SACRAMENTO MUNICIPAL UTILITY DISTRICT
UPPER AMERICAN RIVER PROJECT
FERC Project No. 2101

Slab Creek Reservoir
Sediment Investigation Report

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CERTIFICATION

All geologic and environmental information, conclusions and recommendations in this report have been prepared by, or under the direct supervision of a DTA California Registered Geologist.

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LIST OF ACRONYMS

ac-ft	acre-feet
ASTM	American Society for Testing and Materials
FERC	Federal Energy Regulatory Commission
GPS	Geographic Positioning System
MeHg	Methylmercury
MS/MSD	Matrix Spike/Matrix Spike Duplicate
ng/g	nanograms per gram
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RPD	Relative Percent Difference
SFAR	South Fork American River
SMUD	Sacramento Municipal Utility District
SWRCB	California State Water Resources Control Board
THg	Total mercury
UARP	Upper American River Project
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

1.0 INTRODUCTION

The 688 MW Upper American River Project (UARP) is the sole hydroelectric project owned by the Sacramento Municipal Utility District (SMUD). It produces nearly 20 percent of SMUD's energy generation portfolio in normal water years. The UARP is composed of seven jointly-operated, load-following hydroelectric developments, which are crucial to meeting demand for electricity during the long, hot summers experienced by the Sacramento area. The proposed Iowa Hill Pumped-storage Development will be a valuable addition to the UARP, helping meet the needs of California's growing population by providing renewable, long-term capacity and energy through non-fossil fuel based power. The addition of 400 megawatts of capacity from the Iowa Hill Development would further these goals without significant environmental impacts because it augments existing facilities with little change to natural resources of the South Fork American River (SFAR) basin. The proposed plan for the development incorporates the existing Slab Creek Reservoir as the lower reservoir. A new, 6,400 ac-ft reservoir will be constructed on top of Iowa Hill, approximately 1,200 feet above Slab Creek Reservoir. Operation of the development will consist of pumping water from Slab Creek Reservoir into the upper reservoir through an underground tunnel/powerhouse system during periods of low power demand. When demand is high, water will be released from the upper reservoir and pass through the powerhouse in generation mode and back into Slab Creek Reservoir. The general vicinity is shown in Figure 1 and the overall development configuration relative to Slab Creek Reservoir is presented in Figure 2.

1.1 Mining in the Western Sierra Nevada

Within the western Sierra Nevada, historic hydraulic placer gold mining employed liquid mercury as an amalgamating agent in the gold recovery process. Some of this mercury was lost during mining as uncontrolled discharges into receiving waters, primarily within the rivers and lakes of the region. Mercury in reservoir sediments have been well-documented in numerous United States Geological Survey (USGS) studies in streams and lakes draining the watersheds north of the American River, including the Bear and Yuba rivers (Alpers et al., 2006).

A review of existing literature on historic mining in the Iowa Hill area shows there are/were no known sizeable hydraulic mines upstream of Slab Creek Reservoir (USGS and others) on the SFAR watershed. A review of the state mining database and field reconnaissance of the identified mine sites identified several small (1 acre or less) shallow hydraulic mines located on the ridgetop adjacent to Slab Creek Reservoir, approximately one mile distant from the shoreline and over 1,500 feet vertical distance from the lake. As shown on Figure 3, the majority of major mining operations took place at lower elevation sites downstream of the development, in the vicinity of Placerville, and within watersheds to the north, primarily on the Bear and Yuba Rivers. However, impacts on river sediments in the SFAR and Slab Creek Reservoir from these small individual ridgetop operations are unknown.

1.2 Purpose of the Slab Creek Sediment Investigation

Slab Creek Reservoir extends 4.5 miles from the dam upstream along the SFAR. As part of the licensing process for the Iowa Hill Development, the California State Water Resources Control Board (SWRCB) raised concerns about the potential for water quality impairment related to disturbance of reservoir sediments during the construction and operation of the proposed pumped-storage facility. These concerns focused on Iowa Hill Development construction and/or operation disturbing sediment and increasing turbidity in the water column of Slab Creek Reservoir. Because historic gold mining has elevated the levels of mercury in sediment in river systems immediately north of the project, the SWRCB was concerned about the potential for disturbed sediments in Slab Creek Reservoir to release elevated levels of mercury into the water. If present in significant quantities, and under the necessary biogeochemical conditions, elemental mercury can transform to methylmercury, which then becomes available to biota in impacted streams and could ultimately progress up the food chain through fish consumption.

In response to SWRCB concerns, SMUD agreed to perform a screening-level survey of sediments within Slab Creek Reservoir to determine if evidence of significant mining-related mercury is present Since mercury is present in nearly all near-surface sediments worldwide from airborne deposition of particulate matter as a byproduct of industrialization, the study was intended to identify if elevated concentrations of mercury existed in the reservoir sediments that could be attributed to historical mining practices. For the purposes of this study, the uppermost four centimeters of the reservoir sediment were evaluated because these sediments are more likely to be disturbed during Iowa Hill Development construction/operation.

1.3 Related Studies or Reports

A Work Plan for this investigation (DTA, 2007a) was prepared and submitted to the SWRCB prior to performance of the sediment sampling. This Work Plan was reviewed by an independent expert from the USGS, identified by the SWRCB, whose expertise centers around mercury occurrence within reservoir sediments in the western Sierra Nevada. The Work Plan is provided in Appendix A in this report.

Previous turbidity studies were performed during the relicensing process by SMUD that examined the sedimentation process within Slab Creek Reservoir (DTA and Stillwater Sciences 2004). This study, in concert with other water quality studies (DTA 2005a), was designed to evaluate potential water quality impacts that could result from operation of the Iowa Hill Development. In 2007, the SWRCB requested updated turbidity analyses using new bathymetric data on sediment elevations in the reservoir. Results of previous DTA investigations on sources of sediment and the new bathymetric survey (DTA, 2005b and 2007b) show that reservoir sediments are primarily deposited in the upper portions of Slab Creek Reservoir, upstream of the proposed location of the Iowa Hill intake, and are not likely to be affected by pumping/ generating operations over the development lifetime.

2.0 SEDIMENT INVESTIGATION

Sediment samples were collected at ten locations along the length of the reservoir, within the approximate center of the former channel (Figure 4). These sample locations were selected in accordance with the Work Plan submitted to the SWRCB (DTA, 2007a). The Work Plan was independently reviewed by the USGS in advance of the field work. It was also reviewed and approved by the SWRCB prior to performance of the investigation. The initial sampling points were used as approximate sediment collection locations in advance of the field work. Once in the field, the sampling locations were recorded as latitude and longitude coordinates, measured with a hand held geographic positioning system (GPS) device (Table 1). Figure 5 depicts the longitudinal bottom elevation profile of Slab Creek Reservoir relative to the 10 sample site locations.

2.1 Sampling Methods

Sediments were collected from a small boat equipped with a bottom-sampling grab sampler (Eckman dredge) and winch system. Once the approximate location was determined in the field, the dredge was lowered from the side of the boat through the water column to the lake bottom. The depth to bottom was then estimated from graduated markers on the dredge line and sampling depth recorded. To obtain a bottom sediment sample, the dredge was suspended approximately five meters above the bottom and allowed to fall in the open position by gravity to the lake bottom. A releasing device was then sent down the cable to close the spring-activated sampler jaws and capture the sediment sample. The dredge containing the sediment sample was then raised and positioned over a plastic tub in the boat, where two clear acetate sleeves were pushed into the top of the sediment (parallel and adjacent to each other) within the dredge sampler. A teflon sheet was placed beneath the sleeves to hold the sediment in the sleeves, and both ends of the sleeves were capped, fixed in a sample holder in an upright position, and transported to shore. Sample locations (GPS coordinates), depth from water surface to reservoir bottom, time of collection, and brief description of sample quality and/or description of material retrieved were entered into a field notebook.

The quality of each sample was generally determined by the amount of sample retrieved and the apparent disturbance to the sediment from the sampling process. Only fine grained sediments (fine sand and silt) produced relatively undisturbed samples with this sampling method. The coarser, dense sandy sediments were difficult to retain in the sampler during retrieval or were too dense for the sampler to penetrate by this method. Two or more sampling attempts were required in several locations furthest upstream where coarse sands and gravels were encountered. The mid-reservoir locations and those further downstream in the area of the proposed Iowa Hill intake/outlet structure consisted of finer grained materials that were effectively sampled.

2.2 Sample Handling and Preparation

The two sediment cores, collected at the same depth intervals and adjacent to each other, were delivered to a designated sample handling station on shore. The samples were then extruded from each sleeve with a plunger at discrete 2-cm depth intervals in accordance with the procedures specified in the Work Plan. The sample sleeve designated for mercury analysis was

partitioned into the pre-determined depth intervals of 0-2 cm and 2-4 cm and sealed in glass jars. In some cases, the depth interval varied depending on the amount of sample retrieved within the dredge (e.g. SS-9-0-4), but each sample depth was noted in the field log book and was numbered with a depth specific indicator (SS-1-2-4 indicates sample location one, depth of 2-4 centimeters). Contents of the second sleeve (collected from the second core tube) were placed in a separate jar for physical grain-size analysis, also in accordance with the Work Plan.

3.0 RESULTS AND DISCUSSION

Previous studies by the USGS at Englebright Reservoir (Alpers et al, 2006) indicated that fine-grained sediments generally contain a higher concentration of mercury than coarser grained sediments. To evaluate this at Slab Creek Reservoir, the sediment samples were evaluated for both chemical (total mercury and methylmercury) and physical properties (grain-size distribution). The results of these chemical and physical analyses are presented below.

3.1 Mercury Analytical Results

Chemical analyses were performed on the sediments for mercury in the form of total mercury (THg) by cold vapor atomic fluorescence spectrometry following USEPA Method 245.7 (FGS-069) and for methylmercury (meHg) by USEPA Method 1630.1 (FGS-070), in accordance with the Work Plan. Analytical results are provided in Appendix B and summarized in Table 2 (see tables section).

Although statistical analysis of the chemical data was not performed due to the limited data set, some general observations can be made concerning the levels of mercury found in the samples. Total mercury detected in the samples ranged between 3.7 and 74.0 nanograms per gram (ng/g), with most samples exhibiting total mercury concentrations in the range of 20-50 ng/g. THg concentrations appeared to generally decline with distance upstream with the exception of sample SS-3-3/4, 0-2cm, which contained a measured concentration of 74.0 ng/g (discussed further in Section 3.2 below). No significant variations in mercury concentration were noted between the two discrete depth intervals (0-2 cm and 2-4 cm), as shown in Figure 6. Sample recovery was limited at the four upstream-most sites, SS-7 through SS-10, where only a single sample could be collected at each.

Methylmercury concentrations ranged from non-detect (<0.060 ng/g) to 1.4 ng/g. The highest concentrations were detected in samples SS-9-1, 0-4cm (1.4 ng/g) and SS-8-2, 0-3cm (1.19 ng/g), as shown in Figure 7. Organic (plant) material was also noted at both these locations. Most samples exhibited methylmercury in the range of 0.30-0.70 ng/g.

Total mercury is plotted in Figure 6 and methylmercury is plotted in Figure 7. The combined results are plotted together in Figure 8 for comparison of the relative concentrations of each.

3.2 Grain Size Distribution Results

Grain size distribution testing was performed on the sediment samples following ASTM Method D422, for both depth intervals. The grain size test results are presented in Appendix C and summarized in Table 3 below. The majority of the samples from the reservoir were poorly sorted sandy clayey silts. The coarsest sediments were encountered near the upstream end of the reservoir, as expected from the higher channel velocity energy in the upstream section of the reservoir. Conversely, finer grained samples are correlative to the lower energy depositional environment in the downstream reaches of the reservoir. Sample SS-10-2, collected at the most upstream location, consisted of 79.2 % medium grained sand by volume. Sample SS-9-1, which was the nearest sample to SS-10-2, consisted of 5.1% medium sand and all other downstream

samples contained less than 5% medium sand, predominantly in the silt and clay ranges (Table 3). The overall sand-silt-clay fractions for the 10 sampling locations are plotted in Figure 9.

Sample collection was challenging at the upstream locations due to the apparent difficulty of sampler penetration in the coarser sand materials. The samples collected from SS-7 to SS-10 experienced partial loss of the dredged material during sampling.

3.3 Data Quality Review

Below is a general review of the total mercury and methylmercury data quality in light of the data quality objectives provided in the project Quality Assurance Project Plan (QAPP: an attachment to the Work Plan provided as Appendix A). Quality assurance/quality control (QA/QC) data reported by the analytical laboratory are reported along with the results in Appendix B and summarized in Table 4.

Precision. Precision refers to the reproducibility of measurements under a given set of conditions and is generally reported as relative percent difference (RPD), where:

$$\text{RPD (\%)} = \frac{(X_1 - X_2) \times 100}{(X_1 + X_2)/2}$$

For laboratory data, precision was evaluated using the laboratory's matrix duplicate analysis and laboratory control samples. For field data, precision was evaluated using the field duplicate analysis. Laboratory duplicate analyses were performed with each batch. All laboratory matrix duplicate and laboratory control sample results were within the acceptance criteria [RPD values less than 25%].

For field data, consistent with the Work Plan and QAPP requirements, one field duplicate was collected for every 10 samples. Data are shown in Table 2 and repeated in Table 4. Samples SS-3-3/4, 0-2 cm and SS-13-3/4, 0-2 cm were duplicates and Sample SS-3-3/4, 2-4 cm and SS-13-3/4, 2-4 cm were duplicates. Total mercury data collected from the 0-2 cm depth sediments were 74 ng/g and 44.8 ng/g [RPD = 49%], while total mercury data from the 2-4 cm depth interval were 41.5 ng/g and 46.8 ng/g [RPD = 12 %]. Methylmercury data collected from the 0-2 cm depth interval was detected at 0.637 and 0.402 ng/g [RPD = 45%]. Deeper samples were not analyzed for methylmercury, in accordance with the Work Plan.

Grain size ranges were also variable between duplicates. The high variability between the shallow depth intervals is likely due to the lack of homogeneity of the samples and no action was taken.

Accuracy. Accuracy was evaluated using laboratory matrix spikes/matrix spike duplicates (MS/MSD), field blanks, and trip blanks. The single MS/MSD result was within the laboratory's acceptance criteria [RPD values less than 25%]. Two equipment rinsate samples were reported with the sediment samples; SS-4-1R had trace detections of mercury (0.56 ng/L) and SS-4-2R was non-detect (<.50 ng/L). These results indicate that field sampling efforts were effective in

minimizing cross-contamination between samples. The trip blank was broken upon receipt and could not be evaluated.

Completeness. Completeness is a measure of the amount of valid data obtained compared to the amount that is expected to be collected under normal operating conditions. Completeness is determined for both field sampling activities and laboratory analyses. Eighteen sediment samples were sent to and received intact by both Frontier Geosciences, Inc. and Sierra Testing Laboratories, Inc. for analysis of mercury concentrations and grain size respectively. Additionally, three water samples were sent to Frontier Geosciences, Inc. of which the trip blank was reported broken upon receipt.

Mercury samples were all analyzed within the QAPP-required holding time criterion of 28 days from date of sampling to date of analysis. The laboratory submitted all required deliverables. Upon receipt from the laboratory, a complete (100%) verification of the electronic data deliverable results was performed by comparison to the hardcopy laboratory data package. Laboratory QC results were also verified (100%). No errors were found. Data completeness was within the acceptance criteria [95% for all analyses].

Comparability. Comparability expresses the confidence with which one data set can be compared to another data set measuring the same property. Comparability was ensured through the use of established and approved sampling and analytical methods, through consistency in the basis of analysis, through analysis of standard reference materials, and through consistency in reporting units.

4.0 RELATED INVESTIGATIONS OF OTHER SIERRA NEVADA LAKE SEDIMENTS

DTA reviewed other investigations in the Sierra Nevada in close proximity to Slab Creek Reservoir to evaluate mercury concentrations in nearby water bodies. This review included a reservoir known to contain elevated mercury concentrations related to hydraulic gold mining (Englebright Lake) and a lake with no mining activity within its watershed boundaries (Lake Tahoe).

4.1 Geochemical Analysis of Sediments at Englebright Lake, California

A study conducted by the USGS at Englebright Lake (Alpers, et al. 2006), examined THg and meHg concentrations at eleven locations along the bottom of the reservoir. Englebright Lake is located on the Yuba River approximately 45 miles northwest of the Slab Creek Reservoir, as shown on Figure 1. Englebright Lake was constructed specifically to capture sediments transported via the Yuba River drainage from previous hydraulic gold mining operations.

Core samples were collected by USGS in both shallow sediments (several centimeters below the reservoir bottom) and deep sediments (up to 32.8 meters deep), along the length of the reservoir. Total mercury concentrations in the 0-4 cm depth interval ranged from 148 to 428 ng/g. Methylmercury was detected in the 0-4 cm interval in the range of 0.37 to 4.00 ng/g. For comparison to Slab Creek Reservoir, only shallow sediments in the 0-4 cm interval, extracted from central (thalweg) locations of Englebright Lake, are summarized in Table 5 below.

4.2 Historical Atmospheric Mercury Deposition at Lake Tahoe, California-Nevada

Heyvarert et al. (2000) studied the anthropogenic concentrations of atmospheric mercury deposition in the sediments of Lake Tahoe, comparing modern rates of mercury deposition to "pre-industrial baseline rates". This study assumes the origin of mercury in Lake Tahoe is derived from atmospheric or fluvial deposition, based on the lack of evidence for mining activities or use of mercury in the Lake Tahoe Basin. Results of this study showed "pre-industrial" baseline THg concentrations in sediments ranged from 30-37 ng/g, representing natural background concentrations from fluvial runoff. The "industrial" surficial concentrations ranged from 157-223 ng/g, and were concluded to be primarily attributable to atmospheric deposition from anthropogenic processes, mainly the advent of fossil fuel combustion. The 2000 study was limited to three sample locations, which did not allow for statistical analysis. However, the authors conclude that significant differences are readily observable between the data sets which can be attributed to the transport of "post-industrial" airborne mercury from urban and agricultural areas west of the Tahoe Basin.

5.0 CONCLUSION

The purpose of this report was to develop a screening –level assessment to determine if potential mining-related impacts to mercury concentrations were present in the shallow sediments of Slab Creek Reservoir that could potentially be disturbed by development of the Iowa Hill Project. Total mercury, methylmercury, and grain size analyses were performed on eighteen (18) sediment core samples (which include QA/QC duplicate samples for all three analyses) collected along the centerline of Slab Creek Reservoir. Samples at each location were generally split into two depth intervals, 0-2 cm, and 2-4 cm deep, with analysis of meHg on the 0-2 cm interval only. Shallow sample depth intervals were selected under the premise that they were most vulnerable to disturbance during construction and operation of the proposed Iowa Hill Development.

Total mercury (analyzed for both depth intervals) was < 100 ng/g for all locations and meHg < 1.4 ng/g for all 0-2 cm intervals. The dominant particle size of the sediments collected was silt, with exception of the most upstream samples, which graded to fine to medium grained sand.

The Englebright Lake study (Alpers et al., 2006) examined THg and meHg in deep and shallow sediments along the entire length of the reservoir. To ensure comparability to the Slab Creek study, only the upper 4 cm of sediment results were compared. Total mercury (post 1940) from sediments assumed to be derived from hydraulic gold mining was measured at concentrations ranging from 148-428 ng/g. Methylmercury concentrations in this depth interval ranged from 0.37-4.00 ng/g. The high levels observed in these sediments at Engelbright Lake are believed to be the result of remobilization of sediments deposited during hydraulic gold mining along the upper reaches of the Yuba River.

The Lake Tahoe sediment analyses are assumed to represent sediments un-impacted by mining in the Sierra Nevada. The mercury detections from this study were separated into “pre-industrial” and “industrial” periods, based on age dating of the sediment and knowledge of the advent of airborne mercury from man-made processes in the region. It is noted, however, that there was substantial mercury production and consumption during the late 1800s in California and Nevada mining districts adjacent to the Tahoe basin. The “industrial” signature since 1850, likely includes contributions from gold mining in the Sierra Nevada and mercury mining from the Coast Range and associated retort activities through atmospheric deposition. The study evaluated three sample locations in Lake Tahoe, and there appeared to be a reasonable difference in mercury concentrations between “pre-industrial” (30-37 ng/g) and “industrial” (157-223 ng/g) age sediments unrelated to mining activity.

Based on the results of this screening-level study, the Slab Creek Reservoir sediments appear to contain mercury concentrations similar to those found in area water bodies that other researchers have attributed to atmospheric deposition from a variety of industrial sources.

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TABLES

TABLE 1
SLAB CREEK SEDIMENT SAMPLING LOCATIONS
SLAB CREEK RESERVOIR SEDIMENT INVESTIGATION

Sample ID	Depth Below Water (ft.)	Approx. Dist. from Dam (ft.)	Approx. Longitude	Approx. Latitude	Approx. Sed. Elev. (ft.)
SS-1-5	165	2,270	N38.77584	W120.69067	1,680
SS-2-1	165	2,270	N38.77982	W120.68943	1,690
SS-3-3/4	120	3,802	N38.78333	W120.6886	1,720
SS-4-1	90	5,122	N38.7871	W120.6847	1,723
SS-5-2	75	7,075	N38.7877	W120.6747	1,750
SS-6-1	65	9,979	N38.7857	W120.6650	1,780
SS-7-1	35	12,936	N38.7906	W120.6573	1,815
SS-8-2	35	16,262	N38.7932	W120.6517	1,820
SS-9-1	22	18,110	N38.7903	W120.6428	1,820
SS-10-2	15	23,866	N38.7919	W120.6534	1,830

TABLE 2
SLAB CREEK SEDIMENT MERCURY ANALYTICAL RESULTS
SLAB CREEK RESERVOIR SEDIMENT INVESTIGATION

Sample ID	Date	Sample Depth Interval (cm)	Approx. Reservoir Depth (m)	THg (ng/g)	meHg (ng/g)	Ratio meHg/THg (%)
SS-1-5, 0-2cm	12/14/2007	0-2	50.3	46.2	0.394	0.9
SS-1-5, 0-4cm	12/14/2007	2-4	50.3	46.3	nm	nm
SS-2-1, 0-2cm	12/14/2007	0-2	50.3	44.6	0.467	1.0
SS-2-1, 2-4cm	12/14/2007	2-4	50.3	44.4	nm	nm
SS-3-3/4, 0-2cm*	12/14/2007	0-2	36.6	74.0	0.637	0.9
SS-13-3/4, 0-2 cm (duplicate)	12/14/2007	0-2	36.6	44.8	0.401	0.9
SS-3-3/4, 2-4cm	12/14/2007	2-4	36.6	41.5	nm	nm
SS-13-3/4, 2-4 cm (duplicate)	12/14/2007	2-4	36.6	46.8	nm	nm
SS-4-1, 0-2cm	12/14/2007	0-2	27.4	43.8	0.448	1.0
SS-4-1, 2-4cm	12/14/2007	2-4	27.4	36.6	nm	nm
SS-5-2, 0-2cm	12/14/2007	0-2	22.9	30.6	0.311	1.0
SS-5-2, 2-4cm	12/14/2007	2-4	22.9	24.2	nm	nm
SS-6-1, 0-2cm	12/14/2007	0-2	19.8	25.4	0.304	1.2
SS-6-1, 2-4cm	12/14/2007	2-4	19.8	21.0	nm	nm
SS-7-1, 0-3cm	12/14/2007	0-3	10.7	15.7	0.396	2.5
SS-8-2, 0-3cm	12/14/2007	0-3	10.7	17.7	1.19	6.7
SS-9-1, 0-4cm	12/13/2007	0-4	6.7	20.9	1.4	6.7
SS-10-2, 0-2cm	12/13/2007	0-2	10.7	3.7	<.060	<1.60%

Notes:
* anomaly likely due to low percent solids compared to other samples including its duplicate, SS13-3/4-0-2cm
ng/g = nanograms per gram
nm = methylmercury not measured in this sample
THg = Total mercury
meHg = methylmercury

TABLE 3
SLAB CREEK SEDIMENT GRAIN SIZE DISTRIBUTION RESULTS
SLAB CREEK RESERVOIR SEDIMENT INVESTIGATION

Sample ID	Sample Interval (cm)	% Gravel		% Sand			% Silt & Clay	
		coarse	fine	coarse	med.	fine	silt	clay
SS-1-2	0.0 - 2.0	0.0	0.0	0.0	0.1	3.8	80	16.1
SS-1-2	2.0- 4.0	0.0	0.0	0.0	0.3	3.3	81.1	15.3
SS-2-2	0.0 - 2.0	0.0	0.0	0.0	0.4	3.2	79.6	16.8
SS-2-2	2.0- 4.0	0.0	0.0	0.0	0.3	1.4	79.4	18.9
SS-3-1/2	0.0 - 2.0	0.0	0.0	0.0	0.1	3.8	81.0	15.1
SS-13-1/2 (duplicate)	0.0 - 2.0	0.0	0.0	0.0	1.1	1.5	78.1	19.3
SS-3-1/2	2.0- 4.0	0.0	0.0	0.0	1.4	1.7	77.7	19.2
SS-13-1/2 (duplicate)	2.0- 4.0	0.0	0.0	0.0	1.3	1.3	72.1	25.3
SS-4-2	0.0 - 2.0	0.0	0.0	0.0	0.3	5.5	78.1	16.1
SS-4-2	2.0- 4.0	0.0	0.0	0.0	1.5	2.5	79.2	16.8
SS-5-1	0.0 - 2.0	0.0	0.0	0.0	0.4	13.5	78.6	7.5
SS-5-1	2.0- 4.0	0.0	0.0	0.0	0.8	13.9	74	11.3
SS-6-2	0.0 - 2.0	0.0	0.0	0.3	2.2	24.6	61.0	11.9
SS-6-2	2.0- 4.0	0.0	0.0	0.0	2.3	29.9	59.4	8.4
SS-7-2	0.0 - 3.0	0.0	0.0	0.2	1.3	24.7	65.8	8.0
SS-8-1	0.0 - 1.0	0.0	0.0	0.0	3.5	54.9	32.1	9.5
SS-9-1	0.0 - 4.0	0.0	0.0	0.8	5.1	56.9	26.4	10.8
SS-10-2	0.0 - 2.0	0.0	0.0	0.0	79.2	18.3	2.5	0.0

TABLE 4
SUMMARY OF QUALITY ASSURANCE/QUALITY CONTROL SAMPLE RESULTS
SLAB CREEK RESERVOIR SEDIMENT INVESTIGATION

LABORATORY QUALITY ASSURANCE/QUALITY CONTROL			
Sample Type	**RPD (%)**	**RPD Limit[a] (%)**	**Notes**
Methy mercury in Sediment			
Matrix Duplicate	11.5	25	--
MS/MSD	8.69	25	All spiked recoveries within limits.
Laboratory Control Sample	6.31	25	All spiked recoveries within limits.
Preparation Blanks	<0.050		All three preparation blanks less than reporting limits
Mercury, Total in Sediment			
Matrix Duplicate	6.96	25	--
MS/MSD	13.2	25	All spiked recoveries within limits.
Laboratory Control Sample	5.58	25	All spiked recoveries within limits.
Preparation Blanks	<0.05		Results of all three preparation blanks less than reporting limits
Mercury, Total in Sediment			
Matrix Duplicate	8.33	25	--
MS/MSD	0.00	25	All spiked recoveries within limits.
Laboratory Control Sample	5.74	25	All spiked recoveries within limits.
Preparation Blanks	--	--	Results of all four preparation blanks less than reporting limit of <0.50
FIELD QUALITY ASSURANCE SAMPLES			
Sample Type/Location	**Original Concentration (ug/L)**	**Duplicate Concentration (ug/L)**	**Notes**
Methylmercury in Sediment			
SS-3-3/4, 0-2 cm	0.637	0.401	--
Mercury, Total in Sediment			
SS-3-3/4, 0-2 cm	74.0	44.8	--
SS-3-3/4, 2-4 cm	41.5	46.8	--
Mercury, Total in Water			
Sample Type	**Concentration (ug/L)**		**Notes**
Field Rinsate	0.56	NA	Reporting Limit is 0.50.
Field Rinsate	<0.50	NA	--
Trip Blank	--	NA	The trip blank was broken upon receipt at the laboratory. It was unsalvageable and was not analyzed.

RPD = Relative Percent Difference
NA = Not applicable
[a]The RPD Limit is defined by the analytical method.
The complete data report can be reviewed in Appendix B.

TABLE 5
MERCURY AND METHYLMERCURY
VERTICAL VARIATION IN CONCENTRATIONS
ENGLEBRIGHT LAKE, CALIFORNIA
(Modified from USGS, 2006)

blf (cm)	Total Hg (ng/g dry) 0-4 cm (all)	meHg (ng/g dry) 0-4 cm (all)
minimum	148	0.37
maximum	428	4.00

blf - Below lake floor.

0-4 cm (all) represents all intervals within 0-4 cm blf including 0-1,1-2, 0-2, 2-3, 3 -4, 2-4, and 0-4 cm blf.

TABLE 6
CONCENTRATIONS OF BASELINE (PRE-INDUSTRIAL) MERCURY TO SURFICIAL (INDUSTRIAL) MERCURY
in LAKE TAHOE SEDIMENT CORES
(Modified from Heyvaert et al., 2000.)

Sample Core	Hg (ng/g)	
	Baseline	Surficial
LT-91-1	30	223
LT-91-3	37	157
LT-91-4	33	193

Baseline samples represent “pre-industrial” natural runoff concentrations

Surficial samples represent “industrial” concentrations from aerial deposition

Appendix A

Work Plan
Slab Creek Reservoir Sediment Investigation
(DTA, 2007)

SACRAMENTO MUNICIPAL UTILITY DISTRICT
UPPER AMERICAN RIVER PROJECT
(FERC Project No. 2101)

Work Plan
Slab Creek Reservoir Sediment Investigation

Prepared by:

Devine Tarbell & Associates, Inc.
Sacramento, California

Prepared for:

Sacramento Municipal Utility District
Sacramento, California

Rev 1, 12-12-2007

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FIGURES

TABLES

APPENDICES

List of Acronyms

mg/kg	milligrams per kilogram
µg/kg	micrograms per kilogram
ng/l	nanograms per liter
ppm	part per million
FERC	Federal Energy Regulatory
MTRL	Maximum Tissue Residual Level
SMUD	Sacramento Municipal Utility District
SFAR	South Fork American River
SWRCB	California State Water Resources Control Board
UARP	Upper American River Project
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

1. INTRODUCTION

The 688 MW Upper American River Project (UARP) comprises the bulk of hydroelectric energy produced by the Sacramento Municipal Utilities District (SMUD). It represents nearly 20 percent of SMUD's energy generation portfolio in normal water years and is a load-following facility, which is crucial to meeting demand for electricity during the long, hot summers experienced by the Sacramento area. The Iowa Hill Pumped-storage Project is integral to meeting the needs of California's population by providing renewable, long-term capacity and energy through non-fossil based power. The addition of 400 megawatts of capacity through construction and operation of the Iowa Hill Project would further these goals without significant new environmental impacts because it augments existing facilities with little change as to natural resources of the South Fork American River (SFAR) basin. The project general location is shown in Figure 1 and the overall project configuration is presented in Figure 2.

Within the western Sierra Nevada, hydraulic placer mining for gold historically employed liquid mercury as an amalgamating agent in the gold recovery process. Some of this mercury was lost during mining to uncontrolled discharges into receiving waters, primarily within rivers and lakes. Attributed to historic mining operations, mercury concentrations sequestered in reservoir sediments have been well-documented by the United States Geological Survey (USGS) and others. The most notable investigations have addressed mercury deposition in streams and lakes draining the watersheds to the north of the American River, including the Bear and Yuba rivers (USGS, various).

A review of existing literature on historic mining shows that there are/were no known hydraulic or hard rock mines upstream of Slab Creek Reservoir (USGS and others) on the South Fork American River watershed. As shown on Figure 3, Locations of Historic Mining in the Western Sierra Nevada, the majority of the major mining operations took place on the watersheds to the north, primarily on the Bear and Yuba Rivers. However, small individual operations may have existed on the South Fork American and their mining practices and potential mining impacts are unknown.

Staff of the California State Water Resources Control Board (SWRCB or Board) have expressed concern that mercury occurrence may exist in the reach of the SFAR in the vicinity of the Iowa Hill Project, within Slab Creek Reservoir. If present, the construction and operation of the Iowa Hill Project could possibly disturb mercury-containing sediments entrapped by the reservoir, potentially resulting in impaired water quality and possible introduction of bioavailable mercury into the food chain.

The purpose of this investigation is to assess the presence of mercury within shallow sediments (0-6 cm depth) near the proposed intake/outlet structure and upstream within the general length of the reservoir. While low concentrations of mercury are expected to be present throughout the environment, the intent of this study is to determine relative presence or absence of mercury related to mining and, if present, at what concentrations. Grain size analysis of sediments will be also be performed because recent investigations at Englebright Reservoir (USGS, 2003?) found that mercury concentrations appeared to occur in higher concentrations within the fine grained sediments at that location.

2. INVESTIGATION METHODS

The proposed investigation will employ simple grab sample methods. Sediment samples will be retrieved with grab sampling devices such as sediment corers, grab samplers, or Eckman-type sediment dredge equipment. These samplers are designed specifically for underwater sampling of near-bottom sediments. The sampling will be performed from a stable boat with handheld equipment. All sampling locations will be field-located using hand-held global positioning (GPS) instruments or by best available location methods if GPS signals cannot be received at that location. Based on discussions with staff of the State Water Resources Control Board, sediment samples will be taken upstream and downstream of the proposed intake/outlet for the Iowa Hill project, at two locations upstream of the submerged PG&E dam within the reservoir, and at five locations locations at approximately ½ mile intervals upstream within the upper reaches of the reservoir.. This way, sediments that could possibly be disturbed during project construction and/or operation can be evaluated, and upstream sediments that could potentially be relocated during high flood events within the upstream portion of the reservoir can be assessed. Figure 4 (3 sheets) shows the approximate sediment sampling locations.

2.1 Sediment Sampling Locations and Rationale

The intent is to sample sediments in the area of the proposed intake and to characterize the shallow lakebed sediments along the length of the reservoir. Locations and depths of sampling may be adjusted slightly in the field depending on site conditions and sampling equipment.

Sediment samples will be retrieved from the reservoir approximately coincident with the centerline (thalweg) of the channel (Figure 4). The samples from the intake area will assess the sediment that is could potentially be disturbed by the construction of the intake/outlet feature. The presence or absence of mercury within sediments in this area is the first question that must be addressed to determine if water quality impacts from mercury during construction and/or operation may be of concern. Recent (2007) reservoir bathymetry studies provides the reservoir topography on Figure 4 and the 2007 centerline profile of the thalweg (middle of flow channel) is presented in Figure 5. The location of the proposed intake and the former PG&E dam are also presented on this figure. Note that the elevation of the proposed intake is currently 90-100 feet above the existing thalweg (Figure 5).

Previous turbidity studies have been performed that modeled the sedimentation process within the reservoir to assess potential water quality impacts that might result from project operation (SMUD, 2005). Additional turbidity analyses using the 2007 sediment elevation data are underway by others that will re-evaluate potential impacts from construction and operation of the project. The initial results were based on 1992 bathymetric data that showed reservoir sediments are primarily deposited upstream of the Iowa Hill intake and thus are not likely to be affected by pumping/generating operations over the project lifetime. At the request of the SWRCB, additional turbidity analyses using the 2007 sediment elevation data are underway as part of a comprehensive set of studies that will re-evaluate potential impacts from operation of the project. The sediment sampling will provide

information regarding mercury presence or absence in the intake/outlet area.

2.2 Analytical Program

As defined in the objectives above, the purpose of this investigation is primarily to assess the presence or absence of mercury in Slab Creek Reservoir sediments in the vicinity of the proposed Iowa Hill Pumped-Storage Project intake/outlet structure, and to a lesser extent investigate the changes in sediment grain size distribution with depth. Additional archive samples will be retrieved from each location during this field program to facilitate additional studies by others, if desired. These samples will be taken to avoid the cost and effort of remobilizing the sampling equipment and crew a second time in the event that others would like samples available for testing outside the scope of the current investigation. Sampling procedures, analytical test methods and number of samples are specified in detail within Appendix A, Field Sampling and Analysis Plan.

Table 1 below presents a list of information required for the investigation, including sample types, sample containers, preservation method, and chemical analytical methods, among other factors. The table summarizes information to be gathered during the investigation.

Table 1: Sample Collection, Preservation, Holding Time and Analytical Methods
Rev 1, 12-12-07

Sample Type	Media	Preservation	Sample Size/Container	Holding Time	Analyses	Total Number of Samples
Grab	Sediment	Stored on dry ice, frozen in field and delivered to the laboratory (Chemical samples only). Gradation samples not preserved.	10 g / 4oz Jar	28 days	Total mercury in soil by EPA 245.7. (18 samples) Methyl mercury by EPA 1630 (9 0-2 cm depth samples). Grain size distribution by ASTM D422-63 (2002) (18 samples)	18 sediment samples for chemical analysis 2 duplicates 1 rinsate 11 total chemical samples 18 sediment samples for grain size distribution, 9 sediment samples for hydrometer analysis (final number to be determined in the field)

Note: Additional sediment samples will be collected and archived during the field sampling for future analysis, if warranted. All samples will be preserved in the field by freezing with dry ice as the samples are collected. Extra samples will be delivered to the laboratory for holding pending any additional analytical requests.

In addition to the chemical analytical sampling, grain size measurement testing with depth will be performed on approximately half the samples at each location. Discussions with USGS staff will lead to a final determination of the number and location for grain size analysis.

3. EQUIPMENT CLEANING AND WASTE WATER MANAGEMENT

All sample containers will consist of precleaned containers delivered to the site by the laboratory prior to the field sampling. To ensure no transfer of chemicals by the sampling device between samples, re-usable sampling equipment will be cleaned onsite by hand washing with Alconox or other approved non-phosphate detergent and double-rinsing with distilled water. Since wash fluids will be made up of distilled water rinsate and there is no reason to suspect hazardous levels of constituents, all wash fluids will be contained on site and delivered for disposal in a permitted sanitary sewer system offsite.

4. PROPOSED SCHEDULE

This field sampling program is scheduled for mid-December, 2007, with the assumption that weather permits the field work to be conducted in a safe manner.

5. REFERENCES

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EPA-821-R-01-020, Method 1630. "Methyl Mercury in Water by Distillation, Aqueous Ethylation, Purge and Trap, and CVAFS", January, 2001.

Appendix B

Mercury Analytical Data Report
(Frontier GeoSciences Inc., 2008)

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

23 January 2008

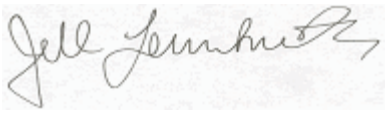
Megan Lionberger
Devine Tarbell & Associates, Inc.
2720 Gateway Oaks Dr. Suite 300
Sacramento, CA 95833

RE: MHg and THg in Sediments

Enclosed are the analytical results for samples received by Frontier GeoSciences, Inc. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jill Lamberts

Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
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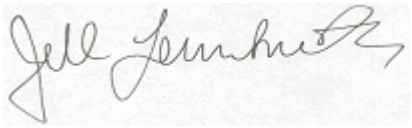
ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier GeoSciences, Inc.
SDG:
Client: Devine Tarbell & Associates, Inc.
Project: MHg and THg in Sediments

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS-1-5, 0-2 cm	0712083-01	Soil/Sediment	14-Dec-07 11:20	18-Dec-07 09:39
SS-1-5, 2-4 cm	0712083-02	Soil/Sediment	14-Dec-07 11:20	18-Dec-07 09:39
SS-2-1, 0-2 cm	0712083-03	Soil/Sediment	14-Dec-07 11:50	18-Dec-07 09:39
SS-2-1, 2-4 cm	0712083-04	Soil/Sediment	14-Dec-07 11:50	18-Dec-07 09:39
SS-3-3/4, 0-2 cm	0712083-05	Soil/Sediment	14-Dec-07 13:00	18-Dec-07 09:39
SS-3-3/4, 2-4 cm	0712083-06	Soil/Sediment	14-Dec-07 13:00	18-Dec-07 09:39
SS-13-3/4, 0-2 cm	0712083-07	Soil/Sediment	14-Dec-07 13:00	18-Dec-07 09:39
SS-13-3/4, 2-4 cm	0712083-08	Soil/Sediment	14-Dec-07 13:00	18-Dec-07 09:39
SS-4-1, 0-2 cm	0712083-09	Soil/Sediment	14-Dec-07 13:20	18-Dec-07 09:39
SS-4-1, 2-4 cm	0712083-10	Soil/Sediment	14-Dec-07 13:20	18-Dec-07 09:39
SS-5-2, 0-2 cm	0712083-11	Soil/Sediment	14-Dec-07 14:25	18-Dec-07 09:39
SS-5-2, 2-4 cm	0712083-12	Soil/Sediment	14-Dec-07 14:25	18-Dec-07 09:39
SS-6-1, 0-2 cm	0712083-13	Soil/Sediment	14-Dec-07 14:50	18-Dec-07 09:39
SS-6-1, 2-4 cm	0712083-14	Soil/Sediment	14-Dec-07 14:50	18-Dec-07 09:39
SS-7-1, 0-3 cm	0712083-15	Soil/Sediment	14-Dec-07 15:05	18-Dec-07 09:39
SS-8-2, 0-3 cm	0712083-16	Soil/Sediment	14-Dec-07 15:05	18-Dec-07 09:39
SS-9-1, 0-4 cm	0712083-17	Soil/Sediment	13-Dec-07 12:25	18-Dec-07 09:39
SS-10-2, 0-2 cm	0712083-18	Soil/Sediment	13-Dec-07 12:00	18-Dec-07 09:39
SS-4-1 R	0712083-19	Water	14-Dec-07 13:50	18-Dec-07 09:39
SS-4-2 R	0712083-20	Water	14-Dec-07 13:50	18-Dec-07 09:39

Frontier GeoSciences, Inc.



Jill Lamberts, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
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CASE NARRATIVE

Work Order Number: 0712083:

SAMPLE RECEIPT
Eighteen (18) sediment samples and three (3) water samples were received at Frontier GeoSciences, Inc. (FGS) on December 18, 2007 for total and methyl mercury analysis. All samples were to be analyzed for total mercury and 11 for methyl mercury. Samples were received within two sealed coolers with temperatures of -27.0 and 0.2°C.
Upon receipt, sediment samples were placed into a freezer until sample preparation. Water samples for total mercury were preserved to 2% with a bromine monochloride (BrCl) solution.

Sediment samples were received packed in dry ice. FGS suggests that regular ice with overnight delivery is sufficient for sample shipment.

The Shipping and Receiving department noted the following issues with the shipment:
- The trip blank broken upon receipt. It was not salvageable and was not analyzed
- Sample SS-1-5 2-4cm was labeled on jar as 4-6 cm. The client was contacted and 2-4 cm was verified.
- Jar SS-13-3/4 0-2cm was broken. Since the sample was frozen and intact, it was transferred into a clean jar.
- Sample SS-1-5, 4-6cm and SS-1-5, 6-8cm were mistakenly sent by the client. FGS returned them to the client via FedEx Ground on 12-19-07.

SAMPLE PREPARATION
Sediment samples for total mercury determination were subjected to a cold aqua regia digest according to method FGS-066 prior to analysis.

Sediment samples for methyl mercury determination were prepared for analysis by an acidic potassium bromate extraction into methylene chloride according to method FGS-045.

Water samples for total mercury determination were allowed to oxidize with BrCl at least overnight according to method FGS-012 prior to analysis.

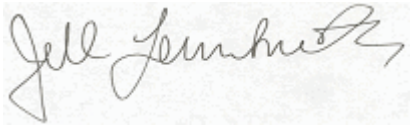
SAMPLE ANALYSIS
Total mercury was analyzed in oxidized water samples and digested sediment samples by cold vapor atomic fluorescence spectrometry (CVAFS) according to method FGS-069.

Methyl mercury was analyzed in extracted sediment samples by cold vapor gas chromatography atomic fluorescence spectrometry (CV-GC-AFS) according to method FGS-070.

ANALYTICAL AND QUALITY CONTROL ISSUES
There were no analytical difficulties and all quality control analyses were within acceptable limits except as flagged and described in the following report.

Please feel free to contact me if you have any questions or concerns.

Frontier GeoSciences, Inc.



Jill Lamberts, Project Manager

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Chain of Custody Record & Laboratory Analysis Request

Client: Devine Tarbell and Associates	Contact: Megan Lionberger	FGS PM: Jill Lamberts
Address: 2720 Gateway Oaks Dr., Suite 300 Sacramento, CA 95833	Phone: (916) 576-0482 Fax: (916) 564-4203	Date: 12/17/2007
	E-mail: megan.lionberger@devinetarbell.com	Page 1 of 2
Project Name: Slab Creek Sediment Sampling	Contract/PO: Kelly Tilford	Turn-Around-Time: (20) 19 18 17 16 15 14 13 12 11 10 (business days - for TAT less than 10 days contact the PM)
Report to: Kelly Tilford	Invoice to: Kelly Tilford	EDD ☐ No ☑ Yes
Address: 2720 Gateway Oaks Dr., Suite 300 Sacramento, CA 95833	Address: 2720 Gateway Oaks Dr., Suite 300 Sacramento, CA 95833	QA ☑ Std. ☐ High
Phone: (916) 561-4586 Fax: (916) 564-4203	Phone: (916) 561-4586 Fax: (916) 564-4203	Saturday Delivery? ☑ No ☐ Yes
E-mail: kelly.tilford@devinetarbell.com	E-mail: kelly.tilford@devinetarbell.com	(Saturday delivery is available for a small fee; please contact your PM to arrange this service)

No.	Engraved Bottle ID	Sample ID	Matrix	Containers	Date & Time	Analysis Requested: Total Hg - water	Total Hg - sediment	MeHg - sediment	solids analysis	Comments
1.		SS-1-5, 0-2 cm	SS	1	12/14/07 11:20		x	x	x	naming convention: sample site #1, from sediment core #5, top 2 cm of core
2.	Jar broke 4-6 cm	SS-1-5, 2-4 cm	SS	1	12/14/07 11:20		x		x	
3.		SS-2-1, 0-2 cm	SS	1	12/14/07 11:50		x	x	x	
4.		SS-2-1, 2-4 cm	SS	1	12/14/07 11:50		x		x	
5.		SS-3-3/4, 0-2 cm	SS	1	12/14/07 13:00		x	x	x	SS-3 duplicate, 0 to 2 cm depth
6.		SS-3-3/4, 2-4 cm	SS	1	12/14/07 13:00		x		x	SS-3 duplicate, 2 to 4 cm depth
7.	Jar broke, sample	SS-13-3/4, 0-2 cm	SS	1	12/14/07 13:00		x	x	x	SS-3 duplicate, 0 to 2 cm depth
8.	in new jar	SS-13-3/4, 2-4 cm	SS	1	12/14/07 13:00		x		x	SS-3 duplicate, 2 to 4 cm depth
9.		SS-4-1, 0-2 cm	SS	1	12/14/07 13:20		x	x	x	
10.		SS-4-1, 2-4 cm	SS	1	12/14/07 13:20		x		x	
11.		SS-5-2, 0-2 cm	SS	1	12/14/07 14:25		x	x	x	
12.		SS-5-2, 2-4 cm	SS	1	12/14/07 14:25		x		x	
13.		SS-6-1, 0-2 cm	SS	1	12/14/07 14:50		x	x	x	
14.		SS-6-1, 2-4 cm	SS	1	12/14/07 14:50		x		x	
15.		SS-7-1, 0-3 cm	SS	1	12/14/07 15:05		x	x	x	one sample only from SS-7. Outer bag ripped, sealed with duct tape
16.		SS-8-2, 0-3 cm	SS	1	12/14/07 15:05		x	x	x	one sample only from SS-8, not deep enough for two.
17.		SS-9-1, 0-4 cm	SS	1	12/13/07 12:25		x	x	x	sediment was homogenized during retrieval, did not separate layers
18.		SS-10-2, 0-2 cm	SS	1	12/13/07 12:00		x	x	x	one sample only from SS-10, not deep enough for two.
19.		SS-4-1 R	FW	1	12/14/07 13:50	x				Eckman Dredge rinsate, sample #1
20.		SS-4-2 R	FW	1	12/14/07 13:50	x				Eckman Dredge rinsate, sample #2

For Laboratory Use Only		Matrix Codes	Relinquished by:	Received by:	Received by:
COC Seal: N/A	Comments:	FW = fresh water WW = waste water SB = sea & brackish water SS = soil & sediment TS = plant & animal tissue TR = trap OT = other	Name: Megan Lionberger	Name: Nick Strong	Name:
Cooler Temp: 37, 42			Organization: Devine Tarbell & Assoc.	Organization: FGS	Organization:
Carrier: FedEx			Date & Time: 12/17/2007 15:30	Date & Time: 12/18/07 9:40	Date & Time:
VTSR: 9:30					

7997 7035 0106

Frontier GeoSciences, Inc.

Jill Lamberts

Jill Lamberts, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Address: 2720 Gateway Oaks Dr., Suite 300 Sacramento, CA 95833	Phone: (916) 576-0482 Fax: (916) 564-4203	Date: 12/17/2007
	E-mail: megan.lionberger@devinetarbell.com	Page 2 of 2
Project Name: Slab Creek Sediment Sampling	Contract/PO: Kelly Tilford	Turn-Around-Time: 20 19 18 17 16 15 14 13 12 11 10 (business days - for TAT less than 10 days contact the PM)
Report to: Kelly Tilford	Invoice to: Kelly Tilford	EDD ☐ No ☑ Yes
Address: 2720 Gateway Oaks Dr., Suite 300 Sacramento, CA 95833	Address: 2720 Gateway Oaks Dr., Suite 300 Sacramento, CA 95833	QA ☑ Std. ☐ High
Phone: (916) 561-4556 Fax: (916) 564-4203	Phone: (916) 561-4556 Fax: (916) 564-4203	Saturday Delivery? ☑ No ☐ Yes
E-mail: kelly.tilford@devinetarbell.com	E-mail: kelly.tilford@devinetarbell.com	*(Saturday delivery is available for a small fee; please contact your PM to arrange this service)*

No.	Engraved Bottle ID	Sample ID	Matrix	Containers	Date & Time	Analysis Requested: Total Hg - water	Total Hg - sediment	MeHg - sediment	solids analysis	Comments
1.	Broken	Trip Blank	FW	1		x				
2.	Sample lost									
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										
11.										
12.										
13.										
14.										
15.										
16.										
17.										
18.										
19.										
20.										

For Laboratory Use Only		Matrix Codes	Relinquished by:	Received by:	Received by:
COC Seal:	Comments:	FW = fresh water WW = waste water SB = sea & brackish water SS = soil & sediment TS = plant & animal tissue TR = trap OT = other	Name: Megan Lionberger	Name:	Name:
Cooler Temp:			Organization: Devine Tarbell & Assoc.	Organization:	Organization:
Carrier:			Date & Time: 12/17/2007 15:30	Date & Time:	Date & Time:
VTSR:					

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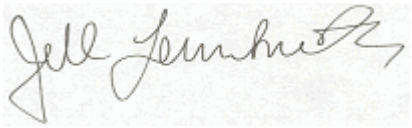

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Mercury Analytical Results

Matrix: Soil/Sediment **Preparation:** Cold Aqua Regia Digestion for Hg

Sample Name	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method	Notes
SS-1-5, 0-2 cm	**46.2**	7.20	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-1-5, 2-4 cm	**46.3**	6.76	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-2-1, 0-2 cm	**44.6**	7.19	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-2-1, 2-4 cm	**44.4**	6.23	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-3-3/4, 0-2 cm	**74.0**	10.2	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-3-3/4, 2-4 cm	**41.5**	6.55	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-13-3/4, 0-2 cm	**44.8**	7.47	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-13-3/4, 2-4 cm	**46.8**	6.56	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-4-1, 0-2 cm	**43.8**	6.97	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-4-1, 2-4 cm	**36.6**	6.24	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-5-2, 0-2 cm	**30.6**	5.74	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-5-2, 2-4 cm	**24.2**	5.32	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-6-1, 0-2 cm	**25.4**	5.85	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-6-1, 2-4 cm	**21.0**	4.45	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-7-1, 0-3 cm	**15.7**	4.69	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-8-2, 0-3 cm	**17.7**	5.50	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-9-1, 0-4 cm	**20.9**	5.75	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	
SS-10-2, 0-2 cm	**3.66**	2.73	ng/g dry	50	F801056	01/10/08	8A18003	01/14/08	FGS-069	

Matrix: Water **Preparation:** BrCl Oxidation

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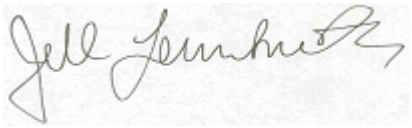

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Mercury Analytical Results

Matrix: Water **Preparation:** BrCl Oxidation

Sample Name	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method	Notes
SS-4-1 R	**0.56**	0.50	ng/L	1	F801063	12/18/07	8A16009	01/10/08	FGS-069	
SS-4-2 R	ND	0.50	ng/L	1	F801063	12/18/07	8A16009	01/10/08	FGS-069	U

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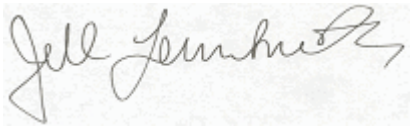

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Methyl Mercury Analytical Results

Matrix: Soil/Sediment **Preparation:** Methylene Chloride Extraction for Methyl Hg

Sample Name	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method	Notes
SS-1-5, 0-2 cm	**0.394**	0.160	ng/g dry	0.95	F801046	01/08/08	8A14002	01/09/08	FGS-070	
SS-2-1, 0-2 cm	**0.467**	0.157	ng/g dry	0.95	F801046	01/08/08	8A14002	01/09/08	FGS-070	
SS-3-3/4, 0-2 cm	**0.637**	0.224	ng/g dry	0.95	F801046	01/08/08	8A14002	01/09/08	FGS-070	
SS-13-3/4, 0-2 cm	**0.401**	0.166	ng/g dry	0.95	F801046	01/08/08	8A14002	01/09/08	FGS-070	
SS-4-1, 0-2 cm	**0.448**	0.155	ng/g dry	0.95	F801046	01/08/08	8A14002	01/09/08	FGS-070	
SS-5-2, 0-2 cm	**0.311**	0.126	ng/g dry	0.95	F801046	01/08/08	8A14002	01/09/08	FGS-070	
SS-6-1, 0-2 cm	**0.304**	0.128	ng/g dry	0.95	F801046	01/08/08	8A14002	01/09/08	FGS-070	
SS-7-1, 0-3 cm	**0.396**	0.103	ng/g dry	0.95	F801046	01/08/08	8A14002	01/09/08	FGS-070	
SS-8-2, 0-3 cm	**1.19**	0.121	ng/g dry	0.95	F801046	01/08/08	8A14002	01/09/08	FGS-070	
SS-9-1, 0-4 cm	**1.40**	0.125	ng/g dry	0.95	F801046	01/08/08	8A14002	01/09/08	FGS-070	
SS-10-2, 0-2 cm	ND	0.060	ng/g dry	0.95	F801046	01/08/08	8A14002	01/09/08	FGS-070	U

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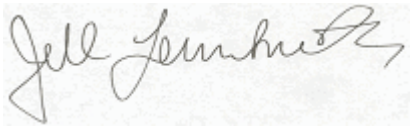

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% Solids Analytical Results

Matrix: Soil/Sediment **Preparation:** Solids Analysis

Sample Name	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method	Notes
SS-1-5, 0-2 cm	**34.4**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-1-5, 2-4 cm	**36.6**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-2-1, 0-2 cm	**34.7**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-2-1, 2-4 cm	**40.0**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-3-3/4, 0-2 cm	**24.4**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-3-3/4, 2-4 cm	**38.1**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-13-3/4, 0-2 cm	**33.2**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-13-3/4, 2-4 cm	**38.2**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-4-1, 0-2 cm	**35.7**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-4-1, 2-4 cm	**40.0**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-5-2, 0-2 cm	**43.4**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-5-2, 2-4 cm	**46.7**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-6-1, 0-2 cm	**42.6**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-6-1, 2-4 cm	**55.7**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-7-1, 0-3 cm	**53.0**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-8-2, 0-3 cm	**45.3**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-9-1, 0-4 cm	**43.6**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09
SS-10-2, 0-2 cm	**91.4**	0.1	% by Weight	1	F801047	01/08/08		01/08/08	FGS-019	O-04, O-09

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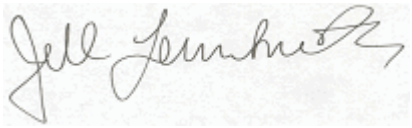

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Seattle, WA 98109
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MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0712083-01

Matrix: Soil/Sediment

Sequence: 8A14002

Batch: F801046

Lab Number: F801046-DUP1

Preparation: Methylene Chloride Extraction for Methyl Hg

Analyte	Sample Concentration ng/g dry	Duplicate Concentration ng/g dry	MRL	% RPD	RPD Limit	Method	Notes
Methyl Mercury	0.394	0.441	0.159	11.5	25	FGS-070	

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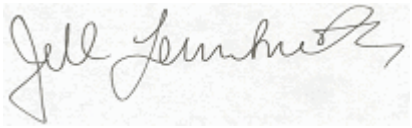

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MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0712083-01

Matrix: Soil/Sediment
Batch: F801047
Preparation: Solids Analysis

Sequence:
Lab Number: F801047-DUP1

Analyte	Sample Concentration % by Weight	Duplicate Concentration % by Weight	MRL	% RPD	RPD Limit	Method	Notes
% Solids	34.4	31.6	0.1	8.48	25	FGS-019	O-04, O-09

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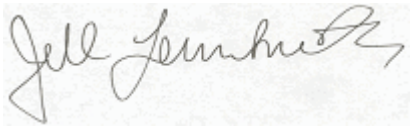

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MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0712083-18

Matrix: Soil/Sediment

Batch: F801047

Preparation: Solids Analysis

Sequence:

Lab Number: F801047-DUP2

Analyte	Sample Concentration % by Weight	Duplicate Concentration % by Weight	MRL	% RPD	RPD Limit	Method	Notes
% Solids	91.4	76.0	0.1	18.4	25	FGS-019	O-04, O-09

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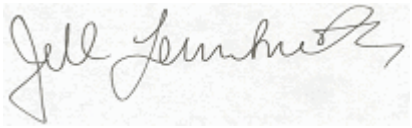

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MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0712083-01

Matrix: Soil/Sediment
Sequence: 8A18003
Batch: F801056
Lab Number: F801056-DUP2
Preparation: Cold Aqua Regia Digestion for Hg

Analyte	Sample Concentration ng/g dry	Duplicate Concentration ng/g dry	MRL	% RPD	RPD Limit	Method	Notes
Mercury	46.22	43.11	7.21	6.96	25	FGS-069	

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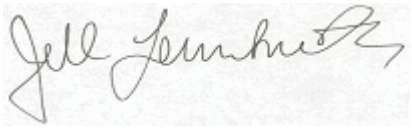

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MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0712097-15RE1

Matrix: Water
Sequence: 8A16009
Batch: F801063
Lab Number: F801063-DUP2
Preparation: BrCl Oxidation

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Mercury	12.74	13.85	3.47	8.33	25	FGS-069	

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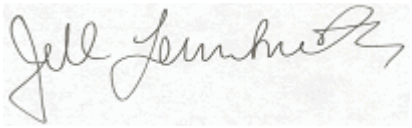

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0712083-01

Matrix: Soil/Sediment

Sequence: 8A14002

Batch: F801046

Lab Number: F801046-MS/MSD1

Preparation: Methylene Chloride Extraction for Methyl Hg

Analyte	Sample Concentration (ng/g dry)	Spike Added (ng/g dry)	MS Concentration (ng/g dry)	MS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	0.394	14.477	14.52	97.6	70 - 130	FGS-070	

Analyte	Spike Added (ng/g dry)	MSD Concentration (ng/g dry)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	14.448	15.77	106	8.69	70 - 130	25	FGS-070	

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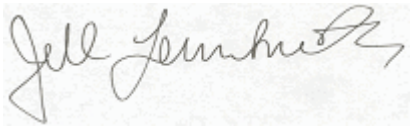

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0712083-01

Matrix: Soil/Sediment
Sequence: 8A18003
Batch: F801056
Lab Number: F801056-MS/MSD1
Preparation: Cold Aqua Regia Digestion for Hg

Analyte	Sample Concentration (ng/g dry)	Spike Added (ng/g dry)	MS Concentration (ng/g dry)	MS % Recovery	Revovery Limits	Method	Notes
Mercury	46.22	115.82	133.5	75.4	75 - 125	FGS-069	

Analyte	Spike Added (ng/g dry)	MSD Concentration (ng/g dry)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Mercury	115.59	145.7	86.1	13.2	75 - 125	25	FGS-069	

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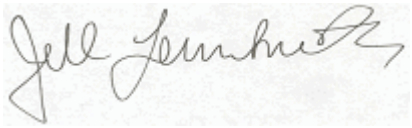

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0712097-15RE1

Matrix: Water
Batch: F801063
Preparation: BrCl Oxidation

Sequence: 8A16009
Lab Number: F801063-MS/MSD1

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Revovery Limits	Method	Notes
Mercury	12.74	35.000	48.56	102	75 - 125	FGS-069	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Mercury	35.000	48.56	102	0.00	75 - 125	25	FGS-069	

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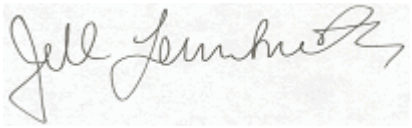

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Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

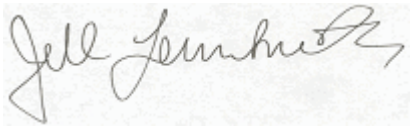
RECOVERY AND RPD

Matrix: Soil/Sediment
Sequence: 8A14002
Batch: F801046
Lab Number: F801046-BS/BSD1
Preparation: Methylene Chloride Extraction for Methyl Hg
LCS Source: IAEA 405

Analyte	Spike Added (ng/g wet)	LCS Concentration (ng/g wet)	LCS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	5.3600	4.908	91.6	70 - 130	FGS-070	

Analyte	Spike Added (ng/g wet)	LCSD Concentration (ng/g wet)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	5.3600	4.608	86.0	6.31	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.



Jill Lamberts, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

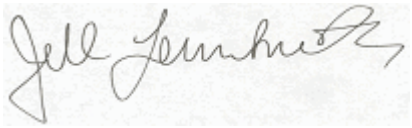
RECOVERY AND RPD

Matrix: Soil/Sediment
Sequence: 8A18003
Batch: F801056
Lab Number: F801056-BS/BSD1
Preparation: Cold Aqua Regia Digestion for Hg
LCS Source: NIST 2709

Analyte	Spike Added (ng/g wet)	LCS Concentration (ng/g wet)	LCS % Recovery	Revovery Limits	Method	Notes
Mercury	1373.9	1416	103	75 - 125	FGS-069	

Analyte	Spike Added (ng/g wet)	LCSD Concentration (ng/g wet)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Mercury	1373.9	1340	97.5	5.58	75 - 125	25	FGS-069	

Frontier GeoSciences, Inc.



Jill Lamberts, Project Manager

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Seattle, WA 98109
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Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

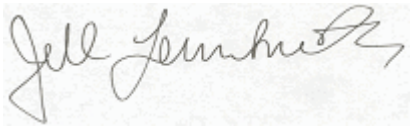
RECOVERY AND RPD

Matrix: Water
Sequence: 8A16009
Batch: F801063
Lab Number: F801063-BS/BSD1
Preparation: BrCl Oxidation
LCS Source: nist 1641d

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Revovery Limits	Method	Notes
Mercury	16.011	16.09	100	80 - 120	FGS-069	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Mercury	16.011	17.04	106	5.74	80 - 120	25	FGS-069	

Frontier GeoSciences, Inc.



Jill Lamberts, Project Manager

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FRONTIER GEOSCIENCES INC.

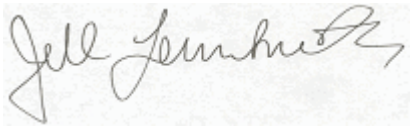
414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Soil/Sediment
Sequence: 8A14002
Instrument: Hg-07
Preparation: Methylene Chloride Extraction for Methyl Hg

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F801046-BLK1	Methyl Mercury	0.005	0.050	ng/g wet	F801046	FGS-070	U
F801046-BLK2	Methyl Mercury	0.010	0.050	ng/g wet	F801046	FGS-070	U
F801046-BLK3	Methyl Mercury	0.005	0.050	ng/g wet	F801046	FGS-070	U

Frontier GeoSciences, Inc.



Jill Lamberts, Project Manager

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FRONTIER GEOSCIENCES INC.

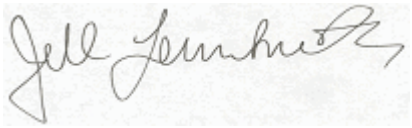
414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Water
Instrument: Hg-08
Sequence: 8A16009
Preparation: BrCl Oxidation

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F801063-BLK1	Mercury	0.01	0.50	ng/L	F801063	FGS-069	U
F801063-BLK2	Mercury	0.01	0.50	ng/L	F801063	FGS-069	U
F801063-BLK3	Mercury	-0.007	0.50	ng/L	F801063	FGS-069	U
F801063-BLK4	Mercury	0.01	0.50	ng/L	F801063	FGS-069	QB-04, U

Frontier GeoSciences, Inc.



Jill Lamberts, Project Manager

FRONTIER GEOSCIENCES INC.

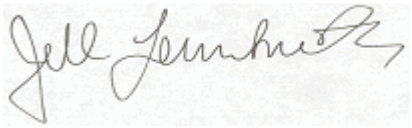
414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Soil/Sediment
Sequence: 8A18003
Instrument: Hg-13
Preparation: Cold Aqua Regia Digestion for Hg

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F801056-BLK1	Mercury	0.01	0.05	ng/g wet	F801056	FGS-069	U
F801056-BLK2	Mercury	0.005	0.05	ng/g wet	F801056	FGS-069	U
F801056-BLK3	Mercury	0.006	0.05	ng/g wet	F801056	FGS-069	U

Frontier GeoSciences, Inc.



Jill Lamberts, Project Manager

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FRONTIER GEOSCIENCES INC.

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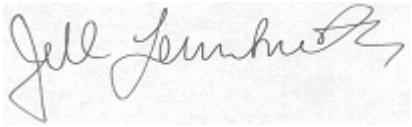
Notes and Definitions

U	Analyte included in the analysis, but not detected
QB-04	The blank was preserved to 2% BrCl rather than 1%. The control limit for blanks preserved to greater than 1% BrCl is the preservation percentage multiplied by the MRL.
O-09	Total Solids are prepared at the same time as the preparation for the analyte(s) of interest in order to provide the most accurate dry mass correction.
O-04	This sample was analyzed outside of the recommended holding time.
DET	Analyte Detected
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

Frontier GeoSciences, Inc.



Jill Lamberts, Project Manager

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Appendix C

Grain Size Analysis Data Report (Sierra Testing, 2008)

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

February 11, 2008

Devine Tarbell & Associates, Inc.
Attn: Kelly Tilford
2720 Gateway Oaks Dr, Suite 300
Sacramento, Ca. 95833

STL Project No: **08-101**
Subject: **Slab Creek Sediment Analysis**
Project No:

Invoice No: **5179**

LABORATORY TEST RESULTS

Dear Ms. Tilford:

As requested, Sierra Testing Laboratories, Inc. performed laboratory testing on **eighteen samples** of material from the subject site. The samples were identified as

1. SS-1-2G 0-2	**2. SS-1-2G 2-4**	**3. SS-2-2G 0-2**
4. SS-2-2G 2-4	**5. SS-10-2G 0-2**	**6. SS-5-1G 0-2**
7. SS-5-1G 2-4	**8. SS-13-1/2G 0-2**	**9. SS-13-1/2G 2-4**
10. SS-4-2G 0-2	**11. SS-4-2G 2-4**	**12. SS-6-2G 2-4**
13. SS-7-2G 0-3	**14. SS-8-1G 0-1**	**15. SS-9-1G 0-4**
16. SS-3-1/2G 0-2	**17. SS-3-1/2G 2-4**	**18. SS-6-2G 0-2**

Our laboratory received the sample on **January 3, 2008.** The test performed on the submitted samples was as follows:

1) Particle Size Analysis, Sieve Analysis to #200(D422, T88, T27)

The results of the above referenced testing are presented on the attached figure(s).

We appreciate the opportunity to be of service to you on this project and look forward to providing additional service, as needed, in the future.

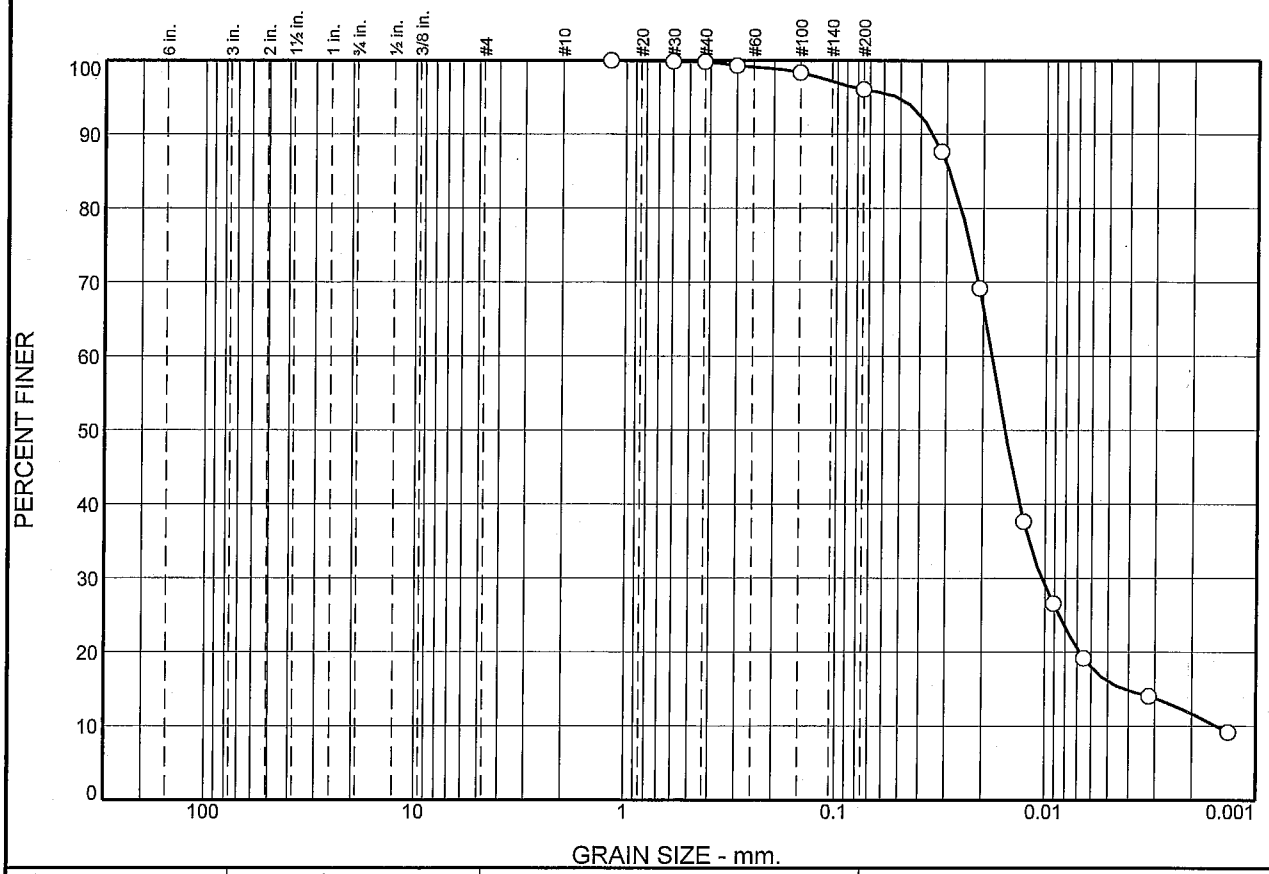
Should you have any questions or require additional information, please contact our office at your convenience.

Very truly yours,

Chad M. Walker
Project Manager

Enclosures
rr

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	3.8	80.0	16.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	99.9		
#40	99.9		
#50	99.3		
#100	98.4		
#200	96.1		
0.0317 mm.	87.7		
0.0207 mm.	69.2		
0.0126 mm.	37.7		
0.0091 mm.	26.6		
0.0065 mm.	19.2		
0.0032 mm.	14.0		
0.0013 mm.	9.2		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0290 D_{60}= 0.0180 D_{50}= 0.0156
D_{30}= 0.0103 D_{15}= 0.0042 D_{10}= 0.0015
C_u= 11.78 C_c= 3.87

Classification

USCS= AASHTO=

Remarks

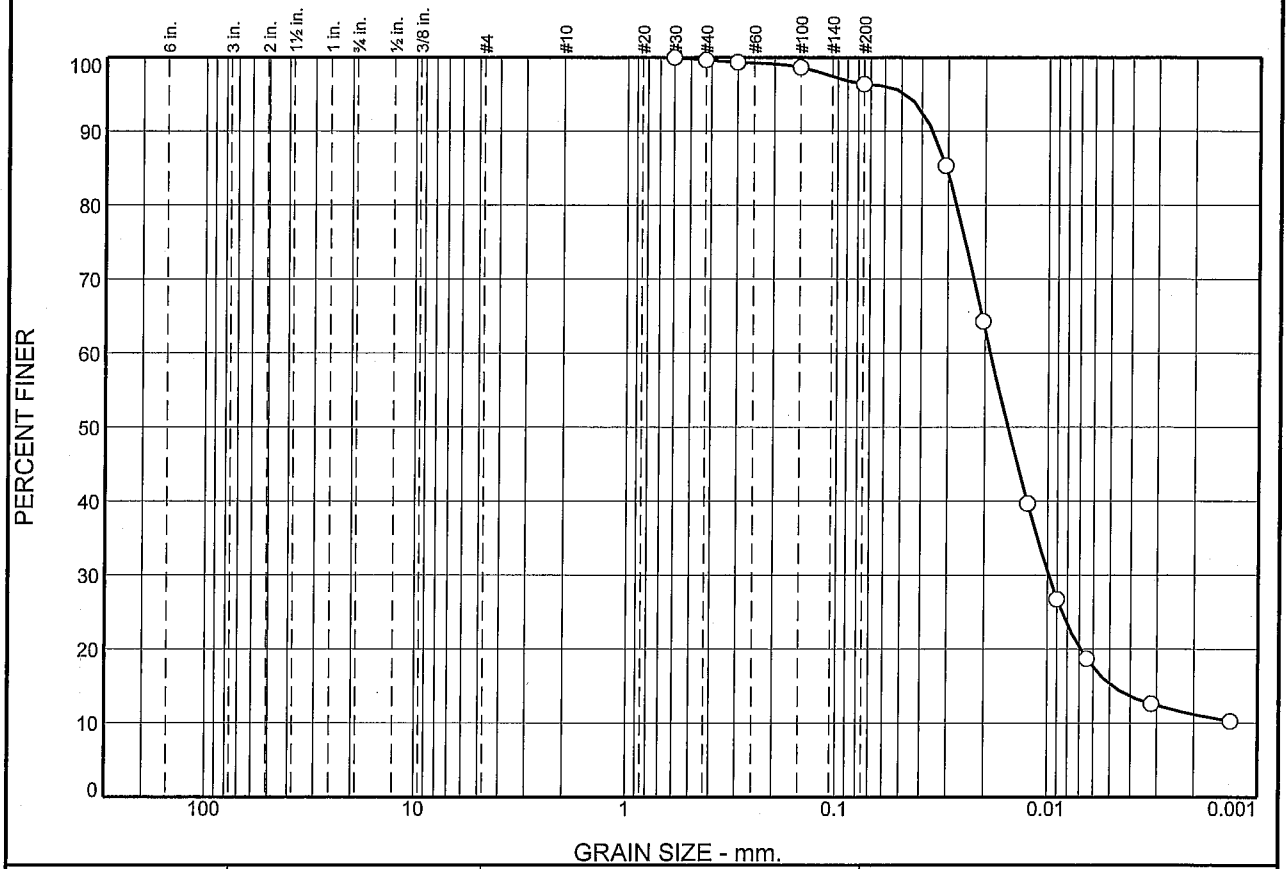
Sample No.: S3004 **Source of Sample:** SS-1-2G **Date:** 1/3/08
Location: SS-1-2G **Elev./Depth:** 0-2cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: PD/TV **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	3.3	81.1	15.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#30	100.0		
#40	99.7		
#50	99.3		
#100	98.7		
#200	96.4		
0.0307 mm.	85.3		
0.0203 mm.	64.3		
0.0124 mm.	39.7		
0.0090 mm.	26.8		
0.0064 mm.	18.7		
0.0032 mm.	12.6		
0.0013 mm.	10.3		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0304 D_{60}= 0.0188 D_{50}= 0.0154
D_{30}= 0.0098 D_{15}= 0.0048 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

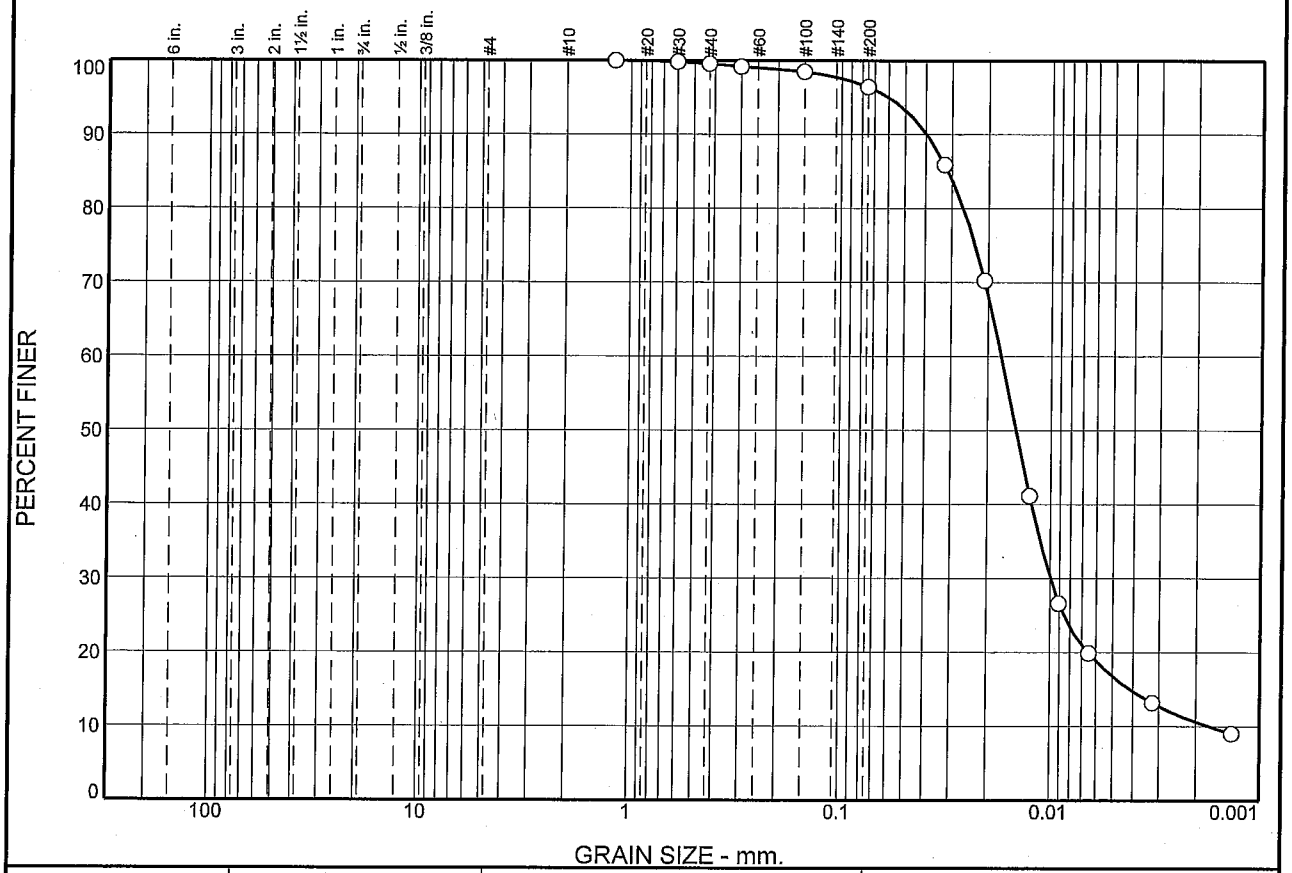
Sample No.: S3005 **Source of Sample:** SS-1-2G **Date:** 1/28/08
Location: SS-1-2G **Elev./Depth:** 2-4cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: TV/JL **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	3.2	79.6	16.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	99.8		
#40	99.6		
#50	99.2		
#100	98.5		
#200	96.4		
0.0323 mm.	85.9		
0.0208 mm.	70.3		
0.0125 mm.	41.2		
0.0090 mm.	26.6		
0.0065 mm.	19.9		
0.0032 mm.	13.2		
0.0014 mm.	9.0		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0312 D_{60}= 0.0172 D_{50}= 0.0146
D_{30}= 0.0099 D_{15}= 0.0041 D_{10}= 0.0017
C_u= 10.00 C_c= 3.33

Classification

USCS= AASHTO=

Remarks

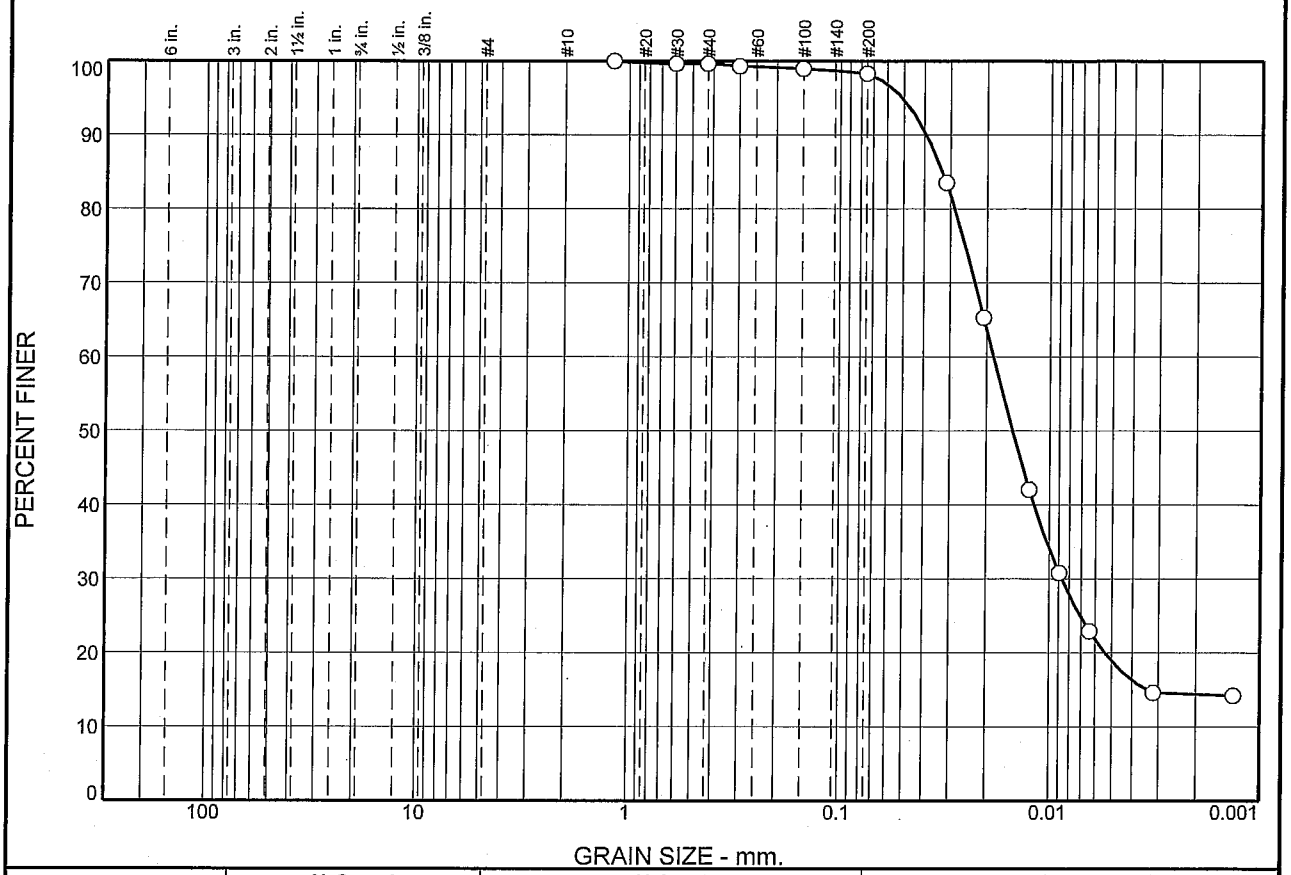
Sample No.: S3006 **Source of Sample:** SS-2-2G **Date:** 1/3/08
Location: SS-2-2G **Elev./Depth:** 0-2cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: PD/TV **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	1.4	79.4	18.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	99.7		
#40	99.7		
#50	99.3		
#100	99.0		
#200	98.3		
0.0313 mm.	83.5		
0.0206 mm.	65.3		
0.0124 mm.	42.1		
0.0089 mm.	30.8		
0.0064 mm.	22.9		
0.0032 mm.	14.6		
0.0013 mm.	14.2		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0327 D_{60}= 0.0185 D_{50}= 0.0150
D_{30}= 0.0087 D_{15}= 0.0034 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

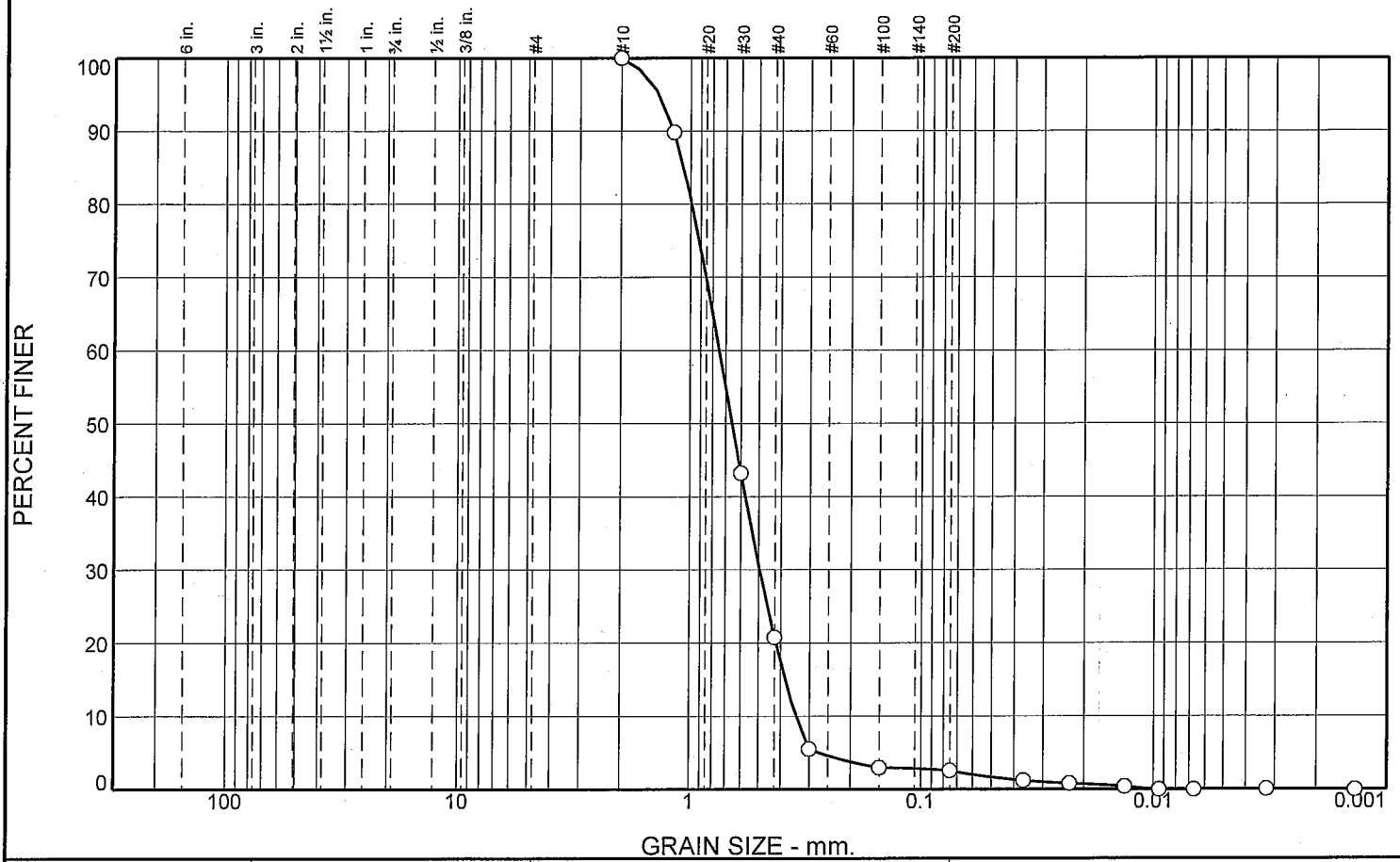
Sample No.: S3007 **Source of Sample:** SS-2-2G **Date:** 1/28/08
Location: SS-2-2G **Elev./Depth:** 2-4cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: TV/JL

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	79.2	18.3	2.5	0.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#16	89.8		
#30	43.2		
#40	20.8		
#50	5.5		
#100	3.0		
#200	2.5		
0.0364 mm.	1.2		
0.0230 mm.	0.8		
0.0133 mm.	0.4		
0.0094 mm.			
0.0067 mm.			
0.0032 mm.	0.0		
0.0014 mm.			

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.0706 D_{60}= 0.7469 D_{50}= 0.6565
D_{30}= 0.4953 D_{15}= 0.3814 D_{10}= 0.3418
C_u= 2.19 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

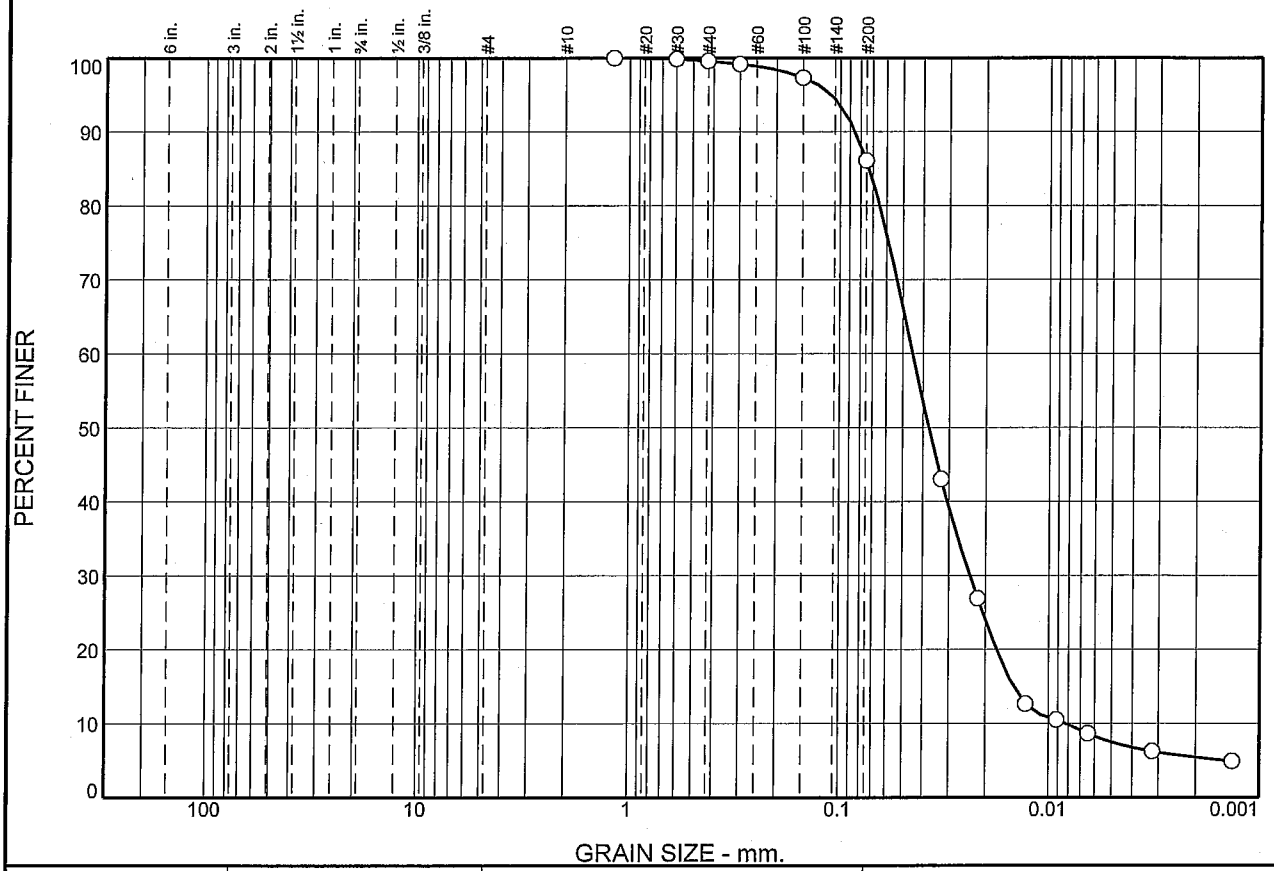
Sample No.: S3008 **Source of Sample:** SS-10-2G **Date:** 1/28/08
Location: SS-10-2G **Elev./Depth:** 0-2cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: TV/JL **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	13.5	78.6	7.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	99.9		
#40	99.6		
#50	99.2		
#100	97.4		
#200	86.1		
0.0327 mm.	43.0		
0.0217 mm.	27.0		
0.0128 mm.	12.7		
0.0091 mm.	10.5		
0.0064 mm.	8.7		
0.0032 mm.	6.2		
0.0013 mm.	4.9		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0728 D_{60}= 0.0448 D_{50}= 0.0374
D_{30}= 0.0237 D_{15}= 0.0146 D_{10}= 0.0082
C_u= 5.49 C_c= 1.53

Classification

USCS= AASHTO=

Remarks

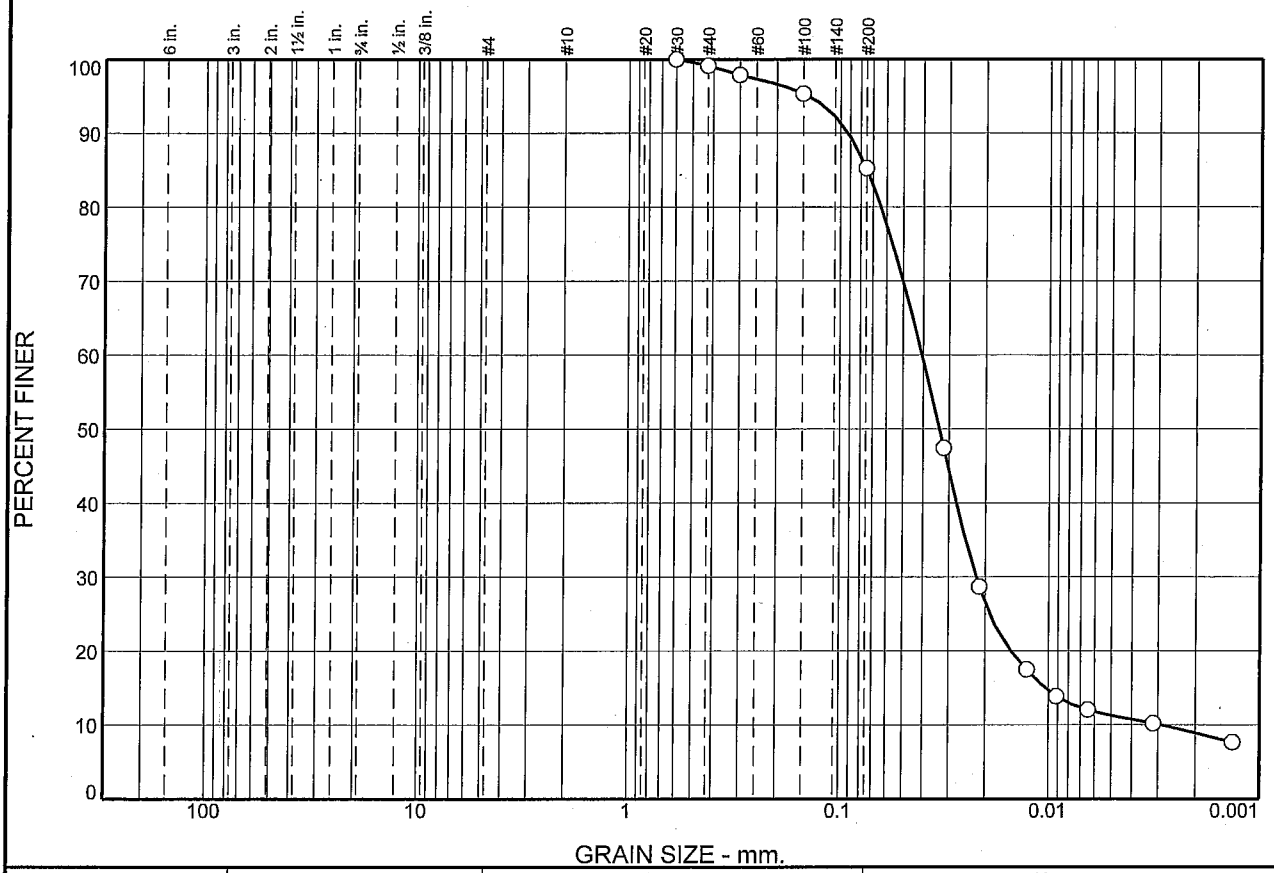
Sample No.: S3009 **Source of Sample:** SS-5-1G **Date:** 1/3/08
Location: SS-5-1G **Elev./Depth:** 0-2cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: PD/TV **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.8	13.9	74.0	11.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#30	100.0		
#40	99.2		
#50	97.9		
#100	95.4		
#200	85.3		
0.0317 mm.	47.4		
0.0213 mm.	28.7		
0.0126 mm.	17.5		
0.0091 mm.	13.9		
0.0064 mm.	12.1		
0.0032 mm.	10.2		
0.0013 mm.	7.7		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0743 D_{60}= 0.0405 D_{50}= 0.0333
D_{30}= 0.0220 D_{15}= 0.0103 D_{10}= 0.0029
C_u= 13.97 C_c= 4.14

Classification

USCS= AASHTO=

Remarks

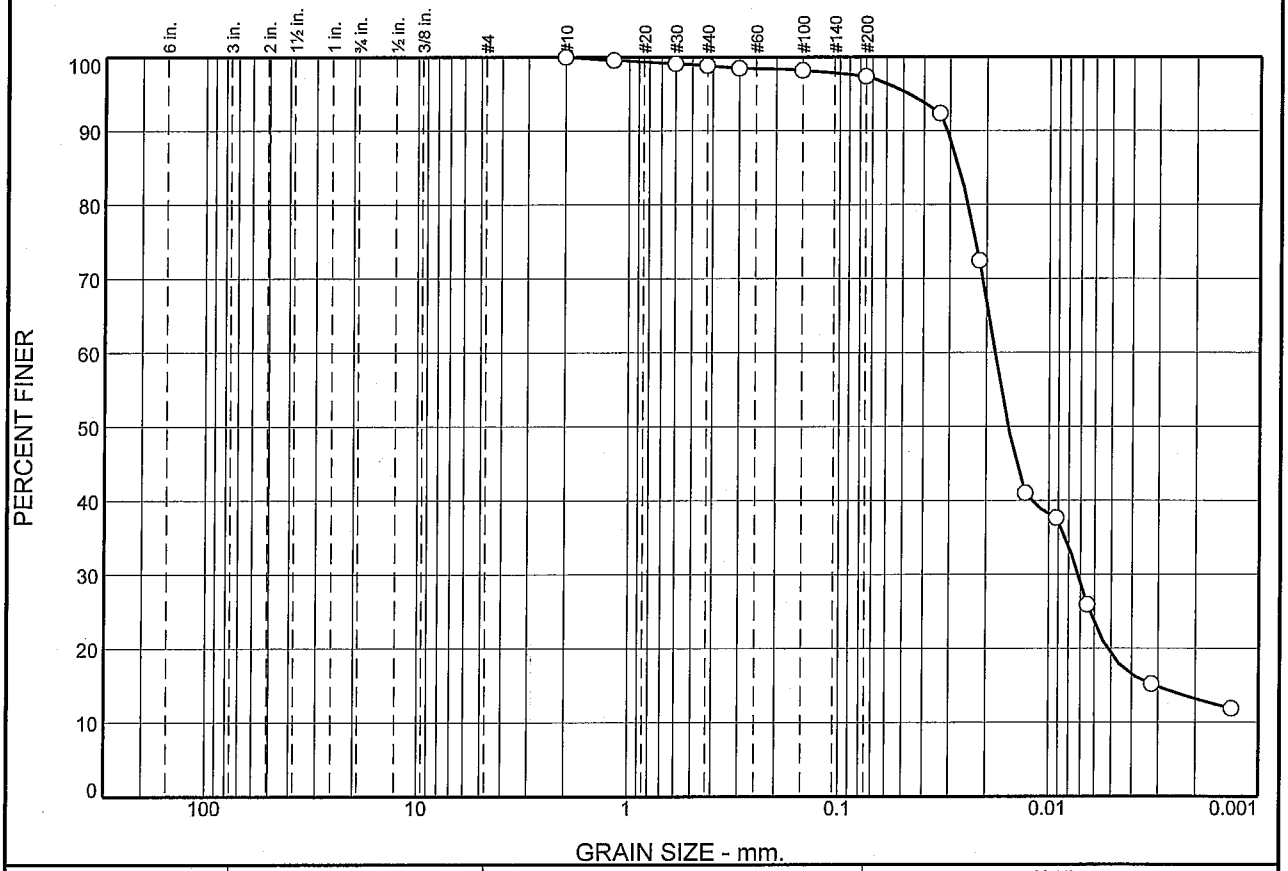
Sample No.: S3010 **Source of Sample:** SS-5-1G **Date:** 1/28/08
Location: SS-5-1G **Elev./Depth:** 2-4cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: TV/JL

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.1	1.5	78.1	19.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#16	99.6		
#30	99.1		
#40	98.9		
#50	98.5		
#100	98.2		
#200	97.4		
0.0335 mm.	92.4		
0.0216 mm.	72.4		
0.0129 mm.	41.0		
0.0092 mm.	37.7		
0.0065 mm.	26.0		
0.0032 mm.	15.2		
0.0013 mm.	11.9		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0271 D_{60}= 0.0181 D_{50}= 0.0157
D_{30}= 0.0072 D_{15}= 0.0031 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

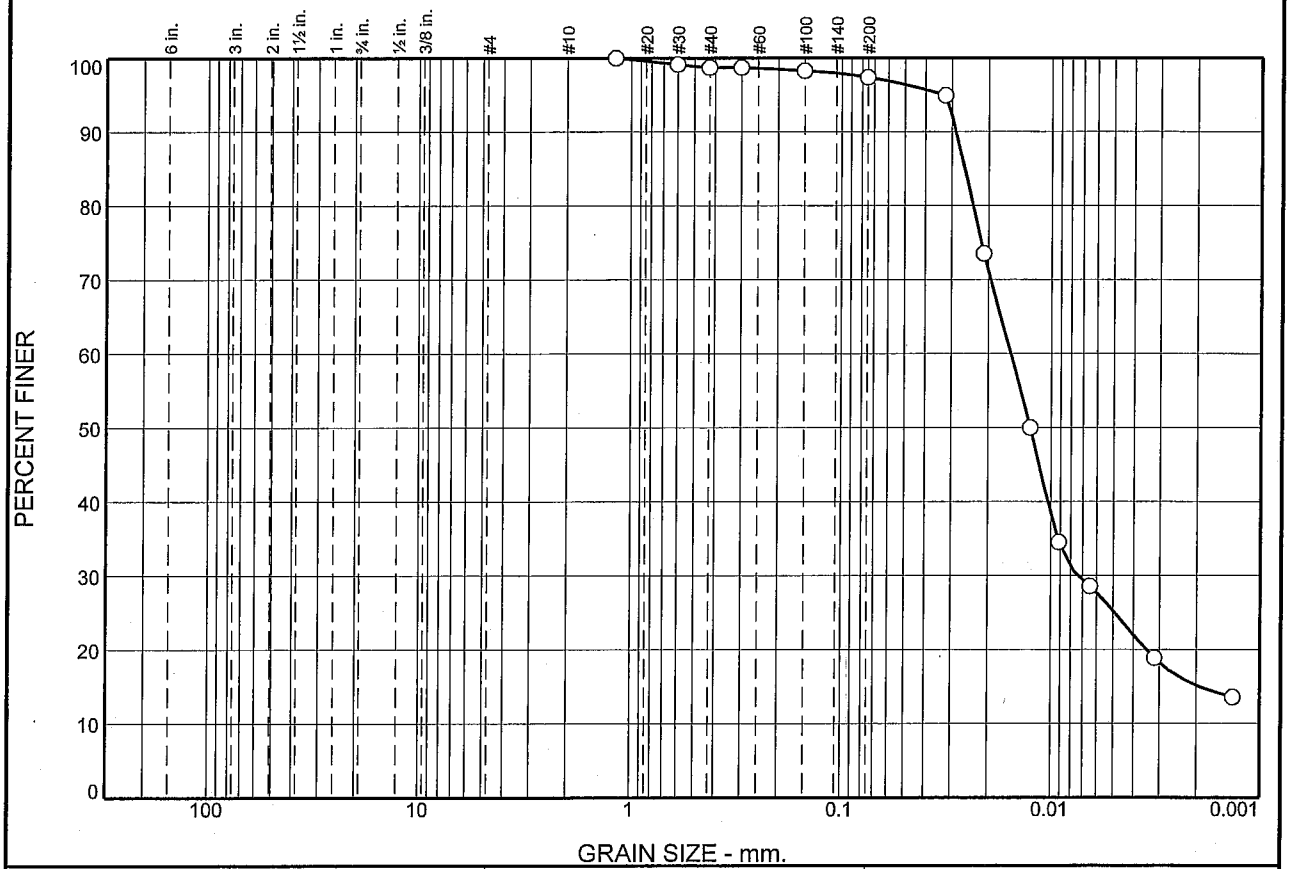
Sample No.: S3011 **Source of Sample:** SS-13-1/2G **Date:** 1/3/08
Location: SS-13-1/2G **Elev./Depth:** 0-2cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: PD/TV **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.3	1.3	72.1	25.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	99.1		
#40	98.7		
#50	98.7		
#100	98.3		
#200	97.4		
0.0320 mm.	94.9		
0.0209 mm.	73.5		
0.0125 mm.	50.0		
0.0091 mm.	34.5		
0.0065 mm.	28.6		
0.0032 mm.	18.9		
0.0013 mm.	13.6		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0259 D_{60}= 0.0156 D_{50}= 0.0125
D_{30}= 0.0074 D_{15}= 0.0019 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

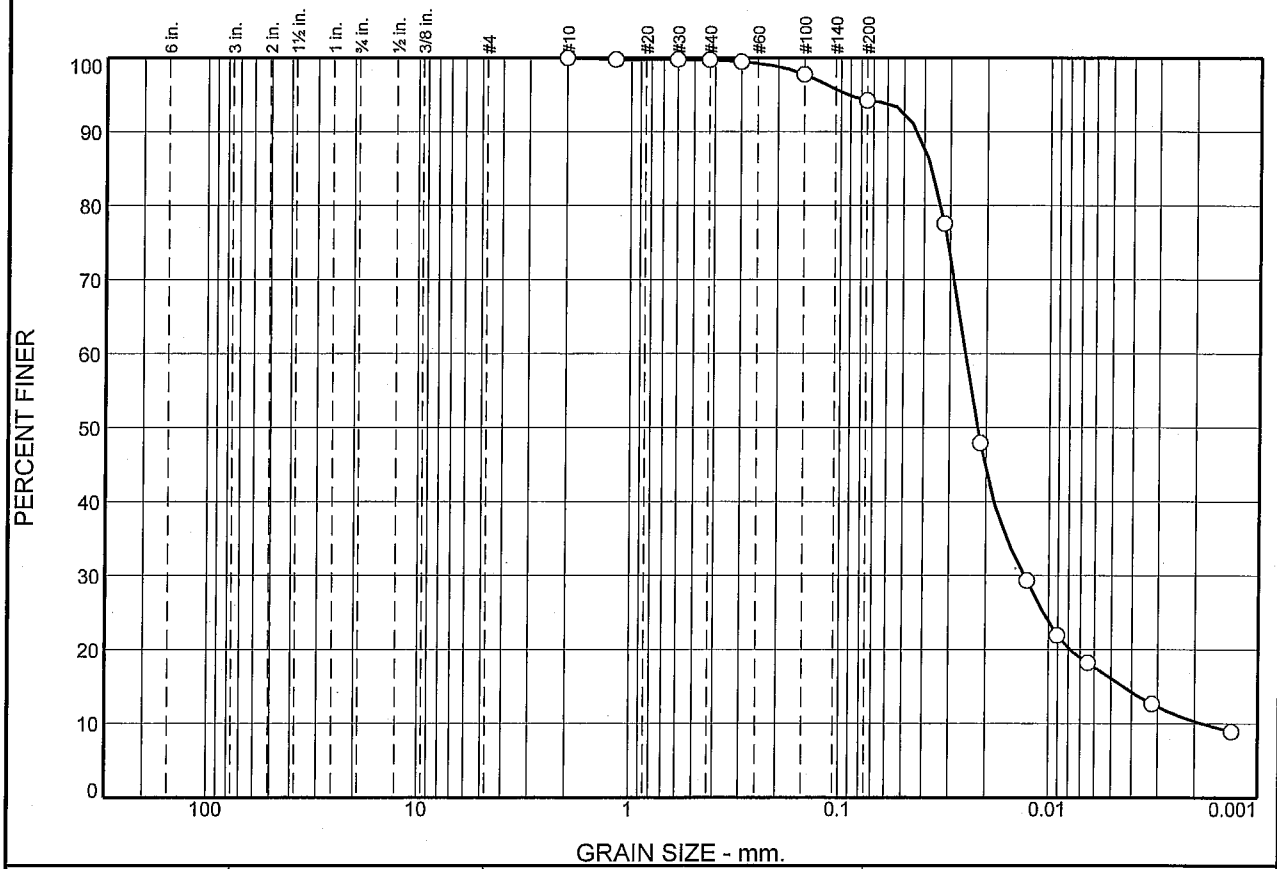
Sample No.: S3012 **Source of Sample:** SS-13-1/2G **Date:** 1/28/08
Location: SS-13-1/2G **Elev./Depth:** 2-4cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: TV/JL **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	5.5	78.1	16.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#16	99.8		
#30	99.8		
#40	99.7		
#50	99.5		
#100	97.8		
#200	94.2		
0.0319 mm.	77.6		
0.0213 mm.	47.9		
0.0127 mm.	29.4		
0.0091 mm.	21.9		
0.0064 mm.	18.2		
0.0032 mm.	12.7		
0.0013 mm.	8.9		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0369 D_{60}= 0.0252 D_{50}= 0.0220
D_{30}= 0.0130 D_{15}= 0.0044 D_{10}= 0.0018
C_u= 13.72 C_c= 3.67

Classification

USCS= AASHTO=

Remarks

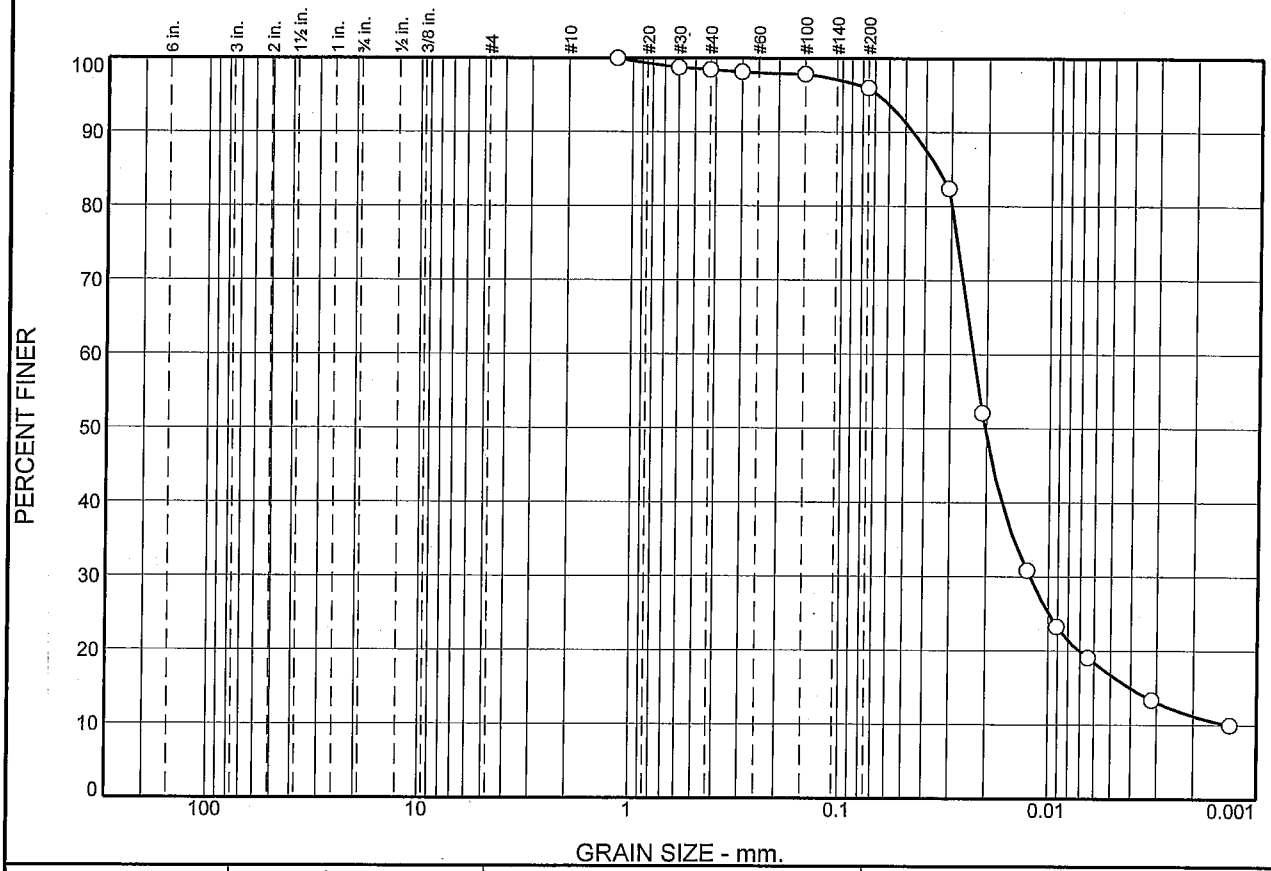
Sample No.: S3013 **Source of Sample:** SS-4-2G **Date:** 1/3/08
Location: SS-4-2G **Elev./Depth:** 0-2cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: PD/TV **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.5	2.5	79.2	16.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	98.8		
#40	98.5		
#50	98.2		
#100	97.9		
#200	96.0		
0.0309 mm.	82.4		
0.0209 mm.	52.1		
0.0126 mm.	30.9		
0.0091 mm.	23.3		
0.0064 mm.	19.1		
0.0032 mm.	13.4		
0.0013 mm.	10.0		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0348 D_{60}= 0.0232 D_{50}= 0.0203
D_{30}= 0.0122 D_{15}= 0.0040 D_{10}= 0.0013
C_u= 17.28 C_c= 4.79

Classification

USCS= AASHTO=

Remarks

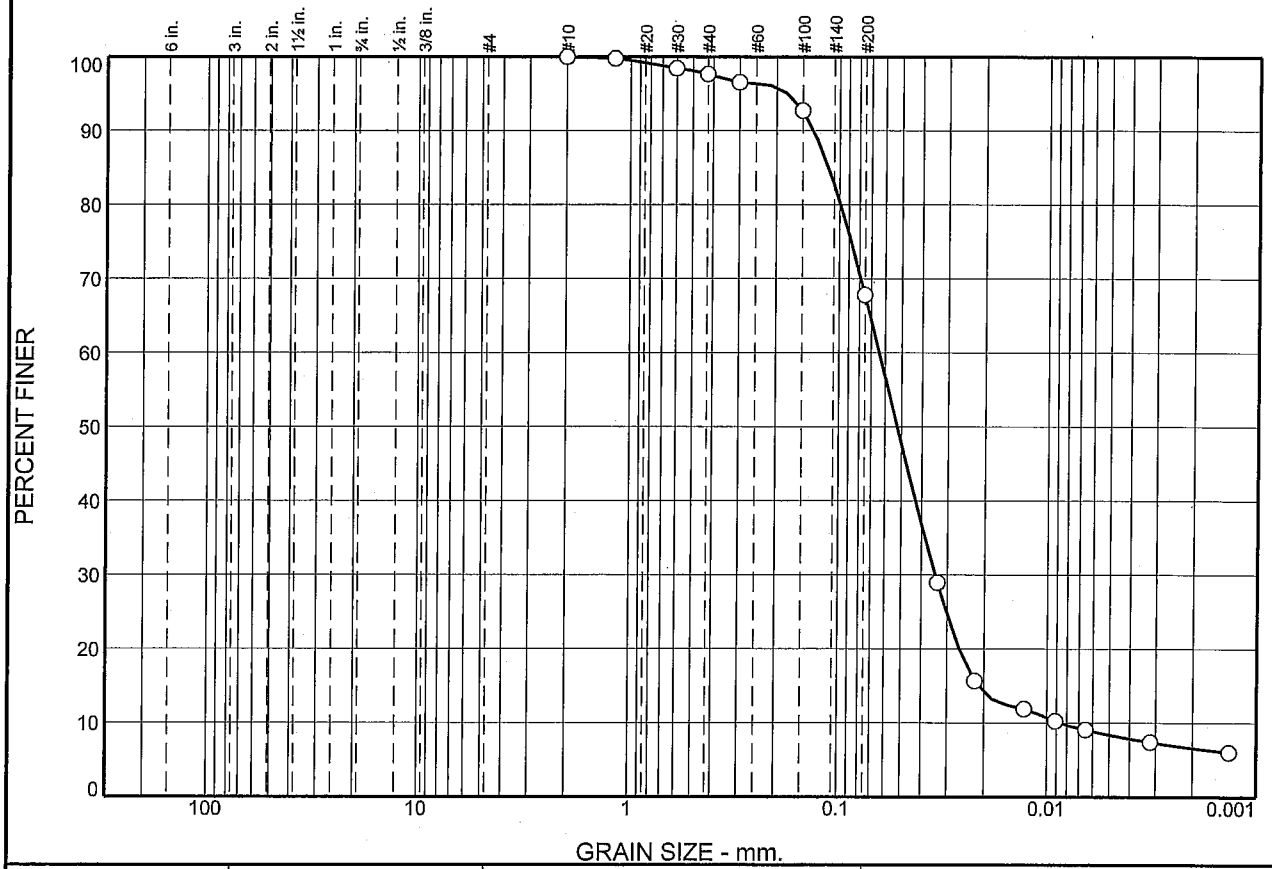
Sample No.: S3014 **Source of Sample:** SS-4-2G **Date:** 1/28/08
Location: SS-4-2G **Elev./Depth:** 2-4cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: TV/JL **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.3	29.9	59.4	8.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#16	99.8		
#30	98.5		
#40	97.7		
#50	96.6		
#100	92.7		
#200	67.8		
0.0333 mm.	29.0		
0.0220 mm.	15.7		
0.0129 mm.	11.9		
0.0091 mm.	10.2		
0.0065 mm.	9.1		
0.0032 mm.	7.4		
0.0013 mm.	6.0		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.1129 D_{60}= 0.0639 D_{50}= 0.0523
D_{30}= 0.0342 D_{15}= 0.0212 D_{10}= 0.0086
C_u= 7.43 C_c= 2.13

Classification

USCS= AASHTO=

Remarks

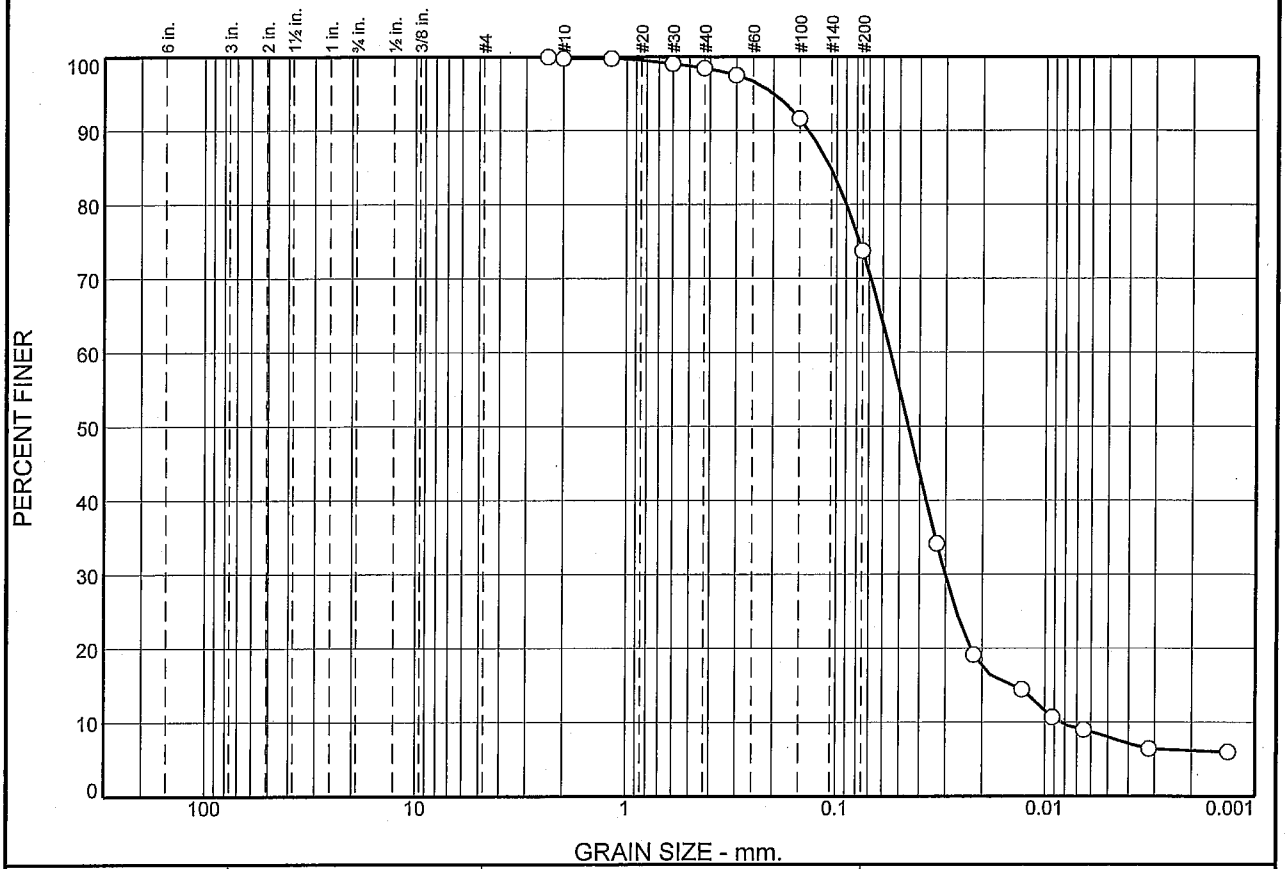
Sample No.: S3015 **Source of Sample:** SS-6-2G **Date:** 1/28/08
Location: SS-6-2G **Elev./Depth:** 2-4cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: TV/JL **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.3	24.7	65.8	8.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#10	99.8		
#16	99.8		
#30	99.0		
#40	98.5		
#50	97.5		
#100	91.6		
#200	73.8		
0.0329 mm.	34.2		
0.0219 mm.	19.1		
0.0128 mm.	14.4		
0.0092 mm.	10.7		
0.0065 mm.	9.0		
0.0032 mm.	6.4		
0.0013 mm.	6.0		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.1070 D_{60}= 0.0551 D_{50}= 0.0452
D_{30}= 0.0300 D_{15}= 0.0140 D_{10}= 0.0084
C_u= 6.57 C_c= 1.95

Classification

USCS= AASHTO=

Remarks

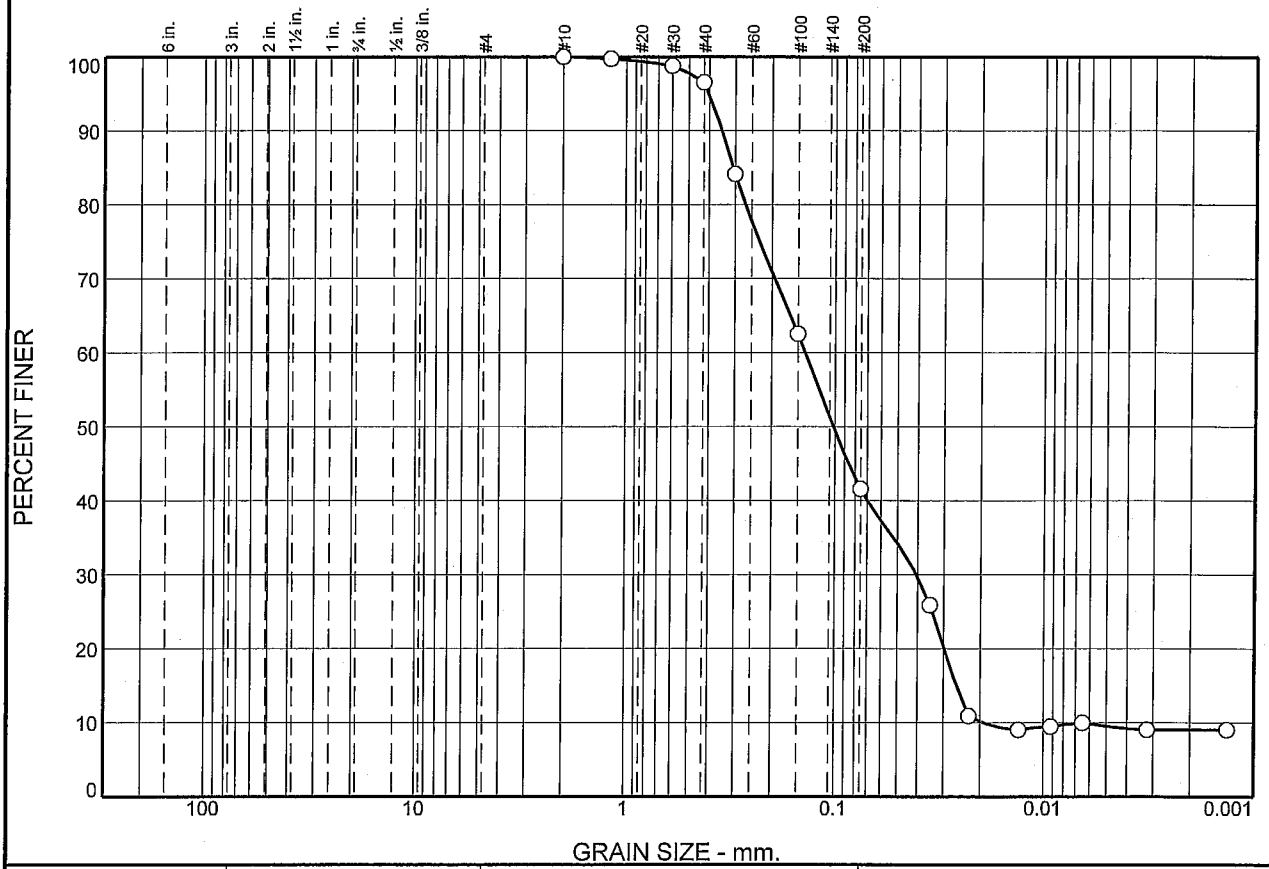
Sample No.: S3016 **Source of Sample:** SS-7-2G **Date:** 1/28/08
Location: SS-7-2G **Elev./Depth:** 0-3cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: TV/JL **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.5	54.9	32.1	9.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#16	99.8		
#30	98.8		
#40	96.5		
#50	84.1		
#100	62.6		
#200	41.6		
0.0349 mm.	25.9		
0.0226 mm.	10.9		
0.0131 mm.	9.0		
0.0092 mm.	9.5		
0.0065 mm.	10.0		
0.0032 mm.	9.0		
0.0013 mm.	9.0		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.3066 D_{60}= 0.1383 D_{50}= 0.1016
D_{30}= 0.0403 D_{15}= 0.0260 D_{10}= 0.0191
C_u= 7.24 C_c= 0.62

Classification

USCS= AASHTO=

Remarks

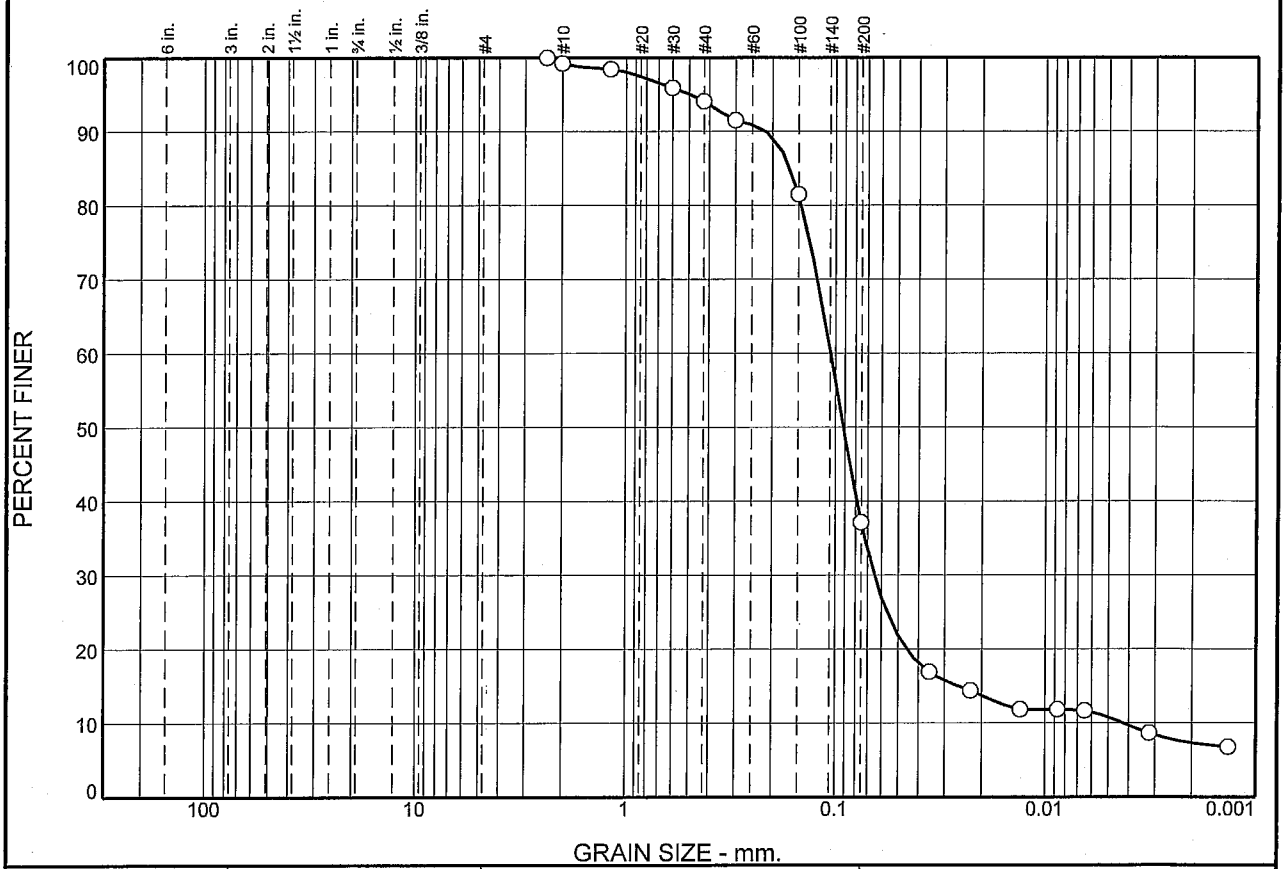
Sample No.: S3017 **Source of Sample:** SS-8-1G **Date:** 1/3/08
Location: SS-8-1G **Elev./Depth:** 0-1cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: PD/TV **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.8	5.1	56.9	26.4	10.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#10	99.2		
#16	98.5		
#30	95.9		
#40	94.1		
#50	91.5		
#100	81.5		
#200	37.2		
0.0353 mm.	16.9		
0.0225 mm.	14.4		
0.0131 mm.	11.9		
0.0087 mm.	11.9		
0.0065 mm.	11.7		
0.0032 mm.	8.6		
0.0013 mm.	6.8		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.1645 D_{60}= 0.1054 D_{50}= 0.0916
D_{30}= 0.0647 D_{15}= 0.0255 D_{10}= 0.0042
C_u= 24.93 C_c= 9.39

Classification

USCS= AASHTO=

Remarks

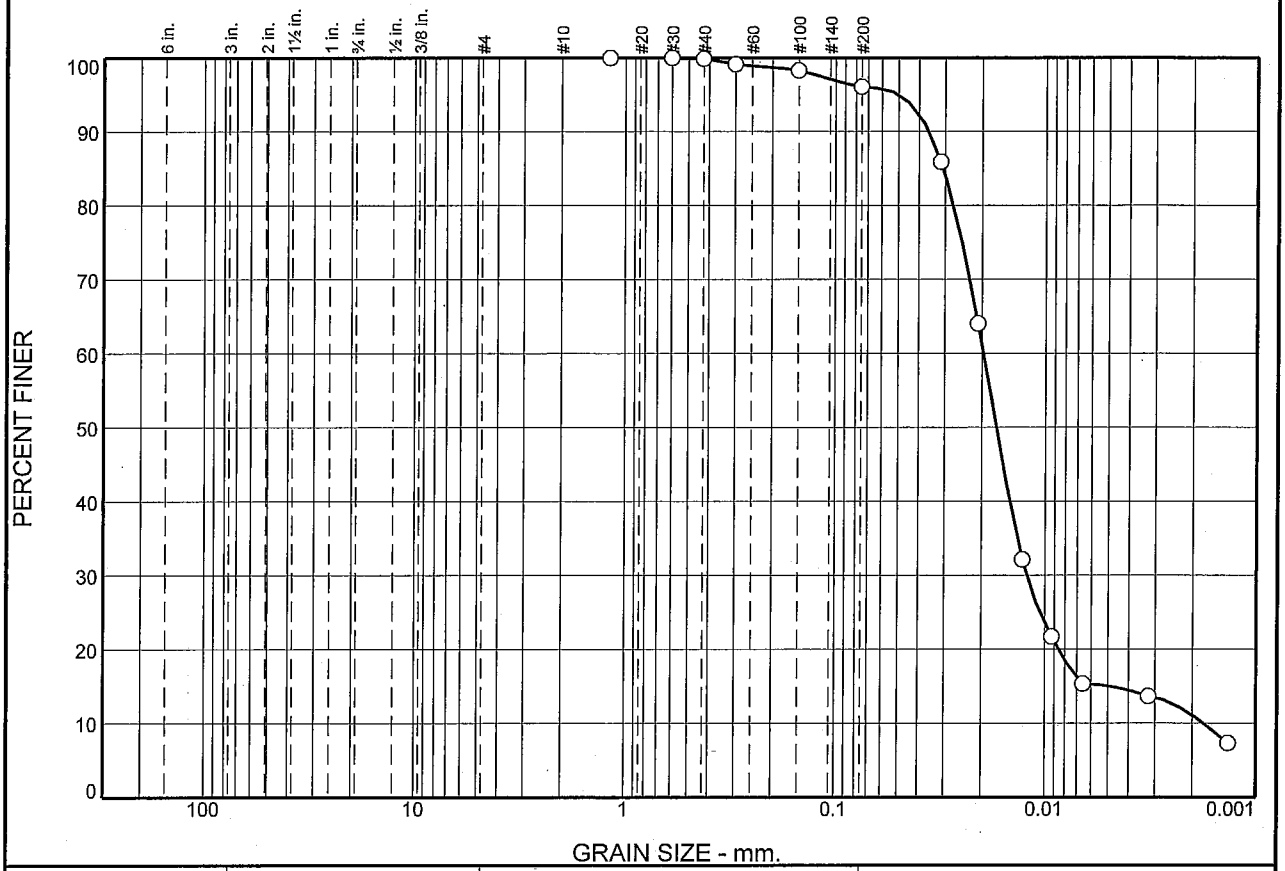
Sample No.: S3018 **Source of Sample:** SS-9-1G **Date:** 1/28/08
Location: SS-9-1G **Elev./Depth:** 0-4cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: TV/JL **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	3.8	81.0	15.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	100.0		
#40	99.9		
#50	99.2		
#100	98.3		
#200	96.1		
0.0314 mm.	85.9		
0.0208 mm.	64.1		
0.0128 mm.	32.1		
0.0092 mm.	21.7		
0.0066 mm.	15.3		
0.0032 mm.	13.7		
0.0014 mm.	7.3		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0307 D_{60}= 0.0196 D_{50}= 0.0170
D_{30}= 0.0122 D_{15}= 0.0048 D_{10}= 0.0018
C_u= 11.10 C_c= 4.27

Classification

USCS= AASHTO=

Remarks

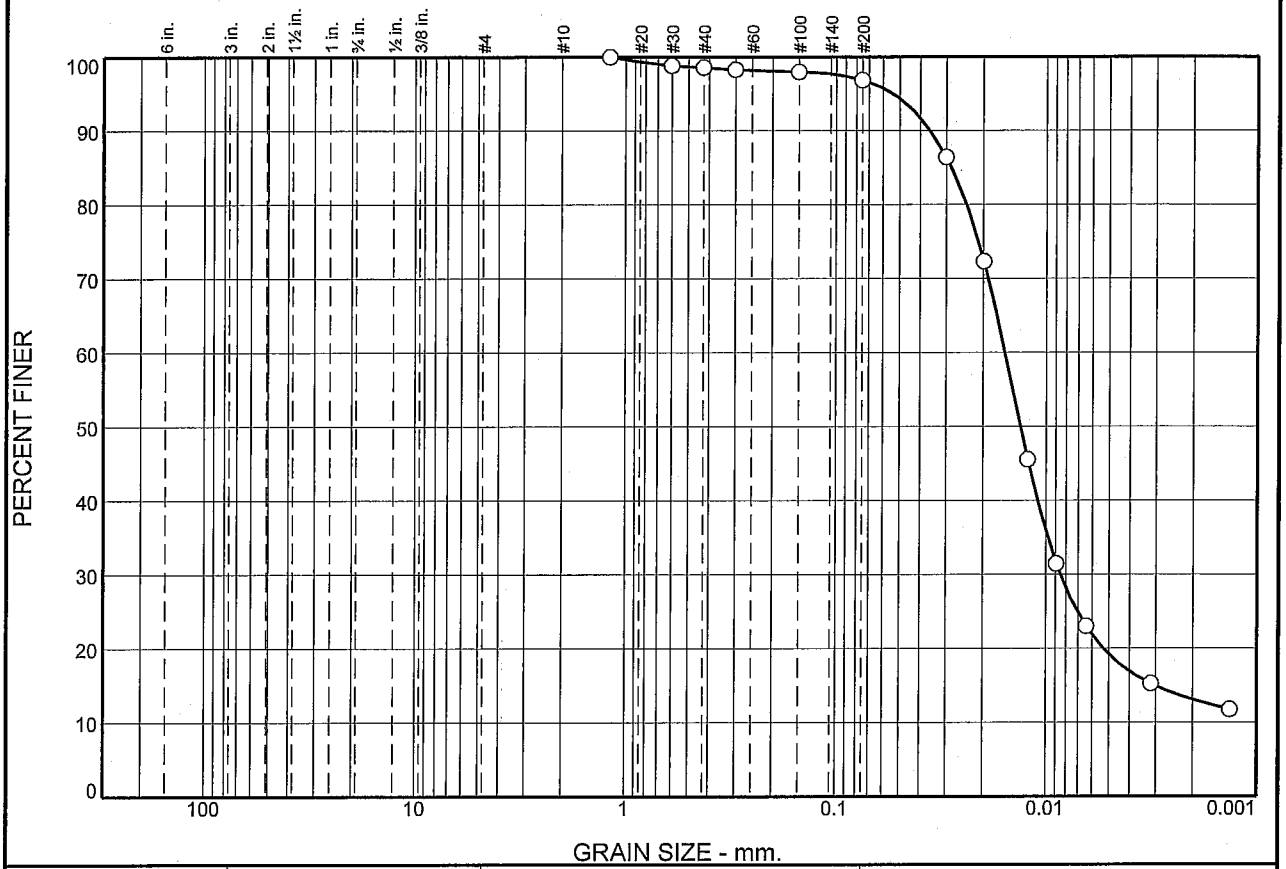
Sample No.: S3019 **Source of Sample:** SS-3-1/2G **Date:** 1/3/08
Location: SS-3-1/2G **Elev./Depth:** 0-2cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: PD/TV **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.4	1.7	77.7	19.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	98.9		
#40	98.6		
#50	98.3		
#100	98.0		
#200	96.9		
0.0300 mm.	86.4		
0.0197 mm.	72.3		
0.0122 mm.	45.6		
0.0089 mm.	31.5		
0.0064 mm.	23.0		
0.0031 mm.	15.2		
0.0013 mm.	11.8		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0283 D_{60}= 0.0157 D_{50}= 0.0132
D_{30}= 0.0085 D_{15}= 0.0030 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

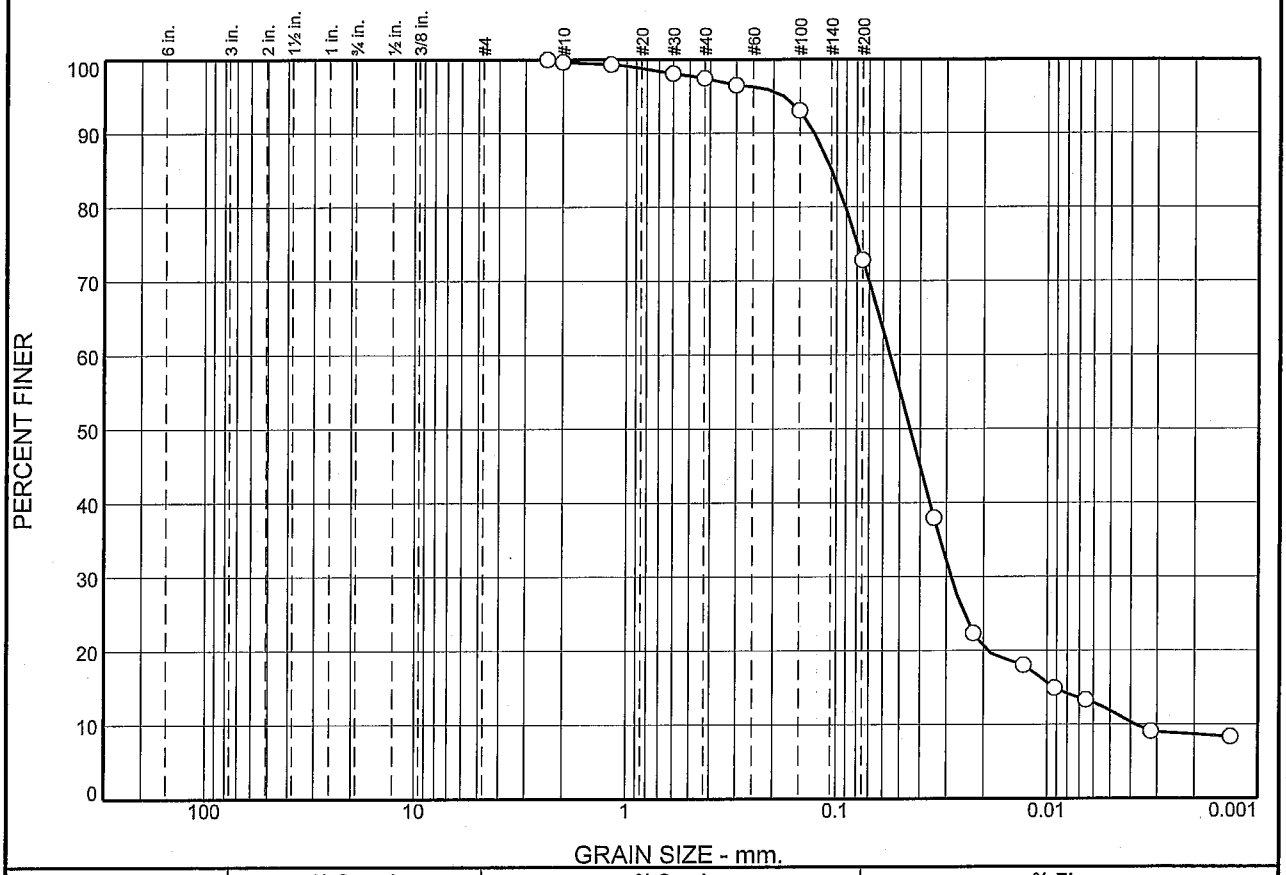
Sample No.: S3020 **Source of Sample:** SS-3-1/2G **Date:** 1/28/08
Location: SS-3-1/2G **Elev./Depth:** 2-4cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: TV/JL **Checked By:** MN

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	2.2	24.6	61.0	11.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#10	99.7		
#16	99.4		
#30	98.1		
#40	97.5		
#50	96.5		
#100	93.1		
#200	72.9		
0.0342 mm.	38.0		
0.0223 mm.	22.4		
0.0129 mm.	18.1		
0.0092 mm.	14.9		
0.0065 mm.	13.4		
0.0032 mm.	9.1		
0.0013 mm.	8.3		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.1057 D_{60}= 0.0555 D_{50}= 0.0445
D_{30}= 0.0284 D_{15}= 0.0092 D_{10}= 0.0038
C_u= 14.70 C_c= 3.84

Classification

USCS= AASHTO=

Remarks

Sample No.: S3175 **Source of Sample:** SS-6-2G **Date:** 1/28/08
Location: SS-6-2G **Elev./Depth:** 0-2cm

SIERRA TESTING LABS, INC.
El Dorado Hills, CA

Client: DTA
Project: Slab Creek Sediment Analysis
Project No: 08-101 **Figure**

Tested By: TV/JL **Checked By:** MN