depth:** 28-30
Sample Number: S10 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	3	2	25	65	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100		
#4	97		
#10	95		
#20	88		
#40	70		
#60	37		
#140	7		
#200	5.4		

* (no specification provided)

Material Description

Brown sand with organics

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.9813 D_{85}= 0.6742 D_{60}= 0.3575
D_{50}= 0.3068 D_{30}= 0.2211 D_{15}= 0.1537
D_{10}= 0.1263 C_u= 2.83 C_c= 1.08

Classification

USCS= AASHTO=

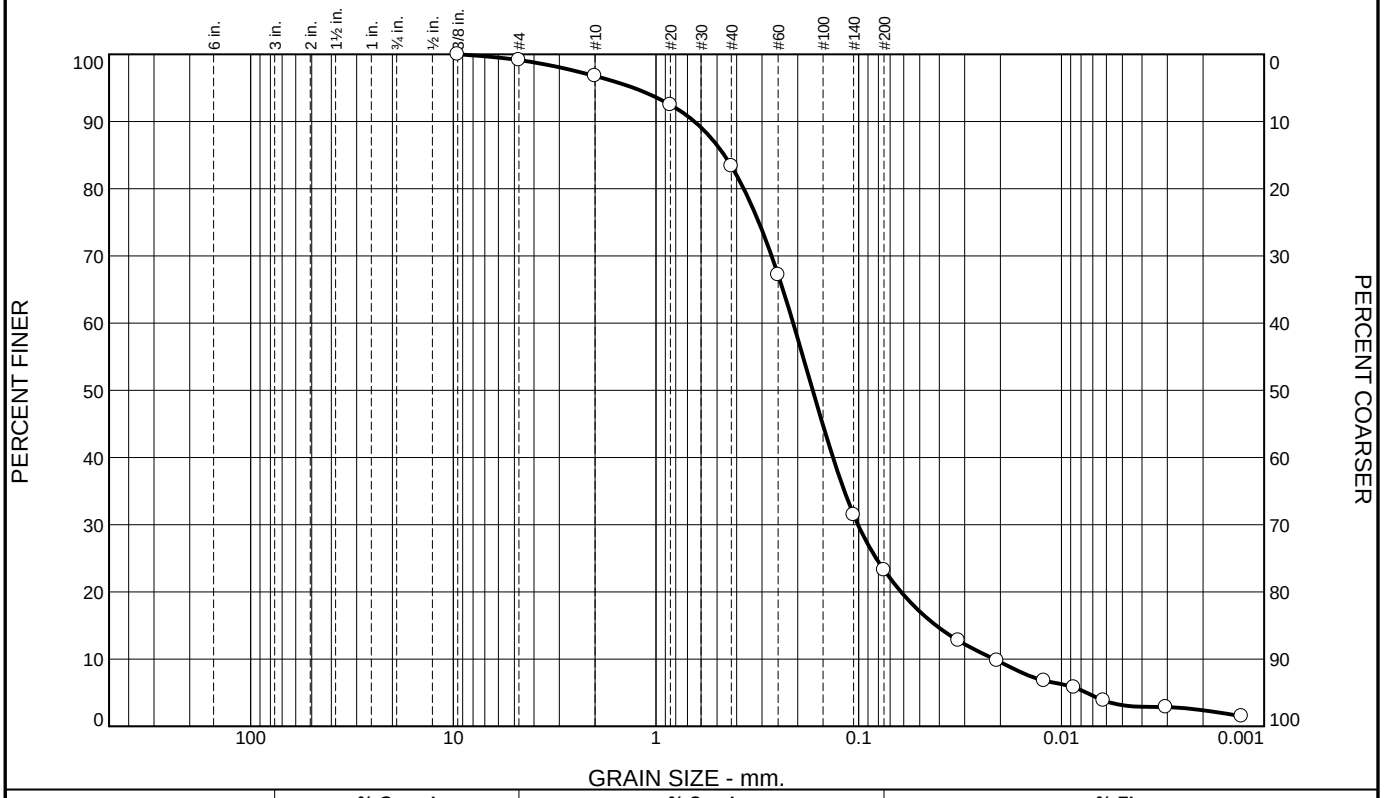
Remarks

Source of Sample: B-4 **Depth:** 4.5-6.5
Sample Number: S02 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	2	14	60	20	3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100		
#4	99		
#10	97		
#20	92		
#40	83		
#60	67		
#140	31		
#200	23		

* (no specification provided)

Material Description

Grayish brown sand with silt and organics

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.6467 D_{85}= 0.4606 D_{60}= 0.2106
D_{50}= 0.1686 D_{30}= 0.1009 D_{15}= 0.0415
D_{10}= 0.0215 C_u= 9.80 C_c= 2.25

Classification

USCS= AASHTO=

Remarks

Source of Sample: B-4 **Depth:** 14.5-16.5
Sample Number: S04 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	10	2	2	16	64	6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100		
3/4	90		
3/8	89		
#4	88		
#10	86		
#20	80		
#40	70		
#60	48		
#140	10		
#200	5.9		

* (no specification provided)

Material Description

Brown sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 16.9281 D_{85}= 1.7697 D_{60}= 0.3219
D_{50}= 0.2599 D_{30}= 0.1763 D_{15}= 0.1251
D_{10}= 0.1051 C_u= 3.06 C_c= 0.92

Classification

USCS= AASHTO=

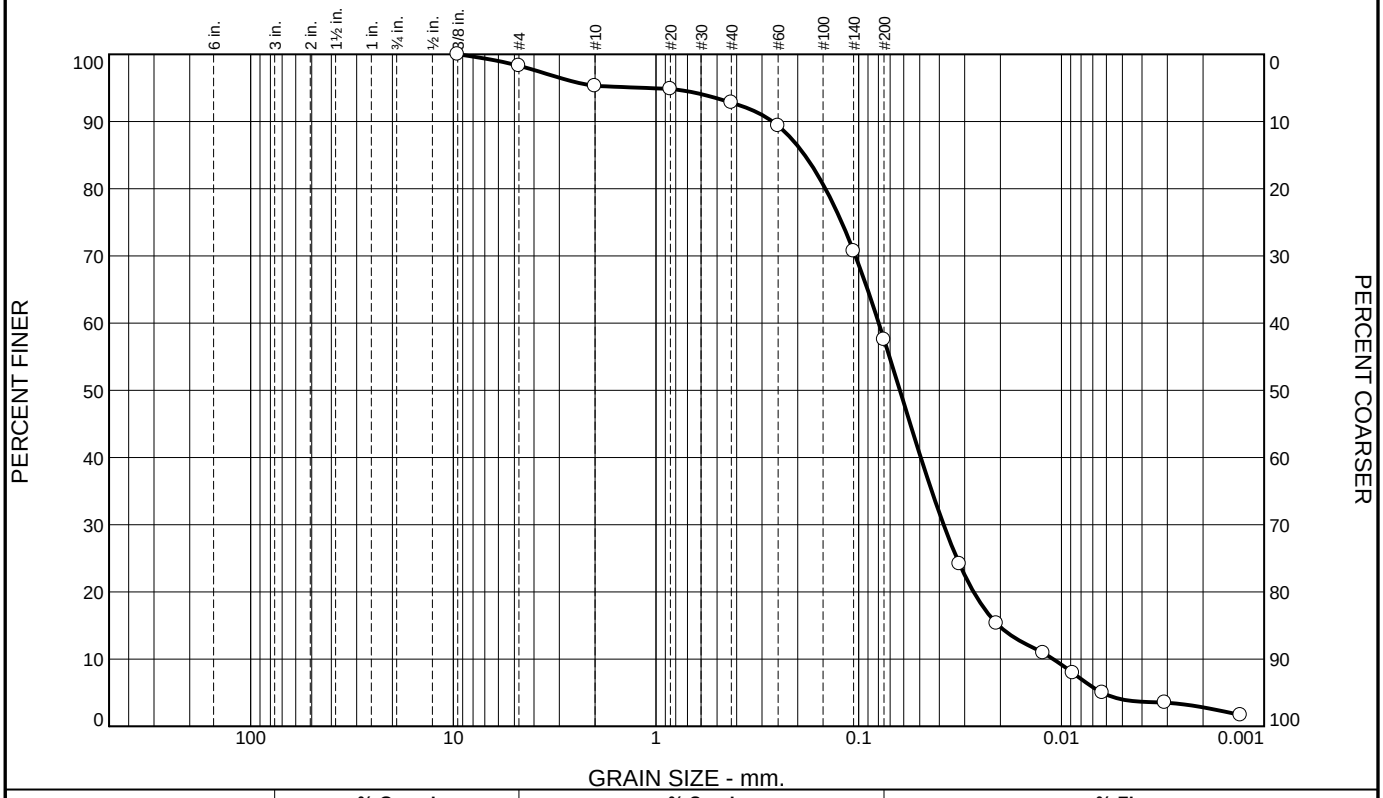
Remarks

Source of Sample: B-4 **Depth:** 21.5-23.5
Sample Number: S06 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	2	3	2	35	54	4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100		
#4	98		
#10	95		
#20	95		
#40	93		
#60	89		
#140	71		
#200	58		

* (no specification provided)

Material Description

Black sandy silt with organics

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 0.2666 D_{85}= 0.1847 D_{60}= 0.0796
D_{50}= 0.0627 D_{30}= 0.0381 D_{15}= 0.0204
D_{10}= 0.0110 C_u= 7.26 C_c= 1.66

Classification

USCS= ML AASHTO= A-4(0)

Remarks

Source of Sample: B-5 **Depth:** 0.5-2.5
Sample Number: S01 **Date:** 8-11-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	4	9	7	43	35	2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100		
3/4	96		
3/8	91		
#4	87		
#10	80		
#20	62		
#40	37		
#60	15		
#140	3		
#200	2.4		

* (no specification provided)

Material Description

Brown sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 8.0525 D_{85}= 3.3059 D_{60}= 0.8072
D_{50}= 0.5939 D_{30}= 0.3626 D_{15}= 0.2499
D_{10}= 0.2081 C_u= 3.88 C_c= 0.78

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: B-5 **Depth:** 8.5-9.9
Sample Number: S03 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	10	6	9	36	34	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100		
1"	92		
3/4	90		
3/8	89		
#4	84		
#10	75		
#20	60		
#40	39		
#60	22		
#140	7		
#200	5.0		

* (no specification provided)

Material Description

Gray sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 19.4277 D_{85}= 5.5184 D_{60}= 0.8626
D_{50}= 0.5921 D_{30}= 0.3247 D_{15}= 0.1919
D_{10}= 0.1427 C_u= 6.05 C_c= 0.86

Classification

USCS= AASHTO=

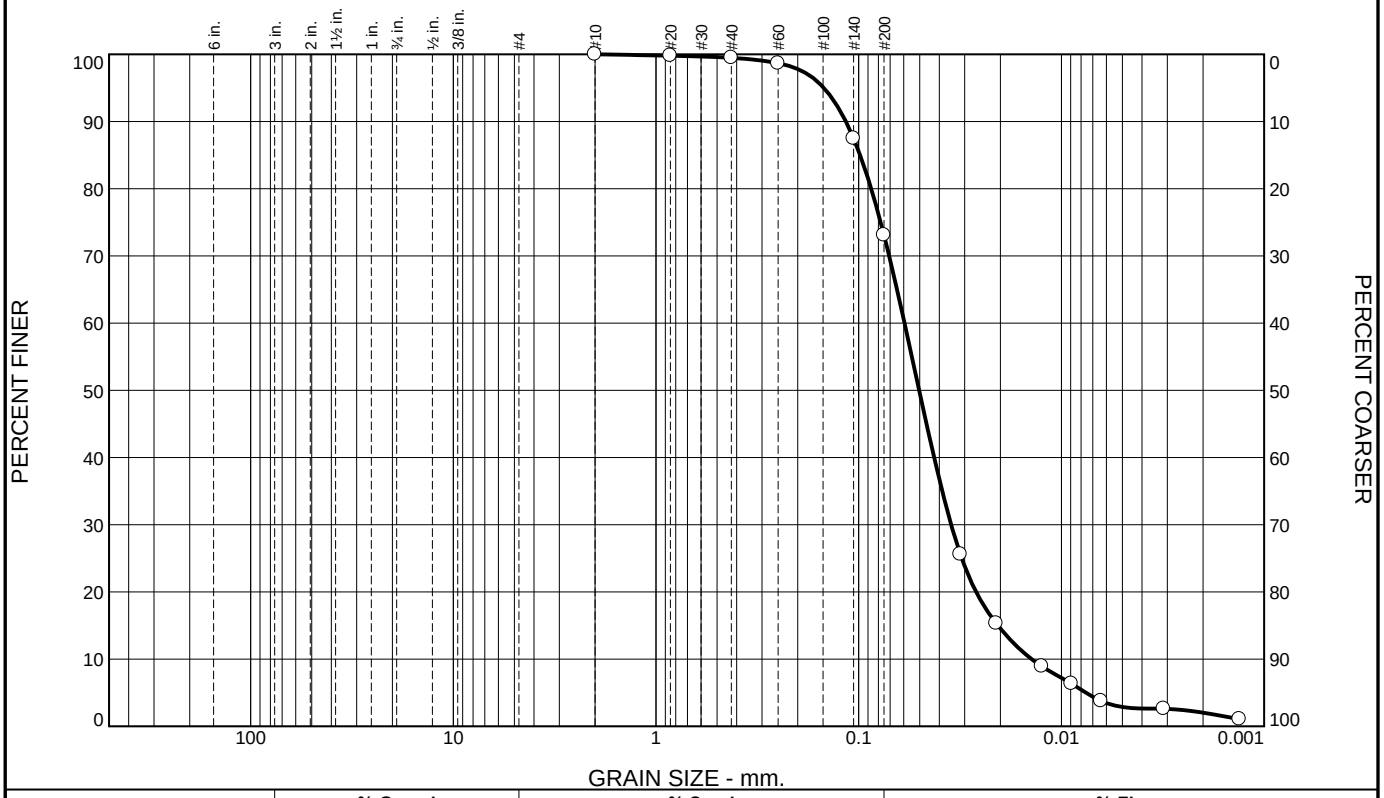
Remarks

Source of Sample: B-5 **Depth:** 17.5-19.5
Sample Number: S06 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	1	26	70	3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100		
#20	100		
#40	99		
#60	99		
#140	87		
#200	73		

* (no specification provided)

Material Description

Dark brown silt with sand

Atterberg Limits

PL= 37 LL= 53 PI= 16

Coefficients

D_{90}= 0.1157 D_{85}= 0.0985 D_{60}= 0.0594
D_{50}= 0.0503 D_{30}= 0.0350 D_{15}= 0.0206
D_{10}= 0.0140 C_u= 4.24 C_c= 1.47

Classification

USCS= MH AASHTO= A-7-5(14)

Remarks

Source of Sample: B-5 **Depth:** 32.5-33.6
Sample Number: S10u **Date:** 8-14-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	1	7	86	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100		
#4	99		
#10	98		
#20	97		
#40	91		
#60	63		
#140	10		
#200	4.6		

* (no specification provided)

Material Description

Gray sand with organics

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.4165 D_{85}= 0.3658 D_{60}= 0.2384
D_{50}= 0.2072 D_{30}= 0.1561 D_{15}= 0.1201
D_{10}= 0.1054 C_u= 2.26 C_c= 0.97

Classification

USCS= SP AASHTO=

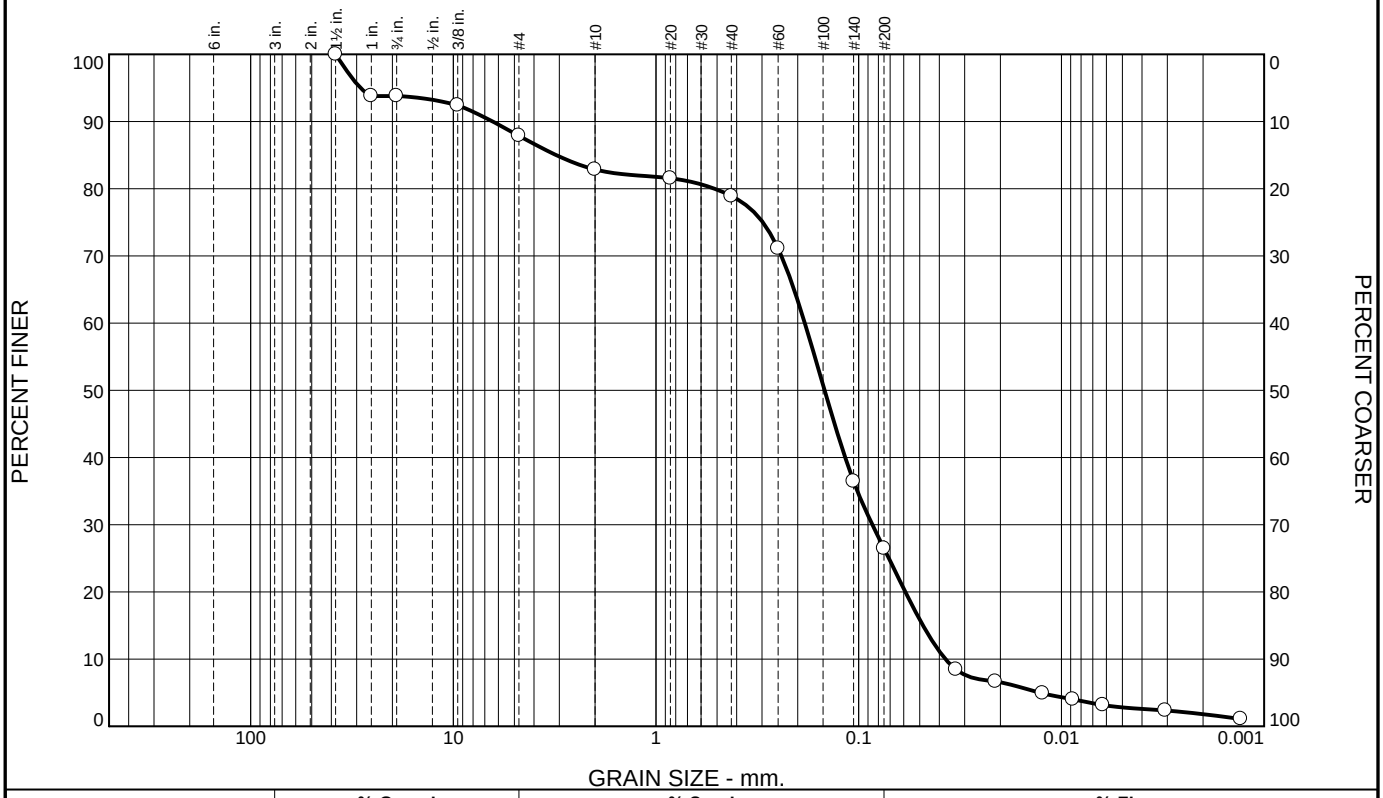
Remarks

Source of Sample: B-6 **Depth:** 0-2
Sample Number: S01 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	6	6	5	4	53	23	3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100		
1"	94		
3/4	94		
3/8	92		
#4	88		
#10	83		
#20	82		
#40	79		
#60	71		
#140	36		
#200	26		

* (no specification provided)

Material Description

Black sand with silt and organics

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 6.4072 D_{85}= 3.1090 D_{60}= 0.1845
D_{50}= 0.1473 D_{30}= 0.0857 D_{15}= 0.0482
D_{10}= 0.0373 C_u= 4.94 C_c= 1.07

Classification

USCS= AASHTO=

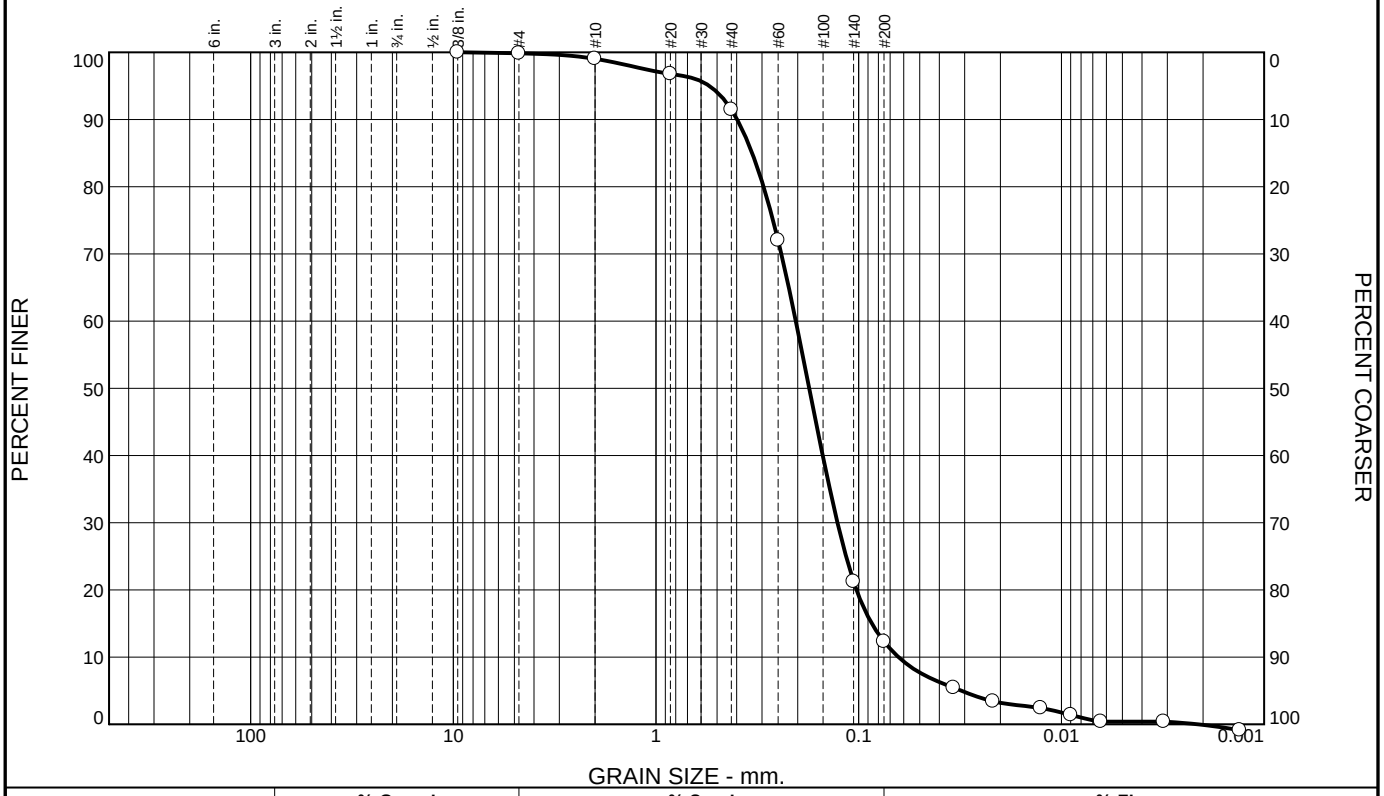
Remarks

Source of Sample: B-6 **Depth:** 7-9
Sample Number: S03 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	1	8	79	12	0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100		
#4	100		
#10	99		
#20	97		
#40	91		
#60	72		
#140	21		
#200	12		

* (no specification provided)

Material Description

Gray sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.3979 D_{85}= 0.3355 D_{60}= 0.2044
D_{50}= 0.1755 D_{30}= 0.1273 D_{15}= 0.0863
D_{10}= 0.0636 C_u= 3.21 C_c= 1.25

Classification

USCS= AASHTO=

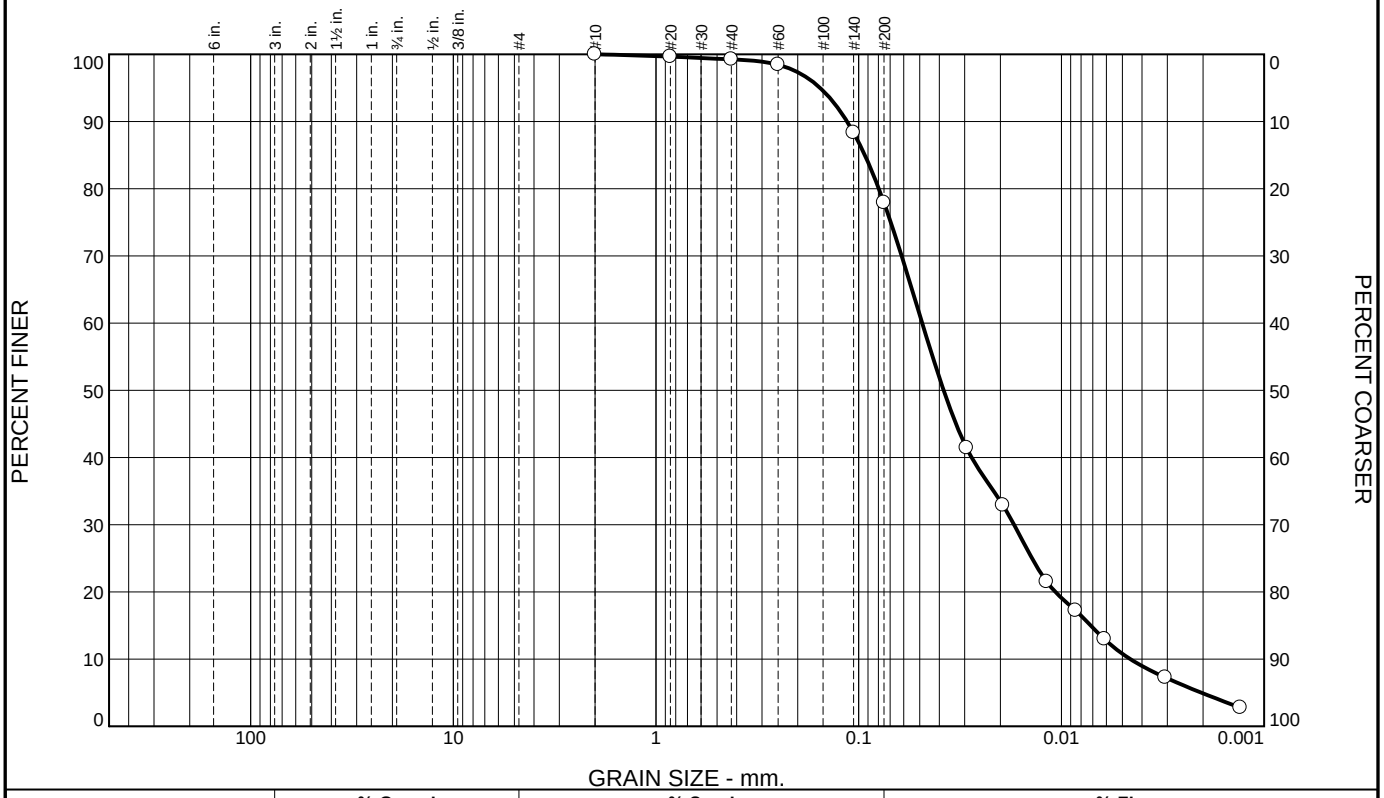
Remarks

Source of Sample: B-6 **Depth:** 22-24
Sample Number: S08 **Date:** 8-11-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	1	21	67	11

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100		
#20	100		
#40	99		
#60	98		
#140	88		
#200	78		

* (no specification provided)

Material Description

Dark gray silt with sand

Atterberg Limits

PL= 41 LL= 61 PI= 20

Coefficients

D_{90}= 0.1142 D_{85}= 0.0933 D_{60}= 0.0486
D_{50}= 0.0381 D_{30}= 0.0171 D_{15}= 0.0072
D_{10}= 0.0046 C_u= 10.64 C_c= 1.32

Classification

USCS= MH AASHTO= A-7-5(19)

Remarks

Source of Sample: B-6 **Depth:** 37-39
Sample Number: S12 **Date:** 8-11-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	3	21	58	17	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100		
#4	99		
#10	96		
#20	88		
#40	75		
#60	58		
#140	24		
#200	17		

* (no specification provided)

Material Description

Black sand with silt and organics

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.0134 D_{85}= 0.7046 D_{60}= 0.2631
D_{50}= 0.2065 D_{30}= 0.1286 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Source of Sample: B-7 **Depth:** 5-7
Sample Number: S02 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	2	20	69	9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100		
#20	99		
#40	98		
#60	96		
#140	85		
#200	78		

* (no specification provided)

Material Description

Black silt with sand

Atterberg Limits

PL= 42 LL= 56 PI= 14

Coefficients

D_{90}= 0.1450 D_{85}= 0.1063 D_{60}= 0.0450
D_{50}= 0.0349 D_{30}= 0.0172 D_{15}= 0.0075
D_{10}= 0.0053 C_u= 8.48 C_c= 1.25

Classification

USCS= MH AASHTO= A-7-5(15)

Remarks

Source of Sample: B-7 **Depth:** 9-11
Sample Number: S03

Date: 8-11-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	2	41	51	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100		
#4	99		
#10	97		
#20	92		
#40	56		
#60	26		
#140	7		
#200	4.6		

* (no specification provided)

Material Description

Gray sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.8094 D_{85}= 0.7136 D_{60}= 0.4549
D_{50}= 0.3878 D_{30}= 0.2742 D_{15}= 0.1831
D_{10}= 0.1415 C_u= 3.22 C_c= 1.17

Classification

USCS= SP AASHTO=

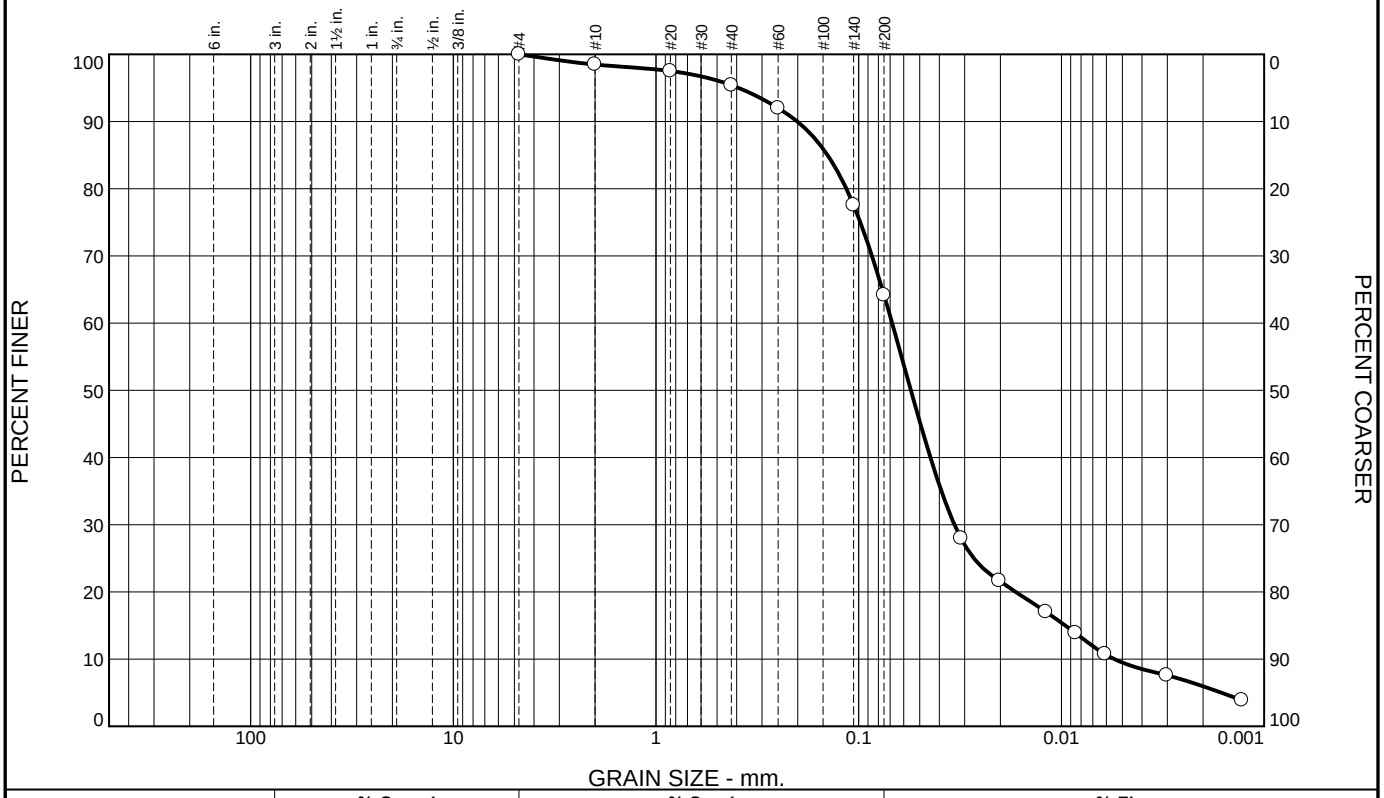
Remarks

Source of Sample: B-7 **Depth:** 29-31
Sample Number: S08 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	2	3	31	55	9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100		
#10	98		
#20	98		
#40	95		
#60	92		
#140	78		
#200	64		

* (no specification provided)

Material Description

Gray sandy silt with organics

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.2010 D_{85}= 0.1425 D_{60}= 0.0684
D_{50}= 0.0553 D_{30}= 0.0337 D_{15}= 0.0096
D_{10}= 0.0055 C_u= 12.47 C_c= 3.03

Classification

USCS= AASHTO=

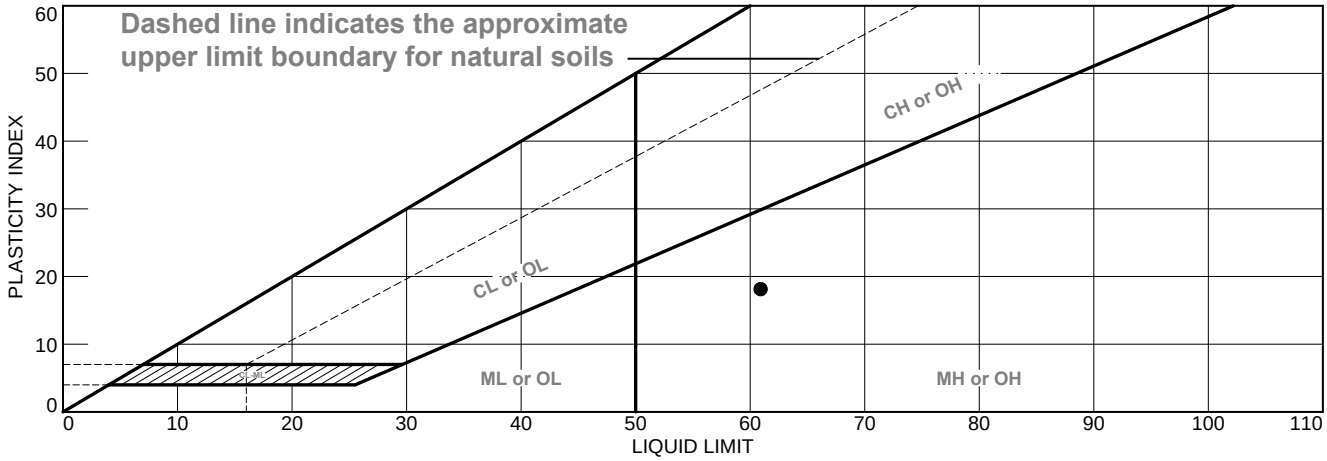
Remarks

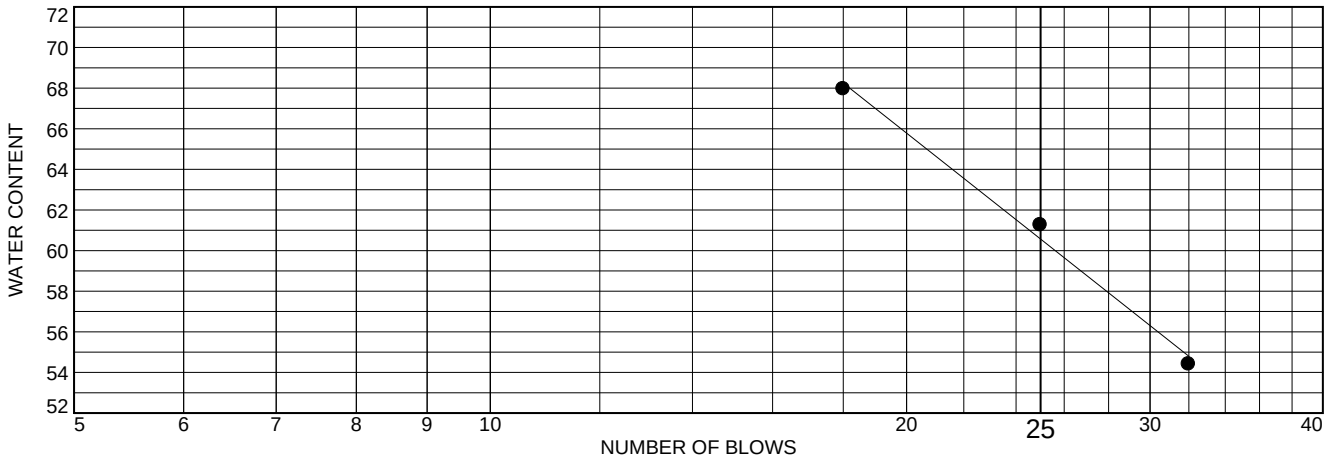
Source of Sample: B-7 **Depth:** 40.2-41
Sample Number: S10 **Date:** 8-7-17

Client: AECOM
Project: Los Padres Dam Alternatives Study
60536296
Project No: 2301-040.0 **Figure**

Tested By: JH **Checked By:** JH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark gray silt with clay	61	43	18	100	98	MH

Project No. 2301-040.0 **Client:** AECOM

Project: Los Padres Dam Alternatives Study

60536296

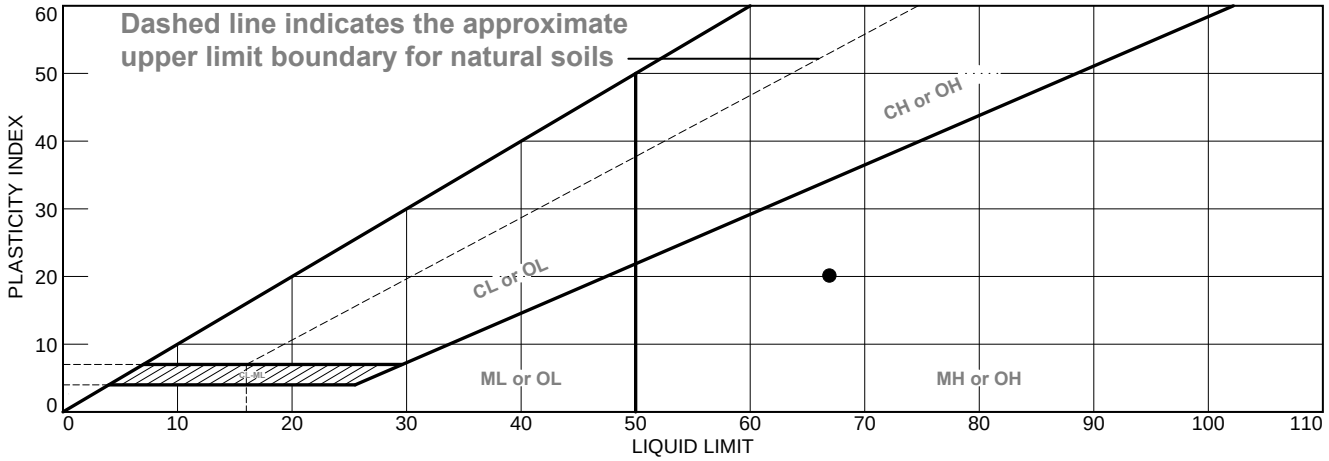
●**Source of Sample:** B-1 **Depth:** 20.5-22.5 **Sample Number:** S06

Remarks:

Figure

Tested By: JH **Checked By:** JH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark gray silt with clay	67	47	20	100	96	MH

Project No. 2301-040.0 **Client:** AECOM

Project: Los Padres Dam Alternatives Study

60536296

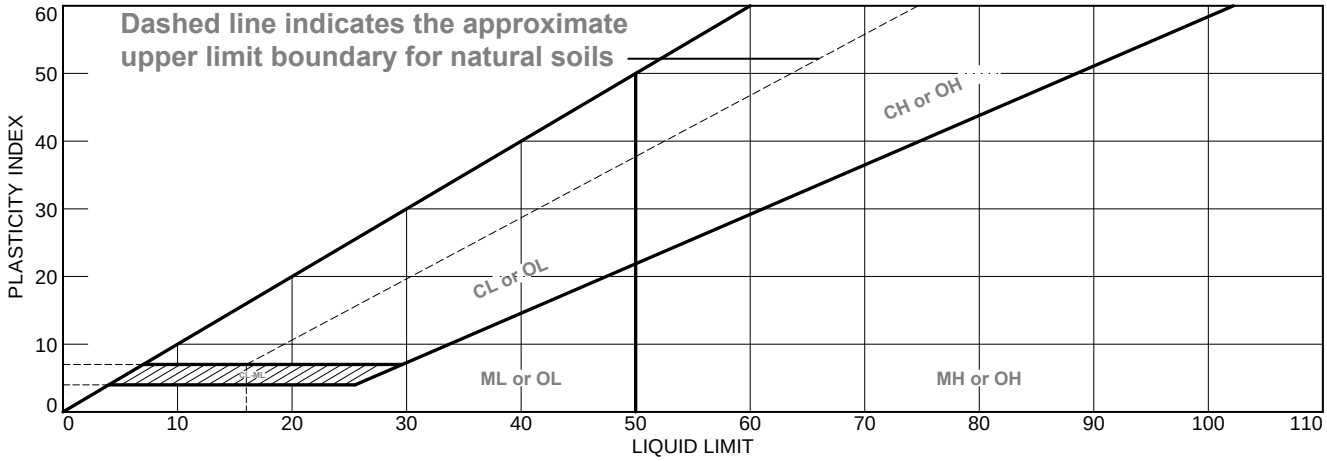
●**Source of Sample:** B-2 **Depth:** 9-11 **Sample Number:** S03

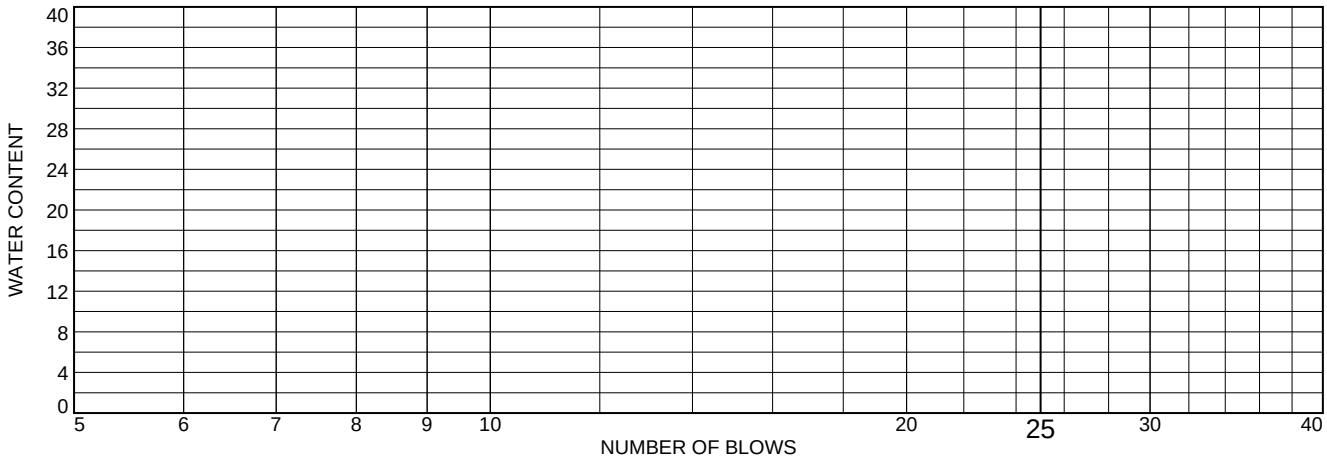
Remarks:

Figure

Tested By: JH **Checked By:** JH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark gray sand with silt	NP	NP	NP	85	31	SM

Project No. 2301-040.0 **Client:** AECOM

Project: Los Padres Dam Alternatives Study

60536296

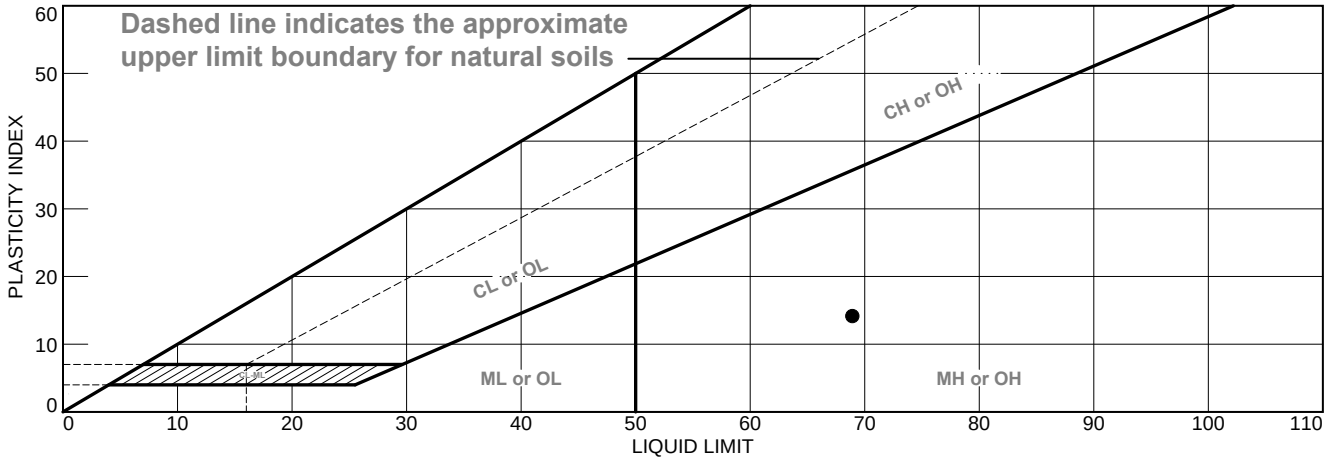
●**Source of Sample:** B-3 **Depth:** 4-6 **Sample Number:** S02

Remarks:

Figure

Tested By: JH **Checked By:** JH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray silt with sand	69	55	14			

Project No. 2301-040.0 **Client:** AECOM

Project: Los Padres Dam Alternatives Study

60536296

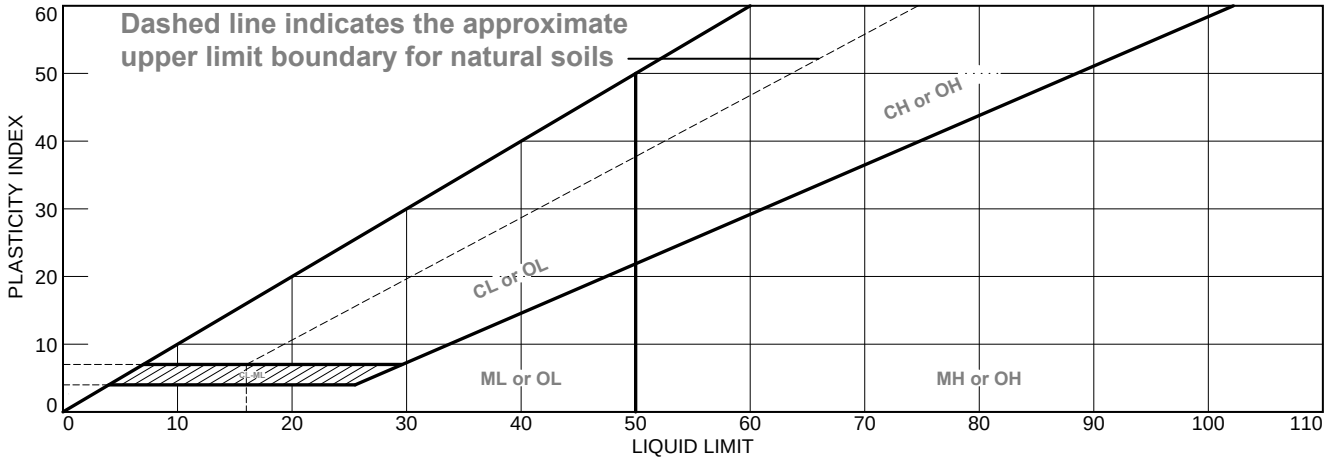
●**Source of Sample:** B-4 **Depth:** 0.5-2.5 **Sample Number:** S01

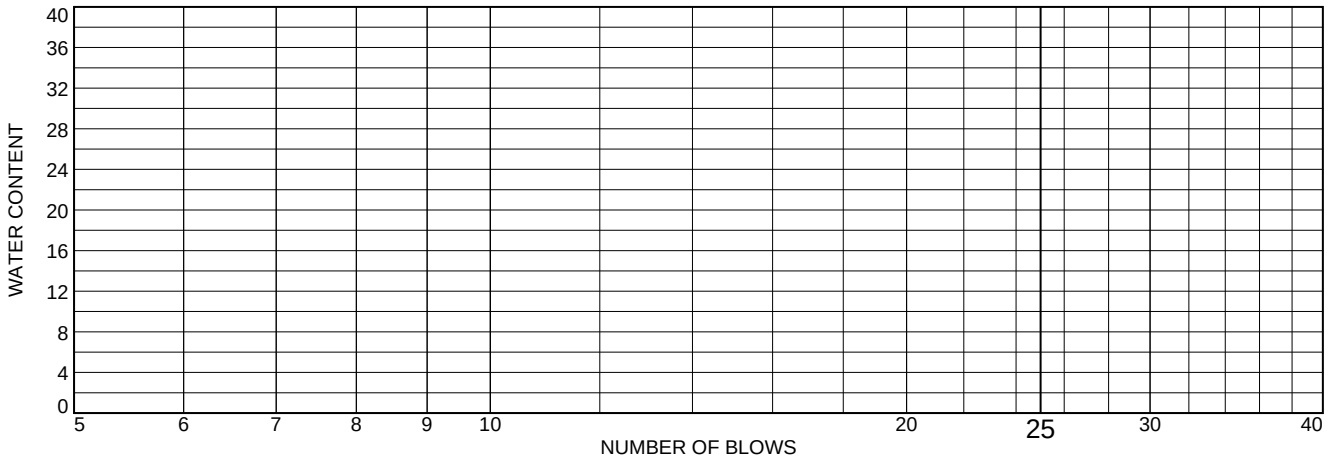
Remarks:

Figure

Tested By: JH **Checked By:** JH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Black sandy silt with organics	NP	NP	NP	93	58	ML

Project No. 2301-040.0 **Client:** AECOM

Project: Los Padres Dam Alternatives Study

60536296

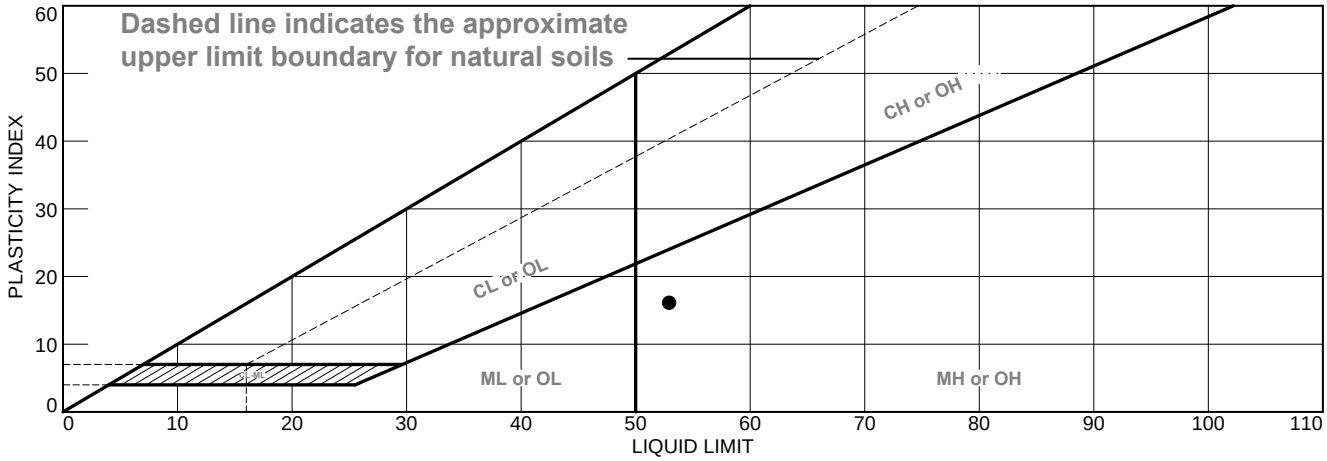
●**Source of Sample:** B-5 **Depth:** 0.5-2.5 **Sample Number:** S01

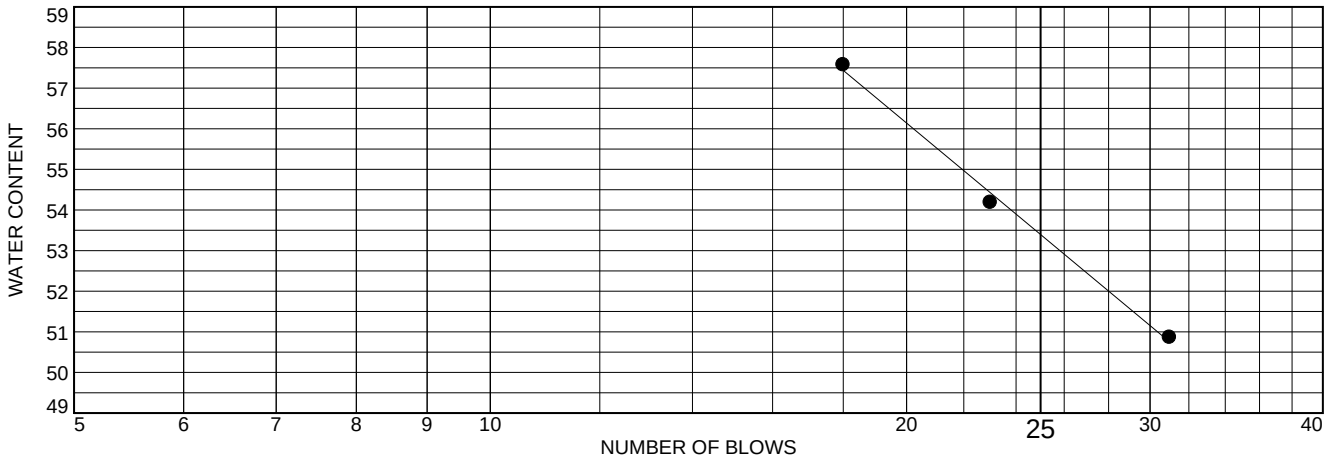
Remarks:

Figure

Tested By: JH **Checked By:** JH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark brown silt with sand	53	37	16	99	73	MH

Project No. 2301-040.0 **Client:** AECOM

Project: Los Padres Dam Alternatives Study

60536296

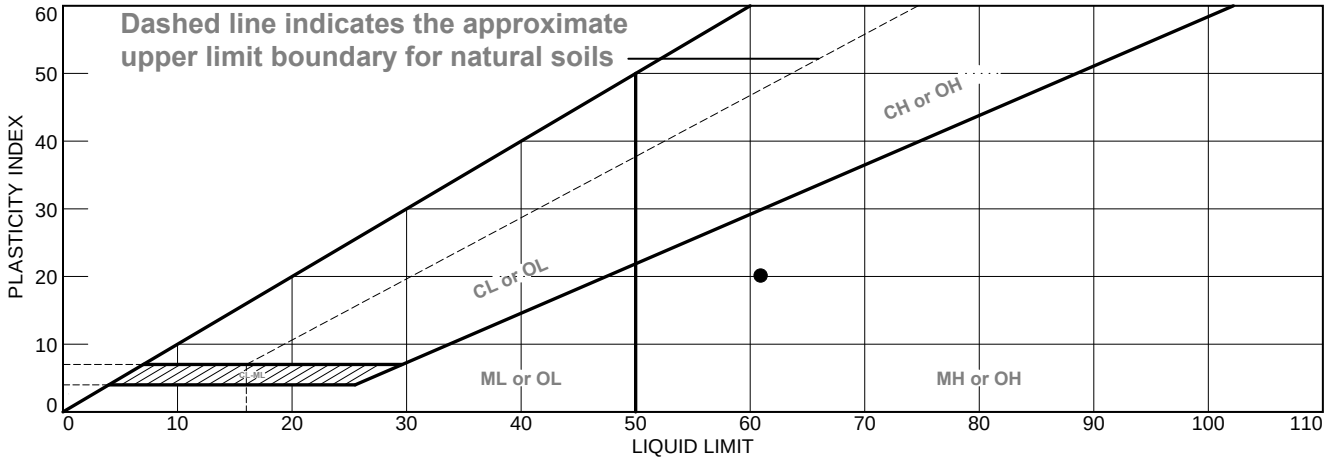
●**Source of Sample:** B-5 **Depth:** 32.5-33.6 **Sample Number:** S10u

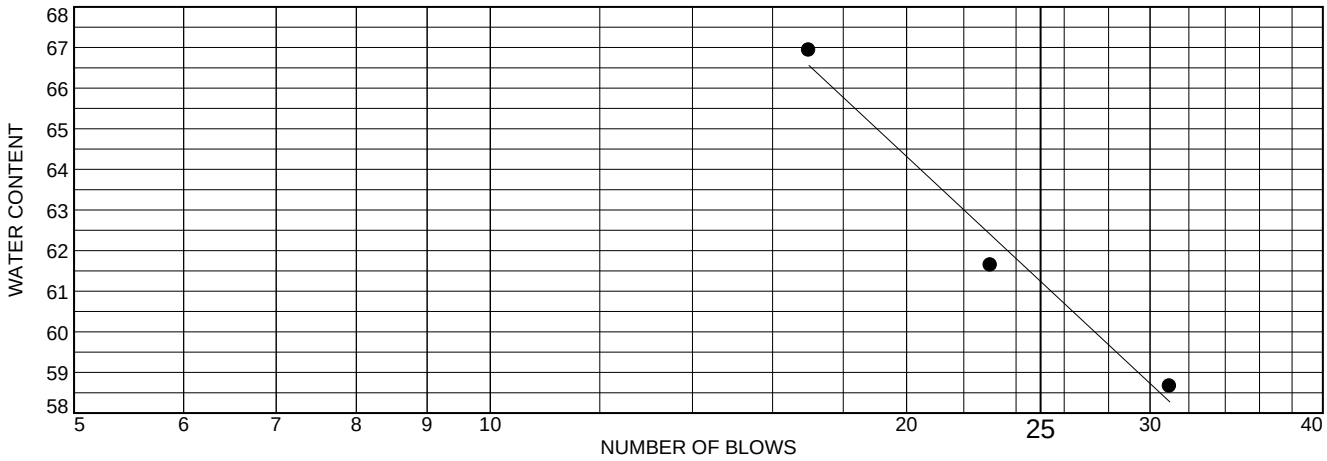
Remarks:

Figure

Tested By: JH **Checked By:** JH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark gray silt with sand	61	41	20	99	78	MH

Project No. 2301-040.0 **Client:** AECOM

Project: Los Padres Dam Alternatives Study

60536296

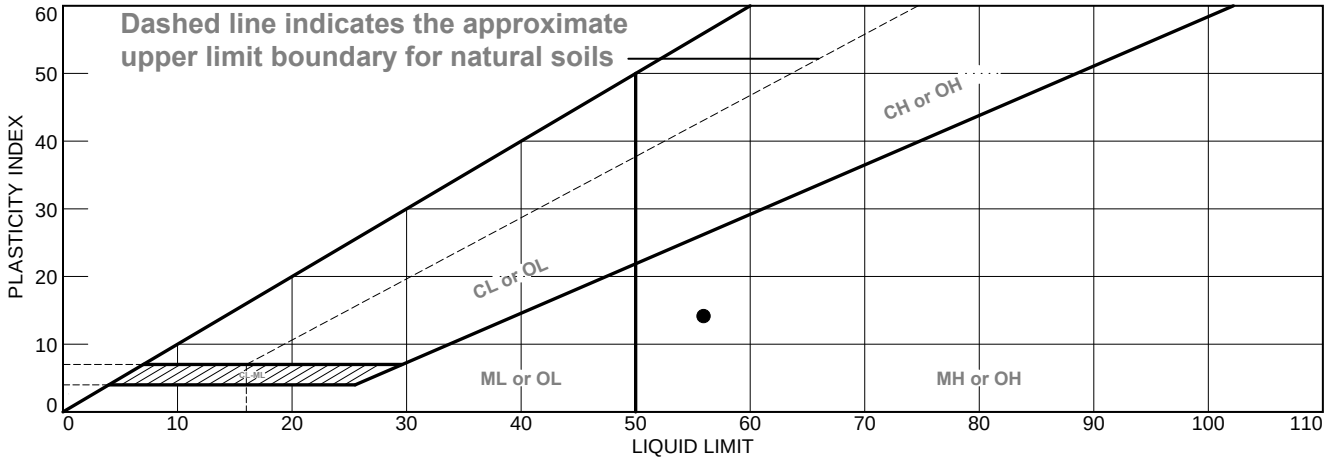
●**Source of Sample:** B-6 **Depth:** 37-39 **Sample Number:** S12

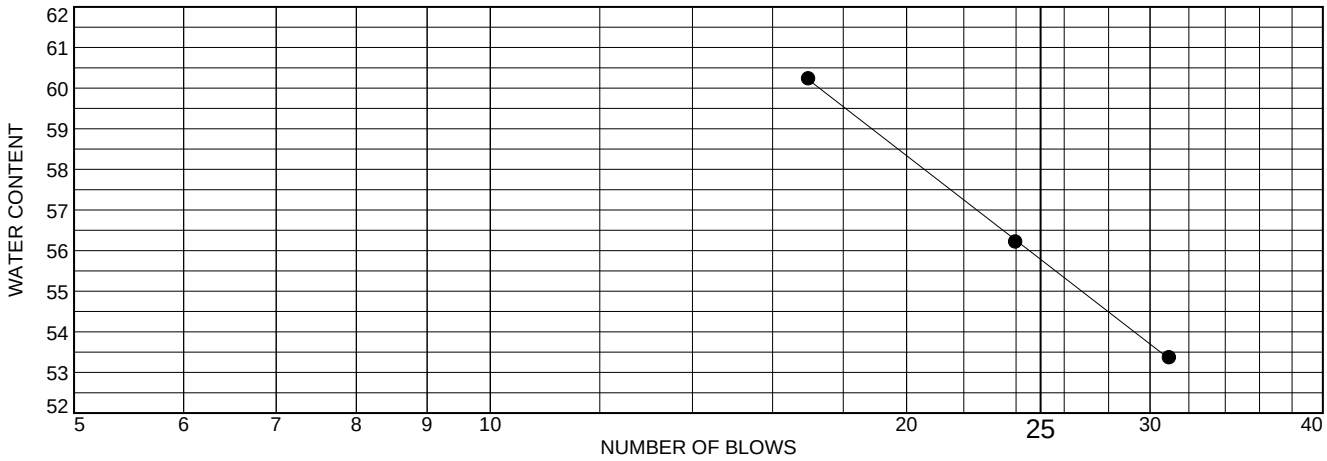
Remarks:

Figure

Tested By: JH **Checked By:** JH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Black silt with sand	56	42	14	98	78	MH

Project No. 2301-040.0 **Client:** AECOM

Project: Los Padres Dam Alternatives Study

60536296

●**Source of Sample:** B-7 **Depth:** 9-11 **Sample Number:** S03

Remarks:

Figure

Tested By: JH **Checked By:** JH

MOISTURE & DENSITY TEST

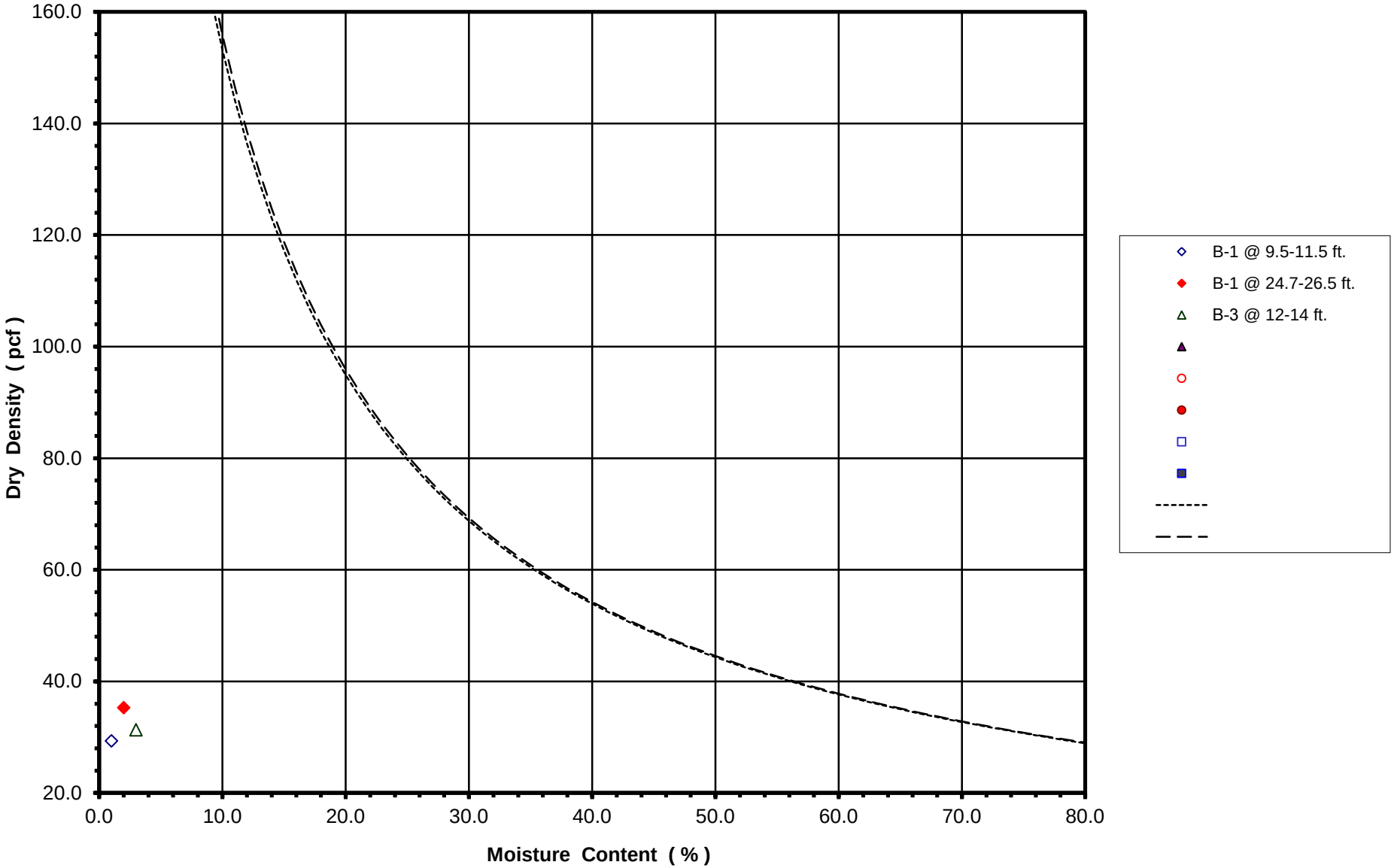
Client : AECOM Project : Los Padres Dam Alternatives Study ISI Lab No.: G-61269 Job no : 60536296

Boring #	B-1	B-1	B-3					
Sample #	S03	S07	S04					
Depth (ft.)	9.5-11.5	24.7-26.5	12-14					
Soil type: (visual)	Black silt with organics	Dark greenish gray clayey silt with oragnics	Gray silty sand with organics					
1. Date tested:	08/31/17	08/31/17	08/30/17					
2. Tested by:	JH	JH	JH					
3. Specimen height (in.)	1.63	1.70	2.52					
4. Wt. of specimen + tare (gm)	169.59	207.48	240.40					
5. Tare wt. (gm)	0.00	0.00	0.00					
6. Diameter (in.)	2.85	2.85	2.86					
7. Wet wt. of soil + dish wt. (gm)	256.64	292.90	428.01					
8. Dry wt. of soil + dish wt. (gm)	167.08	185.87	320.70					
9. Wt. of dish (gm)	87.05	85.42	187.61					
10. Dish ID								
Wet Density (pcf)	62.1	72.8	56.5					
Dry Density (pcf)	29.3	35.3	31.3					
Moisture Content (%)	111.9	106.6	80.6					
Gs (Assumed)	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70
Void Ratio	4.751	3.779	4.384					
Saturation (%)	63.6	76.1	49.7					

Additional data:

Wt. of dry soil + dish before washing (gm)								
Wt. of dry soil + dish after washing (gm)								
% Passing # 200 sieve								
USCS symbol								

Job no : 60536296 **Moisture Content Vs Dry Density**



Signet Testing labs

Appendix C-2 Analytical Test Results


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 290553
ANALYTICAL REPORT

AECOM	Project : 60536296
300 Lakeside Drive	Location : Los Padres
Oakland, CA 94612	Level : II

Sample ID	Lab ID
B-1-S01A	290553-001
B-1-S02A	290553-002
B-2-S01A	290553-003
B-2-S02A	290553-004
B-2-S03A	290553-005
B-3-S01A	290553-006

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: Tracy Babjar Date: 07/28/2017

Tracy Babjar
Project Manager
tracy.babjar@ctberk.com
(510) 204-2226 Ext 13107

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**290553**
Client:	**AECOM**
Project:	**60536296**
Location:	**Los Padres**
Request Date:	**07/14/17**
Samples Received:	**07/14/17**

This data package contains sample and QC results for six soil samples, requested for the above referenced project on 07/14/17. The samples were received cold and intact.

Semivolatile Organics by GC/MS SIM (EPA 8270C-SIM):
B-1-S02A (lab # 290553-002) was diluted due to high non-target analytes. B-1-S01A (lab # 290553-001), B-2-S01A (lab # 290553-003), and B-3-S01A (lab # 290553-006) were diluted due to the dark and viscous nature of the sample extracts. No other analytical problems were encountered.

Metals (EPA 6010B and EPA 7471A):
Copper was detected at or above the RL in the CCB analyzed 07/19/17 17:38; affected data was qualified with "b". Sodium was detected at or above the RL in the CCB analyzed 07/27/17 13:17; affected data was qualified with "b". No other analytical problems were encountered.

Ammonia Nitrogen (SM4500NH3-D):
Ammonia-N was detected between the MDL and the RL in the method blank for batch 249953; this analyte was not detected in samples at or above the RL. No other analytical problems were encountered.

Total Kjeldahl Nitrogen (SM4500NH3-C):
No analytical problems were encountered.

pH (EPA 9045D):
No analytical problems were encountered.

Total Phosphorous (SM4500P-E):
No analytical problems were encountered.

Total Organic Carbon (TOC) (WALKLEY-BLACK):
No analytical problems were encountered.

***** Missing Items *****

The following items are valid in the narrative, but for some reason didn't end up in the above report:

Item 2 (UNCLASSIFIED/Soil): Eurofins (CalScience) in Garden Grove, CA performed the analysis (not NELAP certified). Please see the Eurofins (CalScience) case narrative.

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**290553**
Client:	**AECOM**
Project:	**60536296**
Location:	**Los Padres**
Request Date:	**07/14/17**
Samples Received:	**07/14/17**

***** Missing Items *****

You can invalidate these items, or adjust rgroup/matrix/method ([C] button) for each until they appear in the main body of the report. See the operations manager or LIMS staff for assistance if necessary.

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

CHAIN OF CUSTODY

Chain of Custody # : _____

C&T LOGIN # 290553

Project No: 60536296
Project Name: Los Padres Alts Field Investigation
EDD Format: Standard Rpt Level: ☒ II ☐ III ☐ IV
Turnaround Time: ☐ RUSH _____ ☒ Standard

Sampler: Ben Kozlowicz
Report To: Jon Stead
Company : AECOM
Telephone: 510-874-3058
Email: jon.stead@aecom.com

Lab No.	Sample ID	Sampling		Matrix				Chemical Preservative					Analytical Request								
		Date	Time	Water	Soil	Sediment	# of Containers	HCl	H_2SO_4	HNO_3	NaOH	None	6010-TAL MET / 7471 Hg	Ammonia (SM4500NH3)	TKN (SM4500NH3)	PO4-T (SM4500P-E)	Sulfide (EPA 9034)	TOC (Walkley-Black)	pH (EPA 9045D)	PAHs (8270-SIM)	
1	B-1-S01A	7/12/17	1345			x	1					x	x	x	x	x	x	x	x	x	
2	B-1-S02A	7/12/17	1520			x	1					x	x	x	x	x	x	x	x	x	
	[redacted]																				
3	B-2-S01A	7/13/17	1120			x	1					x	x	x	x	x	x	x	x	x	
4	B-2-S02A	7/13/17	1155			x	1					x	x	x	x	x	x	x	x	x	
5	B-2-S03A	7/13/17	1245			x	1					x	x	x	x	x	x	x	x	x	
6	B-3-S01A	7/13/17	1540			x	1					x	x	x	x	x	x	x	x	x	
	[redacted]																				
	[redacted]																				
	[redacted]																				
	[redacted]																				
	[redacted]																				

Notes:

SAMPLE RECEIPT
☐ Intact ☐ Cold
☒ On Ice ☐ Ambient

RELINQUISHED BY:

Ben Kozlowicz 7/14/17 0810 DATE/TIME

7/14/17 1122 DATE/TIME

DATE/TIME

RECEIVED BY:

7/14/17 0810 DATE/TIME

Pat Hanly 7/14/17 11:22 DATE/TIME

DATE/TIME

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 290553 Date Received 7-14-17 Number of coolers 1
Client AECOM Project Los Padres Alts Field Investigation

Date Opened 7-14-17 By (print) KP & TLB (sign) KP TLB
Date Logged in 7-14-17 By (print) TLB (sign) TLB
Date Labelled 7-14-17 By (print) EHS (sign)

1. Did cooler come with a shipping slip (airbill, etc) YES NO
   Shipping info
2A. Were custody seals present? .... ☑ YES (circle) on cooler on samples ☐ NO
   How many 6 Name signature Date 7-13-17
2B. Were custody seals intact upon arrival? YES NO N/A
3. Were custody papers dry and intact when received? YES NO
4. Were custody papers filled out properly (ink, signed, etc)? YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO
6. Indicate the packing in cooler: (if other, describe)

☐ Bubble Wrap ☐ Foam blocks ☑ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☑ Wet ☐ Blue/Gel ☐ None Temp(°C) 0.6

☐ Temperature blank(s) included? ☐ Thermometer# ☐ IR Gun# B

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES NO
   If YES, what time were they transferred to freezer?
9. Did all bottles arrive unbroken/unopened? YES NO
10. Are there any missing / extra samples? YES NO
11. Are samples in the appropriate containers for indicated tests? YES NO
12. Are sample labels present, in good condition and complete? YES NO
13. Do the sample labels agree with custody papers? YES NO
14. Was sufficient amount of sample sent for tests requested? YES NO
15. Are the samples appropriately preserved? YES NO N/A
16. Did you check preservatives for all bottles for each sample? YES NO N/A
17. Did you document your preservative check? (pH strip lot#) YES NO N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO N/A
19. Did you change the hold time in LIMS for preserved terracores? YES NO N/A
20. Are bubbles > 6mm absent in VOA samples? YES NO N/A
21. Was the client contacted concerning this sample delivery? YES NO
   If YES, Who was called? By Date:

COMMENTS

Rev 13, 6/01/16

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-1-S01A	Batch#:	249773
Lab ID:	290553-001	Sampled:	07/12/17
Matrix:	Soil	Received:	07/14/17
Units:	ug/Kg	Prepared:	07/18/17
Basis:	as received	Analyzed:	07/26/17
Diln Fac:	6.250		

Analyte	Result	RL
Naphthalene	ND	31
Acenaphthylene	ND	31
Acenaphthene	ND	31
Fluorene	ND	31
Phenanthrene	ND	31
Anthracene	ND	31
Fluoranthene	ND	31
Pyrene	ND	31
Benzo(a)anthracene	ND	31
Chrysene	ND	31
Benzo(b)fluoranthene	ND	31
Benzo(k)fluoranthene	ND	31
Benzo(a)pyrene	ND	31
Indeno(1,2,3-cd)pyrene	ND	31
Dibenz(a,h)anthracene	ND	31
Benzo(g,h,i)perylene	ND	31

Surrogate	%REC	Limits
Nitrobenzene-d5	62	36-120
2-Fluorobiphenyl	62	42-120
Terphenyl-d14	57	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-1-S02A	Batch#:	249773
Lab ID:	290553-002	Sampled:	07/12/17
Matrix:	Soil	Received:	07/14/17
Units:	ug/Kg	Prepared:	07/18/17
Basis:	as received	Analyzed:	07/26/17
Diln Fac:	2.000		

Analyte	Result	RL
Naphthalene	14	10
Acenaphthylene	ND	10
Acenaphthene	ND	10
Fluorene	ND	10
Phenanthrene	ND	10
Anthracene	ND	10
Fluoranthene	ND	10
Pyrene	ND	10
Benzo(a)anthracene	ND	10
Chrysene	ND	10
Benzo(b)fluoranthene	ND	10
Benzo(k)fluoranthene	ND	10
Benzo(a)pyrene	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Dibenz(a,h)anthracene	ND	10
Benzo(g,h,i)perylene	ND	10

Surrogate	%REC	Limits
Nitrobenzene-d5	75	36-120
2-Fluorobiphenyl	86	42-120
Terphenyl-d14	67	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-2-S01A	Batch#:	249773
Lab ID:	290553-003	Sampled:	07/13/17
Matrix:	Soil	Received:	07/14/17
Units:	ug/Kg	Prepared:	07/18/17
Basis:	as received	Analyzed:	07/26/17
Diln Fac:	100.0		

Analyte	Result	RL
Naphthalene	ND	500
Acenaphthylene	ND	500
Acenaphthene	ND	500
Fluorene	ND	500
Phenanthrene	ND	500
Anthracene	ND	500
Fluoranthene	ND	500
Pyrene	ND	500
Benzo(a)anthracene	ND	500
Chrysene	ND	500
Benzo(b)fluoranthene	ND	500
Benzo(k)fluoranthene	ND	500
Benzo(a)pyrene	ND	500
Indeno(1,2,3-cd)pyrene	ND	500
Dibenz(a,h)anthracene	ND	500
Benzo(g,h,i)perylene	ND	500

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	36-120
2-Fluorobiphenyl	DO	42-120
Terphenyl-d14	DO	44-120

DO= Diluted Out
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-2-S02A	Batch#:	249773
Lab ID:	290553-004	Sampled:	07/13/17
Matrix:	Soil	Received:	07/14/17
Units:	ug/Kg	Prepared:	07/18/17
Basis:	as received	Analyzed:	07/26/17
Diln Fac:	1.000		

Analyte	Result	RL
Naphthalene	7.9	5.0
Acenaphthylene	ND	5.0
Acenaphthene	ND	5.0
Fluorene	6.0	5.0
Phenanthrene	ND	5.0
Anthracene	ND	5.0
Fluoranthene	ND	5.0
Pyrene	ND	5.0
Benzo(a)anthracene	ND	5.0
Chrysene	ND	5.0
Benzo(b)fluoranthene	ND	5.0
Benzo(k)fluoranthene	ND	5.0
Benzo(a)pyrene	ND	5.0
Indeno(1,2,3-cd)pyrene	ND	5.0
Dibenz(a,h)anthracene	ND	5.0
Benzo(g,h,i)perylene	ND	5.0

Surrogate	%REC	Limits
Nitrobenzene-d5	73	36-120
2-Fluorobiphenyl	91	42-120
Terphenyl-d14	66	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-2-S03A	Batch#:	249773
Lab ID:	290553-005	Sampled:	07/13/17
Matrix:	Soil	Received:	07/14/17
Units:	ug/Kg	Prepared:	07/18/17
Basis:	as received	Analyzed:	07/26/17
Diln Fac:	1.000		

Analyte	Result	RL
Naphthalene	ND	5.0
Acenaphthylene	ND	5.0
Acenaphthene	ND	5.0
Fluorene	5.2	5.0
Phenanthrene	ND	5.0
Anthracene	ND	5.0
Fluoranthene	ND	5.0
Pyrene	ND	5.0
Benzo(a)anthracene	ND	5.0
Chrysene	ND	5.0
Benzo(b)fluoranthene	ND	5.0
Benzo(k)fluoranthene	ND	5.0
Benzo(a)pyrene	ND	5.0
Indeno(1,2,3-cd)pyrene	ND	5.0
Dibenz(a,h)anthracene	ND	5.0
Benzo(g,h,i)perylene	ND	5.0

Surrogate	%REC	Limits
Nitrobenzene-d5	88	36-120
2-Fluorobiphenyl	101	42-120
Terphenyl-d14	78	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-3-S01A	Batch#:	249773
Lab ID:	290553-006	Sampled:	07/13/17
Matrix:	Soil	Received:	07/14/17
Units:	ug/Kg	Prepared:	07/18/17
Basis:	as received	Analyzed:	07/26/17
Diln Fac:	50.00		

Analyte	Result	RL
Naphthalene	ND	250
Acenaphthylene	ND	250
Acenaphthene	ND	250
Fluorene	ND	250
Phenanthrene	ND	250
Anthracene	ND	250
Fluoranthene	ND	250
Pyrene	ND	250
Benzo(a)anthracene	ND	250
Chrysene	ND	250
Benzo(b)fluoranthene	ND	250
Benzo(k)fluoranthene	ND	250
Benzo(a)pyrene	ND	250
Indeno(1,2,3-cd)pyrene	ND	250
Dibenz(a,h)anthracene	ND	250
Benzo(g,h,i)perylene	ND	250

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	36-120
2-Fluorobiphenyl	DO	42-120
Terphenyl-d14	DO	44-120

DO= Diluted Out
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC893555	Batch#:	249773
Matrix:	Soil	Prepared:	07/18/17
Units:	ug/Kg	Analyzed:	07/25/17

Analyte	Result	RL
Naphthalene	ND	5.0
Acenaphthylene	ND	5.0
Acenaphthene	ND	5.0
Fluorene	ND	5.0
Phenanthrene	ND	5.0
Anthracene	ND	5.0
Fluoranthene	ND	5.0
Pyrene	ND	5.0
Benzo(a)anthracene	ND	5.0
Chrysene	ND	5.0
Benzo(b)fluoranthene	ND	5.0
Benzo(k)fluoranthene	ND	5.0
Benzo(a)pyrene	ND	5.0
Indeno(1,2,3-cd)pyrene	ND	5.0
Dibenz(a,h)anthracene	ND	5.0
Benzo(g,h,i)perylene	ND	5.0

Surrogate	%REC	Limits
Nitrobenzene-d5	84	36-120
2-Fluorobiphenyl	103	42-120
Terphenyl-d14	69	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC893556	Batch#:	249773
Matrix:	Soil	Prepared:	07/18/17
Units:	ug/Kg	Analyzed:	07/26/17

Analyte	Spiked	Result	%REC	Limits
Acenaphthene	33.66	36.14	107	61-120
Pyrene	33.66	33.51	100	54-132

Surrogate	%REC	Limits
Nitrobenzene-d5	92	36-120
2-Fluorobiphenyl	109	42-120
Terphenyl-d14	78	44-120

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-1-S01A	Batch#:	249773
MSS Lab ID:	290553-001	Sampled:	07/12/17
Matrix:	Soil	Received:	07/14/17
Units:	ug/Kg	Prepared:	07/18/17
Basis:	as received	Analyzed:	07/26/17
Diln Fac:	6.250		

Type: MS Lab ID: QC893557

Analyte	MSS Result	Spiked	Result	%REC	Limits
Acenaphthene	<6.223	33.70	27.68	82	47-120
Pyrene	<6.223	33.70	33.39	99	34-138

Surrogate	%REC	Limits
Nitrobenzene-d5	73	36-120
2-Fluorobiphenyl	72	42-120
Terphenyl-d14	64	44-120

Type: MSD Lab ID: QC893558

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Acenaphthene	33.55	23.99	72	47-120	14	42
Pyrene	33.55	28.77	86	34-138	14	45

Surrogate	%REC	Limits
Nitrobenzene-d5	64	36-120
2-Fluorobiphenyl	59	42-120
Terphenyl-d14	57	44-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290553	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-1-S01A	Basis:	as received
Lab ID:	290553-001	Sampled:	07/12/17
Matrix:	Soil	Received:	07/14/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	20,000	500	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Arsenic	1.7	1.5	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Barium	220	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Beryllium	0.83	0.10	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Cadmium	0.45	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Calcium	6,400	1,000	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Chromium	39	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Cobalt	13	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Copper	21 b	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Iron	26,000	500	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Lead	6.0	1.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Magnesium	9,100	2,000	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Manganese	500	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Mercury	0.029	0.017	1.000	249874	07/20/17	07/20/17	METHOD	EPA 7471A
Molybdenum	0.25	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Nickel	32	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Potassium	4,400	25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Silver	ND	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Sodium	190	25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Thallium	ND	0.50	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Vanadium	55	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Zinc	100	1.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B

b= See narrative
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290553	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-1-S02A	Basis:	as received
Lab ID:	290553-002	Sampled:	07/12/17
Matrix:	Soil	Received:	07/14/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	21,000	530	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Barium	230	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Beryllium	0.92	0.11	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Cadmium	0.47	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Calcium	9,400	1,100	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Chromium	37	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Cobalt	12	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Copper	19 b	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Iron	24,000	530	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Lead	6.3	1.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Magnesium	8,600	2,100	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Manganese	650	26	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Mercury	0.037	0.015	1.000	249874	07/20/17	07/20/17	METHOD	EPA 7471A
Molybdenum	ND	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Nickel	24	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Potassium	3,700	26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Silver	ND	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Sodium	150	26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Thallium	ND	0.53	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Vanadium	56	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Zinc	79	1.1	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B

b= See narrative
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290553	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-2-S01A	Basis:	as received
Lab ID:	290553-003	Sampled:	07/13/17
Matrix:	Soil	Received:	07/14/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	9,400	470	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Antimony	ND	1.9	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.4	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Barium	92	0.24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Beryllium	0.45	0.094	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Cadmium	0.32	0.24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Calcium	3,600	24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Chromium	17	0.24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Cobalt	5.6	0.24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Copper	9.4 b	0.24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Iron	14,000	470	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Lead	2.9	0.94	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Magnesium	3,900	24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Manganese	270	0.24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Mercury	0.023	0.017	1.000	249874	07/20/17	07/20/17	METHOD	EPA 7471A
Molybdenum	0.31	0.24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Nickel	15	0.24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Potassium	1,700	24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Selenium	ND	1.9	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Silver	ND	0.24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Sodium	130	24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Thallium	ND	0.47	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Vanadium	27	0.24	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Zinc	41	0.94	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B

b= See narrative
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290553	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-2-S02A	Basis:	as received
Lab ID:	290553-004	Sampled:	07/13/17
Matrix:	Soil	Received:	07/14/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	19,000	490	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Barium	210	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Beryllium	0.83	0.098	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Cadmium	0.45	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Calcium	6,000	980	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Chromium	34	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Cobalt	10	0.25	1.000	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Copper	14	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Iron	24,000	490	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Lead	4.0	0.98	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Magnesium	8,600	2,000	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Manganese	600	25	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Mercury	0.022	0.016	1.000	249874	07/20/17	07/20/17	METHOD	EPA 7471A
Molybdenum	ND	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Nickel	21	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Potassium	4,400	25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Silver	ND	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Sodium	150	25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Thallium	ND	0.49	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Vanadium	53	0.25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Zinc	70	0.98	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290553	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-2-S03A	Basis:	as received
Lab ID:	290553-005	Sampled:	07/13/17
Matrix:	Soil	Received:	07/14/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	13,000	510	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Barium	160	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Beryllium	0.66	0.10	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Cadmium	0.32	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Calcium	4,400	25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Chromium	34	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Cobalt	8.6	0.26	1.000	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Copper	9.9	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Iron	22,000	510	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Lead	1.8	1.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Magnesium	8,400	2,000	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Manganese	310	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Mercury	0.018	0.018	1.000	249874	07/20/17	07/20/17	METHOD	EPA 7471A
Molybdenum	ND	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Nickel	19	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Potassium	5,500	2,600	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Silver	ND	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Sodium	170	26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Thallium	ND	0.51	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Vanadium	52	0.26	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Zinc	65	1.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290553	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-3-S01A	Basis:	as received
Lab ID:	290553-006	Sampled:	07/13/17
Matrix:	Soil	Received:	07/14/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	11,000	560	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Barium	110	0.28	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Beryllium	0.55	0.11	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Cadmium	0.31	0.28	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Calcium	4,700	25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Chromium	23	0.28	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Cobalt	6.3	0.28	1.000	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Copper	9.4	0.28	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Iron	14,000	560	100.0	249790	07/18/17	07/25/17	EPA 3050B	EPA 6010B
Lead	2.3	1.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Magnesium	5,300	25	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Manganese	210	0.28	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Mercury	0.017	0.017	1.000	249874	07/20/17	07/20/17	METHOD	EPA 7471A
Molybdenum	ND	0.28	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Nickel	15	0.28	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Potassium	2,800	28	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Silver	ND	0.28	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Sodium	150	28	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Thallium	ND	0.56	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Vanadium	34	0.28	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B
Zinc	130	1.1	1.000	249790	07/18/17	07/19/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Target Analyte List Metals

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3050B
Project#:	60536296	Analysis:	EPA 6010B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC893615	Batch#:	249790
Matrix:	Soil	Prepared:	07/18/17
Units:	mg/Kg		

Analyte	Result	RL	Analyzed
Aluminum	ND	5.2	07/19/17
Antimony	ND	2.0	07/19/17
Arsenic	ND	1.5	07/19/17
Barium	ND	0.26	07/19/17
Beryllium	ND	0.10	07/19/17
Cadmium	ND	0.26	07/19/17
Calcium	ND	25	07/19/17
Chromium	ND	0.26	07/19/17
Cobalt	ND	0.26	07/19/17
Copper	ND	0.26	07/19/17
Iron	ND	5.2	07/26/17
Lead	ND	1.0	07/19/17
Magnesium	ND	25	07/19/17
Manganese	ND	0.26	07/19/17
Molybdenum	ND	0.26	07/19/17
Nickel	ND	0.26	07/19/17
Potassium	ND	26	07/26/17
Selenium	ND	2.0	07/19/17
Silver	ND	0.26	07/19/17
Sodium	ND	26	07/19/17
Thallium	ND	0.52	07/19/17
Vanadium	ND	0.26	07/19/17
Zinc	ND	1.0	07/19/17

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Target Analyte List Metals

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3050B
Project#:	60536296	Analysis:	EPA 6010B
Matrix:	Soil	Batch#:	249790
Units:	mg/Kg	Prepared:	07/18/17
Diln Fac:	1.000		

Type: BS Lab ID: QC893616

Analyte	Spiked	Result	%REC	Limits	Analyzed
Aluminum	52.08	54.31	104	80-136	07/27/17
Antimony	52.08	49.08	94	80-120	07/19/17
Arsenic	52.08	55.89	107	80-120	07/19/17
Barium	52.08	52.89	102	80-120	07/19/17
Beryllium	26.04	26.45	102	80-120	07/19/17
Cadmium	52.08	51.88	100	80-120	07/19/17
Calcium	520.8	532.6	102	80-127	07/19/17
Chromium	52.08	54.40	104	80-120	07/19/17
Cobalt	52.08	52.98	102	80-120	07/19/17
Copper	52.08	51.31	99	80-120	07/19/17
Iron	520.8	535.1	103	80-128	07/27/17
Lead	52.08	50.85	98	80-120	07/19/17
Magnesium	520.8	552.3	106	80-125	07/27/17
Manganese	52.08	51.12	98	80-120	07/19/17
Molybdenum	52.08	50.50	97	80-120	07/19/17
Nickel	52.08	52.44	101	80-120	07/19/17
Potassium	520.8	521.3	100	75-122	07/27/17
Selenium	52.08	54.93	105	80-120	07/19/17
Silver	5.208	4.704	90	80-120	07/19/17
Sodium	520.8	553.7 b	106	68-133	07/27/17
Thallium	52.08	54.83	105	80-120	07/19/17
Vanadium	52.08	55.07	106	80-120	07/19/17
Zinc	52.08	53.80	103	80-120	07/19/17

b= See narrative
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Target Analyte List Metals

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3050B
Project#:	60536296	Analysis:	EPA 6010B
Matrix:	Soil	Batch#:	249790
Units:	mg/Kg	Prepared:	07/18/17
Diln Fac:	1.000		

Type: BSD Lab ID: QC893617

Analyte	Spiked	Result	%REC	Limits	RPD	Lim	Analyzed
Aluminum	51.02	53.05	104	80-136	0	34	07/27/17
Antimony	51.02	49.64	97	80-120	3	20	07/19/17
Arsenic	51.02	55.14	108	80-120	1	20	07/19/17
Barium	51.02	52.71	103	80-120	2	20	07/19/17
Beryllium	25.51	26.20	103	80-120	1	20	07/19/17
Cadmium	51.02	52.30	103	80-120	3	20	07/19/17
Calcium	510.2	529.0	104	80-127	1	25	07/19/17
Chromium	51.02	54.81	107	80-120	3	20	07/19/17
Cobalt	51.02	52.33	103	80-120	1	20	07/19/17
Copper	51.02	52.16	102	80-120	4	20	07/19/17
Iron	510.2	521.8	102	80-128	0	26	07/27/17
Lead	51.02	51.36	101	80-120	3	20	07/19/17
Magnesium	510.2	539.4	106	80-125	0	23	07/27/17
Manganese	51.02	50.88	100	80-120	2	20	07/19/17
Molybdenum	51.02	51.46	101	80-120	4	20	07/19/17
Nickel	51.02	52.88	104	80-120	3	20	07/19/17
Potassium	510.2	505.5	99	75-122	1	26	07/27/17
Selenium	51.02	54.18	106	80-120	1	20	07/19/17
Silver	5.102	4.690	92	80-120	2	20	07/19/17
Sodium	510.2	537.7 b	105	68-133	1	26	07/27/17
Thallium	51.02	54.07	106	80-120	1	20	07/19/17
Vanadium	51.02	55.68	109	80-120	3	20	07/19/17
Zinc	51.02	53.93	106	80-120	2	20	07/19/17

b= See narrative
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Target Analyte List Metals

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	EPA 7471A
Analyte:	Mercury	Diln Fac:	1.000
Type:	BLANK	Batch#:	249874
Lab ID:	QC893964	Prepared:	07/20/17
Matrix:	Soil	Analyzed:	07/20/17
Units:	mg/Kg		

Result	RL
ND	0.017

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Target Analyte List Metals

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	EPA 7471A
Analyte:	Mercury	Batch#:	249874
Matrix:	Soil	Prepared:	07/20/17
Units:	mg/Kg	Analyzed:	07/20/17
Diln Fac:	1.000		

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC893965	0.1894	0.1793	95	79-129		
BSD	QC893966	0.2155	0.2052	95	79-129	1	40

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Target Analyte List Metals

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	EPA 7471A
Analyte:	Mercury	Diln Fac:	1.000
Field ID:	ZZZZZZZZZZ	Batch#:	249874
MSS Lab ID:	290568-001	Sampled:	07/13/17
Matrix:	Soil	Received:	07/14/17
Units:	mg/Kg	Prepared:	07/20/17
Basis:	as received	Analyzed:	07/20/17

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC893967	0.02906	0.2016	0.2625	116	63-149		
MSD	QC893968		0.2232	0.2753	110	63-149	4	69

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Ammonia Nitrogen

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Analysis:	SM4500NH3-D
Project#:	60536296		
Analyte:	Ammonia-N	Batch#:	249953
Matrix:	Soil	Received:	07/14/17
Units:	mg/Kg	Prepared:	07/24/17 10:36
Basis:	as received	Analyzed:	07/25/17 15:19
Diln Fac:	1.000		

Field ID	Type	Lab ID	Result	RL	Sampled
B-1-S01A	SAMPLE	290553-001	120	10	07/12/17 13:45
B-1-S02A	SAMPLE	290553-002	280	9.9	07/12/17 15:20
B-2-S01A	SAMPLE	290553-003	56	11	07/13/17 11:20
B-2-S02A	SAMPLE	290553-004	84	9.9	07/13/17 11:55
B-2-S03A	SAMPLE	290553-005	74	10	07/13/17 12:45
B-3-S01A	SAMPLE	290553-006	11	9.3	07/13/17 15:40
	BLANK	QC894253	2.0 J	10	

J= Estimated value
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Ammonia Nitrogen

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Analysis:	SM4500NH3-D
Project#:	60536296		
Analyte:	Ammonia-N	Diln Fac:	1.000
Field ID:	B-1-S01A	Batch#:	249953
MSS Lab ID:	290553-001	Sampled:	07/12/17 13:45
Matrix:	Soil	Received:	07/14/17
Units:	mg/Kg	Prepared:	07/24/17 10:36
Basis:	as received	Analyzed:	07/25/17 15:19

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
LCS	QC894254		500.0	510.0	102	80-120		
MS	QC894255	122.4	458.7	559.6	95	70-130		
MSD	QC894256		476.2	561.9	92	70-130	3	30

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

pH

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	EPA 9045D
Analyte:	pH	Batch#:	249733
Matrix:	Soil	Received:	07/14/17
Units:	SU	Prepared:	07/17/17 11:50
Diln Fac:	1.000	Analyzed:	07/17/17 12:54

Field ID	Lab ID	Result	RL	Sampled
B-1-S01A	290553-001	6.5	1.0	07/12/17 13:45
B-1-S02A	290553-002	6.7	1.0	07/12/17 15:20
B-2-S01A	290553-003	6.6	1.0	07/13/17 11:20
B-2-S02A	290553-004	6.6	1.0	07/13/17 11:55
B-2-S03A	290553-005	6.9	1.0	07/13/17 12:45
B-3-S01A	290553-006	6.2	1.0	07/13/17 15:40

RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

pH			
Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	EPA 9045D
Analyte:	pH	Diln Fac:	1.000
Field ID:	ZZZZZZZZZZ	Batch#:	249733
Type:	SDUP	Sampled:	07/13/17 11:53
MSS Lab ID:	290573-001	Received:	07/14/17
Lab ID:	QC893400	Prepared:	07/17/17 11:50
Matrix:	Soil	Analyzed:	07/17/17 12:54
Units:	SU		

MSS Result	Result	RL	RPD	Lim
8.880	8.840	1.000	0	20

RL= Reporting Limit
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Phosphorous

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	SMWW21:4500P-B
Project#:	60536296	Analysis:	SM4500P-E
Analyte:	Phosphorus (Total)	Batch#:	249801
Matrix:	Soil	Received:	07/14/17
Units:	mg/Kg	Prepared:	07/19/17
Basis:	as received	Analyzed:	07/20/17

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled
B-1-S01A	SAMPLE	290553-001	120	7.5	25.00	07/12/17
B-1-S02A	SAMPLE	290553-002	3.6	0.30	1.000	07/12/17
B-2-S01A	SAMPLE	290553-003	40	1.5	5.000	07/13/17
B-2-S02A	SAMPLE	290553-004	130	7.5	25.00	07/13/17
B-2-S03A	SAMPLE	290553-005	2.4	0.30	1.000	07/13/17
B-3-S01A	SAMPLE	290553-006	100	7.5	25.00	07/13/17
	BLANK	QC893671	ND	0.30	1.000	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Phosphorous

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	SMWW21:4500P-B
Project#:	60536296	Analysis:	SM4500P-E
Analyte:	Phosphorus (Total)	Batch#:	249801
Matrix:	Soil	Prepared:	07/19/17
Units:	mg/Kg	Analyzed:	07/20/17
Diln Fac:	1.000		

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC893672	4.000	4.050	102	80-120		
BSD	QC893673	4.000	4.120	103	80-120	2	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Kjeldahl Nitrogen

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	SMWW20:4500-NORG
Project#:	60536296	Analysis:	SM4500NH3-C
Analyte:	Nitrogen, Total Kjeldahl	Diln Fac:	1.000
Matrix:	Soil	Batch#:	249952
Units:	mg/Kg	Received:	07/14/17
Basis:	as received	Analyzed:	07/24/17

Field ID	Type	Lab ID	Result	RL	Sampled	Prepared
B-1-S01A	SAMPLE	290553-001	ND	100	07/12/17	07/22/17
B-1-S02A	SAMPLE	290553-002	3,400	98	07/12/17	07/22/17
B-2-S01A	SAMPLE	290553-003	1,700	98	07/13/17	07/22/17
B-2-S02A	SAMPLE	290553-004	1,500	100	07/13/17	07/22/17
B-2-S03A	SAMPLE	290553-005	1,200	96	07/13/17	07/22/17
B-3-S01A	SAMPLE	290553-006	2,300	100	07/13/17	07/22/17
	BLANK	QC894249	ND	100		07/21/17

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Kjeldahl Nitrogen

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	SMWW20:4500-NORG
Project#:	60536296	Analysis:	SM4500NH3-C
Analyte:	Nitrogen, Total Kjeldahl	Diln Fac:	1.000
Field ID:	B-5-S01 A	Batch#:	249952
MSS Lab ID:	290628-001	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg	Prepared:	07/21/17
Basis:	as received	Analyzed:	07/24/17

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
LCS	QC894250		2,000	1,798	90	80-120		
MS	QC894251	1,620	2,000	4,129	118	70-130		
MSD	QC894252		2,000	3,624	102	70-130	13	30

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Organic Carbon (TOC)

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	WALKLEY-BLACK
Analyte:	Total Organic Carbon	Batch#:	249902
Matrix:	Soil	Received:	07/14/17
Units:	%	Analyzed:	07/21/17
Basis:	as received		

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled
B-1-S01A	SAMPLE	290553-001	3.2	0.16	15.63	07/12/17
B-1-S02A	SAMPLE	290553-002	5.0	0.15	15.38	07/12/17
B-2-S01A	SAMPLE	290553-003	2.1	0.24	23.81	07/13/17
B-2-S02A	SAMPLE	290553-004	3.3	0.17	16.67	07/13/17
B-2-S03A	SAMPLE	290553-005	2.4	0.14	14.08	07/13/17
B-3-S01A	SAMPLE	290553-006	4.8	0.29	28.57	07/13/17
	BLANK	QC894073	ND	0.01	0.9990	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Organic Carbon (TOC)

Lab #:	290553	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	WALKLEY-BLACK
Analyte:	Total Organic Carbon	Basis:	as received
Field ID:	ZZZZZZZZZZ	Batch#:	249902
MSS Lab ID:	290508-001	Sampled:	07/12/17
Matrix:	Soil	Received:	07/12/17
Units:	%	Analyzed:	07/21/17

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Diln Fac
LCS	QC894074		0.1297	0.1201	93	79-120			0.9980
MS	QC894075	0.5284	0.6220	1.151	100	64-120			4.785
MSD	QC894076		0.6220	1.077	88	64-120	7	20	4.785

RPD= Relative Percent Difference


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 290628
ANALYTICAL REPORT

AECOM	Project : 60536296
300 Lakeside Drive	Location : Los Padres
Oakland, CA 94612	Level : II

Sample ID	Lab ID
B-5-S01 A	290628-001
B-5-S02 A	290628-002
B-5-S03 A	290628-003
B-6-S01 A	290628-004
B-6-S02 A	290628-005
B-6-S03 A	290628-006
B-7-S01 A	290628-007
B-7-S02 A	290628-008
B-7-S03 A	290628-009
B-3502A	290628-010
B-4501A	290628-011
B-4502A	290628-012
B-5504A	290628-013

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: Tracy Babjar Date: 07/28/2017

Tracy Babjar
Project Manager
tracy.babjar@ctberk.com
(510) 204-2226 Ext 13107

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**290628**
Client:	**AECOM**
Project:	**60536296**
Location:	**Los Padres**
Request Date:	**07/17/17**
Samples Received:	**07/17/17**

This data package contains sample and QC results for thirteen soil samples, requested for the above referenced project on 07/17/17. The samples were received cold and intact.

Semivolatile Organics by GC/MS SIM (EPA 8270C-SIM):
Matrix spikes QC893751,QC893752 (batch 249822) were not reported because the parent sample required a dilution that would have diluted out the spikes. Many samples were diluted due to the dark and viscous nature of the sample extracts. No other analytical problems were encountered.

Metals (EPA 6010B and EPA 7471A):
High recoveries were observed for mercury in the MS/MSD for batch 249984; the parent sample was not a project sample, and the BS/BSD were within limits. Response exceeding the instrument's linear range was observed for mercury in the MS for batch 249984; affected data was qualified with "b". Chromium and nickel were detected above the RL in the method blank for batch 249879; these analytes were detected in samples at a level at least 10 times that of the blank. No other analytical problems were encountered.

Ammonia Nitrogen (SM4500NH3-D):
Ammonia-N was detected between the MDL and the RL in the method blank for batch 249953; this analyte was not detected in samples at or above the RL. No other analytical problems were encountered.

Total Kjeldahl Nitrogen (SM4500NH3-C):
No analytical problems were encountered.

pH (EPA 9045D):
No analytical problems were encountered.

Total Phosphorous (SM4500P-E):
No analytical problems were encountered.

Total Organic Carbon (TOC) (WALKLEY-BLACK):
No analytical problems were encountered.

***** Missing Items *****

The following items are valid in the narrative, but for some reason didn't end up in the above report:

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**290628**
Client:	**AECOM**
Project:	**60536296**
Location:	**Los Padres**
Request Date:	**07/17/17**
Samples Received:	**07/17/17**

*** Missing Items ***

Item 2 (WETCHEM/Soil): Eurofins (CalScience) in Garden Grove, CA performed the analysis (not NELAP certified). Please see the Eurofins (CalScience) case narrative.

You can invalidate these items, or adjust rgroup/matrix/method ([C] button) for each until they appear in the main body of the report. See the operations manager or LIMS staff for assistance if necessary.

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
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CHAIN OF CUSTODY

Chain of Custody # : _____

C&T LOGIN # 290628

Project No: 60536296
Project Name: Los Padres Alts Field Investigation
EDD Format: Standard Rpt Level: ☒ II ☐ III ☐ IV
Turnaround Time: ☐ RUSH _____ ☒ Standard

Sampler: Ben Kozlowicz
Report To: Jon Stead
Company : AECOM
Telephone: 510-874-3058
Email: jon.stead@aecom.com

Lab No.	Sample ID	Sampling		Matrix				Chemical Preservative					Analytical Request															
		Date	Time	Water	Soil	Sediment	# of Containers	HCl	H_2SO_4	HNO_3	NaOH	None	6010-TAL MET / 7471 Hg	Ammonia (SM4500NH3)	TKN (SM4500NH3)	PO4-T (SM4500P-E)	Sulfide (EPA 9034)	TOC (Walkley-Black)	pH (EPA 9045D)	PAHs (8270-SIM)								
1	B-5-S01 A	7/15/17	840			x	1					x	x	x	x	x	x	x	x	x								
2	B-5-S02 A	7/15/17	1015			x	1					x	x	x	x	x	x	x	x	x								
3	B-5-S03 A	7/15/17	1055			x	1					x	x	x	x	x	x	x	x	x								
4	B-6-S01 A	7/15/17	1500			x	1					x	x	x	x	x	x	x	x	x								
5	B-6-S02 A	7/15/17	1529			x	1					x	x	x	x	x	x	x	x	x								
6	B-6-S03 A	7/15/17	1552			x	1					x	x	x	x	x	x	x	x	x								
7	B-7-S01 A	7/16/17	1104			x	1					x	x	x	x	x	x	x	x	x								
8	B-7-S02 A	7/16/17	1144			x	1					x	x	x	x	x	x	x	x	x								
9	B-7-S03A	7/16/17	1216			x	1					x	x	x	x	x	x	x	x	x								
10	[redacted] B-3S02A	7/14/17	1030			x	1					x	x	x	x	x	x	x	x	x								
11	[redacted] B-4S01A	7/14/17	1440			x	1					x	x	x	x	x	x	x	x	x								
12	[redacted] B-4S02A	7/14/17	1505			x	1					x	x	x	x	x	x	x	x	x								
13	B-5 S04A	7/15/17	1110			x	1					x	x	x	x	x	x	x	x	x								

Notes:

SAMPLE RECEIPT
☐ Intact ☐ Cold
☐ On Ice ☐ Ambient

RELINQUISHED BY:

Ben K 7/17/17 1720 DATE/TIME

DATE/TIME

DATE/TIME

RECEIVED BY:

7/17/17 1720 DATE/TIME

DATE/TIME

DATE/TIME

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 290628 Date Received 7-17-17 Number of coolers 1
Client AECOM Project LOS Padres Alts field investigation

Date Opened 7-17-17 By (print) EM (sign) EM
Date Logged in [illegible] By (print) [illegible] (sign) [illegible]
Date Labelled [illegible] By (print) [illegible] (sign) [illegible]

1. Did cooler come with a shipping slip (airbill, etc) _____ YES (NO)
   Shipping info _____
2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☐ NO
   How many 1 Name _____ Date 7-14-17
2B. Were custody seals intact upon arrival? _____ YES NO N/A
3. Were custody papers dry and intact when received? _____ YES NO
4. Were custody papers filled out properly (ink, signed, etc)? _____ YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO
6. Indicate the packing in cooler: (if other, describe) _____

☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☐ Wet ☐ Blue/Gel ☐ None Temp(°C) 4.5

☐ Temperature blank(s) included? ☐ Thermometer# _____ ☐ IR Gun# B

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? _____ YES (NO)
   If YES, what time were they transferred to freezer? _____
9. Did all bottles arrive unbroken/unopened? _____ (YES) NO
10. Are there any missing / extra samples? _____ YES (NO)
11. Are samples in the appropriate containers for indicated tests? _____ (YES) NO
12. Are sample labels present, in good condition and complete? _____ (YES) NO
13. Do the sample labels agree with custody papers? _____ (YES) NO
14. Was sufficient amount of sample sent for tests requested? _____ (YES) NO
15. Are the samples appropriately preserved? _____ YES NO (N/A)
16. Did you check preservatives for all bottles for each sample? _____ YES NO (N/A)
17. Did you document your preservative check? (pH strip lot# _____) YES NO (N/A)
18. Did you change the hold time in LIMS for unpreserved VOAs? _____ YES NO (N/A)
19. Did you change the hold time in LIMS for preserved terracores? _____ YES NO (N/A)
20. Are bubbles > 6mm absent in VOA samples? _____ YES NO (N/A)
21. Was the client contacted concerning this sample delivery? _____ YES (NO)
   If YES, Who was called? _____ By _____ Date: _____

COMMENTS _____

Rev 13, 6/01/16

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-5-S01 A	Batch#:	249822
Lab ID:	290628-001	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/19/17
Basis:	as received	Analyzed:	07/26/17
Diln Fac:	10.00		

Analyte	Result	RL
Naphthalene	ND	50
Acenaphthylene	ND	50
Acenaphthene	ND	50
Fluorene	ND	50
Phenanthrene	ND	50
Anthracene	ND	50
Fluoranthene	ND	50
Pyrene	ND	50
Benzo(a)anthracene	ND	50
Chrysene	ND	50
Benzo(b)fluoranthene	ND	50
Benzo(k)fluoranthene	ND	50
Benzo(a)pyrene	ND	50
Indeno(1,2,3-cd)pyrene	ND	50
Dibenz(a,h)anthracene	ND	50
Benzo(g,h,i)perylene	ND	50

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	36-120
2-Fluorobiphenyl	DO	42-120
Terphenyl-d14	DO	44-120

DO= Diluted Out
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-5-S02 A	Batch#:	249822
Lab ID:	290628-002	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/19/17
Basis:	as received	Analyzed:	07/26/17
Diln Fac:	1.000		

Analyte	Result	RL
Naphthalene	ND	5.0
Acenaphthylene	ND	5.0
Acenaphthene	ND	5.0
Fluorene	ND	5.0
Phenanthrene	ND	5.0
Anthracene	ND	5.0
Fluoranthene	ND	5.0
Pyrene	ND	5.0
Benzo(a)anthracene	ND	5.0
Chrysene	ND	5.0
Benzo(b)fluoranthene	ND	5.0
Benzo(k)fluoranthene	ND	5.0
Benzo(a)pyrene	ND	5.0
Indeno(1,2,3-cd)pyrene	ND	5.0
Dibenz(a,h)anthracene	ND	5.0
Benzo(g,h,i)perylene	ND	5.0

Surrogate	%REC	Limits
Nitrobenzene-d5	47	36-120
2-Fluorobiphenyl	52	42-120
Terphenyl-d14	73	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-5-S03 A	Batch#:	249822
Lab ID:	290628-003	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/19/17
Basis:	as received	Analyzed:	07/27/17
Diln Fac:	10.00		

Analyte	Result	RL
Naphthalene	ND	50
Acenaphthylene	ND	50
Acenaphthene	ND	50
Fluorene	ND	50
Phenanthrene	ND	50
Anthracene	ND	50
Fluoranthene	ND	50
Pyrene	ND	50
Benzo(a)anthracene	ND	50
Chrysene	ND	50
Benzo(b)fluoranthene	ND	50
Benzo(k)fluoranthene	ND	50
Benzo(a)pyrene	ND	50
Indeno(1,2,3-cd)pyrene	ND	50
Dibenz(a,h)anthracene	ND	50
Benzo(g,h,i)perylene	ND	50

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	36-120
2-Fluorobiphenyl	DO	42-120
Terphenyl-d14	DO	44-120

DO= Diluted Out
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-6-S01 A	Batch#:	249822
Lab ID:	290628-004	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/19/17
Basis:	as received	Analyzed:	07/27/17
Diln Fac:	3.000		

Analyte	Result	RL
Naphthalene	ND	15
Acenaphthylene	ND	15
Acenaphthene	ND	15
Fluorene	ND	15
Phenanthrene	ND	15
Anthracene	ND	15
Fluoranthene	ND	15
Pyrene	ND	15
Benzo(a)anthracene	ND	15
Chrysene	ND	15
Benzo(b)fluoranthene	ND	15
Benzo(k)fluoranthene	ND	15
Benzo(a)pyrene	ND	15
Indeno(1,2,3-cd)pyrene	ND	15
Dibenz(a,h)anthracene	ND	15
Benzo(g,h,i)perylene	ND	15

Surrogate	%REC	Limits
Nitrobenzene-d5	71	36-120
2-Fluorobiphenyl	88	42-120
Terphenyl-d14	75	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-6-S02 A	Batch#:	249863
Lab ID:	290628-005	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/20/17
Basis:	as received	Analyzed:	07/26/17
Diln Fac:	1.000		

Analyte	Result	RL
Naphthalene	8.4	5.0
Acenaphthylene	ND	5.0
Acenaphthene	ND	5.0
Fluorene	8.8	5.0
Phenanthrene	ND	5.0
Anthracene	ND	5.0
Fluoranthene	ND	5.0
Pyrene	ND	5.0
Benzo(a)anthracene	ND	5.0
Chrysene	ND	5.0
Benzo(b)fluoranthene	ND	5.0
Benzo(k)fluoranthene	ND	5.0
Benzo(a)pyrene	ND	5.0
Indeno(1,2,3-cd)pyrene	ND	5.0
Dibenz(a,h)anthracene	ND	5.0
Benzo(g,h,i)perylene	ND	5.0

Surrogate	%REC	Limits
Nitrobenzene-d5	81	36-120
2-Fluorobiphenyl	97	42-120
Terphenyl-d14	71	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-6-S03 A	Batch#:	249863
Lab ID:	290628-006	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/20/17
Basis:	as received	Analyzed:	07/27/17
Diln Fac:	10.00		

Analyte	Result	RL
Naphthalene	ND	50
Acenaphthylene	ND	50
Acenaphthene	ND	50
Fluorene	ND	50
Phenanthrene	ND	50
Anthracene	ND	50
Fluoranthene	ND	50
Pyrene	ND	50
Benzo(a)anthracene	ND	50
Chrysene	ND	50
Benzo(b)fluoranthene	ND	50
Benzo(k)fluoranthene	ND	50
Benzo(a)pyrene	ND	50
Indeno(1,2,3-cd)pyrene	ND	50
Dibenz(a,h)anthracene	ND	50
Benzo(g,h,i)perylene	ND	50

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	36-120
2-Fluorobiphenyl	DO	42-120
Terphenyl-d14	DO	44-120

DO= Diluted Out
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-7-S01 A	Batch#:	249863
Lab ID:	290628-007	Sampled:	07/16/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/20/17
Basis:	as received	Analyzed:	07/27/17
Diln Fac:	3.000		

Analyte	Result	RL
Naphthalene	ND	15
Acenaphthylene	ND	15
Acenaphthene	ND	15
Fluorene	ND	15
Phenanthrene	ND	15
Anthracene	ND	15
Fluoranthene	ND	15
Pyrene	ND	15
Benzo(a)anthracene	ND	15
Chrysene	ND	15
Benzo(b)fluoranthene	ND	15
Benzo(k)fluoranthene	ND	15
Benzo(a)pyrene	ND	15
Indeno(1,2,3-cd)pyrene	ND	15
Dibenz(a,h)anthracene	ND	15
Benzo(g,h,i)perylene	ND	15

Surrogate	%REC	Limits
Nitrobenzene-d5	73	36-120
2-Fluorobiphenyl	86	42-120
Terphenyl-d14	79	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-7-S02 A	Batch#:	249863
Lab ID:	290628-008	Sampled:	07/16/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/20/17
Basis:	as received	Analyzed:	07/27/17
Diln Fac:	5.000		

Analyte	Result	RL
Naphthalene	ND	25
Acenaphthylene	ND	25
Acenaphthene	ND	25
Fluorene	ND	25
Phenanthrene	ND	25
Anthracene	ND	25
Fluoranthene	ND	25
Pyrene	ND	25
Benzo(a)anthracene	ND	25
Chrysene	ND	25
Benzo(b)fluoranthene	ND	25
Benzo(k)fluoranthene	ND	25
Benzo(a)pyrene	ND	25
Indeno(1,2,3-cd)pyrene	ND	25
Dibenz(a,h)anthracene	ND	25
Benzo(g,h,i)perylene	ND	25

Surrogate	%REC	Limits
Nitrobenzene-d5	81	36-120
2-Fluorobiphenyl	91	42-120
Terphenyl-d14	78	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-7-S03 A	Batch#:	249863
Lab ID:	290628-009	Sampled:	07/16/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/20/17
Basis:	as received	Analyzed:	07/26/17
Diln Fac:	1.000		

Analyte	Result	RL
Naphthalene	ND	5.0
Acenaphthylene	ND	5.0
Acenaphthene	ND	5.0
Fluorene	ND	5.0
Phenanthrene	ND	5.0
Anthracene	ND	5.0
Fluoranthene	ND	5.0
Pyrene	ND	5.0
Benzo(a)anthracene	ND	5.0
Chrysene	ND	5.0
Benzo(b)fluoranthene	ND	5.0
Benzo(k)fluoranthene	ND	5.0
Benzo(a)pyrene	ND	5.0
Indeno(1,2,3-cd)pyrene	ND	5.0
Dibenz(a,h)anthracene	ND	5.0
Benzo(g,h,i)perylene	ND	5.0

Surrogate	%REC	Limits
Nitrobenzene-d5	61	36-120
2-Fluorobiphenyl	83	42-120
Terphenyl-d14	85	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-3502A	Batch#:	249863
Lab ID:	290628-010	Sampled:	07/14/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/20/17
Basis:	as received	Analyzed:	07/27/17
Diln Fac:	10.00		

Analyte	Result	RL
Naphthalene	ND	50
Acenaphthylene	ND	50
Acenaphthene	ND	50
Fluorene	ND	50
Phenanthrene	ND	50
Anthracene	ND	50
Fluoranthene	ND	50
Pyrene	ND	50
Benzo(a)anthracene	ND	50
Chrysene	ND	50
Benzo(b)fluoranthene	ND	50
Benzo(k)fluoranthene	ND	50
Benzo(a)pyrene	ND	50
Indeno(1,2,3-cd)pyrene	ND	50
Dibenz(a,h)anthracene	ND	50
Benzo(g,h,i)perylene	ND	50

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	36-120
2-Fluorobiphenyl	DO	42-120
Terphenyl-d14	DO	44-120

DO= Diluted Out
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-4501A	Batch#:	249863
Lab ID:	290628-011	Sampled:	07/14/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/20/17
Basis:	as received	Analyzed:	07/27/17
Diln Fac:	25.00		

Analyte	Result	RL
Naphthalene	ND	130
Acenaphthylene	ND	130
Acenaphthene	ND	130
Fluorene	ND	130
Phenanthrene	ND	130
Anthracene	ND	130
Fluoranthene	ND	130
Pyrene	ND	130
Benzo(a)anthracene	ND	130
Chrysene	ND	130
Benzo(b)fluoranthene	ND	130
Benzo(k)fluoranthene	ND	130
Benzo(a)pyrene	ND	130
Indeno(1,2,3-cd)pyrene	ND	130
Dibenz(a,h)anthracene	ND	130
Benzo(g,h,i)perylene	ND	130

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	36-120
2-Fluorobiphenyl	DO	42-120
Terphenyl-d14	DO	44-120

DO= Diluted Out
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-4502A	Batch#:	249863
Lab ID:	290628-012	Sampled:	07/14/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/20/17
Basis:	as received	Analyzed:	07/27/17
Diln Fac:	10.00		

Analyte	Result	RL
Naphthalene	ND	50
Acenaphthylene	ND	50
Acenaphthene	ND	50
Fluorene	ND	50
Phenanthrene	ND	50
Anthracene	ND	50
Fluoranthene	ND	50
Pyrene	ND	50
Benzo(a)anthracene	ND	50
Chrysene	ND	50
Benzo(b)fluoranthene	ND	50
Benzo(k)fluoranthene	ND	50
Benzo(a)pyrene	ND	50
Indeno(1,2,3-cd)pyrene	ND	50
Dibenz(a,h)anthracene	ND	50
Benzo(g,h,i)perylene	ND	50

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	36-120
2-Fluorobiphenyl	DO	42-120
Terphenyl-d14	DO	44-120

DO= Diluted Out
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-5504A	Batch#:	249863
Lab ID:	290628-013	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/20/17
Basis:	as received	Analyzed:	07/27/17
Diln Fac:	8.330		

Analyte	Result	RL
Naphthalene	ND	42
Acenaphthylene	ND	42
Acenaphthene	ND	42
Fluorene	ND	42
Phenanthrene	ND	42
Anthracene	ND	42
Fluoranthene	ND	42
Pyrene	ND	42
Benzo(a)anthracene	ND	42
Chrysene	ND	42
Benzo(b)fluoranthene	ND	42
Benzo(k)fluoranthene	ND	42
Benzo(a)pyrene	ND	42
Indeno(1,2,3-cd)pyrene	ND	42
Dibenz(a,h)anthracene	ND	42
Benzo(g,h,i)perylene	ND	42

Surrogate	%REC	Limits
Nitrobenzene-d5	76	36-120
2-Fluorobiphenyl	84	42-120
Terphenyl-d14	79	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC893749	Batch#:	249822
Matrix:	Soil	Prepared:	07/19/17
Units:	ug/Kg	Analyzed:	07/21/17

Analyte	Result	RL
Naphthalene	ND	4.9
Acenaphthylene	ND	4.9
Acenaphthene	ND	4.9
Fluorene	ND	4.9
Phenanthrene	ND	4.9
Anthracene	ND	4.9
Fluoranthene	ND	4.9
Pyrene	ND	4.9
Benzo(a)anthracene	ND	4.9
Chrysene	ND	4.9
Benzo(b)fluoranthene	ND	4.9
Benzo(k)fluoranthene	ND	4.9
Benzo(a)pyrene	ND	4.9
Indeno(1,2,3-cd)pyrene	ND	4.9
Dibenz(a,h)anthracene	ND	4.9
Benzo(g,h,i)perylene	ND	4.9

Surrogate	%REC	Limits
Nitrobenzene-d5	97	36-120
2-Fluorobiphenyl	113	42-120
Terphenyl-d14	86	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC893750	Batch#:	249822
Matrix:	Soil	Prepared:	07/19/17
Units:	ug/Kg	Analyzed:	07/21/17

Analyte	Spiked	Result	%REC	Limits
Acenaphthene	32.98	37.20	113	61-120
Pyrene	32.98	34.79	105	54-132

Surrogate	%REC	Limits
Nitrobenzene-d5	102	36-120
2-Fluorobiphenyl	115	42-120
Terphenyl-d14	83	44-120

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC893922	Batch#:	249863
Matrix:	Soil	Prepared:	07/20/17
Units:	ug/Kg	Analyzed:	07/26/17

Analyte	Result	RL
Naphthalene	ND	5.0
Acenaphthylene	ND	5.0
Acenaphthene	ND	5.0
Fluorene	ND	5.0
Phenanthrene	ND	5.0
Anthracene	ND	5.0
Fluoranthene	ND	5.0
Pyrene	ND	5.0
Benzo(a)anthracene	ND	5.0
Chrysene	ND	5.0
Benzo(b)fluoranthene	ND	5.0
Benzo(k)fluoranthene	ND	5.0
Benzo(a)pyrene	ND	5.0
Indeno(1,2,3-cd)pyrene	ND	5.0
Dibenz(a,h)anthracene	ND	5.0
Benzo(g,h,i)perylene	ND	5.0

Surrogate	%REC	Limits
Nitrobenzene-d5	92	36-120
2-Fluorobiphenyl	110	42-120
Terphenyl-d14	80	44-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC893923	Batch#:	249863
Matrix:	Soil	Prepared:	07/20/17
Units:	ug/Kg	Analyzed:	07/26/17

Analyte	Spiked	Result	%REC	Limits
Acenaphthene	33.61	26.85	80	61-120
Pyrene	33.61	29.52	88	54-132

Surrogate	%REC	Limits
Nitrobenzene-d5	84	36-120
2-Fluorobiphenyl	99	42-120
Terphenyl-d14	70	44-120

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3550B
Project#:	60536296	Analysis:	EPA 8270C-SIM
Field ID:	B-6-S02 A	Batch#:	249863
MSS Lab ID:	290628-005	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	ug/Kg	Prepared:	07/20/17
Basis:	as received	Analyzed:	07/26/17
Diln Fac:	1.000		

Type: MS Lab ID: QC893924

Analyte	MSS Result	Spiked	Result	%REC	Limits
Acenaphthene	<0.9983	33.82	30.27	90	47-120
Pyrene	2.043	33.82	36.20	101	34-138

Surrogate	%REC	Limits
Nitrobenzene-d5	91	36-120
2-Fluorobiphenyl	109	42-120
Terphenyl-d14	84	44-120

Type: MSD Lab ID: QC893925

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Acenaphthene	33.48	30.57	91	47-120	2	42
Pyrene	33.48	37.32	105	34-138	4	45

Surrogate	%REC	Limits
Nitrobenzene-d5	94	36-120
2-Fluorobiphenyl	113	42-120
Terphenyl-d14	87	44-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-5-S01 A	Basis:	as received
Lab ID:	290628-001	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	16,000	530	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	200	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.71	0.11	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	0.31	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	6,800	1,100	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Chromium	33	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	7.7	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	13	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	19,000	530	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	3.2	1.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Magnesium	7,700	2,100	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Manganese	430	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Mercury	0.039	0.018	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	ND	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Nickel	20	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	3,900	26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	170	26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.53	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	44	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	83	1.1	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-5-S02 A	Basis:	as received
Lab ID:	290628-002	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	9,400	530	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	110	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.42	0.11	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	ND	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	1,500	25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Chromium	18	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	4.5	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	13	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	15,000	530	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	ND	1.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Magnesium	5,700	2,100	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Manganese	140	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Mercury	ND	0.015	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	ND	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Nickel	12	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	4,500	27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	150	27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.53	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	31	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	40	1.1	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-5-S03 A	Basis:	as received
Lab ID:	290628-003	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	17,000	520	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	200	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.78	0.10	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	0.38	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	5,600	1,000	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Chromium	35	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	8.2	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	13	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	24,000	520	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	2.7	1.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Magnesium	9,000	2,100	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Manganese	430	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Mercury	0.022	0.016	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	ND	0.26	1.000	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Nickel	21	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	5,800	2,600	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	190	26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.52	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	53	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	65	1.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-6-S01 A	Basis:	as received
Lab ID:	290628-004	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	15,000	530	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	180	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.73	0.11	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	0.34	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	2,900	25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Chromium	36	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	7.1	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	11	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	23,000	530	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	1.4	1.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Magnesium	9,100	2,100	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Manganese	310	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Mercury	ND	0.016	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	ND	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Nickel	19	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	6,700	2,600	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	150	26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.53	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	55	0.26	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	110	1.1	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-6-S02 A	Basis:	as received
Lab ID:	290628-005	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	16,000	540	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	200	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.72	0.11	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	0.29	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	4,600	25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Chromium	33	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	7.5	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	9.1	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	24,000	540	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	1.9	1.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Magnesium	9,300	2,200	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Manganese	400	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Mercury	ND	0.016	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	ND	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Nickel	18	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	6,100	2,700	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	190	27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.54	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	51	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	65	1.1	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-6-S03 A	Basis:	as received
Lab ID:	290628-006	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	14,000	510	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	190	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.70	0.10	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	0.33	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	7,100	1,000	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Chromium	28	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	6.5	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	11	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	18,000	510	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	4.0	1.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Magnesium	6,900	2,000	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Manganese	400	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Mercury	0.018	0.017	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	0.32	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Nickel	14	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	3,900	25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	130	25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.51	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	43	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	54	1.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-7-S01 A	Basis:	as received
Lab ID:	290628-007	Sampled:	07/16/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	14,000	450	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	1.8	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.4	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	150	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.67	0.091	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	0.33	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	2,500	23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Chromium	33	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	7.2	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	10	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	23,000	450	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	1.2	0.91	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Magnesium	8,600	1,800	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Manganese	260	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Mercury	ND	0.018	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	ND	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Nickel	19	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	6,400	2,300	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Selenium	ND	1.8	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	200	23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.45	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	50	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	61	0.91	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-7-S02 A	Basis:	as received
Lab ID:	290628-008	Sampled:	07/16/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	19,000	480	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	1.9	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	1.7	1.4	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	190	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.93	0.096	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	0.50	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	5,200	960	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Chromium	38	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	10	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	19	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	27,000	480	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	3.9	0.96	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Magnesium	9,600	1,900	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Manganese	530	24	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Mercury	0.023	0.017	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	0.53	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Nickel	31	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	5,100	2,400	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Selenium	ND	1.9	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	190	24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.48	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	56	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	75	0.96	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-7-S03 A	Basis:	as received
Lab ID:	290628-009	Sampled:	07/16/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	8,600	500	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	77	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.38	0.10	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	ND	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	2,800	25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Chromium	15	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	4.2	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	4.9	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	12,000	500	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	1.0	1.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Magnesium	4,400	25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Manganese	130	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Mercury	ND	0.018	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	ND	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Nickel	9.5	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	2,900	25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	290	25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.50	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	25	0.25	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	32	1.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-3502A	Basis:	as received
Lab ID:	290628-010	Sampled:	07/14/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	12,000	490	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	1.9	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	140	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.61	0.097	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	0.30	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	2,300	24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Chromium	29	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	6.7	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	9.5	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	20,000	490	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	1.5	0.97	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Magnesium	7,400	1,900	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Manganese	220	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Mercury	ND	0.017	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	ND	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Nickel	17	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	5,100	2,400	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Selenium	ND	1.9	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	150	24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.49	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	45	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	54	0.97	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-4501A	Basis:	as received
Lab ID:	290628-011	Sampled:	07/14/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	12,000	470	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	1.9	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.4	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	150	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.55	0.093	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	0.27	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	5,000	930	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Chromium	20	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	5.1	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	8.5	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	14,000	470	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	2.5	0.93	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Magnesium	5,500	1,900	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Manganese	370	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Mercury	ND	0.017	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	ND	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Nickel	17	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	2,800	23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Selenium	ND	1.9	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	120	23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.47	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	29	0.23	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	45	0.93	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-4502A	Basis:	as received
Lab ID:	290628-012	Sampled:	07/14/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	13,000	470	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	1.9	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.4	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	140	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.63	0.094	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	0.28	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	2,300	24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Chromium	29	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	7.0	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	8.2	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	22,000	470	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	ND	0.94	1.000	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Magnesium	8,400	1,900	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Manganese	220	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Mercury	ND	0.016	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	ND	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Nickel	18	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	6,000	2,400	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Selenium	ND	1.9	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	180	24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.47	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	47	0.24	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	66	0.94	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Target Analyte List Metals

Lab #:	290628	Project#:	60536296
Client:	AECOM	Location:	Los Padres
Field ID:	B-5504A	Basis:	as received
Lab ID:	290628-013	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg		

Analyte	Result	RL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Aluminum	22,000	550	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Antimony	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Arsenic	ND	1.5	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Barium	240	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Beryllium	0.99	0.11	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cadmium	0.45	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Calcium	8,400	1,100	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Chromium	42	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Cobalt	10	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Copper	13	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Iron	28,000	550	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Lead	4.2	1.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Magnesium	11,000	2,200	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Manganese	490	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Mercury	0.025	0.016	1.000	249984	07/24/17	07/24/17	METHOD	EPA 7471A
Molybdenum	ND	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Nickel	22	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Potassium	5,500	2,700	100.0	249879	07/20/17	07/24/17	EPA 3050B	EPA 6010B
Selenium	ND	2.0	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Silver	ND	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Sodium	170	27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Thallium	ND	0.55	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Vanadium	64	0.27	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B
Zinc	78	1.1	1.000	249879	07/20/17	07/21/17	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Target Analyte List Metals

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3050B
Project#:	60536296	Analysis:	EPA 6010B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC893995	Batch#:	249879
Matrix:	Soil	Prepared:	07/20/17
Units:	mg/Kg	Analyzed:	07/21/17

Analyte	Result	RL
Aluminum	ND	4.9
Antimony	ND	1.9
Arsenic	ND	1.5
Barium	ND	0.24
Beryllium	ND	0.097
Cadmium	ND	0.24
Calcium	ND	24
Chromium	0.34 b	0.24
Cobalt	ND	0.24
Copper	ND	0.24
Iron	ND	4.9
Lead	ND	0.97
Magnesium	ND	24
Manganese	ND	0.24
Molybdenum	ND	0.24
Nickel	0.28 b	0.24
Potassium	ND	24
Selenium	ND	1.9
Silver	ND	0.24
Sodium	ND	24
Thallium	ND	0.49
Vanadium	ND	0.24
Zinc	ND	0.97

b= See narrative
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Target Analyte List Metals

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	EPA 3050B
Project#:	60536296	Analysis:	EPA 6010B
Matrix:	Soil	Batch#:	249879
Units:	mg/Kg	Prepared:	07/20/17
Diln Fac:	1.000	Analyzed:	07/21/17

Type: BS Lab ID: QC893996

Analyte	Spiked	Result	%REC	Limits
Aluminum	53.76	58.25	108	80-136
Antimony	53.76	52.24	97	80-120
Arsenic	53.76	58.46	109	80-120
Barium	53.76	55.71	104	80-120
Beryllium	26.88	27.28	101	80-120
Cadmium	53.76	53.96	100	80-120
Calcium	537.6	560.1	104	80-127
Chromium	53.76	56.43	105	80-120
Cobalt	53.76	52.72	98	80-120
Copper	53.76	53.56	100	80-120
Iron	537.6	555.0	103	80-128
Lead	53.76	53.09	99	80-120
Magnesium	537.6	585.7	109	80-125
Manganese	53.76	56.67	105	80-120
Molybdenum	53.76	52.60	98	80-120
Nickel	53.76	54.09	101	80-120
Potassium	537.6	547.4	102	75-122
Selenium	53.76	56.43	105	80-120
Silver	5.376	4.812	90	80-120
Sodium	537.6	589.9	110	68-133
Thallium	53.76	56.04	104	80-120
Vanadium	53.76	57.00	106	80-120
Zinc	53.76	54.83	102	80-120

Type: BSD Lab ID: QC893997

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Aluminum	52.08	55.20	106	80-136	2	34
Antimony	52.08	52.57	101	80-120	4	20
Arsenic	52.08	57.04	110	80-120	1	20
Barium	52.08	55.25	106	80-120	2	20
Beryllium	26.04	27.00	104	80-120	2	20
Cadmium	52.08	53.83	103	80-120	3	20
Calcium	520.8	532.3	102	80-127	2	25
Chromium	52.08	56.37	108	80-120	3	20
Cobalt	52.08	53.00	102	80-120	4	20
Copper	52.08	53.81	103	80-120	4	20
Iron	520.8	526.7	101	80-128	2	26
Lead	52.08	52.10	100	80-120	1	20
Magnesium	520.8	557.9	107	80-125	2	23
Manganese	52.08	56.05	108	80-120	2	20
Molybdenum	52.08	52.41	101	80-120	3	20
Nickel	52.08	53.97	104	80-120	3	20
Potassium	520.8	524.0	101	75-122	1	26
Selenium	52.08	55.28	106	80-120	1	20
Silver	5.208	4.731	91	80-120	1	20
Sodium	520.8	558.0	107	68-133	2	26
Thallium	52.08	54.86	105	80-120	1	20
Vanadium	52.08	57.02	109	80-120	3	20
Zinc	52.08	54.92	105	80-120	3	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Target Analyte List Metals			
Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	EPA 7471A
Analyte:	Mercury	Diln Fac:	1.000
Type:	BLANK	Batch#:	249984
Lab ID:	QC894362	Prepared:	07/24/17
Matrix:	Soil	Analyzed:	07/24/17
Units:	mg/Kg		

Result	RL
ND	0.016

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Target Analyte List Metals

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	EPA 7471A
Analyte:	Mercury	Batch#:	249984
Matrix:	Soil	Prepared:	07/24/17
Units:	mg/Kg	Analyzed:	07/24/17
Diln Fac:	1.000		

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC894363	0.2016	0.2207	109	79-129		
BSD	QC894364	0.1923	0.2150	112	79-129	2	40

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Target Analyte List Metals

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	EPA 7471A
Analyte:	Mercury	Diln Fac:	1.000
Field ID:	ZZZZZZZZZZ	Batch#:	249984
MSS Lab ID:	290447-044	Sampled:	07/10/17
Matrix:	Soil	Received:	07/10/17
Units:	mg/Kg	Prepared:	07/24/17
Basis:	as received	Analyzed:	07/24/17

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC894365	0.4635	0.2155	1.878 >LR b	656 *	63-149		
MSD	QC894366		0.2083	0.8174	170 *	63-149	NC	69

*= Value outside of QC limits; see narrative
b= See narrative
NC= Not Calculated
>LR= Response exceeds instrument's linear range
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Ammonia Nitrogen

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Analysis:	SM4500NH3-D
Project#:	60536296		
Analyte:	Ammonia-N	Batch#:	249953
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg	Prepared:	07/24/17 10:36
Basis:	as received	Analyzed:	07/25/17 15:19
Diln Fac:	1.000		

Field ID	Type	Lab ID	Result	RL	Sampled
B-5-S01 A	SAMPLE	290628-001	28	9.4	07/15/17 08:40
B-5-S02 A	SAMPLE	290628-002	ND	9.3	07/15/17 10:15
B-5-S03 A	SAMPLE	290628-003	49	10	07/15/17 10:55
B-6-S01 A	SAMPLE	290628-004	14	9.4	07/15/17 15:00
B-6-S02 A	SAMPLE	290628-005	25	10	07/15/17 15:29
B-6-S03 A	SAMPLE	290628-006	74	9.7	07/15/17 15:52
B-7-S01 A	SAMPLE	290628-007	15	10	07/16/17 11:04
B-7-S02 A	SAMPLE	290628-008	51	9.7	07/16/17 11:44
B-7-S03 A	SAMPLE	290628-009	13	9.6	07/16/17 12:16
B-3502A	SAMPLE	290628-010	15	9.6	07/14/17 10:30
B-4501A	SAMPLE	290628-011	21	9.4	07/14/17 14:40
B-4502A	SAMPLE	290628-012	18	11	07/14/17 15:05
B-5504A	SAMPLE	290628-013	90	10	07/15/17 11:10
	BLANK	QC894253	2.0 J	10	

J= Estimated value
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Ammonia Nitrogen

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Analysis:	SM4500NH3-D
Project#:	60536296		
Analyte:	Ammonia-N	Diln Fac:	1.000
Field ID:	B-1-S01A	Batch#:	249953
MSS Lab ID:	290553-001	Sampled:	07/12/17 13:45
Matrix:	Soil	Received:	07/14/17
Units:	mg/Kg	Prepared:	07/24/17 10:36
Basis:	as received	Analyzed:	07/25/17 15:19

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
LCS	QC894254		500.0	510.0	102	80-120		
MS	QC894255	122.4	458.7	559.6	95	70-130		
MSD	QC894256		476.2	561.9	92	70-130	3	30

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

pH

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	EPA 9045D
Analyte:	pH	Batch#:	249816
Matrix:	Soil	Received:	07/17/17
Units:	SU	Prepared:	07/19/17 11:42
Diln Fac:	1.000	Analyzed:	07/19/17 13:30

Field ID	Lab ID	Result	RL	Sampled
B-5-S01 A	290628-001	7.0	1.0	07/15/17 08:40
B-5-S02 A	290628-002	7.1	1.0	07/15/17 10:15
B-5-S03 A	290628-003	7.0	1.0	07/15/17 10:55
B-6-S01 A	290628-004	6.4	1.0	07/15/17 15:00
B-6-S02 A	290628-005	6.9	1.0	07/15/17 15:29
B-6-S03 A	290628-006	7.1	1.0	07/15/17 15:52
B-7-S01 A	290628-007	6.2	1.0	07/16/17 11:04
B-7-S02 A	290628-008	6.8	1.0	07/16/17 11:44
B-7-S03 A	290628-009	6.4	1.0	07/16/17 12:16
B-3502A	290628-010	6.3	1.0	07/14/17 10:30
B-4501A	290628-011	7.0	1.0	07/14/17 14:40
B-4502A	290628-012	6.2	1.0	07/14/17 15:05
B-5504A	290628-013	7.0	1.0	07/15/17 11:10

RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

pH			
Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	EPA 9045D
Analyte:	pH	Diln Fac:	1.000
Field ID:	B-5-S01 A	Batch#:	249816
Type:	SDUP	Sampled:	07/15/17 08:40
MSS Lab ID:	290628-001	Received:	07/17/17
Lab ID:	QC893727	Prepared:	07/19/17 11:42
Matrix:	Soil	Analyzed:	07/19/17 13:30
Units:	SU		

MSS Result	Result	RL	RPD	Lim
6.970	6.860	1.000	2	20

RL= Reporting Limit
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Phosphorous

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	SMWW21:4500P-B
Project#:	60536296	Analysis:	SM4500P-E
Analyte:	Phosphorus (Total)	Basis:	as received
Matrix:	Soil	Batch#:	249801
Units:	mg/Kg	Received:	07/17/17

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled	Prepared	Analyzed
B-5-S01 A	SAMPLE	290628-001	13	1.5	5.000	07/15/17	07/20/17	07/21/17
B-5-S02 A	SAMPLE	290628-002	130	7.5	25.00	07/15/17	07/20/17	07/21/17
B-5-S03 A	SAMPLE	290628-003	18	1.5	5.000	07/15/17	07/20/17	07/21/17
B-6-S01 A	SAMPLE	290628-004	56	7.5	25.00	07/15/17	07/20/17	07/21/17
B-6-S02 A	SAMPLE	290628-005	2.2	0.30	1.000	07/15/17	07/20/17	07/21/17
B-6-S03 A	SAMPLE	290628-006	5.1	1.5	5.000	07/15/17	07/20/17	07/21/17
B-7-S01 A	SAMPLE	290628-007	8.5	1.5	5.000	07/16/17	07/20/17	07/21/17
B-7-S02 A	SAMPLE	290628-008	4.1	0.30	1.000	07/16/17	07/20/17	07/21/17
B-7-S03 A	SAMPLE	290628-009	9.2	1.5	5.000	07/16/17	07/20/17	07/21/17
B-3502A	SAMPLE	290628-010	48	7.5	25.00	07/14/17	07/20/17	07/21/17
B-4501A	SAMPLE	290628-011	4.4	1.5	5.000	07/14/17	07/20/17	07/21/17
B-4502A	SAMPLE	290628-012	4.7	0.30	1.000	07/14/17	07/20/17	07/21/17
B-5504A	SAMPLE	290628-013	2.1	0.30	1.000	07/15/17	07/20/17	07/21/17
	BLANK	QC893671	ND	0.30	1.000		07/19/17	07/20/17

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Phosphorous

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	SMWW21:4500P-B
Project#:	60536296	Analysis:	SM4500P-E
Analyte:	Phosphorus (Total)	Batch#:	249801
Matrix:	Soil	Prepared:	07/19/17
Units:	mg/Kg	Analyzed:	07/20/17
Diln Fac:	1.000		

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC893672	4.000	4.050	102	80-120		
BSD	QC893673	4.000	4.120	103	80-120	2	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Kjeldahl Nitrogen

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	SMWW20:4500-NORG
Project#:	60536296	Analysis:	SM4500NH3-C
Analyte:	Nitrogen, Total Kjeldahl	Batch#:	249952
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg	Prepared:	07/21/17
Basis:	as received	Analyzed:	07/24/17
Diln Fac:	1.000		

Field ID	Type	Lab ID	Result	RL	Sampled
B-5-S01 A	SAMPLE	290628-001	1,600	98	07/15/17
B-5-S02 A	SAMPLE	290628-002	250	91	07/15/17
B-5-S03 A	SAMPLE	290628-003	1,500	100	07/15/17
B-6-S01 A	SAMPLE	290628-004	660	110	07/15/17
B-6-S02 A	SAMPLE	290628-005	1,100	100	07/15/17
B-6-S03 A	SAMPLE	290628-006	2,400	110	07/15/17
B-7-S01 A	SAMPLE	290628-007	750	100	07/16/17
B-7-S02 A	SAMPLE	290628-008	1,600	110	07/16/17
B-7-S03 A	SAMPLE	290628-009	230	110	07/16/17
B-3502A	SAMPLE	290628-010	990	110	07/14/17
B-4501A	SAMPLE	290628-011	2,300	96	07/14/17
B-4502A	SAMPLE	290628-012	440	100	07/14/17
B-5504A	SAMPLE	290628-013	2,300	96	07/15/17
	BLANK	QC894249	ND	100	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Kjeldahl Nitrogen

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	SMWW20:4500-NORG
Project#:	60536296	Analysis:	SM4500NH3-C
Analyte:	Nitrogen, Total Kjeldahl	Diln Fac:	1.000
Field ID:	B-5-S01 A	Batch#:	249952
MSS Lab ID:	290628-001	Sampled:	07/15/17
Matrix:	Soil	Received:	07/17/17
Units:	mg/Kg	Prepared:	07/21/17
Basis:	as received	Analyzed:	07/24/17

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
LCS	QC894250		2,000	1,798	90	80-120		
MS	QC894251	1,620	2,000	4,129	118	70-130		
MSD	QC894252		2,000	3,624	102	70-130	13	30

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Organic Carbon (TOC)

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	WALKLEY-BLACK
Analyte:	Total Organic Carbon	Batch#:	249902
Matrix:	Soil	Received:	07/17/17
Units:	%	Analyzed:	07/21/17
Basis:	as received		

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled
B-5-S01 A	SAMPLE	290628-001	4.5	0.22	22.22	07/15/17
B-5-S02 A	SAMPLE	290628-002	0.05	0.02	2.415	07/15/17
B-5-S03 A	SAMPLE	290628-003	3.7	0.22	22.22	07/15/17
B-6-S01 A	SAMPLE	290628-004	0.96	0.04	4.065	07/15/17
B-6-S02 A	SAMPLE	290628-005	1.5	0.05	4.566	07/15/17
B-6-S03 A	SAMPLE	290628-006	4.1	0.21	20.83	07/15/17
B-7-S01 A	SAMPLE	290628-007	0.61	0.03	3.344	07/16/17
B-7-S02 A	SAMPLE	290628-008	2.5	0.16	16.39	07/16/17
B-7-S03 A	SAMPLE	290628-009	0.29	0.03	3.289	07/16/17
B-3502A	SAMPLE	290628-010	1.3	0.04	4.032	07/14/17
B-4501A	SAMPLE	290628-011	4.3	0.27	27.03	07/14/17
B-4502A	SAMPLE	290628-012	0.66	0.04	4.292	07/14/17
B-5504A	SAMPLE	290628-013	3.0	0.26	25.64	07/15/17
	BLANK	QC894073	ND	0.01	0.9990	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Organic Carbon (TOC)

Lab #:	290628	Location:	Los Padres
Client:	AECOM	Prep:	METHOD
Project#:	60536296	Analysis:	WALKLEY-BLACK
Analyte:	Total Organic Carbon	Basis:	as received
Field ID:	ZZZZZZZZZZ	Batch#:	249902
MSS Lab ID:	290508-001	Sampled:	07/12/17
Matrix:	Soil	Received:	07/12/17
Units:	%	Analyzed:	07/21/17

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Diln Fac
LCS	QC894074		0.1297	0.1201	93	79-120			0.9980
MS	QC894075	0.5284	0.6220	1.151	100	64-120			4.785
MSD	QC894076		0.6220	1.077	88	64-120	7	20	4.785

RPD= Relative Percent Difference

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WORK ORDER NUMBER: 17-07-1218

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Curtis & Tompkins, Ltd.

Client Project Name: 290628

Attention: Tracy Babjar
2323 Fifth Street
Berkeley, CA 94710-2407

Vikas Patel

Approved for release on 07/24/2017 by:
Vikas Patel
Project Manager

ResultLink ▸

Email your PM ▸

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Client Project Name: 290628
Work Order Number: 17-07-1218

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Work Order Narrative

Work Order: 17-07-1218 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 07/19/17. They were assigned to Work Order 17-07-1218.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

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Sample Summary

Client:	Curtis & Tompkins, Ltd.	Work Order:	17-07-1218
	2323 Fifth Street	Project Name:	290628
	Berkeley, CA 94710-2407	PO Number:	
		Date/Time Received:	07/19/17 10:30
		Number of Containers:	13
Attn:	Tracy Babjar		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
B-5-S01 A	17-07-1218-1	07/15/17 08:40	1	Solid
B-5-S02 A	17-07-1218-2	07/15/17 10:15	1	Solid
B-5-S03 A	17-07-1218-3	07/15/17 10:55	1	Solid
B-6-S01 A	17-07-1218-4	07/15/17 15:00	1	Solid
B-6-S02 A	17-07-1218-5	07/15/17 15:29	1	Solid
B-6-S03 A	17-07-1218-6	07/15/17 15:52	1	Solid
B-7-S01 A	17-07-1218-7	07/16/17 11:04	1	Solid
B-7-S02 A	17-07-1218-8	07/16/17 11:44	1	Solid
B-7-S03 A	17-07-1218-9	07/16/17 12:16	1	Solid
B-3502A	17-07-1218-10	07/14/17 10:30	1	Solid
B-4501A	17-07-1218-11	07/14/17 14:40	1	Solid
B-4502A	17-07-1218-12	07/14/17 15:05	1	Solid
B-5504A	17-07-1218-13	07/15/17 11:10	1	Solid

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Detections Summary

Client:	Curtis & Tompkins, Ltd.	Work Order:	17-07-1218
	2323 Fifth Street	Project Name:	290628
	Berkeley, CA 94710-2407	Received:	07/19/17
Attn:	Tracy Babjar		

Client SampleID / Analyte	Result	Qualifiers	RL	Units	Method	Extraction
B-5-S01 A (17-07-1218-1)						
Sulfide, Total	0.75		0.50	mg/kg	EPA 376.2M	N/A
B-5-S02 A (17-07-1218-2)						
Sulfide, Total	3.5		0.50	mg/kg	EPA 376.2M	N/A
B-5-S03 A (17-07-1218-3)						
Sulfide, Total	2.8		0.50	mg/kg	EPA 376.2M	N/A
B-6-S01 A (17-07-1218-4)						
Sulfide, Total	2.8		0.50	mg/kg	EPA 376.2M	N/A
B-6-S02 A (17-07-1218-5)						
Sulfide, Total	5.0		0.50	mg/kg	EPA 376.2M	N/A
B-6-S03 A (17-07-1218-6)						
Sulfide, Total	1.0		0.50	mg/kg	EPA 376.2M	N/A
B-7-S01 A (17-07-1218-7)						
Sulfide, Total	2.5		0.50	mg/kg	EPA 376.2M	N/A
B-7-S02 A (17-07-1218-8)						
Sulfide, Total	3.5		0.50	mg/kg	EPA 376.2M	N/A
B-7-S03 A (17-07-1218-9)						
Sulfide, Total	1.5		0.50	mg/kg	EPA 376.2M	N/A
B-3502A (17-07-1218-10)						
Sulfide, Total	3.5		0.50	mg/kg	EPA 376.2M	N/A
B-4501A (17-07-1218-11)						
Sulfide, Total	1.8		0.50	mg/kg	EPA 376.2M	N/A
B-4502A (17-07-1218-12)						
Sulfide, Total	2.0		0.50	mg/kg	EPA 376.2M	N/A
B-5504A (17-07-1218-13)						
Sulfide, Total	1.5		0.50	mg/kg	EPA 376.2M	N/A

Subcontracted analyses, if any, are not included in this summary.

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* MDL is shown

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Analytical Report

Curtis & Tompkins, Ltd.
2323 Fifth Street
Berkeley, CA 94710-2407

Project: 290628

Date Received: 07/19/17
Work Order: 17-07-1218
Preparation: N/A
Method: EPA 376.2M
Units: mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-5-S01 A	**17-07-1218-1-A**	**07/15/17 08:40**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	0.75	0.50	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-5-S02 A	**17-07-1218-2-A**	**07/15/17 10:15**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	3.5	0.50	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-5-S03 A	**17-07-1218-3-A**	**07/15/17 10:55**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	2.8	0.50	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-6-S01 A	**17-07-1218-4-A**	**07/15/17 15:00**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	2.8	0.50	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-6-S02 A	**17-07-1218-5-A**	**07/15/17 15:29**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	5.0	0.50	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-6-S03 A	**17-07-1218-6-A**	**07/15/17 15:52**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	1.0	0.50	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-7-S01 A	**17-07-1218-7-A**	**07/16/17 11:04**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	2.5	0.50	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-7-S02 A	**17-07-1218-8-A**	**07/16/17 11:44**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	3.5	0.50	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Curtis & Tompkins, Ltd.
2323 Fifth Street
Berkeley, CA 94710-2407

Project: 290628

Date Received: 07/19/17
Work Order: 17-07-1218
Preparation: N/A
Method: EPA 376.2M
Units: mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-7-S03 A	**17-07-1218-9-A**	**07/16/17 12:16**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	1.5	0.50	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-3502A	**17-07-1218-10-A**	**07/14/17 10:30**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	3.5	0.50	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-4501A	**17-07-1218-11-A**	**07/14/17 14:40**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	1.8	0.50	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-4502A	**17-07-1218-12-A**	**07/14/17 15:05**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	2.0	0.50	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B-5504A	**17-07-1218-13-A**	**07/15/17 11:10**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	1.5	0.50	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-05-001-6087**	**N/A**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Result	RL	DF	Qualifiers
Sulfide, Total	ND	0.50	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - Sample Duplicate

Curtis & Tompkins, Ltd.		Date Received:	07/19/17
2323 Fifth Street		Work Order:	17-07-1218
Berkeley, CA 94710-2407		Preparation:	N/A
		Method:	EPA 376.2M
Project: 290628			Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
B-5504A	**Sample**	**Solid**	**N/A**	**07/21/17 00:00**	**07/21/17 14:52**	**H0721SD1**
B-5504A	**Sample Duplicate**	**Solid**	**N/A**	**07/21/17 00:00**	**07/21/17 14:52**	**H0721SD1**

Parameter	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Sulfide, Total	1.500	1.500	0	0-25	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

Curtis & Tompkins, Ltd.
2323 Fifth Street
Berkeley, CA 94710-2407

Project: 290628

Date Received: 07/19/17
Work Order: 17-07-1218
Preparation: N/A
Method: EPA 376.2M

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-05-001-6087	**LCS**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**
099-05-001-6087	**LCSD**	**Solid**	**N/A**	**07/21/17**	**07/21/17 14:52**	**H0721SL1**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Sulfide, Total	1.000	0.8500	85	0.9000	90	80-120	6	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Sample Analysis Summary Report

Work Order: 17-07-1218 Page 1 of 1

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 376.2M	N/A	1064	N/A	1

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Glossary of Terms and Qualifiers

Work Order: 17-07-1218 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900
(510) 486-0532

RUSH

17-07-1218

Project Number: 290628
Site: Los Padres

Subcontract Laboratory:
Eurofins (CalScience)
7440 Lincoln Way
Garden Grove, CA 92841-1432
(714) 895-5494
ATTN: Vik Patel

Results due: ~~07/21/17~~ 7/24/17 Report Level: II

Please send report to: Tracy Babjar (tracy.babjar@ctberk.com)
*** Please report using Sample ID rather than C&T Lab #.

	Sample ID	Sampled	Matrix	Analysis	C&T Lab #	Comments
1	B-5-S01 A	07/15 08:40	Soil	SULFIDE	290628-001	
2	B-5-S02 A	07/15 10:15	Soil	SULFIDE	290628-002	
3	B-5-S03 A	07/15 10:55	Soil	SULFIDE	290628-003	
4	B-6-S01 A	07/15 15:00	Soil	SULFIDE	290628-004	
5	B-6-S02 A	07/15 15:29	Soil	SULFIDE	290628-005	
6	B-6-S03 A	07/15 15:52	Soil	SULFIDE	290628-006	
7	B-7-S01 A	07/16 11:04	Soil	SULFIDE	290628-007	
8	B-7-S02 A	07/16 11:44	Soil	SULFIDE	290628-008	
9	B-7-S03 A	07/16 12:16	Soil	SULFIDE	290628-009	
10	B-3502A	07/14 10:30	Soil	SULFIDE	290628-010	
11	B-4501A	07/14 14:40	Soil	SULFIDE	290628-011	
12	B-4502A	07/14 15:05	Soil	SULFIDE	290628-012	
13	B-5504A	07/15 11:10	Soil	SULFIDE	290628-013	

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Notes:	Relinquished By:	Received By:
first hold 13 7/21!	Kevin Poon	
	Date/Time: 7-18-17 @ 12:39	Date/Time: 07/19/17 1030
	Date/Time: @ 07/19/17	Date/Time:

Signature on this form constitutes a firm Purchase Order for the services requested above.

Page 1 of 1

GSO GOLDEN STATE OVERNIGHT

800-322-5555 www.gso.com

1218

Ship From
CURTIS & TOMPKINS
MICHAEL DAHLQUIST
2323 FIFTH STREET
BERKELEY, CA 94710

Ship To
EUROFINS (CALSCIENCE)
VIK PATEL
7440 LINCOLN WAY
92841-1432
GARDEN GROVE, CA 92841

COD: $0.00
Weight: 0 lb(s)
Reference:

Delivery Instructions:

Signature Type: REQUIRED

Tracking #: 536892424

PDS

ORC
GARDEN GROVE

A

D92845A

69606192

Print Date: 7/18/2017 12:58 PM

LABEL INSTRUCTIONS:

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WORK ORDER NUMBER: 17-07- 6218

SAMPLE RECEIPT CHECKLIST

COOLER 1 OF 1

CLIENT: Curtis & Tompkins

DATE: 07 / 19 / 2017

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: +0.2°C); Temperature (w/o CF): 2.7 °C (w/ CF): 2.7 °C; ☒ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

☐ Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature: ☐ Air ☐ Filter Checked by: 681

CUSTODY SEAL:

Cooler ☒ Present and Intact ☐ Present but Not Intact ☐ Not Present ☐ N/A Checked by: 681

Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☒ Not Present ☐ N/A Checked by: 681

SAMPLE CONDITION:	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	☒	☐	☐
COC document(s) received complete	☒	☐	☐
☐ Sampling date ☐ Sampling time ☐ Matrix ☐ Number of containers			
☐ No analysis requested ☐ Not relinquished ☐ No relinquished date ☐ No relinquished time			
Sampler's name indicated on COC	☐	☐	☒
Sample container label(s) consistent with COC	☒	☐	☐
Sample container(s) intact and in good condition	☒	☐	☐
Proper containers for analyses requested	☒	☐	☐
Sufficient volume/mass for analyses requested	☒	☐	☐
Samples received within holding time	☒	☐	☐
Aqueous samples for certain analyses received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfide ☐ Dissolved Oxygen	☐	☐	☒
Proper preservation chemical(s) noted on COC and/or sample container	☐	☐	☒
Unpreserved aqueous sample(s) received for certain analyses			
☐ Volatile Organics ☐ Total Metals ☐ Dissolved Metals			
Container(s) for certain analysis free of headspace	☐	☐	☒
☐ Volatile Organics ☐ Dissolved Gases (RSK-175) ☐ Dissolved Oxygen (SM 4500)			
☐ Carbon Dioxide (SM 4500) ☐ Ferrous Iron (SM 3500) ☐ Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	☐	☐	☒

CONTAINER TYPE: (Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOA**h** ☐ VOA**na$_2$** ☐ 100PJ ☐ 100PJ**na$_2$** ☐ 125AGB ☐ 125AGB**h** ☐ 125AGB**p** ☐ 125PB

☐ 125PB**znna** ☐ 250AGB ☐ 250CGB ☐ 250CGB**s** ☐ 250PB ☐ 250PB**n** ☐ 500AGB ☐ 500AGJ ☐ 500AGJ**s**

☐ 500PB ☐ 1AGB ☐ 1AGB**na$_2$** ☐ 1AGB**s** ☐ 1PB ☐ 1PB**na** ☐ _____ ☐ _____ ☐ _____ ☐ _____

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (_____) ☐ EnCores® (_____) ☐ TerraCores® (_____) ☒ 2ozCGJ

Air: ☐ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ **Other Matrix** (_____): ☐ _____ ☐ _____

Container: **A** = Amber, **B** = Bottle, **C** = Clear, **E** = Envelope, **G** = Glass, **J** = Jar, **P** = Plastic, and **Z** = Ziploc/Resealable Bag

Preservative: **b** = buffered, **f** = filtered, **h** = HCl, **n** = HNO_3, **na** = NaOH, **na$_2$** = $Na_2S_2O_3$, **p** = H_3PO_4, **s** = H_2SO_4, **u** = ultra-pure, **x** = Na_2SO_3+$NaHSO_4.H_2O$, **znna** = Zn $(CH_3CO_2)_2$ + NaOH

Labeled/Checked by: 681

Reviewed by: 1650

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Appendix D Cross Sections Used for End Area Calculations

LOS PADRES SEDIMENT VOLUME ANALYSIS

CROSS SECTION PLAN

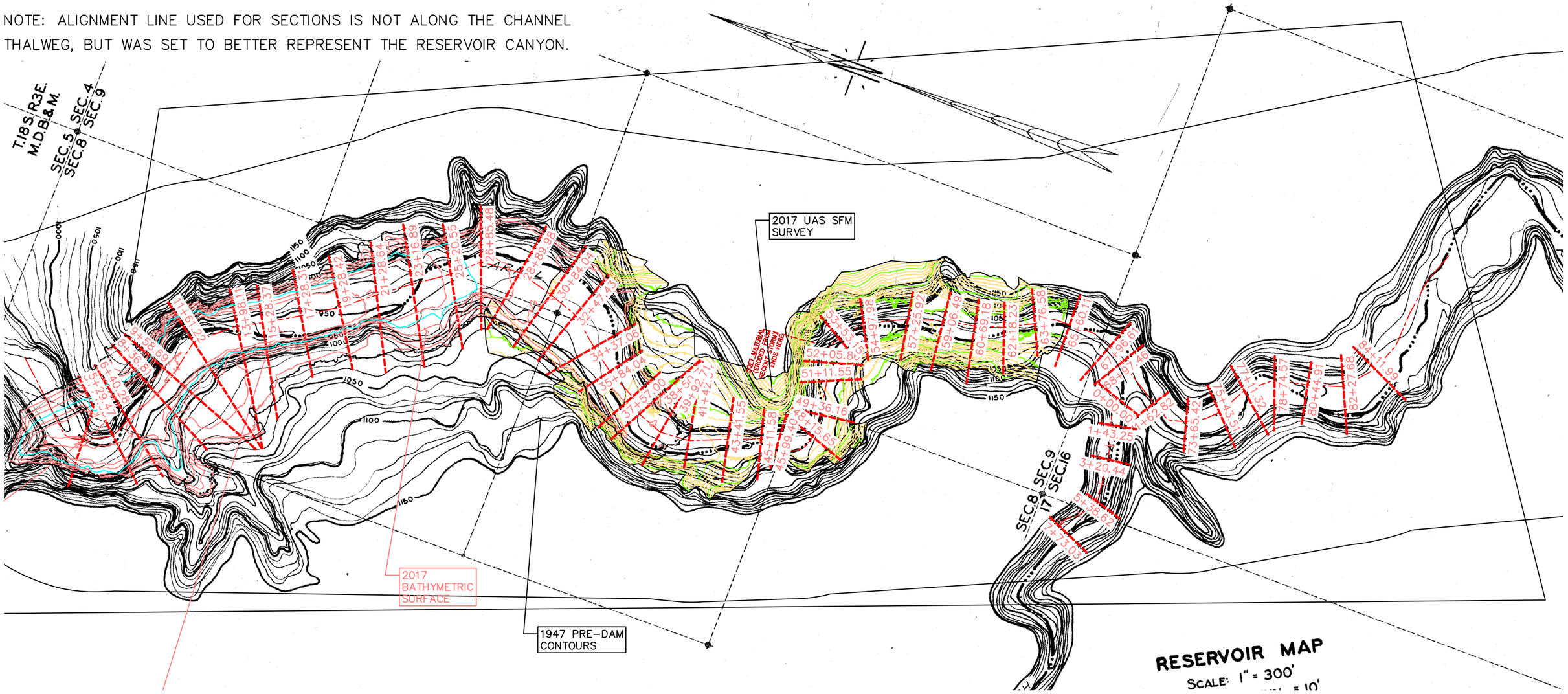
SHEET 1 OF 1

HORIZ SCALE: 1"=500'

LEGEND

- 2017 BATHYMETRIC SURFACE
- 2017 UAS SFM SURFACE
- 2016 LIDAR SURFACE
- 1947 PRE-DAM SURFACE
- 1947 PRE-DAM SURFACE (SHIFTED)
- 1947 PRE-DAM SURFACE TIE-IN ADJUSTMENT
- NMWS (1042.9 FT NAVD88)
- ZONE 1-ZONE 2 TRANSITION PLANE
- ZONE 1 SEDIMENT
- ZONE 2 SEDIMENT
- ZONE 3 SEDIMENT
- RES STORAGE ADJUSTMENT (REDUCE)
- RES STORAGE ADJUSTMENT (INCREASE)
- REMAINING RES STORAGE AREA

NOTE: ALIGNMENT LINE USED FOR SECTIONS IS NOT ALONG THE CHANNEL THALWEG, BUT WAS SET TO BETTER REPRESENT THE RESERVOIR CANYON.



LOS PADRES SEDIMENT VOLUME ANALYSIS

RESERVOIR CANYON CROSS-SECTIONS

SHEET 1 OF 4

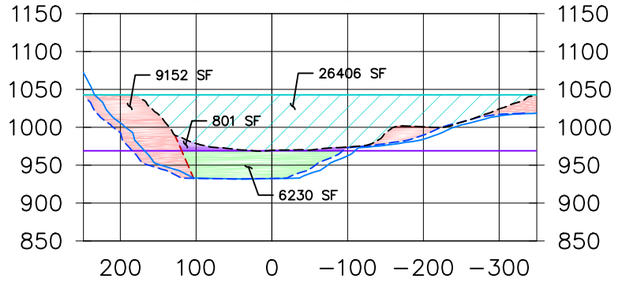
VERT SCALE: 1"=200'

HORIZ SCALE: 1"=200'

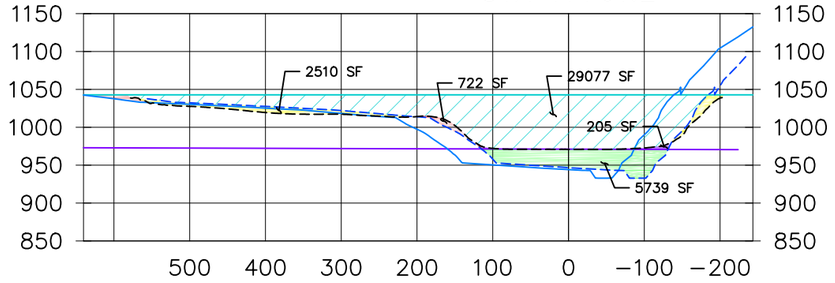
LEGEND

- 2017 BATHYMETRIC SURFACE
- 2017 UAS SFM SURFACE
- 2016 LIDAR SURFACE
- 1947 PRE-DAM SURFACE
- 1947 PRE-DAM SURFACE (SHIFTED)
- 1947 PRE-DAM SURFACE TIE-IN ADJUSTMENT
- NMWS (1042.9 FT NAVD88)
- ZONE 1-ZONE 2 TRANSITION PLANE
- ZONE 1 SEDIMENT
- ZONE 2 SEDIMENT
- ZONE 3 SEDIMENT
- RES STORAGE ADJUSTMENT (REDUCE)
- RES STORAGE ADJUSTMENT (INCREASE)
- REMAINING RES STORAGE AREA

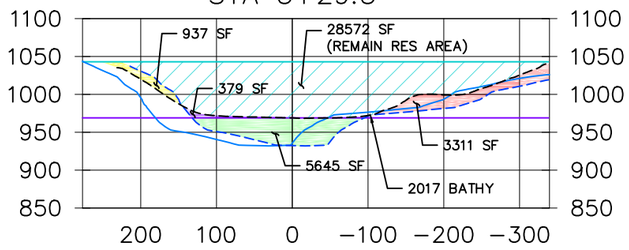
STA 3+74.9



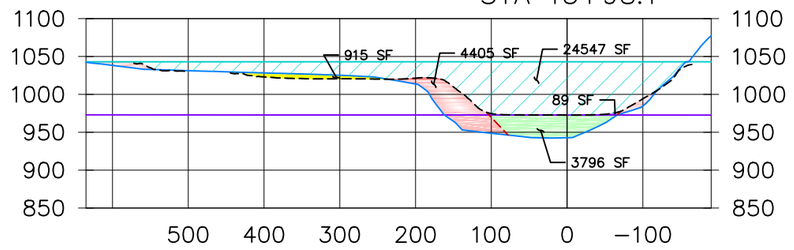
STA 11+61.2



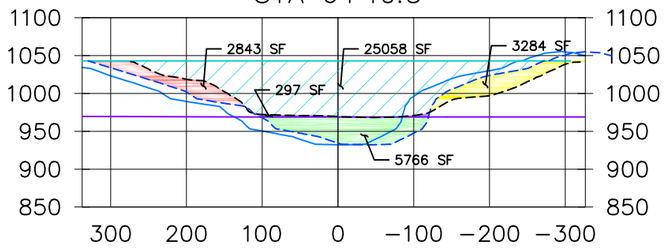
STA 5+29.5



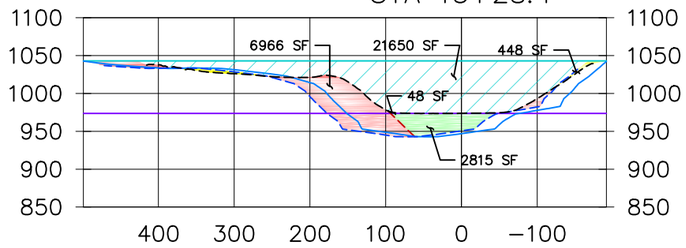
STA 13+98.1



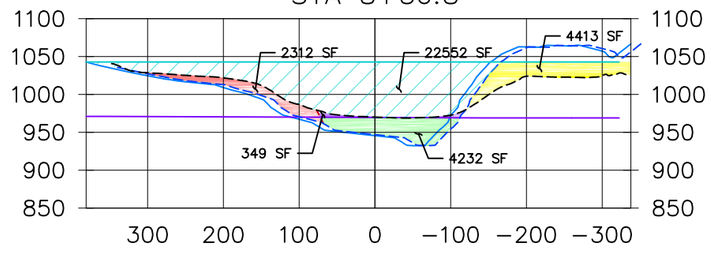
STA 6+40.3



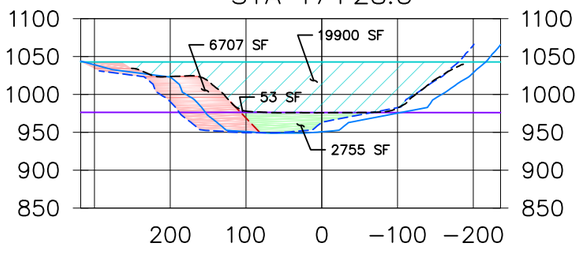
STA 15+28.4



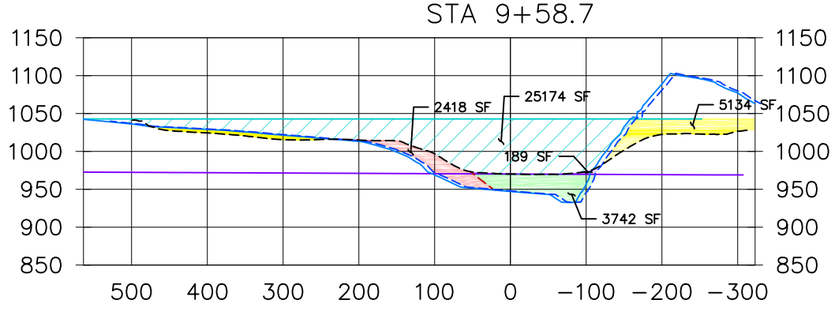
STA 8+36.8



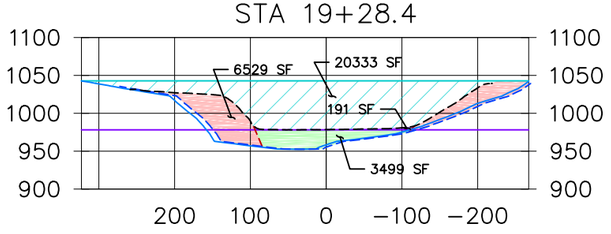
STA 17+28.3



STA 9+58.7



STA 19+28.4



LOS PADRES SEDIMENT VOLUME ANALYSIS

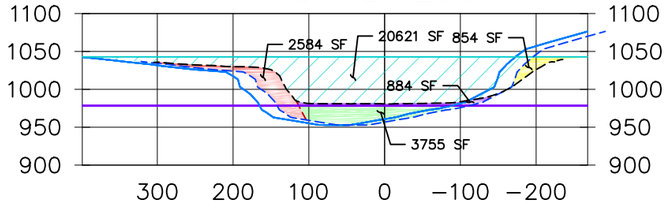
RESERVOIR CANYON CROSS-SECTIONS

SHEET 2 OF 4

VERT SCALE: 1"=200'

HORIZ SCALE: 1"=200'

STA 21+28.6



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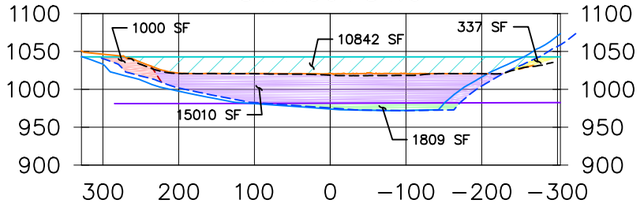
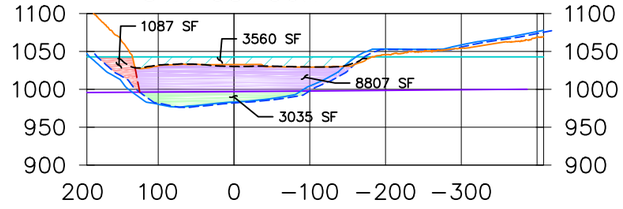
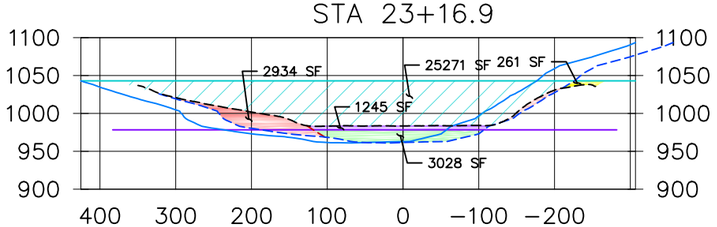


STA 38+50.7



STA 23+16.9



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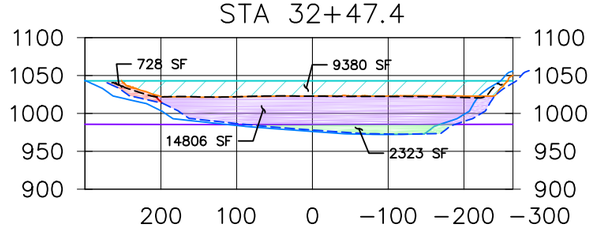
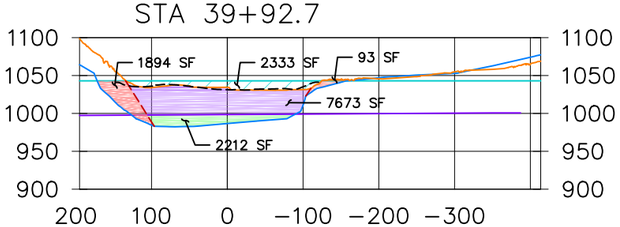
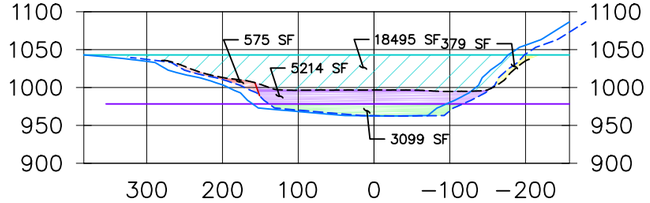


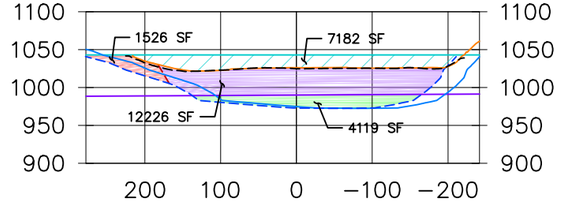
STA 39+92.7



STA 25+20.6



STA 34+37.1



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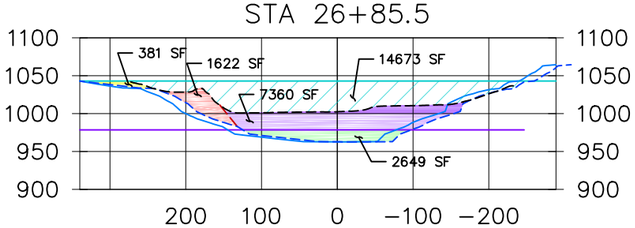

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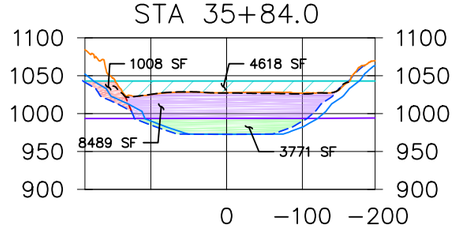

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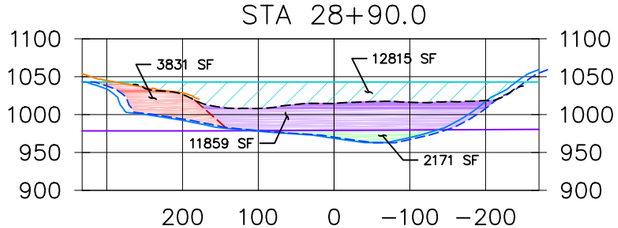

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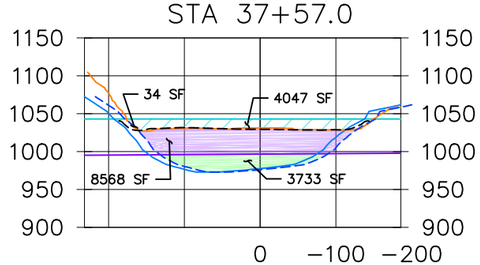


LOS PADRES SEDIMENT VOLUME ANALYSIS

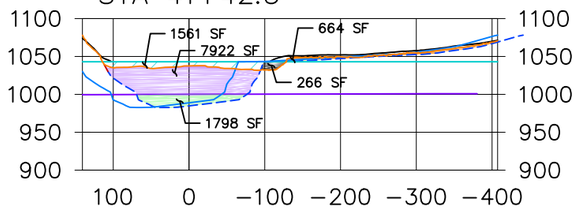
RESERVOIR CANYON CROSS-SECTIONS

SHEET 3 OF 4

VERT SCALE: 1"=200'

HORIZ SCALE: 1"=200'

STA 41+42.3



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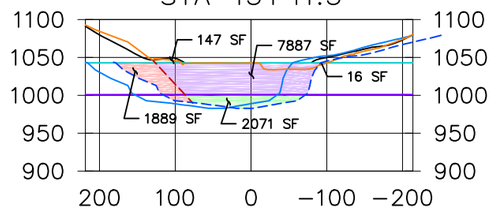

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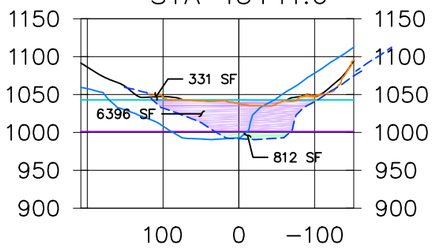
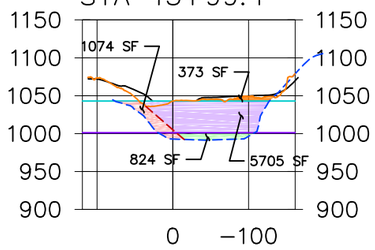
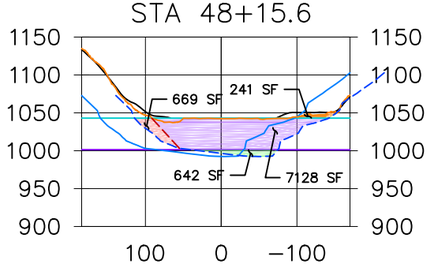


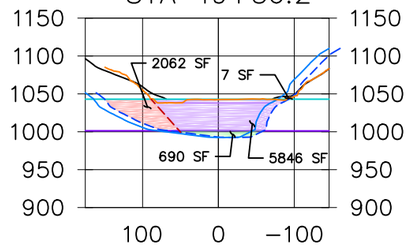
STA 45+99.4



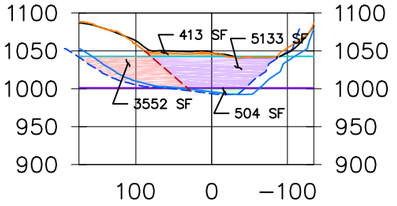
STA 48+15.6



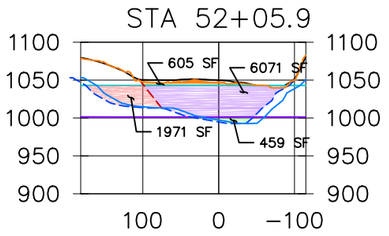
STA 49+36.2



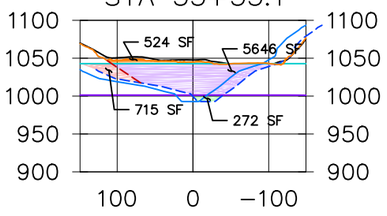
STA 51+11.6



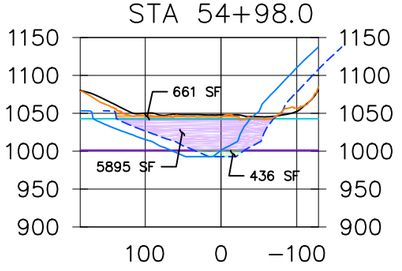
STA 52+05.9



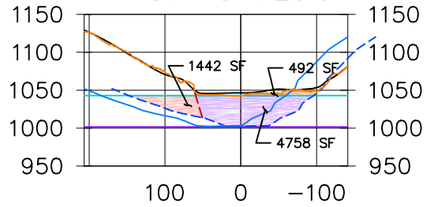
STA 53+53.1



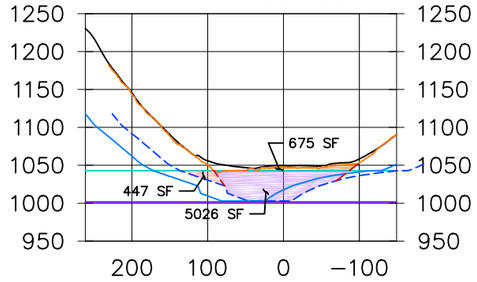
STA 54+98.0



STA 57+25.9



STA 59+06.5



LOS PADRES SEDIMENT VOLUME ANALYSIS

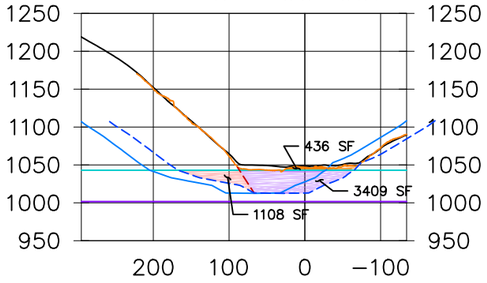
RESERVOIR CANYON CROSS-SECTIONS

SHEET 4 OF 4

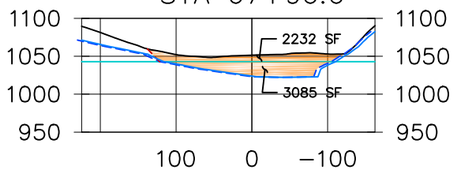
VERT SCALE: 1"=200'

HORIZ SCALE: 1"=200'

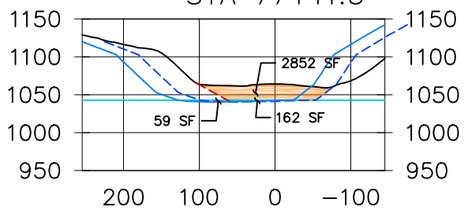
STA 60+69.2



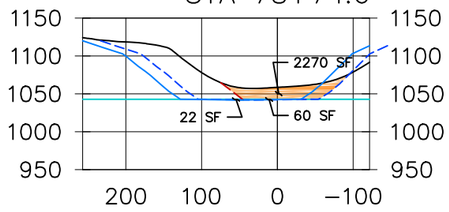
STA 67+96.6



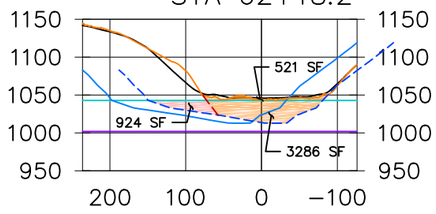
STA 77+11.3



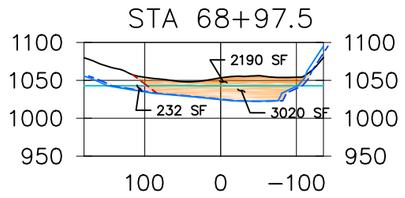
STA 78+74.6



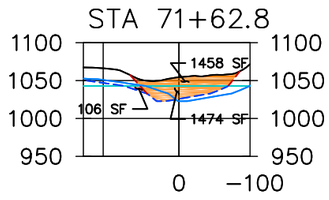
STA 62+18.2



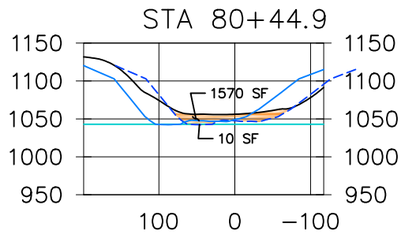
STA 68+97.5



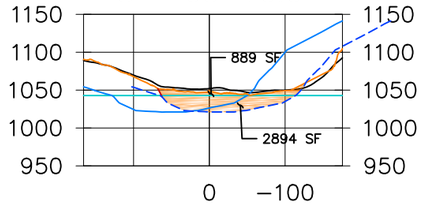
STA 71+62.8



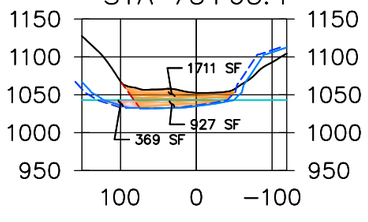
STA 80+44.9



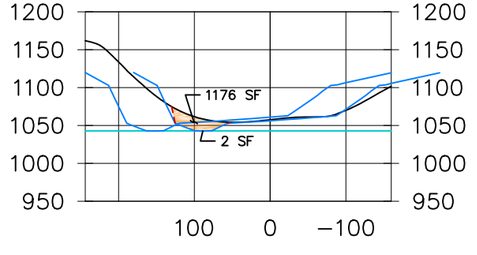
STA 63+76.6



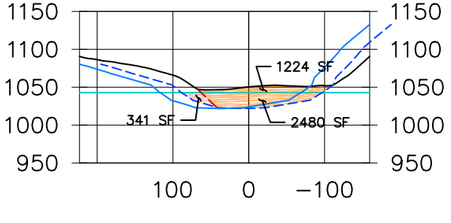
STA 73+65.4



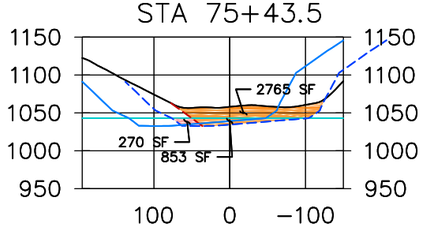
STA 82+27.7



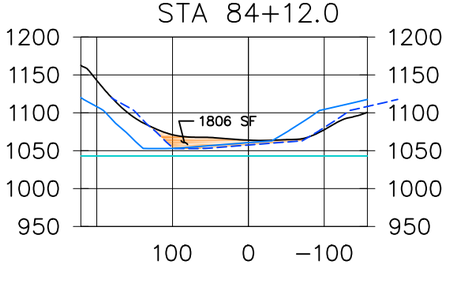
STA 65+60.1



STA 75+43.5



STA 84+12.0



LOS PADRES SEDIMENT VOLUME ANALYSIS

DANISH CREEK CROSS-SECTIONS

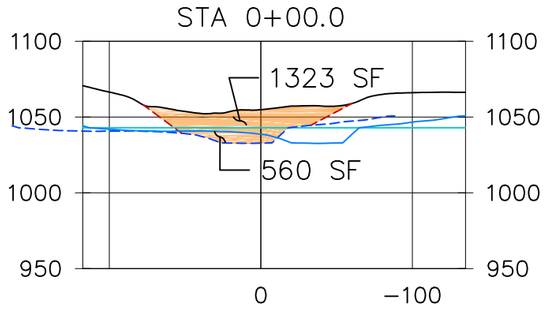
SHEET 1 OF 1

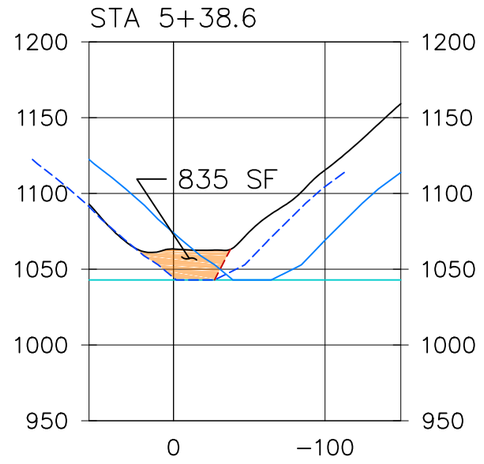
VERT SCALE: 1"=100'

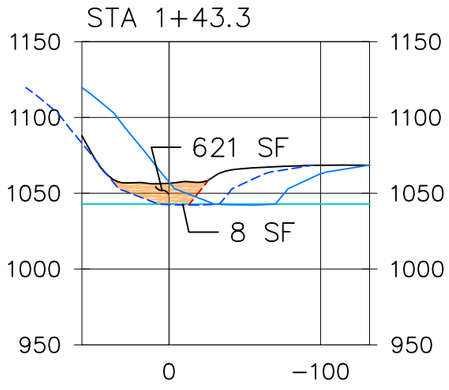
HORIZ SCALE: 1"=100'

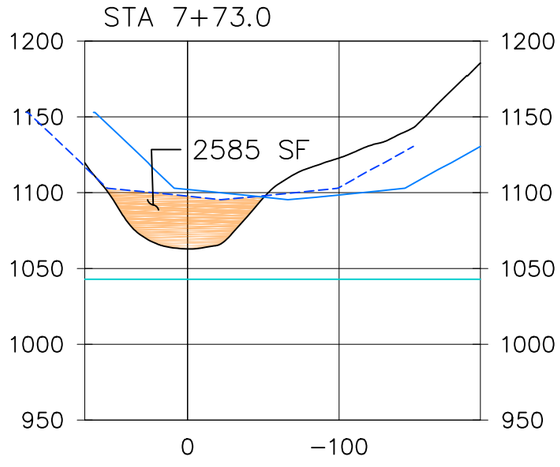
LEGEND

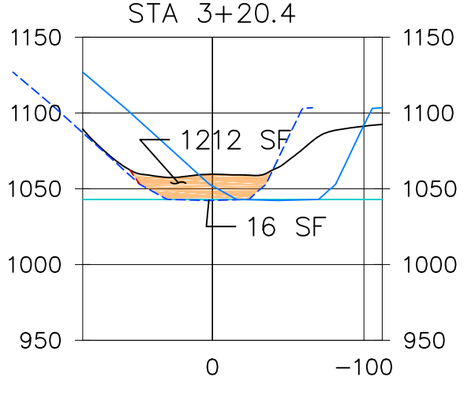
- 2017 BATHYMETRIC SURFACE
- 2017 UAS SFM SURFACE
- 2016 LIDAR SURFACE
- 1947 PRE-DAM SURFACE
- 1947 PRE-DAM SURFACE (SHIFTED)
- 1947 PRE-DAM SURFACE TIE-IN ADJUSTMENT
- NMWS (1042.9 FT NAVD88)
- ZONE 1-ZONE 2 TRANSITION PLANE
- ZONE 1 SEDIMENT
- ZONE 2 SEDIMENT
- ZONE 3 SEDIMENT
- RES STORAGE ADJUSTMENT (REDUCE)
- RES STORAGE ADJUSTMENT (INCREASE)
- REMAINING RES STORAGE AREA











LOS PADRES RESERVOIR CANYON SECTIONS		**CROSS-SECTION AREA**									**AVERAGE OF CROSS SECTION AREAS**								**VOLUMES BETWEEN AVERAGED CROSS SECTION AREAS**							
Station	Length (FT)	Z1 Fill Area (SF)	Z2 Fill Area (SF)	Z3 Fill Area, Above NMWS (SF)	Z3 Fill Area, Below NMWS (SF)	Res Stor Area Reduce (SF)	Res Stor Area Increase (SF)	Remain Res Area Fill (SF)	***1947 Res Stor Area (SF)***	***2017 Res Stor Area (SF)***	Z1 Fill Area (SF)	Z2 Fill Area (SF)	Z3 Fill Area, Above NMWS (SF)	Z3 Fill Area, Below NMWS (SF)	Res Stor Area Reduce (SF)	Res Stor Area Increase (SF)	***1947 Res Stor Area (SF)***	***2017 Res Stor Area (SF)***	Z1 Fill Vol (AF)	Z2 Fill Vol (AF)	Z3 Fill Vol, Above NMWS (AF)	Z3 Fill Vol, Below NMWS (AF)	Res Stor Vol Reduce (AF)	Res Stor Vol Increase (AF)	***1947 Res Stor Vol (AF)***	***2017 Res Stor Vol (AF)***
374.9	154.5	6230	801	0	0	9152	0	26406	33437	17254	5937.5	590	0	0	6231.5	468.5	34485	23381.5	21	2	0	0	22	2	122	83
529.5	110.8	5645	379	0	0	3311	937	28572	35533	29509	5705.5	338	0	0	3077	2110.5	34969	28925.5	15	1	0	0	8	5	89	74
640.3	196.5	5766	297	0	0	2843	3284	25058	34405	28342	4999	323	0	0	2577.5	3848.5	32975.5	27653.5	23	1	0	0	12	17	149	125
836.8	121.9	4232	349	0	0	2312	4413	22552	31546	26965	3987	269	0	0	2365	4773.5	32892.5	28636.5	11	1	0	0	7	13	92	80
958.7	202.5	3742	189	0	0	2418	5134	25174	34239	30308	4740.5	197	0	0	1570	3822	35885	30947.5	22	1	0	0	7	18	167	144
1,161.2	236.9	5739	205	0	0	722	2510	29077	37531	31587	4767.5	147	0	0	2563.5	1712.5	33439	28524.5	26	1	0	0	14	9	182	155
1,398.1	130.3	3796	89	0	0	4405	915	24547	29347	25462	3305.5	68.5	0	0	5685.5	681.5	27154	23780	10	0	0	0	17	2	81	71
1,528.4	199.9	2815	48	0	0	6966	448	21650	24961	22098	2785	50.5	0	0	6836.5	224	23834.5	20999	13	0	0	0	31	1	109	96
1,728.3	200.1	2755	53	0	0	6707	0	19900	22708	19900	3127	122	0	0	6618	0	23365.5	20116.5	14	1	0	0	30	0	107	92
1,928.4	200.2	3499	191	0	0	6529	0	20333	24023	20333	3627	537.5	0	0	4556.5	427	25068.5	20904	17	2	0	0	21	2	115	96
2,128.6	188.3	3755	884	0	0	2584	854	20621	26114	21475	3391.5	1064.5	0	0	2759	557.5	27959.5	23503.5	15	5	0	0	12	2	121	102
2,316.9	203.7	3028	1245	0	0	2934	261	25271	29805	25532	3063.5	3229.5	0	0	1754.5	320	28496	22203	14	15	0	0	8	1	133	104
2,520.6	164.9	3099	5214	0	0	575	379	18495	27187	18874	2874	6287	0	0	1098.5	380	26125	16964	11	24	0	0	4	1	99	64
2,685.5	204.5	2649	7360	0	0	1622	381	14673	25063	15054	2410	9609.5	0	0	2726.5	190.5	25954	13934.5	11	45	0	0	13	1	122	65
2,890.0	194.1	2171	11859	0	0	3831	0	12815	26845	12815	1990	13434.5	0	0	2415.5	168.5	27421.5	11997	9	60	0	0	11	1	122	53
3,084.0	163.4	1809	15010	0	0	1000	337	10842	27998	11179	2066	14908	0	0	864	168.5	27253.5	10279.5	8	56	0	0	3	1	102	39
3,247.4	189.6	2323	14806	0	0	728	0	9380	26509	9380	3221	13516	0	0	1127	0	25018	8281	14	59	0	0	5	0	109	36
3,437.1	147.0	4119	12226	0	0	1526	0	7182	23527	7182	3945	10357.5	0	0	1267	0	20202.5	5900	13	35	0	0	4	0	68	20
3,584.0	173.0	3771	8489	0	0	1008	0	4618	16878	4618	3752	8528.5	0	0	521	0	16613	4332.5	15	34	0	0	2	0	66	17
3,757.0	93.7	3733	8568	0	0	34	0	4047	16348	4047	3384	8687.5	0	0	560.5	0	15875	3803.5	7	19	0	0	1	0	34	8
3,850.7	142.0	3035	8807	0	0	1087	0	3560	15402	3560	2623.5	8240	0	0	1537	0	13810	2946.5	9	27	0	0	5	0	45	10
3,992.7	149.6	2212	7673	0	0	1987	0	2333	12218	2333	2005	7797.5	332	0	993.5	133	11882.5	2080	7	27	1	0	3	0	41	7
4,142.3	199.2	1798	7922	664	0	0	266	1561	11547	1827	1934.5	7904.5	405.5	0	944.5	133	10752.5	913.5	9	36	2	0	4	1	49	4
4,341.6	170.0	2071	7887	147	0	1889	0	0	9958	0	1441.5	7141.5	239	0	944.5	0	8583	0	6	28	1	0	4	0	34	0
4,511.6	87.8	812	6396	331	0	0	0	0	7208	0	818	6050.5	352	0	537	0	6868.5	0	2	12	1	0	1	0	14	0
4,599.4	216.3	824	5705	373	0	1074	0	0	6529	0	733	6416.5	307	0	871.5	0	7149.5	0	4	32	2	0	4	0	35	0
4,815.7	120.5	642	7128	241	0	669	0	0	7770	0	666	6487	124	0	1365.5	0	7153	0	2	18	0	0	4	0	20	0
4,936.2	175.4	690	5846	7	0	2062	0	0	6536	0	597	5489.5	210	0	2807	0	6086.5	0	2	22	1	0	11	0	25	0
5,111.6	94.3	504	5133	413	0	3552	0	0	5637	0	481.5	5602	509	0	2761.5	0	6083.5	0	1	12	1	0	6	0	13	0
5,205.9	147.3	459	6071	605	0	1971	0	0	6530	0	365.5	5858.5	564.5	0	1343	0	6224	0	1	20	2	0	5	0	21	0
5,353.2	144.8	272	5646	524	0	715	0	0	5918	0	354	5770.5	592.5	0	357.5	0	6124.5	0	1	19	2	0	1	0	20	0
5,498.0	227.9	436	5895	661	0	0	0	0	6331	0	218	5326.5	576.5	0	721	0	5544.5	0	1	28	3	0	4	0	29	0
5,725.9	180.6	0	4758	492	0	1442	0	0	4758	0	0	4892	583.5	0	944.5	0	4892	0	0	20	2	0	4	0	20	0
5,906.5	162.7	0	5026	675	0	447	0	0	5026	0	0	4217.5	555.5	0	777.5	0	4217.5	0	0	16	2	0	3	0	16	0
6,069.2	149.0	0	3409	436	0	1108	0	0	3409	0	0	1704.5	478.5	1643	1016	0	3347.5	0	0	6	2	6	3	0	11	0
6,218.2	158.4	0	0	521	3286	924	0	0	3286	0	0	0	705	3090	462	0	3090	0	0	0	3	11	2	0	11	0
6,376.6	183.5	0	0	889	2894	0	0	0	2894	0	0	0	1056.5	2687	170.5	0	2687	0	0	0	4	11	1	0	11	0
6,560.1	236.5	0	0	1224	2480	341	0	0	2480	0	0	0	1728	2782.5	170.5	0	2782.5	0	0	0	9	15	1	0	15	0
6,796.6	100.9	0	0	2232	3085	0	0	0	3085	0	0	0	2211	3052.5	116	0	3052.5	0	0	0	5	7	0	0	7	0
6,897.5	265.4	0	0	2190	3020	232	0	0	3020	0	0	0	1824	2247	169	0	2247	0	0	0	11	14	1	0	14	0
7,162.8	202.6	0	0	1458	1474	106	0	0	1474	0	0	0	1584.5	1200.5	237.5	0	1200.5	0	0	0	7	6	1	0	6	0
7,365.4	178.1	0	0	1711	927	369	0	0	927	0	0	0	2238	890	319.5	0	890	0	0	0	9	4	1	0	4	0
7,543.5	167.8	0	0	2765	853	270	0	0	853	0	0	0	2808.5	507.5	164.5	0	507.5	0	0	0	11	2	1	0	2	0
7,711.3	163.3	0	0	2852	162	59	0	0	162	0	0	0	2561	111	40.5	0	111	0	0	0	10	0	0	0	0	0
7,874.6	170.3	0	0	2270	60	22	0	0	60	0	0	0	1920	35	11	0	35	0	0	0	8	0	0	0	0	0
8,044.9	182.8	0	0	1570	10	0	0	0	10	0	0	0	1373	6	0	0	6	0	0	0	6	0	0	0	0	0
8,227.7	184.3	0	0	1176	2	0	0	0	2	0	0	0	1491	1	0	0	1	0	0	0	6	0	0	0	0	0
8,412.0	160.4	0	0	1806	0	0	0	0	0	0	0	0	903	0	0	0	0	0	0	0	3	0	0	0	0	0
8,572.4	180.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DANISH CREEK																										
0	143.3	0	0	1323	560	0	0	0	560	0	0	0	972	284	0	0	284	0	0	0	3	1	0	0	1	0
143.25	177.2	0	0	621	8	0	0	0	8	0	0	0	916.5	12	0	0	12	0	0	0	4	0	0	0	0	0
320.44	218.2	0	0	1212	16	0	0	0	16	0	0	0	1023.5	8	0	0	8	0	0	0	5	0	0	0	0	0
538.62	234.4	0	0	835	0	0	0	0	0	0	0	0	1710	0	0	0	0	0	0	0	9	0	0	0	0	0
773.03	0.0	0	0	2585	0	0	0	0	0	0	0	0	2585	0	0	0	0	0	0	0	0	0	0	0	0	0
																			332	**684**	**135**	**77**	**303**	**79**	**2,655**	**1,546** **= TOTAL**