CTSW-RT-03-017

REPORT OF FINDINGS

CALTRANS TAHOE BASIN GEOTECHNICAL SITE INVESTIGATION FOR LARGE SCALE PILOT SYSTEMS

INFILTRATION BASINS B101 AND B109

APRIL 2003

Prepared for:

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1.0 Project Overview

As part of a water quality and roadway improvement project along Route 50 in El Dorado County near Meyers, Caltrans is planning to pilot test two "modified" or "enhanced" infiltration basins for enhanced storm water runoff treatment through a combination of filtration through sand, sorptive material, gravel filter media, and infiltration. As a part of this project, two of the proposed basin locations, Basins B101 and B109, (Figure 1, Site Location Map) have been selected for a more detailed geotechnical site investigation to evaluate the infiltration capacities and overall feasibility of infiltrating stormwater runoff at the sites.

This Report of Findings describes the results of a geotechnical site investigation performed to characterize the subsurface physical and chemical conditions including, but not limited to, seasonal high groundwater elevation, lithology, thickness, infiltration rates, and pollution capture potential in soils underlying the proposed basin sites. The data collected during this investigation is compared to Caltrans' Storm Water Quality Guidelines (Caltrans, 2002) to assess the physical and chemical characteristics as they relate to the functionality of the proposed basins. The proposed infiltration basin sites were selected for evaluation by Caltrans based on a previous infiltration investigation of the project area (PM 71.5 through PM 73.7) (Caltrans, 2001).

2.0 Scope of Report

This Draft Report of Findings describes a geotechnical site investigation undertaken to characterize site-specific conditions that underlie the proposed basins. Data collected during a regional groundwater data review and the geotechnical site investigation will be evaluated to determine if the proposed infiltration basins B101 and B109 meet the criteria of the Caltrans' Storm Water Quality Practice Guidelines (Caltrans, 2002).

Based on Caltrans application and siting criteria, infiltration basins must meet the following minimum criteria:

- Minimum 3.0 m separation between the basin invert and the seasonal high groundwater elevation,
- Soil infiltration rate >1.3 cm/hr,
- Clay content <30% and/or <40% clay/silt content combined,
- Adequate horizontal hydraulic capacity,
- Runoff quality > standards for infiltration to local groundwater,
- Infiltrated water does not pose an impact to the stability of down gradient structures, slopes, and embankments.

The obtained data was then compared for conformance to Caltrans' Storm Water Quality Practice Guidelines (2002) to evaluate the suitability of the proposed basins.

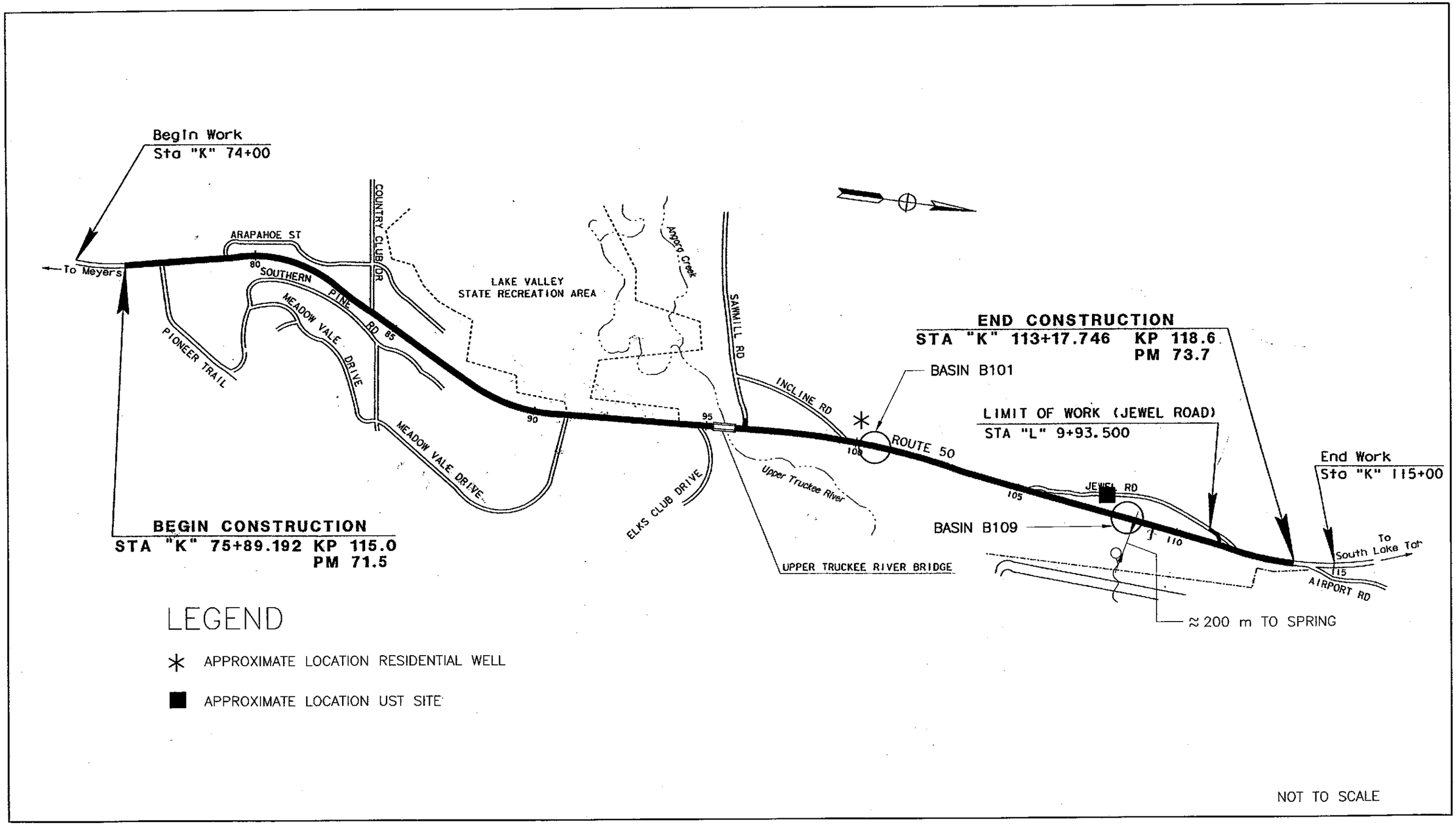

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Figure 1
Site Location Map
Large Scale Pilot Systems Infiltration Basin
Highway 50, South Lake Tahoe, CA

3.0 Review of Available Data

In order to assess local subsurface conditions and local groundwater quality and hydrogeological characteristics, available data was reviewed from the following sources:

- Previously compiled databases on potential best management practices (BMP) sites (such as outfall inventory databases);
- Data and maps available from regional government databases, Department of Water Resources, other local agencies, and internal Caltrans sources;
- The Tahoe Basin Area, California and Nevada Soil Survey, 1972 (United States Department of Agriculture Soil Conservation Service and Forest Service);
- Soil lithology, infiltration rate and groundwater depth data from the El Dorado County Environmental Management department or other specialists that approve soil boring and well installations in the local area;
- Information on local government beneficial uses and groundwater quality issues from the RWQCB and other water agencies; and
- Information on local groundwater-related drinking water issues from the Department of Health Service.

Available information was reviewed to develop an understanding of seasonal fluctuations in groundwater elevations in the area and, more specifically, to determine at what time during the year the regional seasonal high groundwater elevation occurs.

The findings of the review were incorporated into the results of the field investigation, to evaluate the suitability of the proposed basins.

4.0 Geotechnical Field Investigation

Six borings were advanced and two piezometers were installed at proposed Infiltration Basins B101 and B109 on June 13 and 14, 2002. Boring and piezometer locations are shown in Figures 2 and 3 and are consistent with the locations shown in the approved Sampling and Analysis Plan (SAP), dated May 2002 (Appendix A). Drilling, soil sampling, piezometer construction, and water level monitoring were conducted as outlined in the SAP, except for the drilling method. The drilling method was modified to utilize a hollow stem auger drill rig instead of a direct push Geoprobe rig, which was specified in the SAP.

4.1 Permitting and Utility Locating

Prior to mobilizing to the field, soil boring/monitoring well permits were obtained from the El Dorado County Environmental Management Department. Underground Services Alert (USA) was notified 48 hours prior to drilling.

Caltrans District 3 was contacted to assess whether an encroachment permit would be needed for this work. Given the limited extent of the work and because this work is being conducted under contract to Caltrans, District 3 staff indicated that an encroachment permit would not be necessary. All investigation activities were conducted adjacent to U.S. Highway 50 in manner not to impede traffic.

4.2 Soil Borings

Six borings were advanced and two piezometers were installed at Infiltration Basins B101 and B109, to depths ranging from 9.8 to 11.1 meters below ground surface (bgs), for gathering subsurface soil data and groundwater elevation data. The borings were advanced at locations shown in Figures 2 and 3 and boring location, designation, and total depths are summarized in Table 1, Summary of Exploration Borings. A Central Mining Equipment (CME)-75 hollow stem auger drill rig was used for soil boring and piezometer installation. The initial 1.52 m (5 ft) of each boring was advanced using a hand auger to minimize possible damage to underground utilities.

Table 1
Summary of Exploration Borings

Location	*Boring*	*Total Depth (m bgs)*
Basin B101	B-1	10.9
Basin B101	B-2	10.9
Basin B101	B-3/PZ-1	11.1
Basin B109	B-4	9.8
Basin B109	B-5	10.1
Basin B109	B-6/PZ-2	10.8

m = meters
bgs = below ground surface

4.3 Collection of Soil Samples

Soil samples were collected at each boring between 1.52 m (5 ft) and the total depth explored. Soil samples were collected using a 453-millimeter (18-inch) Modified Split Spoon California Sampler lined with three 152 mm (6-inch) brass sleeves. The drill rig utilized a 63.5 kg (140 lb) hammer that was allowed to free-fall 0.76 m (30 in) to drive the sampler. The blow count for each 152 mm (6-inch) driven interval was recorded and used to estimate sample consistency/density. Table 2, Soil Sample Collection and Laboratory Analysis Schedule, summarizes soil sample locations, sample depths, and lists the analysis performed on each respective sample.

At each borehole, drive soil samples were collected from a 300 mm (12-in) interval directly beneath the proposed basin invert depth and the samples were analyzed for pH, organic content, cation exchange capacity, grain size distribution, and moisture content. Additional soil samples were collected at 3.0 m, 4.6 m, 6.1 m, 7.6 m, 9.1 m, and 10.7 m (10, 15, 20, 25, 30, and 35 feet respectively) and analyzed for grain size distribution and moisture content. Bulk soil samples were collected with a hand auger from the surface to 1.7 m (5.5 ft) bgs. Soil samples were contained in the 51 mm (2-inch) diameter brass sleeves, the ends of which were sealed with Teflon sheets and plastic end caps and secured with duct tape. Samples were stored in coolers with ice then transported to the laboratory under proper chain-of-custody documentation.

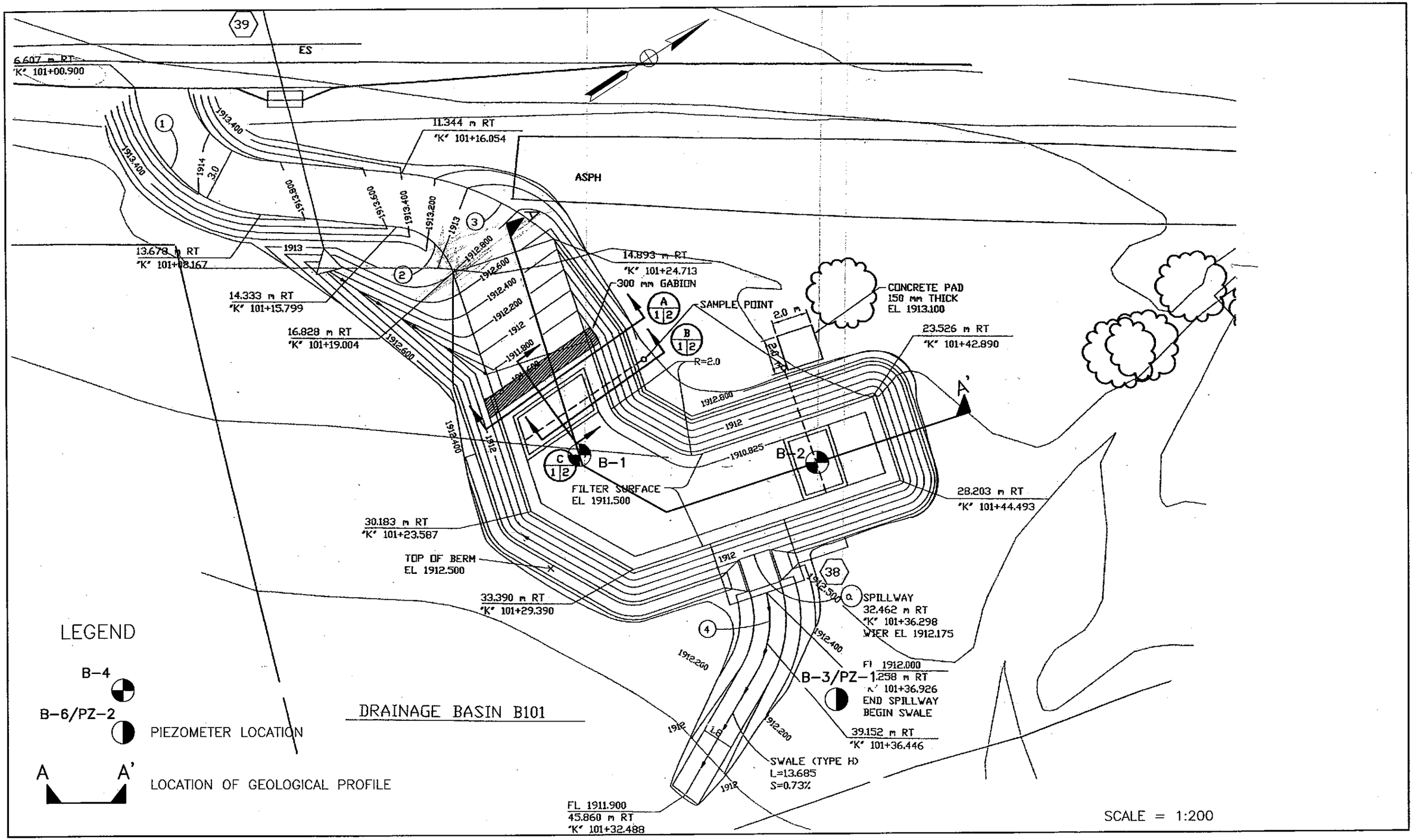

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Figure 2
Basin B101 Exploration Locations
Large Scale Pilot Systems Infiltration Basin
Highway 50, South Lake Tahoe, CA

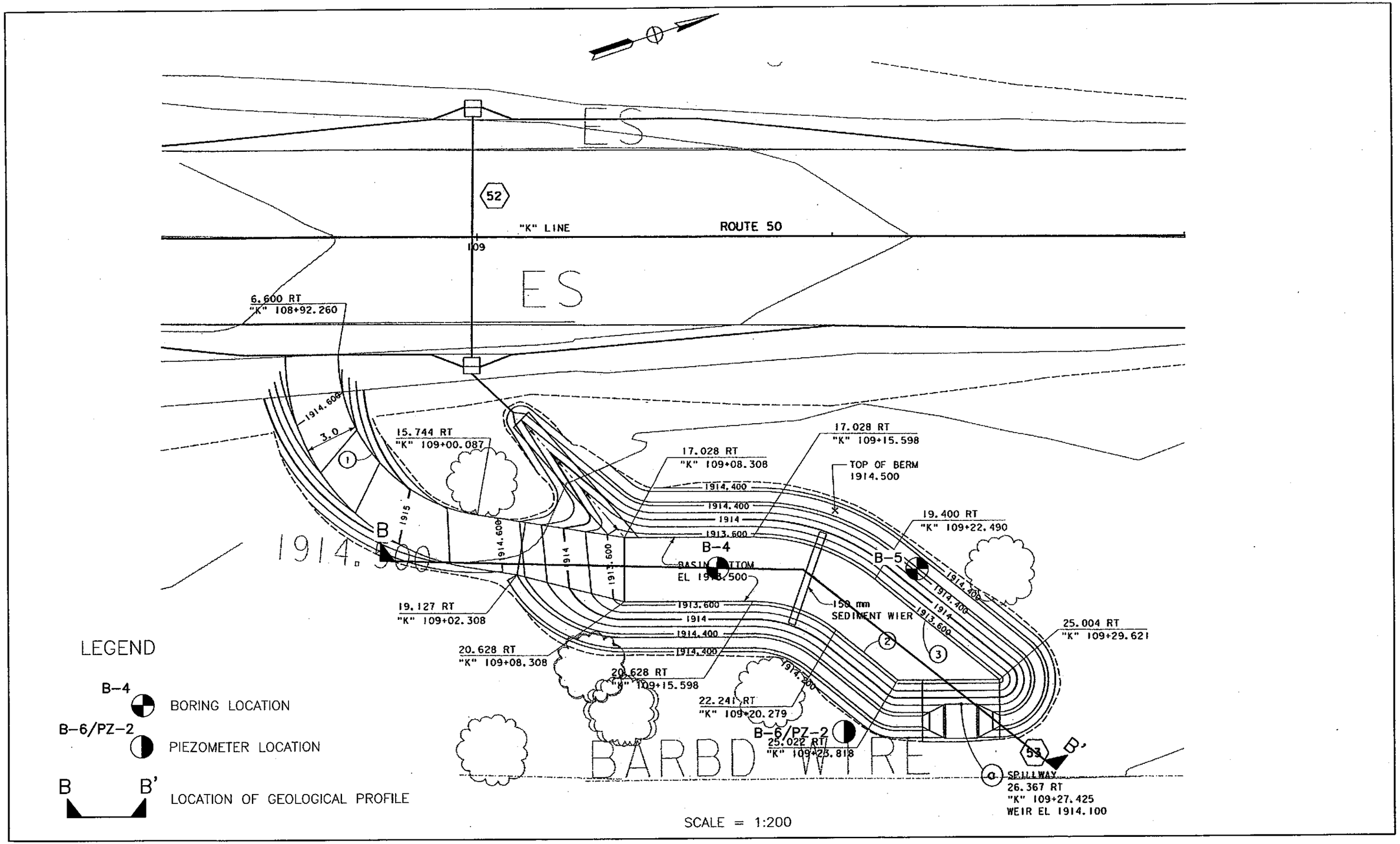

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Figure 3
Basin B109 Exploration Locations
Large Scale Pilot Systems Infiltration Basin
Highway 50, South Lake Tahoe, CA

Table 2
Soil Sample Collection Depths and Laboratory Analysis Schedule

Location	Boring	Surface Elevation	Basin Invert	Sample Depth (Metric)	Sample Depth (English)	Analyses
Basin B101	B-1	1912.60 m (6275.29 ft)	1910.61 m (6268.41 ft)	2.1 m	6.9 ft	pH, OC, CEC, GSD, MC
				3.0, 4.6, 6.1, 7.6, 9.1, and 10.6 m	10, 15, 20, 25, 30, and 35 ft.	GSD, MC
	B-2	1912.42 m (6274.35 ft)	1910.61 m (6268.41 ft)	1.81 m	5.94 ft	pH, OC, CEC, GSD, MC
				3.0, 4.6, 6.1, 7.6, 9.1, and 10.6 m	10, 15, 20, 25, 30, and 35 ft.	GSD, MC
	B-3	1912.77 m (6275.49 ft)	1910.61 m (6268.41 ft)	2.16 m	7.1 ft	pH, OC, CEC, GSD, MC
				3.0, 4.6, 6.1, 7.6, 9.1, and 10.6 m	10, 15, 20, 25, 30, and 35 ft.	GSD, MC
Basin B109	B-4	1914.39 m (6280.82 ft)	1912.61 m (6274.97 ft)	1.78 m	5.84 ft.	pH, OC, CEC, GSD, MC
				3.0, 4.6, 6.1, 7.6, 9.1, and 9.8 m	10, 15, 20, 25, 30, and 35 ft.	GSD, MC
	B-5	1914.37 m (6280.74 ft)	1912.61 m (6274.97 ft)	1.76 m	5.77 ft	pH, OC, CEC, GSD, MC
				3.0, 4.6, 6.1, 7.6, 9.1, and 10.1 m	10, 15, 20, 25, 30, and 35 ft.	GSD, MC
	B-6	1914.37 m (6280.74 ft)	1912.61 m (6274.97 ft)	1.76 m	5.77 ft	pH, OC, CEC, GSD, MC
				3.0, 4.6, 6.1, 7.6, 9.1, and 10.6 m	10, 15, 20, 25, 30, and 35 ft.	GSD, MC

OC = Organic Content
CEC = Cation Exchange Capacity
GSD = Grain Size Distribution
MC = Moisture Content

Prior to drilling each borehole and between each boring location, the drill augers were decontaminated with a steam cleaner. The Modified Split Spoon California Sampler was decontaminated prior to sample collection using a step process consisting of an Alconox/water wash, rinse with potable water, and a final distilled water wash.

4.4 Piezometer Installation

Piezometers were installed in boreholes B-3 (Basin B101) and B-6 (Basin B109) and are designated B-3/PZ-1 and B6/PZ-2, respectively. Each piezometer was constructed using 51 mm (2-in) diameter Schedule 40 PVC, 20-slot screen, RMC Pacific Materials Lonestar #3 sand, a bentonite and Portland Type I/II cement seal, and a steel monument stick-up completion with a locking well cap. Construction details of each piezometer are included in Appendix A, Boring Logs and Piezometer Construction Details. Each piezometer was located adjacent to the basin locations in an attempt to eliminate the need to abandon the piezometer during construction of the basin.

Subsequent to piezometer construction, each piezometer was developed using surge and bail techniques to restore hydraulic properties of sediments around the well screen. Approximately ten well volumes of groundwater were bailed from each piezometer.

4.5 Groundwater Elevation Monitoring

The depth to groundwater was measured during drilling of borings B-1, B-2, B-3/PZ-2, B-4, B-5, and B-6/PZ-2 and recorded on each respective boring log. From June 2002 through September 2003, 14 water level measurements from each piezometer were recorded. The collection of depth to groundwater readings will continue in order to characterize changes in the water table elevation at each basin site.

Water levels were measured using a Heron electronic water level meter. Each measurement was made at the north edge of the top of the PVC piezometer casing. The height of the piezometer stickup (above ground surface) was subtracted from the measurement to calculate the depth of water below ground surface.

4.6 Waste Handling and Borehole Abandonment

Soil auger cuttings, decontamination water, and piezometer development water were placed in properly labeled 55-gallon drums. Four drums of soil cuttings and two drums of development/decontamination water were generated at Basin B101 and five drums of soil cuttings and two drums of development/decontamination water were generated at Basin B109. A composite sample representative of all soil in the drums from boreholes in each basin site was collected and submitted to the laboratory for analysis of Total Petroleum Hydrocarbons (TPH) per EPA Method 8015, Volatile Organics per EPA Method 8240, and a TCLP analysis for RCRA metals. The drums were stored at each basin site pending laboratory analysis for proper disposal.

Boreholes B-1, B-2, B-4, and B-5 were abandoned by placing Portland cement through the augers from the bottom of the borehole to ground surface. After the augers were extracted, the boreholes were grouted to within 1 m of the ground surface and the remaining portion of the boreholes were filled with soil cuttings. Piezometers were constructed in boreholes B-3/PZ-1 and B-6/PZ-2. Borehole abandonment and piezometer installation was conducted under the supervision of an Eldorado County Environmental Management inspector.

5.0 Site Conditions

Field data collected during the geotechnical investigation is discussed in terms of subsurface geology and groundwater elevation.

5.1 Geologic Conditions

A summary of the geologic conditions at Basin B101 and B109 is based on review of the boring logs from boreholes B-1, B-2, B-3/PZ-1, B-4, B-5, and B-6/PZ-2 (Appendix B). Soil textures and mineralogy indicate that geologic materials at Basin B101 and B109 sites comprise native alluvium derived primarily from granitic source rocks.

5.1.1 Basin B101

In general, boreholes B-1, B-2, and B-3/PZ-1 comprise silty sand with gravel and granitic rock fragments to approximately 1.5 m (4.9 ft) bgs. Between approximately 1.5 m (4.9 ft) and 4.9 m (16 ft) bgs, a distinctive horizon of very dark grayish brown sandy silt was encountered. Discussions with Natural Resource Conservation Service (NRCS)

soil scientist indicate that this may be a lacustrine deposit resulting from historically higher surface elevations of Lake Tahoe (personal communication, 2002). Poorly graded sand to well graded sand with gravel up to 2 cm was encountered between 4.9 m (16 ft) and 6.1 m (20 ft) bgs. Below 6.1 m (20 ft) bgs to the maximum depth explored, sediments comprise well-graded sand, well-graded sand with silt, silty sand, and clayey sand, ranging from fine to coarse-grained. An oxidized horizon of well-graded sand with silt and gravel was encountered from approximately 5.5 to 6.7 m (18 to 22 ft) bgs in borehole B-3/PZ-1.

5.1.2 Basin B109

Lithologies in boreholes B-4, B-5, and B-6/PZ-2 comprise silty sand with gravel, silty sand, and well-graded sand with silt between the ground surface and 4.5 m (14.8 ft) bgs. Between 4.5 m (14.8 ft) bgs and approximately 7.6 m (25 ft) bgs, sediments comprise well-graded sand and clayey sand. A hard, very dark gray, micaceous silt was encountered between 7.6 m (25 ft) bgs and the maximum depth explored. Auger refusal occurred at 9.8 and 10.1 m (32 and 33 ft) bgs in boreholes B-4 and B-5, respectively. Refusal is interpreted as the contact with a dense volcanic ash unit and is based on the presence of white fine-grained, laminated, powdery ash.

5.2 Generalized Subsurface Profile

Subsurface profiles are based on the Drainage Basin B101 Layout Plan, drawing number 831037-3 (Basin B101); the Drainage Basin Details, sheet D-62 (Basin B109); and review of boring logs and analytical results. Using this information, geologic profiles A-A'; Geologic Profile of Basin B101 (Figure 4) and B-B'; Geologic Profile of Basin B109 (Figure 5), were developed to illustrate the geologic conditions with respect to the proposed basin design. It should be noted that these profiles represent the general subsurface conditions at each basin and minor variations in unit lithology, permeability, and thickness is common.

5.3 Groundwater

Observed depths to water in each borehole is summarized in Table 3, Summary of Depth to Groundwater Measurements. Note that on June 13 and 14, 2002 water level measurements were made shortly following drilling and or piezometer development and may not represent static water level.

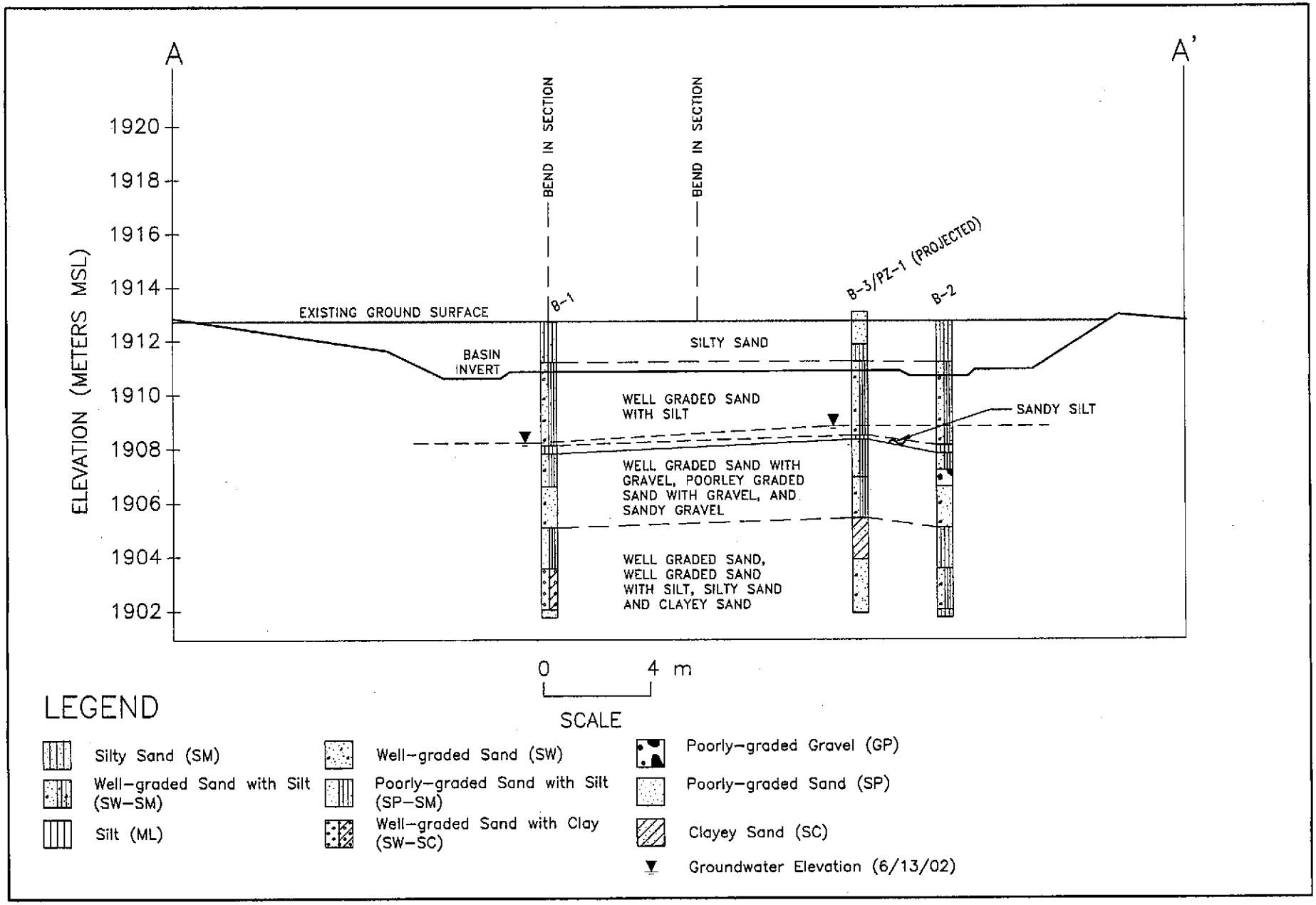

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Figure 4
Geologic Profile of Basin B101
Large Scale Pilot Systems Infiltration Basin
Highway 50, South Lake Tahoe, CA
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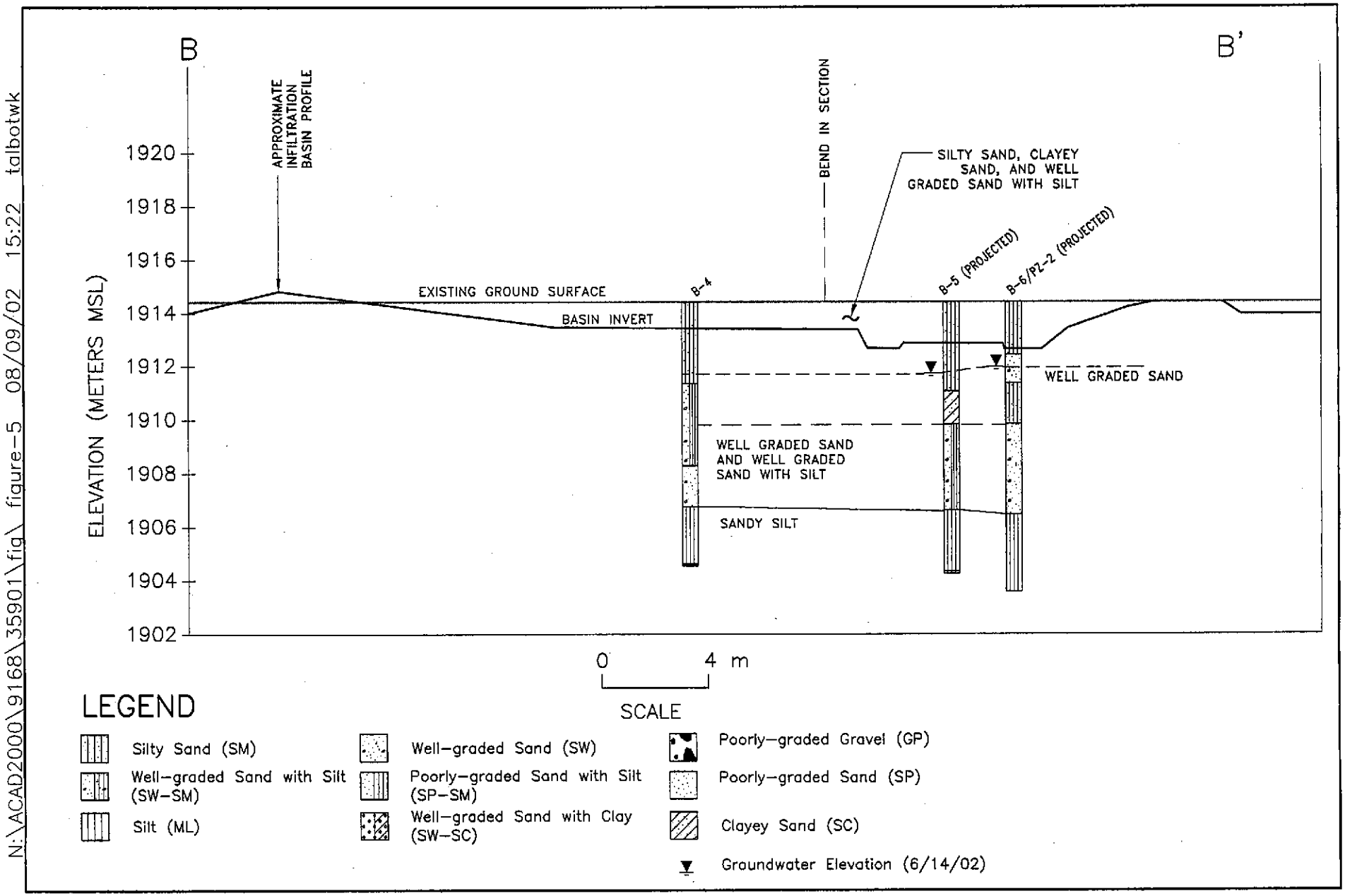

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Figure 5
Geologic Profile of Basin B109
Large Scale Pilot Systems Infiltration Basin
Highway 50, South Lake Tahoe, CA
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Table 3
Summary of Depth to Groundwater Measurements

Piezometer	Date	Time	Depth to Water (meters below top of casing)	Depth to Water (meters below ground surface)
B-3/PZ-1	6/13/2002	1556	5.124	4.237
	6/14/2002	1735	5.307	4.420
	6/18/2002	1200	5.035	4.148
	6/28/2002	1005	5.191	4.307
	7/08/2002	0805	5.337	4.450
	7/16/2002	1130	5.435	4.548
	7/23/2002	0900	5.471	4.578
	8/8/2002	1500	5.605	4.712
	8/16/2002	1300	5.617	4.724
	8/22/2002	0930	5.654	4.761
	8/29/2002	1300	5.669	4.776
	9/6/2002	1105	5.685	4.791
	9/12/2002	1200	5.700	4.807
	9/20/2002	1105	5.675	4.782
B-6/PZ-2	6/14/2002	1317	3.514	2.438
	6/14/2002	1750	3.517	2.469
	6/18/2002	1245	3.347	2.283
	6/28/2002	1035	3.505	2.429
	7/08/2002	0830	3.673	2.597
	7/16/2002	1150	3.801	2.725
	7/23/2002	0930	3.874	2.798
	8/8/2002	1500	4.103	3.027
	8/16/2002	1300	4.206	3.130
	8/22/2002	0930	4.289	3.213
	8/29/2002	1315	4.368	3.292
	9/6/2002	1115	4.453	3.377
	9/12/2002	1210	4.514	3.438
	9/20/2002	1115	4.578	3.502

6.0 Laboratory Results

Laboratory results include the analytical results for geotechnical/pollutant capture capacity samples and the analytical results for the composite soil samples collected from drummed waste soil at each basin location.

6.1 Geotechnical Results

Physical and chemical analysis was performed on selected samples by Calscience Environmental Labs. A copy of the laboratory analytical reports and chain of custody are included in Appendix C. Additionally, moisture content data is displayed on the boring logs contained in Appendix B.

Grain size distribution data (Appendix C) presents the relative percentages of gravel, sand, silt, and clay in soil. The data was used to confirm the soil types classified in the field during drilling. The grain size distribution results and moisture content results are used to characterize the porosity and permeability of soils beneath Basin B101 and B109.

The analytical results for soil pollutant capture capacity for selected samples collected at Basin B101 and B109 are summarized in Table 4, Analysis for Pollutant Capture Capacity. Each sample was collected from a 300 mm (12-in) interval directly below the proposed invert depth.

Table 4
Analytical Results for Pollutant Capture Capacity

Sample ID	Cation Exchange (meq/kg)	Moisture Content %	Ash Content %	Organic Content %	pH EPA 9045.00
Basin B101					
B1-2.1	48	5.1	98.6	1.4	6.44
B2-1.81	110	7.7	97.7	2.3	4.95
B3-2.16	34	3.3	99.1	0.9	5.23
Basin B109					
B4-1.78	74	14.4	97.8	2.2	5.02
B5-1.76	38	23.0	97.1	2.9	5.75
B6-1.76	64	21.5	97.4	2.6	5.52

6.2 Exploration Derived Waste Results

The analytical results from the composite sample from the drums of soil at Basin B101 indicated a Total Petroleum Hydrocarbon (TPH-MO) as motor oil concentration of 49 mg/kg. Based on these results, the four drums of soil and two drums of development/decontamination water at Basin B101 were disposed of at the Pollution Control Industries facility located in Rancho Cordova, California. Analytical reports are contained in Appendix C. Waste disposal documentation is contained in Appendix D.

Analytical results from the composite sample from the drums at Basin B109 were below detection limits for all analyses. The analytical report is contained in Appendix B. Based on these results, and the approval of the Eldorado County Environmental Management, the soil cuttings and development/decontamination water were spread at the drill sites.

7.0 Data Evaluation and Recommendations

The proposed infiltration Basins B101 and B109 are evaluated based on the infiltration characteristics of the soil, the pollutant capture capacity of the soil, and whether the basins pass or fail the Caltrans Infiltration Basin Siting Criteria (Caltrans, 2002).

7.1 Soil Infiltration Characteristics

Soil beneath the Basin B101 invert and above the water table generally comprises well-graded sand with silt (SW-SM). Grain size distribution results indicate that soil beneath the basin invert contains less than 40% combined fines (clay and silt) and meets the Infiltration Basin Siting Criteria for soils with capacity for infiltration.

Soil beneath the Basin B109 invert and above the water table generally comprises silty sand (SM). Grain size distribution results indicate that soil beneath the basin invert contains less than 40% combined fines (clay and silt) and meets the Infiltration Basin Siting Criteria for soils with capacity for infiltration.

7.2 Soil Pollutant Capture Capacity

Soil samples collected from 300 mm (12 in) directly beneath the proposed Basin B101 invert (B-1, B-2, and B-3/PZ-1) have pH values ranging from 4.95 to 6.44 and organic content percentage ranging from 0.9 to 2.3% (Table 4). When compared to Caltrans guidelines, these values fall below the optimal values promoting pollutant capture (pH 6-8 and organic content > 5%) in soil.

Soil samples collected from 300 mm (12 in) directly beneath the proposed Basin B109 invert (B-4, B-5, and B-6/PZ-2) have pH values ranging from 5.02 to 5.75 and organic content ranging from 0.9 to 2.3% (Table 4). When compared to Caltrans guidelines, these values fall below the optimal values promoting pollutant capture (pH 6-8 and organic content > 5%) in soil.

7.3 Comparison to Infiltration Basin Siting Criteria and Recommendations

To evaluate the suitability of the proposed infiltration basins, the site physical and chemical characteristics where directly compared to each respective basin design (refer to Figures 2 and 3). Tables 5 and 6 summarize the primary basin siting criteria and compares specific parameters for basins B101 and B109, respectively, for suitability based on Caltrans guidelines (2002). It should be noted that the Caltrans guidelines are intended for evaluating site conditions for "unimproved" or "non-enhanced" basins. The basins evaluated in this study are considered "enhanced" infiltration basins as the final design includes the integration of "filter media" to increase pollutant capture. Also included in this table are specific recommendations that are suggested to further evaluate suitability or to develop means to improve suitability at a specific basin. Included in each table are columns that summarize the key criteria, denote applicability to design guideline evaluation using these criteria, and include comments and recommendations to further define each respective parameter condition and present recommendations.

Table 5
Evaluation of Basin B101 Characteristics to Siting Criteria

Criteria	***Meets Criteria***	***Comments***	***Recommendations***
Basin site is within the Caltrans right of way	✓		
Basin site should not be constructed in fill material	✓	The proposed infiltration basin is located entirely in native soil.	
Existing ground surface slopes less than 15%.	✓	Topography of the proposed infiltration basin does not exceed 15% grade.	
Infiltration basin should not be sited in locations of previously identified contaminated groundwater plumes.	✓	No known groundwater contamination identified. However, low concentrations of TPH, 49 mg/kg; measured in soil during investigation.	▪ Evaluate potential source of contamination.
The infiltration basin should be located at least 300 m (1000 ft) from any municipal water supply well, 30 m (100 ft) from any private well, septic tank or drain field, and 60 m (200 ft) from a Holocene fault zone.	✓	A domestic well is located approximately 60 m (200 ft) west (upgradient from proposed basin).	
A minimum of 3 m (10 feet) separation between the basin invert and the seasonal high water table.	-	Based on existing data from piezometer PZ-1 (6/13/02), minimum 2.71 m (8.9 ft) separation exists.	▪ Continued monitoring of PZ-1 to determine seasonal high water table. ▪ Consultation with the RWQCB for approval of separation < 3 m (10 ft).
Soil lithologies suitable to promote infiltration beneath the proposed infiltration basin (soils have less than 40% combined clay and silt).	✓	Soil beneath the proposed infiltration basin invert and above the water table generally comprise well graded sand with silt (SW-SM).	
The soil in the first 300 mm (12 in) below the basin invert has an organic content (OC) > 5 percent	-	Analytical data indicates an organic content percentage of 1.4, 2.3, and 0.9, for samples collected at the invert in boreholes B-1, B-2, and B-3/PZ-1, respectively.	▪ Selected filter media will enhance pollution capture capacity potential.
The soil in the first 300 mm (12 in) below the basin invert has a pH in the range of 6 – 8.	-	Analytical data indicates a pH of 6.44, 4.95, and 5.23 for samples collected at the invert in boreholes B-1, B-2, and B-3/PZ-1, respectively.	▪ Evaluate subgrade augmentation options/feasibility to provide more neutral pH condition.
The soil in the first 300 mm (12 in) below the basin invert has a cation exchange capacity (CEC) >5 meg/100 g of soil.	✓		
The proposed infiltration basin site has adequate horizontal hydraulic capacity.	✓	Three soil borings advanced at the site (B-1, B-2, and B3/PZ-1) indicate laterally continuous horizons with lithologies suitable for infiltration.	
Soil infiltration rate of > 1.3 cm/hr.	Unknown	Soil infiltration testing at proposed Basin B101 in progress at time of this report.	▪ Consider performing in-situ soil infiltration testing to estimate infiltration capacity.
Runoff quality ≥ standards for infiltration to local groundwater.	✓	Runoff monitoring data indicates runoff quality meets this criterion.	
Infiltrating groundwater does not pose an impact on stability of down gradient structures, slopes, and embankments.	✓	No downgradient structures, slopes, or embankments present.	

Table 6
Evaluation of Basin B109 Characteristics to Siting Criteria

Criteria	***Meets Criteria***	***Comments***	***Recommendations***
Basin site is within the Caltrans right of way	✓		
Basin site should not be constructed in fill material	✓	The proposed infiltration basin is located entirely in native soil.	
Existing ground surface slopes less than 15%.	✓	Topography of the proposed infiltration basin does not exceed 15% grade.	
Infiltration basin should not be sited in locations of previously identified contaminated groundwater plumes.	✓	No known groundwater contamination identified.	
The infiltration basin should be located at least 300 m (1000 ft) from any municipal water supply well, 30 m (100 ft) from any private well, septic tank or drain field, and 60 m (200 ft) from a Holocene fault zone.	✓		
A minimum of 3 m (10 feet) separation between the basin invert and the seasonal high water table.	-	Depth to groundwater measurements from piezometer PZ-2 (6/14/02) indicate minimum 0.678 m separation between the water table and basin invert.	▪ The high water table at Basin B109 will most likely result in infiltration failure. ▪ Select alternate site that is more suitable for infiltration basin. ▪ Evaluate options/feasibility of improving infiltration capacity using engineered –infiltration wells, etc. ▪ Consider removing site from further evaluation. ▪ Consult with RWQCB for approval of location, if deemed best available location.
Soil lithologies suitable to promote infiltration beneath the proposed infiltration basin (soils have less than 40% combined clay and silt).	✓	Soil beneath the proposed infiltration basin invert and above the water table generally comprise silty sand (SM).	
The soil in the first 300 mm (12 in) below the basin invert has an organic content (OC) > 5 percent	-	Analytical data indicates an organic content percentage of 2.2, 2.9, and 2.6, for invert samples.	▪ See comment in Table 5.
The soil in the first 300 mm (12 in) below the basin invert has a pH in the range of 6 – 8.	-	Analytical data indicates a pH of 5.02, 5.75, and 5.52 for invert samples.	▪ See comment in Table 5.
The soil in the first 300 mm (12 in) below the basin invert has a cation exchange capacity (CEC) >5 meg/100 g of soil.	✓		
The proposed infiltration basin site has adequate horizontal hydraulic capacity.	✓	Three soil borings advanced at the site (B-4, B-5, and B6/PZ-2) indicate laterally continuous horizons with lithologies suitable for infiltration. However, separation between the basin invert and water table may inhibit effectiveness.	
Soil infiltration rate of > 1.3 cm/hr.	Unknown	Soil infiltration testing at proposed Basin B109 in progress at time of this report.	▪ Consider performing in-situ soil infiltration testing to estimate infiltration capacity.
Runoff quality ≥ standards for infiltration to local groundwater.	✓	Runoff monitoring data indicates runoff quality meets this criterion.	
Infiltrating groundwater does not pose an impact on stability of down gradient structures, slopes, and embankments.	✓	No downgradient structures, slopes, or embankments present.	

Based on the available field data and direct comparison to Caltrans design criteria (2002) for "non-enhanced" infiltration basin systems, the following conclusions were developed.

Basin B101 is considered suitable for infiltration providing the deficiencies identified in Table 5 can be addressed. The primary design concerns include groundwater separation from the proposed basin invert, low pH, low organic content, and lack of infiltration rate information.

Basin 109 may not be suitable for infiltration based on the minimal separation of groundwater to the proposed basin invert, 0.678 m. Engineering design options are available to improve infiltration capacity and other areas of noted potential deficiencies listed in Table 6. However, the costs to implement must be evaluated and other nearby sites may provide a more suitable location for infiltration.

8.0 References

California Department of Transportation, *Sampling and Analysis Plan, Geotechnical Investigation for Large Scale Pilot Systems, Infiltration Basins B101 and B109.* May 2002.

California Department of Transportation, *Drainage Basin B101 Layout Plan, Drawing Number 831037-3.* February 2002.

California Department of Transportation, *Draining Basin Details, Sheet D-62.* March 2002.

California Department of Transportation, *Storm Water Quality Practice Guidelines*, pp. 5-13 through 5-29, January 2002.

California Department of Transportation, Engineering Service Center. 2001. *Infiltration Summary Report* (File No. 03-ED-50 KP 115.1/118.6). January 2001.

Appendix A

Sampling and Analysis Plan

SAMPLING AND ANALYSIS PLAN

CALTRANS TAHOE BASIN GEOTECHNICAL SITE INVESTIGATION FOR LARGE SCALE PILOT SYSTEMS INFILTRATION BASINS #B101 AND #B109

Contract 43A0036 Task Order 17

Prepared for:

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
SACRAMENTO, CALIFORNIA

MAY 2002

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Appendix A Health and Safety Plan

Appendix B Field Forms

1.0 Project Overview

As part of an erosion control project along Route 50 in El Dorado County near Meyers, Caltrans is designing two large-scale pilot infiltration basins (Basins #B101 and #B109) (refer to Figure 1, Site Location Map). These projects are part of Caltrans' Lake Tahoe Large Scale Pilot Systems Project. Basin #B101 and Basin #B109 will provide enhanced storm water runoff treatment through a combination of filtration through sand, sorptive material and gravel filter media and infiltration.

This Sampling and Analysis Plan (SAP) describes the activities and procedures to be performed during a geotechnical site investigation to characterize the subsurface physical and chemical conditions (e.g. seasonal high groundwater elevation, lithology, thickness, infiltration rates, and pollution capture potential) in soils underlying the proposed basin sites. The data collected during this investigation will be compared to Caltrans' Storm Water Quality Guidelines (Caltrans, 2002) to assess the physical and chemical characteristics, as they relate to the functionality of the proposed basins. The proposed infiltration basin sites were selected for evaluation by Caltrans based on a previous infiltration investigation of the project area (PM 71.5 through PM 73.7) (Caltrans, 2001).

The rationale and methodology for review of existing groundwater and soil data, collection and analysis of soil samples, installation of piezometers, in-situ hydraulic conductivity testing, and monitoring of groundwater elevation at the proposed infiltration basins is presented below.

2.0 Scope of This Plan

This Sampling and Analysis Plan (SAP) describes a geotechnical site investigation to evaluate subsurface and groundwater conditions to identify site specific conditions that may impact the performance of infiltration basins being constructed in conjunction with the highway drainage improvements.

Based on Caltrans application and siting criteria, infiltration basins must meet the following minimum criteria:

- Minimum 3.0 m separation between the basin invert and the seasonal high groundwater elevation,
- Soil infiltration rate $\geq$1.3 cm/hr,
- Clay content <30% and/or <40% clay/silt content combined,
- Adequate horizontal hydraulic capacity,
- Runoff quality $\geq$ standards for infiltration to local groundwater,
- Infiltrated water does not pose an impact to the stability of down gradient structures, slopes, and embankments.

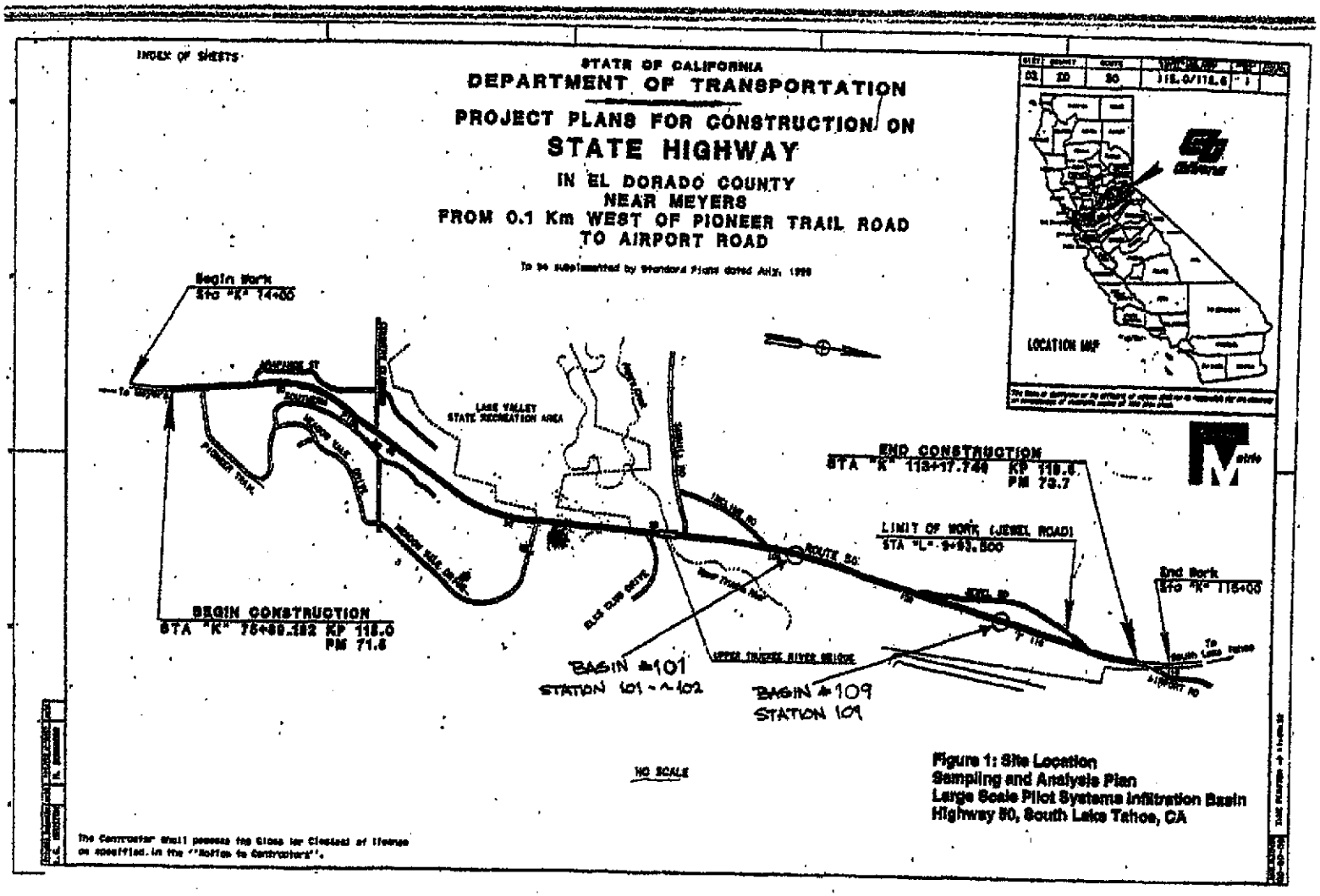


Figure 1: Site Location
Sampling and Analysis Plan
Large Scale Pilot Systems Infiltration Basin
Highway 50, South Lake Tahoe, CA

- If pretreatment is required, only approved BMP's should be considered
- Consult with RWQCB, water agencies, vector control authorities, and local utilities

The following tasks will be completed as part of this site investigation:

- Compile and review regional groundwater level data,
- Conduct a field investigation to characterize the subsurface physical and chemical conditions (e.g. seasonal high groundwater elevation, lithology, thickness, infiltration rates, and pollution capture potential)
- Analyze the collected data and prepare a report that evaluates the suitability of the infiltration basins using Caltrans' Infiltration Basin Siting and Design Criteria.

3.0 Regional Groundwater Data Review

In order to assess local subsurface conditions and local groundwater quality and hydrogeological characteristics, data will be reviewed from the following sources:

- Previously compiled databases on potential best management practices (BMP) sites (such as outfall inventory databases);
- Data and maps available from regional government databases, Department of Water Resources, other local agencies, and internal Caltrans sources;
- The Tahoe Basin Area, California and Nevada Soil Survey, 1972 (United States Department of Agriculture Soil Conservation Service and Forest Service);
- Soil lithology, infiltration rate and groundwater depth data from the El Dorado County Environmental Management department or other specialists that approve soil boring and well installations in the local area;
- Information on local government beneficial uses and groundwater quality issues from the RWQCB and other water agencies; and
- Information on local groundwater-related drinking water issues from the Department of Health Service.

The information from the sources above will be reviewed to provide an understanding of seasonal fluctuations in groundwater elevations in the area and, more specifically, to determine at what time during the year the regional seasonal high groundwater elevation occurs.

This information will then be used, in conjunction with the data collected during the field investigation, to evaluate the suitability of the proposed basing locations using the criteria presented above.

4.0 Geotechnical Field Investigation

The geotechnical field investigation will be carried out over 3 days.

- Day 1: Conduct a site walk to locate and mark the proposed boring/piezometer locations, confirm access for the drill rig, and identify site access limitations (e.g. overhead utilities or vegetation).
- Days 2 and 3: Advance six borings, install two piezometers, collect soil samples, and prepare lithological descriptions.
- Day 4: Measure water levels in each piezometer and conduct in-hole hydraulic conductivity tests.

4.1 Permitting and Utility Locating

Prior to mobilizing for the field, an approved soil boring/monitoring well permit will be obtained from the El Dorado County Environmental Management Department.

Underground Services Alert (USA) will be notified 48 hours prior to mobilizing the drill rig.

Caltrans District 3 was contacted to assess whether an encroachment permit would be needed for this work. Given the limited extent of the work and because this work is being conducted under contract to Caltrans, District 3 staff indicated that an encroachment permit would not be necessary. In addition, this investigation will be conducted adjacent to US 50 in manner not to impede traffic.

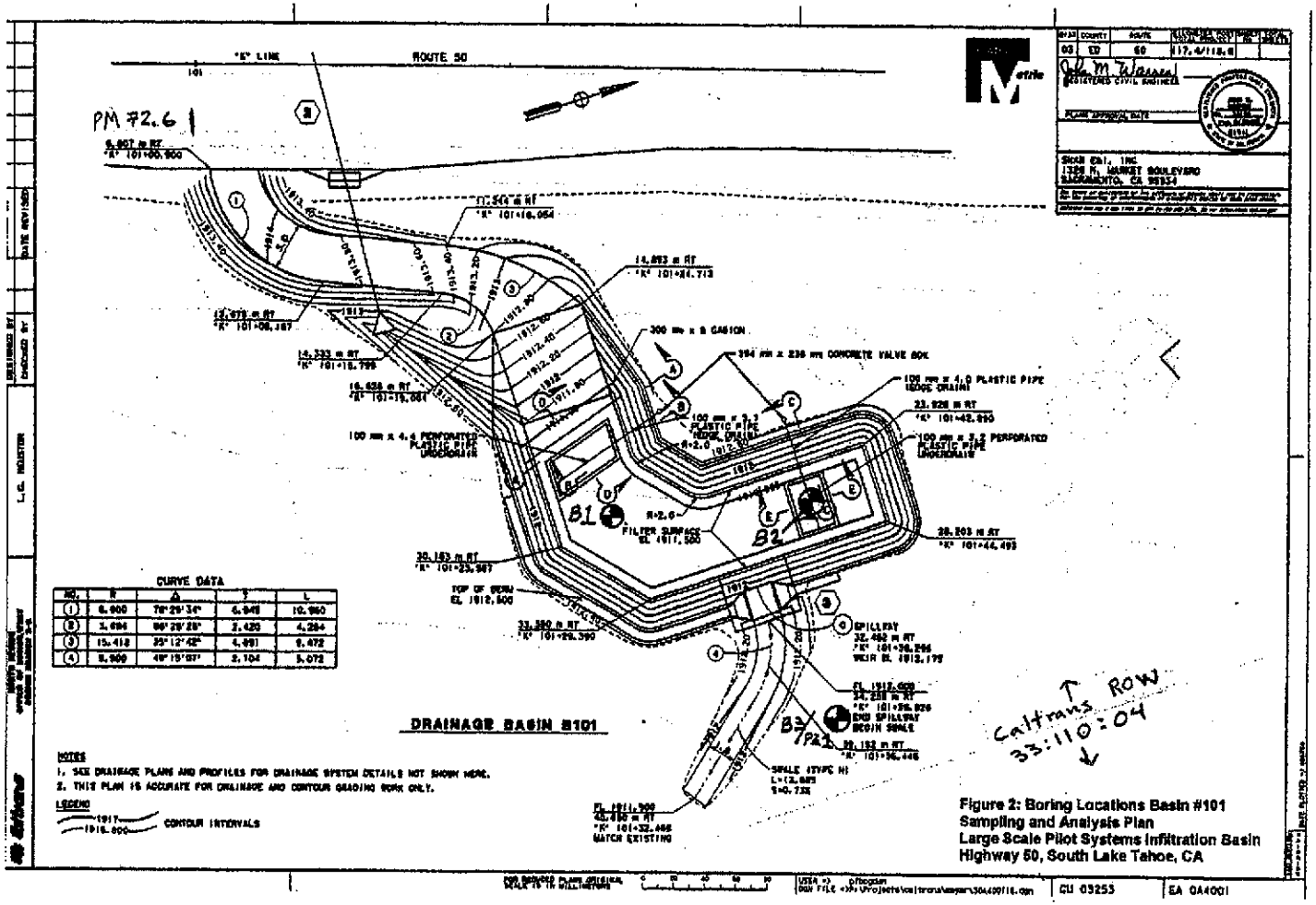
4.2 Soil Borings

Boreholes will be advanced by a driller licensed in the State of California. Onsite personnel will have participated in health and safety-training programs designed to comply with U.S. Department of Labor, OSHA, *General Industry Standards 29 CFR 1910*.29. A total of six (6) 51-mm (2-inch) diameter borings will be advanced, three each at proposed Basin #B101 and Basin #B109. Figure 2 shows the proposed location of borings B-1, B-2, and B-3 at Basin #B101. Figure 3 shows the proposed location of borings B-4, B-5, and B-6 at Basin #B109.

Four of the borings will be abandoned by filling the holes with Portland cement grout from the bottom up using a tremmie pipe. El Dorado County will be contacted to arrange for inspection and observation of this procedure. The remaining two boreholes will be used to construct the peizometers (see below).

All down-hole equipment will be decontaminated between drilling locations using a phosphate free detergent and deionized water. Decontamination water will be collected in a container for proper disposal.

The initial 1.52 m (5 ft) will be advanced using a hand auger to minimize possible damage to underground utilities. Below 1.52 m (5 ft), each boring will be continuously cored using a Geoprobe direct push rig to an approximate total depth of 10.67 m (35 feet) below ground surface (bgs), or refusal. The Geoprobe rig was selected due to the



CURVE DATA

NO.	R	Δ	T	L
1	6.900	78°29'34"	6.948	10.960
2	3.694	98°29'29"	3.420	4.284
3	15.418	25°12'42"	4.491	9.472
4	9.900	49°15'07"	3.104	5.072

Figure 2: Boring Locations Basin #101
Sampling and Analysis Plan
Large Scale Pilot Systems Infiltration Basin
Highway 50, South Lake Tahoe, CA

CU 03253 | EA 0A4001

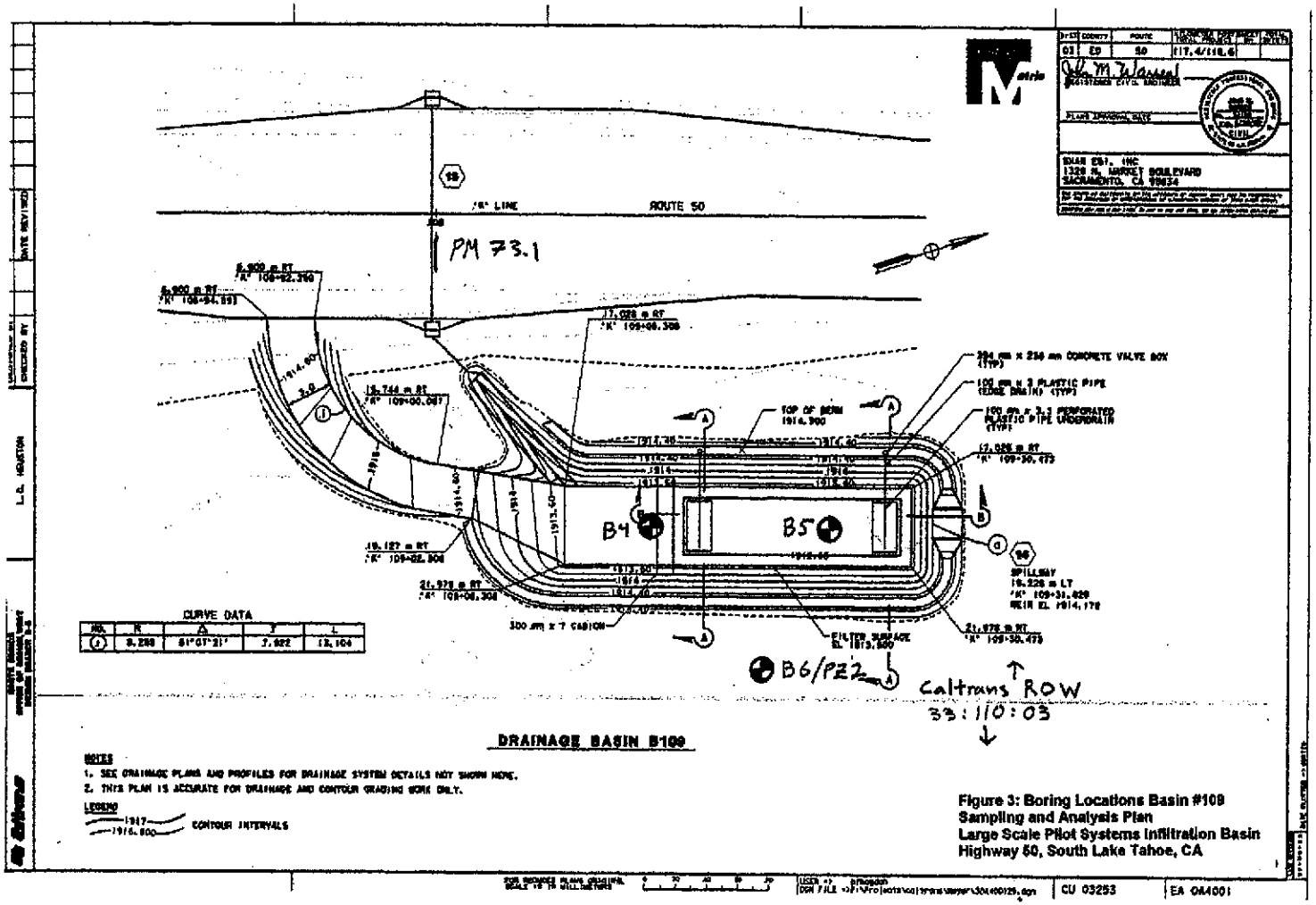


Figure 3: Boring Locations Basin #109
Sampling and Analysis Plan
Large Scale Pilot Systems Infiltration Basin
Highway 50, South Lake Tahoe, CA

limited access noted at the proposed Basin #B109. The lithology of the soil borings will be logged by a geologist and observations will be recorded on boring logs in accordance with the Unified Soil Classification System (USCS). In addition to recording lithologic thicknesses, soil type, color, grain size, moisture content, grading type, consistency, soil structures, mineralogy, and organic content, special attention will be given to identifying evidence of previous high groundwater elevation (eg. mottling, iron-oxide staining, color changes). A copy of CDM's borehole log template is attached.

4.3 Collection of Soil Samples

An 83-mm (3.25-in) diameter hand auger with a slide hammer sampling attachment will be used to collect soil samples between 0 and 1.52 m (5 ft) bgs. Below 1.52 m (5 ft), soil samples will be collected with the Geoprobe by hydraulically pushing a pre-cleaned 51-mm (2-inch) diameter core barrel equipped with acetate liners into the soil. At the desired sampling interval the liner will be cut and the ends of the tube will be covered with Teflon sheets and plastic end caps. Duct tape will then be used to secure and seal the caps to the tube. Table 1, Proposed Sample Collection Schedule and Laboratory Analysis, summarizes soil sample locations and analyses for borings B-1 through B-6.

Table 1: Proposed Sample Collection Schedule and Laboratory Analysis

Location	Boring	Surface Elevation	Basin Invert	Sample Depth (Metric)	Sample Depth (English)	Analyses
Basin # B101	B-1	1912.60 m (6275.29 ft)	1910.61 m (6268.41 ft)	2.1 m	6.9 ft	pH, OC, CEC, GSD, MC
				3.0, 4.6, 6.1, 7.6, and 9.1 m	10, 15, 20, 25, 30, and 35 ft.	GSD, MC
	B-2	1912.42 m (6274.35 ft)	1910.61 m (6268.41 ft)	1.81 m	5.94 ft	pH, OC, CEC, GSD, MC
				3.0, 4.6, 6.1, 7.6, and 9.1 m	10, 15, 20, 25, 30, and 35 ft.	GSD, MC
	B-3	1912.77 m (6275.49 ft)	1910.61 m (6268.41 ft)	2.16 m	7.1 ft	pH, OC, CEC, GSD, MC
				3.0, 4.6, 6.1, 7.6, and 9.1 m	10, 15, 20, 25, 30, and 35 ft.	GSD, MC
Basin # B109	B-4	1914.39 m (6280.82 ft)	1912.61 m (6274.97 ft)	1.78 m	5.84 ft.	pH, OC, CEC, GSD, MC
				3.0, 4.6, 6.1, 7.6, and 9.1 m	10, 15, 20, 25, 30, and 35 ft.	GSD, MC
	B-5	1914.37 m (6280.74 ft)	1912.61 m (6274.97 ft)	1.76 m	5.77 ft	pH, OC, CEC, GSD, MC
				3.0, 4.6, 6.1, 7.6, and 9.1 m	10, 15, 20, 25, 30, and 35 ft.	GSD, MC
	B-6	1914.37 m (6280.74 ft)	1912.61 m (6274.97 ft)	1.76 m	5.77 ft	pH, OC, CEC, GSD, MC
				3.0, 4.6, 6.1, 7.6, and 9.1 m	10, 15, 20, 25, 30, and 35 ft.	GSD, MC

OC = Organic Content
CEC = Cation Exchange Capacity
GSD = Grain Size Distribution
MC = Moisture Content

Each sample will be labeled with the following information: sample identification (ID), date, time, site name, and sampler's initials. Relevant observations will be noted in a field logbook. Sample IDs will be based on a job identification number (35901), the borehole identification number, the starting depth of the sample, and the date sampled. For example, a 150 mm (6-inch) soil sample collected at exploration point B1 at a depth interval of 1.52 m to 1.68 m on June 10, 2002 will be assigned a sample ID of 35901-B1-1.52-061002. Samples will be stored in coolers with ice then transported to the laboratory under proper chain-of-custody documentation.

4.4 Piezometer Installation

A total of two (2) piezometers will be constructed, one at each basin location as shown in Figure 2. The peizometers will be located adjacent to the basin locations to eliminate the need to modify or move the peizometers when the basins are constructed. Table 2, Piezometer Construction Details, summarizes the piezometer identification, location, and targeted construction details. Each piezometer will be completed to an approximate depth of 10.67 m (35 feet) bgs with a screen interval from approximately 3.05 – 10.67 m (10 to 35 feet) bgs, depending on the depth of groundwater encountered during drilling. Screening will be installed such that it extends approximately 1.5 m (5 feet) above the observed groundwater level. The piezometers will be constructed of 25-mm (1-in) diameter, schedule-40 PVC, with a 0.05 mm (0.02 inch) slot size, and an above grade stick-up type monument completion in accordance with El Dorado County requirements. From 0.30 m (1 ft) below grade to 4 feet above the screen interval, the annulus will be filled with Portland cement grout. From 4 feet to 2 feet above the screen the annulus will be filled with a bentonite seal. From 2 feet above the screen to the bottom of the screen, the annulus will be filled with #3 Lone Star sand or equivalent.

Table 2: Piezometer Construction Details[1]

Piezometer ID	Boring ID	Total Depth	Screen Interval	Slot Size	Cement Seal Interval	Bentonite Seal	Filter Pack
PZ-1	B-3	10.67 m (35.0 ft)	3.05 – 10.67 m (10 – 35 ft)	0.50 mm (0.02 in)	0.30 – 1.8 m (1 – 6 ft)	1.8 – 2.4 m (6 – 8 ft)	2.4 – 10.67m (8 – 35 ft)
PZ-2	B-6	10.67 m (35.0 ft)	3.05 – 10.67 m (10 – 35 ft)	0.50 mm (0.02 in)	0.30 – 1.8 m (1 – 6 ft)	1.8 – 2.4 m (6 – 8 ft)	2.4 – 10.67 m (8 – 35 ft)

[1] Depths are based on estimated groundwater levels. Actual depth intervals will be recorded on a well construction log and included with the final project report.

4.5 In-Situ Hydraulic Conductivity Testing

An in-situ evaluation of the hydraulic conductivity will be conducted at each of the two peizometer locations. The Bauer and Rice Slug Test permits the measurement of saturated hydraulic conductivity (K) of aquifer materials with a single well. The method consists of quickly lowering or raising the water level in the well and measuring its

subsequent rate of rise or fall, respectively (Bouwer, 1989). Hydraulic conductivity is then calculated using the Thiem equation:

$$Q = 2\pi KL_e(y/\ln(R_e/r_w))$$

4.6 Groundwater Elevation Monitoring

During drilling the depth at which groundwater is first encountered will be recorded on the boring log. Immediately after each piezometer is installed, an electronic water level meter will be used to measure the depth to groundwater. The north edge of the top of the PVC piezometer casing will be used as a reference point. The water level will be measured again, 24 hours subsequent to the first water level measurement.

Groundwater level monitoring will be conducted on a bi-weekly basis for up to 4 months to characterize changes in water table elevation at the sites.

4.7 Waste Handling

Less than five (5) cubic feet of drill cuttings are expected to be generated during this investigation. The cuttings will be containerized in a labeled 55-gallon drum and stored onsite pending laboratory analysis for proper disposal. A composite sample representative of all material in the drums will be collected and submitted to the laboratory for analysis of Total Petroleum Hydrocarbons (TPH) per EPA Method 8015, Volatile Organics per EPA Method 8240, and a TCLP analysis for RCRA metals. These analyses are in accordance with the procedures for soil disposal at Nevada Thermal Services in Sparks, Nevada. Should we use Title 22 Metals as this is in CA? I'm not sure how this works up your way, just want to make sure that El Dorado will accept this approach.

5.0 Laboratory Analysis

Soil samples will be collected and shipped under proper chain-of-custody procedures to CDM's soils laboratory in Denver, Colorado for analysis, as summarized in Table 1. In order to assess pollutant capture potential in each of the proposed basins, one soil sample from each boring will be collected from a 300 mm (12 inch) interval, immediately below the proposed basin invert depth. The samples will be analyzed for Organic Content (OC), pH, and Cation Exchange Capacity (CEC), Grain Size Distribution (GSD), and Moisture Content (MC).

Below the basin invert elevation, soil samples will be collected every 1.52 m (5 feet) and submitted for GSD and MC analysis. Actual depths of the samples for grain size analysis will be determined in the field, and selected based on representative soil horizons.

6.0 Quality Assurance and Quality Control

Quality assurance/quality control (QA/QC) duplicate samples allow a check on analytical reproducibility. Laboratory duplicate samples will be analyzed at a frequency greater than one per every ten samples. For this project the samples collected

at the basin invert elevations will be split in the Laboratory and analyzed as duplicates. No special sampling considerations are required for sample laboratory duplicates. However, double the normal volume must be collected and laboratory duplicate analysis requested on the chain-of-custody form.

When the laboratory reports are received the reported data will be checked as possible to identify errors committed in sampling, analysis or reporting. The laboratory must report results in a timely fashion (typically within 30 days of receipt of the samples) and the results will then be reviewed immediately upon receipt. This may allow for re-analysis of questionable results. The data screening will include the following checks:

- ✓ Completeness. The chain of custody forms should be checked to ensure that all laboratory analyses specified in the sampling plan were requested. The laboratory reports should also be checked to ensure that all laboratory analyses are performed as specified on the chain of custody forms, including the requested QA/QC analyses.
- ✓ Holding Time. The lab reports should be checked to verify that all analyses were performed within the prescribed holding times.
- ✓ Reporting Errors. On occasion laboratories commit typographical errors or send incomplete results. Results that appear out of range or inconsistent are indicators of potential laboratory reporting problems, and will be investigated when detected.

Irregularities found in the data screening will immediately be reported to the laboratory for clarification or correction. This process can identify and correct errors that would otherwise cause problems further along in the data evaluation process, or in subsequent uses of the data for higher-level analysis. When appropriate, reanalysis of out-of-range values can increase confidence in the integrity of questionable data.

7.0 Data Management and Reporting

Following completion of field activities and receipt of analytical results, a technical memorandum will be prepared and submitted. The report will include the following information:

- Overview of field activities;
- Site map documenting sample locations;
- Table, cross-section, and map summaries of soil quality data;
- Results of the geotechnical data evaluation;
- Comparison of actual site conditions relative to minimum Caltrans siting criteria for infiltration basins;
- Chain-of-custody documentation and laboratory analytical reports; and

- Borehole/piezometer construction logs.

The technical memo will include a Summary and Conclusions section providing an assessment of how well each infiltration basin is expected to perform under the observed subsurface conditions specific to each site.

8.0 Health and Safety

Health and safety procedures have been established for the project and must be followed at all times. These procedures are presented in the document, *Caltrans Geotechnical Site Investigation for Large Scale Pilot Systems Health and Safety Plan*. A copy of the plan is located in Appendix A. Each field team member will receive a copy to review prior to the start of the monitoring project. A copy of this plan will be present on site during the field-work.

References

California Department of Transportation Engineering Service Center. 2001. Infiltration Summary Report (File No. 03-ED-50 KP 115.1/118.6). January 2001.

California Department of Transportation, Storm Water Quality Practice Guidelines, pp. 5-13 through 5-29, January 2002,.

Bouwer, H. 1989. The Bouwer and Rice Slug Test - An Update. In Groundwater, Vol 27, No. 3. May-June 1989.

Caltrans
Tahoe Basin
Geotechnical Site Investigation for Large Scale Pilot Systems

Health and Safety Plan

May 2002

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Section 1
Introduction

This Health and Safety Plan (HSP) identifies the health and safety procedures for work to be conducted for the Caltrans Tahoe Basin Geotechnical Site Investigation for Large Scale Pilot System Infiltration Basins. This includes advancing (6) soil borings, installing (2) piezometers, logging soil borings, procuring samples, storage and handling of soil boring cuttings, and utility clearance. Implementation of this plan is the responsibility of the CDM Project Managers. The Site Safety Officer assists the CDM Project Managers in carrying out this responsibility at the work site by enforcing the requirements of the Health and Safety Plan and by the authority to suspend work to protect worker health and safety. Either the Site Safety Officer or the Corporate Health and Safety Officer may suspend or limit work, or direct changes in work practices, if the HSP and/or work practices used are deemed inadequate.

This HSP may not be used for work other than that described in Section 4.0. It may not be modified or used beyond the effective date shown in the title page without the written approval of the Corporate Health and Safety Officer.

This plan is to be followed by all CDM personnel and CDM's subcontractors who will be participating in the monitoring program. All personnel included in the monitoring program shall be responsible for reading this plan and following its procedures.

CDM and CDM's subcontractors will share responsibility for providing health and safety management. This includes joint planning, management, site control, reporting and problem solving. Each employer is also responsible for its employees in accordance with the employer's own health and safety policies.

Section 2
Project Health and Safety Personnel

Project and Safety Personnel

This section identifies key project health and safety personnel involved in the Caltrans Tahoe Basin Geotechnical Site Investigation for Large Scale Pilot System Infiltration Basins. This outline presents the names, titles, and specific responsibilities of these individuals in terms of project health and safety.

Personnel

Title	Name and Number	
Corporate Health and Safety Officer	Chris Marlowe	(908) 225-7000 (800) 313-5593

Responsibilities

- Overall health and safety advisor.
- Interface with CDM personnel, subcontractors and Caltrans' project managers in matters of health and safety.
- Review, approve or disapprove project Health and Safety Plans.
- Monitor compliance with Health and Safety Plans.

Title	Name and Number	
Study Project Manager	Tom Quasebarth	(916) 567-9900

Responsibilities

- Assure that the project is performed in a manner consistent with the CDM Health and Safety Program.
- Assure that the project Health and Safety Plan is prepared, approved, and properly implemented.
- Implement Health and Safety Plan.
- Assure that adequate project resources are allocated to fully implement the project HSP.

- Assure compliance with the Health and Safety Plan by contractor personnel.
- Coordinate with the Corporate Health and Safety Officer on Health and Safety matters.

Title	Name	Number
Site Safety Officers	Stefan Schuster	(775) 588-0201 (o), (916) 708-3754 (c)
	Tim Boyer	(775) 588-0201 (o), (775) 690-9340 (c)

Responsibilities

- Direct health and safety activities on-site.
- Report all safety-related incident or accidents to the Corporate Health and Safety Officer and project manager.
- Assist project manager in all aspects of implementing Health and Safety Plan.
- Maintain health and safety equipment on-site.
- Implement emergency procedures as required.
- Conduct health and safety investigations and briefings as needed.

Section 3
Site Information

The proposed investigation will be conducted along the eastbound right of way of U.S. Highway 50 between KP 115.1 (PM 71.5) and KP 118.6 (PM 73.7). Highway 50 along this section consists mostly of a two-lane roadway paved with asphalt. The proposed basins are located in El Dorado County, California, between the cities of Meyers and South Lake Tahoe. Infiltration Basin #1 is located east of the intersection of Incline Road and Highway 50 along the eastbound dirt shoulder and old highway pavement. Infiltration Basin #2 is located east of the intersection of Jewel Road and Highway 50 along the eastbound semi vegetated shoulder. Numerous commercial and residential properties border the highway. Refer to Attachment 1, Figure 1, Site Vicinity Map.

Section 4
Work Activities Covered by Health and Safety Plan

The objective of the geotechnical study is to further characterize soil and groundwater conditions at the infiltration basins (e.g., seasonal high groundwater elevation, lithology of soils beneath the basins, and infiltration rates of soils underlying the two sites). The proposed investigation will be carried out over 3 days.

- **Day 1:** Conduct a site walk to locate and mark the proposed boring/piezometer locations, confirm access for the drill rig, and identify site access limitations (e.g. overhead utilities or vegetation).

- **Days 2 & 3:** Advance (6) soil borings, install (2) piezometers, and collect soil samples.

- **Day 4:** Measure water levels in each piezometer and conduct in-hole conductivity tests.

Field activities at the two infiltration basins will include advancing (6) soil borings to a total depth of 9.1 m (35 ft.) or refusal, logging soil boring lithology, collecting soil samples at depth intervals, installing (2) piezometers to a total depth of 9.1 m (35 ft.), conducting in-hole conductivity tests, measuring water levels in each piezometers, and containment of soil boring cuttings.

Section 5
Hazard Assessment

The hazards associated with field work performed at the proposed infiltration basins include: (1) being involved in a vehicle accident while driving to or from a site, (2) being struck by a vehicle while working at a site, (3) injury from operating mechanical equipment associated with the geoprobe rig, (4) experiencing cold and heat stress, (5) altitude sickness due to dehydration, (6) slips, trips, and falls, (7) muscle strains from lifting and moving heavy objects, and (8) possible exposure to hazardous materials or vapors discovered in subsurface soils. CDM staff and CDM subcontractors will maintain the sampling and monitoring equipment at both sites.

5.1 Chemical Hazards

Although the two proposed infiltration basins are not known to contain hazardous materials, there is a potential for hazardous gaseous and/or liquid contaminants to be present as the result of spills and/or illicit dumping. The presence of chemicals and/or chemical vapors may result in (but is not limited to) one or more of the following threats: toxic conditions, oxygen displacement and explosion and/or fire. The risks associated with these threats include poisoning (acute and/or chronic), asphyxiation, and bodily injury.

5.2 Physical Hazards

5.2.1 Vehicle Traffic

Traffic hazards will be encountered when working at the side of or near a roadway. These hazards will be increased during times of reduced visibility such as during storm events and at night. The primary threats associated with working in or alongside roadways are workers being struck by passing vehicles or being involved in a vehicular collision. The risk associated with these threats is severe bodily injury and/or death. No work will be performed during snowstorms due to the high risks associated with poor visibility, slippery roads, and snow management activities.

5.2.2 Equipment Operation

Personnel working around the geoprobe rig should always be aware of moving and operating equipment associated with drilling. Associated hazards include: mobilizing drill rig, raising and lowering mast, moving cables and belts, operating hydraulic motors, retooling rig with heavy sampling gear to collect soil samples, and loud noise associated with drilling. The risk associated with these threats is severe bodily injury and/or death, and reduced hearing.

5.2.3 Environmental

Hazards associated with the outside environment will be encountered when working at the sites. The primary threat associated with working outside is cold temperatures. These hazards will increase during times of freezing or near freezing temperatures, and rainy and snowy conditions. In addition, altitude sickness due to dehydration may be of concern. The threats associated with these hazards are developing hypothermia, frostbite, dizziness, and headaches. The risk associated with these threats is decrease in mental capacity, bodily injury and/or death.

5.2.4 Heavy Equipment and Supplies

Crew members working at the sites must be aware of lifting and moving heavy equipment and supplies. Proper lifting techniques must be used to move objects. If objects are to heavy to lift and move, utilize additional staff or use proper lifting equipment. While moving equipment around the site, personnel should be aware of uneven surfaces to avoid trips, slips, and falls. The risk associated with these threats is muscle strains and injuries, and broken bones.

5.3 Biological Hazards

Rodents, pathogenic microorganisms, and viruses are potential biological hazards of concern. In addition, a potential exists for contact with squirrels and mice that carry and transmit the plague and hanta virus. The primary threats associated with these hazards are receiving bites and/or contracting disease. The threats associated with these hazards include flesh wounds and/or infections (acute and/or chronic), and possible death.

Section 6
General Health and Safety Requirements

6.1 Employee Clearance

Active health and safety clearance will consist of a 40-hour HAZWOPER course and a current annual 8-hour refresher course. All field personnel involved in the field investigation activities must receive training from the Site Safety Officer before conducting field work.

6.2 Site Safety Meetings

All personnel assigned to perform the work described in this HSP must be (1) given a personal copy of this HSP by a Site Safety Officer, (2) briefed on the health and safety requirements of this HSP by a Site Safety Officer, and (3) must acknowledge receipt of and willingness to comply with the provisions of the plan by signing the Employee Acknowledgment located in Attachment 2. Individuals refusing to sign the agreement will not be permitted to conduct field work for this project. Completed agreements shall be provided to the CDM Project Manager, who will file them with the Project Health and Safety Officer. It is expected that site safety meetings be conducted on two occasions: (1) at a project kick-off meeting to discuss the overall program and (2) just after mobilizing to a new site location for sampling. Additional briefings should be scheduled and conducted by the Site Safety Officer as needed.

6.3 Incident Reporting

6.3.1 Purpose

All health and safety incidents shall be reported to CDM management and health and safety staff immediately. The prompt investigation and reporting of incidents will reduce the risk of future incidents, better protect all employees, and reduce CDM liability.

6.3.2 Definitions

A health and safety incident is any event listed below:

- Illness resulting from chemical exposure or suspected chemical exposure.
- Physical injury, including both those that do and do not require medical attention to CDM employees or CDM subcontractors.
- Fire, explosions, and flashes resulting from activities performed by CDM and its subcontractors.
- Property damage resulting from activities performed by CDM and its subcontractors.
- Vehicular accidents occurring on-site, while traveling to and from client locations, or with any company-owned vehicle.

- Infractions of safety rules and requirements.
- Uncontrolled chemical exposures.
- Complaints from the public regarding CDM field operations.

6.3.3 Reporting Procedures

Reporting Format

Incident reports shall be prepared by completing an Incident Report Form. This form may be obtained from any CDM Health and Safety Officer and is located in Attachment 2.

Responsible Party

Reports of incidents occurring in the field shall be prepared by the Site Safety Officer or, in the absence of the Site Safety Officer, the supervising field engineer, witness, or injured/exposed individual.

Filing

A report must be submitted to the Health and Safety Officer of the Operating Unit to which the CDM Project Manager belongs within 24 hours of each incident involving medical treatment. In turn, the Health and Safety Officer must distribute copies of the report to the Corporate Health and Safety Officer. When an injury or illness is reported, the Health and Safety Officer must deliver a copy of the report to the individual in charge of Human Resources so that a Worker's Compensation Insurance Report can be filed if necessary. Human Resources must receive reports within 48 hours of each qualifying incident.

Major Incidents

Incidents that include fatalities, hospitalization of employees or subcontractors, or involve injury/illness of the public shall be reported to the Health and Safety Officer and CDM Project Manager as soon as possible after emergency authorities (e.g. ambulance) are contacted. Any contact with the media should be referred to the CDM Project Manager and Operating Unit Manager.

6.4 Prohibited On-site Activities

The following are prohibited on-site activities: (1) conducting site investigations without clearance from the Site Safety Officer, (3) eating and drinking without prior decontamination (e.g., washing hands and face), and (4) smoking. Violations of these prohibitions will result in dismissal from the field crew.

Section 7
Site Specific Health and Safety Requirements

7.1 Special Training

All personnel working in the field shall be required to have their 40-hour HAZWOPER training and current 8 hour annual HAZWOPER refresher. No confined space entry will be performed during this investigation.

7.2 Physical Hazards

Work site and traffic controls will be established at each site. Field crews will use traffic control cones, warning signs, and vehicles to develop work zones and site control at sites where the safety of crews and the public may be threatened. An example of this would be the use of traffic cones to direct pedestrians away from the work zone. Site specific protocols for proper vehicle and traffic safety in relation to a given site are provided in Attachment 3. Actual field conditions may require modification of the directions. Modifications, if any, will be made by the Site Safety Officer who will then inform the Project Health and Safety Officer.

Traffic hazards pose the greatest risk to workers. Traffic hazards to both workers and motorists must be minimized at each site. Standard traffic control measures that can be used to reduce traffic hazards are described below. However, sites may be located in areas where standard traffic measures may not be applicable. In these cases, standard control measures will be modified to meet a given situation.

Warning signs (i.e., Shoulder Work Ahead) shall be erected on the roadway or shoulder and shall be removed upon termination of work. Portable signs shall be erected vertically, with the bottom of the sign a minimum of 18 inches above the roadway. Portable signs shall be illuminated at night and/or be accompanied by a flashing yellow light. Traffic cones or pylons shall be placed on the roadway to divert traffic away from work zones. These cones must have reflective striping in order to be visible at night.

Employees should not rely on traffic warning devices, like cones or saw-horses, for protection against oncoming traffic. CDM encourages workers to place one or more vehicles between them and the direction from which traffic flows.

7.3 Hazardous Materials Identification and Protection

Subsurface soils encountered during drilling have a potential to contain hazardous materials and/or microorganisms and should be approached with caution. All soil boring cuttings will be stored in 55-gallon drums, labeled, and stored onsite until analytical tests have been performed.

Commercial areas are of particular concern because of the possibility of illegal dumping of wastes. Any unusual smells and/or discolored soil samples are a cause for alarm. The following procedures are recommended to help protect field personnel from these hazards:

- If field crews detect or suspect any dangerous situations they must notify the Site Safety Officer of their intended protective procedures.

- Field personnel should wear chemically resistant gloves when handling soil samples. It is important to realize that soils impacted by dangerous constituents due to illegal dumping sites may be encountered. Crew members who come into contact with soil samples must decontaminate. This is especially important prior to eating, drinking or smoking. All personnel must also decontaminate before leaving the site. Proper decontamination techniques will ensure that contamination will not spread to vehicles or other locations. Decontamination should include disposal of gloves and washing the hands and face with soap and water. Each crew shall carry 5-gallon containers containing wash/drinking water. Crew members must be careful to not contaminate the container.

It is very important to notify all members of the field crew when hazardous situations are encountered. In general, the notification process will consist of notifying the Site Safety Officer. This individual, will in turn, notify higher levels of CDM management. However, if the Site Safety Officer is not available the CDM Project Manager must be contacted.

7.4 Biological Hazards

Field crews must protect themselves from biological hazards they may be exposed to during field activities. Bacteria and other micro-organisms may potentially be present in collected soil samples. Crews should protect themselves by using disposable nitrile or latex gloves when handling soil samples. There is also the possibility of exposure to either wild or domestic animals. In particular, crews should avoid squirrels and mice that could carry the plague or the hanta virus. Insects may pose some concern for personnel who are allergic to bites or stings, especially from yellow jackets and wasps. No poisonous reptiles or plants are present in the Lake Tahoe Basin.

7.5 Environmental Hazards

Field crews must protect themselves from hazards associated with environmental conditions, such as cold temperatures, rain and snow, and altitude sickness. When working during periods of cold temperatures (below 10 degrees Centigrade), crew members should dress in layers of warm clothing, avoid keeping their hands and head exposed for long periods of time, minimize the time spent outside of protected areas. At the first signs of becoming very cold, crewmembers should seek shelter until their body temperature returns to near normal. When working during periods of rain and snow, crewmembers should wear waterproof clothing and boots. Altitude sickness is also of concern. Crew members should drink plenty of liquids to stay hydrated to prevent altitude sickness

7.6 Personal Protective Equipment

Protective equipment shall be used and shall consist of the following:

- Hardhat
- Reflective safety vest
- Steel toed boots
- Rain Gear (when needed)
- Cold weather gear such as hat, gloves, boots, coat, pants (when needed)
- Nitrile or latex gloves
- Safety glasses

In addition, a first aid kit and fire extinguisher will be present in each vehicle. It is the responsibility of field crew leaders to ensure vehicles have a first aid kit and fire extinguisher before entering the field.

Section 8
Emergency Response Procedures and Location of Nearest Hospitals and Fire Departments

In the event of an injury, illness, or accident that may require the attention of a physician, the Site Safety Officer(s) must be notified immediately. In the event of emergency, the CDM Task Order Manager and the CDM Project Corporate Health and Safety Officer will also be notified immediately:

- CDM Task Order Managers: Tom Quasebarth (916) 567-9900
- CDM Corporate H&S Officer: Chris Marlowe (732) 225 - 7042 x 332 (phone)
  (800) 313 - 5593 (pager)

If a person(s) is transported to a medical facility, the location of this facility must be given to the Site Safety Officer. In emergency situations, field personnel should call 911 for an emergency response team. All CDM employees and subcontractors must be familiar with the location of and route to the nearest hospital. Location maps and routes to local hospitals and fire departments are provided in Attachment 1, Figure 4, and must be carried in the field vehicle at all times.

Table 8-1
Site and Hospital Locations

Site	*Hospital Location*	*Phone Number*	*Fire Department Location*	*Phone Number*
Infiltration Basin #1	Barton Memorial Hospital 2170 South Avenue South Lake Tahoe (corner of South & 3rd)	(530) 541-3420	2101 Lake Tahoe Blvd. (Highway 50) South Lake Tahoe	911
Infiltration Basin #2				

Attachment 1
Site Vicinity Map,
Locations of Local Fire Departments and Hospitals

Figure 1, Site Vicinity Map of Infiltration Basins

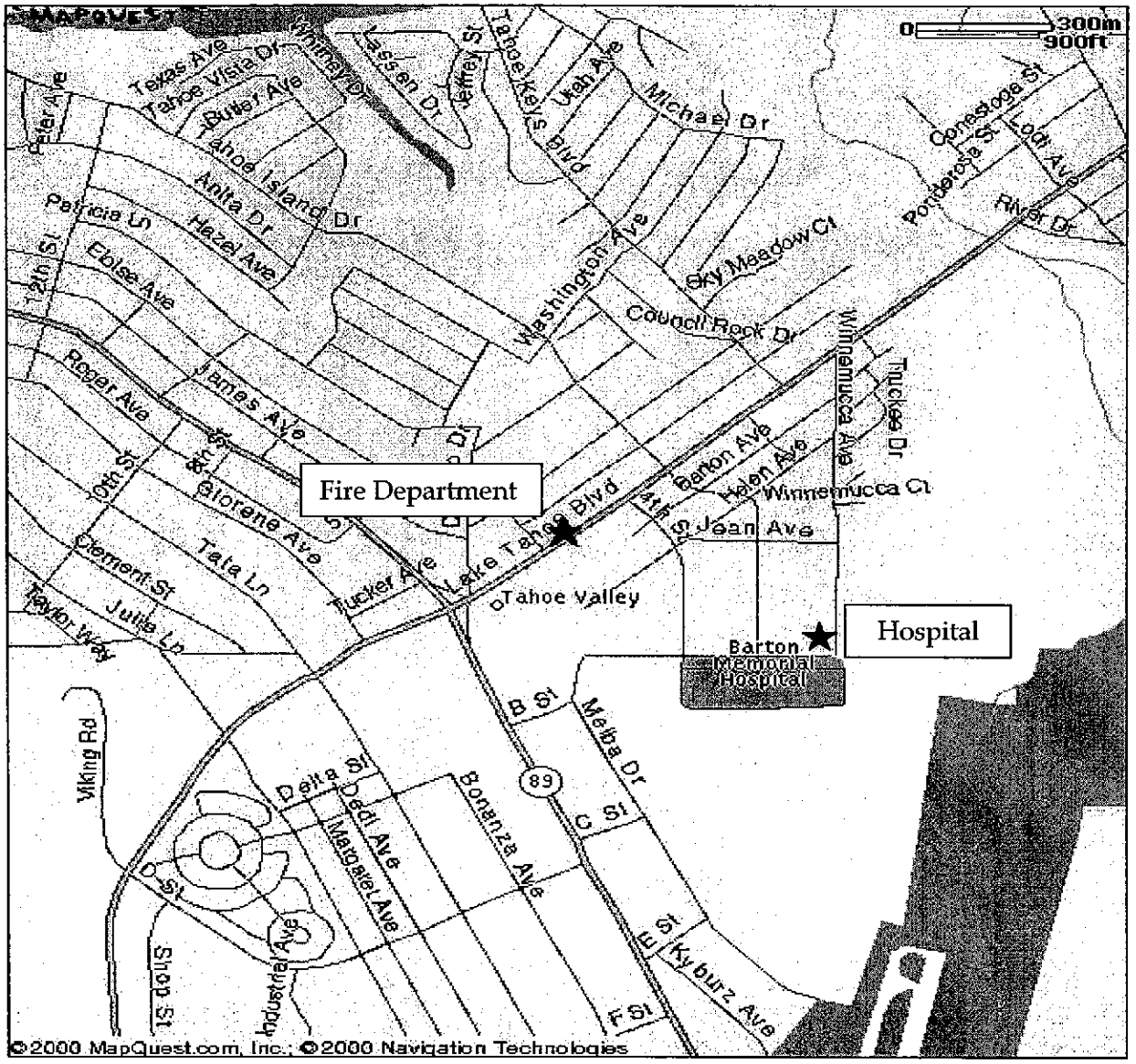

Figure 2, Location of Hospital and Fire Department

Attachment 2
Employee Acknowledgement
Injury / Illness Report

Employee Acknowledgment

(Please sign, detach and return to CDM Project Manager)

I hereby certify that I have read and understand the safety and health guidelines contained in Caltrans Tahoe Basin Geotechnical Soil Investigation for Large Scale Pilot Systems Health and Safety Plan.

Employee Name

Signature Date

In case of emergency, please contact:

1.

Name Relationship Phone Number

2.

Name Relationship Phone Number

Received by:

Site Safety Officer

Signature Date

CDM Employee Injury or Exposure Incident Report

EMPLOYEE DATA:

Name _____ Business Unit _____

Address _____ Office Location _____

_____ Occupation _____

Home Phone _____ Marital Status _____

Soc. Sec. # _____ Date of Hire _____

Birth Date _____ Date of Report _____

INJURY/ILLNESS INFORMATION:

Location of Incident **Office** **Field** **Public Space** **Plant**

Site Name and Address _____

_____

Operation in Process _____

INCIDENT TYPE: Exposure ( ) Injury ( )

Possible Exposure ( ) Near Miss ( )

Date of Incident: _____

Time of Incident: _____

SOURCE OF HAZARD OR HARM *(e.g. Machine, Auger, Car, Chemical Substance)*

_____

INJURED OBJECT OR BODY PART *(e.g. Arm, Leg, Lungs, Shoe, Crew Vehicle)*

_____

NATURE OF LOSS *(e.g. Cut, Burn, Fracture, Headache, Property Damage*

_____

DESCRIBE HOW INJURY/ILLNESS OCCURRED *(e.g. Struck by…Fell from…Exposed to…)*

_____

_____

_____

_____

SITE CONDITIONS AT TIME INCIDENT:

Temperature _____ Humidity _____

Wind Speed & Direction _____ Cloud Cover _____

Precipitation _____ Other _____

Physician Name and Address **Hospital Name and Address**

_____

_____

_____

MEDICAL CARE RECEIVED *(when, where, by whom):*

PHYSICIAN'S COMMENTS: *(Attach Physicians' Report(s), if any).*

HAS INCIDIENT RESULTED IN:

Loss of Work Time	( )	*If Yes, Enter Below (Actual or Anticipated):*	
Number of Days Lost		*Date of Return to Work*	_____
Death	( )	Permanent Disability	( )
Temporary Disability	( )	Property Damage	( )
Other Type of Loss	( )	Explain:	_____

HEALTH AND SAFETY ISSURES (If applicable)

MATERIALS EXPOSED TO *(chemical compound name, physical state, etc.):*

OTHER INDIVIDUAL(S) INVOLVED OR AFFECTED:

WITNESSES TO THE INCIDENT:

WAS OPERATION SUBJECT TO AN APPROVED SAFETY PLAN OR PERMIT?

YES ( ) Reference _____

NO ( ) Explain _____

WAS INJURY/ILLNESS/EXPOSURE DUE TO FAILURE OF PROTECTIVE EQUIPMENT?

YES ( ) NO ( ) Explain _____

_____

POSSIBLE CAUSES OF INJURY OR EXPOSURE:

HAS HSM BEEN NOTIFIED? NO ( ) YES ( )

_____ _____

Employee Signature **Date**

HSM COMMENTS:

ACTION REQUIRED:

Attachment 3
Site Specific
Safety Information Sheets

CDM Site Safety Inspection

Project: Tahoe Basin Geotechnical Soil Investigation for Large Scale Pilot Systems
Location: Highway 50 Tahoe Airport
Infiltration Basin # 1

Activities

Conduct geotechnical soils investigation for large-scale pilot systems. Advance (3) soil borings to a depth of 9.1 m (35 ft.). Collect soil samples from depth intervals and submit for laboratory analysis. Install (1) piezometer to a depth of 9.1 m (35 ft.), and measure groundwater levels to assess hydrologic conditions.

Site Description

Parking – The site investigation will be conducted on Highway 50 along right of way. Parking is available on old Highway 50 pavement and dirt shoulder.

Facility – Infiltration basin # 1 is proposed within the Caltrans Hwy 50 right-of-way (ROW). The site is located on the eastbound side of highway.

Safety Hazards

1. Traffic traveling along Highway 50.
2. Entering and exiting the site along the highway.
3. Public access corridor.
4. Small rodents such as squirrels and mice carrying the plague and hanta virus.

Recommendations

1. Field crews need to keep aware of traffic traveling at high speeds along Highway 50 when entering and exiting the site.
2. Crews should stay as far away from the active traffic lanes on Highway 50 while visiting the site.
3. Crews need to delineate work zones with cones, flagging, and signs to keep public off site.
4. Do not confront or feed wild animals.
5. Always wear hardhats, steel toed boots and safety vests

CDM Site Safety Inspection

Project: Tahoe Basin Geotechnical Soil Investigation for Large Scale Pilot Systems
Location: Highway 50 Tahoe Airport
Infiltration Basin # 2

Activities

Conduct geotechnical soils investigation for large-scale pilot systems. Advance (3) soil borings to a depth of 9.1 m (35 ft.). Collect soil samples from depth intervals and submit for laboratory analysis. Install (1) piezometer to a depth of 9.1 m (35 ft.), and measure groundwater levels to assess hydrologic conditions.

Site Description

Parking – The site investigation will be conducted on Highway 50 along right of way. Parking is available along dirt shoulder.

Facility – Infiltration basin # 2 is proposed within the Caltrans Hwy 50 right-of-way (ROW). The site is located on the eastbound side of highway.

Safety Hazards

1. Traffic traveling along Highway 50.
2. Entering and exiting the site along the highway.
3. Public access corridor.
4. Small rodents such as squirrels and mice carrying the plague and hanta virus.

Recommendations

1. Field crews need to keep aware of traffic traveling at high speeds along Highway 50 when entering and exiting the site.
2. Crews should stay as far away from the active traffic lanes on Highway 50 while visiting the site.
3. Crews need to delineate work zones with cones, flagging, and signs to keep public off site.
4. Do not confront or feed wild animals.
5. Always wear hardhats, steel toed boots and safety vests.

Appendix A

Health and Safety Plan

Appendix B

Field Forms

CAMP DRESSER & McKEE

CDM

7025 Longley Lane, Ste 20
Reno, NV 89511

Sheet 1 of

MONITORING WELL DETAIL

Location ID:

Client:
Project Location:

Project Name:
Project Number:

Drilling Contractor:
Drilling Method/Rig:
Drillers:
Drilling Date: Start: End:
Borehole Coordinates:
N E
Development Date: Start: End:

Casing Elevation (ft.):
Total Depth (ft.):
Depth to Initial Water Level (ft. BGS):
Development Method:
Field Screening Instrument:
Logged By:
Top of Riser Elevation (ft.):

Sample Type	Sample Number	Field Instrument Reading (ppm)	Blows per 6 Inches	Sample Recovery (in.)	Stratum Designation	Depth (ft.)	Material Description

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger
AR - Air Rotary
HRT - Hand Tube Rotary
GP/DP - Geoprobe/Direct Push
MR - Mud Rotary
RC - Reverse Circulation
CT - Cable Tool
J - Jetting
D - Drilling
DTC - Drill Through Casing

SAMPLING TYPES:
A/G - Auger/Grab Sample
CS - California Sampler
1.5" RC - 1.5" Rock Core
2.1" RC - 2.1" Rock Core
G - Geoprobe
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample

OTHER:
AGS - Above Ground Surface

REMARKS

Reviewed by: Date:

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Appendix B

Boring Logs and Piezometer Construction Details

Boring Log B-1

Other Tests	Sample No.	Moisture Content (%)	Dry Density (kN/m³)	PID (ppm) (reading/background)	Penetration Resistance (blows / 0.15m)	Depth (meters)	Sample	USCS	Symbol	DESCRIPTION	Elev. (meters)
	B									SILTY SAND WITH GRAVEL, dark brown (10YR3/3), medium to coarse grained, dry, loose, 20% fine gravel, granitic rock fragments to 2 cm, micaceous, some wood and charcoal fragments.	1912
	B					1		SM			
	B									WELL GRADED SAND WITH SILT AND GRAVEL, dark yellowish brown (10YR3/4), fine sand to fine gravel, dry, loose, granitic rock fragments to 1 cm.	1911
GSD, CET, OC, pH	B1-2.1	5.1			5 5 5	2		SW-SM			1910
GSD	B1-3.0	5			8 9 10	3		SW-SM		WELL GRADED SAND WITH SILT, dark yellowish brown (10YR4/4), fine to coarse grained, dry, loose, few granitic rock fragments to 0.5 cm.	1909
						4					
GSD	B1-4.6	9.1			21 34 52	5		ML		SANDY SILT, very dark grayish brown (10YR3/2), 20% fine to medium grained sand, dry, dense, micaceous.	1908
								SW-SM		WELL GRADED SAND WITH SILT AND GRAVEL, olive brown (2.5Y4/3), fine to coarse sand, wet, dense, 10-30% gravel, subangular to rounded grains.	1907
GSD	B1-6.1	7.7			34 50/5"	6				WELL GRADED SAND WITH GRAVEL, dark yellowish brown (10YR4/6), fine sand to coarse gravel, wet, very dense, subrounded grains, <10% clay.	1906
						7		SW			
GSD	B1-7.6	15.8			28 42 50/3"	8		SP-SM		POORLY GRADED SAND WITH SILT, light olive brown (2.5Y5/3), fine to medium grained, wet, very dense, 10 - 15% silt.	1905
											1904
GSD	B1-9.1	19.0			35 39 26	9				WELL GRADED SAND WITH CLAY, dark yellowish brown (10YR4/4), fine to coarse grained, wet, dense, granitic composition.	1903
						10		SW-SC			
GSD	B1-10.6	15.3			31 50/5"	11		SW		WELL GRADED SAND, light olive brown (2.5YR5/4), fine to coarse grained, wet, very dense.	1902
										Total depth 10.9 meters below ground surface (6/13/02). Borehole backfilled with Portland type I/II cement from 0.91 to 10.9 m and soil cuttings from 0 to 0.91 m bgs. Groundwater was encountered at 4.47 m during drilling.	1901

Location: STA 101+26.4, 26.4 RT
Surface Elevation: 1912.71m
Logged By: H. Young

Drill Rig: CME-75
Equipment/Hammer: Modified California Sampler/140 lb
Date Completed: 6-13-02

Caltrans
Infiltration Basin Pilot Test
South Lake Tahoe, California

CDM

Boring Log B-1
Project No: 9168-35901

Figure: 1 of 1

BORING LOG CALTRANS.GPJ CDM_BLLV.GDT 8/9/02 REV. 8

Boring Log B-2

Other Tests	Sample No.	Moisture Content (%)	Dry Density (kN/m³)	PID (ppm) [reading/background]	Penetration Resistance (blows / 0.15m)	Depth (meters)	Sample	USCS	Symbol	DESCRIPTION	Elev. (meters)
	B									SILTY SAND, dark brown (10YR3/3), dry, loose, trace fine gravel to 4 mm, micaceous.	1912
	B					1		SM			
											1911
	B									WELL GRADED SAND WITH SILT AND GRAVEL, dark brown (10YR3/2), fine to coarse grained, moist, loose.	
GSD, CET, OC, pH	B2-1.8	7.7			7 6 9	2		SW-SM			1910
GSD	B2-3.0	5.0			6 9 10	3				WELL GRADED SAND WITH SILT, dark brown (10YR3/2), fine to coarse grained, moist, loose.	1909
						4		SW-SM			1908
GSD	B2-4.6	22.5			8 6 17	5		ML		SANDY SILT, very dark brown (10YR3/2), moist, stiff, some sand to 3 mm.	
								SW-SM		WELL GRADED SAND WITH SILT AND GRAVEL, olive brown (2.5Y4/3), medium dense.	1907
								GP		POORLY GRADED GRAVEL WITH SAND, wet, 2 cm cobbles, well rounded (logged from auger flight cuttings).	
GSD	B2-6.1	17.2			14 14 50/5"	6				WELL GRADED SAND, dark yellowish brown (10YR4/6), fine to coarse grained, wet, very dense, few well rounded gravel to 2 cm.	1906
						7		SW			1905
GSD	B2-7.6	16.3			31 50/4"	8				SILTY SAND, yellowish brown (10YR4/6), fine to coarse grained, wet, very dense, biotite flakes.	
								SM			1904
GSD	B2-9.1	18.0			15 17 24	9				WELL GRADED SAND WITH SILT, gray brown (2.5Y5/2), fine to medium grained, wet, medium dense, ~10% silt.	1903
						10		SW-SM			1902
GSD	B2-10.6	17.6			28 50/5"	11		SM		SILTY SAND, gray-brown (2.5Y5/2), fine to medium grained, wet, very dense.	
										Total depth 10.9 meters below ground surface (6/13/02). Borehole backfilled with Portland type I/II cement from 0.61 to 10.9 m and soil cuttings from 0 to 0.61 m bgs. Groundwater was encountered at 6.1 m bgs during drilling.	1901

Location: STA 101+39.4, 27.4 RT
Surface Elevation: 1912.42m
Logged By: H. Young

Drill Rig: CME-75
Equipment/Hammer: Modified California Sampler/140 lb
Date Completed: 6-13-02

Caltrans
Infiltration Basin Pilot Test
South Lake Tahoe, California

CDM

Boring Log B-2
Project No: 9168-35901

Figure: 1 of 1

BORING LOG CALTRANS.GPJ CDM_BLLV.GDT 6/9/02 REV. 8

Boring Log B-3/PZ-1

Other Tests	Sample No.	Moisture Content (%)	Dry Density (kN/m³)	PID (ppm) [reading/background]	Penetration Resistance (blows / 0.15m)	Depth (meters)	Sample	USCS	Symbol	DESCRIPTION	Elev. (meters)
	B							SP		POORLY GRADED SAND, olive (5Y5/4), coarsed grained, dry, loose, some granitic gravel to 2 cm, some silt, micaceous.	
	B					1					1912
	B							SM		SILTY SAND, dark olive gray (5Y3/2), dry, loose, 15% gravel to 0.5 cm, abundant organic matter (roots).	1911
GSD, CET, OC, pH	B3-2.16	3.3			14 12 10	2		SW-SM		WELL GRADED SAND WITH SILT, dark grayish brown (2.5Y4/2), very fine to coarse grained, dry, medium dense, few (10%) gravel to 1.5 cm.	1910
GSD	B3-3.0	4.2			22 19 18	3		SW-SM		WELL GRADED SAND WITH SILT AND GRAVEL, brown (10YR4/3), fine to medium grained, moist, medium dense, little fine gravel.	1909
GSD	B3-4.6	11.4			47 50/4"	4		ML		SILT, very dark grayish brown (10YR3/2), some fine grained sand, moist, very stiff, poor recovery.	1908
						5		SP-SM		POORLY GRADED SAND WITH SILT AND GRAVEL, olive-brown (2.5Y4/3), medium to coarse grained, wet, very dense, little gravel to 2 cm.	1907
GSD	B3-6.1	12.1			31 37 35	6		SW-SM		WELL GRADED SAND WITH SILT, dark yellow-brown (10YR4/4), medium to coarse grained, wet, medium dense, coarse biotite flakes, free water is orange-brown and has a musty odor.	1906
GSD	B3-7.6	23.3			28 15 17	7		SC		CLAYEY SAND, yellowish brown (10YR5/6), fine to medium grained, wet, medium dense, well graded.	1905
GSD	B3-9.1	29.3			13 22 24	8		SW		WELL GRADED SAND, dark grayish brown (10YR4/2), fine to coarse grained, wet, medium dense, subangular to angular grains, granitic composition, coarse biotite.	1904
GSD	B3-10.6	26.7			13 19 24	9		SW		WELL GRADED SAND, dark grayish brown (2.5YR4/2), fine to medium grained, wet, medium dense, trace clay, micaceous.	1903
						10				Total depth 11.1 meters below ground surface. Piezometer PZ-1 constructed in borehole, refer to construction diagram for details. Groundwater encoutered at 4.2 m bgs.	1902
						11					1901

Location: STA 101+40.9, 41.0 RT
Surface Elevation: 1912.77m
Logged By: H. Young

Drill Rig: CME-75
Equipment/Hammer: Modified California Sampler/140 lb
Date Completed: 6-13-02

Caltrans
Infiltration Basin Pilot Test
South Lake Tahoe, California

CDM

Boring Log B-3/PZ-1
Project No: 9168-35901

Figure: 1 of 1

BORING LOG CALTRANS.GPJ CDM_BLLV.GDT 8/9/02 REV. 8

Boring Log B-4

Other Tests	Sample No.	Moisture Content (%)	Dry Density (kN/m³)	PID (ppm) [reading/background]	Penetration Resistance (blows / 0.15m)	Depth (meters)	USCS	DESCRIPTION	Elev. (meters)
	B						SM	SILTY SAND, brown (7.4YR4/6), fine to medium grained, dry, loose, abundant rootlets.	1914
	B					1	SM	SILTY SAND WITH GRAVEL, brown (7.5YR4/6), dry, loose, 5-10% gravel, granitic composition.	1913
GSD, CET, OC, pH	B B4-1.78	14.4			15 16 12	2	SM	SILTY SAND, same as above, less gravel, medium dense.	1912
GSD	B4-3.0	12.7			18 32 44	3	SW-SM	WELL GRADED SAND WITH SILT AND GRAVEL, strong brown (7.5YR4/6), fine to coarse grained, wet, dense. As above, reddish orange oxidized horizons between 3.35 and 3.51 m bgs.	1911
						4	SW-SM		1910
GSD	B4-4.6	12.5			42 50/1"	5	SW-SM	WELL GRADED SAND WITH SILT, light olive brown (2.5Y5/3), fine to medium grained, wet, very dense, trace orange oxidized patches.	1909
GSD	B4-6.1	19.5			7 7 7	6	SW	WELL GRADED SAND, olive brown (2.5Y4/4), fine to medium grained, wet, loose, trace fine gravel, 10% clay/silt.	1908
						7			1907
GSD	B4-7.6	16			7 14 19	8		SANDY SILT, very dark gray (2.5Y3/1), moist, hard.	1906
						9	ML		
GSD	B4-9.1	34.9			18 32 54				1905
GSD	B4-10.6	38.1			50/4"	10	ML ML	SANDY SILT, very dark gray (2.5Y3/1), hard. VOLCANIC ASH, white, fine grained, laminated.	1904
						11		Total depth 9.8 meters below ground surface (6/14/02). Borehole backfilled with Portland type I/II cement from 0.91 m to 9.8 m and soil cuttings from 0 to 0.91 m bgs. Groundwater encountered at 8.7 m bgs during drilling.	1903

Location: STA 109+13.6, 19.8 RT
Surface Elevation: 1914.39m
Logged By: H. Young

Drill Rig: CME-75
Equipment/Hammer: Modified California Sampler/140 lb
Date Completed: 6-14-02

Caltrans
Infiltration Basin Pilot Test
South Lake Tahoe, California

CDM

Boring Log B-4
Project No: 9168-35901

Figure: 1 of 1

BORING LOG CALTRANS.GPJ CDM_BLLV.GDT 8/9/02 REV. 8

Boring Log B-5

Other Tests	Sample No.	Moisture Content (%)	Dry Density (kN/m³)	PID (ppm) (reading/background)	Penetration Resistance (blows / 0.15m)	Depth (meters)	USCS	DESCRIPTION	Elev. (meters)
	B						SM	SILTY SAND, strong brown (7.5YR4/6), fine to medium grained, dry, loose, micaceous, some rootlets.	1914
	B					1			
	B						SM	SILTY SAND, strong brown (7.5YR4/6), fine to medium grained, moist, medium dense, 10% fine gravel, granitic composition.	1913
GSD, CET, OC, pH	B5-1.76	23.0			21 26 25	2		SILTY SAND, very dark brown (10YR2/2), medium grained, moist, medium dense, micaceous.	1912
							SM		
GSD	B5-3.0	13.4			14 14 14	3			1911
						4	SC	CLAYEY SAND, yellow brown (2.5YR5/6), medium to coarse grained, wet, medium dense.	1910
GSD	B5-4.6	12.1			21 34 29	5	SW-SM	WELL GRADED SAND WITH SILT, olive brown (2.5YR4/3), medium to coarse grained, wet, dense, trace clay, occassional fine gravel.	1909
GSD	B5-6.1	18.6			37 50/5"	6		WELL GRADED SAND WITH SILT, light olive brown (2.5Y5/6), fine to medium grained, wet, very dense, abundant biotite flakes, minor oxidation.	1908
						7	SW-SM		1907
GSD	B5-7.6	17.6			34 50/5"	8		SANDY SILT, very dark gray (2.5Y3/1), moist, hard, low plasticity.	1906
							ML		
GSD	B5-9.1	21.4			13 19 35	9		SANDY SILT, very dark gray (2.5Y3/1), wet, hard, moderate plasticity, trace brown wood fragments, micaceous.	1905
							ML		
GSD	B5-10.6	33.0			50/3"	10	ML	As above, trace white rootlets, hard.	1904
						11		Total depth is 10.1meters below ground surface (6/14/02). Borehole backfilled with Portland type I/II cement from 0.91 m to 10.1 m and soil cuttings from 0 to 0.91 m bgs. Groundwater encountered at 2.7 m bgs during drilling.	1903

Location: STA 109+24.9, 20 RT
Surface Elevation: 1914.37m
Logged By: H. Young

Drill Rig: CME-75
Equipment/Hammer: Modified California Sampler/140 lb
Date Completed: 6-14-02

Caltrans
Infiltration Basin Pilot Test
South Lake Tahoe, California

CDM

Boring Log B-5
Project No: 9168-35901

Figure: 1 of 1

BORING LOG CALTRANS.GPJ CDM_BLLV.GDT 8/9/02 REV. 8

Boring Log B-6/PZ-2

Other Tests	Sample No.	Moisture Content (%)	Dry Density (kN/m³)	PID (ppm) [reading/background]	Penetration Resistance (blows / 0.15m)	Depth (meters)	USCS	DESCRIPTION	Elev. (meters)
	B						SM	SILTY SAND WITH GRAVEL, brown, dry, gravel to 0.5 cm, abundant rootlets and wood fragments.	1914
	B					1			1913
	B								
GSD, CET, OC, pH	B6-1.76	21.5			12 16 11	2	SW	WELL GRADED SAND WITH GRAVEL, strong brown (7.5Y4/6), fine to coarse grained, dry, medium dense, 10-20% gravel to 0.5 cm, micaceous.	1912
GSD	B6-3.0	9.3			25 29 34	3	SM	SILTY SAND, mottled yellowish-brown (10YR5/6) and light yellowish-brown (2.5YR6/3), fine to coarse grained, wet, dense, trace gravel to 1 cm, granitic composition, micaceous.	1911
						4			1910
GSD	B6-4.6	15.7			29 50/5"	5	SW	WELL GRADED SAND, light yellowish brown (2.5Y6/3), fine to coarse grained, wet, very dense, micaceous.	1909
GSD	B6-6.1	14.5			18 25 28	6	SW	WELL GRADED SAND, olive brown (2.5Y4/2), fine to medium grained, wet, medium dense, few (1-3%) gravel to 0.5 cm, micaceous.	1908
						7			1907
GSD	B6-7.6	10.5			21 50/5"	8	ML	SANDY SILT, very dark gray (2.5Y3/1), moist, hard, medium plasticity, low toughness, trace fine-grained sand, trace wood fragments and rootlets, abundant biotite flakes (<1 mm).	1906
GSD	B6-9.1	24.8			23 48 45	9	ML	SANDY SILT, very dark gray (2.5Y3/1), moist, hard, micaceous, fissured (sample breaks along bedding cleavage).	1905
						10			1904
GSD	B6-10.6	11.7			50/3"	11		Total depth 10.8 meters below ground surface (6/14/02). Piezometer PZ-2 constructed in borehole, refer to construction diagram for details. Groundwater encountered at 2.4 m bgs during drilling.	1903

Location: STA 109+20.8, 29 RT
Surface Elevation: 1914.37m
Logged By: H. Young

Drill Rig: CME-75
Equipment/Hammer: Modified California Sampler/140 lb
Date Completed: 6-14-02

Caltrans
Infiltration Basin Pilot Test
South Lake Tahoe, California

CDM

Boring Log B-6/PZ-2
Project No: 9168-35901

Figure: 1 of 1

BORING LOG CALTRANS.GPJ CDM_BLLY.GDT 8/9/02 REV. 8

CAMP DRESSER & McKEE

CDM

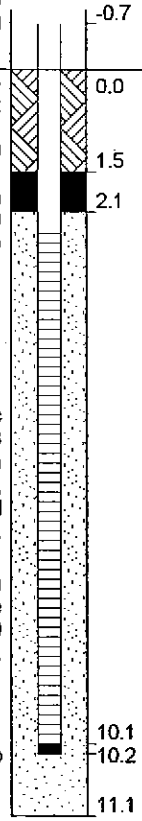
100 Pringle Ave, Suite 300
Walnut Creek, CA 94596

MONITORING WELL DETAIL
B-3/PZ-1

Client: Caltrans
Project Name: Large Scale Infiltration Basin Pilot Test
Project Location: Highway 50, South Lake Tahoe, California
Project Number: 9168-35901-RMT17.GEOTECH

Drilling Contractor: Cascade Drilling
Surface Elevation (m): 1912.77
Drilling Method/Rig: HSA/CME-75
Total Depth (m): 11.1
Drillers: T. Jaramillo
Depth to Initial Water Level (m BGS): 4.2
Drilling Date: Start: 6/13/02 **End:** 6/13/02
Development Method: Surge block and bailer.
Borehole Coordinates:
Field Screening Instrument:
N E
Logged By: H. Young
Development Date: Start 6/14/02 **End** 6/14/02
Top of Riser Elevation (m): 1,915.07

Sample Type	Sample Number	Field Instrument Reading (ppm)	Blows per 6 Inches	Stratum Designation	Material Description	Graphic Log	Elev. Depth (ft.)	Well Construction Detail
								Surface Completion - 0.6 X 0.6 m concrete pad, 150 mm diameter steel monument, locking cap. -0.7
							1912.8	*Ground Surface*
					Refer to boring log B-3 for descriptive and testing information. Depth to groundwater after piezometer construction 5.124 m below the top of the PVC casing.		0	Surface Seal - Portland cement 0.0 Blank Casing - 51 mm Schedule 40 PVC. 1.5 Seal - Medium bentonite chips (50 lb bag) 2.1
							1907.8 5	Filter - RMC Pacific Materials, #3 Lonestar, clean graded, kiln dried, Monterey, silica sand (400 lbs). Well Screen - 51 mm diameter, Schedule 40 PVC screen, 20 slot.
							1902.8 10	10.1 Bottom Cap 10.2 11.1



EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger
AR - Air Rotary
DTR - Dual Tube Rotary
FR - Foam Rotary
MR - Mud Rotary
RC - Reverse Circulation
CT - Cable Tool
JET - Jetting
D - Driving
DTC - Drill Through Casing

SAMPLING TYPES:
AS - Auger/Grab Sample
CS - California Sampler
BX - 1.5" Rock Core
NX - 2.1" Rock Core
GP - Geoprobe
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
OTHER:
AGS - Above Ground Surface

REMARKS

STA 101 + 40.9, 41.0 RT

Reviewed by: M.Gray **Date:** 8/6/02

MW INFWELL.GPJ CDM_MA.GDT 8/12/02

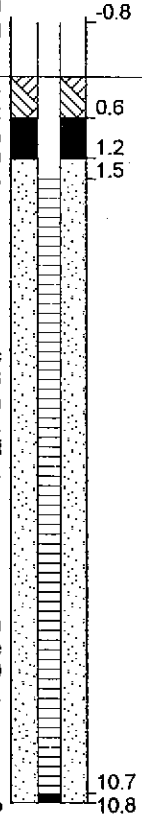
CAMP DRESSER & McKEE
CDM
100 Pringle Ave, Suite 300
Walnut Creek, CA 94596

MONITORING WELL DETAIL
B-6/PZ-2

Client: Caltrans
Project Name: Large Scale Infiltration Basin Pilot Test
Project Location: Highway 50, South Lake Tahoe, California
Project Number: 9168-35901-RMT17.GEOTECH

Drilling Contractor: Cascade Drilling
Surface Elevation (m): 1914.37
Drilling Method/Rig: HSA/CME-75
Total Depth (m): 10.82
Drillers: T. Jaramillo
Depth to Initial Water Level (m BGS): 2.4
Drilling Date: Start: 6/14/02 **End:** 6/14/02
Development Method: Surge block and bailer.
Borehole Coordinates:
Field Screening Instrument:
N E
Logged By: H. Young
Development Date: Start 6/14/02 **End** 6/14/02
Top of Riser Elevation (m): 1,917.07

Sample Type	Sample Number	Field Instrument Reading (ppm)	Blows per 6 Inches	Stratum Designation	Material Description	Graphic Log	Elev. Depth (ft.)	Well Construction Detail
								Surface Completion - 0.6 X 0.6 m concrete pad, 150 mm diameter steel monument, locking cap. -0.8
							1914.4 *Ground Surface*	
					Refer to boring log B-6 for descriptive and testing information. Depth to groundwater after piezometer construction 3.514 m below the top of the PVC casing.		0	Surface Seal - Portland cement 0.6; Seal - Medium bentonite chips (50 lb bag) 1.2–1.5
							1909.4 / 5	Filter - RMC Pacific Materials, #3 Lonestar, clean graded, kiln dried, Monterey, silica sand (550 lbs).
							1904.4 / 10	Well Screen - 51 mm diameter, Schedule 40 PVC screen, 20 slot. 10.7–10.8; Bottom Cap



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HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
OTHER:
AGS - Above Ground Surface

REMARKS

STA 109 + 20.8, 29 RT

Reviewed by: M.Gray **Date:** 8/6/02

Appendix C

Analytical Laboratory Reports

Results of Geotechnical Analysis

Calscience
Environmental
Laboratories, Inc.

Geotechnical
Geochemical
Results

July 15, 2002

Mike Gray
Camp Dresser & McKee, Inc.
100 Pringle Ave. , Suite 300
Walnut Creek, CA 94596-3580

Subject: **Calscience Work Order No.:** **02-06-0837**
Client Reference: **Caltrans Infiltration Basin 101 & 109 / 9168-35901-RMT17**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 6/21/2002 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Stephen Nowak
Project Manager

Michael J. Crisostomo
Quality Assurance Manager

JUL 26 2002

7440 Lincoln Way, Garden Grove, CA 92841-1432 • TEL: (714) 895-5494 • FAX: (714) 894-7501

PTS Laboratories
Geotechnical Services
8100 Secura Way • Santa Fe Springs • CA 90670
Phone (562) 907-3607 • Fax (562) 907-3610

July 11, 2002

Mr. Stephen Nowak
Calscience
7440 Lincoln Way
Garden Grove, CA 92841-1432

Re: 02-06-0837
PTS File: 32254

Dear Mr. Nowak:

Enclosed are final data for your Project # 02-06-0837. All analyses were performed by applicable ASTM, EPA or API methodology. Samples will be retained for 30 days before disposal unless other arrangements are made.

We appreciate the opportunity to be of service and trust these data will prove beneficial in the development of this project. Please feel free to call me at (562) 907-3607 should you have any questions or require additional information.

Sincerely,

PTS Laboratories, Inc.

Larry Kunkel
District Manager

LK/vk

encl.

MOISTURE CONTENT DATA

(METHODOLOGY: ASTM D2216)

PROJECT NAME: N/A
PROJECT NO: 02-06-0837

SAMPLE ID.	DEPTH, ft.	MOISTURE CONTENT (% wt)
35901-B1-3.0-061302		5.0
35901-B1-4.6-061302		9.1
35901-B1-6.1-061302		7.7
35901-B1-7.6-061302		15.8
35901-B1-9.1-061302		19.0
35901-B1-10.6-061302		15.3
35901-B2-3.0-061302		5.0
35901-B2-4.6-061302		22.5
35901-B2-6.1-061302		17.2
35901-B2-7.6-061302		16.3
35901-B2-9.1-061302		18.0
35901-B2-10.6-061302		17.6
35901-B3-3.0-061302		4.2
35901-B3-4.72-061302		11.4
35901-B3-6.1-061302		12.1
35901-B3-7.6-061302		23.3
35901-B3-9.1-061302		29.3
35901-B3-10.6-061302		26.7
35901-B4-3.0-061402		12.7
35901-B4-4.6-061402		12.5
35901-B4-6.1-061402		19.5
35901-B4-7.6-061402		16.0
35901-B4-9.1-061402		34.9
35901-B4-9.8-061402		38.1
35901-B5-3.0-061402		13.4
35901-B5-4.6-061402		12.1
35901-B5-6.1-061402		18.6
35901-B5-7.6-061402		17.6
35901-B5-9.1-061402		21.4
35901-B5-10.1-061402		33.0
35901-B6-3.0-061402		9.3
35901-B6-4.6-061402		15.7
35901-B6-6.1-061402		14.5
35901-B6-7.6-061402		10.5
35901-B6-9.1-061402		24.8
35901-B6-10.6-061402		11.7

PTS Laboratories, Inc.

Calscience Enviromental Laboratories
PTS File No: 32254

PARTICLE SIZE SUMMARY

(METHODOLOGY: ASTM D422/4464M)

PROJECT NAME: N/A
PROJECT NO: 02-06-0837

Sample ID	Depth, ft.	Grain Size Description (1)	Median Grain Size, mm	Particle Size Distribution, wt. percent						Silt & Clay
				Gravel	Sand Size			Silt	Clay	
					Coarse	Medium	Fine			
35901-B1-2.1-061302		Coarse sand	1.070	25.87	11.05	36.18	20.12	(2)	(2)	6.78
35901-B1-3.0-061302		Medium sand	0.936	8.67	9.10	52.76	22.26	(2)	(2)	7.22
35901-B1-4.6-061302		Coarse sand	1.358	32.64	10.51	31.19	19.43	(2)	(2)	6.22
35901-B1-6.1-061302		N/A	2.020	33.16	17.07	30.49	16.68	(2)	(2)	2.60
35901-B1-7.6-061302		Medium sand	0.471	5.38	6.94	42.73	35.60	(2)	(2)	9.35
35901-B1-9.1-061302		Medium sand	0.622	9.38	11.55	42.67	29.32	(2)	(2)	7.08
35901-B1-10.6-061302		Medium sand	0.502	0.00	4.52	53.67	36.49	(2)	(2)	5.32
35901-B2-1.81-061302		Medium sand	0.920	20.42	11.26	39.52	21.94	(2)	(2)	6.86
35901-B2-3.0-061302		Medium sand	0.642	3.70	9.37	53.23	26.00	(2)	(2)	7.70
35901-B2-4.6-061302		Silt	0.042	0.00	0.00	8.94	26.38	52.44	12.24	64.68
35901-B2-6.1-061302		Medium sand	1.422	8.29	24.69	54.62	10.53	(2)	(2)	1.86
35901-B2-7.6-061302		Medium sand	0.383	6.20	11.37	29.82	41.09	(2)	(2)	11.52
35901-B2-9.1-061302		Medium sand	0.341	2.30	7.06	33.22	47.80	(2)	(2)	9.62
35901-B2-10.6-061302		Fine sand	0.268	0.00	0.00	27.89	53.90	13.68	4.53	18.21
35901-B3-2.16-061302		Medium sand	0.775	5.71	15.59	47.82	24.39	(2)	(2)	6.49
35901-B3-3.0-061302		Medium sand	0.683	17.11	9.45	37.65	26.84	(2)	(2)	8.95
35901-B3-4.72-061302		Medium sand	0.474	6.17	7.56	40.26	34.28	(2)	(2)	11.73
35901-B3-6.1-061302		Medium sand	1.075	10.21	22.48	43.10	19.80	(2)	(2)	4.41
35901-B3-7.6-061302		Medium sand	0.551	3.10	10.51	45.68	30.48	(2)	(2)	10.23
35901-B3-9.1-061302		Fine sand	0.254	0.00	1.98	21.94	72.37	(2)	(2)	3.70
35901-B3-10.6-061302		Fine sand	0.372	1.03	1.62	39.95	53.42	(2)	(2)	3.98
35901-B4-1.78-061402		Medium sand	0.501	1.06	12.73	41.33	30.42	(2)	(2)	14.46
35901-B4-3.0-061402		Medium sand	0.6110	17.83	11.01	30.33	29.97	(2)	(2)	10.86
35901-B4-4.6-061402		Medium sand	0.371	6.88	3.69	35.25	44.10	(2)	(2)	10.07
35901-B4-6.1-061402		Fine sand	0.368	0.00	2.29	39.78	54.02	(2)	(2)	3.92

(1) based on Mean from Trask

PTS Laboratories, Inc.

Calscience Enviromental Laboratories
PTS File No: 32254

PARTICLE SIZE SUMMARY

(METHODOLOGY: ASTM D422/4464M)

PROJECT NAME: N/A
PROJECT NO: 02-06-0837

Sample ID	Depth, ft.	Grain Size Description (1)	Median Grain Size, mm	Particle Size Distribution, wt. percent						Silt & Clay
				Gravel	Sand Size			Silt	Clay	
					Coarse	Medium	Fine			
35901-B4-7.6-061402		Medium sand	0.561	0.00	1.10	64.07	29.14	(2)	(2)	5.69
35901-B4-9.8-061402		Silt	0.042	0.00	0.00	3.33	27.61	58.02	11.04	69.06
35901-B4-9.1-061402		Fine sand	0.066	0.00	0.00	9.96	36.26	45.74	8.04	53.78
35901-B5-1.76-061402		Medium sand	0.454	1.28	8.81	42.17	32.42	(2)	(2)	15.31
35901-B5-3.0-061402		Medium sand	0.476	4.78	9.62	39.30	31.37	(2)	(2)	14.93
35901-B5-4.6-061402		Medium sand	0.421	7.15	9.77	33.11	41.46	(2)	(2)	8.51
35901-B5-6.1-061402		Medium sand	0.404	0.00	1.50	46.51	46.28	(2)	(2)	5.71
35901-B5-7.6-061402		Fine sand	0.331	0.00	3.71	33.62	57.00	(2)	(2)	5.67
35901-B5-9.1-061402		N/A	1.834	47.63	2.13	5.56	18.28	(2)	(2)	26.40
35901-B5-10.1-061402		Silt	0.046	0.00	0.00	7.09	25.83	57.55	9.53	67.08
35901-B6-1.76-061402		Coarse sand	1.339	23.48	18.76	34.38	18.14	(2)	(2)	5.24
35901-B6-3.0-061402		Medium sand	0.584	3.90	15.53	39.79	29.22	(2)	(2)	11.57
35901-B6-4.6-061837		Medium sand	0.554	0.00	1.68	64.10	32.89	(2)	(2)	1.32
35901-B6-6.1-061402		Medium sand	0.668	0.00	2.74	72.07	22.90	(2)	(2)	2.29
35901-B6-7.6-061402		Coarse sand	1.057	19.05	20.48	29.83	22.28	(2)	(2)	8.37
35901-B6-10.6-061402		Fine sand	0.042	0.00	0.00	10.82	28.02	46.87	14.30	61.16
35901-B6-9.1-061402		Fine sand	0.055	0.00	0.00	15.55	26.64	47.80	10.01	57.81

(1) based on Mean from Trask

CEC, MOISTURE, ASH and ORGANIC CONTENT

(METHODOLOGY: EPA 9081ASTM D2974)

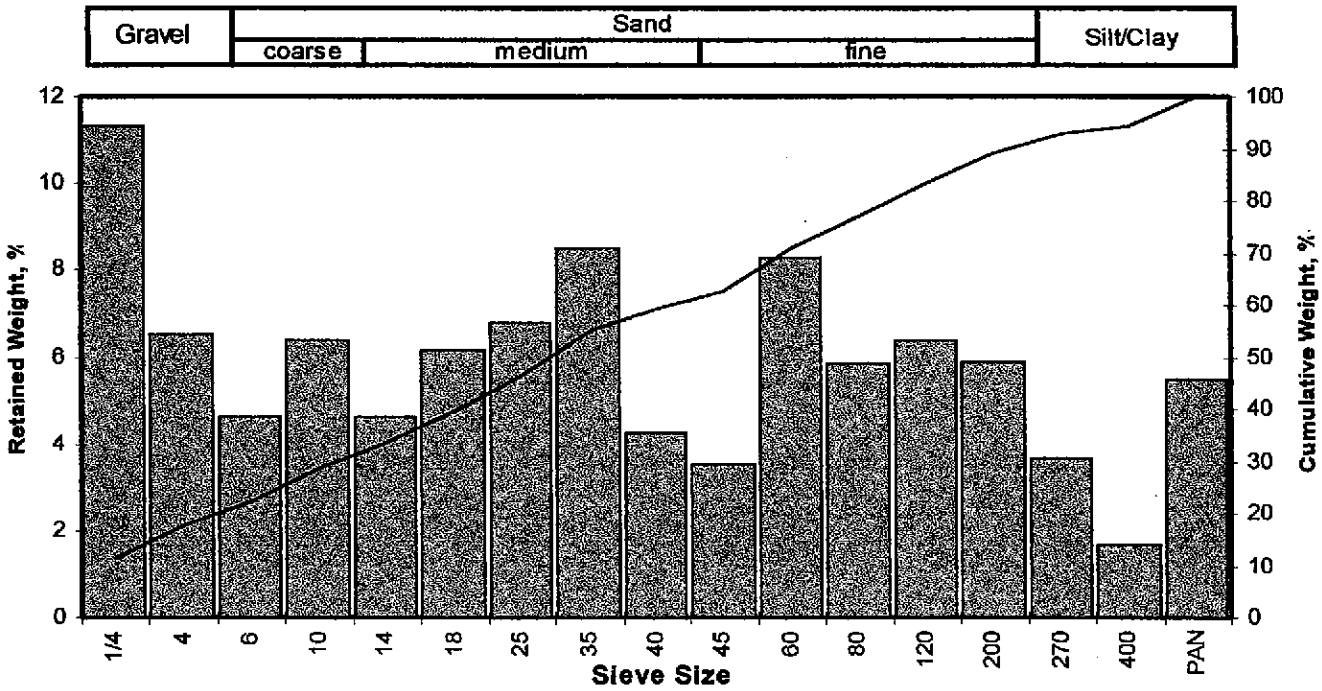
PROJECT NAME: N/A
PROJECT NO: 02-06-0837

SAMPLE ID.	CATION EXCHANGE (meq/kg)	Moisture Content %	Ash Content %	Organic Content %	pH EPA 9045.00
35901-B1-2.1	48	5.1	98.6	1.4	6.44
35901-B2-1.81	110	7.7	97.7	2.3	4.95
35901-B3-2.16	34	3.3	99.1	0.9	5.23
35901-B4-1.78	74	14.4	97.8	2.2	5.02
35901-B5-1.76	38	23.0	97.1	2.9	5.75
35901-B6-1.76	64	21.5	97.4	2.6	5.52

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience Enviromental Laboratories	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B4-3.0-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	2.21	11.32	11.32
0.1873	4.757	-2.25	4	1.27	6.51	17.83
0.1324	3.364	-1.75	6	0.90	4.61	22.44
0.0787	2.000	-1.00	10	1.25	6.40	28.84
0.0557	1.414	-0.50	14	0.90	4.61	33.45
0.0394	1.000	0.00	18	1.20	6.15	39.60
0.0278	0.707	0.50	25	1.33	6.81	46.41
0.0197	0.500	1.00	35	1.66	8.50	54.92
0.0166	0.420	1.25	40	0.83	4.25	59.17
0.0139	0.354	1.50	45	0.69	3.53	62.70
0.0098	0.250	2.00	60	1.62	8.30	71.00
0.0070	0.177	2.50	80	1.14	5.84	76.84
0.0049	0.125	3.00	120	1.25	6.40	83.25
0.0029	0.074	3.75	200	1.15	5.89	89.14
0.0021	0.053	4.25	270	0.72	3.69	92.83
0.0015	0.037	4.75	400	0.33	1.69	94.52
			PAN	1.07	5.48	100.00
TOTALS				19.52	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5			
10			
16	-2.37	0.2031	5.159
25	-1.45	0.1076	2.732
40	0.03	0.0386	0.980
50	0.71	0.0241	0.611
60	1.31	0.0159	0.404
75	2.34	0.0078	0.197
84	3.10	0.0046	0.117
90	3.87	0.0027	0.069
95	4.33	0.0020	0.050

Measure	Trask	Inman	Folk-Ward
Median, phi	0.71	0.71	0.71
Median, in.	0.0241	0.0241	0.0241
Median, mm	0.611	0.611	0.611
Mean, phi	-0.55	0.36	0.48
Mean, in.	0.0577	0.0306	0.0282
Mean, mm	1.465	0.777	0.717
Sorting	3.722	2.731	
Skewness	1.201	-0.127	
Kurtosis			

Grain Size Description (ASTM-USCS Scale)	Medium sand (based on Mean from Trask)

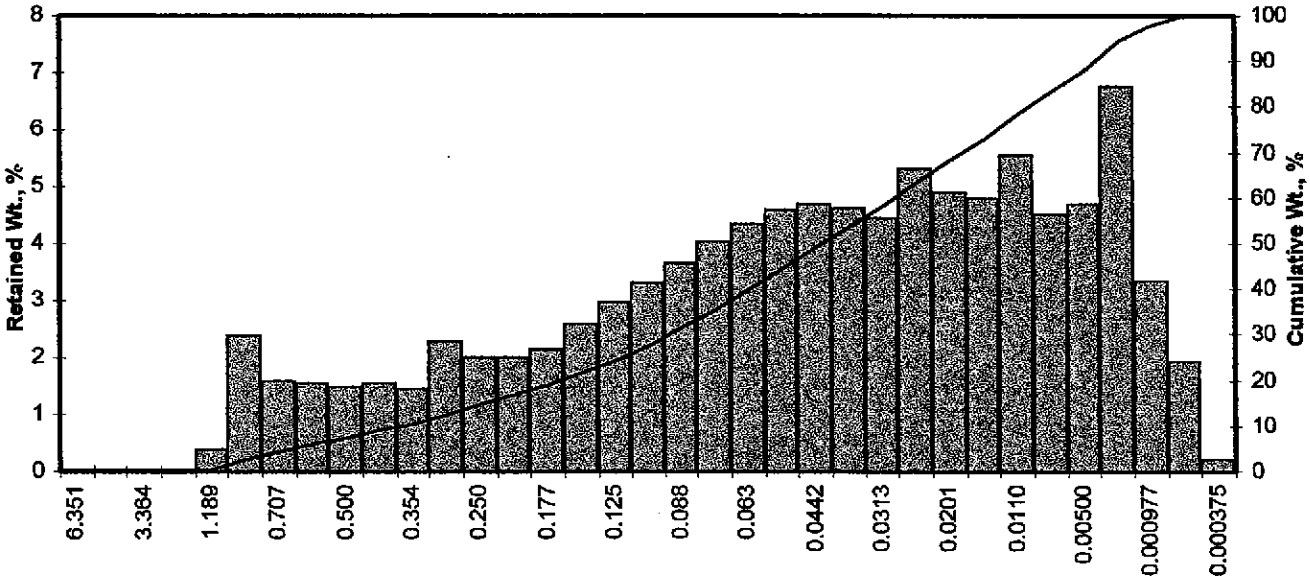
Description	Retained on Sieve #	Weight Percent
Gravel	4	17.83
Coarse Sand	10	11.01
Medium Sand	40	30.33
Fine Sand	200	29.97
Silt/Clay	<200	10.86
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	Calscience Enviromental Laboratories	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B2-4.6-061302
Project No:	02-06-0837	**Depth, ft:**	N/A

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.39	0.39	0.39
0.0331	0.841	0.25	20	2.39	2.39	2.78
0.0278	0.707	0.50	25	1.58	1.58	4.36
0.0234	0.595	0.75	30	1.55	1.55	5.91
0.0197	0.500	1.00	35	1.48	1.48	7.39
0.0166	0.420	1.25	40	1.55	1.55	8.94
0.0139	0.354	1.50	45	1.45	1.45	10.39
0.0117	0.297	1.75	50	2.26	2.26	12.65
0.0098	0.250	2.00	60	1.99	1.99	14.64
0.0083	0.210	2.25	70	2.01	2.01	16.65
0.0070	0.177	2.50	80	2.15	2.15	18.80
0.0059	0.149	2.75	100	2.57	2.57	21.37
0.0049	0.125	3.00	120	2.96	2.96	24.33
0.0041	0.105	3.25	140	3.31	3.31	27.64
0.0035	0.088	3.50	170	3.65	3.65	31.29
0.0029	0.074	3.75	200	4.03	4.03	35.32
0.0025	0.063	4.00	230	4.35	4.35	39.67
0.0021	0.053	4.25	270	4.58	4.58	44.25
0.00174	0.0442	4.50	325	4.68	4.68	48.93
0.00146	0.0372	4.75	400	4.62	4.62	53.55
0.00123	0.0313	5.00	450	4.44	4.44	57.99
0.000986	0.0250	5.32	500	5.32	5.32	63.31
0.000790	0.0201	5.64	635	4.88	4.88	68.19
0.000615	0.0156	6.00		4.81	4.81	73.00
0.000435	0.0110	6.50		5.55	5.55	78.55
0.000308	0.00781	7.00		4.52	4.52	83.07
0.000197	0.00500	7.65		4.69	4.69	87.76
0.000077	0.00195	9.00		6.75	6.75	94.51
0.000038	0.000977	10.00		3.35	3.35	97.86
0.000019	0.000488	11.00		1.94	1.94	99.80
0.000015	0.000375	11.38		0.20	0.20	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	0.60	0.0259	0.658
10	1.43	0.0146	0.370
16	2.17	0.0088	0.222
25	3.05	0.0048	0.121
40	4.02	0.0024	0.062
50	4.56	0.0017	0.042
60	5.12	0.0011	0.029
75	6.18	0.0005	0.014
84	7.13	0.0003	0.007
90	8.09	0.0001	0.004
95	9.15	0.0001	0.002

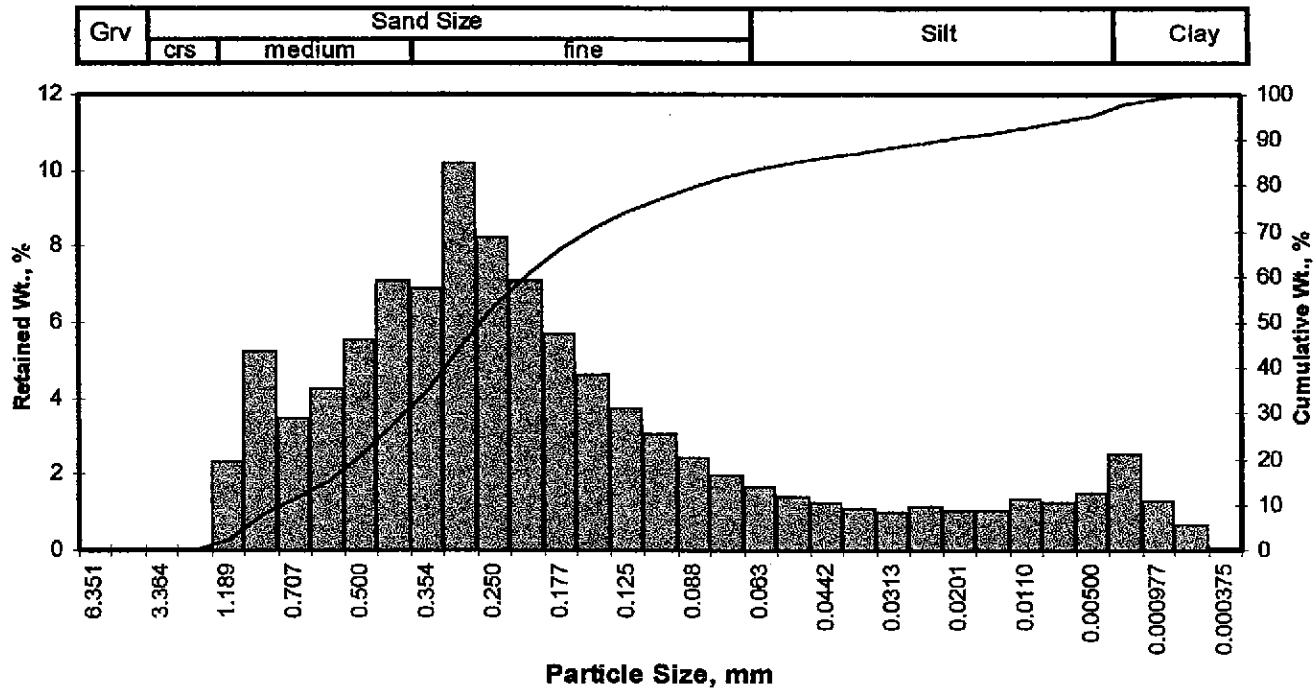
Measure	Trask	Inman	Folk-Ward
Median, phi	4.56	4.56	4.56
Median, in.	0.0017	0.0017	0.0017
Median, mm	0.042	0.042	0.042
Mean, phi	3.89	4.65	4.62
Mean, in.	0.0026	0.0016	0.0016
Mean, mm	0.067	0.040	0.041
Sorting	2.958	2.479	2.534
Skewness	0.961	0.037	0.055
Kurtosis	0.146	0.723	1.119
Grain Size Description (ASTM-USCS Scale)		Silt (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	8.94
Fine Sand	200	26.38
Silt	>0.005 mm	52.44
Clay	<0.005 mm	12.24
	Total	**100**

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	Calscience Enviromental Laboratories	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B2-10.6-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	2.34	2.34	2.34
0.0331	0.841	0.25	20	5.22	5.22	7.56
0.0278	0.707	0.50	25	3.49	3.49	11.05
0.0234	0.595	0.75	30	4.23	4.23	15.28
0.0197	0.500	1.00	35	5.53	5.53	20.81
0.0166	0.420	1.25	40	7.08	7.08	27.89
0.0139	0.354	1.50	45	6.90	6.90	34.79
0.0117	0.297	1.75	50	10.20	10.20	44.99
0.0098	0.250	2.00	60	8.25	8.25	53.24
0.0083	0.210	2.25	70	7.08	7.08	60.32
0.0070	0.177	2.50	80	5.68	5.68	66.00
0.0059	0.149	2.75	100	4.60	4.60	70.60
0.0049	0.125	3.00	120	3.73	3.73	74.33
0.0041	0.105	3.25	140	3.03	3.03	77.36
0.0035	0.088	3.50	170	2.44	2.44	79.80
0.0029	0.074	3.75	200	1.99	1.99	81.79
0.0025	0.063	4.00	230	1.67	1.67	83.46
0.0021	0.053	4.25	270	1.42	1.42	84.88
0.00174	0.0442	4.50	325	1.23	1.23	86.11
0.00146	0.0372	4.75	400	1.09	1.09	87.20
0.00123	0.0313	5.00	450	0.97	0.97	88.17
0.000986	0.0250	5.32	500	1.12	1.12	89.29
0.000790	0.0201	5.64	635	1.02	1.02	90.31
0.000615	0.0156	6.00		1.05	1.05	91.36
0.000435	0.0110	6.50		1.35	1.35	92.71
0.000308	0.00781	7.00		1.26	1.26	93.97
0.000197	0.00500	7.65		1.50	1.50	95.47
0.000077	0.00195	9.00		2.54	2.54	98.01
0.000038	0.000977	10.00		1.28	1.28	99.29
0.000019	0.000488	11.00		0.65	0.65	99.94
0.000015	0.000375	11.38		0.06	0.06	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	0.00	0.0392	0.997
10	0.42	0.0293	0.745
16	0.78	0.0229	0.581
25	1.15	0.0178	0.451
40	1.63	0.0127	0.324
50	1.90	0.0105	0.268
60	2.24	0.0083	0.212
75	3.06	0.0047	0.120
84	4.10	0.0023	0.058
90	5.54	0.0008	0.021
95	7.44	0.0002	0.006

Measure	Trask	Inman	Folk-Ward
Median, phi	1.90	1.90	1.90
Median, in.	0.0105	0.0105	0.0105
Median, mm	0.268	0.268	0.268
Mean, phi	1.81	2.44	2.26
Mean, in.	0.0113	0.0073	0.0082
Mean, mm	0.286	0.184	0.209
Sorting	1.937	1.657	1.956
Skewness	0.871	0.324	0.407
Kurtosis	0.229	1.246	1.598
Grain Size Description (ASTM-USCS Scale)		Fine sand (based on Mean from Trask)	

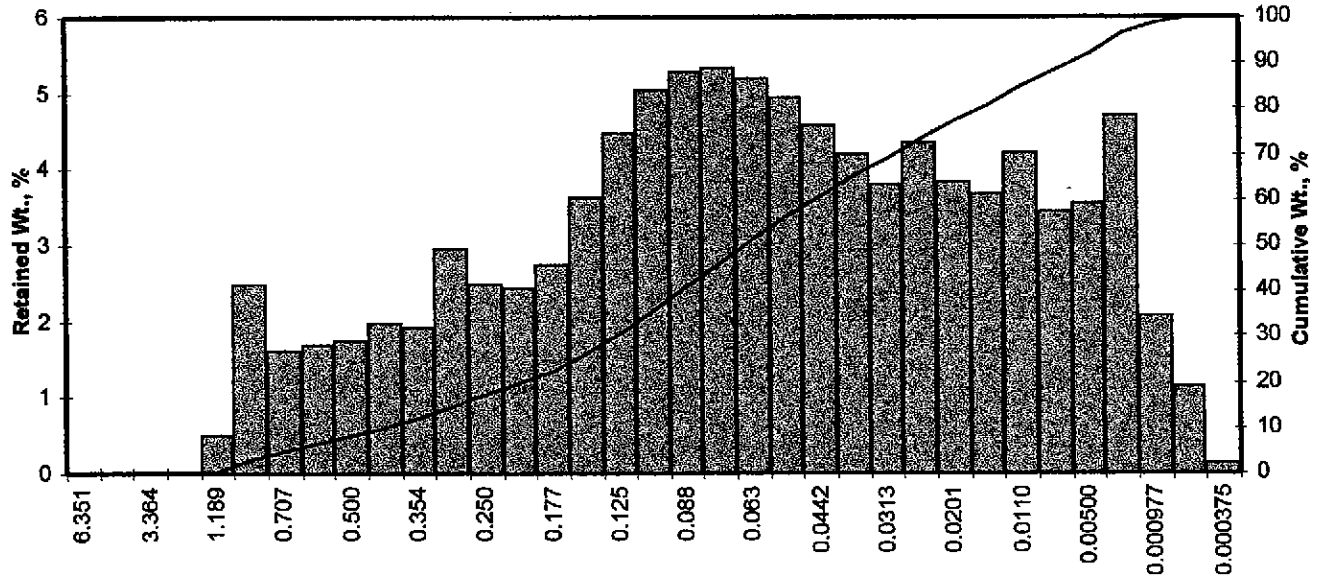
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	27.89
Fine Sand	200	53.90
Silt	>0.005 mm	13.68
Clay	<0.005 mm	4.53
	Total	**100**

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	Calscience Enviromental Laboratories	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B4-9.1-061402
Project No:	02-06-0837	**Depth, ft:**	N/A

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.49	0.49	0.49
0.0331	0.841	0.25	20	2.47	2.47	2.96
0.0278	0.707	0.50	25	1.61	1.61	4.57
0.0234	0.595	0.75	30	1.69	1.69	6.26
0.0197	0.500	1.00	35	1.74	1.74	8.00
0.0166	0.420	1.25	40	1.96	1.96	9.96
0.0139	0.354	1.50	45	1.91	1.91	11.87
0.0117	0.297	1.75	50	2.95	2.95	14.82
0.0098	0.250	2.00	60	2.48	2.48	17.30
0.0083	0.210	2.25	70	2.43	2.43	19.73
0.0070	0.177	2.50	80	2.75	2.75	22.48
0.0059	0.149	2.75	100	3.63	3.63	26.11
0.0049	0.125	3.00	120	4.48	4.48	30.59
0.0041	0.105	3.25	140	5.04	5.04	35.63
0.0035	0.088	3.50	170	5.27	5.27	40.90
0.0029	0.074	3.75	200	5.32	5.32	46.22
0.0025	0.063	4.00	230	5.20	5.20	51.42
0.0021	0.053	4.25	270	4.94	4.94	56.36
0.00174	0.0442	4.50	325	4.58	4.58	60.94
0.00146	0.0372	4.75	400	4.19	4.19	65.13
0.00123	0.0313	5.00	450	3.79	3.79	68.92
0.000986	0.0250	5.32	500	4.34	4.34	73.26
0.000790	0.0201	5.64	635	3.82	3.82	77.08
0.000615	0.0156	6.00		3.67	3.67	80.75
0.000435	0.0110	6.50		4.22	4.22	84.97
0.000308	0.00781	7.00		3.45	3.45	88.42
0.000197	0.00500	7.65		3.54	3.54	91.96
0.000077	0.00195	9.00		4.70	4.70	96.66
0.000038	0.000977	10.00		2.08	2.08	98.74
0.000019	0.000488	11.00		1.14	1.14	99.88
0.000015	0.000375	11.38		0.12	0.12	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	0.56	0.0266	0.677
10	1.26	0.0165	0.419
16	1.87	0.0108	0.274
25	2.67	0.0062	0.157
40	3.46	0.0036	0.091
50	3.93	0.0026	0.066
60	4.45	0.0018	0.046
75	5.47	0.0009	0.023
84	6.39	0.0005	0.012
90	7.29	0.0003	0.006
95	8.52	0.0001	0.003

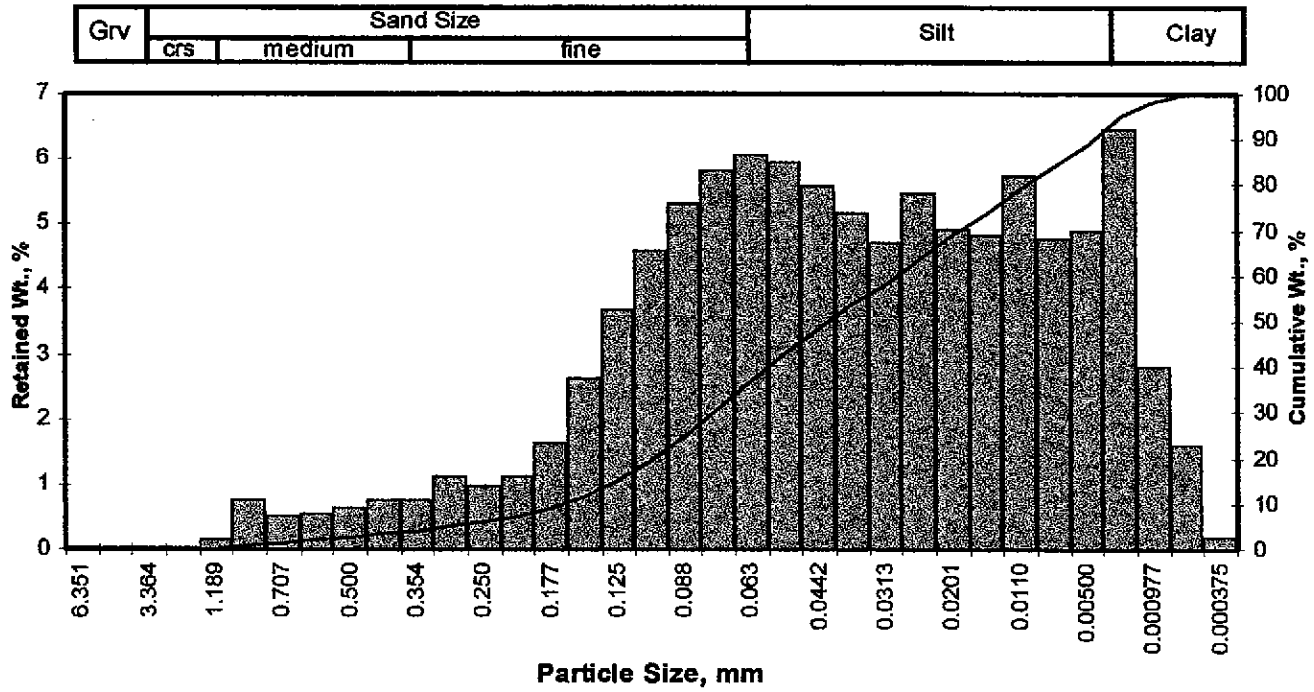
Measure	Trask	Inman	Folk-Ward
Median, phi	3.93	3.93	3.93
Median, in.	0.0026	0.0026	0.0026
Median, mm	0.066	0.066	0.066
Mean, phi	3.48	4.13	4.06
Mean, in.	0.0035	0.0023	0.0024
Mean, mm	0.090	0.057	0.060
Sorting	2.632	2.258	2.335
Skewness	0.909	0.086	0.120
Kurtosis	0.163	0.762	1.168
Grain Size Description (ASTM-USCS Scale)		Fine sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	9.96
Fine Sand	200	36.26
Silt	>0.005 mm	45.74
Clay	<0.005 mm	8.04
	Total	**100**

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	Calscience Enviromental Laboratories	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B4-9.8-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1673	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.15	0.15	0.15
0.0331	0.841	0.25	20	0.76	0.76	0.91
0.0278	0.707	0.50	25	0.50	0.50	1.41
0.0234	0.595	0.75	30	0.55	0.55	1.96
0.0197	0.500	1.00	35	0.62	0.62	2.58
0.0166	0.420	1.25	40	0.75	0.75	3.33
0.0139	0.354	1.50	45	0.74	0.74	4.07
0.0117	0.297	1.75	50	1.12	1.12	5.19
0.0098	0.250	2.00	60	0.96	0.96	6.15
0.0083	0.210	2.25	70	1.11	1.11	7.26
0.0070	0.177	2.50	80	1.62	1.62	8.88
0.0059	0.149	2.75	100	2.64	2.64	11.52
0.0049	0.125	3.00	120	3.69	3.69	15.21
0.0041	0.105	3.25	140	4.60	4.60	19.81
0.0035	0.088	3.50	170	5.30	5.30	25.11
0.0029	0.074	3.75	200	5.83	5.83	30.94
0.0025	0.063	4.00	230	6.05	6.05	36.99
0.0021	0.053	4.25	270	5.94	5.94	42.93
0.00174	0.0442	4.50	325	5.59	5.59	48.52
0.00146	0.0372	4.75	400	5.15	5.15	53.67
0.00123	0.0313	5.00	450	4.71	4.71	58.38
0.000986	0.0250	5.32	500	5.47	5.47	63.85
0.000790	0.0201	5.64	635	4.91	4.91	68.76
0.000615	0.0156	6.00		4.83	4.83	73.59
0.000435	0.0110	6.50		5.72	5.72	79.31
0.000308	0.00781	7.00		4.77	4.77	84.08
0.000197	0.00500	7.65		4.88	4.88	88.96
0.000077	0.00195	9.00		6.46	6.46	95.42
0.000038	0.000977	10.00		2.82	2.82	98.24
0.000019	0.000488	11.00		1.59	1.59	99.83
0.000015	0.000375	11.38		0.17	0.17	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	1.71	0.0121	0.306
10	2.61	0.0065	0.164
16	3.04	0.0048	0.121
25	3.49	0.0035	0.089
40	4.13	0.0023	0.057
50	4.57	0.0017	0.042
60	5.09	0.0012	0.029
75	6.12	0.0006	0.014
84	6.99	0.0003	0.008
90	7.86	0.0002	0.004
95	8.91	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	4.57	4.57	4.57
Median, in.	0.0017	0.0017	0.0017
Median, mm	0.042	0.042	0.042
Mean, phi	4.28	5.02	4.87
Mean, in.	0.0020	0.0012	0.0013
Mean, mm	0.052	0.031	0.034
Sorting	2.487	1.974	2.079
Skewness	0.848	0.226	0.215
Kurtosis	0.232	0.824	1.123
Grain Size Description (ASTM-USCS Scale)		Silt (based on Mean from Trask)	

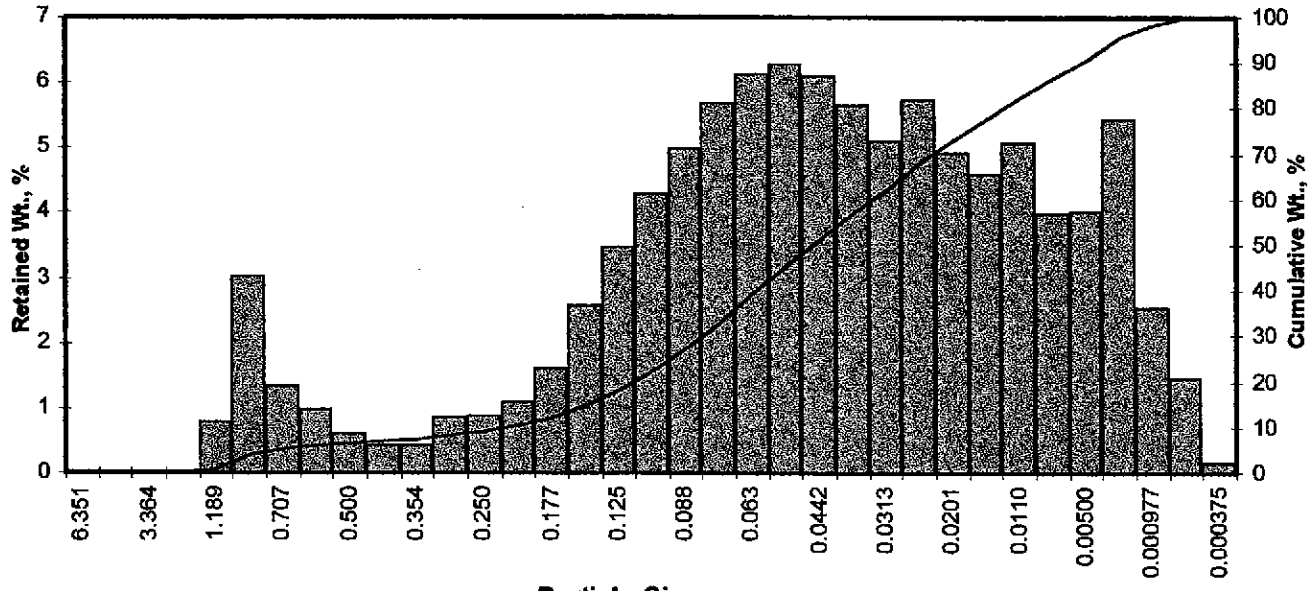
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	3.33
Fine Sand	200	27.61
Silt	>0.005 mm	58.02
Clay	<0.005 mm	11.04
	Total	**100**

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	Calscience Enviromental Laboratories	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B5-10.1-061402
Project No:	02-06-0837	**Depth, ft:**	N/A

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0466	1.189	-0.25	16	0.77	0.77	0.77
0.0331	0.841	0.25	20	3.01	3.01	3.78
0.0278	0.707	0.50	25	1.32	1.32	5.10
0.0234	0.595	0.75	30	0.97	0.97	6.07
0.0197	0.500	1.00	35	0.59	0.59	6.66
0.0166	0.420	1.25	40	0.43	0.43	7.09
0.0139	0.354	1.50	45	0.43	0.43	7.52
0.0117	0.297	1.75	50	0.84	0.84	8.36
0.0098	0.250	2.00	60	0.88	0.88	9.24
0.0083	0.210	2.25	70	1.10	1.10	10.34
0.0070	0.177	2.50	80	1.61	1.61	11.95
0.0059	0.149	2.75	100	2.56	2.56	14.51
0.0049	0.125	3.00	120	3.48	3.48	17.99
0.0041	0.105	3.25	140	4.28	4.28	22.27
0.0035	0.088	3.50	170	4.98	4.98	27.25
0.0029	0.074	3.75	200	5.67	5.67	32.92
0.0025	0.063	4.00	230	6.14	6.14	39.06
0.0021	0.053	4.25	270	6.28	6.28	45.34
0.00174	0.0442	4.50	325	6.09	6.09	51.43
0.00146	0.0372	4.75	400	5.65	5.65	57.08
0.00123	0.0313	5.00	450	5.10	5.10	62.18
0.000986	0.0250	5.32	500	5.74	5.74	67.92
0.000790	0.0201	5.64	635	4.91	4.91	72.83
0.000615	0.0156	6.00		4.58	4.58	77.41
0.000435	0.0110	6.50		5.07	5.07	82.48
0.000308	0.00781	7.00		3.99	3.99	86.47
0.000197	0.00500	7.65		4.00	4.00	90.47
0.000077	0.00195	9.00		5.42	5.42	95.89
0.000038	0.000977	10.00		2.52	2.52	98.41
0.000019	0.000488	11.00		1.44	1.44	99.85
0.000015	0.000375	11.38		0.15	0.15	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	0.48	0.0282	0.716
10	2.17	0.0087	0.222
16	2.86	0.0054	0.138
25	3.39	0.0038	0.096
40	4.04	0.0024	0.061
50	4.44	0.0018	0.046
60	4.89	0.0013	0.034
75	5.81	0.0007	0.018
84	6.69	0.0004	0.010
90	7.57	0.0002	0.005
95	8.78	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	4.44	4.44	4.44
Median, in.	0.0018	0.0018	0.0018
Median, mm	0.046	0.046	0.046
Mean, phi	4.14	4.77	4.66
Mean, in.	0.0022	0.0014	0.0016
Mean, mm	0.057	0.037	0.039
Sorting	2.316	1.917	2.215
Skewness	0.897	0.173	0.109
Kurtosis	0.180	1.164	1.403
Grain Size Description (ASTM-USCS Scale)		Silt (based on Mean from Trask)	

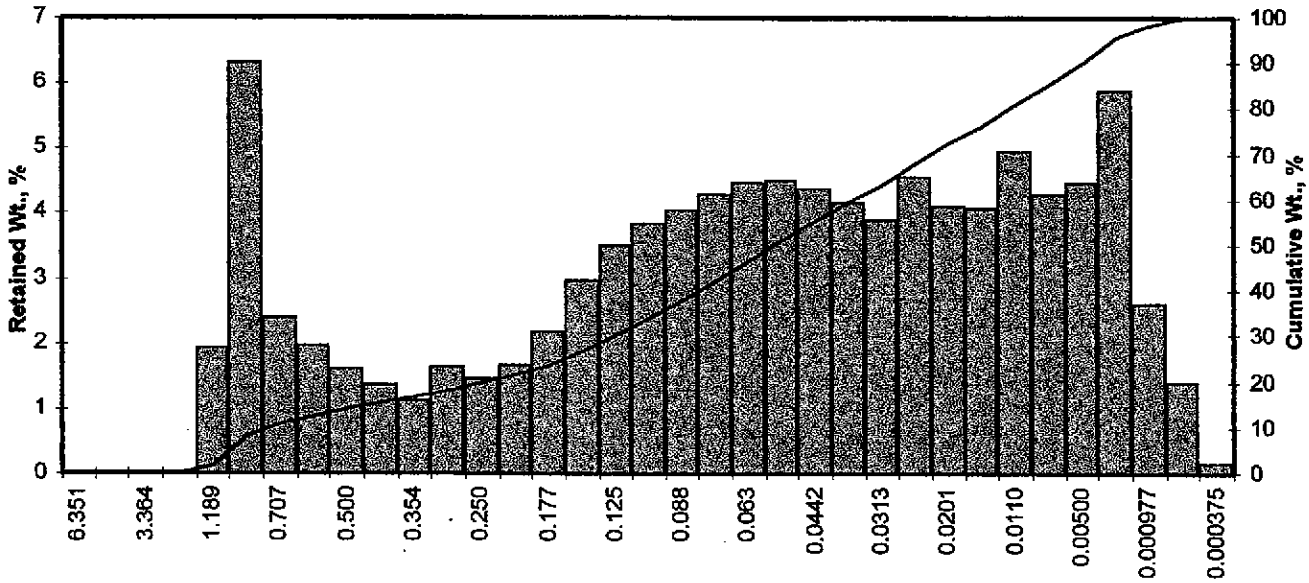
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	7.09
Fine Sand	200	25.83
Silt	>0.005 mm	57.55
Clay	<0.005 mm	9.53
	Total	**100**

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	Calscience Enviromental Laboratories	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B6-9.1-061402
Project No:	02-06-0837	**Depth, ft:**	N/A

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Particle Size, mm

Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	1.93	1.93	1.93
0.0331	0.841	0.25	20	6.31	6.31	8.24
0.0278	0.707	0.50	25	2.39	2.39	10.63
0.0234	0.595	0.75	30	1.96	1.96	12.59
0.0197	0.500	1.00	35	1.59	1.59	14.18
0.0166	0.420	1.25	40	1.37	1.37	15.55
0.0139	0.354	1.50	45	1.12	1.12	16.67
0.0117	0.297	1.75	50	1.62	1.62	18.29
0.0098	0.250	2.00	60	1.45	1.45	19.74
0.0083	0.210	2.25	70	1.66	1.66	21.40
0.0070	0.177	2.50	80	2.16	2.16	23.56
0.0059	0.149	2.75	100	2.95	2.95	26.51
0.0049	0.125	3.00	120	3.51	3.51	30.02
0.0041	0.105	3.25	140	3.83	3.83	33.85
0.0035	0.088	3.50	170	4.05	4.05	37.90
0.0029	0.074	3.75	200	4.29	4.29	42.19
0.0025	0.063	4.00	230	4.47	4.47	46.66
0.0021	0.053	4.25	270	4.49	4.49	51.15
0.00174	0.0442	4.50	325	4.37	4.37	55.52
0.00146	0.0372	4.75	400	4.15	4.15	59.67
0.00123	0.0313	5.00	450	3.88	3.88	63.55
0.000986	0.0250	5.32	500	4.56	4.56	68.11
0.000790	0.0201	5.64	635	4.11	4.11	72.22
0.000615	0.0156	6.00		4.07	4.07	76.29
0.000435	0.0110	6.50		4.96	4.96	81.25
0.000308	0.00781	7.00		4.28	4.28	85.53
0.000197	0.00500	7.65		4.46	4.46	89.99
0.000077	0.00195	9.00		5.89	5.89	95.88
0.000038	0.000977	10.00		2.58	2.58	98.46
0.000019	0.000488	11.00		1.40	1.40	99.86
0.000015	0.000375	11.38		0.14	0.14	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-0.01	0.0396	1.005
10	0.43	0.0291	0.740
16	1.35	0.0154	0.392
25	2.62	0.0064	0.162
40	3.62	0.0032	0.081
50	4.19	0.0022	0.055
60	4.77	0.0014	0.037
75	5.89	0.0007	0.017
84	6.82	0.0003	0.009
90	7.65	0.0002	0.005
95	8.80	0.0001	0.002

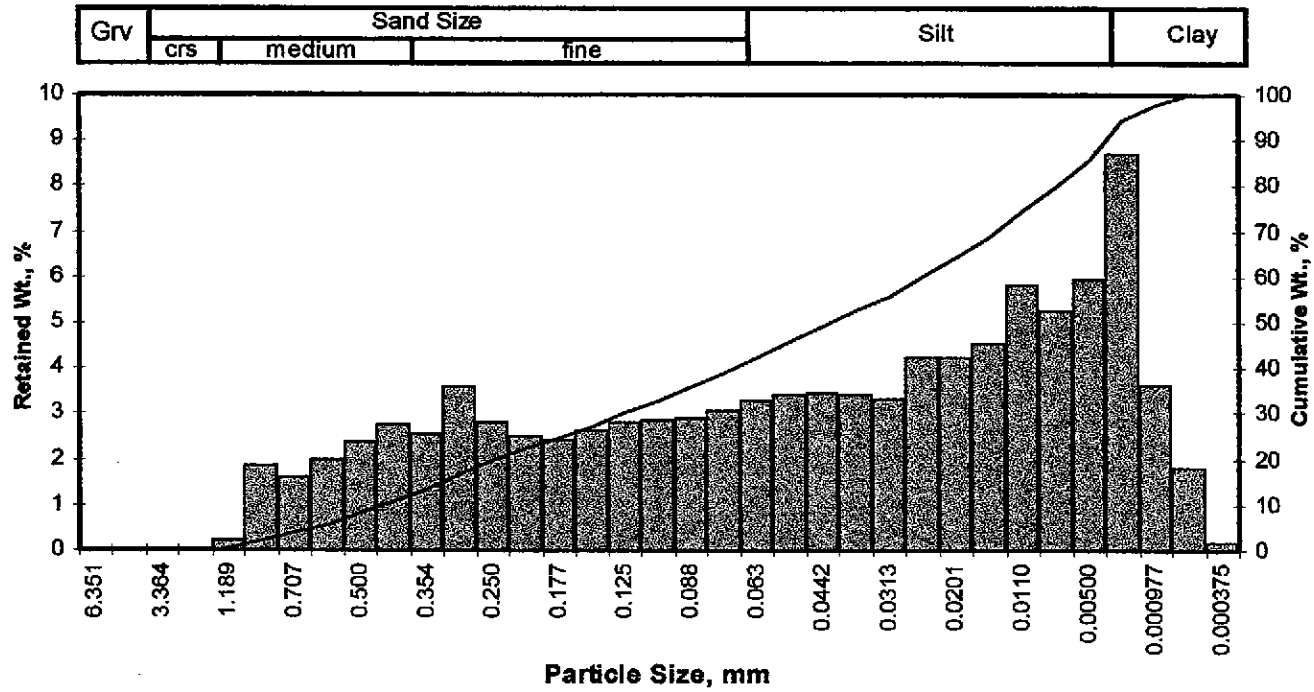
Measure	Trask	Inman	Folk-Ward
Median, phi	4.19	4.19	4.19
Median, in.	0.0022	0.0022	0.0022
Median, mm	0.055	0.055	0.055
Mean, phi	3.48	4.09	4.12
Mean, in.	0.0035	0.0023	0.0023
Mean, mm	0.090	0.059	0.058
Sorting	3.099	2.735	2.702
Skewness	0.954	-0.037	0.005
Kurtosis	0.099	0.609	1.106
Grain Size Description (ASTM-USCS Scale)		Fine sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	15.55
Fine Sand	200	26.64
Silt	>0.005 mm	47.80
Clay	<0.005 mm	10.01
	Total	**100**

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	Calscience Enviromental Laboratories	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B6-10.6-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.23	0.23	0.23
0.0331	0.841	0.25	20	1.85	1.85	2.08
0.0278	0.707	0.50	25	1.60	1.60	3.68
0.0234	0.595	0.75	30	1.98	1.98	5.66
0.0197	0.500	1.00	35	2.39	2.39	8.05
0.0166	0.420	1.25	40	2.77	2.77	10.82
0.0139	0.354	1.50	45	2.53	2.53	13.35
0.0117	0.297	1.75	50	3.56	3.56	16.91
0.0098	0.250	2.00	60	2.80	2.80	19.71
0.0083	0.210	2.25	70	2.51	2.51	22.22
0.0070	0.177	2.50	80	2.42	2.42	24.64
0.0059	0.149	2.75	100	2.65	2.65	27.29
0.0049	0.125	3.00	120	2.80	2.80	30.09
0.0041	0.105	3.25	140	2.83	2.83	32.92
0.0035	0.088	3.50	170	2.87	2.87	35.79
0.0029	0.074	3.75	200	3.05	3.05	38.84
0.0025	0.063	4.00	230	3.27	3.27	42.11
0.0021	0.053	4.25	270	3.42	3.42	45.53
0.00174	0.0442	4.50	325	3.46	3.46	48.99
0.00146	0.0372	4.75	400	3.40	3.40	52.38
0.00123	0.0313	5.00	450	3.33	3.33	55.71
0.000986	0.0250	5.32	500	4.21	4.21	59.92
0.000790	0.0201	5.64	635	4.22	4.22	64.14
0.000615	0.0156	6.00		4.53	4.53	68.67
0.000435	0.0110	6.50		5.82	5.82	74.49
0.000308	0.00781	7.00		5.27	5.27	79.76
0.000197	0.00500	7.65		5.94	5.94	85.70
0.000077	0.00195	9.00		8.72	8.72	94.42
0.000038	0.000977	10.00		3.61	3.61	98.03
0.000019	0.000488	11.00		1.79	1.79	99.82
0.000015	0.000375	11.38		0.18	0.18	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	0.67	0.0248	0.630
10	1.18	0.0174	0.443
16	1.69	0.0122	0.311
25	2.53	0.0068	0.173
40	3.84	0.0028	0.070
50	4.57	0.0017	0.042
60	5.33	0.0010	0.025
75	6.55	0.0004	0.011
84	7.46	0.0002	0.006
90	8.31	0.0001	0.003
95	9.16	0.0001	0.002

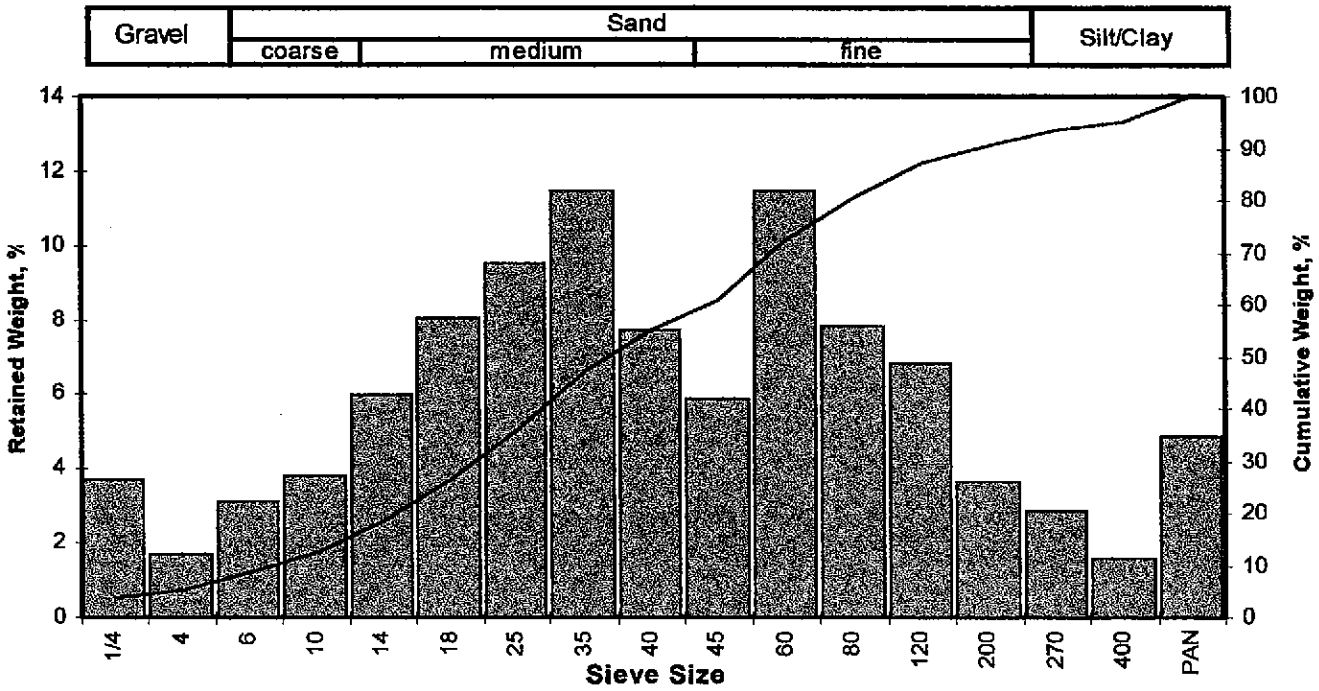
Measure	Trask	Inman	Folk-Ward
Median, phi	4.57	4.57	4.57
Median, in.	0.0017	0.0017	0.0017
Median, mm	0.042	0.042	0.042
Mean, phi	3.45	4.57	4.57
Mean, in.	0.0036	0.0017	0.0017
Mean, mm	0.092	0.042	0.042
Sorting	4.019	2.887	2.730
Skewness	1.023	0.000	0.040
Kurtosis	0.184	0.471	0.867
Grain Size Description (ASTM-USCS Scale)		Fine sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	10.82
Fine Sand	200	28.02
Silt	>0.005 mm	46.87
Clay	<0.005 mm	14.30
	Total	**100**

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B1-7.6-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.97	3.70	3.70
0.1873	4.757	-2.25	4	0.44	1.68	5.38
0.1324	3.364	-1.75	6	0.82	3.13	8.51
0.0787	2.000	-1.00	10	1.00	3.82	12.32
0.0557	1.414	-0.50	14	1.57	5.99	18.31
0.0394	1.000	0.00	18	2.11	8.05	26.36
0.0278	0.707	0.50	25	2.49	9.50	35.86
0.0197	0.500	1.00	35	3.01	11.48	47.35
0.0166	0.420	1.25	40	2.02	7.71	55.06
0.0139	0.354	1.50	45	1.54	5.88	60.93
0.0098	0.250	2.00	60	3.00	11.45	72.38
0.0070	0.177	2.50	80	2.05	7.82	80.20
0.0049	0.125	3.00	120	1.78	6.79	86.99
0.0029	0.074	3.75	200	0.96	3.66	90.65
0.0021	0.053	4.25	270	0.75	2.86	93.51
0.0015	0.037	4.75	400	0.42	1.60	95.12
			PAN	1.28	4.88	100.00
TOTALS				26.21	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.34	0.1999	5.078
10	-1.46	0.1081	2.745
16	-0.69	0.0637	1.617
25	-0.08	0.0418	1.060
40	0.68	0.0246	0.624
50	1.09	0.0185	0.471
60	1.46	0.0143	0.363
75	2.17	0.0088	0.223
84	2.78	0.0057	0.146
90	3.62	0.0032	0.082
95	4.71	0.0015	0.038

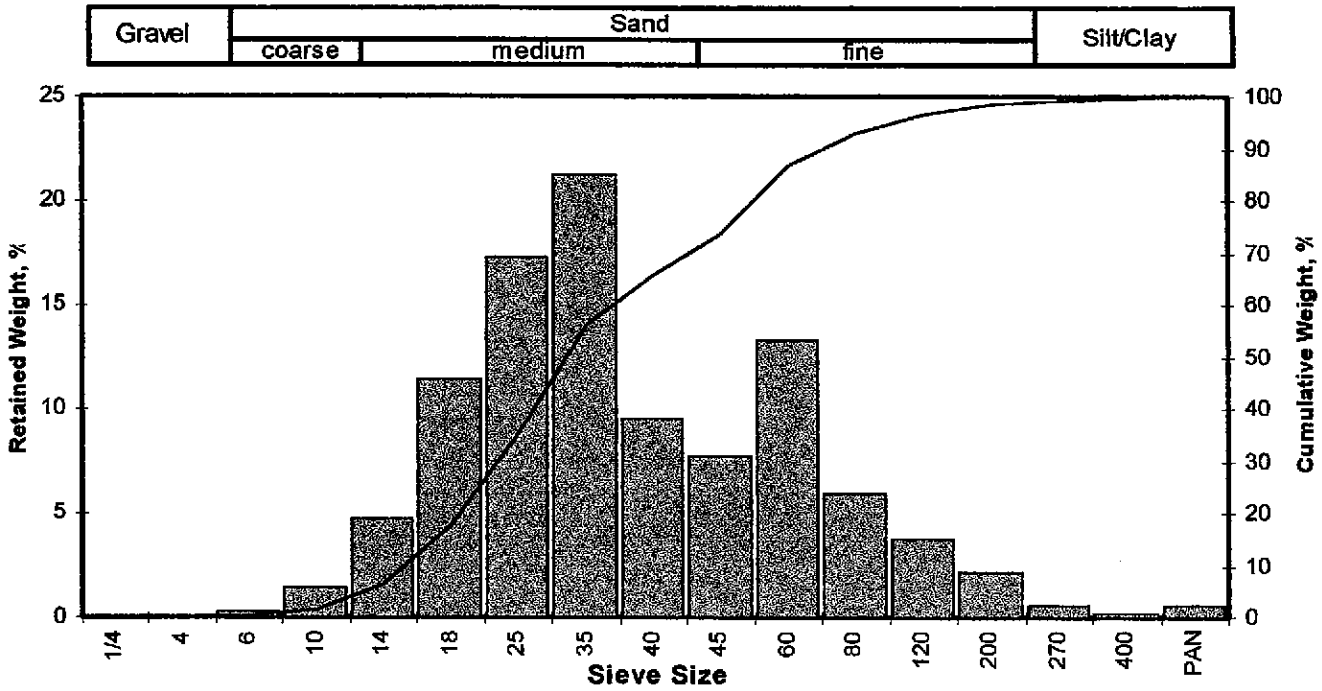
Measure	Trask	Inman	Folk-Ward
Median, phi	1.09	1.09	1.09
Median, in.	0.0185	0.0185	0.0185
Median, mm	0.471	0.471	0.471
Mean, phi	0.64	1.04	1.06
Mean, in.	0.0253	0.0191	0.0189
Mean, mm	0.642	0.485	0.480
Sorting	2.183	1.737	1.938
Skewness	1.031	-0.025	0.002
Kurtosis	0.157	1.032	1.284
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	5.38
Coarse Sand	10	6.94
Medium Sand	40	42.73
Fine Sand	200	35.60
Silt/Clay	<200	9.35
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B6-4.6-061837
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.05	0.25	0.25
0.0787	2.000	-1.00	10	0.28	1.43	1.68
0.0557	1.414	-0.50	14	0.92	4.68	6.36
0.0394	1.000	0.00	18	2.24	11.41	17.77
0.0278	0.707	0.50	25	3.39	17.26	35.03
0.0197	0.500	1.00	35	4.17	21.23	56.26
0.0166	0.420	1.25	40	1.87	9.52	65.78
0.0139	0.354	1.50	45	1.52	7.74	73.52
0.0098	0.250	2.00	60	2.62	13.34	86.86
0.0070	0.177	2.50	80	1.16	5.91	92.77
0.0049	0.125	3.00	120	0.74	3.77	96.54
0.0029	0.074	3.75	200	0.42	2.14	98.68
0.0021	0.053	4.25	270	0.11	0.56	99.24
0.0015	0.037	4.75	400	0.04	0.20	99.44
			PAN	0.11	0.56	100.00
TOTALS				19.64	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-0.65	0.0616	1.564
10	-0.34	0.0499	1.266
16	-0.08	0.0415	1.055
25	0.21	0.0341	0.865
40	0.62	0.0257	0.652
50	0.85	0.0218	0.554
60	1.10	0.0184	0.467
75	1.56	0.0134	0.340
84	1.89	0.0106	0.269
90	2.27	0.0082	0.208
95	2.80	0.0057	0.144

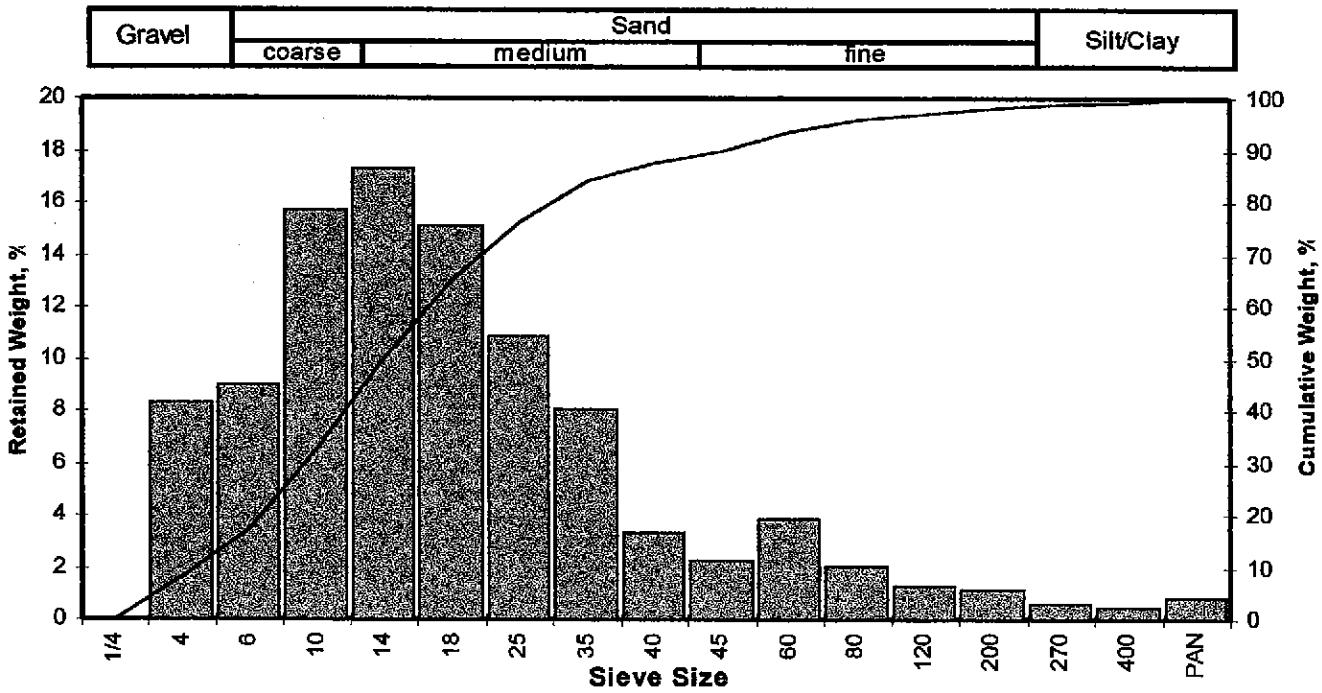
Measure	Trask	Inman	Folk-Ward
Median, phi	0.85	0.85	0.85
Median, in.	0.0218	0.0218	0.0218
Median, mm	0.554	0.554	0.554
Mean, phi	0.73	0.91	0.89
Mean, in.	0.0237	0.0210	0.0213
Mean, mm	0.603	0.533	0.540
Sorting	1.594	0.985	1.014
Skewness	0.980	0.056	0.093
Kurtosis	0.248	0.747	1.048
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	1.68
Medium Sand	40	64.10
Fine Sand	200	32.89
Silt/Clay	<200	1.32
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B2-6.1-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	1.74	8.29	8.29
0.1324	3.364	-1.75	6	1.89	9.01	17.30
0.0787	2.000	-1.00	10	3.29	15.68	32.98
0.0557	1.414	-0.50	14	3.63	17.30	50.29
0.0394	1.000	0.00	18	3.16	15.06	65.35
0.0278	0.707	0.50	25	2.28	10.87	76.22
0.0197	0.500	1.00	35	1.70	8.10	84.32
0.0166	0.420	1.25	40	0.69	3.29	87.61
0.0139	0.354	1.50	45	0.47	2.24	89.85
0.0098	0.250	2.00	60	0.81	3.86	93.71
0.0070	0.177	2.50	80	0.43	2.05	95.76
0.0049	0.125	3.00	120	0.27	1.29	97.04
0.0029	0.074	3.75	200	0.23	1.10	98.14
0.0021	0.053	4.25	270	0.12	0.57	98.71
0.0015	0.037	4.75	400	0.09	0.43	99.14
			PAN	0.18	0.86	100.00
TOTALS				20.98	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.42	0.2101	5.335
10	-2.16	0.1754	4.455
16	-1.82	0.1392	3.536
25	-1.38	0.1026	2.606
40	-0.80	0.0684	1.738
50	-0.51	0.0560	1.422
60	-0.18	0.0445	1.131
75	0.44	0.0289	0.735
84	0.98	0.0200	0.507
90	1.52	0.0137	0.349
95	2.32	0.0079	0.201

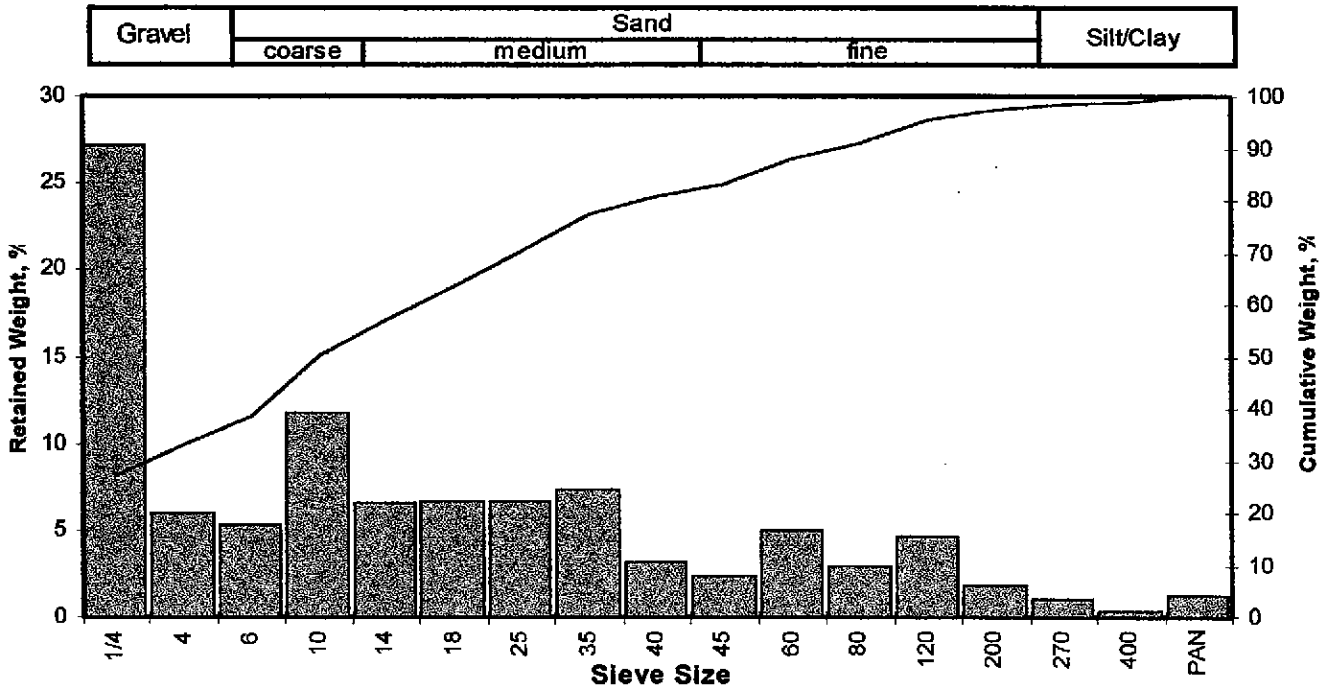
Measure	Trask	Inman	Folk-Ward
Median, phi	-0.51	-0.51	-0.51
Median, in.	0.0560	0.0560	0.0560
Median, mm	1.422	1.422	1.422
Mean, phi	-0.74	-0.42	-0.45
Mean, in.	0.0658	0.0527	0.0538
Mean, mm	1.671	1.339	1.366
Sorting	1.883	1.401	1.417
Skewness	0.973	0.062	0.128
Kurtosis	0.228	0.688	1.062
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	8.29
Coarse Sand	10	24.69
Medium Sand	40	54.62
Fine Sand	200	10.53
Silt/Clay	<200	1.86
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B1-6.1-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	7.74	27.19	27.19
0.1873	4.757	-2.25	4	1.70	5.97	33.16
0.1324	3.364	-1.75	6	1.52	5.34	38.50
0.0787	2.000	-1.00	10	3.34	11.73	50.23
0.0557	1.414	-0.50	14	1.88	6.60	56.83
0.0394	1.000	0.00	18	1.90	6.67	63.51
0.0278	0.707	0.50	25	1.91	6.71	70.21
0.0197	0.500	1.00	35	2.08	7.31	77.52
0.0166	0.420	1.25	40	0.91	3.20	80.72
0.0139	0.354	1.50	45	0.67	2.35	83.07
0.0098	0.250	2.00	60	1.41	4.95	88.02
0.0070	0.177	2.50	80	0.83	2.92	90.94
0.0049	0.125	3.00	120	1.32	4.64	95.57
0.0029	0.074	3.75	200	0.52	1.83	97.40
0.0021	0.053	4.25	270	0.28	0.98	98.38
0.0015	0.037	4.75	400	0.10	0.35	98.74
			PAN	0.36	1.26	100.00
TOTALS				28.47	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5			
10			
16			
25			
40	-1.65	0.1239	3.147
50	-1.01	0.0795	2.020
60	-0.26	0.0472	1.200
75	0.83	0.0222	0.563
84	1.59	0.0130	0.331
90	2.34	0.0078	0.198
95	2.94	0.0051	0.130

Measure	Trask	Inman	Folk-Ward
Median, phi	-1.01	-1.01	-1.01
Median, in.	0.0795	0.0795	0.0795
Median, mm	2.020	2.020	2.020
Mean, phi			
Mean, in.			
Mean, mm			
Sorting			
Skewness			
Kurtosis			

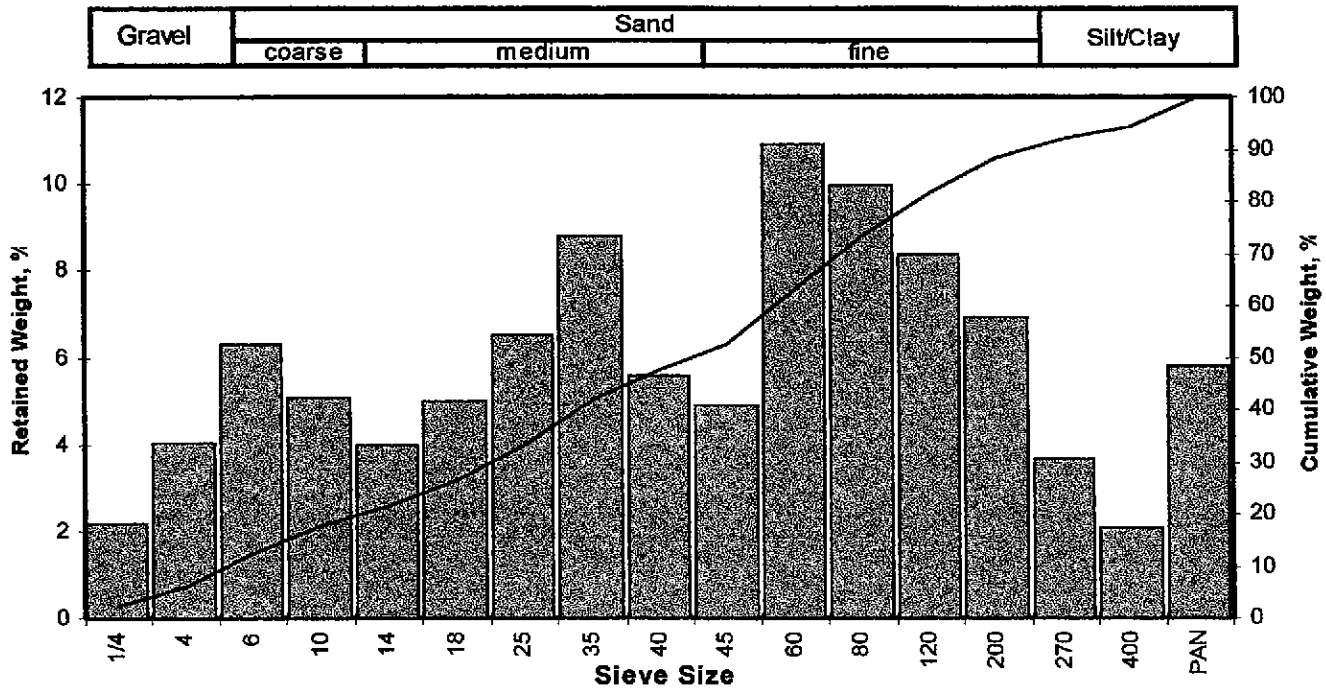
Grain Size Description (ASTM-USCS Scale)	N/A (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	33.16
Coarse Sand	10	17.07
Medium Sand	40	30.49
Fine Sand	200	16.68
Silt/Clay	<200	2.60
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B2-7.6-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.42	2.17	2.17
0.1873	4.757	-2.25	4	0.78	4.03	6.20
0.1324	3.364	-1.75	6	1.22	6.30	12.51
0.0787	2.000	-1.00	10	0.98	5.06	17.57
0.0557	1.414	-0.50	14	0.77	3.98	21.55
0.0394	1.000	0.00	18	0.96	4.96	26.51
0.0278	0.707	0.50	25	1.26	6.51	33.02
0.0197	0.500	1.00	35	1.70	8.79	41.81
0.0166	0.420	1.25	40	1.08	5.58	47.39
0.0139	0.354	1.50	45	0.95	4.91	52.30
0.0098	0.250	2.00	60	2.11	10.90	63.20
0.0070	0.177	2.50	80	1.93	9.97	73.18
0.0049	0.125	3.00	120	1.62	8.37	81.55
0.0029	0.074	3.75	200	1.34	6.93	88.48
0.0021	0.053	4.25	270	0.71	3.67	92.14
0.0015	0.037	4.75	400	0.40	2.07	94.21
			PAN	1.12	5.79	100.00
TOTALS				19.35	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.37	0.2041	5.185
10	-1.95	0.1520	3.860
16	-1.23	0.0925	2.350
25	-0.15	0.0438	1.111
40	0.90	0.0211	0.537
50	1.38	0.0151	0.383
60	1.85	0.0109	0.277
75	2.61	0.0065	0.164
84	3.27	0.0041	0.104
90	3.96	0.0025	0.064
95	4.10	0.0023	0.058

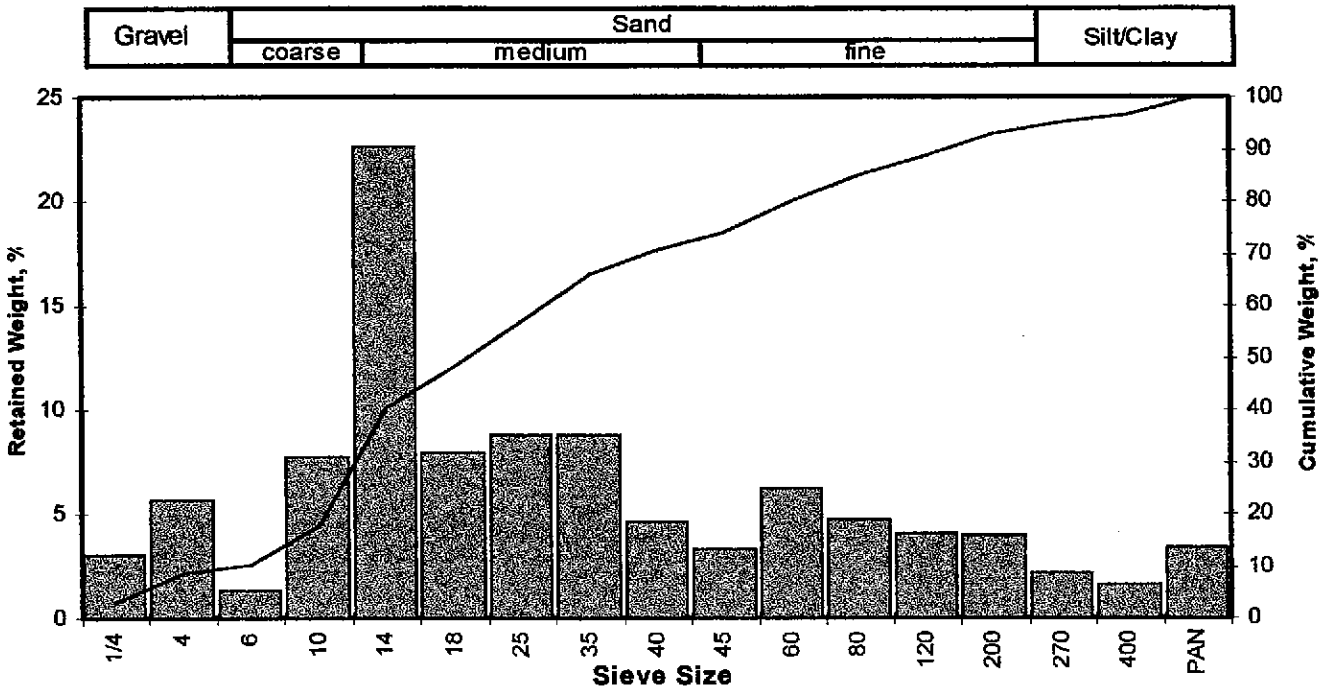
Measure	Trask	Inman	Folk-Ward
Median, phi	1.38	1.38	1.38
Median, in.	0.0151	0.0151	0.0151
Median, mm	0.383	0.383	0.383
Mean, phi	0.65	1.02	1.14
Mean, in.	0.0251	0.0195	0.0179
Mean, mm	0.638	0.494	0.454
Sorting	2.604	2.249	2.106
Skewness	1.113	-0.163	-0.162
Kurtosis	0.125	0.440	0.961
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	6.20
Coarse Sand	10	11.37
Medium Sand	40	29.82
Fine Sand	200	41.09
Silt/Clay	<200	11.52
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B1-3.0-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.50	3.03	3.03
0.1873	4.757	-2.25	4	0.93	5.64	8.67
0.1324	3.364	-1.75	6	0.22	1.33	10.01
0.0787	2.000	-1.00	10	1.28	7.76	17.77
0.0557	1.414	-0.50	14	3.73	22.62	40.39
0.0394	1.000	0.00	18	1.31	7.94	48.33
0.0278	0.707	0.50	25	1.45	8.79	57.13
0.0197	0.500	1.00	35	1.45	8.79	65.92
0.0166	0.420	1.25	40	0.76	4.61	70.53
0.0139	0.354	1.50	45	0.55	3.34	73.86
0.0098	0.250	2.00	60	1.02	6.19	80.05
0.0070	0.177	2.50	80	0.78	4.73	84.78
0.0049	0.125	3.00	120	0.67	4.06	88.84
0.0029	0.074	3.75	200	0.65	3.94	92.78
0.0021	0.053	4.25	270	0.36	2.18	94.97
0.0015	0.037	4.75	400	0.27	1.64	96.60
			PAN	0.56	3.40	100.00
TOTALS				16.49	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.52	0.2261	5.742
10	-1.75	0.1326	3.369
16	-1.17	0.0886	2.251
25	-0.84	0.0705	1.790
40	-0.51	0.0560	1.423
50	0.09	0.0369	0.936
60	0.66	0.0249	0.631
75	1.59	0.0131	0.332
84	2.42	0.0074	0.187
90	3.22	0.0042	0.107
95	4.26	0.0021	0.052

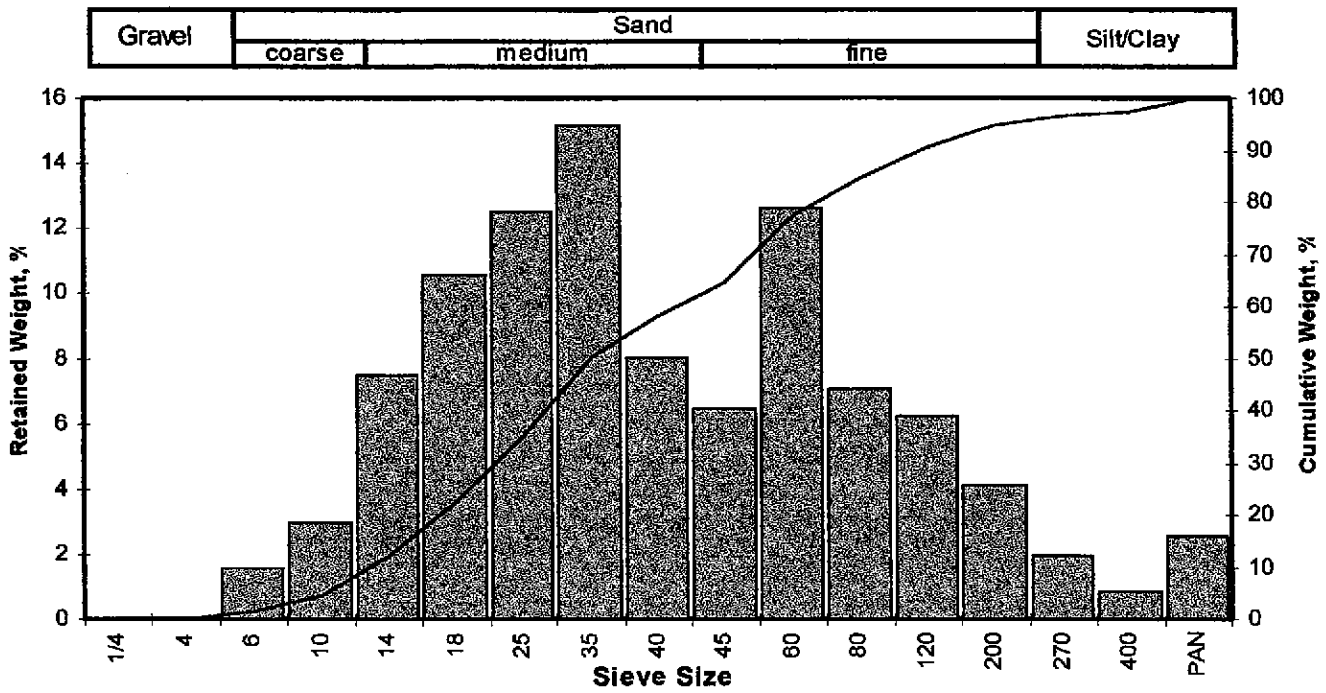
Measure	Trask	Inman	Folk-Ward
Median, phi	0.09	0.09	0.09
Median, in.	0.0369	0.0369	0.0369
Median, mm	0.936	0.936	0.936
Mean, phi	-0.09	0.62	0.45
Mean, in.	0.0418	0.0256	0.0289
Mean, mm	1.061	0.649	0.733
Sorting	2.323	1.794	1.925
Skewness	0.823	0.295	0.262
Kurtosis	0.224	0.890	1.143
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	8.67
Coarse Sand	10	9.10
Medium Sand	40	52.76
Fine Sand	200	22.26
Silt/Clay	<200	7.22
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B1-10.6-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.26	1.59	1.59
0.0787	2.000	-1.00	10	0.48	2.93	4.52
0.0557	1.414	-0.50	14	1.22	7.46	11.98
0.0394	1.000	0.00	18	1.73	10.57	22.56
0.0278	0.707	0.50	25	2.04	12.47	35.02
0.0197	0.500	1.00	35	2.48	15.16	50.18
0.0166	0.420	1.25	40	1.31	8.01	58.19
0.0139	0.354	1.50	45	1.06	6.48	64.67
0.0098	0.250	2.00	60	2.06	12.59	77.26
0.0070	0.177	2.50	80	1.16	7.09	84.35
0.0049	0.125	3.00	120	1.02	6.23	90.59
0.0029	0.074	3.75	200	0.67	4.10	94.68
0.0021	0.053	4.25	270	0.32	1.96	96.64
0.0015	0.037	4.75	400	0.14	0.86	97.49
			PAN	0.41	2.51	100.00
TOTALS				16.36	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-0.97	0.0770	1.956
10	-0.63	0.0610	1.551
16	-0.31	0.0488	1.240
25	0.10	0.0368	0.934
40	0.66	0.0248	0.631
50	0.99	0.0198	0.502
60	1.32	0.0158	0.401
75	1.91	0.0105	0.266
84	2.48	0.0071	0.180
90	2.95	0.0051	0.129
95	3.83	0.0028	0.070

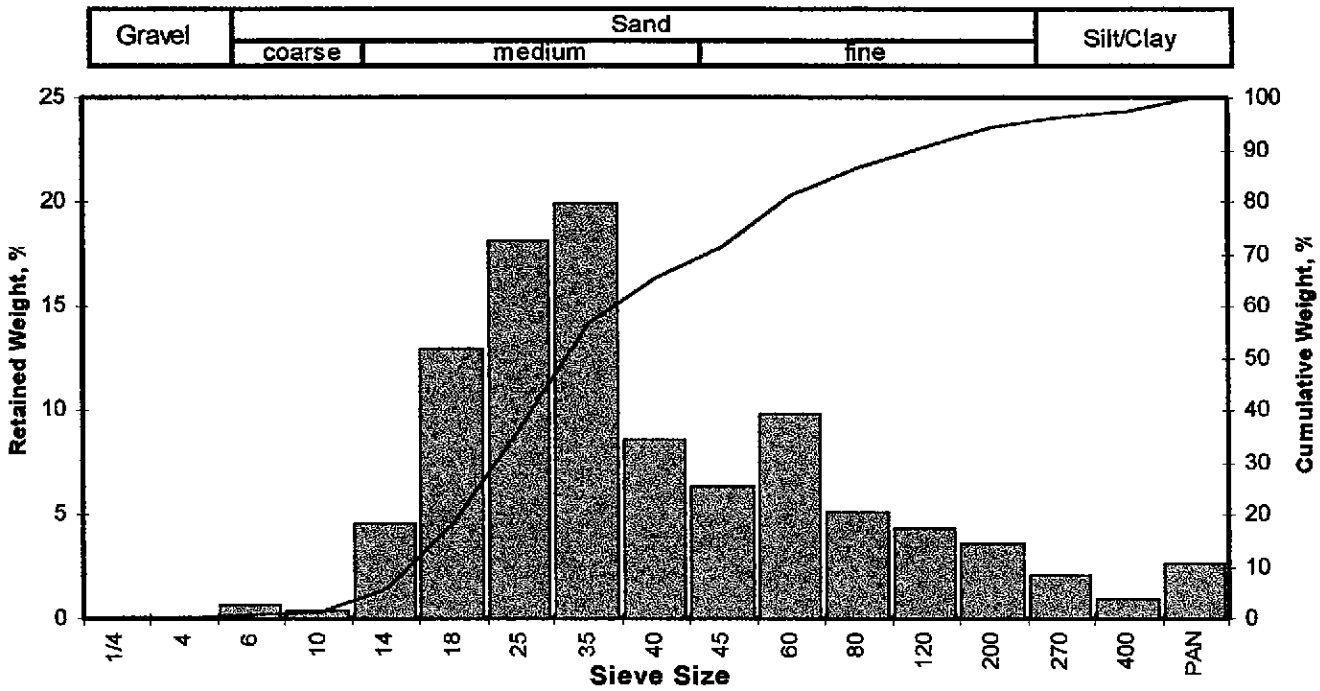
Measure	Trask	Inman	Folk-Ward
Median, phi	0.99	0.99	0.99
Median, in.	0.0198	0.0198	0.0198
Median, mm	0.502	0.502	0.502
Mean, phi	0.74	1.08	1.05
Mean, in.	0.0236	0.0186	0.0190
Mean, mm	0.600	0.472	0.482
Sorting	1.874	1.393	1.423
Skewness	0.993	0.064	0.123
Kurtosis	0.235	0.723	1.085
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	4.52
Medium Sand	40	53.67
Fine Sand	200	36.49
Silt/Clay	<200	5.32
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B4-7.6-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.15	0.69	0.69
0.0787	2.000	-1.00	10	0.09	0.41	1.10
0.0557	1.414	-0.50	14	0.98	4.50	5.60
0.0394	1.000	0.00	18	2.82	12.94	18.54
0.0278	0.707	0.50	25	3.95	18.13	36.67
0.0197	0.500	1.00	35	4.34	19.92	56.59
0.0166	0.420	1.25	40	1.87	8.58	65.17
0.0139	0.354	1.50	45	1.37	6.29	71.45
0.0098	0.250	2.00	60	2.14	9.82	81.28
0.0070	0.177	2.50	80	1.12	5.14	86.42
0.0049	0.125	3.00	120	0.94	4.31	90.73
0.0029	0.074	3.75	200	0.78	3.58	94.31
0.0021	0.053	4.25	270	0.45	2.07	96.37
0.0015	0.037	4.75	400	0.21	0.96	97.34
			PAN	0.58	2.66	100.00
TOTALS				21.79	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-0.57	0.0583	1.481
10	-0.33	0.0495	1.257
16	-0.10	0.0421	1.070
25	0.18	0.0348	0.884
40	0.58	0.0263	0.667
50	0.83	0.0221	0.561
60	1.10	0.0184	0.467
75	1.68	0.0123	0.312
84	2.27	0.0082	0.208
90	2.92	0.0052	0.133
95	3.92	0.0026	0.066

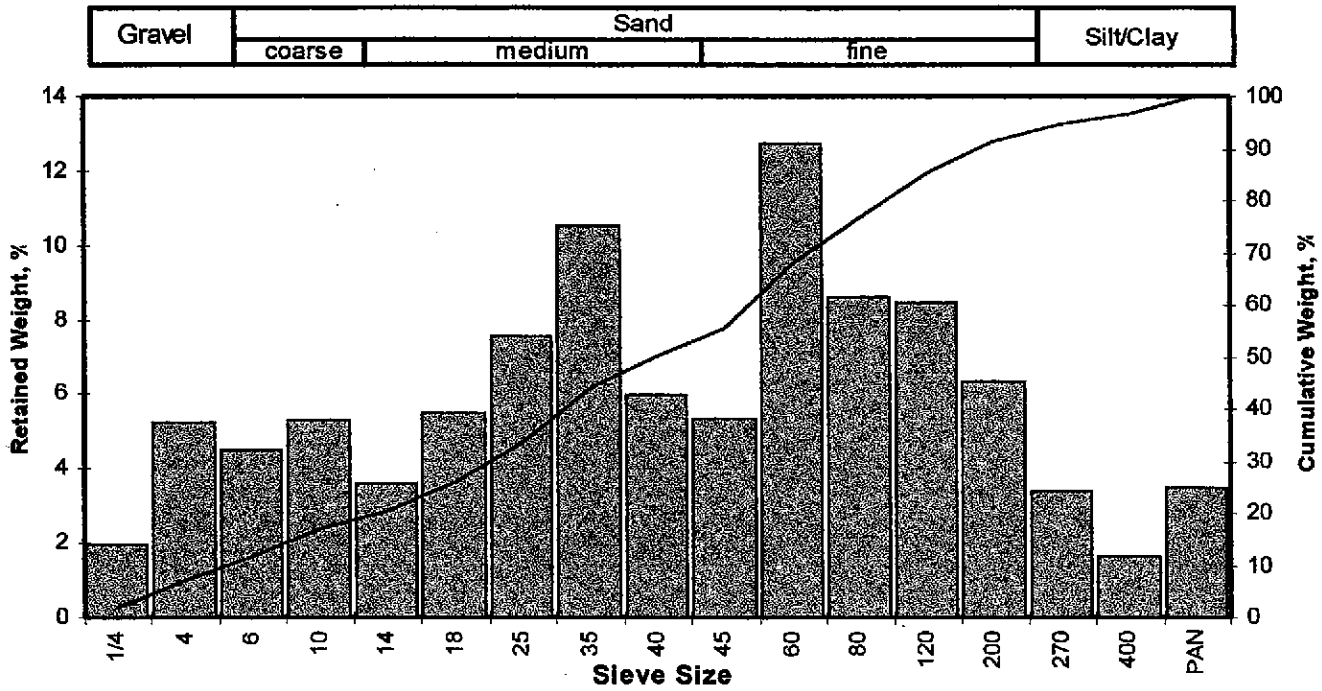
Measure	Trask	Inman	Folk-Ward
Median, phi	0.83	0.83	0.83
Median, in.	0.0221	0.0221	0.0221
Median, mm	0.561	0.561	0.561
Mean, phi	0.74	1.08	1.00
Mean, in.	0.0235	0.0186	0.0197
Mean, mm	0.598	0.472	0.500
Sorting	1.683	1.182	1.270
Skewness	0.936	0.211	0.293
Kurtosis	0.254	0.897	1.223
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	1.10
Medium Sand	40	64.07
Fine Sand	200	29.14
Silt/Clay	<200	5.69
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B5-4.6-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.37	1.93	1.93
0.1873	4.757	-2.25	4	1.00	5.22	7.15
0.1324	3.364	-1.75	6	0.86	4.49	11.64
0.0787	2.000	-1.00	10	1.01	5.27	16.92
0.0557	1.414	-0.50	14	0.69	3.60	20.52
0.0394	1.000	0.00	18	1.05	5.48	26.01
0.0278	0.707	0.50	25	1.45	7.57	33.58
0.0197	0.500	1.00	35	2.01	10.50	44.07
0.0166	0.420	1.25	40	1.14	5.95	50.03
0.0139	0.354	1.50	45	1.02	5.33	55.35
0.0098	0.250	2.00	60	2.44	12.74	68.09
0.0070	0.177	2.50	80	1.65	8.62	76.71
0.0049	0.125	3.00	120	1.62	8.46	85.17
0.0029	0.074	3.75	200	1.21	6.32	91.49
0.0021	0.053	4.25	270	0.65	3.39	94.88
0.0015	0.037	4.75	400	0.31	1.62	96.50
			PAN	0.67	3.50	100.00
TOTALS				19.15	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.42	0.2110	5.359
10	-1.93	0.1503	3.819
16	-1.13	0.0862	2.190
25	-0.09	0.0420	1.066
40	0.81	0.0225	0.572
50	1.25	0.0166	0.421
60	1.68	0.0123	0.312
75	2.40	0.0075	0.189
84	2.93	0.0052	0.131
90	3.57	0.0033	0.084
95	4.29	0.0020	0.051

Measure	Trask	Inman	Folk-Ward
Median, phi	1.25	1.25	1.25
Median, in.	0.0166	0.0166	0.0166
Median, mm	0.421	0.421	0.421
Mean, phi	0.67	0.90	1.02
Mean, in.	0.0247	0.0211	0.0195
Mean, mm	0.627	0.536	0.494
Sorting	2.372	2.031	2.032
Skewness	1.068	-0.172	-0.133
Kurtosis	0.117	0.652	1.103
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

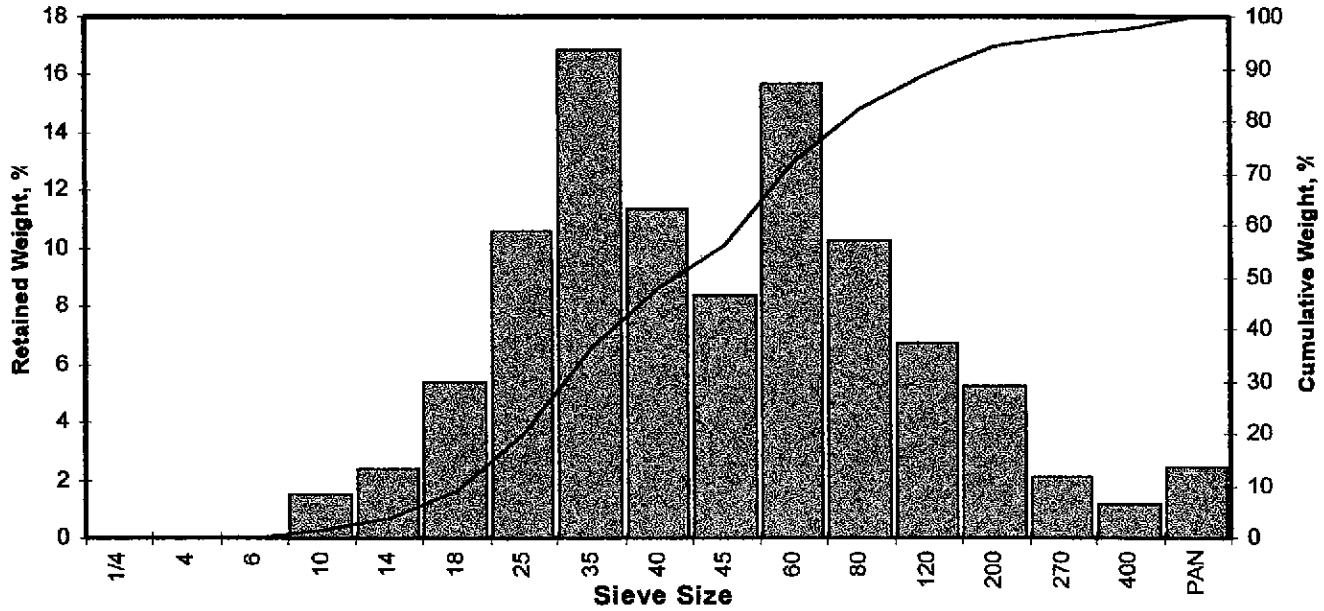
Description	Retained on Sieve #	Weight Percent
Gravel	4	7.15
Coarse Sand	10	9.77
Medium Sand	40	33.11
Fine Sand	200	41.46
Silt/Clay	<200	8.51
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B5-6.1-061402
Project No:	02-06-0837	**Depth, ft:**	N/A

Gravel	Sand			Silt/Clay
	coarse	medium	fine	



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.32	1.50	1.50
0.0557	1.414	-0.50	14	0.51	2.39	3.89
0.0394	1.000	0.00	18	1.14	5.34	9.23
0.0278	0.707	0.50	25	2.26	10.59	19.81
0.0197	0.500	1.00	35	3.60	16.86	36.67
0.0166	0.420	1.25	40	2.42	11.33	48.01
0.0139	0.354	1.50	45	1.79	8.38	56.39
0.0098	0.250	2.00	60	3.35	15.69	72.08
0.0070	0.177	2.50	80	2.19	10.26	82.34
0.0049	0.125	3.00	120	1.43	6.70	89.04
0.0029	0.074	3.75	200	1.12	5.25	94.29
0.0021	0.053	4.25	270	0.45	2.11	96.39
0.0015	0.037	4.75	400	0.25	1.17	97.56
			PAN	0.52	2.44	100.00
TOTALS				21.35	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-0.40	0.0518	1.316
10	0.04	0.0384	0.975
16	0.32	0.0315	0.801
25	0.65	0.0250	0.636
40	1.07	0.0187	0.475
50	1.31	0.0159	0.404
60	1.61	0.0129	0.326
75	2.14	0.0089	0.227
84	2.62	0.0064	0.162
90	3.14	0.0045	0.114
95	3.92	0.0026	0.066

Measure	Trask	Inman	Folk-Ward
Median, phi	1.31	1.31	1.31
Median, in.	0.0159	0.0159	0.0159
Median, mm	0.404	0.404	0.404
Mean, phi	1.21	1.47	1.42
Mean, in.	0.0170	0.0142	0.0147
Mean, mm	0.431	0.361	0.374
Sorting	1.675	1.152	1.230
Skewness	0.940	0.141	0.175
Kurtosis	0.237	0.873	1.188
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

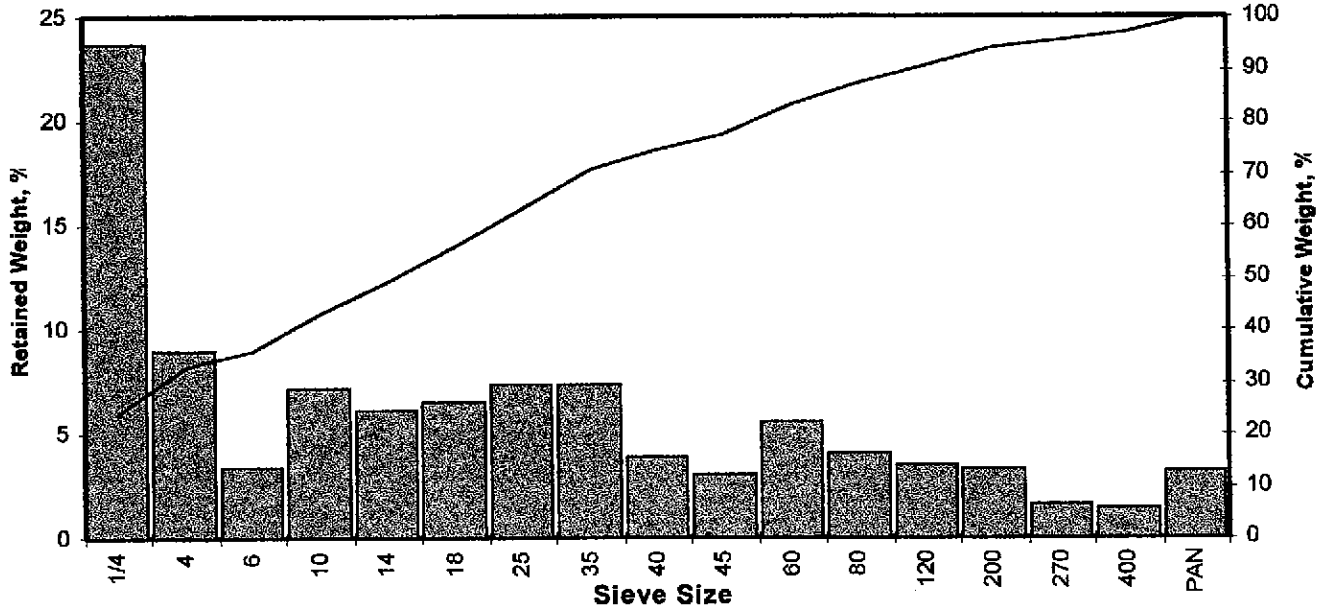
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	1.50
Medium Sand	40	46.51
Fine Sand	200	46.28
Silt/Clay	<200	5.71
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B1-4.6-061302
Project No:	02-06-0837	**Depth, ft:**	N/A

Gravel	Sand			Silt/Clay
	coarse	medium	fine	



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	3.42	23.65	23.65
0.1873	4.757	-2.25	4	1.30	8.99	32.64
0.1324	3.364	-1.75	6	0.49	3.39	36.03
0.0787	2.000	-1.00	10	1.03	7.12	43.15
0.0557	1.414	-0.50	14	0.88	6.09	49.24
0.0394	1.000	0.00	18	0.94	6.50	55.74
0.0278	0.707	0.50	25	1.07	7.40	63.14
0.0197	0.500	1.00	35	1.06	7.33	70.47
0.0166	0.420	1.25	40	0.56	3.87	74.34
0.0139	0.354	1.50	45	0.43	2.97	77.32
0.0098	0.250	2.00	60	0.81	5.60	82.92
0.0070	0.177	2.50	80	0.59	4.08	87.00
0.0049	0.125	3.00	120	0.50	3.46	90.46
0.0029	0.074	3.75	200	0.48	3.32	93.78
0.0021	0.053	4.25	270	0.23	1.59	95.37
0.0015	0.037	4.75	400	0.21	1.45	96.82
			PAN	0.46	3.18	100.00
TOTALS				14.46	100.00	100.00

Cumulative Weight Percent greater than

Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5			
10			
16			
25	-2.60	0.2394	6.082
40	-1.33	0.0991	2.518
50	-0.44	0.0535	1.358
60	0.29	0.0322	0.819
75	1.31	0.0159	0.405
84	2.13	0.0090	0.228
90	2.93	0.0052	0.131
95	4.13	0.0022	0.057

Measure	Trask	Inman	Folk-Ward
Median, phi	-0.44	-0.44	-0.44
Median, in.	0.0535	0.0535	0.0535
Median, mm	1.358	1.358	1.358
Mean, phi	-1.70		
Mean, in.	0.1277		
Mean, mm	3.243		
Sorting	3.877		
Skewness	1.155		
Kurtosis			

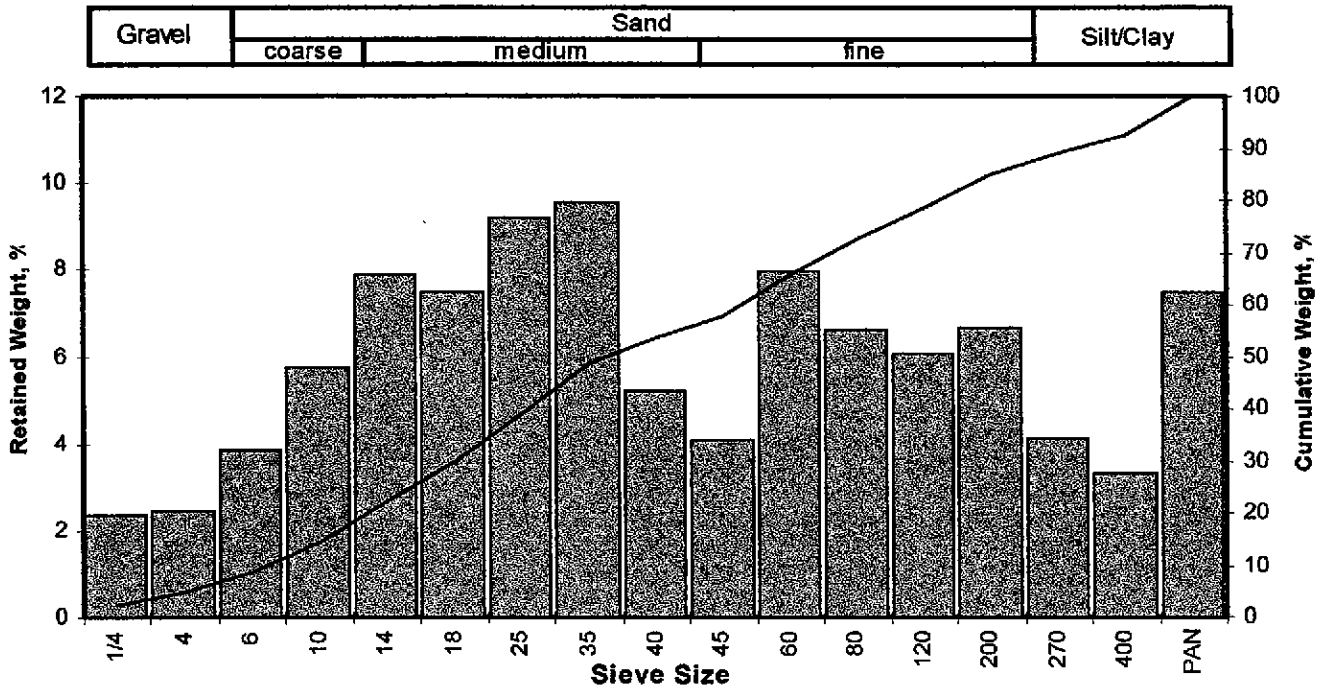
Grain Size Description (ASTM-USCS Scale)	Coarse sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	32.64
Coarse Sand	10	10.51
Medium Sand	40	31.19
Fine Sand	200	19.43
Silt/Clay	<200	6.22
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B5-3.0-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.40	2.33	2.33
0.1873	4.757	-2.25	4	0.42	2.45	4.78
0.1324	3.364	-1.75	6	0.66	3.85	8.63
0.0787	2.000	-1.00	10	0.99	5.77	14.40
0.0557	1.414	-0.50	14	1.35	7.87	22.27
0.0394	1.000	0.00	18	1.28	7.46	29.74
0.0278	0.707	0.50	25	1.58	9.21	38.95
0.0197	0.500	1.00	35	1.64	9.56	48.51
0.0166	0.420	1.25	40	0.89	5.19	53.70
0.0139	0.354	1.50	45	0.70	4.08	57.78
0.0098	0.250	2.00	60	1.37	7.99	65.77
0.0070	0.177	2.50	80	1.13	6.59	72.36
0.0049	0.125	3.00	120	1.04	6.06	78.43
0.0029	0.074	3.75	200	1.14	6.65	85.07
0.0021	0.053	4.25	270	0.71	4.14	89.21
0.0015	0.037	4.75	400	0.57	3.32	92.54
			PAN	1.28	7.46	100.00
TOTALS				17.15	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.22	0.1836	4.664
10	-1.57	0.1171	2.973
16	-0.90	0.0734	1.864
25	-0.32	0.0491	1.246
40	0.55	0.0268	0.681
50	1.07	0.0187	0.476
60	1.64	0.0126	0.321
75	2.72	0.0060	0.152
84	3.63	0.0032	0.081
90	4.37	0.0019	0.048
95	3.18	0.0043	0.110

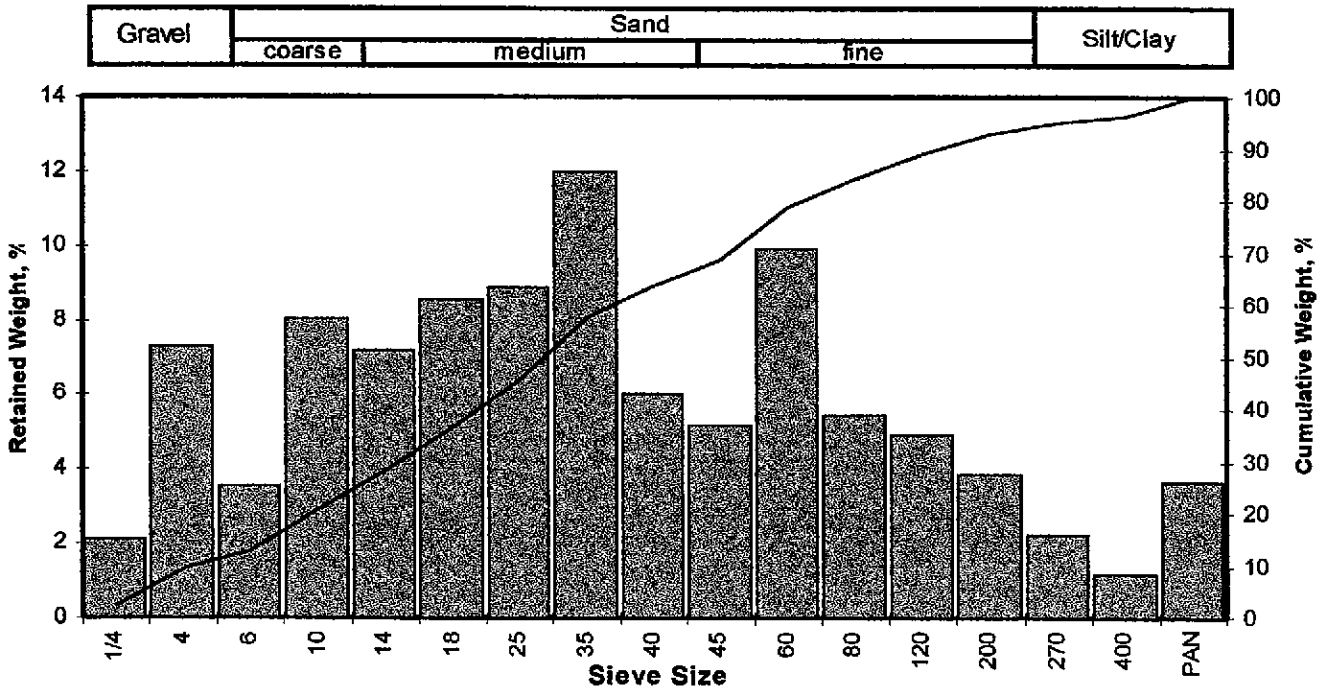
Measure	Trask	Inman	Folk-Ward
Median, phi	1.07	1.07	1.07
Median, in.	0.0187	0.0187	0.0187
Median, mm	0.476	0.476	0.476
Mean, phi	0.52	1.37	1.27
Mean, in.	0.0275	0.0153	0.0164
Mean, mm	0.699	0.388	0.415
Sorting	2.863	2.264	1.951
Skewness	0.915	0.130	-0.045
Kurtosis	0.187	0.194	0.730
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	4.78
Coarse Sand	10	9.62
Medium Sand	40	39.30
Fine Sand	200	31.37
Silt/Clay	<200	14.93
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B1-9.1-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.34	2.11	2.11
0.1873	4.757	-2.25	4	1.17	7.27	9.38
0.1324	3.364	-1.75	6	0.57	3.54	12.92
0.0787	2.000	-1.00	10	1.29	8.01	20.93
0.0557	1.414	-0.50	14	1.16	7.20	28.14
0.0394	1.000	0.00	18	1.38	8.57	36.71
0.0278	0.707	0.50	25	1.43	8.88	45.59
0.0197	0.500	1.00	35	1.93	11.99	57.58
0.0166	0.420	1.25	40	0.97	6.02	63.60
0.0139	0.354	1.50	45	0.83	5.16	68.76
0.0098	0.250	2.00	60	1.60	9.94	78.70
0.0070	0.177	2.50	80	0.88	5.47	84.16
0.0049	0.125	3.00	120	0.79	4.91	89.07
0.0029	0.074	3.75	200	0.62	3.85	92.92
0.0021	0.053	4.25	270	0.36	2.24	95.16
0.0015	0.037	4.75	400	0.19	1.18	96.34
			PAN	0.59	3.66	100.00
TOTALS				16.10	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.50	0.2229	5.662
10	-2.16	0.1762	4.476
16	-1.46	0.1084	2.754
25	-0.72	0.0647	1.645
40	0.19	0.0346	0.879
50	0.68	0.0245	0.622
60	1.10	0.0184	0.466
75	1.81	0.0112	0.284
84	2.49	0.0070	0.179
90	3.18	0.0043	0.110
95	4.22	0.0021	0.054

Measure	Trask	Inman	Folk-Ward
Median, phi	0.68	0.68	0.68
Median, in.	0.0245	0.0245	0.0245
Median, mm	0.622	0.622	0.622
Mean, phi	0.05	0.51	0.57
Mean, in.	0.0380	0.0276	0.0265
Mean, mm	0.964	0.701	0.674
Sorting	2.405	1.973	2.004
Skewness	1.099	-0.087	-0.018
Kurtosis	0.156	0.702	1.087
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	9.38
Coarse Sand	10	11.55
Medium Sand	40	42.67
Fine Sand	200	29.32
Silt/Clay	<200	7.08
	Total	100

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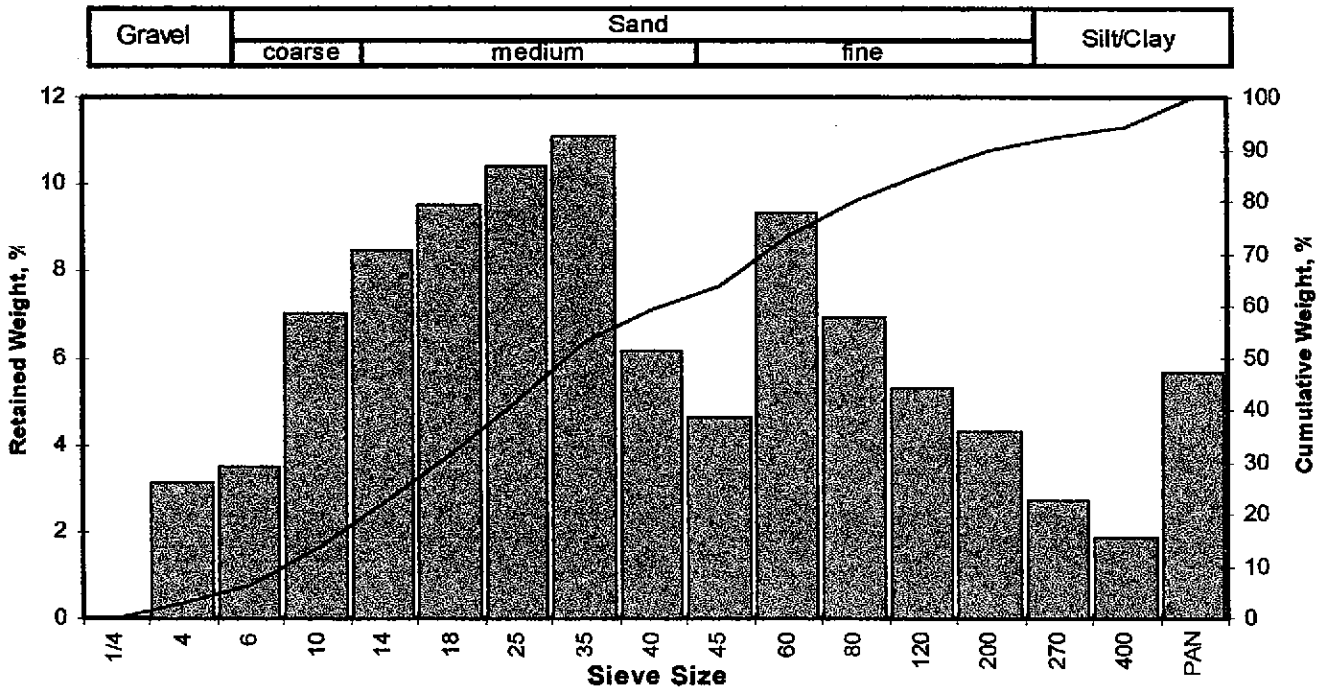
PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B3-7.6-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.88	3.10	3.10
0.1324	3.364	-1.75	6	0.99	3.49	6.60
0.0787	2.000	-1.00	10	1.99	7.02	13.62
0.0557	1.414	-0.50	14	2.40	8.47	22.08
0.0394	1.000	0.00	18	2.70	9.52	31.60
0.0278	0.707	0.50	25	2.95	10.41	42.01
0.0197	0.500	1.00	35	3.15	11.11	53.12
0.0166	0.420	1.25	40	1.75	6.17	59.29
0.0139	0.354	1.50	45	1.31	4.62	63.92
0.0098	0.250	2.00	60	2.65	9.35	73.26
0.0070	0.177	2.50	80	1.96	6.91	80.18
0.0049	0.125	3.00	120	1.50	5.29	85.47
0.0029	0.074	3.75	200	1.22	4.30	89.77
0.0021	0.053	4.25	270	0.77	2.72	92.49
0.0015	0.037	4.75	400	0.52	1.83	94.32
			PAN	1.61	5.68	100.00
TOTALS				28.35	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-1.98	0.1552	3.941
10	-1.39	0.1029	2.614
16	-0.86	0.0714	1.814
25	-0.35	0.0501	1.272
40	0.40	0.0298	0.756
50	0.86	0.0217	0.551
60	1.29	0.0161	0.409
75	2.13	0.0090	0.229
84	2.86	0.0054	0.138
90	3.79	0.0028	0.072
95	4.18	0.0022	0.055

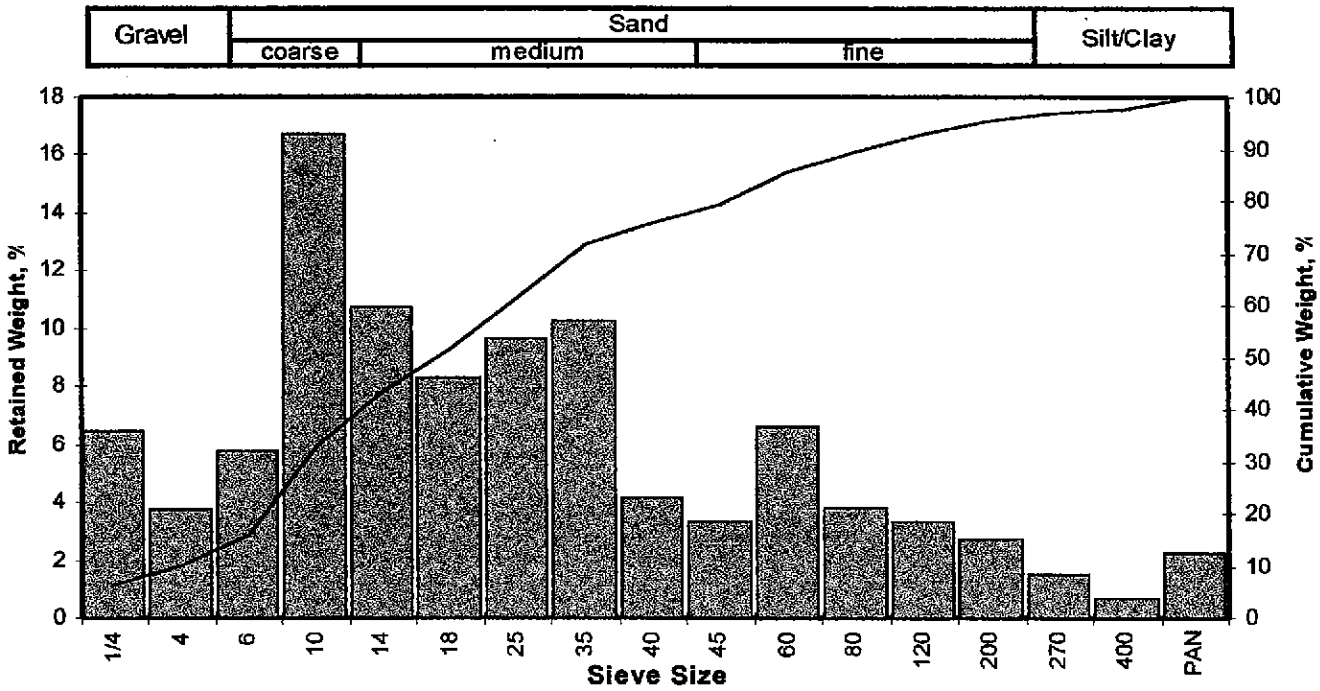
Measure	Trask	Inman	Folk-Ward
Median, phi	0.86	0.86	0.86
Median, in.	0.0217	0.0217	0.0217
Median, mm	0.551	0.551	0.551
Mean, phi	0.41	1.00	0.95
Mean, in.	0.0295	0.0197	0.0203
Mean, mm	0.750	0.500	0.516
Sorting	2.356	1.860	1.864
Skewness	0.979	0.076	0.077
Kurtosis	0.205	0.656	1.021
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	3.10
Coarse Sand	10	10.51
Medium Sand	40	45.68
Fine Sand	200	30.48
Silt/Clay	<200	10.23
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B3-6.1-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	1.35	6.47	6.47
0.1873	4.757	-2.25	4	0.78	3.74	10.21
0.1324	3.364	-1.75	6	1.21	5.80	16.01
0.0787	2.000	-1.00	10	3.48	16.68	32.69
0.0557	1.414	-0.50	14	2.24	10.74	43.43
0.0394	1.000	0.00	18	1.73	8.29	51.73
0.0278	0.707	0.50	25	2.01	9.64	61.36
0.0197	0.500	1.00	35	2.14	10.26	71.62
0.0166	0.420	1.25	40	0.87	4.17	75.79
0.0139	0.354	1.50	45	0.70	3.36	79.15
0.0098	0.250	2.00	60	1.38	6.62	85.76
0.0070	0.177	2.50	80	0.79	3.79	89.55
0.0049	0.125	3.00	120	0.69	3.31	92.86
0.0029	0.074	3.75	200	0.57	2.73	95.59
0.0021	0.053	4.25	270	0.31	1.49	97.08
0.0015	0.037	4.75	400	0.14	0.67	97.75
			PAN	0.47	2.25	100.00
TOTALS				20.86	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5			
10	-2.27	0.1904	4.835
16	-1.75	0.1325	3.366
25	-1.35	0.1001	2.542
40	-0.66	0.0622	1.580
50	-0.10	0.0423	1.075
60	0.43	0.0292	0.743
75	1.20	0.0171	0.434
84	1.87	0.0108	0.274
90	2.57	0.0066	0.169
95	3.59	0.0033	0.083

Measure	Trask	Inman	Folk-Ward
Median, phi	-0.10	-0.10	-0.10
Median, in.	0.0423	0.0423	0.0423
Median, mm	1.075	1.075	1.075
Mean, phi	-0.57	0.06	0.00
Mean, in.	0.0586	0.0378	0.0393
Mean, mm	1.488	0.961	0.997
Sorting	2.419	1.809	
Skewness	0.978	0.090	
Kurtosis	0.226		

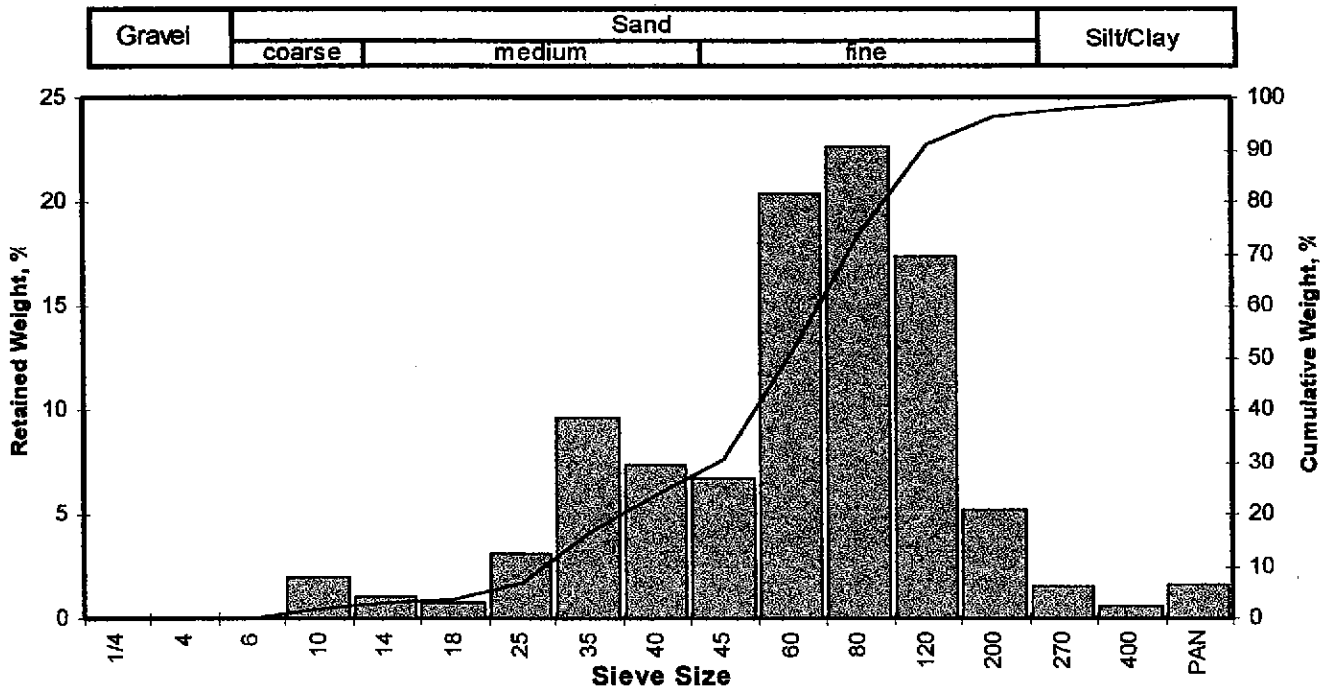
Grain Size Description (ASTM-USCS Scale)	Medium sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	10.21
Coarse Sand	10	22.48
Medium Sand	40	43.10
Fine Sand	200	19.80
Silt/Clay	<200	4.41
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B3-9.1-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.30	1.98	1.98
0.0557	1.414	-0.50	14	0.16	1.06	3.04
0.0394	1.000	0.00	18	0.12	0.79	3.83
0.0278	0.707	0.50	25	0.47	3.11	6.94
0.0197	0.500	1.00	35	1.46	9.65	16.59
0.0166	0.420	1.25	40	1.11	7.34	23.93
0.0139	0.354	1.50	45	1.01	6.68	30.60
0.0098	0.250	2.00	60	3.09	20.42	51.02
0.0070	0.177	2.50	80	3.43	22.67	73.69
0.0049	0.125	3.00	120	2.63	17.38	91.08
0.0029	0.074	3.75	200	0.79	5.22	96.30
0.0021	0.053	4.25	270	0.23	1.52	97.82
0.0015	0.037	4.75	400	0.09	0.59	98.41
			PAN	0.24	1.59	100.00
TOTALS				15.13	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	0.19	0.0346	0.878
10	0.66	0.0249	0.634
16	0.97	0.0201	0.511
25	1.29	0.0161	0.409
40	1.73	0.0119	0.301
50	1.97	0.0100	0.254
60	2.20	0.0086	0.218
75	2.54	0.0068	0.172
84	2.80	0.0057	0.144
90	2.97	0.0050	0.128
95	3.56	0.0033	0.085

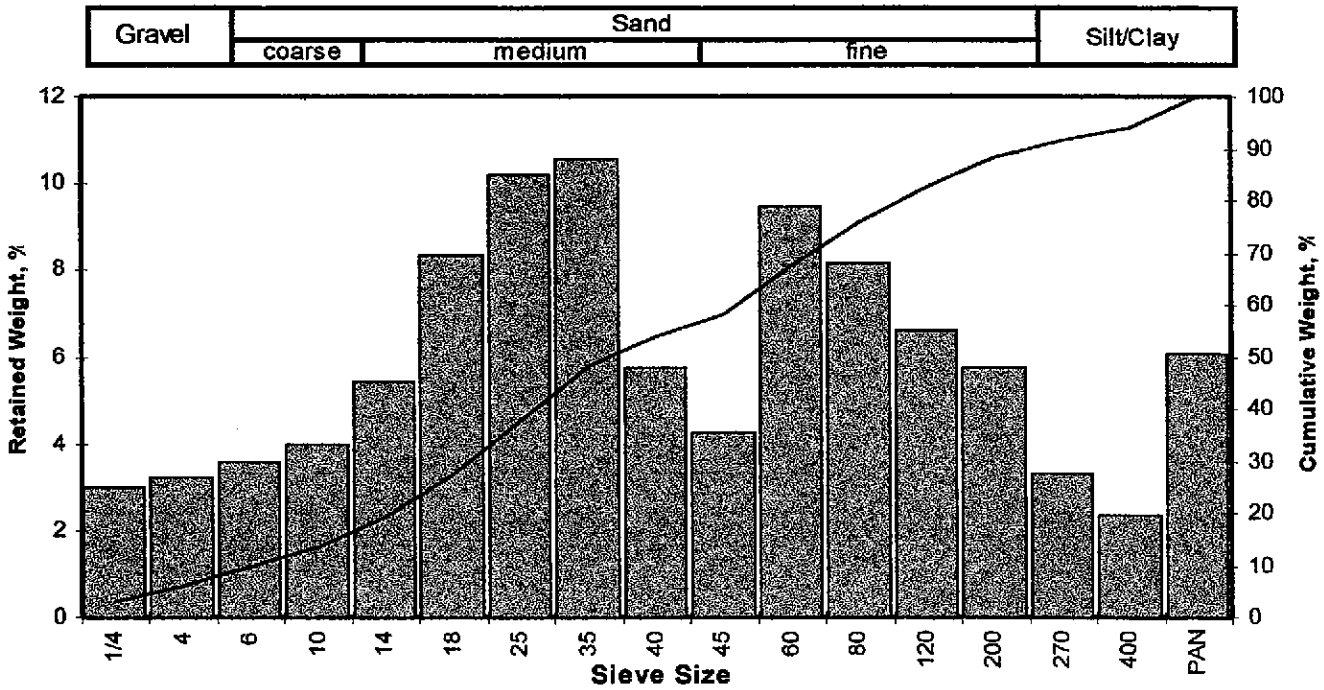
Measure	Trask	Inman	Folk-Ward
Median, phi	1.97	1.97	1.97
Median, in.	0.0100	0.0100	0.0100
Median, mm	0.254	0.254	0.254
Mean, phi	1.78	1.88	1.91
Mean, in.	0.0114	0.0107	0.0104
Mean, mm	0.291	0.271	0.265
Sorting	1.541	0.913	0.968
Skewness	1.043	-0.101	-0.080
Kurtosis	0.234	0.848	1.109
Grain Size Description (ASTM-USCS Scale)		Fine sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	1.98
Medium Sand	40	21.94
Fine Sand	200	72.37
Silt/Clay	<200	3.70
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B3-4.72-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.64	2.97	2.97
0.1873	4.757	-2.25	4	0.69	3.20	6.17
0.1324	3.364	-1.75	6	0.77	3.57	9.74
0.0787	2.000	-1.00	10	0.86	3.99	13.73
0.0557	1.414	-0.50	14	1.17	5.43	19.16
0.0394	1.000	0.00	18	1.80	8.35	27.50
0.0278	0.707	0.50	25	2.20	10.20	37.71
0.0197	0.500	1.00	35	2.27	10.53	48.24
0.0166	0.420	1.25	40	1.24	5.75	53.99
0.0139	0.354	1.50	45	0.92	4.27	58.26
0.0098	0.250	2.00	60	2.04	9.46	67.72
0.0070	0.177	2.50	80	1.76	8.16	75.88
0.0049	0.125	3.00	120	1.43	6.63	82.51
0.0029	0.074	3.75	200	1.24	5.75	88.27
0.0021	0.053	4.25	270	0.71	3.29	91.56
0.0015	0.037	4.75	400	0.51	2.37	93.92
			PAN	1.31	6.08	100.00
TOTALS				21.56	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.40	0.2081	5.286
10	-1.70	0.1280	3.252
16	-0.79	0.0681	1.730
25	-0.15	0.0437	1.110
40	0.61	0.0258	0.656
50	1.08	0.0187	0.474
60	1.59	0.0131	0.332
75	2.45	0.0072	0.184
84	3.19	0.0043	0.109
90	4.01	0.0024	0.062
95	3.91	0.0026	0.067

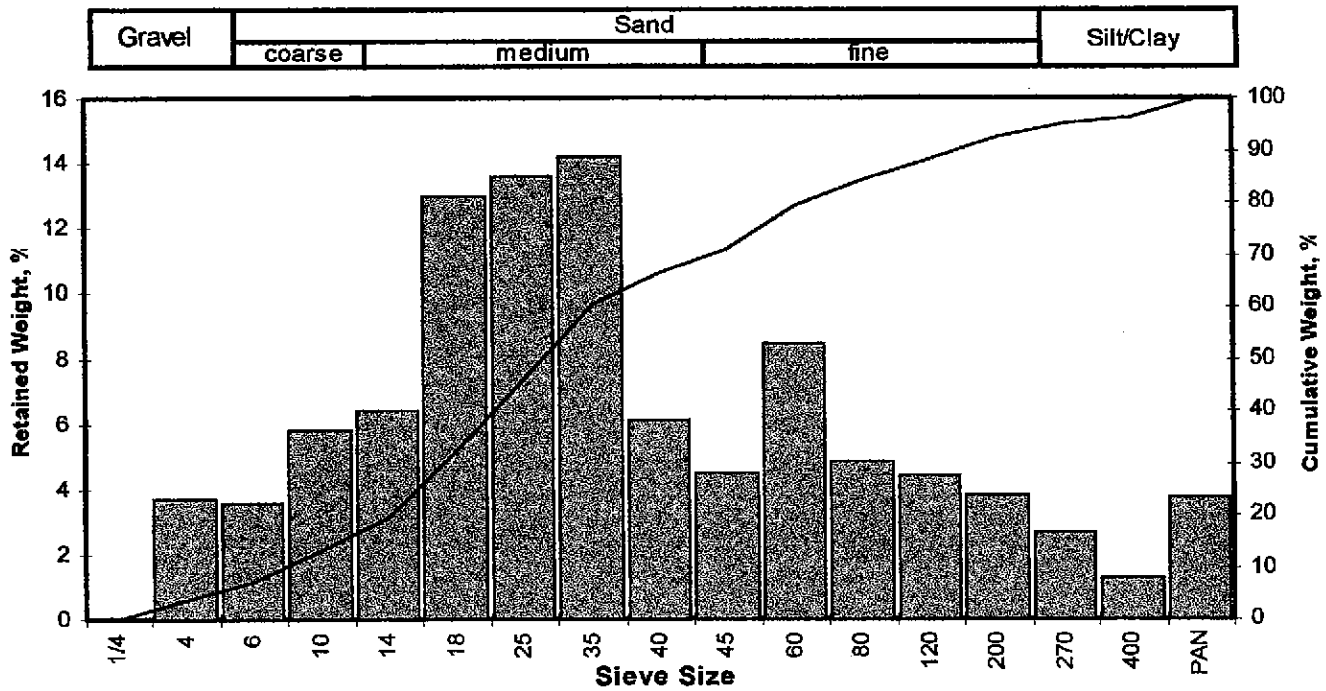
Measure	Trask	Inman	Folk-Ward
Median, phi	1.08	1.08	1.08
Median, in.	0.0187	0.0187	0.0187
Median, mm	0.474	0.474	0.474
Mean, phi	0.63	1.20	1.16
Mean, in.	0.0255	0.0171	0.0176
Mean, mm	0.647	0.435	0.448
Sorting	2.459	1.992	1.952
Skewness	0.952	0.063	-0.020
Kurtosis	0.145	0.584	0.996
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	6.17
Coarse Sand	10	7.56
Medium Sand	40	40.26
Fine Sand	200	34.28
Silt/Clay	<200	11.73
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B2-3.0-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.60	3.70	3.70
0.1324	3.364	-1.75	6	0.58	3.57	7.27
0.0787	2.000	-1.00	10	0.94	5.79	13.06
0.0557	1.414	-0.50	14	1.04	6.41	19.47
0.0394	1.000	0.00	18	2.11	13.00	32.47
0.0278	0.707	0.50	25	2.20	13.56	46.03
0.0197	0.500	1.00	35	2.30	14.17	60.20
0.0166	0.420	1.25	40	0.99	6.10	66.30
0.0139	0.354	1.50	45	0.73	4.50	70.79
0.0098	0.250	2.00	60	1.37	8.44	79.24
0.0070	0.177	2.50	80	0.78	4.81	84.04
0.0049	0.125	3.00	120	0.72	4.44	88.48
0.0029	0.074	3.75	200	0.62	3.82	92.30
0.0021	0.053	4.25	270	0.43	2.65	94.95
0.0015	0.037	4.75	400	0.21	1.29	96.24
			PAN	0.61	3.76	100.00
TOTALS				16.23	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.07	0.1650	4.192
10	-1.40	0.1036	2.633
16	-0.77	0.0672	1.706
25	-0.29	0.0480	1.220
40	0.28	0.0325	0.825
50	0.64	0.0253	0.642
60	0.99	0.0198	0.502
75	1.75	0.0117	0.297
84	2.50	0.0070	0.177
90	3.30	0.0040	0.102
95	4.27	0.0020	0.052

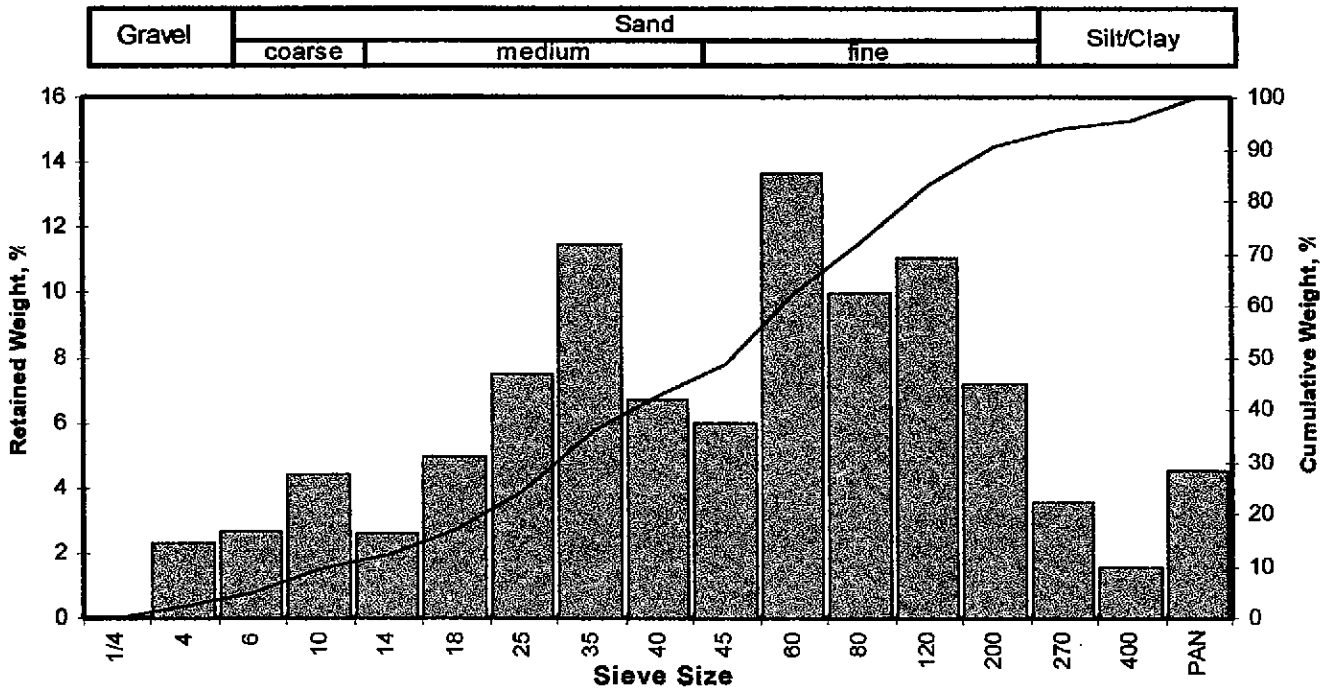
Measure	Trask	Inman	Folk-Ward
Median, phi	0.64	0.64	0.64
Median, in.	0.0253	0.0253	0.0253
Median, mm	0.642	0.642	0.642
Mean, phi	0.40	0.86	0.79
Mean, in.	0.0299	0.0217	0.0228
Mean, mm	0.759	0.550	0.579
Sorting	2.025	1.633	1.777
Skewness	0.939	0.136	0.141
Kurtosis	0.182	0.940	1.276
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	3.70
Coarse Sand	10	9.37
Medium Sand	40	53.23
Fine Sand	200	26.00
Silt/Clay	<200	7.70
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B2-9.1-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.46	2.30	2.30
0.1324	3.364	-1.75	6	0.53	2.66	4.96
0.0787	2.000	-1.00	10	0.88	4.41	9.37
0.0557	1.414	-0.50	14	0.52	2.61	11.97
0.0394	1.000	0.00	18	0.99	4.96	16.93
0.0278	0.707	0.50	25	1.49	7.46	24.40
0.0197	0.500	1.00	35	2.29	11.47	35.87
0.0166	0.420	1.25	40	1.34	6.71	42.59
0.0139	0.354	1.50	45	1.19	5.96	48.55
0.0098	0.250	2.00	60	2.72	13.63	62.17
0.0070	0.177	2.50	80	1.99	9.97	72.14
0.0049	0.125	3.00	120	2.20	11.02	83.17
0.0029	0.074	3.75	200	1.44	7.21	90.38
0.0021	0.053	4.25	270	0.71	3.56	93.94
0.0015	0.037	4.75	400	0.31	1.55	95.49
			PAN	0.90	4.51	100.00
TOTALS				19.96	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-1.74	0.1318	3.348
10	-0.88	0.0724	1.839
16	-0.09	0.0420	1.067
25	0.53	0.0273	0.694
40	1.15	0.0177	0.449
50	1.55	0.0134	0.341
60	1.92	0.0104	0.264
75	2.63	0.0064	0.162
84	3.09	0.0046	0.118
90	3.71	0.0030	0.076
95	4.59	0.0016	0.041

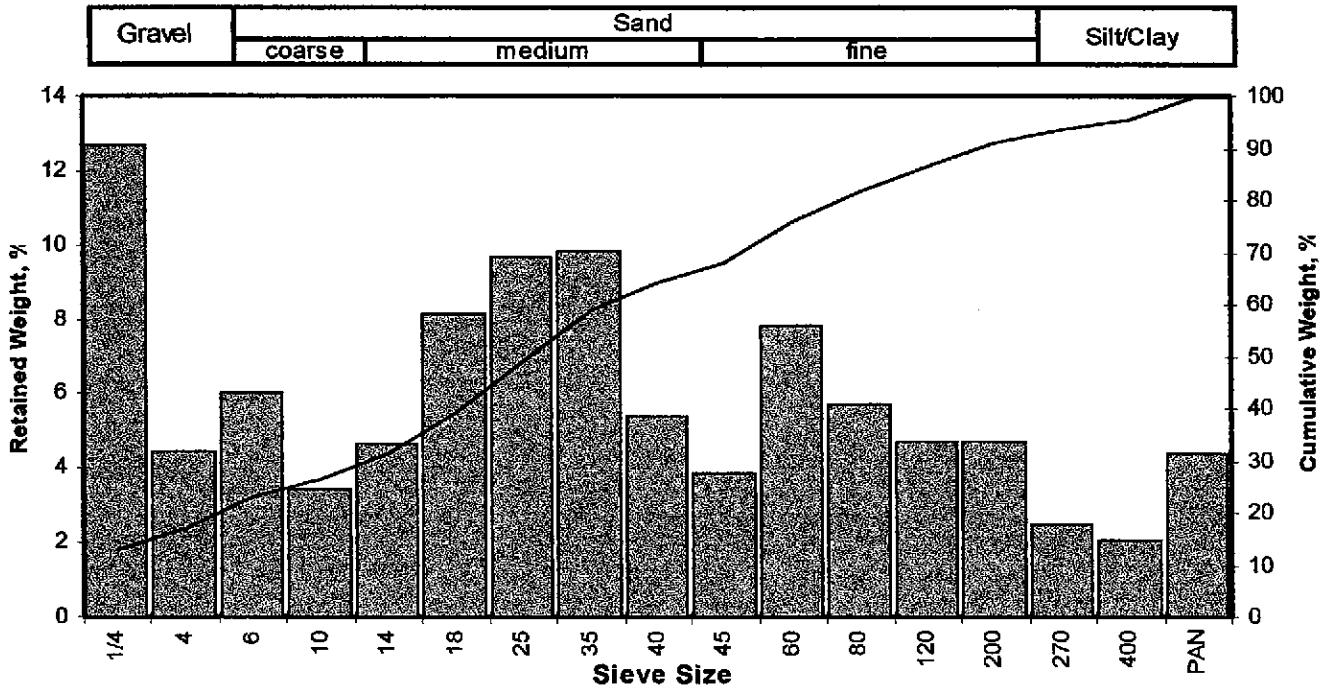
Measure	Trask	Inman	Folk-Ward
Median, phi	1.55	1.55	1.55
Median, in.	0.0134	0.0134	0.0134
Median, mm	0.341	0.341	0.341
Mean, phi	1.22	1.50	1.52
Mean, in.	0.0168	0.0140	0.0138
Mean, mm	0.428	0.354	0.350
Sorting	2.073	1.590	1.755
Skewness	0.983	-0.036	-0.038
Kurtosis	0.151	0.992	1.234
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	2.30
Coarse Sand	10	7.06
Medium Sand	40	33.22
Fine Sand	200	47.80
Silt/Clay	<200	9.62
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B3-3.0-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	1.77	12.67	12.67
0.1873	4.757	-2.25	4	0.62	4.44	17.11
0.1324	3.364	-1.75	6	0.84	6.01	23.12
0.0787	2.000	-1.00	10	0.48	3.44	26.56
0.0557	1.414	-0.50	14	0.65	4.65	31.21
0.0394	1.000	0.00	18	1.14	8.16	39.37
0.0278	0.707	0.50	25	1.35	9.66	49.03
0.0197	0.500	1.00	35	1.37	9.81	58.84
0.0166	0.420	1.25	40	0.75	5.37	64.21
0.0139	0.354	1.50	45	0.54	3.87	68.07
0.0098	0.250	2.00	60	1.09	7.80	75.88
0.0070	0.177	2.50	80	0.80	5.73	81.60
0.0049	0.125	3.00	120	0.66	4.72	86.33
0.0029	0.074	3.75	200	0.66	4.72	91.05
0.0021	0.053	4.25	270	0.35	2.51	93.56
0.0015	0.037	4.75	400	0.29	2.08	95.63
			PAN	0.61	4.37	100.00
TOTALS				13.97	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5			
10			
16	-2.35	0.2013	5.113
25	-1.34	0.0997	2.531
40	0.03	0.0385	0.978
50	0.55	0.0269	0.683
60	1.05	0.0190	0.482
75	1.94	0.0102	0.260
84	2.75	0.0058	0.148
90	3.58	0.0033	0.083
95	4.60	0.0016	0.041

Measure	Trask	Inman	Folk-Ward
Median, phi	0.55	0.55	0.55
Median, in.	0.0269	0.0269	0.0269
Median, mm	0.683	0.683	0.683
Mean, phi	-0.48	0.20	0.32
Mean, in.	0.0549	0.0343	0.0316
Mean, mm	1.396	0.871	0.803
Sorting	3.121	2.554	
Skewness	1.187	-0.137	
Kurtosis			

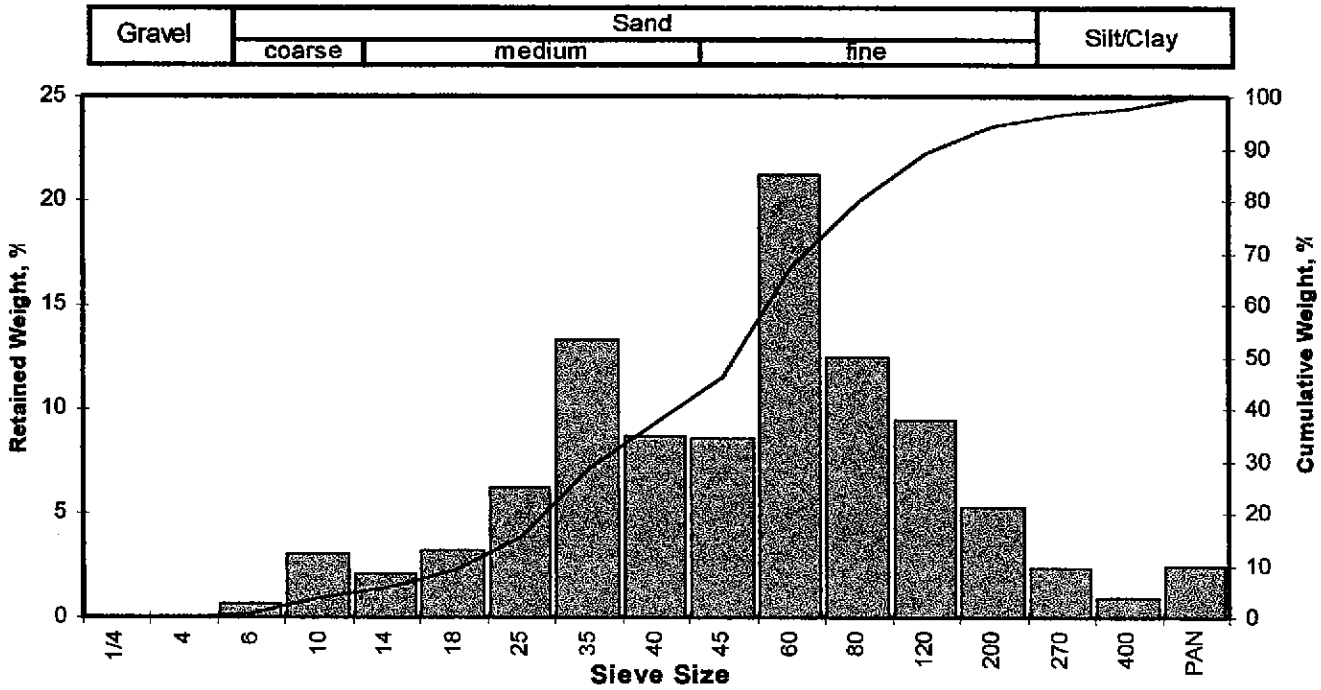
Grain Size Description (ASTM-USCS Scale)	Medium sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	17.11
Coarse Sand	10	9.45
Medium Sand	40	37.65
Fine Sand	200	26.84
Silt/Clay	<200	8.95
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B5-7.6-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.14	0.64	0.64
0.0787	2.000	-1.00	10	0.67	3.06	3.71
0.0557	1.414	-0.50	14	0.46	2.10	5.81
0.0394	1.000	0.00	18	0.71	3.25	9.06
0.0278	0.707	0.50	25	1.37	6.27	15.32
0.0197	0.500	1.00	35	2.91	13.31	28.64
0.0166	0.420	1.25	40	1.90	8.69	37.33
0.0139	0.354	1.50	45	1.88	8.60	45.93
0.0098	0.250	2.00	60	4.64	21.23	67.15
0.0070	0.177	2.50	80	2.72	12.44	79.60
0.0049	0.125	3.00	120	2.06	9.42	89.02
0.0029	0.074	3.75	200	1.16	5.31	94.33
0.0021	0.053	4.25	270	0.51	2.33	96.66
0.0015	0.037	4.75	400	0.20	0.91	97.58
			PAN	0.53	2.42	100.00
TOTALS				21.86	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-0.69	0.0636	1.616
10	0.08	0.0374	0.949
16	0.53	0.0274	0.695
25	0.86	0.0216	0.550
40	1.33	0.0157	0.398
50	1.60	0.0130	0.331
60	1.83	0.0111	0.281
75	2.32	0.0079	0.201
84	2.73	0.0059	0.150
90	3.14	0.0045	0.114
95	3.89	0.0026	0.067

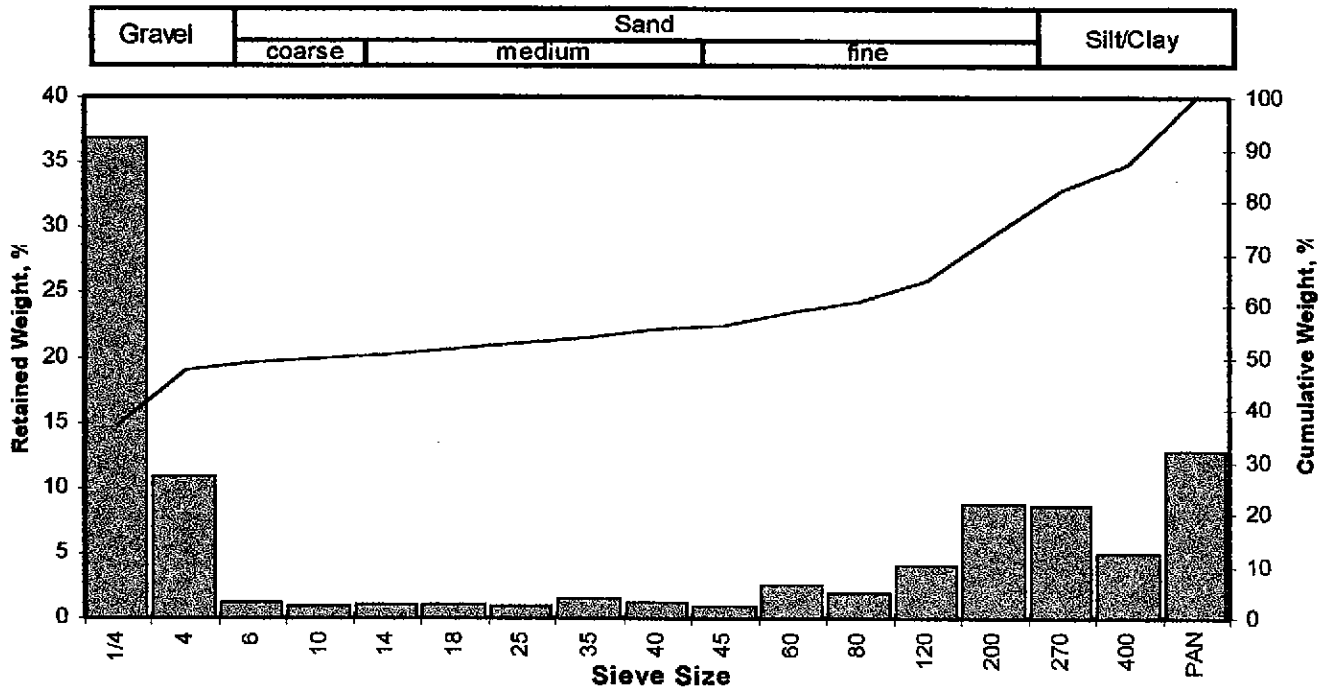
Measure	Trask	Inman	Folk-Ward
Median, phi	1.60	1.60	1.60
Median, in.	0.0130	0.0130	0.0130
Median, mm	0.331	0.331	0.331
Mean, phi	1.41	1.63	1.62
Mean, in.	0.0148	0.0127	0.0128
Mean, mm	0.375	0.323	0.326
Sorting	1.654	1.104	1.247
Skewness	1.005	0.030	0.016
Kurtosis	0.209	1.077	1.295
Grain Size Description (ASTM-USCS Scale)		Fine sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	3.71
Medium Sand	40	33.62
Fine Sand	200	57.00
Silt/Clay	<200	5.67
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B5-9.1-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	6.75	36.82	36.82
0.1873	4.757	-2.25	4	1.98	10.80	47.63
0.1324	3.364	-1.75	6	0.23	1.25	48.88
0.0787	2.000	-1.00	10	0.16	0.87	49.75
0.0557	1.414	-0.50	14	0.18	0.98	50.74
0.0394	1.000	0.00	18	0.19	1.04	51.77
0.0278	0.707	0.50	25	0.16	0.87	52.65
0.0197	0.500	1.00	35	0.27	1.47	54.12
0.0166	0.420	1.25	40	0.22	1.20	55.32
0.0139	0.354	1.50	45	0.17	0.93	56.25
0.0098	0.250	2.00	60	0.48	2.62	58.87
0.0070	0.177	2.50	80	0.36	1.96	60.83
0.0049	0.125	3.00	120	0.74	4.04	64.87
0.0029	0.074	3.75	200	1.60	8.73	73.60
0.0021	0.053	4.25	270	1.58	8.62	82.21
0.0015	0.037	4.75	400	0.90	4.91	87.12
			PAN	2.36	12.88	100.00
TOTALS				18.33	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5			
10			
16			
25			
40	-2.54	0.2297	5.834
50	-0.88	0.0722	1.834
60	2.29	0.0081	0.205
75	3.83	0.0028	0.070
84	4.43	0.0018	0.046
90	3.69	0.0031	0.078
95	1.84	0.0110	0.278

Measure	Trask	Inman	Folk-Ward
Median, phi	-0.88	-0.88	-0.88
Median, in.	0.0722	0.0722	0.0722
Median, mm	1.834	1.834	1.834
Mean, phi			
Mean, in.			
Mean, mm			
Sorting			
Skewness			
Kurtosis			

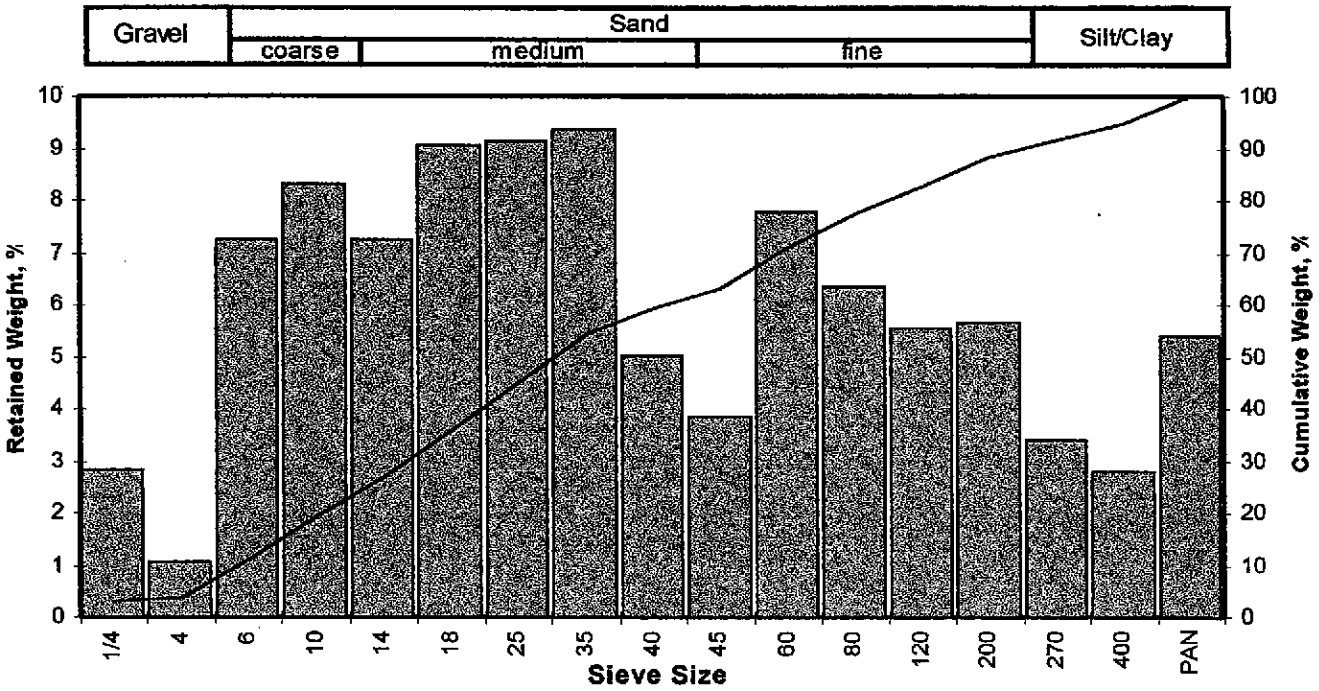
Grain Size Description (ASTM-USCS Scale)	N/A (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	47.63
Coarse Sand	10	2.13
Medium Sand	40	5.56
Fine Sand	200	18.28
Silt/Clay	<200	26.40
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B6-3.0-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.51	2.84	2.84
0.1873	4.757	-2.25	4	0.19	1.06	3.90
0.1324	3.364	-1.75	6	1.30	7.23	11.13
0.0787	2.000	-1.00	10	1.49	8.29	19.42
0.0557	1.414	-0.50	14	1.30	7.23	26.66
0.0394	1.000	0.00	18	1.63	9.07	35.73
0.0278	0.707	0.50	25	1.64	9.13	44.85
0.0197	0.500	1.00	35	1.68	9.35	54.20
0.0166	0.420	1.25	40	0.90	5.01	59.21
0.0139	0.354	1.50	45	0.69	3.84	63.05
0.0098	0.250	2.00	60	1.40	7.79	70.84
0.0070	0.177	2.50	80	1.14	6.34	77.18
0.0049	0.125	3.00	120	1.00	5.56	82.75
0.0029	0.074	3.75	200	1.02	5.68	88.43
0.0021	0.053	4.25	270	0.61	3.39	91.82
0.0015	0.037	4.75	400	0.50	2.78	94.60
			PAN	0.97	5.40	100.00
TOTALS				17.97	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.17	0.1776	4.512
10	-1.83	0.1398	3.551
16	-1.31	0.0976	2.478
25	-0.61	0.0603	1.531
40	0.23	0.0335	0.850
50	0.78	0.0230	0.584
60	1.30	0.0160	0.406
75	2.33	0.0078	0.199
84	3.17	0.0044	0.111
90	3.98	0.0025	0.063
95	4.40	0.0019	0.047

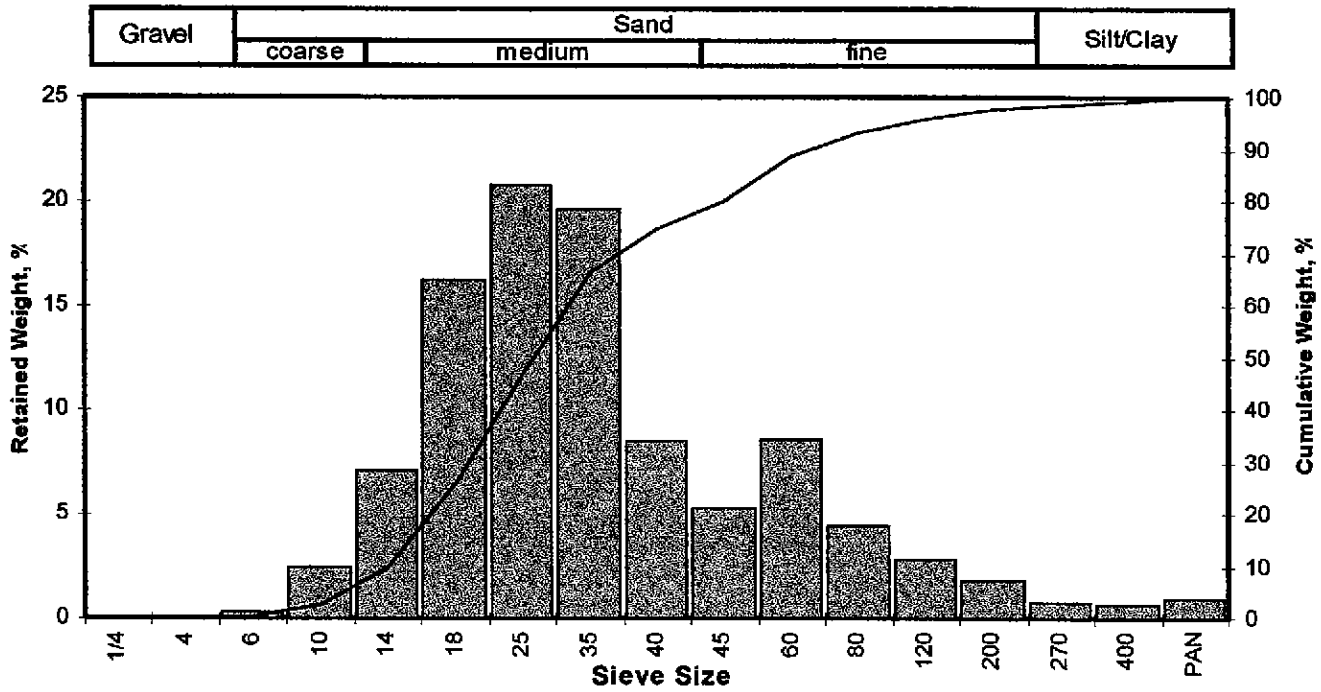
Measure	Trask	Inman	Folk-Ward
Median, phi	0.78	0.78	0.78
Median, in.	0.0230	0.0230	0.0230
Median, mm	0.584	0.584	0.584
Mean, phi	0.21	0.93	0.88
Mean, in.	0.0341	0.0207	0.0214
Mean, mm	0.865	0.526	0.544
Sorting	2.772	2.237	2.115
Skewness	0.945	0.068	0.085
Kurtosis	0.191	0.469	0.916
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	3.90
Coarse Sand	10	15.53
Medium Sand	40	39.79
Fine Sand	200	29.22
Silt/Clay	<200	11.57
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B6-6.1-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.06	0.27	0.27
0.0787	2.000	-1.00	10	0.54	2.47	2.74
0.0557	1.414	-0.50	14	1.54	7.04	9.78
0.0394	1.000	0.00	18	3.55	16.22	26.01
0.0278	0.707	0.50	25	4.54	20.75	46.76
0.0197	0.500	1.00	35	4.29	19.61	66.36
0.0166	0.420	1.25	40	1.85	8.46	74.82
0.0139	0.354	1.50	45	1.16	5.30	80.12
0.0098	0.250	2.00	60	1.88	8.59	88.71
0.0070	0.177	2.50	80	0.96	4.39	93.10
0.0049	0.125	3.00	120	0.61	2.79	95.89
0.0029	0.074	3.75	200	0.40	1.83	97.71
0.0021	0.053	4.25	270	0.16	0.73	98.45
0.0015	0.037	4.75	400	0.14	0.64	99.09
			PAN	0.20	0.91	100.00
TOTALS				21.88	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-0.84	0.0705	1.790
10	-0.49	0.0554	1.408
16	-0.31	0.0488	1.238
25	-0.03	0.0402	1.022
40	0.34	0.0312	0.792
50	0.58	0.0263	0.668
60	0.84	0.0220	0.560
75	1.26	0.0165	0.418
84	1.73	0.0119	0.302
90	2.15	0.0089	0.226
95	2.84	0.0055	0.140

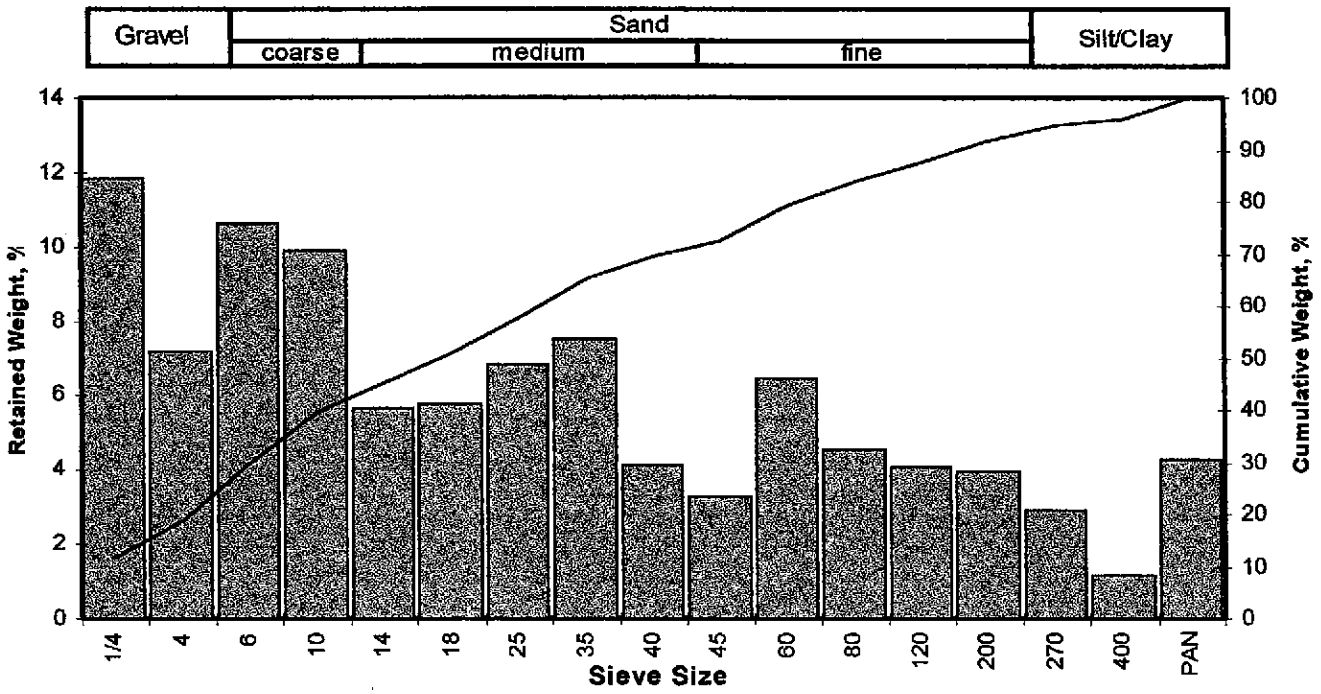
Measure	Trask	Inman	Folk-Ward
Median, phi	0.58	0.58	0.58
Median, in.	0.0263	0.0263	0.0263
Median, mm	0.668	0.668	0.668
Mean, phi	0.47	0.71	0.67
Mean, in.	0.0283	0.0241	0.0248
Mean, mm	0.720	0.612	0.630
Sorting	1.564	1.017	1.066
Skewness	0.979	0.124	0.175
Kurtosis	0.255	0.809	1.170
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	2.74
Medium Sand	40	72.07
Fine Sand	200	22.90
Silt/Clay	<200	2.29
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B6-7.6-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	2.31	11.86	11.86
0.1873	4.757	-2.25	4	1.40	7.19	19.05
0.1324	3.364	-1.75	6	2.07	10.63	29.67
0.0787	2.000	-1.00	10	1.92	9.86	39.53
0.0557	1.414	-0.50	14	1.10	5.65	45.17
0.0394	1.000	0.00	18	1.12	5.75	50.92
0.0278	0.707	0.50	25	1.33	6.83	57.75
0.0197	0.500	1.00	35	1.46	7.49	65.25
0.0166	0.420	1.25	40	0.80	4.11	69.35
0.0139	0.354	1.50	45	0.64	3.29	72.64
0.0098	0.250	2.00	60	1.26	6.47	79.11
0.0070	0.177	2.50	80	0.88	4.52	83.62
0.0049	0.125	3.00	120	0.79	4.06	87.68
0.0029	0.074	3.75	200	0.77	3.95	91.63
0.0021	0.053	4.25	270	0.57	2.93	94.56
0.0015	0.037	4.75	400	0.23	1.18	95.74
			PAN	0.83	4.26	100.00
TOTALS				19.48	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5			
10			
16	-2.43	0.2117	5.377
25	-1.97	0.1542	3.917
40	-0.96	0.0765	1.943
50	-0.08	0.0416	1.057
60	0.65	0.0251	0.637
75	1.68	0.0123	0.312
84	2.55	0.0067	0.171
90	3.44	0.0036	0.092
95	4.44	0.0018	0.046

Measure	Trask	Inman	Folk-Ward
Median, phi	-0.08	-0.08	-0.08
Median, in.	0.0416	0.0416	0.0416
Median, mm	1.057	1.057	1.057
Mean, phi	-1.08	0.06	0.01
Mean, in.	0.0832	0.0378	0.0390
Mean, mm	2.114	0.959	0.991
Sorting	3.546	2.487	
Skewness	1.045	0.056	
Kurtosis			

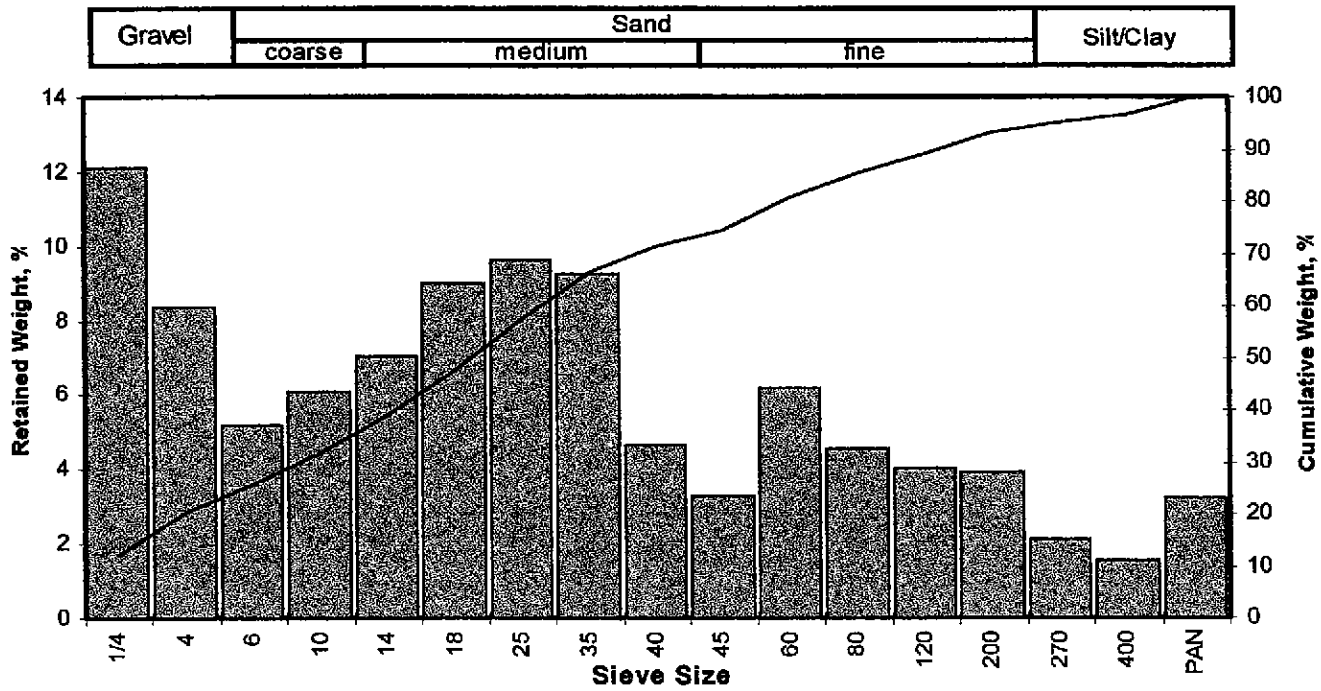
Grain Size Description (ASTM-USCS Scale)	Coarse sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	19.05
Coarse Sand	10	20.48
Medium Sand	40	29.83
Fine Sand	200	22.28
Silt/Clay	<200	8.37
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B2-1.81-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	2.47	12.10	12.10
0.1873	4.757	-2.25	4	1.70	8.33	20.42
0.1324	3.364	-1.75	6	1.06	5.19	25.61
0.0787	2.000	-1.00	10	1.24	6.07	31.68
0.0557	1.414	-0.50	14	1.44	7.05	38.74
0.0394	1.000	0.00	18	1.83	8.96	47.70
0.0278	0.707	0.50	25	1.96	9.60	57.30
0.0197	0.500	1.00	35	1.89	9.26	66.55
0.0166	0.420	1.25	40	0.95	4.65	71.20
0.0139	0.354	1.50	45	0.67	3.28	74.49
0.0098	0.250	2.00	60	1.26	6.17	80.66
0.0070	0.177	2.50	80	0.93	4.55	85.21
0.0049	0.125	3.00	120	0.82	4.02	89.23
0.0029	0.074	3.75	200	0.80	3.92	93.14
0.0021	0.053	4.25	270	0.43	2.11	95.25
0.0015	0.037	4.75	400	0.31	1.52	96.77
			PAN	0.66	3.23	100.00
TOTALS				20.42	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5			
10			
16	-2.47	0.2183	5.546
25	-1.81	0.1379	3.504
40	-0.43	0.0530	1.347
50	0.12	0.0362	0.920
60	0.65	0.0252	0.639
75	1.54	0.0135	0.343
84	2.37	0.0076	0.194
90	3.15	0.0044	0.113
95	4.19	0.0022	0.055

Measure	Trask	Inman	Folk-Ward
Median, phi	0.12	0.12	0.12
Median, in.	0.0362	0.0362	0.0362
Median, mm	0.920	0.920	0.920
Mean, phi	-0.94	-0.05	0.01
Mean, in.	0.0757	0.0408	0.0392
Mean, mm	1.924	1.037	0.996
Sorting	3.194	2.419	
Skewness	1.192	-0.071	
Kurtosis			

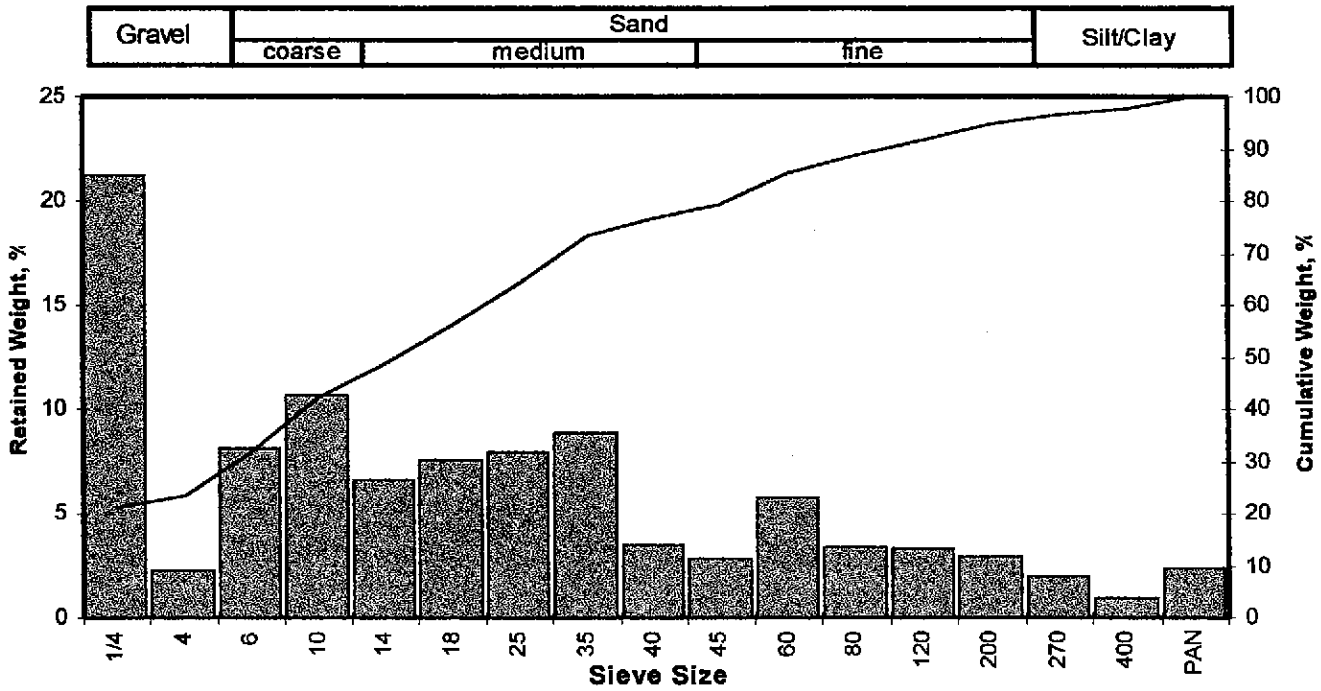
Grain Size Description (ASTM-USCS Scale)	Medium sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	20.42
Coarse Sand	10	11.26
Medium Sand	40	39.52
Fine Sand	200	21.94
Silt/Clay	<200	6.86
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B6-1.76-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	4.46	21.24	21.24
0.1873	4.757	-2.25	4	0.47	2.24	23.48
0.1324	3.364	-1.75	6	1.70	8.10	31.57
0.0787	2.000	-1.00	10	2.24	10.67	42.24
0.0557	1.414	-0.50	14	1.38	6.57	48.81
0.0394	1.000	0.00	18	1.58	7.52	56.33
0.0278	0.707	0.50	25	1.66	7.90	64.24
0.0197	0.500	1.00	35	1.86	8.86	73.10
0.0166	0.420	1.25	40	0.74	3.52	76.62
0.0139	0.354	1.50	45	0.59	2.81	79.43
0.0098	0.250	2.00	60	1.21	5.76	85.19
0.0070	0.177	2.50	80	0.71	3.38	88.57
0.0049	0.125	3.00	120	0.69	3.29	91.86
0.0029	0.074	3.75	200	0.61	2.90	94.76
0.0021	0.053	4.25	270	0.41	1.95	96.71
0.0015	0.037	4.75	400	0.19	0.90	97.62
			PAN	0.50	2.38	100.00
TOTALS				21.00	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5			
10			
16			
25	-2.16	0.1754	4.456
40	-1.16	0.0878	2.230
50	-0.42	0.0527	1.339
60	0.23	0.0335	0.851
75	1.14	0.0179	0.455
84	1.90	0.0106	0.269
90	2.72	0.0060	0.152
95	3.81	0.0028	0.071

Measure	Trask	Inman	Folk-Ward
Median, phi	-0.42	-0.42	-0.42
Median, in.	0.0527	0.0527	0.0527
Median, mm	1.339	1.339	1.339
Mean, phi	-1.30		
Mean, in.	0.0967		
Mean, mm	2.456		
Sorting	3.129		
Skewness	1.064		
Kurtosis			

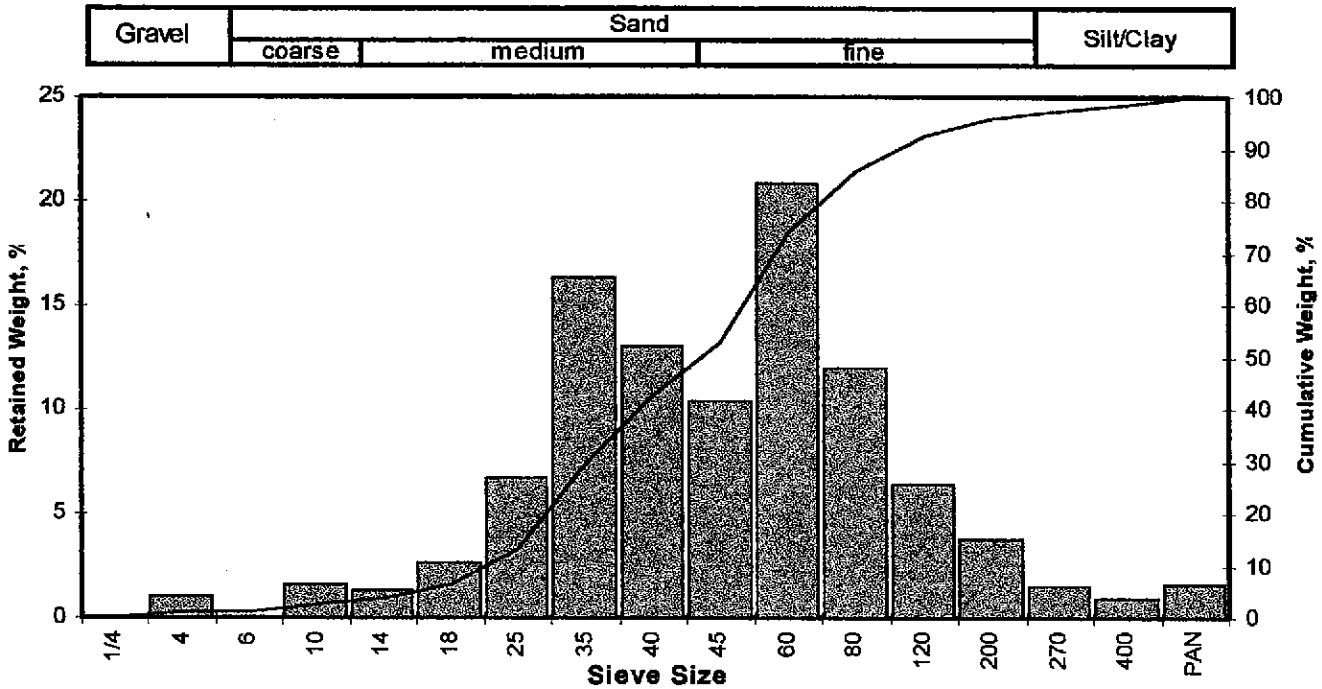
Grain Size Description (ASTM-USCS Scale)	Coarse sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	23.48
Coarse Sand	10	18.76
Medium Sand	40	34.38
Fine Sand	200	18.14
Silt/Clay	<200	5.24
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B3-10.6-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.21	1.03	1.03
0.1324	3.364	-1.75	6	0.00	0.00	1.03
0.0787	2.000	-1.00	10	0.33	1.62	2.65
0.0557	1.414	-0.50	14	0.26	1.28	3.93
0.0394	1.000	0.00	18	0.53	2.60	6.54
0.0278	0.707	0.50	25	1.37	6.73	13.27
0.0197	0.500	1.00	35	3.33	16.36	29.63
0.0166	0.420	1.25	40	2.64	12.97	42.60
0.0139	0.354	1.50	45	2.11	10.37	52.97
0.0098	0.250	2.00	60	4.25	20.88	73.86
0.0070	0.177	2.50	80	2.44	11.99	85.85
0.0049	0.125	3.00	120	1.31	6.44	92.29
0.0029	0.074	3.75	200	0.76	3.73	96.02
0.0021	0.053	4.25	270	0.30	1.47	97.49
0.0015	0.037	4.75	400	0.19	0.93	98.43
			PAN	0.32	1.57	100.00
TOTALS				20.35	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-0.29	0.0483	1.227
10	0.26	0.0329	0.837
16	0.58	0.0263	0.667
25	0.86	0.0217	0.552
40	1.20	0.0171	0.435
50	1.43	0.0146	0.372
60	1.67	0.0124	0.315
75	2.05	0.0095	0.242
84	2.42	0.0073	0.186
90	2.82	0.0056	0.141
95	3.55	0.0034	0.086

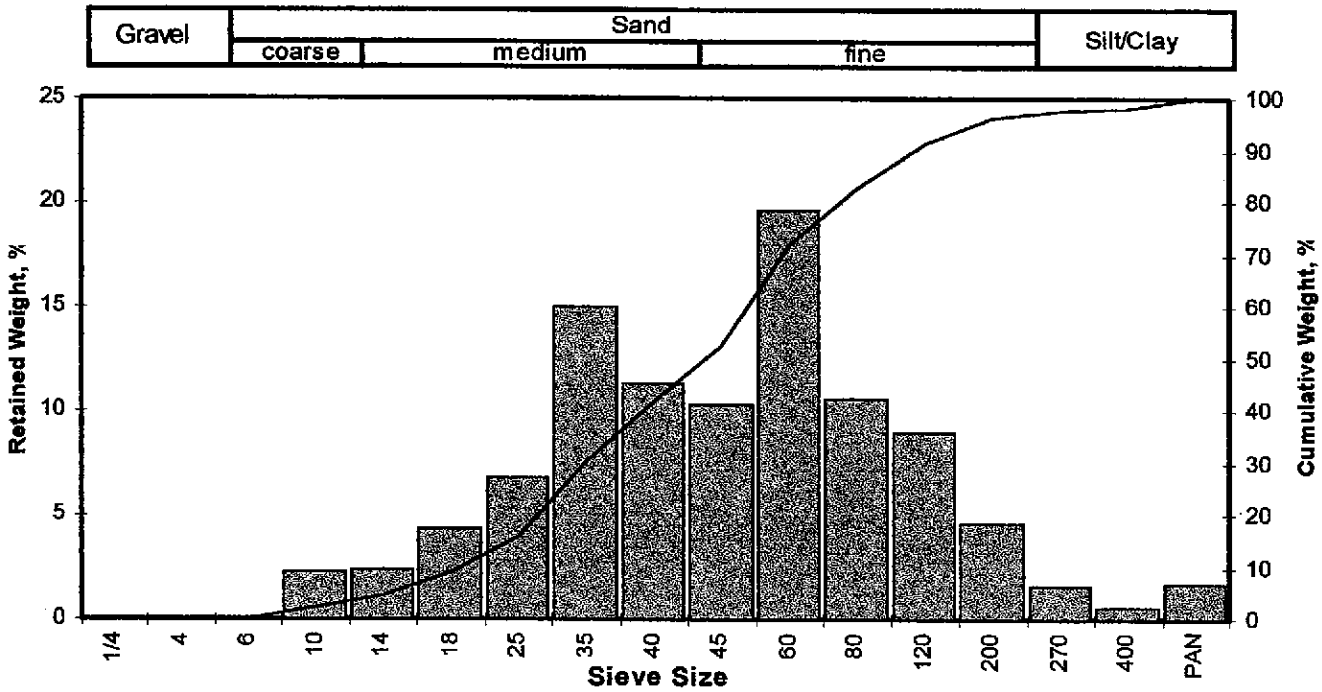
Measure	Trask	Inman	Folk-Ward
Median, phi	1.43	1.43	1.43
Median, in.	0.0146	0.0146	0.0146
Median, mm	0.372	0.372	0.372
Mean, phi	1.33	1.50	1.48
Mean, in.	0.0156	0.0139	0.0141
Mean, mm	0.397	0.353	0.359
Sorting	1.510	0.920	1.042
Skewness	0.983	0.081	0.092
Kurtosis	0.223	1.088	1.323
Grain Size Description (ASTM-USCS Scale)		Fine sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	1.03
Coarse Sand	10	1.62
Medium Sand	40	39.95
Fine Sand	200	53.42
Silt/Clay	<200	3.98
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B4-6.1-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.35	2.29	2.29
0.0557	1.414	-0.50	14	0.36	2.35	4.64
0.0394	1.000	0.00	18	0.66	4.31	8.95
0.0278	0.707	0.50	25	1.04	6.79	15.74
0.0197	0.500	1.00	35	2.29	14.96	30.70
0.0166	0.420	1.25	40	1.74	11.37	42.06
0.0139	0.354	1.50	45	1.57	10.25	52.32
0.0098	0.250	2.00	60	3.00	19.60	71.91
0.0070	0.177	2.50	80	1.62	10.58	82.50
0.0049	0.125	3.00	120	1.37	8.95	91.44
0.0029	0.074	3.75	200	0.71	4.64	96.08
0.0021	0.053	4.25	270	0.25	1.63	97.71
0.0015	0.037	4.75	400	0.09	0.59	98.30
			PAN	0.26	1.70	100.00
TOTALS				15.31	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-0.46	0.0541	1.374
10	0.08	0.0373	0.948
16	0.51	0.0277	0.703
25	0.81	0.0225	0.571
40	1.20	0.0171	0.434
50	1.44	0.0145	0.368
60	1.70	0.0122	0.309
75	2.15	0.0089	0.226
84	2.58	0.0066	0.167
90	2.92	0.0052	0.132
95	3.58	0.0033	0.084

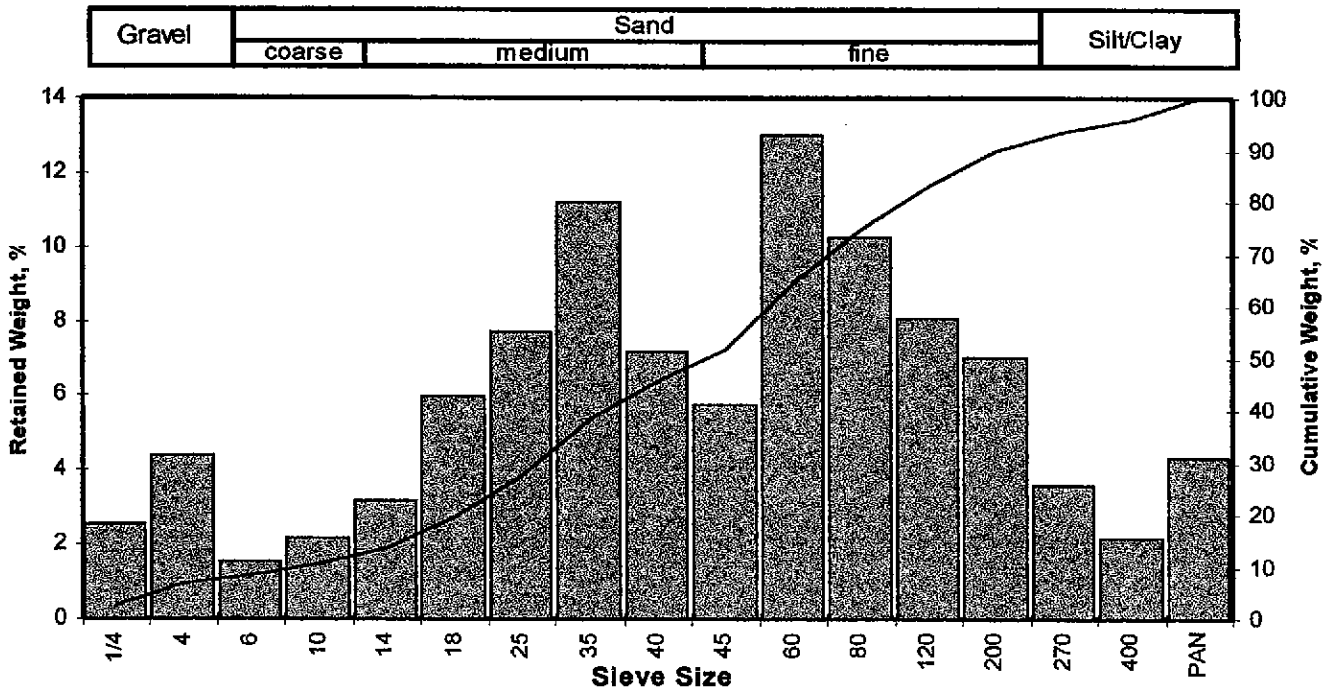
Measure	Trask	Inman	Folk-Ward
Median, phi	1.44	1.44	1.44
Median, in.	0.0145	0.0145	0.0145
Median, mm	0.368	0.368	0.368
Mean, phi	1.33	1.55	1.51
Mean, in.	0.0157	0.0135	0.0138
Mean, mm	0.398	0.342	0.351
Sorting	1.589	1.038	1.130
Skewness	0.977	0.099	0.078
Kurtosis	0.211	0.943	1.237
Grain Size Description (ASTM-USCS Scale)		Fine sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	2.29
Medium Sand	40	39.78
Fine Sand	200	54.02
Silt/Clay	<200	3.92
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B4-4.6-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.45	2.52	2.52
0.1873	4.757	-2.25	4	0.78	4.36	6.88
0.1324	3.364	-1.75	6	0.27	1.51	8.39
0.0787	2.000	-1.00	10	0.39	2.18	10.58
0.0557	1.414	-0.50	14	0.57	3.19	13.77
0.0394	1.000	0.00	18	1.07	5.99	19.75
0.0278	0.707	0.50	25	1.38	7.72	27.48
0.0197	0.500	1.00	35	2.00	11.19	38.67
0.0166	0.420	1.25	40	1.28	7.16	45.83
0.0139	0.354	1.50	45	1.03	5.76	51.59
0.0098	0.250	2.00	60	2.32	12.98	64.58
0.0070	0.177	2.50	80	1.83	10.24	74.82
0.0049	0.125	3.00	120	1.44	8.06	82.88
0.0029	0.074	3.75	200	1.26	7.05	89.93
0.0021	0.053	4.25	270	0.64	3.58	93.51
0.0015	0.037	4.75	400	0.39	2.18	95.69
			PAN	0.77	4.31	100.00
TOTALS				17.87	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.43	0.2121	5.389
10	-1.20	0.0903	2.294
16	-0.31	0.0489	1.243
25	0.34	0.0311	0.790
40	1.05	0.0191	0.484
50	1.43	0.0146	0.371
60	1.82	0.0111	0.282
75	2.51	0.0069	0.175
84	3.12	0.0045	0.115
90	3.76	0.0029	0.074
95	4.59	0.0016	0.041

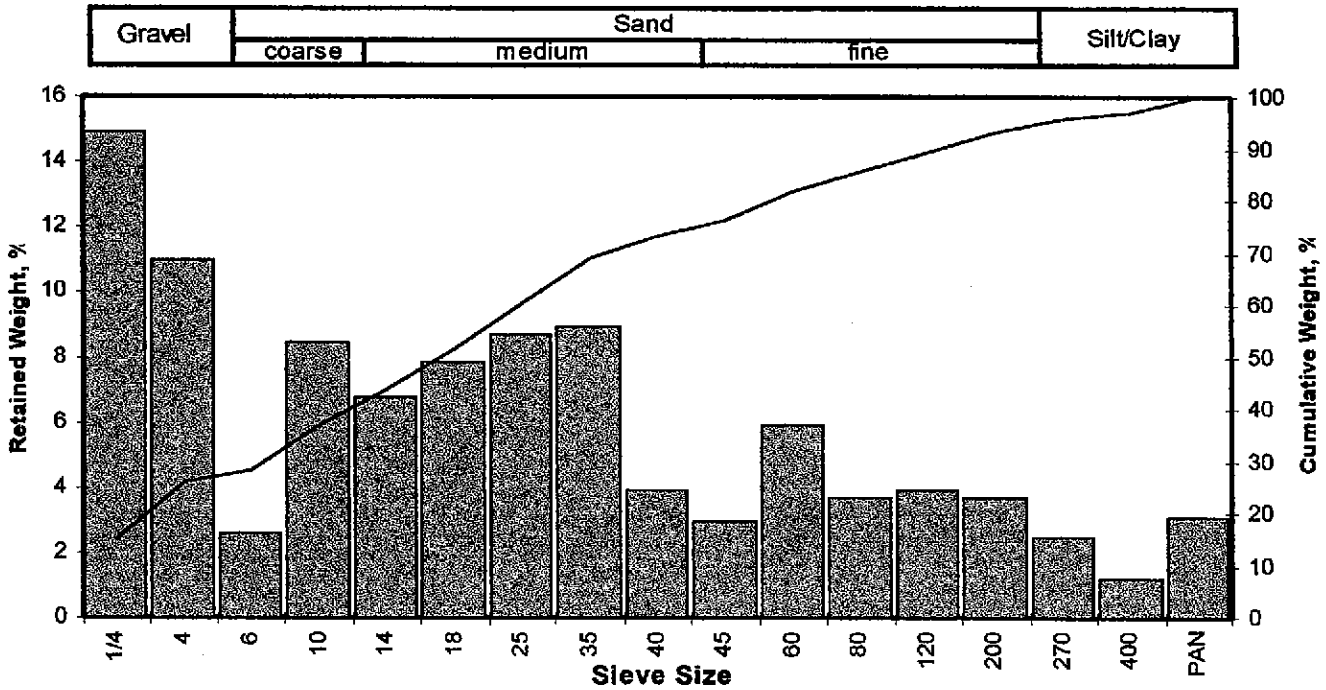
Measure	Trask	Inman	Folk-Ward
Median, phi	1.43	1.43	1.43
Median, in.	0.0146	0.0146	0.0146
Median, mm	0.371	0.371	0.371
Mean, phi	1.05	1.40	1.41
Mean, in.	0.0190	0.0149	0.0148
Mean, mm	0.483	0.378	0.376
Sorting	2.123	1.716	1.922
Skewness	1.004	-0.016	-0.058
Kurtosis	0.138	1.045	1.325
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	6.88
Coarse Sand	10	3.69
Medium Sand	40	35.25
Fine Sand	200	44.10
Silt/Clay	<200	10.07
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B1-2.1-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	3.63	14.91	14.91
0.1873	4.757	-2.25	4	2.67	10.97	25.87
0.1324	3.364	-1.75	6	0.63	2.59	28.46
0.0787	2.000	-1.00	10	2.06	8.46	36.92
0.0557	1.414	-0.50	14	1.65	6.78	43.70
0.0394	1.000	0.00	18	1.91	7.84	51.54
0.0278	0.707	0.50	25	2.12	8.71	60.25
0.0197	0.500	1.00	35	2.18	8.95	69.20
0.0166	0.420	1.25	40	0.95	3.90	73.10
0.0139	0.354	1.50	45	0.72	2.96	76.06
0.0098	0.250	2.00	60	1.44	5.91	81.97
0.0070	0.177	2.50	80	0.90	3.70	85.67
0.0049	0.125	3.00	120	0.95	3.90	89.57
0.0029	0.074	3.75	200	0.89	3.66	93.22
0.0021	0.053	4.25	270	0.60	2.46	95.69
0.0015	0.037	4.75	400	0.30	1.23	96.92
			PAN	0.75	3.08	100.00
TOTALS				24.35	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5			
10			
16	-2.63	0.2429	6.171
25	-2.28	0.1916	4.868
40	-0.77	0.0673	1.708
50	-0.10	0.0421	1.070
60	0.49	0.0281	0.714
75	1.41	0.0148	0.376
84	2.27	0.0081	0.207
90	3.09	0.0046	0.118
95	4.11	0.0023	0.058

Measure	Trask	Inman	Folk-Ward
Median, phi	-0.10	-0.10	-0.10
Median, in.	0.0421	0.0421	0.0421
Median, mm	1.070	1.070	1.070
Mean, phi	-1.39	-0.18	-0.15
Mean, in.	0.1032	0.0445	0.0437
Mean, mm	2.622	1.129	1.109
Sorting	3.597	2.450	
Skewness	1.264	-0.032	
Kurtosis			

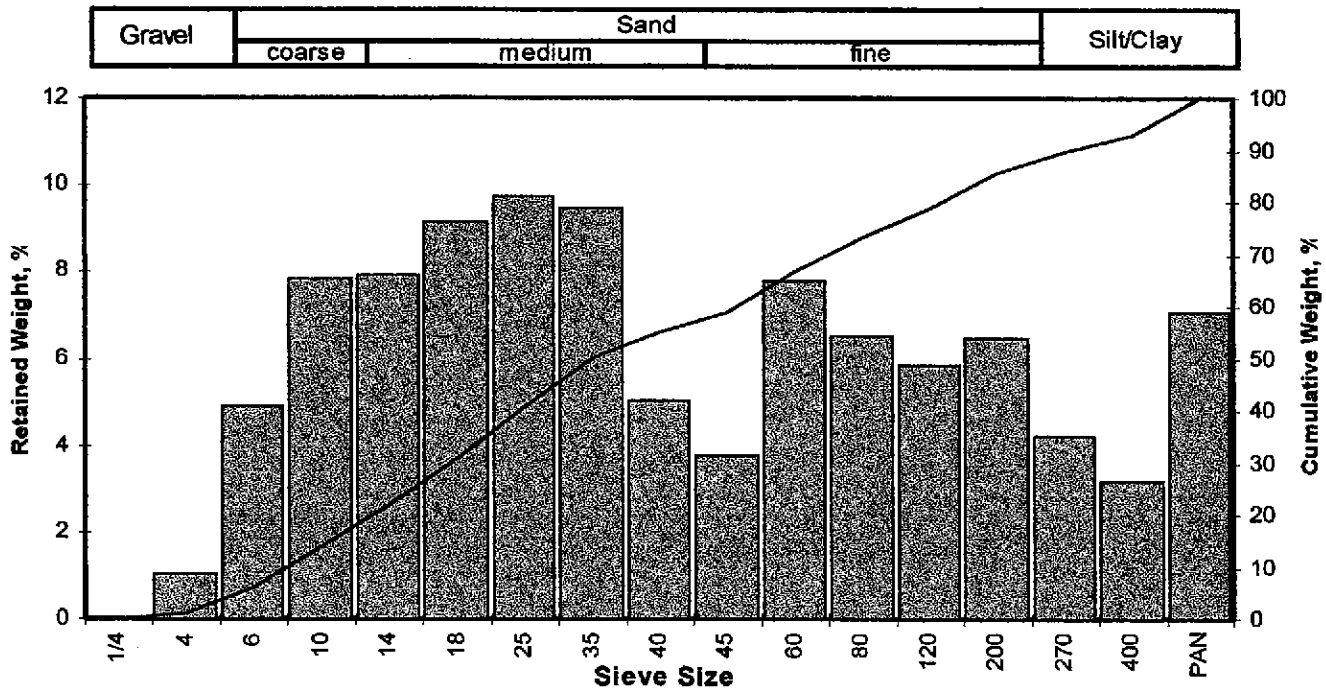
Grain Size Description (ASTM-USCS Scale)	Coarse sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	25.87
Coarse Sand	10	11.05
Medium Sand	40	36.18
Fine Sand	200	20.12
Silt/Clay	<200	6.78
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B4-1.78-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.22	1.06	1.06
0.1324	3.364	-1.75	6	1.02	4.90	5.96
0.0787	2.000	-1.00	10	1.63	7.83	13.79
0.0557	1.414	-0.50	14	1.65	7.93	21.72
0.0394	1.000	0.00	18	1.90	9.13	30.85
0.0278	0.707	0.50	25	2.03	9.75	40.61
0.0197	0.500	1.00	35	1.97	9.47	50.07
0.0166	0.420	1.25	40	1.05	5.05	55.12
0.0139	0.354	1.50	45	0.78	3.75	58.87
0.0098	0.250	2.00	60	1.62	7.78	66.65
0.0070	0.177	2.50	80	1.36	6.54	73.19
0.0049	0.125	3.00	120	1.22	5.86	79.05
0.0029	0.074	3.75	200	1.35	6.49	85.54
0.0021	0.053	4.25	270	0.88	4.23	89.76
0.0015	0.037	4.75	400	0.66	3.17	92.94
			PAN	1.47	7.06	100.00
TOTALS				20.81	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-1.85	0.1417	3.599
10	-1.36	0.1013	2.572
16	-0.86	0.0715	1.816
25	-0.32	0.0492	1.249
40	0.47	0.0284	0.722
50	1.00	0.0197	0.501
60	1.57	0.0132	0.336
75	2.65	0.0063	0.159
84	3.57	0.0033	0.084
90	4.29	0.0020	0.051
95	3.36	0.0038	0.097

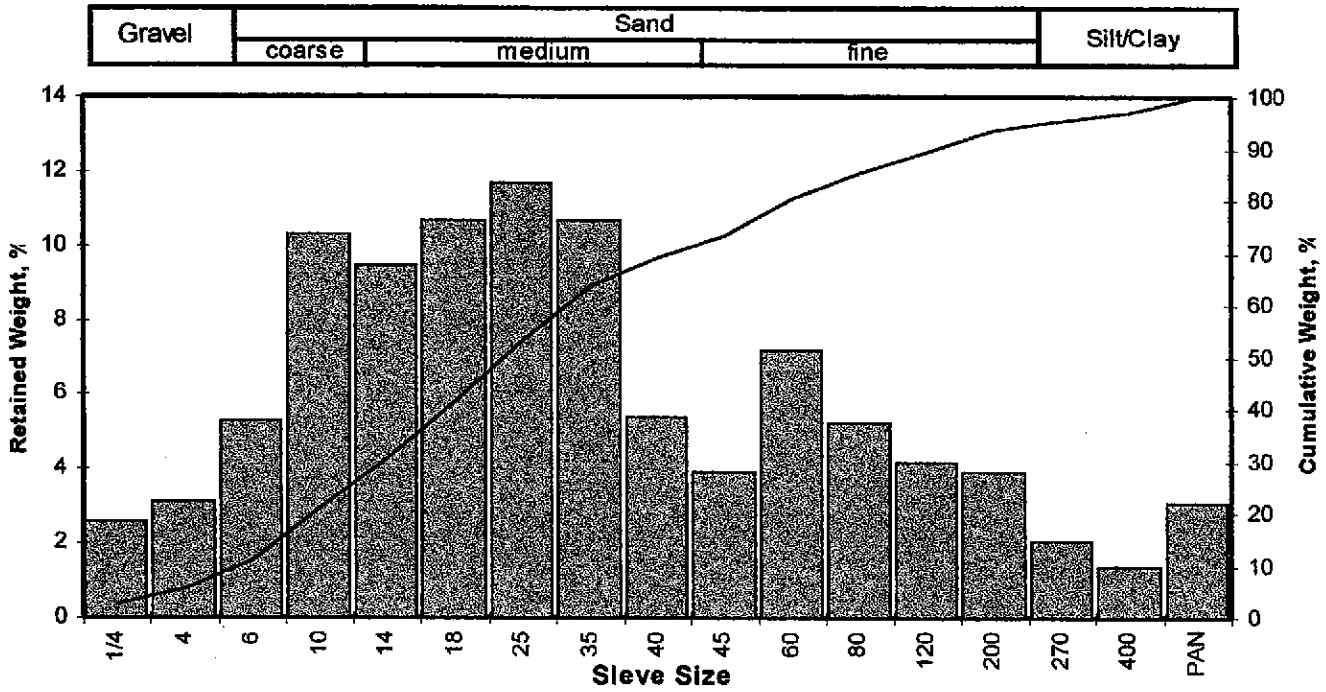
Measure	Trask	Inman	Folk-Ward
Median, phi	1.00	1.00	1.00
Median, in.	0.0197	0.0197	0.0197
Median, mm	0.501	0.501	0.501
Mean, phi	0.51	1.36	1.24
Mean, in.	0.0277	0.0154	0.0167
Mean, mm	0.704	0.391	0.425
Sorting	2.804	2.217	1.898
Skewness	0.888	0.162	0.035
Kurtosis	0.216	0.175	0.718
Grain Size Description (ASTM-USCS Scale)			Medium sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	1.06
Coarse Sand	10	12.73
Medium Sand	40	41.33
Fine Sand	200	30.42
Silt/Clay	<200	14.46
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B3-2.16-061302
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.54	2.61	2.61
0.1873	4.757	-2.25	4	0.64	3.10	5.71
0.1324	3.364	-1.75	6	1.09	5.28	10.99
0.0787	2.000	-1.00	10	2.13	10.31	21.30
0.0557	1.414	-0.50	14	1.95	9.44	30.74
0.0394	1.000	0.00	18	2.21	10.70	41.43
0.0278	0.707	0.50	25	2.41	11.67	53.10
0.0197	0.500	1.00	35	2.20	10.65	63.75
0.0166	0.420	1.25	40	1.11	5.37	69.12
0.0139	0.354	1.50	45	0.81	3.92	73.04
0.0098	0.250	2.00	60	1.48	7.16	80.20
0.0070	0.177	2.50	80	1.08	5.23	85.43
0.0049	0.125	3.00	120	0.86	4.16	89.59
0.0029	0.074	3.75	200	0.81	3.92	93.51
0.0021	0.053	4.25	270	0.43	2.08	95.60
0.0015	0.037	4.75	400	0.28	1.36	96.95
			PAN	0.63	3.05	100.00
TOTALS				20.66	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.35	0.2001	5.083
10	-1.84	0.1413	3.589
16	-1.39	0.1028	2.612
25	-0.80	0.0687	1.746
40	-0.07	0.0412	1.048
50	0.37	0.0305	0.775
60	0.82	0.0222	0.565
75	1.64	0.0127	0.322
84	2.36	0.0077	0.194
90	3.08	0.0047	0.118
95	4.11	0.0023	0.058

Measure	Trask	Inman	Folk-Ward
Median, phi	0.37	0.37	0.37
Median, in.	0.0305	0.0305	0.0305
Median, mm	0.775	0.775	0.775
Mean, phi	-0.05	0.49	0.45
Mean, in.	0.0407	0.0281	0.0289
Mean, mm	1.034	0.713	0.733
Sorting	2.330	1.874	1.915
Skewness	0.966	0.065	0.112
Kurtosis	0.205	0.721	1.084
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	5.71
Coarse Sand	10	15.59
Medium Sand	40	47.82
Fine Sand	200	24.39
Silt/Clay	<200	6.49
	Total	100

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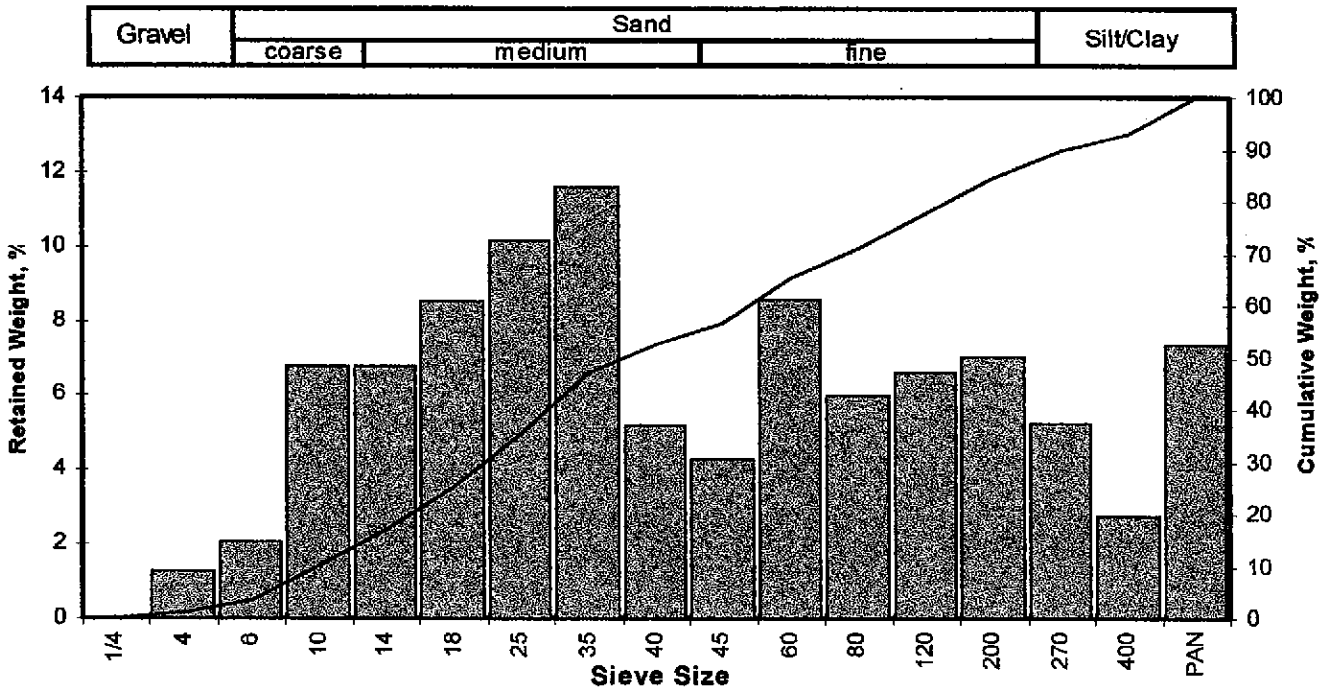
Phone: (562) 907-3607 Fax: (562) 907-3610

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422

Client:	Calscience	**PTS File No:**	32254
Project:	N/A	**Sample ID:**	35901-B5-1.76-061402
Project No:	02-06-0837	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.30	1.28	1.28
0.1324	3.364	-1.75	6	0.48	2.05	3.34
0.0787	2.000	-1.00	10	1.58	6.76	10.09
0.0557	1.414	-0.50	14	1.58	6.76	16.85
0.0394	1.000	0.00	18	1.99	8.51	25.36
0.0278	0.707	0.50	25	2.37	10.14	35.50
0.0197	0.500	1.00	35	2.71	11.59	47.09
0.0166	0.420	1.25	40	1.21	5.18	52.27
0.0139	0.354	1.50	45	1.00	4.28	56.54
0.0098	0.250	2.00	60	2.00	8.55	65.10
0.0070	0.177	2.50	80	1.39	5.95	71.04
0.0049	0.125	3.00	120	1.55	6.63	77.67
0.0029	0.074	3.75	200	1.64	7.01	84.69
0.0021	0.053	4.25	270	1.22	5.22	89.91
0.0015	0.037	4.75	400	0.64	2.74	92.64
			PAN	1.72	7.36	100.00
TOTALS				23.38	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-1.57	0.1165	2.959
10	-1.01	0.0793	2.015
16	-0.56	0.0582	1.477
25	-0.02	0.0400	1.015
40	0.69	0.0243	0.618
50	1.14	0.0179	0.454
60	1.70	0.0121	0.307
75	2.80	0.0057	0.144
84	3.68	0.0031	0.078
90	4.27	0.0020	0.052
95	3.23	0.0042	0.107

Measure	Trask	Inman	Folk-Ward
Median, phi	1.14	1.14	1.14
Median, in.	0.0179	0.0179	0.0179
Median, mm	0.454	0.454	0.454
Mean, phi	0.79	1.56	1.42
Mean, in.	0.0228	0.0134	0.0147
Mean, mm	0.579	0.340	0.374
Sorting	2.657	2.120	1.786
Skewness	0.842	0.196	0.034
Kurtosis	0.222	0.131	0.697
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	1.28
Coarse Sand	10	8.81
Medium Sand	40	42.17
Fine Sand	200	32.42
Silt/Clay	<200	15.31
	Total	100

CALSCIENCE ENVIRONMENTAL
LABORATORIES, INC.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 • FAX: (714) 894-7501

To: PTS 32254

CHAIN OF CUSTODY RECORD

Date 6/21/02

Page 1 of 5

LABORATORY CLIENT:

ADDRESS:

CITY STATE ZIP

TEL: FAX: E-MAIL:

CLIENT PROJECT NAME / NUMBER: 02-06-0837

PROJECT CONTACT: Stephen Nowak

SAMPLER(S): (SIGNATURE)

COELT LOG CODE

P.O. NO.:

LAB USE ONLY

COOLER RECEIPT

TEMP =

TURNAROUND TIME:
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING ☐ COELT REPORTING

SPECIAL INSTRUCTIONS:
- Normal TAT
- Moisture & Grain Size only this page.

REQUESTED ANALYSES

LAB USE ONLY	~~GEIMS ID~~	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH (G)	TPH (D) or	BTEX / MTBE (8021B)	HALOCARBONS (8021B)	VOCs (8260B)	VOCs (5035/ 8260B) EnCore	SVOCs (8270C)	PEST (8081A)	PCBs (8082)	EDB / DBCP (504.1) or (8011)	CAC, T22 METALS (6010B)	PNAs (8310)	VOCs (TO-14A) or (TO-15)	Moisture	Grain Size	Organic Content	SW
		35901-B1-3.0-061302	6/13/02		S	1																	
		-4.6-																					
		-6.1-																					
		-7.6-																					
		-9.1-																					
		-10.6-																					
		35901-B2-3.0-061302																					
		-4.6-																					
		-6.1-																					
		-7.6-																					

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	Roy Gaulke	06.24.02	12:0
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received for Laboratory by: (Signature)	Date:	Time:

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09/10/01 Re

CALSCIENCE ENVIRONMENTAL
LABORATORIES, INC.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 • FAX: (714) 894-7501

32254

CHAIN OF CUSTODY RECORD

Date 6/21/02

Page 2 of 5

LABORATORY CLIENT:

ADDRESS:

CITY STATE ZIP

TEL: FAX: E-MAIL:

CLIENT PROJECT NAME / NUMBER: 02-06-0837

P.O. NO.:

PROJECT CONTACT: Stephen Nowak

LAB USE ONLY

SAMPLER(S): (SIGNATURE)

COELT LOG CODE

COOLER RECEIPT

TEMP =

TURNAROUND TIME:
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING ☐ COELT REPORTING

SPECIAL INSTRUCTIONS:
— Normal TAT
— Moisture, grain size only.

REQUESTED ANALYSES

LAB USE ONLY	~~GEIMS ID~~	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH (G)	TPH (D) or ___	BTEX / MTBE (8021B)	HALOCARBONS (8021B)	VOCs (8260B)	VOCs (5035 / 8260B) EnCore	SVOCs (8270C)	PEST (8081A)	PCBs (8082)	EDB / DBCP (504.1) or (8011)	CAC, T22 METALS (6010B)	PNAs (8310)	VOCs (TO-14A) or (TO-15)	Moisture	Grain Size	Organic Content SR
	35901-B2-7.6-061302		6/13/02		S	1														X	X	X
		-9.1-																				
		-10.6-																				
	35901-B3-3.0-061302																					
		-4.72-																				
		-6.1-																				
		-7.6-																				
		-9.1-																				
		-10.6-																				
	35901-B4-3.0-061302		6/14/02																			

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	Ray Guillar	06.24.02	
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received for Laboratory by: (Signature)	Date:	Time:

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09/10/01 Re

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GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 • FAX: (714) 894-7501

32254

CHAIN OF CUSTODY RECORD

Date 6/21/02

Page 3 of 5

LABORATORY CLIENT:

ADDRESS:

CITY STATE ZIP

TEL: FAX: E-MAIL:

TURNAROUND TIME:
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING ☐ COELT REPORTING

SPECIAL INSTRUCTIONS:
- Normal TAT
- Moisture, Grain size only.

CLIENT PROJECT NAME / NUMBER: 02-06-0837

PROJECT CONTACT: Stephen Nowak

SAMPLER(S): (SIGNATURE)

COELT LOG CODE ☐☐☐☐

P.O. NO.:

LAB USE ONLY ☐☐-☐☐☐

COOLER RECEIPT TEMP =

REQUESTED ANALYSES

LAB USE ONLY	~~GEIMS ID~~	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH (G)	TPH (D) or ___	BTEX / MTBE (8021B)	HALOCARBONS (8021B)	VOCs (8260B)	VOCs (5035 / 8260B) EnCore	SVOCs (8270C)	PEST (8081A)	PCBs (8082)	EDB / DBCP (504.1) or (8011)	CAC, T22 METALS (6010B)	PNAs (8310)	VOCs (TO-14A) or (TO-15)	Moisture	Grain Size	Organic Carbon
		3935901-B4-4.6-061402	6/14/02		S	1														X	X	X
		-6.1-																				
		-7.6-																				
		-9.1-																				
		-9.8-																				
		35901-B5-3.0-061402																				
		-4.6-																				
		-6.1-																				
		-7.6-																				
		-9.1-																				

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	[signature]	06.24.02	12:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received for Laboratory by: (Signature)	Date:	Time:

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LABORATORIES, INC.
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GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 • FAX: (714) 894-7501

32254

CHAIN OF CUSTODY RECORD

Date 6/21/02

Page 4 of 5

LABORATORY CLIENT:

ADDRESS:

CITY STATE ZIP

TEL: FAX: E-MAIL:

TURNAROUND TIME: ☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY): ☐ RWQCB REPORTING ☐ COELT REPORTING

SPECIAL INSTRUCTIONS:

CLIENT PROJECT NAME / NUMBER: 02-06-0837

PROJECT CONTACT: Stephen Nowak

SAMPLER(S): (SIGNATURE)

COELT LOG CODE

P.O. NO.:

LAB USE ONLY

COOLER RECEIPT TEMP =

REQUESTED ANALYSES

LAB USE ONLY	GEIMS ID	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH (G)	TPH(D) or	BTEX / MTBE (8021B)	HALOCARBONS (8021B)	VOCs (8260B)	VOCs (5035 / 8260B) EnCore	SVOCs (8270C)	PEST (8081A)	PCBs (8082)	EDB / DBCP (504.1) or (8011)	CAC, T22 METALS (6010B)	PNAs (8310)	VOCs (TO-14A) or (TO-15)	Moisture	Grain Size	Organic Carbon	
		35901-B5-10.1-061402	6/14/02		S	1														X	X		
		35901-B6-3.0-061402																					
		-4.6-																					
		-6.1-																					
		-7.6-																					
		-9.1-																					
		-10.6-																					
	(1)	35901-B1-2.1-061303	06/13/02			2														X	X	X	X
	(2)	-B2-1.81-				2																	
	(3)	-B3-2.16-				2																	

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	Reg Guillen	06.24.02	12:00
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
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7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL (714) 895-5494 • FAX: (714) 894-7501

32254

CHAIN OF CUSTODY RECORD

Date 6/21/02

Page 5 of 5

LABORATORY CLIENT:

ADDRESS:

CITY STATE ZIP

TEL: FAX: E-MAIL:

CLIENT PROJECT NAME / NUMBER: 02-06-0837

PROJECT CONTACT: Stephen Nowak

SAMPLER(S): (SIGNATURE)

COELT LOG CODE

P.O. NO.:

LAB USE ONLY

COOLER RECEIPT TEMP =

TURNAROUND TIME: ☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY): ☐ RWQCB REPORTING ☐ COELT REPORTING

SPECIAL INSTRUCTIONS: Normal TAT

REQUESTED ANALYSES

LAB USE ONLY	GEIMS ID	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH (G)	TPH (D) or	BTEX / MTBE (8021B)	HALOCARBONS (8021B)	VOCs (8260B)	VOCs (5035 / 8260B) EnCore	SVOCs (8270B)	PEST (8081A)	PCBs (8082)	EDB / DBCP (504.1) or (8011)	CAC, T22 METALS (6010B)	PNAs (8310)	VOCs (TO-14A) or (TO-15)	Moisture	Grain Size	Organic Content	
	(4)	35901-B4-1.78-061402	6/14/02		S	2														X	X	X	X
	(5)	-B5-1.76-																					
	(6)	-B6-1.76-																					

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	Roy Guillen	06.24.02	12:00
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received for Laboratory by: (Signature)	Date:	Time:

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09/10/01 Re

1 of 7

PROJECT NAME: CALTRANS INFILTRATION BASIN 101 + 109 PROJECT No. 9168-35901-RMT17

ASSIGNED BY: MIKE GRAY DATE: 6/19/02 DUE DATE: 6/21/02

BORING No.	B-1	B-1	B-1	B-1	B-1	B-1
SAMPLE No.	B1-3.0	B1-4.6	B1-6.1	B1-7.6	B1-9.1	B1-10.6
DEPTH (m) ~~(ft)~~	3.0	4.6	6.1	7.6	9.1	10.6
MOISTURE (ASTM D2216) (%)	X	X	X	X	X	X
DRY DENSITY (pcf)						
SATURATION (%)						
MAXIMUM DENSITY						
ATTERBERG LIMITS						
HYDROMETER						
GRAIN SIZE (ASTM D422)	X	X	X	X	X	X
EXPANSION INDEX						
DIRECT SHEAR						
RESIDUAL SHEAR						
RING SHEAR						
CONSOLIDATION						
SULFATE						
pH						
RESISTIVITY						
CHLORIDE						
SPECIFIC GRAVITY						
PERMEABILITY						
R-VALUE						
OUTSIDE TEST						
SPECIAL TEST						
REMARKS						
ORGANIC CONTENT						
pH (EPA 9045)						
CATION EXCHANGE CAPACITY (EPA 9081)						
SAMPLE ID.	35901-B1-3.0-061302	35901-B1-4.6-061302	35901-B1-6.1-061302	35901-B1-7.6-061302	35901-B1-9.1-061302	35901-B1-10.6-061302
	1	2	3	4	6	7

SPECIAL INSTRUCTIONS

Received by: [illegible] 6/21/02

Relinquished by: [illegible] 6/21/02

0837

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LAB TEST ASSIGNMENT

2 of 7

PROJECT NAME: CALTRANS INFILTRATION BASIN 101 & 109 PROJECT No. 9168-35901-RMT17

ASSIGNED BY: MIKE GRAY DATE: 6/19/02 DUE DATE:

BORING No.		B-2	B-2	B-2	B-2	B-2	B-2				
SAMPLE No.	B2-1.8	B2-3.0	B2-4.6	B2-6.1	B2-7.6	B2-9.1	B2-10.6				
DEPTH (m) ~~(ft)~~		3.0	4.6	6.1	7.6	9.1	10.6				
MOISTURE (ASTM D2216) (%)		X	X	X	X	X	X				
DRY DENSITY (pcf)											
SATURATION. (%)											
MAXIMUM DENSITY											
ATTERBERG LIMITS											
HYDROMETER											
GRAIN SIZE (ASTM D422)		X	X	X	X	X	X				
EXPANSION INDEX											
DIRECT SHEAR											
RESIDUAL SHEAR											
RING SHEAR											
CONSOLIDATION											
SULFATE											
pH											
RESISTIVITY											
CHLORIDE											
SPECIFIC GRAVITY											
PERMEABILITY											
R-VALUE											
OUTSIDE TEST											
SPECIAL TEST											
REMARKS											
ORGANIC CONTENT											
pH											
CATION EXCHANGE CAPACITY											
SAMPLE I.D.		35901-B2-3.0-061302	35901-B2-4.6-061302	35901-B2-6.1-061302	35901-B2 7.6-061302	35901-B2 9.1-061302	35901-B2 10.6-061302				
SPECIAL INSTRUCTIONS		8	9	10	11	12	13				

0837

Received by: [illegible] 6/21/02 1010

CATEX

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LAB TEST ASSIGNMENT

3 of 7

PROJECT NAME: CALTRANS INFILTRATION BASIN 101 & 109 PROJECT No. 9168-35901-RMT17

ASSIGNED BY: MIKE GRAY DATE: 6/19/02 DUE DATE:

BORING No.		B-3	B-3	B-3	B-3	B-3	B-3				
SAMPLE No.		B3-3.0	B3-4.7	B3-6.1	B3-7.6	B3-9.1	B3-10.6				
DEPTH (m) (ft.)		3.0	4.72	6.1	7.6	9.1	10.6				
MOISTURE (ASTM D2216) (%)		X	X	X	X	X	X				
DRY DENSITY (pcf)											
SATURATION. (%)											
MAXIMUM DENSITY											
ATTERBERG LIMITS											
HYDROMETER											
GRAIN SIZE (ASTM D422)		X	X	X	X	X	X				
EXPANSION INDEX											
DIRECT SHEAR											
RESIDUAL SHEAR											
RING SHEAR											
CONSOLIDATION											
SULFATE											
pH											
RESISTIVITY											
CHLORIDE											
SPECIFIC GRAVITY											
PERMEABILITY											
R-VALUE											
OUTSIDE TEST											
SPECIAL TEST											
REMARKS											
ORGANIC CONTENT											
pH											
CATION EXCHANGE CAPACITY											
SAMPLE ID		35901-B3-3.0-061302	35901-B3-4.72-061302	35901-B3-6.1-061302	35901-B3-7.6-061302	35901-B3-9.1-061302	35901-B3-10.6-061302				
SPECIAL INSTRUCTIONS		14	15	16	17	18	19				

Received by: Albert Rodriguez 6/21/02

0837

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LAB TEST ASSIGNMENT

4 of 7

PROJECT NAME: CALTRANS INFILTRATION BASIN 101 + 109 PROJECT No. 9168-35901-RMT17

ASSIGNED BY: MIKE GRAY DATE: 6/19/02 DUE DATE:

BORING No.	B-4	B-4	B-4	B-4	B-4	B-4
SAMPLE No.	B4-3.0	B4-4.6	B4-6.1	B4-7.6	B4-9.1	B4-9.8
DEPTH (m) (ft)	3.0	4.6	6.1	7.6	9.1	9.8
MOISTURE (ASTM D2216) (%)	X	X	X	X	X	X
DRY DENSITY (pcf)						
SATURATION. (%)						
MAXIMUM DENSITY						
ATTERBERG LIMITS						
HYDROMETER						
GRAIN SIZE (ASTM D422)	X	X	X	X	X	X
EXPANSION INDEX						
DIRECT SHEAR						
RESIDUAL SHEAR						
RING SHEAR						
CONSOLIDATION						
SULFATE						
pH						
RESISTIVITY						
CHLORIDE						
SPECIFIC GRAVITY						
PERMEABILITY						
R-VALUE						
OUTSIDE TEST						
SPECIAL TEST						
REMARKS						
ORGANIC CONTENT						
pH						
CATION EXCHANGE CAPACITY						
SAMPLE ID	35901-B4-3.0-061402	35901-B4-4.6-061402	35901-B4-6.1-061402	35901-B4-7.6-061402	35901-B4-9.1-061402	35901-B4-9.8-061402
SPECIAL INSTRUCTIONS	20	21	22	23	24	25

Received by: [illegible] 6/21/02 1010

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LAB TEST ASSIGNMENT

PROJECT NAME: CALTRANS INFILTRATION BASIN 101 & 109 PROJECT No. 9168-35901-RMT17

ASSIGNED BY: MIKE GRAY DATE: 6/19/02 DUE DATE:

BORING No.	B-5	B-5	B-5	B-5	B-5	B-5
SAMPLE No.	B5-3.0	B5-4.6	B5-6.1	B5-7.6	B5-9.1	B5-10.6
DEPTH (m) ~~(ft)~~	3.0	4.6	6.1	7.6	9.1	10.1
MOISTURE (ASTM D2216) (%)	X	X	X	X	X	X
DRY DENSITY (pcf)						
SATURATION. (%)						
MAXIMUM DENSITY						
ATTERBERG LIMITS						
HYDROMETER						
GRAIN SIZE (ASTM D422)	X	X	X	X	X	X
EXPANSION INDEX						
DIRECT SHEAR						
RESIDUAL SHEAR						
RING SHEAR						
CONSOLIDATION						
SULFATE						
pH						
RESISTIVITY						
CHLORIDE						
SPECIFIC GRAVITY						
PERMEABILITY						
R-VALUE						
OUTSIDE TEST						
SPECIAL TEST						
REMARKS						
ORGANIC CONTENT						
pH						
CATION EXCHANGE CAPACITY						
SAMPLE ID	35901-B5-3.0-061402	35901-B5-4.6-061402	35901-B5-6.1-061402	35901-B5-7.6-061402	35901-B5-9.1-061402	35901-B5-10.1-061402
SPECIAL INSTRUCTIONS	26	27	28	29	30	31

0837

Received by: [illegible] 6/21/02 1010

CDET

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LAB TEST ASSIGNMENT

6 of 7

PROJECT NAME: CALTRANS INFILTRATION BASIN 101 + 109 PROJECT No. 9168-35901-RMT17

ASSIGNED BY: MIKE GRAY DATE: 6/19/02 DUE DATE:

BORING No.	B-6	B-6	B-6	B-6	B-6	B-6
SAMPLE No.	B6-3	B6-4.6	B6-6.1	B6-7.6	B6-9.1	B6-10.6
DEPTH (m) ~~(ft)~~	3.0	4.6	6.1	7.6	9.1	10.6
MOISTURE (ASTM D2216) (%)	X	X	X	X	X	X
DRY DENSITY (pcf)						
SATURATION (%)						
MAXIMUM DENSITY						
ATTERBERG LIMITS						
HYDROMETER						
GRAIN SIZE (ASTM D422)	X	X	X	X	X	X
EXPANSION INDEX						
DIRECT SHEAR						
RESIDUAL SHEAR						
RING SHEAR						
CONSOLIDATION						
SULFATE						
pH						
RESISTIVITY						
CHLORIDE						
SPECIFIC GRAVITY						
PERMEABILITY						
R-VALUE						
OUTSIDE TEST						
SPECIAL TEST						
REMARKS						
ORGANIC CONTENT						
pH						
CATION EXCHANGE CAPACITY						
SAMPLE ID	35901-B6-3.0-061402	35901-B6-4.6-061402	35901-B6-6.1-061402	35901-B6-7.6-061402	35901-B6-9.1-061402	35901-B6-10.6-061402
SPECIAL INSTRUCTIONS	32	33	34	35	36	37

Received by: [illegible] 6/21/02

L380

CEDET

CDM Camp Dresser & McKee Inc.

consulting | One Walnut Creek Center

LAB TEST ASSIGNMENT

7 of 7

PROJECT NAME: CALTRANS INFILTRATION BASIN 101 + 109 PROJECT No. 9168-35901-RMT17

ASSIGNED BY: MIKE GRAY DATE: 6/19/02 DUE DATE:

BORING No.	B1	B2	B3	B4	B5	B6
SAMPLE No.	B1-2.1	B2-1.81	B3-2.16	B4-1.78	B5-1.76	B6-1.76
DEPTH (m)	2.1	1.81	2.16	1.78	1.76	1.76
MOISTURE (ASTM D2216) (%)	X	X	X	X	X	X
DRY DENSITY (pcf)						
SATURATION. (%)						
MAXIMUM DENSITY						
ATTERBERG LIMITS						
HYDROMETER						
GRAIN SIZE (ASTM D422)	X	X	X	X	X	X
EXPANSION INDEX						
DIRECT SHEAR						
RESIDUAL SHEAR						
RING SHEAR						
CONSOLIDATION						
SULFATE						
pH						
RESISTIVITY						
CHLORIDE						
SPECIFIC GRAVITY						
PERMEABILITY						
R-VALUE						
OUTSIDE TEST						
SPECIAL TEST						
REMARKS						
ORGANIC CONTENT	X	X	X	X	X	X
pH (EPA 9045)	X	X	X	X	X	X
CATION EXCHANGE CAPACITY (EPA 9081)	X	X	X	X	X	X
SAMPLE ID	35901-B1 2.1-061302	35901-B2 1.81-061302	35901-B3 2.16-061302	35901-B4 1.78-061402	35901-B5 1.76-061402	35901-B6 1.76-061402
	38	39	40	41	42	43

SPECIAL INSTRUCTIONS
CALL ABOUT ORGANIC CONTENT METHOD.

Received by: [illegible] 6/21/02 1010

0237

GEDEX

CDM Camp Dresser & McKee Inc.

consulting engineering | One Walnut Creek Center
100 Pringle Avenue, Suite 300

LAB TEST ASSIGNMENT

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 02-0 6 - 0 8 3 7

Cooler 1 of 2

SAMPLE RECEIPT FORM

CLIENT: CDM

DATE: 6/21/02

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
_____ Chilled, cooler without temperature blank.
_____ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.

_____ °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
4 °C IR thermometer.
_____ Ambient temperature.

Initial: VL

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Applicable (N/A): ✓

Initial: VL

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial: VL

COMMENTS:

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 02-0 6 - 0 8 3 7

Cooler 2 of 2

SAMPLE RECEIPT FORM

CLIENT: CDM **DATE:** 6/21/02

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
_____ Chilled, cooler without temperature blank.
_____ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.

_____ °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
4 °C IR thermometer.
_____ Ambient temperature.

Initial: M

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Applicable (N/A): ✓

Initial: M

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial: M

COMMENTS:

Results of Waste Disposal Analysis

Calscience Environmental Laboratories, Inc.

Composite Drum Results

June 25, 2002

Mike Gray
Camp Dresser & McKee, Inc.
100 Pringle Ave. , Suite 300
Walnut Creek, CA 94596-3580

Subject: **Calscience Work Order No.: 02-06-0619**
Client Reference: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 6/18/02 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Stephen Nowak
Project Manager

Michael J. Crisostomo
Quality Assurance Manager

7440 Lincoln Way, Garden Grove, CA 92841-1432 • TEL: (714) 895-5494 • FAX: (714) 894-7501

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

Camp Dresser & McKee, Inc.		Date Received:	06/18/02
100 Pringle Ave. , Suite 300		Work Order No:	02-06-0619
Walnut Creek, CA 94596-3580		Preparation:	TCLP
		Method:	EPA 6010B

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Composite (B109 A,B,C,D,E)	02-06-0619-10	06/14/02	Solid	06/18/02	06/20/02	020619lcs3

Parameter	Result	RL	DF	Qual	Units	Parameter	Result	RL	DF	Qual	Units
Arsenic	ND	0.150	1		mg/L	Lead	ND	0.100	1		mg/L
Barium	0.686	0.100	1		mg/L	Selenium	ND	0.150	1		mg/L
Cadmium	ND	0.0500	1		mg/L	Silver	ND	0.0500	1		mg/L
Chromium (Total)	ND	0.0500	1		mg/L						

Composite (B101A, B, C, D)	02-06-0619-11	06/14/02	Solid	06/18/02	06/20/02	020619lcs3

Parameter	Result	RL	DF	Qual	Units	Parameter	Result	RL	DF	Qual	Units
Arsenic	ND	0.150	1		mg/L	Lead	ND	0.100	1		mg/L
Barium	0.640	0.100	1		mg/L	Selenium	ND	0.150	1		mg/L
Cadmium	ND	0.0500	1		mg/L	Silver	ND	0.0500	1		mg/L
Chromium (Total)	ND	0.0500	1		mg/L						

Method Blank	097-05-001-1,970	N/A	Solid	06/18/02	06/19/02	020619lcs3

Parameter	Result	RL	DF	Qual	Units	Parameter	Result	RL	DF	Qual	Units
Arsenic	ND	0.150	1		mg/L	Lead	ND	0.100	1		mg/L
Barium	ND	0.100	1		mg/L	Selenium	ND	0.150	1		mg/L
Cadmium	ND	0.0500	1		mg/L	Silver	ND	0.0500	1		mg/L
Chromium (Total)	ND	0.0500	1		mg/L						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

Camp Dresser & McKee, Inc.
100 Pringle Ave. , Suite 300
Walnut Creek, CA 94596-3580

Date Received:	06/18/02
Work Order No:	02-06-0619
Preparation:	Ext. + D/I
Method:	EPA 8015M

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Client Sample Number	Lab Sample Number	Matrix	Date Collected	Date Prepared	Date Analyzed	QC Batch ID
Composite (B109 A,B,C,D,E)	02-06-0619-10	Solid	06/14/02	06/20/02	06/20/02	02062003sa

Parameter	Result	RL	DF	Qual	Units
TPH as Diesel	ND	5.0	1		mg/kg

Surrogates:	REC (%)	Control Limits	Qual
Decachlorobiphenyl	93	45-149	

Composite (B101A, B, C, D)	02-06-0619-11	Solid	06/14/02	06/20/02	06/20/02	02062003sa

Parameter	Result	RL	DF	Qual	Units
TPH as Diesel	ND	5.0	1		mg/kg

Surrogates:	REC (%)	Control Limits	Qual
Decachlorobiphenyl	89	45-149	

Method Blank	098-03-002-1,895	Solid	N/A	06/20/02	06/20/02	02062003sa

Parameter	Result	RL	DF	Qual	Units
TPH as Diesel	ND	5.0	1		mg/kg

Surrogates:	REC (%)	Control Limits	Qual
Decachlorobiphenyl	80	45-149	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

Camp Dresser & McKee, Inc.
100 Pringle Ave. , Suite 300
Walnut Creek, CA 94596-3580

Date Received:	06/18/02
Work Order No:	02-06-0619
Preparation:	EPA 5030B
Method:	EPA 8015M

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Client Sample Number	Lab Sample Number	Matrix	Date Collected	Date Prepared	Date Analyzed	QC Batch ID
Composite (B109 A,B,C,D,E)	02-06-0619-10	Solid	06/14/02	N/A	06/19/02	02061901sa

Parameter	Result	RL	DF	Qual	Units
TPH as Gasoline	ND	0.50	1		mg/kg

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	85	21-159	

Composite (B101A, B, C, D)	02-06-0619-11	Solid	06/14/02	N/A	06/19/02	02061901sa

Parameter	Result	RL	DF	Qual	Units
TPH as Gasoline	ND	0.50	1		mg/kg

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	79	21-159	

Method Blank	098-03-008-2,119	Solid	N/A	N/A	06/19/02	02061901sa

Parameter	Result	RL	DF	Qual	Units
TPH as Gasoline	ND	0.50	1		mg/kg

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	91	21-159	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

Camp Dresser & McKee, Inc.
100 Pringle Ave. , Suite 300
Walnut Creek, CA 94596-3580

Date Received:	06/18/02
Work Order No:	02-06-0619
Preparation:	Ext. + D/I
Method:	EPA 8015M

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Client Sample Number	Lab Sample Number	Matrix	Date Collected	Date Prepared	Date Analyzed	QC Batch ID
Composite (B109 A,B,C,D,E)	02-06-0619-10	Solid	06/14/02	06/20/02	06/20/02	02062004sa

Parameter	Result	RL	DF	Qual	Units
TPH as motor oil	ND	25	1		mg/kg

Surrogates:	REC (%)	Control Limits	Qual
Decachlorobiphenyl	93	45-149	

Composite (B101A, B, C, D)	02-06-0619-11	Solid	06/14/02	06/20/02	06/20/02	02062004sa

Parameter	Result	RL	DF	Qual	Units
TPH as motor oil	49	25	1		mg/kg

Surrogates:	REC (%)	Control Limits	Qual
Decachlorobiphenyl	89	45-149	

Method Blank	098-03-015-180	Solid	N/A	06/20/02	06/20/02	02062004sa

Parameter	Result	RL	DF	Qual	Units
TPH as motor oil	ND	25	1		mg/kg

Surrogates:	REC (%)	Control Limits	Qual
Decachlorobiphenyl	80	45-149	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

Camp Dresser & McKee, Inc.		Date Received:	06/18/02
100 Pringle Ave. , Suite 300		Work Order No:	02-06-0619
Walnut Creek, CA 94596-3580		Preparation:	N/A
		Method:	EPA 8260B

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Composite (B109 A,B,C,D,E)	02-06-0619-10	06/14/02	Solid	N/A	06/18/02	061802AS

Parameter	Result	RL	DF	Qual	Units	Parameter	Result	RL	DF	Qual	Units
Acetone	ND	50	1		ug/kg	1,3-Dichloropropane	ND	5.0	1		ug/kg
Benzene	ND	5.0	1		ug/kg	2,2-Dichloropropane	ND	5.0	1		ug/kg
Bromobenzene	ND	5.0	1		ug/kg	1,1-Dichloropropene	ND	5.0	1		ug/kg
Bromochloromethane	ND	5.0	1		ug/kg	c-1,3-Dichloropropene	ND	5.0	1		ug/kg
Bromodichloromethane	ND	5.0	1		ug/kg	t-1,3-Dichloropropene	ND	5.0	1		ug/kg
Bromoform	ND	5.0	1		ug/kg	Ethylbenzene	ND	5.0	1		ug/kg
Bromomethane	ND	25	1		ug/kg	2-Hexanone	ND	50	1		ug/kg
2-Butanone	ND	50	1		ug/kg	Isopropylbenzene	ND	5.0	1		ug/kg
n-Butylbenzene	ND	5.0	1		ug/kg	p-Isopropyltoluene	ND	5.0	1		ug/kg
sec-Butylbenzene	ND	5.0	1		ug/kg	Methylene Chloride	ND	50	1		ug/kg
tert-Butylbenzene	ND	5.0	1		ug/kg	4-Methyl-2-Pentanone	ND	50	1		ug/kg
Carbon Disulfide	ND	50	1		ug/kg	Naphthalene	ND	50	1		ug/kg
Carbon Tetrachloride	ND	5.0	1		ug/kg	n-Propylbenzene	ND	5.0	1		ug/kg
Chlorobenzene	ND	5.0	1		ug/kg	Styrene	ND	5.0	1		ug/kg
Chloroethane	ND	5.0	1		ug/kg	1,1,1,2-Tetrachloroethane	ND	5.0	1		ug/kg
Chloroform	ND	5.0	1		ug/kg	1,1,2,2-Tetrachloroethane	ND	5.0	1		ug/kg
Chloromethane	ND	25	1		ug/kg	Tetrachloroethene	ND	5.0	1		ug/kg
2-Chlorotoluene	ND	5.0	1		ug/kg	Toluene	ND	5.0	1		ug/kg
4-Chlorotoluene	ND	5.0	1		ug/kg	1,2,3-Trichlorobenzene	ND	10	1		ug/kg
Dibromochloromethane	ND	5.0	1		ug/kg	1,2,4-Trichlorobenzene	ND	5.0	1		ug/kg
1,2-Dibromo-3-Chloropropane	ND	10	1		ug/kg	1,1,1-Trichloroethane	ND	5.0	1		ug/kg
1,2-Dibromoethane	ND	5.0	1		ug/kg	1,1,2-Trichloroethane	ND	5.0	1		ug/kg
Dibromomethane	ND	5.0	1		ug/kg	Trichloroethene	ND	5.0	1		ug/kg
1,2-Dichlorobenzene	ND	5.0	1		ug/kg	Trichlorofluoromethane	ND	50	1		ug/kg
1,3-Dichlorobenzene	ND	5.0	1		ug/kg	1,2,3-Trichloropropane	ND	5.0	1		ug/kg
1,4-Dichlorobenzene	ND	5.0	1		ug/kg	1,2,4-Trimethylbenzene	ND	5.0	1		ug/kg
Dichlorodifluoromethane	ND	5.0	1		ug/kg	1,3,5-Trimethylbenzene	ND	5.0	1		ug/kg
1,1-Dichloroethane	ND	5.0	1		ug/kg	Vinyl Acetate	ND	50	1		ug/kg
1,2-Dichloroethane	ND	5.0	1		ug/kg	Vinyl Chloride	ND	5.0	1		ug/kg
1,1-Dichloroethene	ND	5.0	1		ug/kg	p/m-Xylene	ND	5.0	1		ug/kg
c-1,2-Dichloroethene	ND	5.0	1		ug/kg	o-Xylene	ND	5.0	1		ug/kg
t-1,2-Dichloroethene	ND	5.0	1		ug/kg	Methyl-t-Butyl Ether (MTBE)	ND	5.0	1		ug/kg
1,2-Dichloropropane	ND	5.0	1		ug/kg						

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
Dibromofluoromethane	110	80-120		Toluene-d8	92	81-117	
1,4-Bromofluorobenzene	94	74-121					

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

Camp Dresser & McKee, Inc.		Date Received:	06/18/02
100 Pringle Ave. , Suite 300		Work Order No:	02-06-0619
Walnut Creek, CA 94596-3580		Preparation:	N/A
		Method:	EPA 8260B

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Composite (B101A, B, C, D)	02-06-0619-11	06/14/02	Solid	N/A	06/18/02	061802AS

Parameter	Result	RL	DF	Qual	Units	Parameter	Result	RL	DF	Qual	Units
Acetone	ND	50	1		ug/kg	1,3-Dichloropropane	ND	5.0	1		ug/kg
Benzene	ND	5.0	1		ug/kg	2,2-Dichloropropane	ND	5.0	1		ug/kg
Bromobenzene	ND	5.0	1		ug/kg	1,1-Dichloropropene	ND	5.0	1		ug/kg
Bromochloromethane	ND	5.0	1		ug/kg	c-1,3-Dichloropropene	ND	5.0	1		ug/kg
Bromodichloromethane	ND	5.0	1		ug/kg	t-1,3-Dichloropropene	ND	5.0	1		ug/kg
Bromoform	ND	5.0	1		ug/kg	Ethylbenzene	ND	5.0	1		ug/kg
Bromomethane	ND	25	1		ug/kg	2-Hexanone	ND	50	1		ug/kg
2-Butanone	ND	50	1		ug/kg	Isopropylbenzene	ND	5.0	1		ug/kg
n-Butylbenzene	ND	5.0	1		ug/kg	p-Isopropyltoluene	ND	5.0	1		ug/kg
sec-Butylbenzene	ND	5.0	1		ug/kg	Methylene Chloride	ND	50	1		ug/kg
tert-Butylbenzene	ND	5.0	1		ug/kg	4-Methyl-2-Pentanone	ND	50	1		ug/kg
Carbon Disulfide	ND	50	1		ug/kg	Naphthalene	ND	50	1		ug/kg
Carbon Tetrachloride	ND	5.0	1		ug/kg	n-Propylbenzene	ND	5.0	1		ug/kg
Chlorobenzene	ND	5.0	1		ug/kg	Styrene	ND	5.0	1		ug/kg
Chloroethane	ND	5.0	1		ug/kg	1,1,1,2-Tetrachloroethane	ND	5.0	1		ug/kg
Chloroform	ND	5.0	1		ug/kg	1,1,2,2-Tetrachloroethane	ND	5.0	1		ug/kg
Chloromethane	ND	25	1		ug/kg	Tetrachloroethene	ND	5.0	1		ug/kg
2-Chlorotoluene	ND	5.0	1		ug/kg	Toluene	ND	5.0	1		ug/kg
4-Chlorotoluene	ND	5.0	1		ug/kg	1,2,3-Trichlorobenzene	ND	10	1		ug/kg
Dibromochloromethane	ND	5.0	1		ug/kg	1,2,4-Trichlorobenzene	ND	5.0	1		ug/kg
1,2-Dibromo-3-Chloropropane	ND	10	1		ug/kg	1,1,1-Trichloroethane	ND	5.0	1		ug/kg
1,2-Dibromoethane	ND	5.0	1		ug/kg	1,1,2-Trichloroethane	ND	5.0	1		ug/kg
Dibromomethane	ND	5.0	1		ug/kg	Trichloroethene	ND	5.0	1		ug/kg
1,2-Dichlorobenzene	ND	5.0	1		ug/kg	Trichlorofluoromethane	ND	50	1		ug/kg
1,3-Dichlorobenzene	ND	5.0	1		ug/kg	1,2,3-Trichloropropane	ND	5.0	1		ug/kg
1,4-Dichlorobenzene	ND	5.0	1		ug/kg	1,2,4-Trimethylbenzene	ND	5.0	1		ug/kg
Dichlorodifluoromethane	ND	5.0	1		ug/kg	1,3,5-Trimethylbenzene	ND	5.0	1		ug/kg
1,1-Dichloroethane	ND	5.0	1		ug/kg	Vinyl Acetate	ND	50	1		ug/kg
1,2-Dichloroethane	ND	5.0	1		ug/kg	Vinyl Chloride	ND	5.0	1		ug/kg
1,1-Dichloroethene	ND	5.0	1		ug/kg	p/m-Xylene	ND	5.0	1		ug/kg
c-1,2-Dichloroethene	ND	5.0	1		ug/kg	o-Xylene	ND	5.0	1		ug/kg
t-1,2-Dichloroethene	ND	5.0	1		ug/kg	Methyl-t-Butyl Ether (MTBE)	ND	5.0	1		ug/kg
1,2-Dichloropropane	ND	5.0	1		ug/kg						

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
Dibromofluoromethane	111	80-120		Toluene-d8	93	81-117	
1,4-Bromofluorobenzene	92	74-121					

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

Camp Dresser & McKee, Inc.
100 Pringle Ave. , Suite 300
Walnut Creek, CA 94596-3580

Date Received:	06/18/02
Work Order No:	02-06-0619
Preparation:	N/A
Method:	EPA 8260B

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	099-10-005-3,179	N/A	Solid	N/A	06/18/02	061802AS

Parameter	Result	RL	DF	Qual	Units	Parameter	Result	RL	DF	Qual	Units
Acetone	ND	50	1		ug/kg	1,3-Dichloropropane	ND	5.0	1		ug/kg
Benzene	ND	5.0	1		ug/kg	2,2-Dichloropropane	ND	5.0	1		ug/kg
Bromobenzene	ND	5.0	1		ug/kg	1,1-Dichloropropene	ND	5.0	1		ug/kg
Bromochloromethane	ND	5.0	1		ug/kg	c-1,3-Dichloropropene	ND	5.0	1		ug/kg
Bromodichloromethane	ND	5.0	1		ug/kg	t-1,3-Dichloropropene	ND	5.0	1		ug/kg
Bromoform	ND	5.0	1		ug/kg	Ethylbenzene	ND	5.0	1		ug/kg
Bromomethane	ND	25	1		ug/kg	2-Hexanone	ND	50	1		ug/kg
2-Butanone	ND	50	1		ug/kg	Isopropylbenzene	ND	5.0	1		ug/kg
n-Butylbenzene	ND	5.0	1		ug/kg	p-Isopropyltoluene	ND	5.0	1		ug/kg
sec-Butylbenzene	ND	5.0	1		ug/kg	Methylene Chloride	ND	50	1		ug/kg
tert-Butylbenzene	ND	5.0	1		ug/kg	4-Methyl-2-Pentanone	ND	50	1		ug/kg
Carbon Disulfide	ND	50	1		ug/kg	Naphthalene	ND	50	1		ug/kg
Carbon Tetrachloride	ND	5.0	1		ug/kg	n-Propylbenzene	ND	5.0	1		ug/kg
Chlorobenzene	ND	5.0	1		ug/kg	Styrene	ND	5.0	1		ug/kg
Chloroethane	ND	5.0	1		ug/kg	1,1,1,2-Tetrachloroethane	ND	5.0	1		ug/kg
Chloroform	ND	5.0	1		ug/kg	1,1,2,2-Tetrachloroethane	ND	5.0	1		ug/kg
Chloromethane	ND	25	1		ug/kg	Tetrachloroethene	ND	5.0	1		ug/kg
2-Chlorotoluene	ND	5.0	1		ug/kg	Toluene	ND	5.0	1		ug/kg
4-Chlorotoluene	ND	5.0	1		ug/kg	1,2,3-Trichlorobenzene	ND	10	1		ug/kg
Dibromochloromethane	ND	5.0	1		ug/kg	1,2,4-Trichlorobenzene	ND	5.0	1		ug/kg
1,2-Dibromo-3-Chloropropane	ND	10	1		ug/kg	1,1,1-Trichloroethane	ND	5.0	1		ug/kg
1,2-Dibromoethane	ND	5.0	1		ug/kg	1,1,2-Trichloroethane	ND	5.0	1		ug/kg
Dibromomethane	ND	5.0	1		ug/kg	Trichloroethene	ND	5.0	1		ug/kg
1,2-Dichlorobenzene	ND	5.0	1		ug/kg	Trichlorofluoromethane	ND	50	1		ug/kg
1,3-Dichlorobenzene	ND	5.0	1		ug/kg	1,2,3-Trichloropropane	ND	5.0	1		ug/kg
1,4-Dichlorobenzene	ND	5.0	1		ug/kg	1,2,4-Trimethylbenzene	ND	5.0	1		ug/kg
Dichlorodifluoromethane	ND	5.0	1		ug/kg	1,3,5-Trimethylbenzene	ND	5.0	1		ug/kg
1,1-Dichloroethane	ND	5.0	1		ug/kg	Vinyl Acetate	ND	50	1		ug/kg
1,2-Dichloroethane	ND	5.0	1		ug/kg	Vinyl Chloride	ND	5.0	1		ug/kg
1,1-Dichloroethene	ND	5.0	1		ug/kg	p/m-Xylene	ND	5.0	1		ug/kg
c-1,2-Dichloroethene	ND	5.0	1		ug/kg	o-Xylene	ND	5.0	1		ug/kg
t-1,2-Dichloroethene	ND	5.0	1		ug/kg	Methyl-t-Butyl Ether (MTBE)	ND	5.0	1		ug/kg
1,2-Dichloropropane	ND	5.0	1		ug/kg						

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
Dibromofluoromethane	110	80-120		Toluene-d8	96	81-117	
1,4-Bromofluorobenzene	92	74-121					

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Camp Dresser & McKee, Inc.		Date Received:	06/18/02
100 Pringle Ave. , Suite 300		Work Order No:	02-06-0619
Walnut Creek, CA 94596-3580		Preparation:	Ext. + D/I
		Method:	EPA 8015M

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Composite (B109 A,B,C,D,E)	Solid	GC 3	06/20/02	06/20/02	02062003ms

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Diesel	82	86	49-139	6	0-28	

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Camp Dresser & McKee, Inc.
100 Pringle Ave. , Suite 300
Walnut Creek, CA 94596-3580

Date Received: 06/18/02
Work Order No: 02-06-0619
Preparation: Ext. + D/I
Method: EPA 8015M

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
098-03-002-1,895	Solid	GC 3	06/20/02	010F0101	02062003sa

Parameter	Conc Added	Conc Recovered	%Rec	%Rec CL	Qualifiers
TPH as Diesel	400	350	88	65-124	

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Camp Dresser & McKee, Inc.		Date Received:	06/18/02
100 Pringle Ave. , Suite 300		Work Order No:	02-06-0619
Walnut Creek, CA 94596-3580		Preparation:	EPA 5030B
		Method:	EPA 8015M

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
02-06-0674-1	Solid	GC-18	N/A	06/20/02	02061901ms

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Gasoline	102	104	75-125	2	0-29	

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Camp Dresser & McKee, Inc.		Date Received:	06/18/02
100 Pringle Ave. , Suite 300		Work Order No:	02-06-0619
Walnut Creek, CA 94596-3580		Preparation:	EPA 5030B
		Method:	EPA 8015M

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
098-03-008-2,119	Solid	GC 18	N/A	06/19/02	02061901sa

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Gasoline	108	108	79-124	0	0-21	

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Camp Dresser & McKee, Inc.		Date Received:	06/18/02
100 Pringle Ave. , Suite 300		Work Order No:	02-06-0619
Walnut Creek, CA 94596-3580		Preparation:	Ext. + D/I
		Method:	EPA 8015M

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Composite (B109 A,B,C,D,E)	Solid	GC 3	06/20/02	06/20/02	02062004ms

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as motor oil	110	106	49-139	4	0-28	

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Camp Dresser & McKee, Inc.
100 Pringle Ave. , Suite 300
Walnut Creek, CA 94596-3580

Date Received: 06/18/02
Work Order No: 02-06-0619
Preparation: Ext. + D/I
Method: EPA 8015M

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
098-03-015-180	Solid	GC 3	06/20/02	010F0101	02062004sa

Parameter	Conc Added	Conc Recovered	%Rec	%Rec CL	Qualifiers
TPH as motor oil	400	380	95	65-124	

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Camp Dresser & McKee, Inc.		Date Received:	06/18/02
100 Pringle Ave. , Suite 300		Work Order No:	02-06-0619
Walnut Creek, CA 94596-3580		Preparation:	TCLP
		Method:	EPA 6010B

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Composite (B109 A,B,C,D,E)	Solid	ICP 3300	06/18/02	06/20/02	061902ms1

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	103	106	75-125	3	0-20	
Barium	103	105	75-125	2	0-20	
Cadmium	101	103	75-125	2	0-20	
Chromium (Total)	102	104	75-125	2	0-20	
Lead	100	102	75-125	2	0-20	
Selenium	99	102	75-125	3	0-20	
Silver	101	104	75-125	3	0-20	

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Camp Dresser & McKee, Inc.
100 Pringle Ave. , Suite 300
Walnut Creek, CA 94596-3580

Date Received: 06/18/02
Work Order No: 02-06-0619
Preparation: TCLP
Method: EPA 6010B

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
097-05-001-1,970	Solid	ICP 3300	06/19/02	020619.1	020619lcs3

Parameter	Conc Added	Conc Recovered	%Rec	%Rec CL	Qualifiers
Arsenic	10.0	9.18	92	80-120	
Barium	10.0	10.0	100	80-120	
Cadmium	10.0	9.39	94	80-120	
Chromium (Total)	10.0	9.71	97	80-120	
Lead	10.0	9.27	93	80-120	
Selenium	10.0	8.68	87	80-120	
Silver	5.00	4.59	92	80-120	

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Camp Dresser & McKee, Inc.		Date Received:	06/18/02
100 Pringle Ave. , Suite 300		Work Order No:	02-06-0619
Walnut Creek, CA 94596-3580		Preparation:	N/A
		Method:	EPA 8260B

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
02-06-0553-2	Solid	GC/MS X	N/A	06/18/02	020605532

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	93	96	72-127	3	0-25	
Carbon Tetrachloride	95	100	70-130	5	0-25	
Chlorobenzene	87	91	72-131	4	0-25	
1,2-Dichlorobenzene	76	80	70-130	4	0-25	
1,1-Dichloroethene	116	130	69-127	12	0-25	3
Toluene	85	85	75-124	0	0-25	
Trichloroethene	87	88	60-137	1	0-25	
Vinyl Chloride	122	140	70-130	14	0-25	3
Methyl-t-Butyl Ether (MTBE)	124	136	80-120	9	0-25	3
Ethanol	133	157	60-140	16	0-25	3

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Camp Dresser & McKee, Inc.		Date Received:	06/18/02
100 Pringle Ave. , Suite 300		Work Order No:	02-06-0619
Walnut Creek, CA 94596-3580		Preparation:	N/A
		Method:	EPA 8260B

Project: Caltrans Infiltration / 9168-35901-RMT.GEOTECH

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-10-005-3,179	Solid	GC/MS X	N/A	06/18/02	061802AS

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	105	106	72-127	1	0-25	
Carbon Tetrachloride	115	113	70-130	2	0-25	
Chlorobenzene	105	103	72-131	1	0-25	
1,2-Dichlorobenzene	101	103	70-130	1	0-25	
1,1-Dichloroethene	116	111	69-127	5	0-25	
Toluene	107	103	75-124	3	0-25	
Trichloroethene	104	102	60-137	2	0-25	
Vinyl Chloride	115	109	79-118	6	0-25	
Methyl-t-Butyl Ether (MTBE)	113	106	80-120	7	0-25	
Tert-Butyl Alcohol (TBA)	127	114	60-140	11	0-25	
Diisopropyl Ether (DIPE)	121	115	60-140	5	0-25	
Ethyl-t-Butyl Ether (ETBE)	124	116	60-140	6	0-25	
Tert-Amyl-Methyl Ether (TAME)	110	108	60-140	2	0-25	
Ethanol	116	108	60-140	7	0-25	

Calscience Environmental Laboratories, Inc.

GLOSSARY OF TERMS AND QUALIFIERS

Work Order Number: 02-06-0619

Qualifier	Definition
3	Spike or Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
ND	Not detected at indicated reporting limit.

7440 Lincoln Way, Garden Grove, CA 92841-1432 • TEL: (714) 895-5494 • FAX: (714) 894-7501

CHROMALAB, INC.

Environmental Services (SDB) (DOHS 1094)

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Fax (925) 484-1096

0619

Reference #: _____

Chain of Custody

DATE 6/14/02 PAGE 1 OF 1

PROJ. MGR MIKE GRAY
COMPANY CDM
ADDRESS 100 PRINGLE AVE. STE 300
WALNUT CREEK, CA 94596

SAMPLERS (SIGNATURE) Howard Young
(PHONE NO.) (925)296-8061
(FAX NO.) (925) 933-4174

ANALYSIS REPORT

SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.	TPH-(EPA 8015,8020) X ☐ Gas w/ ☐ BTEX ☐MTBE	PURGEABLE AROMATICS BTEX (EPA 8020)	TPH-Diesel (EPA 8015M)	TEPH (EPA 8015M) X ☐ Diesel ☐ M.O. ☐ Other	PURGEABLE HALOCARBONS, (HVOCs) (EPA 8010)	VOLATILE ORGANICS (VOCs) (EPA 8260) X	SEMIVOLATILES (EPA 8270)	TOTAL OIL AND GREASE (SM 5520 B+F, E+F)	RCRA 7 METALS -TCLP	☐ PESTICIDES (EPA 8080) ☐ PCB'S (EPA 8080)	PNA's by ☐ 8270 ☐ 8310	☐ Spec. Cond. ☐ TSS ☐ TDS	LUFT METALS: Cd, Cr, Pb, Ni, Zn	CAM 17 METALS (EPA 6010/7470/7471)	TOTAL LEAD	☐ W.E.T. (STLC) ☐ TCLP	☐ Hexavalent Chromium ☐ pH (24 hr hold time for H20)		COMPOSITE SAMPLES.		NUMBER OF CONTAINERS
B109C	6/14/02	16:35	SO	SEE INSTRUCTIONS BELOW				SEE INSTRUCTIONS BELOW		SEE INSTRUCTIONS BELOW			SEE INSTRUCTIONS BELOW												1
B109D	6/14/02	16:42	SO																						1
B109E	6/14/02	16:23	SO																						1
B109B	6/14/02	16:20	SO																						1
B109A	6/14/02	16:16	SO																						1
B101A	6/14/02	17:10	SO																						1
~~B102A~~ B101B	6/14/02	17:42	SO																						1
B101C	6/14/02	17:15	SO																						1
B101D	6/14/02	17:20	SO																						1

PROJECT INFORMATION

PROJECT NAME: CALTRANS INFILTRATION
PROJECT NUMBER: 9168-35901-RMT17.GEOTECH
P.O. #:

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS	9
HEAD SPACE	
TEMPERATURE	
CONFORMS TO RECORD	

TAT	STANDARD 5-DAY			24	48	72	OTHER

SPECIAL INSTRUCTIONS/COMMENTS:

Report: ☐ Routine ☐ Level 2 ☐ Level 3 ☐ Level 4 ☐ Electronic Report

DRUM SAMPLING FROM B101 AND B109 DRILLING; CREATE + ANALYZE 2 COMPOSITES. CREATE A COMPOSITE SAMPLE FOR B101, USING SAMPLES B101A, B101B, B101C, AND B101D. CREATE A COMPOSITE SAMPLE FOR B109, USING B109A, B109B, B109C, B109D, B109E. ANALYZE EACH COMPOSITE SAMPLE (2 TOTAL) FOR TPHg, TPHd, TPHmo (8015), VOCs (8260), AND RCRA 7 METALS-TCLP

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY 3
Howard Young 16:20 (SIGNATURE) (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) (TIME)
HOWARD YOUNG 6/17/02 (PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)
CPM (COMPANY)	(COMPANY)	(COMPANY)

RECEIVED BY 1.	RECEIVED BY 2.	RECEIVED BY (LABORATORY) 3
(SIGNATURE) (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) (TIME)
(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	Albert Rodriguez 1910 (PRINTED NAME) (DATE)
(COMPANY)	(COMPANY)	CEL 6/17/02 (LAB)

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 02-06-0619

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: ~~Chromalab~~ CDM SW

DATE: 6/18/02

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
_____ Chilled, cooler without temperature blank.
_____ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.

_____ °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
4 °C IR thermometer.
_____ Ambient temperature.

Initial: RL

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Applicable (N/A): ✓

Initial: RL

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers for analyses requested	✓		
Proper preservation noted on sample label(s)	✓		
VOA vial(s) free of headspace.	✓ SW		✓
Tedlar bag(s) free of condensation			✓

Initial: RL

COMMENTS:

CHROMALAB, INC.

Environmental Services (SDB) (DOHS 1094)

1220 Quarry Lane • Pleasanton, California 94566-4758
(925) 484-1919 • Fax (925) 484-1096

(0619)

Reference #: _____

Chain of Custody

DATE 6/14/02 PAGE 1 OF 1

PROJ. MGR MIKE GRAY
COMPANY CDM
ADDRESS 100 PRINGLE AVE. STE 300
WALNUT CREEK, CA 94596

SAMPLERS (SIGNATURE) Howard Young
(PHONE NO.) (925) 296-8061
(FAX NO.) (925) 933-4174

ANALYSIS REPORT

SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.	TPH-(EPA 8015,8020) X ☐ Gas w/ ☐ BTEX ☐ MTBE	PURGEABLE AROMATICS BTEX (EPA 8020)	TPH-Diesel (EPA 8015M)	TEPH (EPA 8015M) X ☐ Diesel ☐ M.O. ☐ Other	PURGEABLE HALOCARBONS, (HVOCs) (EPA 8010)	VOLATILE ORGANICS (VOCs) (EPA 8260) X	SEMIVOLATILES (EPA 8270)	TOTAL OIL AND GREASE (SM 5520 B+F, E+F)	RCRA 7 METALS -TCLP	☐ PESTICIDES(EPA 8080) ☐ PCB'S (EPA 8080)	PNA's by ☐ 8270 ☐ 8310	☐ Spec. Cond. ☐ TSS ☐ TDS	LUFT METALS: Cd, Cr, Pb, Ni, Zn	CAM 17 METALS (EPA 6010/7470/7471)	TOTAL LEAD	☐ W.E.T. (STLC) ☐ TCLP	☐ Hexavalent Chromium ☐ pH (24 hr hold time for H20)		COMPOSITE SAMPLES.		NUMBER OF CONTAINERS
B109C	6/14/02	16:35	SO	SEE INSTRUCTIONS BELOW				SEE INSTRUCTIONS BELOW		SEE INSTRUCTIONS BELOW			SEE INSTRUCTIONS BELOW												1
B109D	6/14/02	16:42	SO																						1
B109E	6/14/02	16:23	SO																						1
B109B	6/14/02	16:28	SO																						1
B109A	6/14/02	16:16	SO																						1
B101A	6/14/02	17:10	SO																						1
~~B102A~~ B101B	6/14/02	17:42	SO																						1
B101C	6/14/02	17:15	SO																						1
B101D	6/14/02	17:20	SO																						1

PROJECT INFORMATION

PROJECT NAME: CALTRANS INFILTRATION
PROJECT NUMBER 168-35901-RMT17-GEOTECH
P.O. #

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS	9
HEAD SPACE	
TEMPERATURE	
CONFORMS TO RECORD	

TAT	STANDARD 5-DAY			24	48	72	OTHER

SPECIAL INSTRUCTIONS/COMMENTS:

Report: ☐ Routine ☐ Level 2 ☐ Level 3 ☐ Level 4 ☐ Electronic Report

DRUM SAMPLING FROM B101 AND B109 DRILLING; CREATE + ANALYZE 2 COMPOSITES. CREATE A COMPOSITE SAMPLE FOR B101, USING SAMPLES B101A, B101B, B101C, AND B101D. CREATE A COMPOSITE SAMPLE FOR B109, USING B109A, B109B, B109C, B109D, B109E. ANALYZE EACH COMPOSITE SAMPLE (3 TOTAL) FOR TPH, TPH, TPH - (DIE), VOC (8260) AND RCRA 7 METALS - TCLP

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY 3.
Howard Young 16:20 (SIGNATURE) (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) (TIME)
HOWARD YOUNG 6/17/02 (PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)
CDM (COMPANY)	(COMPANY)	(COMPANY)

RECEIVED BY 1.	RECEIVED BY 2.	RECEIVED BY (LABORATORY) 3
(SIGNATURE) (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) (TIME)
(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	Albert Rodriguez 1910 (PRINTED NAME) (DATE)
(COMPANY)	(COMPANY)	CEL 6/17/02 (LAB)

Appendix D

Waste Disposal/Recycling Documentation

NON-HAZARDOUS WASTE MANIFEST

Please print or type. (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: C E S G G

Manifest Document No.: 11842 | 2. Page 1 of 1

3. Generator's Name and Mailing Address: Cal Trans District 3, 703 B Street, Marysville CA 95901

4. Generator's Phone: (530) 741-4539

5. Transporter 1 Company Name: Universal Environmental Nevada

6. US EPA ID Number: NVR000054213

A. State Transporter's ID: (775) 351-0990

B. Transporter 1 Phone:

7. Transporter 2 Company Name:

8. US EPA ID Number:

C. State Transporter's ID:

D. Transporter 2 Phone:

9. Designated Facility Name and Site Address: Pollution Control Industries (PCI), 11855 Whiterock Road, Rancho Cordova CA 95670

10. US EPA ID Number: CAD980884183

E. State Facility's ID:

F. Facility's Phone: (916) 351-0990

11. WASTE DESCRIPTION	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. Non-Hazardous Waste, Liquid (Water, Motor Oil)	02	DM	00110	G
b. Non-Hazardous Waste, Solid (Water, Motor Oil)	04	DM	03200	P
c.				
d.				

G. Additional Descriptions for Materials Listed Above

11a	229766	ERG # 0
11b	229765	ERG # 0
11c	0	ERG # 0
11d	0	ERG # 0

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Site: Hwy 60, Marker 73, 1/4 Mi. W of Airport
24 HR ER CONTACT:
24 HR ER PHONE:
Waste rejected by the Disposal Facility will be returned to the generator.

Bill Disposal To: Universal Environmental, P.O. Box 10120, Reno, Nevada 89510

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name: GARY GRAY | Signature: [signature] | Date: Month 07 Day 15 Year 02

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: STEVEN MONCY | Signature: Steven Moncy | Date: Month 07 Day 15 Year 02

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: | Signature: | Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.

Printed/Typed Name: Charity Nelson for PCI | Signature: [signature] | Date: Month 07 Day 15 Year 02

GENERATOR

TRANSPORTER

FACILITY

NON-HAZARDOUS WASTE