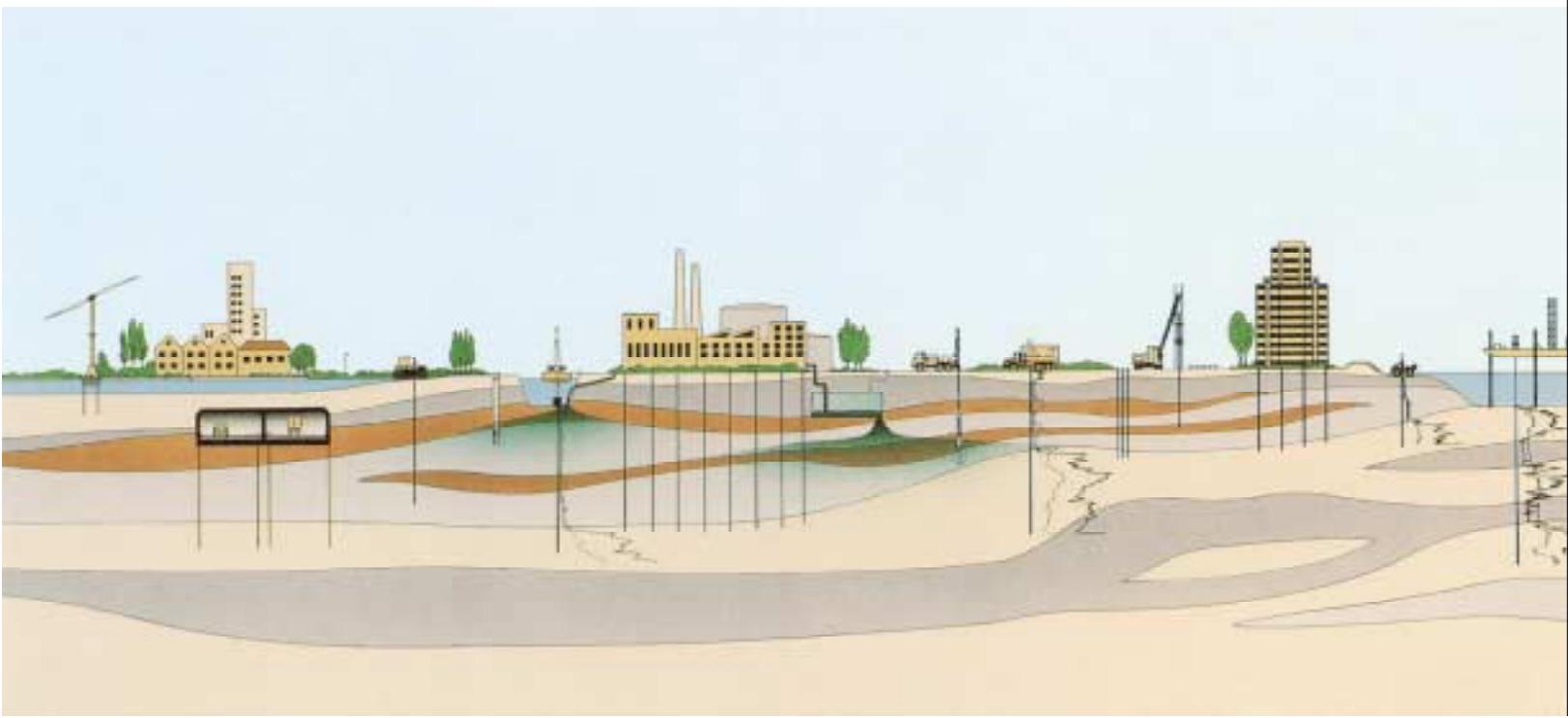


# **GEOTECHNICAL INVESTIGATION RESULTS MAIN CHANNEL DEEPENING PROJECT PORT OF LOS ANGELES, CALIFORNIA**

Prepared for:  
PORT OF LOS ANGELES

May 2001





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May 31, 2001  
Project No. 00-32-3701

City of Los Angeles Harbor Department  
Harbor Department Administration Building  
425 South Palos Verdes Street  
San Pedro, California 90731

Attention: Mr. John Foxworthy

Subject: Geotechnical Investigation Results, Main Channel Deepening Project, Port of Los Angeles, California

Dear John:

The Main Channel (and turning basins) of the Los Angeles Inner Harbor for the Port of Los Angeles (POLA) will be deepened during the planned Main Channel Deepening Project. The dredged materials will allow the future expansion and terminal development of the Southwest Slip, the extension of the Cabrillo Shallow Water Habitat, and the expansion of the Pier 300 terminal. The enclosed report provides the factual results of geotechnical exploration and laboratory testing conducted for the proposed future development of the Pier 300 extension and the shallow water habitat. Similar information for the West Basin and Southwest Slip components are provided in a companion report.

The field exploration and other related activities described in this report were undertaken in conjunction with the second phase of the post-fill investigation on the Pier 400 landfill. The contractor responsible for the post-fill investigation was Connolly-Pacific Company (one of the joint venture partners of the Pier 400 Constructors). Connolly-Pacific provided barges and logistical support for Fugro West, Inc. (Fugro), and their drilling subcontractor, Pitcher Drilling Company, to drill the overwater borings reported herein. Geotechnical and environmental laboratory testing was performed by Fugro and ToxScan, Inc., respectively.

On behalf of Fugro, we appreciate the opportunity to contribute to the Port of Los Angeles' continued success and future development projects. Please contact us if you have questions or comments regarding this report and/or the Main Channel Deepening Project.



Sincerely,  
FUGRO WEST, INC.

Philip Robins, P.E.  
Project Engineer

Thomas W. McNeilan, P.E., G.E.  
Vice President



Copies Submitted: (4)





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## INTRODUCTION

### Background and Project Description

The Port of Los Angeles (POLA) is currently executing a study to determine the feasibility of deepening the Inner Harbor channels and turning basins to accommodate the most modern vessels in the commercial container fleet. In January 1998, POLA approved the Channel Deepening Project to deepen the Main Channel and associated channels and turning basins from the existing elevation (El.) -45 feet Mean Lower Low Water (MLLW) to El. -50 feet MLLW to accommodate new container vessels with a 46-foot draft. Since approval of this project, new ships in the world container fleet and pending ship orders indicate that container vessels with a draft of 52 feet are being planned that would require a navigational channel as deep as El. -55 feet MLLW with a 2-foot over depth allowance (USACOE, 2000).

The dredged materials from the Main Channel Deepening Project will allow POLA to pursue future expansion and terminal development. The recommended plan envisions the use of dredged materials for the following development projects:

1. Southwest Slip expansion,
2. Berth improvements,
3. Cabrillo Shallow Water Habitat (SWH) extension, and
4. Expansion of the Pier 300 Terminal.

Dredged materials unsuitable for fill may be deposited either in the Southwest Slip fill or in the upland Anchorage Road disposal site.

The enclosed report provides the factual results of overwater geotechnical exploration and laboratory testing conducted for the proposed SWH extension and expansion of the Pier 300 Terminal. Factual results of two overwater borings and laboratory testing conducted for the proposed non-federal dredging south of the pilot's station are also included. Factual results of overwater exploration for the proposed future terminal development of the West Basin and Southwest Slip are included in a companion report.

In addition, at several locations, utility lines cross beneath the various channels and basins and are buried at various depths below the current harbor bottom (i.e., mudline). The current design burial depths were typically based on a harbor bottom that is no deeper than about El. -47 feet. Therefore, to deepen the Inner Harbor channels and turning basins, some or all of the existing utility lines will have to be relocated and/or reburied at greater depths. The redesign of utility crossings reportedly will be based on a top elevation of El. -65 feet. The subsurface exploration and related investigation efforts for two pipeline relocations are provided in Fugro



(1997a,b). The subsurface exploration and related investigation efforts for two sewerline crossing relocations are provided in Fugro (2001a,b).

### **Scope of Investigation**

The scope and intent of the geotechnical investigation completed for the POLA Main Channel Deepening Project was described in our proposal letter dated November 8, 2000 (Fugro, 2000). The scope of work for the investigation included:

1. Planning and coordination, including the collection and review of existing geotechnical data, and discussions and meetings with POLA to determine exploration locations;
2. Overwater geotechnical and environmental borings;
3. Geotechnical laboratory testing;
4. Environmental chemistry analyses; and
5. Preparation of a factual data report that describes the field and laboratory procedures and presents the boring logs and laboratory test results.

Each of these tasks for the SWH extension and expansion of the Pier 300 Terminal areas is discussed in the following paragraphs. The areas of study are shown in Plate 1 - Site Vicinity Plan.

### **Authorization**

The field exploration and other related activities described in this report were undertaken in conjunction with the second phase of post-fill investigation on the Pier 400 landfill, and the Department of Public Works (DPW) Main Channel Sewer Relocation Program. The contractor for the Pier 400 Stage 2 Dredging and Landfill Project was the Pier 400 Constructors (P400C). Because the P400C is a joint venture, responsibility for the Pier 400 post-fill investigation was assigned to Connolly-Pacific Company (one of the joint venture partners), who provided overall management, surveying, and logistical coordination-support for the program. Connolly-Pacific retained Fugro West, Inc. (Fugro) as their geotechnical subcontractor. Fugro, in turn, retained Pitcher Drilling for the sample borings. The subsurface exploration and related investigation efforts for POLA's Main Channel Deepening Program, including the SWH extension and expansion of Pier 300 Terminal, were authorized as a subcontract to the P400C contract with the Corps of Engineers for Pier 400 Stage 2 construction.



## SUBSURFACE EXPLORATION

### Existing Geotechnical Data

Fugro West previously completed geological and geotechnical studies of the various waterways in the POLA Inner Harbor to support the proposed Channel Deepening Program. Two phases of field exploration and laboratory testing were previously performed to evaluate stratigraphic (and environmental) conditions within the limits of the Channel Deepening Program project area. The Phase 1 field investigation was performed in August and September 1996, and the Phase 2 field investigation was performed in April 1997. Description of the fieldwork activities is provided in Fugro field program assessment reports (Fugro, 1996a,b).

A total of 143 tethered cone penetration tests (CPTs) were performed throughout the Inner Harbor (Fugro, 1997c). All testing was performed using the tethered Seascout mini-CPT system designed and developed by Fugro. During both phases, a total of 153 vibracores were performed primarily for evaluating sediment chemistry characteristics. Further description of the methods used to obtain those data and the testing results are provided in Fugro's Geotechnical Evaluation Report (Fugro, 1997d).

As part of the POLA 2020 Plan, Fugro completed geological and geotechnical studies within the Outer Harbor. The 2020 Plan Geotechnical Investigation consisted of a geophysical survey, 122 borings, downhole CPT soundings in 29 borings, and 86 vibracores. At the time, the 2020 investigation was one of the largest and most comprehensive geotechnical studies undertaken in United States' coastal waters. The main purpose of that investigation was to gain an understanding of the overall geologic structure of the Pier 400 landfill project area (Fugro-McClelland, 1992). In 1993, supplemental geotechnical investigations were performed in various areas to aid in the conceptual design of Pier 400. The 1993 explorations included 5 borings, 14 CPT soundings, and 27 vibracores (Fugro-McClelland, 1993).

Existing explorations for the Main Channel Deepening Program and 2020 Plan are used to supplement the data from the overwater borings drilled for this project. Subsurface explorations have also been included in the existing geotechnical data and added to Fugro's existing Underground Geographical Information System (UGIS).

### Scope of Exploration

The subsurface explorations conducted specifically for the Main Channel Deepening Project and reported herein included the advancement of eight borings designated as MCD-1 through MCD-8. The borings were advanced at three separate development areas: 1) to the south of the pilot's station, 2) the SWH extension, and 3) expansion of the Pier 300 Terminal.



Two shallow borings for the non-federal dredge area south of Berths 60 to 68 (MCD-1 and MCD-2) were drilled between December 14 and 15, 2000. Borings MCD-1 and MCD-2 were drilled to about El. -65 feet MLLW, as requested by POLA. These two borings were drilled to assist in the characterization of the subsurface conditions in front of Berths 60 to 68. The locations of the borings are shown on Plate 2 - Cross Section Location Map.

Three shallow borings for the SWH extension (MCD-3 through MCD-5) were drilled on November 27 and December 13, 2000, to between El. -45 and El. -55 feet MLLW, as requested by POLA. These three borings were drilled to assist in the characterization of the subsurface conditions along the alignment of the proposed containment dikes. The locations of the borings are shown on Plate 2.

Three borings for the proposed expansion of the Pier 300 Terminal (MCD-6 through MCD-8) were drilled on November 17 through 21, 2000, to depths between El. -85 and El. -103 feet MLLW, as requested by POLA. These three borings were drilled to assist in the characterization of the subsurface conditions along the alignment of the proposed containment dikes. The locations of the borings are shown on Plate 5.

The execution of the boring program was conducted together with the execution of the Department of Public Works sewerline relocations and overwater borings for the West Basin and Southwest Slip development areas. The specific sequence of the borings was based on the requirements imposed by navigation access in the channels and terminal operations in the onshore areas.

A summary of the exploration dates, locations, and harbor bottom elevations for the boring is provided on Plate A-1 in Appendix A. Boring logs for the eight borings are provided on Plates A-2 through A-9, and a key to the terms and symbols used on the boring logs is included as Plate A-10. Soils recovered in the samples were described in general accordance with the methods of ASTM Soil Classification System D2487. A description of the exploration equipment and operations is provided in the subsequent paragraphs.

## Drilling Operations

**Drilling Methods and Borehole Abandonment.** The drilling operation was conducted under the technical guidance and observation of a Fugro geologist who also described and packaged the recovered samples. Drilling services for these borings were provided by Pitcher Drilling of Palo Alto, California, who provided a truck-mounted Failing 1500 drill rig, personnel, and associated equipment. The borings were advanced using wet/rotary procedures using a drag bit attached to a drill string of NW-rod drill pipes, and resulted in hole diameters measuring about 5 inches. The borings were advanced using non-toxic, revert or bentonite-based drilling.



To advance the overwater borings, Pitcher Drilling's truck-mounted drill rig was mounted on a work barge (the *Hightide 18*) owned and operated by Connolly-Pacific. The drill rig was positioned to allow the boring to be advanced through a 3-foot-diameter moon pool. The *Hightide 18* was tied up to Connolly-Pacific's derrick barge (DB) *Los Angeles*. The DB *Los Angeles* measures approximately 50 feet by 150 feet and has a four-point anchor system. The barges were positioned by Connolly-Pacific, who also supplied and operated a 40-foot, 65-ton, twin-screw tugboat (the *Durango*) to move the barges and handle the DB *Los Angeles*' anchors.

**Soil Sampling and Field Testing.** As requested by POLA, continuous sampling was performed within the "near-surface" zone and at about 5-foot intervals thereafter.

The sampling methods included primarily driven sampling using standard penetration test (SPT) and California liner (with rings) samplers (1-3/8-inch-ID by 2-inch-OD and 2.4-inch-ID by 3-inch-OD, respectively). These samplers were driven using a 140-pound hammer falling 30 inches. The hammer was lifted and dropped using a rope and cathead, with the rope looped twice around the cathead. The number of blows required to drive the samplers the last 12 inches of the 18-inch penetration are shown on the boring logs. Additionally, an Osterberg cell (hydraulic piston) sampler (2.7-inch-ID by 3-inch-OD) was used in the soft/loose sediments immediately below the harbor bottom.

To provide for sample splits for environmental testing, most "near-surface" samples were collected using an Osterberg cell (hydraulic piston) sampler. The environmental subsamples in each boring were maintained on ice and accompanied by chain-of-custody documentation. Prior to collection of each sample for possible environmental testing, the sampling equipment was decontaminated by a detergent (TSP) wash and deionized water rinses (two to three) to prevent cross-contamination.

In most borings, each recovered sample was screened for volatile organic hydrocarbons using a field photoionization detector (PID). The field monitoring included the placement of the soil from one sample ring (typically the uppermost section of each sampling interval) into a sealable plastic bag, placement of the bag in the sun for several minutes, and monitoring of the headspace in the bag with a precalibrated MiniRAE Plus (Professional PID) provided by Enviro Supply & Service of Fountain Valley, California. The MiniRAE PID has a detection range of 0 to 999 parts per million (ppm) with a 0.1-ppm resolution and an accuracy of about 10 percent calibrated to 100-ppm isobutylene.

### **Borehole Positions and Mudline Elevations**

Prior to initiating the field exploration, target boring locations proposed by Fugro were preplotted. Field locations were then established using a Differential Global Positioning System (DGPS) navigation positioning system, referenced to known base stations in the Los Angeles Harbor area. Coordinates calculated from the DGPS system are considered accurate to within



about 3 to 5 feet. Coordinates for the boring locations are reported relative to the California State Plane, Zone 7 datum.

Harbor bottom elevations for the overwater borings are based on water depths measured at the beginning of drilling and the published tide chart for the Los Angeles Outer Harbor. Surface elevations are reported to the nearest 0.5 foot. These elevations are relative to MLLW datum. In addition, depths for samples collected from overwater borings were corrected for tidal variations using the published tide chart.

## LABORATORY TESTING

### Geotechnical Laboratory Testing

**Testing Program.** Samples from the borings were tested to define pertinent classification and engineering soil properties. The laboratory testing program requested by POLA included index tests to determine grain size characteristics, Atterberg limits, moisture contents, and unit weights. Unconsolidated undrained triaxial tests and unconfined compression tests were performed to evaluate the undrained shear strength of fine-grained sediments.

The following listing shows the actual numbers of tests assigned and their ASTM standard numbers:

- (108) Water Content and Visual Classification..... ASTM D2216
- (55) In-Place Dry Density..... ASTM D2937
- (27) Mechanical (Sieve) Analysis ..... ASTM D422
- (4) Hydrometer Analysis ..... ASTM D422
- (28) Percent Minus the No. 200 Sieve ..... ASTM D1140
- (23) Atterberg Limits..... ASTM D4318
- (6) Triaxial Unconsolidated Undrained..... ASTM D2850
- (3) Unconfined Compression Test ..... ASTM D2166
- (4) Direct Shear Test ..... ASTM D3080

The geotechnical laboratory testing was performed in Fugro's Ventura laboratory.

**Presentation of Results.** The results of the geotechnical soil tests are provided in Appendix B. Appendix B includes the following presentations:

- Summary of Test Results ..... Plates B-1 to B-8
- Grain Size Curves ..... Plates B-9 to B-16
- Plasticity Chart ..... Plate B-17





- Unconsolidated Undrained Test Results ..... Plates B-18 to B-19
- Direct Shear Test Results ..... Plates B-20 to B-22

Many of the individual classification test results also are tabulated on the boring logs (Plates A-2 through A-9).

### Environmental Chemistry Tests

**Soil Samples.** Select soil samples recovered from the borings were submitted to ToxScan, Inc. (a state-certified laboratory) for chemical analyses. The ToxScan analytical reports are included in Appendix C. Plate C-1 summarizes the environmental testing and ToxScan Laboratory numbers.

The following list shows the numbers of soil samples collected from the eight borings (MCD-1 through MCD-8), and the types and numbers of tests assigned to them:

- (26) Total Recoverable Petroleum Hydrocarbons (TRPH) ..... U.S. EPA 1664
- (7) Volatile Organics including BTEX and MTBE ..... U.S. EPA 8260
- (8) Semivolatile Organics (BNAs)..... U.S. EPA 8270
- (6) Pesticides and Polychlorinated Biphenyls (PCBs)..... U.S. EPA 8081
- (10) CCR Title 22 Metals ..... U.S. EPA 6020

Chemical analyses were preferentially assigned to "near-surface" samples.

## SUBSURFACE CONDITIONS

### Stratigraphy

**Overview.** The subsurface stratigraphy within the three proposed development areas may be divided into two distinct types. The subsurface stratigraphy within the area south of the pilot's station and SWH extension area typically consists of a thin layer of sediments overlying "bedrock formation". The subsurface stratigraphy within the Pier 300 Terminal expansion area typically consists of a layer of recent sediments overlaying Holocene marine deposits.

**South of the Pilot's Station.** The stratigraphy and its variability south of the pilot's station are illustrated on cross section A-A', presented on Plate 3. The cross section, whose location is shown on Plate 2, is drawn looking east. A key to the symbolism used on the cross section is provided on Plate 8. Our interpretation of the stratigraphic conditions (presented in the following paragraph) is primarily based on borings MCD-1 and MCD-2, supplemented by previous borings drilled prior to 1991.



The two overwater borings (MCD-1 and MCD-2) penetrated a surficial layer of loose harbor bottom sediments that are interpreted to have been deposited subsequent to the last dredging program in the early 1980s. The surficial sediment is typically a 5- to 6-foot-thick layer of silty fine sand. Some of this accumulation may be sediments that migrated from the Pier 400 landfill project area. The harbor bottom sediments in both borings are underlain by Malaga Mudstone, a "bedrock formation".

**Shallow Water Habitat Extension.** The stratigraphy and its variability along the alignment of the containment dikes are illustrated on the cross section B-B', presented on Plate 4. The cross section, whose location is shown on Plate 2, is drawn looking northeast. A key to the symbolism used on the cross section is provided on Plate 8. Our interpretation of the stratigraphy (presented in the following paragraph) is based primarily on Borings MCD-3 through MCD-5.

Overwater borings MCD-4 and MCD-5 penetrated a surficial layer of soft harbor bottom sediments. The surficial sediment is typically a 2- to 4-foot-thick layer of soft clay. The harbor bottom sediments in both borings are underlain by a primarily fine-grained "bedrock formation" from the Miocene or Pliocene Epochs. Overwater boring MCD-3 penetrated a surficial layer of loose silty fine sand. The surficial sediment is about 1.5 feet thick, and may have been deposited as outflow during the filling of the permanent SWH. The layer of silty fine sand is underlain by the same silt and siltstone "bedrock formation".

**Pier 300 Terminal Expansion Area.** The stratigraphy and its variability east of the Pier 300 Terminal are illustrated on cross sections C-C' and D-D', which are presented on Plates 6 and 7, respectively. The cross sections, whose locations are shown on Plate 5, are drawn looking north. A key to the symbolism used on the cross sections is provided on Plate 8. Our interpretation of the stratigraphy (presented in the following paragraph) is based primarily on Borings MCD-6 through MCD-8, and is supplemented by previous explorations for the 2020 Plan.

The three overwater borings (MCD-6 through MCD-8) penetrated a surficial layer of loose silty sands and clay. The surficial sediments are typically a 1- to 4-foot-thick layer of silty fine sand overlying a 2- to 6-foot-thick layer of silt and clay. It is likely that the top of the surficial layer of sand has migrated as outflow from the Pier 400 landfill project area during dredging and filling operations. The lower section of the surface layer are likely to be historical deposits from the development of the temporary shallow water habitat and outflow from the Pier 300 Terminal project area during dredging and filling operations in the early 1980s. Layers of silt and silty fine sand from the Quaternary period underlie the near-surface sediments in the borings.



## Material Characteristics

**Fine-Grained Surface Sediments.** The soft, fine-grained surface sediments may include both harbor bottom sediments, and/or a zone of sediments disturbed during past dredging activities. The water content of these sediments typically exceeds 70 percent, and the liquidity index of the fine-grained sediments typically exceeds 1.0.

**Coarse-Grained Surface Sediments.** The loose, coarse-grained surface sediments may include silty fine sands as outflow from previous dredging and fill activities. The submerged unit weight is about 60 to 80 pcf.

**Holocene Sands.** The native Holocene sands are typically poorly graded fine sands with variable quantities of fines. The percentage of fines typically varies from about 5 to 20 percent. The submerged unit weight of the Holocene sands typically ranges from about 55 to 65 pounds per cubic foot (pcf). Above about El. -90 feet, the SPT N-values in the Holocene sands typically range from about 30 to 50. Below about El. -90 feet, the SPT N-values in the Holocene sands typically exceed 50.

**Holocene Silts and Clays.** Silt and clay layers within the primarily Holocene sequence generally classify as "CL" or "ML" on the classification chart. The moisture content of the clays generally ranges from 25 to 40 percent. The liquidity indices typically are between about 0.4 and 0.8.

**Malaga Mudstone.** The Malaga Mudstone is generally considered to be the top member of the Monterey Formation of the Miocene Epoch. Although a "bedrock" formation, the Malaga Mudstone member consists of a hard, elastic silt. The silt is diatomaceous and commonly has an H<sub>2</sub>S odor. The Malaga Mudstone contains discontinuous layers of rock and rock concretions.

Typically the Malaga Mudstone Formation classifies as "MH" on the classification chart. The moisture content of the silt generally ranges from 55 to 70 percent. The undrained shear strength of the silt in unconsolidated undrained triaxial tests is typically between 6 and 9 tons per square foot (tsf), although test results indicated both higher and lower values.

**Tertiary Materials.** Dipping "bedrock" formations west of the pilot's station underlie surficial sediments. Typically, the "bedrock" consists of low to high plasticity silt or clay. The consistency of the formation can be described in soil terminology as heavily overconsolidated, very stiff to hard soil or, in geologic terminology, as very weak rock.



The "bedrock formation" classifies as either "MH" or "CH" on the classification chart. The moisture content of the silt and clay generally ranges from 55 to 70 percent with a submerged unit weight of about 30 to 40 pcf.

**Rock Associated with Formation Materials.** The "bedrock formation" materials consist of a matrix predominantly composed of hard clay and silt, with frequent hard rock inclusions. The rock inclusions are believed to be limestone lenses and/or concretions that occur throughout the Malaga Mudstone and underlying Tertiary deposits as localized deposits and concentrated bands. Uniaxial compressive strengths for the rock-like layers in the Malaga Mudstone underlying the Outer Harbor range from about 1,150 to 6,800 pounds per square inch (psi) (Fugro-McClelland, 1992).

Dredging experience during the construction of the Pier 400 landfill project provide a basis for the anticipation of the problematic conditions that may be encountered when dredging the Malaga Mudstone materials. That experience indicates that relatively significant quantities of the rock-like materials may be encountered within the clay matrix, especially at shallow depths in the northern Glenn Anderson Ship Channel, southern Main Channel, and to the south of the pilot's station. That experience suggests that rock may be encountered as both intact rock within the predominantly hard clay formation or as isolated rocks.

Past experience also suggests that it has been a relatively common dredging practice to overexcavate and bury rock inclusions below the project dredge depth. Thus, subsequent dredging (e.g., dredge elements D6 and D106 of the Pier 400 project) has encountered an atypically large quantity of rock inclusions at the top exposure of the Malaga Mudstone.

## Environmental Chemistry Test Results

The following discussion summarizes the results of the environmental chemistry test results that are presented in Appendix C. All concentrations are reported on a wet weight basis.

**Non-Metals Analyses Results.** The following list summarizes the results of the non-metals analyses on soil samples:

- Total recoverable hydrocarbons were detected in 8 of the 26 samples analyzed:
  - A measured value of 110 milligrams per kilogram (mg/kg) in the sample from 1.5 feet in Boring MCD-3
  - A measured value of 180 mg/kg in the sample from 4 feet in Boring MCD-4
  - Measured values of 140 and 150 mg/kg in two samples from Boring MCD-5
  - Measured values of 300 and 370 mg/kg in two samples from Boring MCD-6



- A measured value of 110 mg/kg in the sample from 1 foot in Boring MCD-7
- A measured value of 210 mg/kg in the sample from 1.5 feet in Boring MCD-8
- Volatile organic compounds were detected in all of the samples analyzed:
  - Measured values of 6.4 parts per billion (ppb) and 5.5 ppb of carbon disulfide and toluene, respectively, in the sample from 0.5 foot in Boring MCD-1
  - Measured values of 13 ppb and 65 ppb of carbon disulfide and toluene, respectively, in the sample from 7.9 feet in Boring MCD-2
  - A measured value of 7 ppb of toluene in the sample from 1.5 feet in Boring MCD-3
  - A measured value of 160 ppb of toluene in the sample from 1.5 feet in Boring MCD-4.
  - A measured value of 8.1 ppb of carbon disulfide in the sample from 2.3 feet in Boring MCD-5.
  - A measured value of 11 ppb of toluene in the sample from 1 foot in Boring MCD-6.
  - A measured value of 45 ppb of toluene in the sample from 5 feet in Boring MCD-8.
- Semi-volatile organic compounds were detected in five of the eight samples analyzed:
  - A measured value of 250 ppb of bis(2-ethylhexyl)phthalate in the sample from 1.5 feet in Boring MCD-4
  - A measured value of 130 ppb of bis(2-ethylhexyl)phthalate in the sample from 10.5 feet in Boring MCD-5
  - A measured value of 380 ppb of bis(2-ethylhexyl)phthalate in the sample from 2 feet in Boring MCD-6
  - A measured value of 140 ppb of bis(2-ethylhexyl)phthalate in the sample from 2 feet in Boring MCD-7
  - A measured value of 170 ppb of bis(2-ethylhexyl)phthalate in the sample from 4.5 feet in Boring MCD-8
- Pesticides or PCBs were detected in one of the six samples analyzed:
  - A measured value of 28 ppb of 4,4'-DDE in the sample from 1.5 feet in Boring MCD-4



**Metals Analyses Results.** Of the 17 CAM metals, beryllium, thallium, and silver were not detected in any of the 10 samples analyzed. The results of the remaining CAM metals analyses on 10 samples are summarized in the following table. No single boring appeared to contain a majority of the high concentration readings.

Analyte	No. of Samples Detected	Typical Range (mg/kg)	Maximum Concentration (mg/kg)
Antimony	2	1.2	1.2
Arsenic	8	2.9 - 8.5	14.0
Barium	9	37 - 100	120.0
Cadmium	3	1.5 - 5.2	5.2
Chromium	9	9.4 - 71.0	71.0
Cobalt	9	2.3 - 7.1	7.1
Copper	9	4.3 - 52.0	110.0
Lead	9	1.8 - 25.0	25.0
Mercury	1	0.51	0.51
Molybdenum	7	1.7 - 15.0	15.0
Nickel	9	4.7 - 71.0	71.0
Selenium	2	1.1 and 4.3	4.3
Vanadium	10	23 - 100	130.0
Zinc	9	25 - 87	100.0

### LIMITATIONS

This geotechnical report has been prepared for the City of Los Angeles Harbor Department solely for the planning and design of the proposed Cabrillo Shallow Water Habitat extension and Pier 300 Terminal extension of the Port of Los Angeles. The applicability of this report and data in the report are specifically limited to current conditions and considerations for the proposed project. Data, results, and interpretations contained in this report are directed at and intended to be utilized within the scope of work contained in Fugro West's proposal dated November 8, 2000. This report is not intended to be used for any other purposes.

In performing our professional services, we have used that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical engineers currently practicing in this or similar localities. No other warranty, express or implied, is made as to the professional advice included in this report. Fugro West, Inc., makes no claim or representation concerning any activity or conditions falling outside its specified purposes to which this report is directed.



The interpretation of general subsurface conditions is based on subsurface conditions observed at exploration locations only. The information interpreted from those explorations has been used as a basis for our interpretations. Conditions may vary at locations not investigated by our explorations. Subsurface conditions also may change with time due to either natural phenomena or people's activities. We note that any statements or absence of statements in this report regarding odors, unusual or suspicious items, or conditions observed are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous/toxic assessment.



## REFERENCES

- Fugro-McClelland (West), Inc. (Fugro-McClelland) (1992), *Final Soils Report, 2020 Plan Geotechnical Investigation, Port of Los Angeles (Volumes 1-3)*, unpublished report prepared for the Los Angeles Harbor Department, FMWI Project No. 0901-2027, December.
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- \_\_\_\_\_ (2000), *Revised Scope of Work - Geotechnical Services, Port of Los Angeles*, proposal letter to the Port of Los Angeles, FWI Project No. 00-32-3701, November 8.
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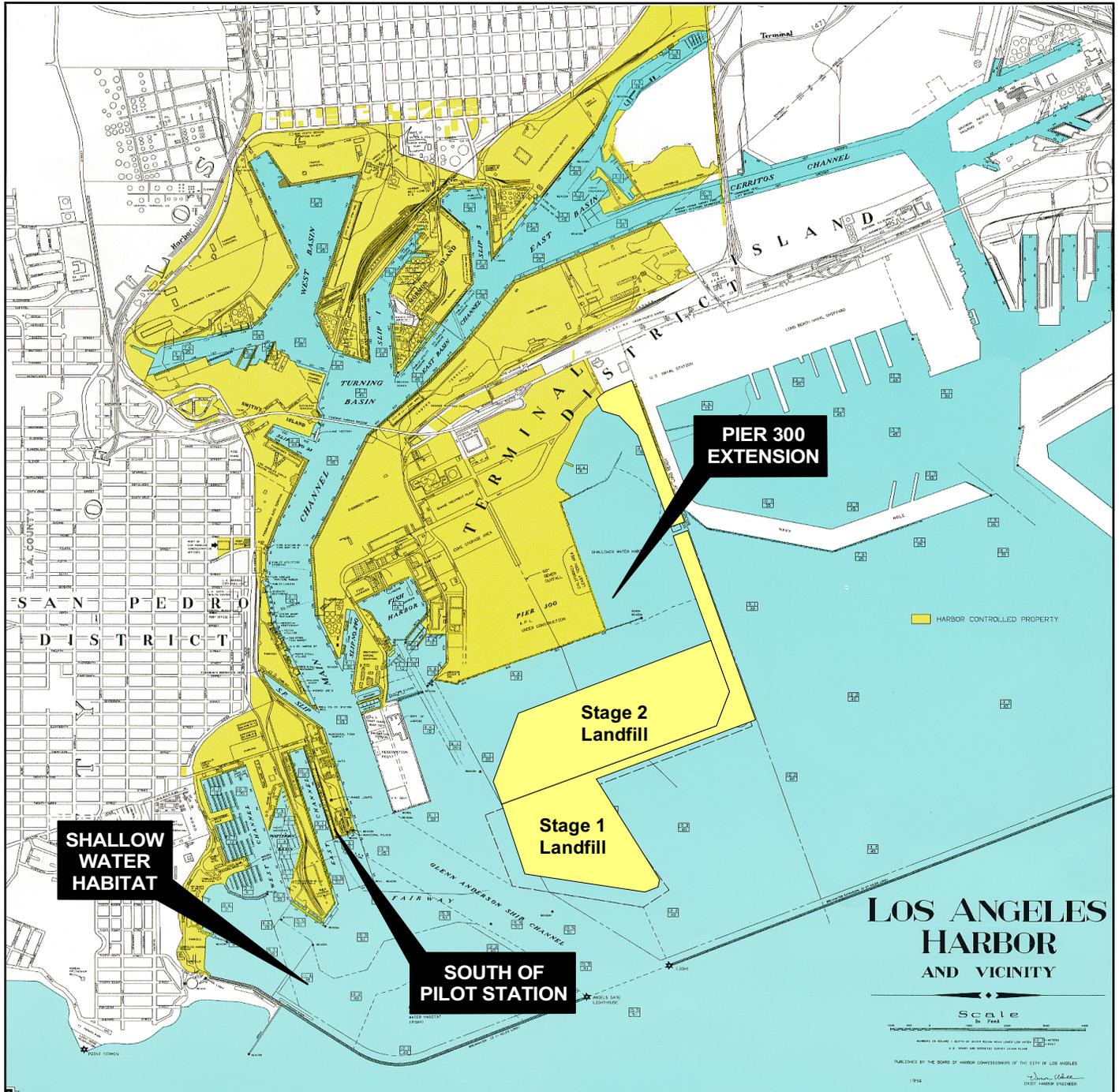


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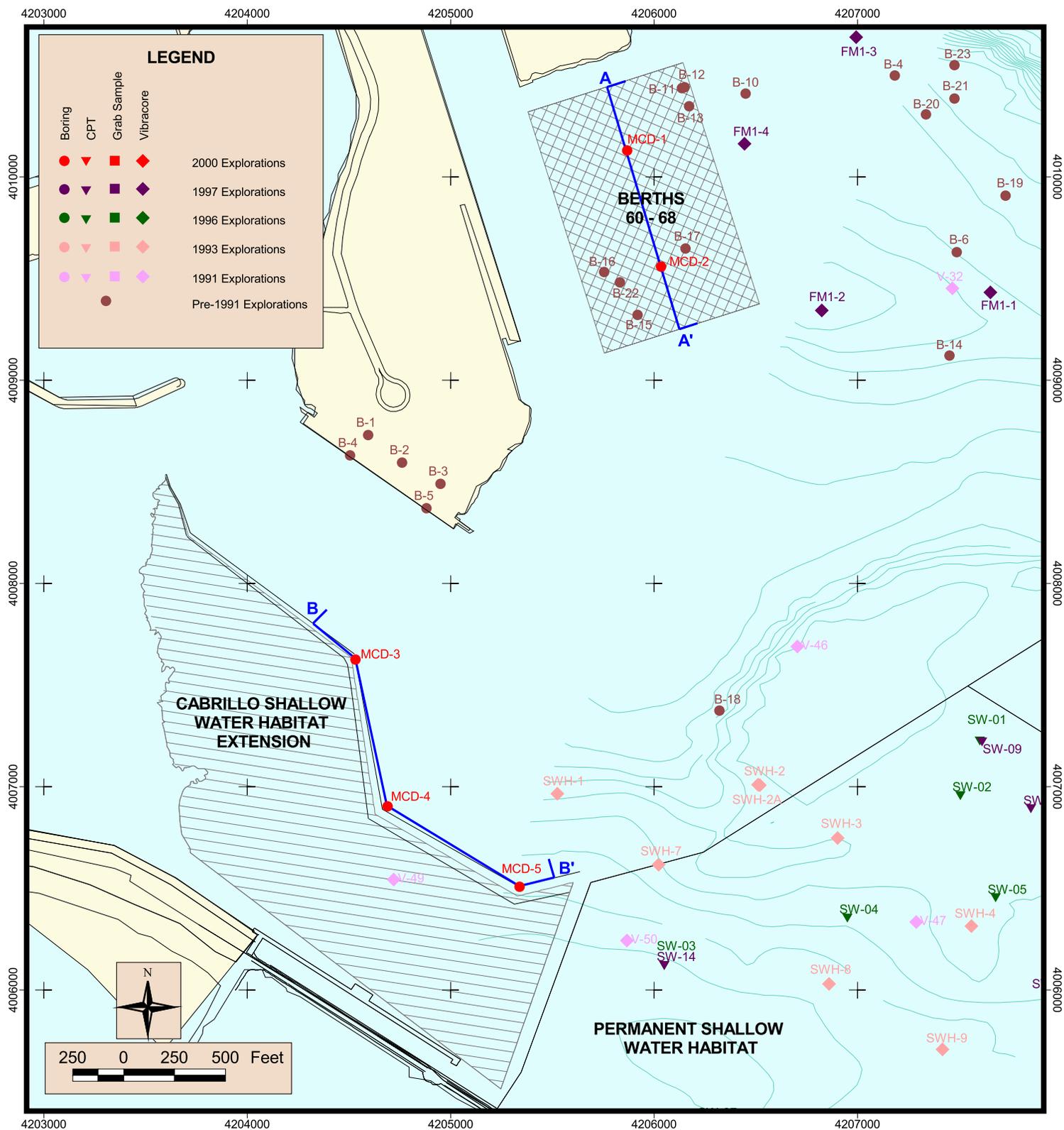
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## PLATES

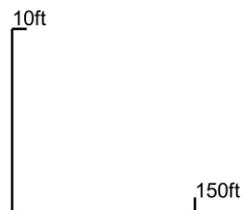
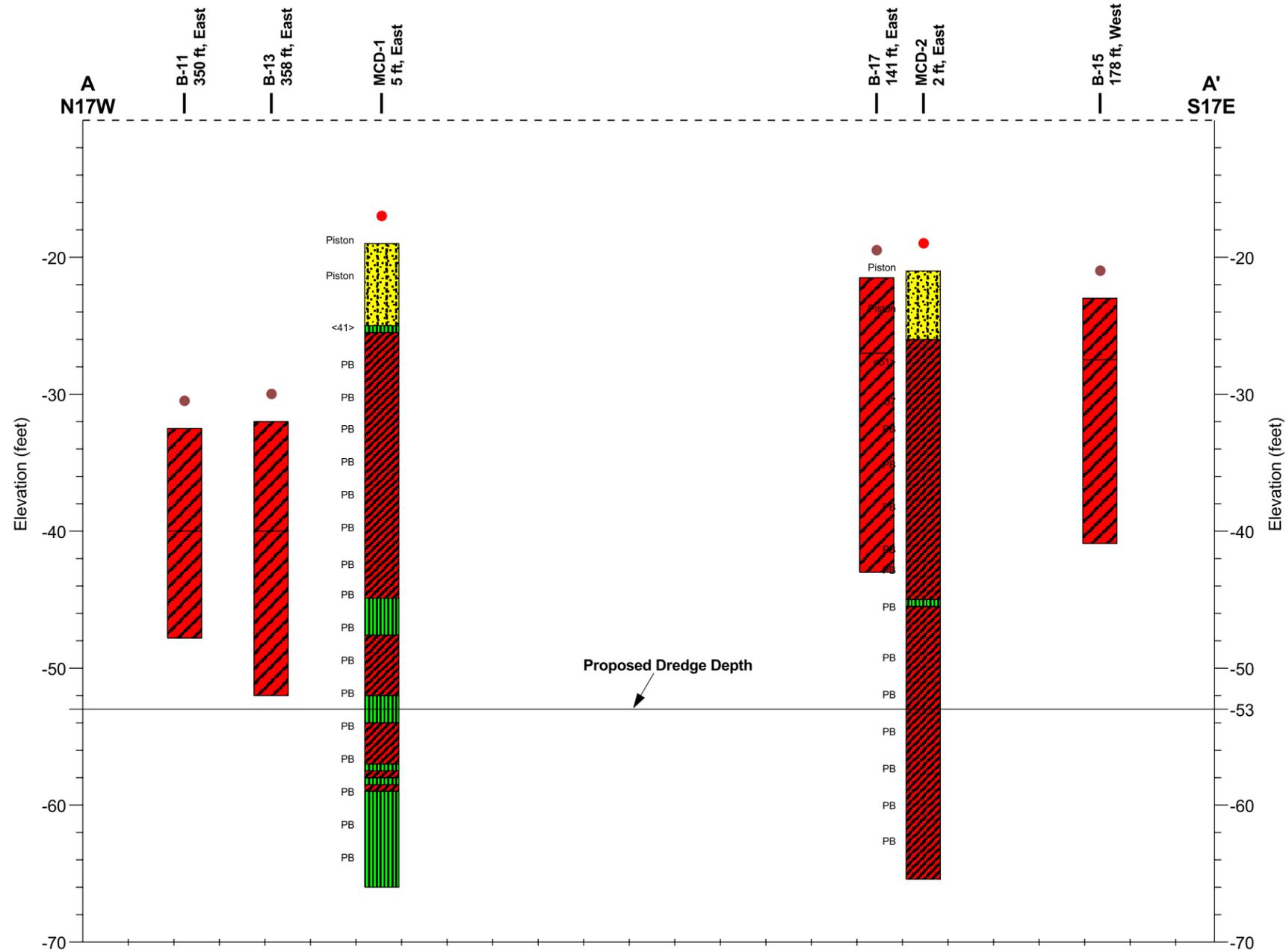


**SITE VICINITY PLAN**  
 Main Channel Deepening  
 Port of Los Angeles





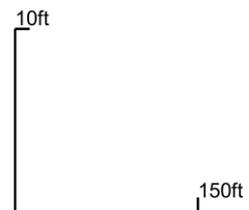
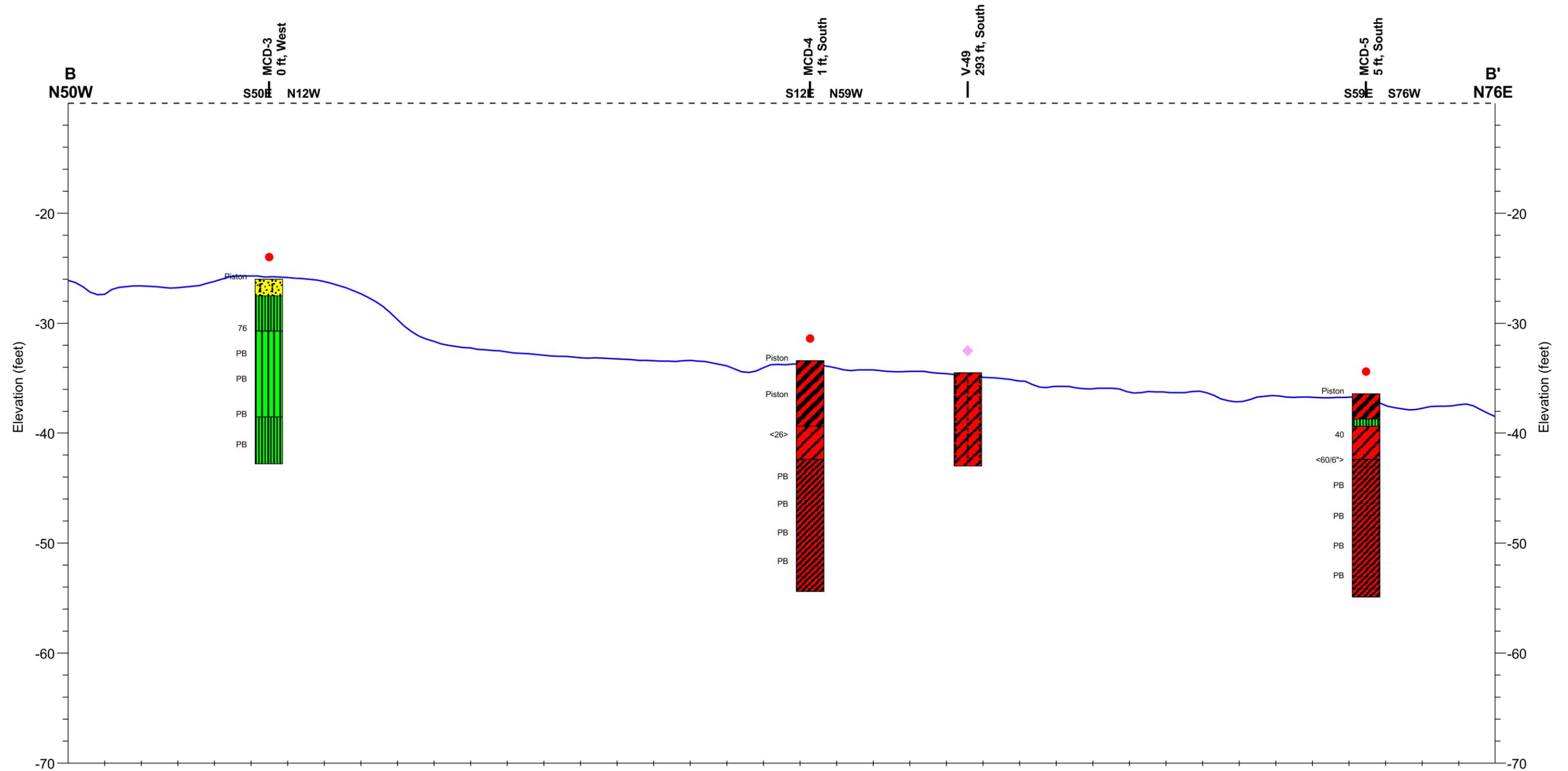
**CROSS SECTION LOCATION MAP**  
 Main Channel Deepening Project  
 Port of Los Angeles, California



GENERAL NOTES:

- 1) Data concerning subsurface conditions were obtained at boring locations only. Actual conditions between exploration points may differ from the generalized profile shown here.
- 2) Boring logs were projected onto the section line.
- 3) Indicated blow counts are SPT and equivalent SPT blow counts estimated from Modified California Sampler blow counts.
- 5) Vertical : Horizontal Exaggeration = 15:1
- 6) Elevation relative to MLLW.

**SUBSURFACE CROSS SECTION A-A'**  
**Main Channel Deepening Project**  
 Port of Los Angeles, California

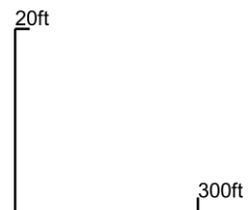
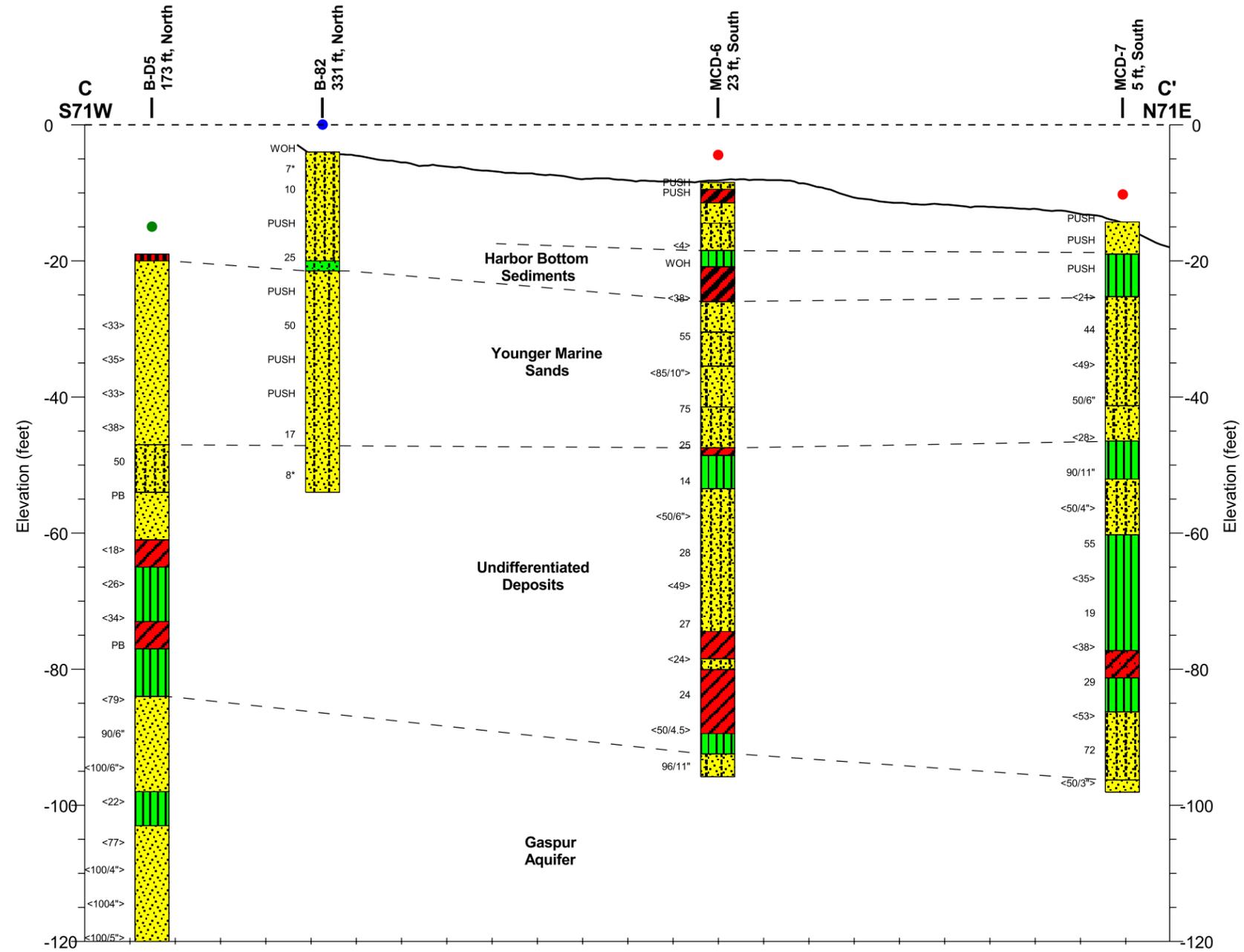


GENERAL NOTES:

- 1) Data concerning subsurface conditions were obtained at boring locations only. Actual conditions between exploration points may differ from the generalized profile shown here.
- 2) Boring logs were projected onto the section line.
- 3) Indicated blow counts are SPT and equivalent SPT blow counts estimated from Modified California Sampler blow counts.
- 5) Vertical : Horizontal Exaggeration = 15:1
- 6) Elevation relative to MLLW.

**SUBSURFACE CROSS SECTION B-B'**  
**Main Channel Deepening Project**  
 Port of Los Angeles, California

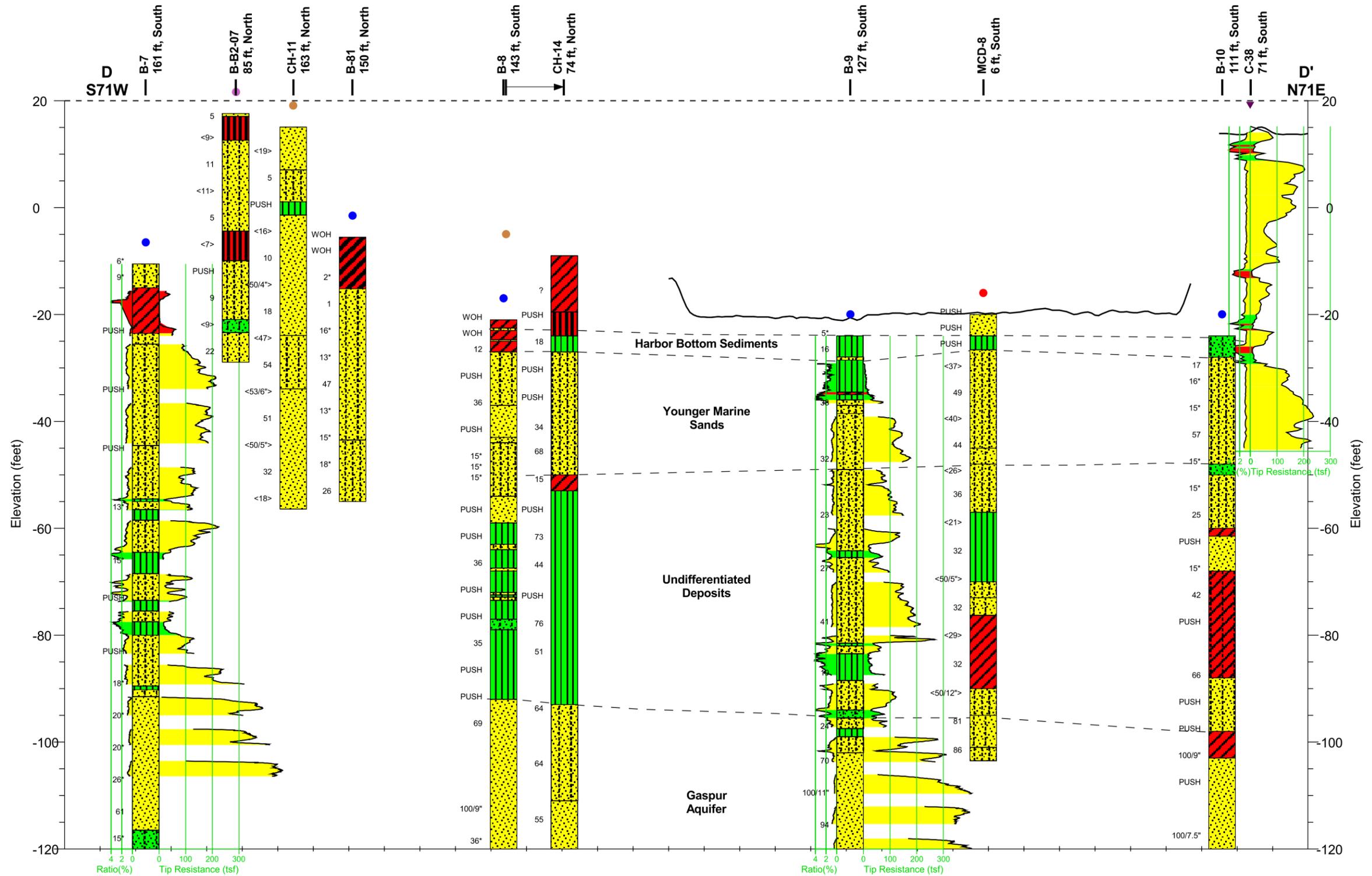




GENERAL NOTES:

- 1) Data concerning subsurface conditions were obtained at boring locations only. Actual conditions between exploration points may differ from the generalized profile shown here.
- 2) Boring logs were projected onto the section line.
- 3) Indicated blow counts are SPT and equivalent SPT blow counts estimated from Modified California Sampler blow counts.
- 5) Vertical : Horizontal Exaggeration = 15:1
- 6) Elevation relative to MLLW.

**SUBSURFACE CROSS SECTION C-C'**  
**Main Channel Deepening Project**  
Port of Los Angeles, California

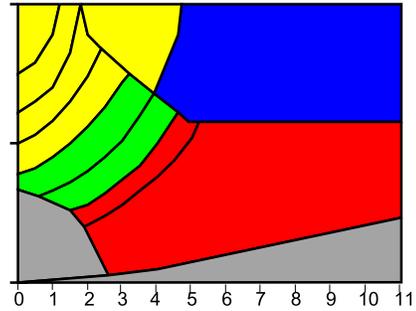
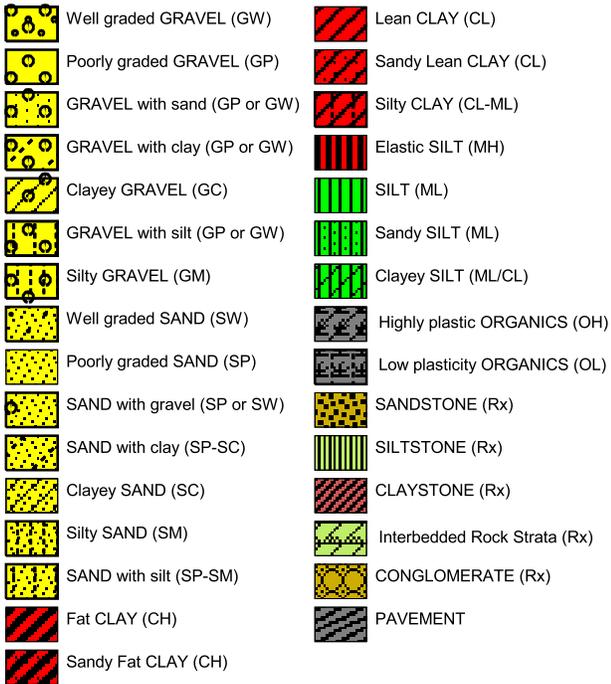


GENERAL NOTES:

- 1) Data concerning subsurface conditions were obtained at boring locations only. Actual conditions between exploration points may differ from the generalized profile shown here.
- 2) Boring logs were projected onto the section line.
- 3) Indicated blow counts are SPT and equivalent SPT blow counts estimated from Modified California Sampler blow counts.
- 4) Vertical : Horizontal Exaggeration = 15:1
- 5) Elevation relative to MLLW.

**SUBSURFACE CROSS SECTION D-D'**  
**Main Channel Deepening Project**  
**Port of Los Angeles, California**

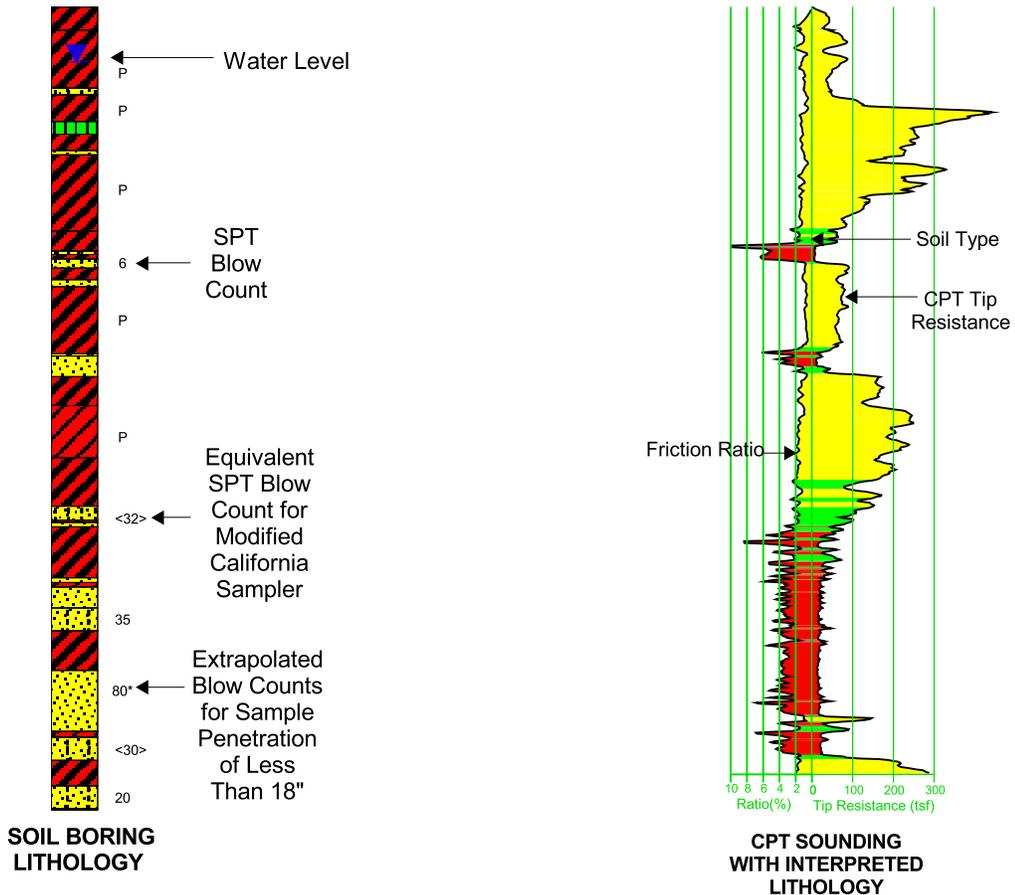
**SOIL TYPES**



Zone	Soil Behavior Type	U.S.C.S.
1	Sensitive Fine-grained	OL-CH
2	Organic Material	OL-OH
3	Clay	CH
4	Silty Clay to Clay	CL-CH
5	Clayey Silt to Silty Clay	MH-CL
6	Sandy Silt to Clayey Silt	ML-MH
7	Silty Sand to Sandy Silt	SM-ML
8	Sand to Silty Sand	SM-SP
9	Sand	SW-SP
10	Gravelly Sand to Sand	SW-GW
11	Very Stiff Fine-grained *	CH-CL
12	Sand to Clayey Sand *	SC-SM

\*overconsolidated or cemented

**CPT CORRELATION CHART (Robertson and Campanella, 1988)**



**KEY TO CROSS SECTIONS**

Main Channel Deepening Project  
Port of Los Angeles, California



**APPENDIX A  
BORING LOGS**



Boring ID	Location	Drill Dates		California State Plane Zone 7, feet		Mudline Elevation, ft (MLLW)	Final Drilling Depth (ft)	Bottom Elevation, ft (MLLW)
		Start	End	Northing	Easting			
MCD-1	South of Pilot's Station (Berths 60-68)	12/15/00	12/15/00	4010130	4205868	-19.0	47.0	-66.0
MCD-2	South of Pilot's Station (Berths 60-68)	12/14/00	12/14/00	4009559	4206035	-21.0	44.4	-65.4
MCD-3	SWH Extension	11/27/00	11/27/00	4007627	4204532	-26.0	16.8	-42.8
MCD-4	SWH Extension	11/27/00	11/27/00	4006905	4204690	-33.4	21.0	-54.4
MCD-5	SWH Extension	12/13/00	12/13/00	4006507	4205338	-36.4	18.5	-54.9
MCD-6	Pier 300 Expansion	11/21/00	11/21/00	4017047	4212901	-8.5	87.3	-95.8
MCD-7	Pier 300 Expansion	11/20/00	11/20/00	4017356	4213740	-14.3	83.8	-98.1
MCD-8	Pier 300 Expansion	11/17/00	11/17/00	4016494	4214071	-20.0	83.5	-103.5

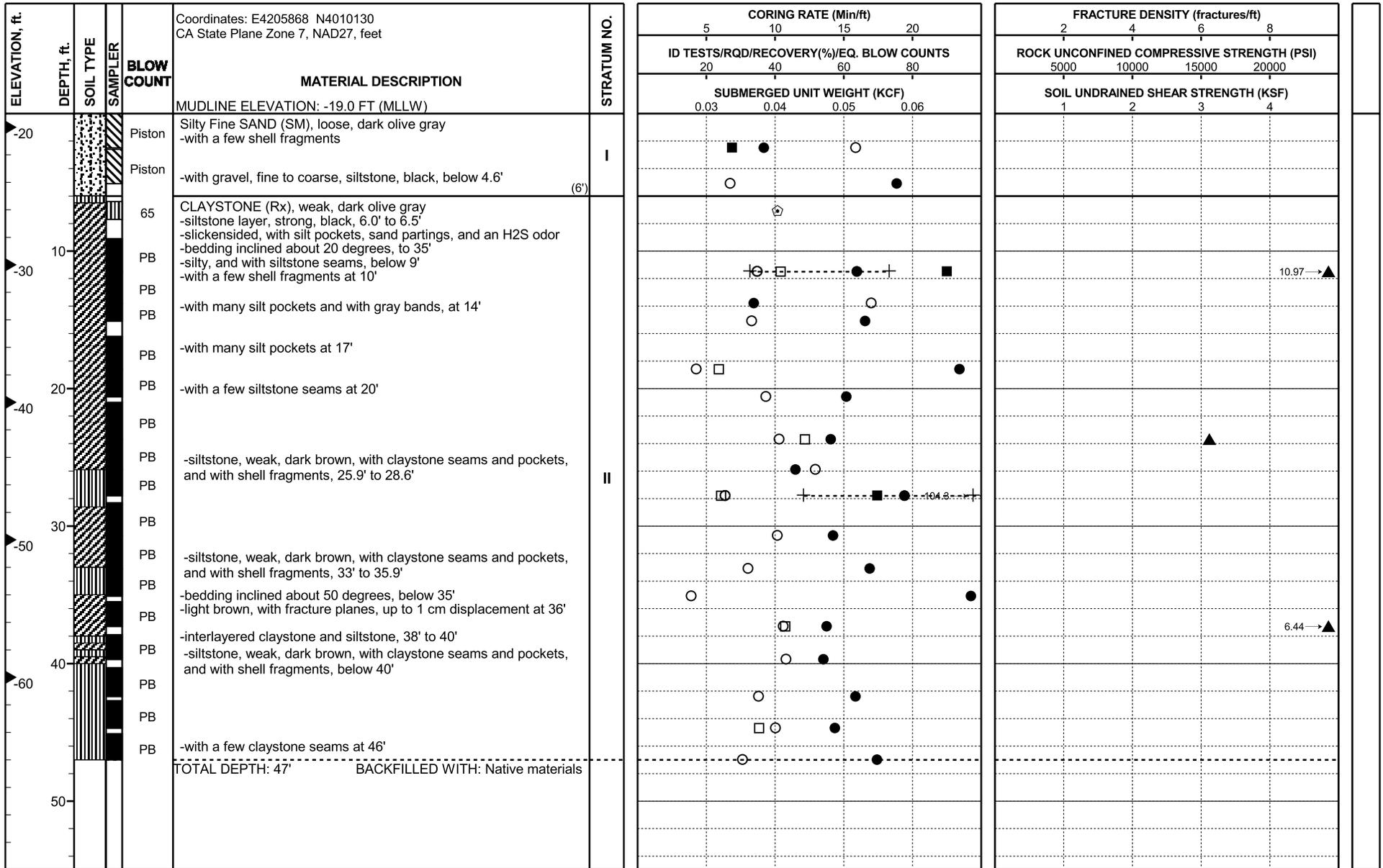
**EXPLORATION SUMMARY**  
 Main Channel Deepening Project  
 Port of Los Angeles



PROJECT NO: 00-32-3701  
 BORING: MCD-1 (Berths 60-68)

START DATE: 12/15/00  
 COMPLETION DATE: 12/15/00

DRILLER: Pitcher Drilling  
 DRILLING METHOD: Rotary Sample Boring (Wet)



# LOG OF BORING AND TEST RESULTS

## BORING MCD-1

Main Channel Deepening Project

Report Date: 03/28/01

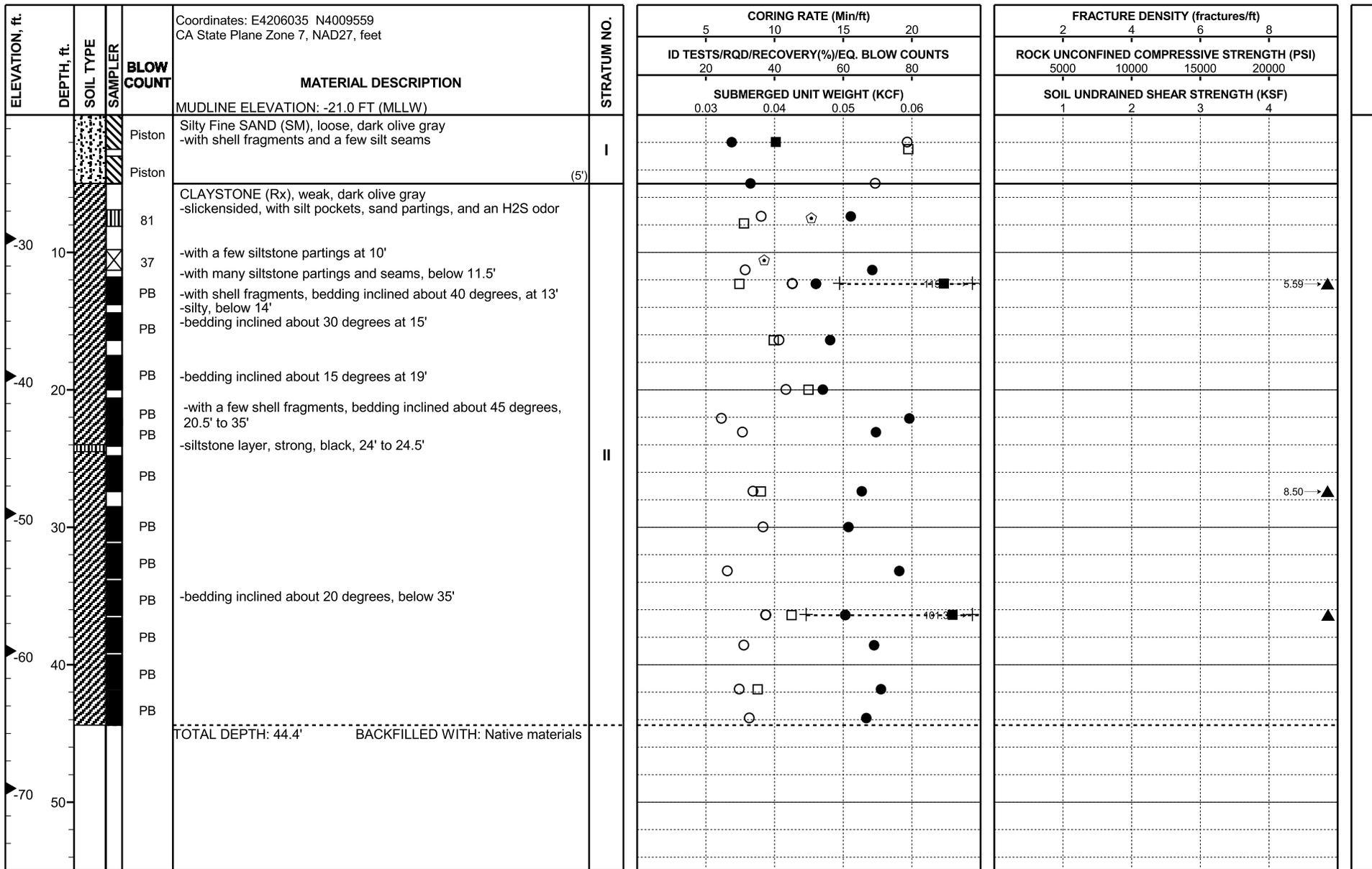


PLATE A-2

PROJECT NO: 00-32-3701  
 BORING: MCD-2 (Berths 60-68)

START DATE: 12/14/00  
 COMPLETION DATE: 12/14/00

DRILLER: Pitcher Drilling  
 DRILLING METHOD: Rotary Sample Boring (Wet)



# LOG OF BORING AND TEST RESULTS

## BORING MCD-2

### Main Channel Deepening Project



Report Date: 03/28/01

PLATE A-3

**PROJECT NO:** 00-32-3701  
**BORING:** MCD-3 (Shallow Water Habitat Extension)

**START DATE:** 11/27/00  
**COMPLETION DATE:** 11/27/00

**DRILLER:** Pitcher Drilling  
**DRILLING METHOD:** Rotary Sample Boring (Wet)

ELEVATION, ft.	DEPTH, ft.	SOIL TYPE	SAMPLER	BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.	CORING RATE (Min/ft)				FRACTURE DENSITY (fractures/ft)			
							ID TESTS/RQD/RECOVERY(%) / EQ. BLOW COUNTS				ROCK UNCONFINED COMPRESSIVE STRENGTH (PSI)			
							SUBMERGED UNIT WEIGHT (KCF)				SOIL UNDRAINED SHEAR STRENGTH (KSF)			
							5	10	15	20	2	4	6	8
					Coordinates: E4204532 N4007627 CA State Plane Zone 7, NAD27, feet									
					MUDLINE ELEVATION: -26.0 FT (MLLW)									
					Silty Fine SAND (SM), dense, dark brown -with abundant shell fragments	(1.5') I								
					SILTSTONE (Rx), dark gray to dark brown, moderately weathered -with many micaceous, silty sand intrusions	(4.7') II								
					SILT (ML), dense, dark brown									
					-with silty fine sand intrusions at 8.5' -very dense below 9.3'	III								
						(12.5') IV								
					SILTSTONE (Rx), dark gray to dark brown, moderately weathered -with a trace of fine sand at 14' -slightly weathered below 15.3'									
					TOTAL DEPTH: 16.8' BACKFILLED WITH: Native materials									

**LOG OF BORING AND TEST RESULTS**  
**BORING MCD-3**  
 Main Channel Deepening Project



Report Date: 03/28/01

PLATE A-4



PROJECT NO: 00-32-3701  
 BORING: MCD-5 (Shallow Water Habitat Extension)

START DATE: 12/13/00  
 COMPLETION DATE: 12/13/00

DRILLER: Pitcher Drilling  
 DRILLING METHOD: Rotary Sample Boring (Wet)

ELEVATION, ft.	DEPTH, ft.	SOIL TYPE	SAMPLER	BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.	CORING RATE (Min/ft)				FRACTURE DENSITY (fractures/ft)						
							5	10	15	20	2	4	6	8			
							ID TESTS/RQD/RECOVERY(%) / EQ. BLOW COUNTS				ROCK UNCONFINED COMPRESSIVE STRENGTH (PSI)						
							20	40	60	80	5000	10000	15000	20000			
							SUBMERGED UNIT WEIGHT (KCF)				SOIL UNDRAINED SHEAR STRENGTH (KSF)						
							0.03	0.04	0.05	0.06	1	2	3	4			
				Piston	Fat CLAY (CH), very soft, dark olive gray -with sand pockets	(2.3') I											
	-40			Piston 40	Lean CLAY (CL), stiff, dark olive gray -siltstone layer, strong, black, 2.3' to 3.0' -with silt seams, below 3'	(6') II											
				60/6"	CLAYSTONE (Rx), weak, dark olive gray -slickensided, with silt partings and sand partings	III											
	10			PB	-with siltstone pockets and partings, gray, at 12'												
	-50			PB	-with a few siltstone pockets at 15'												
				PB	-with silt and with siltstone partings, at 18'												
	20				TOTAL DEPTH: 18.5' BACKFILLED WITH: Native Materials												
	-60																
	-70																
	-80																
	50																

# LOG OF BORING AND TEST RESULTS

## BORING MCD-5

### Main Channel Deepening Project

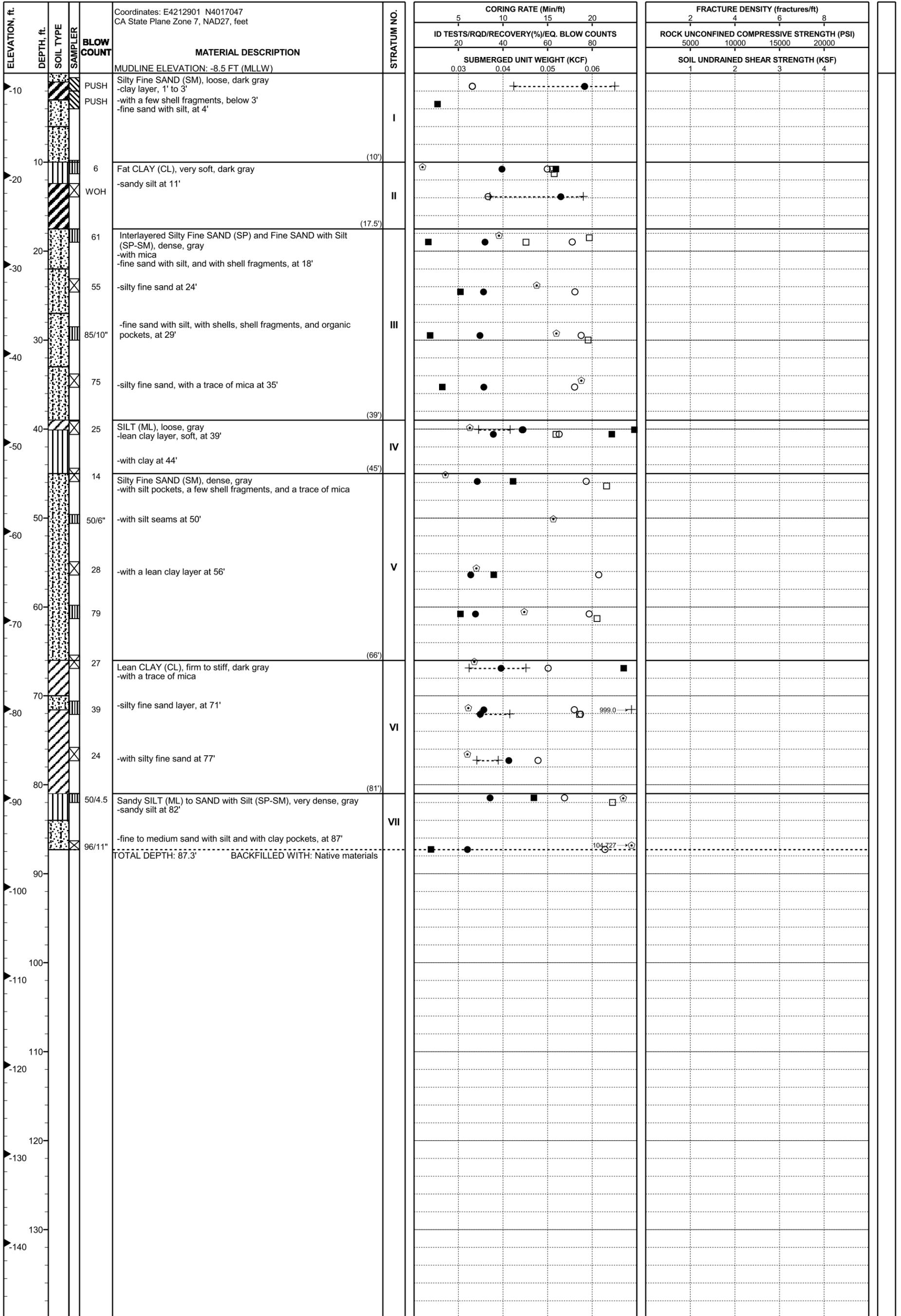
Report Date: 04/03/01



PROJECT NO: 00-32-3701  
 BORING: MCD-6 (Pier 300 Extension)

START DATE: 11/21/00  
 COMPLETION DATE: 11/21/00

DRILLER: Pitcher Drilling  
 DRILLING METHOD: Rotary Sample Boring (Wet)



# LOG OF BORING AND TEST RESULTS

## BORING MCD-6

Main Channel Deepening Project



PROJECT NO: 00-32-3701  
 BORING: MCD-7 (Pier 300 Extension)

START DATE: 11/20/00  
 COMPLETION DATE: 11/20/00

DRILLER: Pitcher Drilling  
 DRILLING METHOD: Rotary Sample Boring (Wet)

ELEVATION, ft.	DEPTH, ft.	SOIL TYPE	SAMPLER	BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.	CORING RATE (Min/ft)				FRACTURE DENSITY (fractures/ft)										
							ID TESTS/RQD/RECOVERY(%) / EQ. BLOW COUNTS				ROCK UNCONFINED COMPRESSIVE STRENGTH (PSI)										
							SUBMERGED UNIT WEIGHT (KCF)				SOIL UNDRAINED SHEAR STRENGTH (KSF)										
							5	10	15	20	20	40	60	80	2	4	6	8			
					Coordinates: E4213740 N4017356 CA State Plane Zone 7, NAD27, feet																
					MUDLINE ELEVATION: -14.3 FT (MLLW)																
				PUSH	Fine SAND (SP), loose, dark gray -with shells and shell fragments at 1'	I															
				PUSH		(4.7')															
	-20			PUSH	SILT (ML), loose, dark gray -with a trace of fine sand and with mica	II															
				PUSH		(11')															
	10																				
				34	Silty Fine SAND (SM), medium dense to very dense, dark gray -with a trace of mica -medium dense at 13'	III															
				44	-with shell fragments, below 16' -dense, 16' to 25'																
	-30			79																	
				50/6"	-fine sand with silt, very dense, at 27'	III															
							(32.2')														
				45	SILT (ML), medium dense, dark gray -with a trace of mica and fine sand	IV															
				90/11"	Silty Fine SAND (SM), very dense, gray	V															
				50/4"	-with shell fragments at 44'		(46')														
	-60																				
				55	Sandy SILT (ML), medium dense to very dense, dark gray -light olive gray at 50'	VI															
				56	-with silt pockets and seams at 54'																
				19	-interlayered with clay at 59'																
				60	-sandy clay layer, hard, at 63'																
	-80																				
				29	-interlayered with clay at 69'	VI															
				60			(72')														
				84	Silty Fine SAND (SM), very dense, dark gray -with mica	VII															
				72	-silty medium sand, light gray, at 78'																
				50/3"	-medium to coarse sand at 83'																
	-100				TOTAL DEPTH: 83.8' BACKFILLED WITH: Native materials																

# LOG OF BORING AND TEST RESULTS

## BORING MCD-7

Main Channel Deepening Project



PROJECT NO: 00-32-3701  
 BORING: MCD-8 (Pier 300 Extension)

START DATE: 11/22/00  
 COMPLETION DATE: 11/22/00

DRILLER: Pitcher Drilling  
 DRILLING METHOD: Rotary Sample Boring (Wet)

ELEVATION, ft.	DEPTH, ft.	SOIL TYPE	SAMPLER	BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.	CORING RATE (Min/ft)				FRACTURE DENSITY (fractures/ft)											
							ID TESTS/RQD/RECOVERY(%)/EQ. BLOW COUNTS				ROCK UNCONFINED COMPRESSIVE STRENGTH (PSI)											
							SUBMERGED UNIT WEIGHT (KCF)				SOIL UNDRAINED SHEAR STRENGTH (KSF)											
							5	10	15	20	2	4	6	8								
					Coordinates: E4214071 N4016494 CA State Plane Zone 7, NAD27, feet																	
					MUDLINE ELEVATION: -20.0 FT (MLLW)																	
				PUSH	Fine SAND (SP), loose, gray -with a faint H2S odor, few shell fragments, and oxidation stains, at 1'	I																
				PUSH	-sandy silt, below 4' -with a trace of mica and a few shell fragments, at 5'																	
					(6.6')																	
				PUSH	Silty Fine SAND (SM), medium dense to dense, gray to dark gray -with mica -loose at 7' -with shell fragments at 10'	II																
				59																		
				49	-with shells and shell fragments, at 16'																	
				64	-with shell fragments, 20' to 28'																	
				44	-fine sand with silt, at 26'																	
				42	-with clay seams and mica, at 30'																	
				36	-with a trace of mica and shell fragments, at 34'																	
					(37')																	
					Sandy SILT (ML), medium dense, gray to dark gray -interlayered silt and silty fine sand, 39.4' to 40.9'	III																
				33																		
				32	-silt layer at 46'																	
				50/5"	-silty fine to medium sand, at 51'																	
					-sand with silt, at 55'																	
					(56.3')																	
					Lean CLAY (CL), stiff to hard, gray -with organic pockets and mica -with thin roots, below 60'	IV																
				46																		
				32	-hard, below 65'																	
					(70')																	
					Silty Fine SAND (SM), dense to very dense, greenish gray to gray -greenish gray, with silt seams and oxidation stains at 72'	V																
				50/12"																		
				81	-fine sand with silt, at 77'																	
				86	-clay seam at 82.2' -silty fine to medium sand, at 83'																	
					TOTAL DEPTH: 83.5' BACKFILLED WITH: Native materials																	

# LOG OF BORING AND TEST RESULTS

## BORING MCD-8

Main Channel Deepening Project



### SOIL TYPES

	Well graded GRAVEL (GW)		Clayey SAND (SC)		Clayey silt (ML/CL)
	Poorly graded GRAVEL (GP)		Silty SAND (SM)		Highly plastic ORGANICS (OH)
	GRAVEL with sand (GP or GW)		SAND with silt (SP-SM)		Low plasticity ORGANICS (OL)
	GRAVEL with clay (GP or GW)		Fat CLAY(CH)		SANDSTONE (Rx)
	Clayey GRAVEL (GC)		Sandy fat CLAY (CH)		SILTSTONE (Rx)
	GRAVEL with silt (GP or GW)		Lean CLAY (CL)		CLAYSTONE (Rx)
	Silty GRAVEL (GM)		Sandy lean CLAY (CL)		Interbedded Rock Strata (Rx)
	Well graded SAND (SW)		Silty CLAY (CL-ML)		CONGLOMERATE (Rx)
	Poorly graded SAND (SP)		Elastic SILT (MH)		PAVEMENT
	SAND with gravel (SP or SW)		SILT (ML)		
	SAND with clay (SP-SC)		Sandy SILT (ML)		

### SAMPLERS

	Thin Walled 3-inch Tube		Modified California Liner		Bulk Bag
	2-1/4-inch Driven Tube		SPT		Osterberg Cell Sampler (Hydraulic Piston)
	PB Pitcher Barrel Sampler		Rock Core (Interior symbol represents percent recovery)		

### CLASSIFICATION TESTS/BLOW COUNTS/ ROCK QUALITY AND CORING RATE

- PERCENT PASSING #200 SIEVE
- WATER CONTENT (%)
- SUBMERGED UNIT WEIGHT (KCF)
- THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
- PLASTIC LIMIT    LIQUID LIMIT
- +-----+-----+
- ⊕ EQUIVALENT SPT BLOW COUNT
- .... ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT

### STRENGTH TESTS

- ⊗ POCKET PENETROMETER
- ◇ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▽ SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- ⊙ POINT LOAD TEST (INTACT SPECIMEN)
- ⊖ POINT LOAD TEST (ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)

△◇ (Open symbols indicate remolded tests)  
 + Strength Exceeds Capacity of Measuring Device

————— PCPT (N<sub>k</sub> = 12 to 15)

### KEY TO TERMS AND SYMBOLS USED ON LOGS

Main Channel Deepening Project

Port of Los Angeles, California



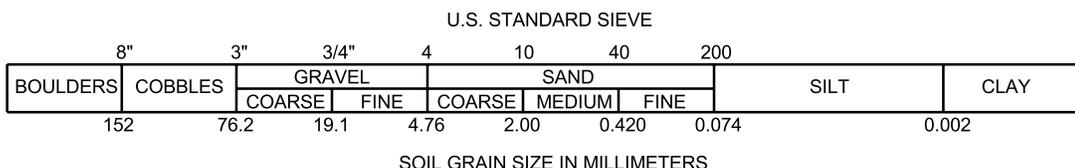
### TUBE AND LINER SAMPLERS

- WOH                      Liner sample advanced with the weight of a 175-pound hammer.
- PUSH or SAVE              Pushed thin-walled 3" tube.
- 15/24"                      Number of blows required to produce the indicated penetration using a 2-1/4" tube sampler. The sampler was driven with a 175-pound downhole hammer dropped approximately 5 feet.

### SPT AND MODIFIED CALIFORNIA LINER SAMPLERS

- Samplers were driven with a 140-pound above deck hammer dropped approximately 2-1/2 feet.
- 20                              Number of blows to produce 12" of penetration after the initial 6" of seating.
  - 86/11"                      Number of blows required to produce the indicated penetration after an initial 6" seating.
  - Ref/3"                      50 blows produced the indicated penetration during the initial 6" interval.

### SOIL GRAIN SIZE



### STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength, Kips Per Sq Ft
Very Soft.....	less than 0.25
Soft.....	0.25 to 0.50
Firm.....	0.50 to 1.00
Stiff.....	1.00 to 2.00
Very Stiff.....	2.00 to 4.00
Hard.....	greater than 4.00

### DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose.....	less than 15
Loose.....	15 to 35
Medium Dense.....	35 to 65
Dense.....	65 to 85
Very Dense.....	greater than 85

\*Estimated from sampler driving record and PCPT tip resistance.

### SOIL STRUCTURE

- Slickensided..... Having planes of weakness that appear slick and glossy. The degree of slickensidedness depends upon the spacing of slickensides and the ease of breaking along these planes.
- Fissured..... Containing shrinkage or relief crack, often filled with fine sand or silt, usually more or less vertical.
- Pocket..... Inclusion of material of different texture that is smaller than the diameter of the sample.
- Parting..... Inclusion less than 1/8 inch thick extending through the sample.
- Seam..... Inclusion 1/8 to 3 inches thick extending through the sample.
- Layer..... Inclusion greater than 3 inches thick extending through the sample.
- Laminated..... Soil sample composed of alternating partings or seams of different soil types.
- Interlayered..... Soil sample composed of alternating layers of different soil types.
- Intermixed..... Soil sample composed of pockets of different soil types and layered or laminated structure is not evident.
- Calcareous..... Having appreciable quantities of carbonate.

### KEY TO TERMS AND SYMBOLS USED ON LOGS

Main Channel Deepening Project  
 Port of Los Angeles, California

**APPENDIX B  
LABORATORY TEST RESULTS**



MCD-1		IDENTIFICATION TESTS						STRENGTH ESTIMATE			MINIATURE VANE TESTS			REMOTE VANE (ksf)	UU TRIAXIAL			MULTI-STAGE TRIAXIAL		DIRECT SHEAR TESTS				ROCK TESTS				ADDITIONAL TESTS		
DEPTH (ft)	Sample No.	MC (%)	LL (%)	PL (%)	LI	SUW (pcf)	Fines (%)	Torvane (ksf)	Pocket Pen. (ksf)	Fall Cone (ksf)	Undist. (ksf)	Remold. (ksf)	Resid. (ksf)		Undist. (ksf)	Remold. (ksf)	e50 (%)	c (ksf)	phi (deg)	Peak c (ksf)	Peak phi (deg)	Post Peak c (ksf)	Post Peak phi (ksf)	Unconf. Comp. (psi)	Youngs Modulus (psi)	TUW (pcf)	Poisson Ratio	Point Load Test (psi)		
2.5	3	37					27																							
5.1	6	75																												
11.5	10	64	73	33	0.77	40.8	90							10.97		0.9														H
13.8	11	34																												
15.1	12	66																												
18.6	13	94				31.8																								
20.6	14	61																												
23.7	15	56				44.4								3.12		0.8														
25.9	16	46																												
27.8	17	78	104	48	0.52	32.1	70																							H
30.7	18	57																												
33.1	19	68																												
35.1	20	97																												
37.3	21	55				41.4								6.45		1.2														
39.7	22	54																												
<b>Identification Tests</b>		<b>Identification Tests</b>						<b>Strength Tests</b>			<b>Additional Tests</b>			<b>Additional Tests</b>																
MC = Moisture Content		SUW = Submerged Unit Weight						UU = Unconsolidated Undrained			H = Hydrometer			K = Ko Consolidated Triaxial Test																
LL = Liquid Limit								e50 = Strain at 50% Failure Stress			C = Consolidation Test			PID=Photo Ionization Detector																
PL = Plastic Limit								c = Effective Cohesion			RC = Resonant Column																			
LI = Liquidity Index		Fines = % Passing No. 200 Sieve						phi = Effective Angle of Friction			CS = Cyclic Simple Shear																			

**SUMMARY OF LABORATORY TEST RESULTS**  
**Boring MCD-1**  
Main Channel Deepening Project





MCD-1		IDENTIFICATION TESTS						STRENGTH ESTIMATE			MINIATURE VANE TESTS			REMOTE VANE (ksf)	UU TRIAXIAL			MULTI-STAGE TRIAXIAL		DIRECT SHEAR TESTS				ROCK TESTS				ADDITIONAL TESTS			
DEPTH (ft)	Sample No.	MC (%)	LL (%)	PL (%)	LI	SUW (pcf)	Fines (%)	Torvane (ksf)	Pocket Pen. (ksf)	Fall Cone (ksf)	Undist. (ksf)	Remold. (ksf)	Resid. (ksf)		Undist. (ksf)	Remold. (ksf)	e50 (%)	c (ksf)	phi (deg)	Peak c (ksf)	Peak phi (deg)	Post Peak c (ksf)	Post Peak phi (ksf)	Unconf. Comp. (psi)	Youngs Modulus (psi)	TUW (pcf)	Poisson Ratio	Point Load Test (psi)			
42.4	23	63																													
44.7	24	57				37.7																									
47.0	25	70																													
<b>Identification Tests</b>		<b>Identification Tests</b>						<b>Strength Tests</b>			<b>Additional Tests</b>			<b>Additional Tests</b>																	
MC = Moisture Content		SUW = Submerged Unit Weight						UU = Unconsolidated Undrained			H = Hydrometer			K = Ko Consolidated Triaxial Test																	
LL = Liquid Limit								e50 = Strain at 50% Failure Stress			C = Consolidation Test			RC = Resonant Column																	
PL = Plastic Limit		Fines = % Passing No. 200 Sieve						c = Effective Cohesion			CS = Cyclic Simple Shear			PID=Photo Ionization Detector																	
LI = Liquidity Index								phi = Effective Angle of Friction																							

**SUMMARY OF LABORATORY TEST RESULTS**  
**Boring MCD-1**  
Main Channel Deepening Project





MCD-2		IDENTIFICATION TESTS						STRENGTH ESTIMATE			MINIATURE VANE TESTS			REMOTE VANE (ksf)	UU TRIAXIAL			MULTI-STAGE TRIAXIAL		DIRECT SHEAR TESTS				ROCK TESTS				ADDITIONAL TESTS		
DEPTH (ft)	Sample No.	MC (%)	LL (%)	PL (%)	LI	SUW (pcf)	Fines (%)	Torvane (ksf)	Pocket Pen. (ksf)	Fall Cone (ksf)	Undist. (ksf)	Remold. (ksf)	Resid. (ksf)		Undist. (ksf)	Remold. (ksf)	e50 (%)	c (ksf)	phi (deg)	Peak c (ksf)	Peak phi (deg)	Post Peak c (ksf)	Post Peak phi (ksf)	Unconf. Comp. (psi)	Youngs Modulus (psi)	TUW (pcf)	Poisson Ratio	Point Load Test (psi)		
2.0	2	28					40																							PID=0.6
2.5	3					59.5																								
4.0	4																													PID=0.9
5.0	5	33																												PID=0.9
7.4	6	62																												
7.9	7					35.5																								
8.1	8																													PID=1.1
11.3	9	68																												PID=1.4
12.3	10	52	116	59		34.9	89							5.59		1.1														H
13.8	12																													PID=1.0
15.9	14																													PID=1.4
16.4	15	56				39.9																								
18.5	16																													PID=0.8
20.0	19	54				45.0																								
22.1	21	79																												PID=1.0

**Identification Tests**  
 MC = Moisture Content  
 LL = Liquid Limit  
 PL = Plastic Limit  
 LI = Liquidity Index

**Identification Tests**  
 SUW = Submerged Unit Weight  
 Fines = % Passing No. 200 Sieve

**Strength Tests**  
 UU = Unconsolidated Undrained  
 e50 = Strain at 50% Failure Stress  
 c = Effective Cohesion  
 phi = Effective Angle of Friction

**Additional Tests**  
 H = Hydrometer  
 C = Consolidation Test  
 RC = Resonant Column  
 CS = Cyclic Simple Shear

**Additional Tests**  
 K = Ko Consolidated Triaxial Test  
 PID=Photo Ionization Detector

**SUMMARY OF LABORATORY TEST RESULTS**  
**Boring MCD-2**  
 Main Channel Deepening Project





MCD-2		IDENTIFICATION TESTS						STRENGTH ESTIMATE			MINIATURE VANE TESTS			REMOTE VANE (ksf)	UU TRIAXIAL			MULTI-STAGE TRIAXIAL		DIRECT SHEAR TESTS				ROCK TESTS				ADDITIONAL TESTS		
DEPTH (ft)	Sample No.	MC (%)	LL (%)	PL (%)	LI	SUW (pcf)	Fines (%)	Torvane (ksf)	Pocket Pen. (ksf)	Fall Cone (ksf)	Undist. (ksf)	Remold. (ksf)	Resid. (ksf)		Undist. (ksf)	Remold. (ksf)	e50 (%)	c (ksf)	phi (deg)	Peak c (ksf)	Peak phi (deg)	Post Peak c (ksf)	Post Peak phi (ksf)	Unconf. Comp. (psi)	Youngs Modulus (psi)	TUW (pcf)	Poisson Ratio	Point Load Test (psi)		
23.1	23	69																												PID=0.8
26.9	27																													PID=0.9
27.4	28	65				38.0								8.50		0.9														
30.0	29	61																												PID=1.2
33.2	33	76																												PID=1.1
35.4	35																													PID=1.9
36.4	37	60	101	49	0.21	42.5	92							4.86		0.8														H
38.6	39	69																												PID=1.9
40.8	41																													PID=2.0
41.8	43	71				37.5																								
43.9	45	67																												PID=2.4
<b>Identification Tests</b>		<b>Identification Tests</b>						<b>Strength Tests</b>			<b>Additional Tests</b>			<b>Additional Tests</b>																
MC = Moisture Content		SUW = Submerged Unit Weight						UU = Unconsolidated Undrained			H = Hydrometer			K = Ko Consolidated Triaxial Test																
LL = Liquid Limit								e50 = Strain at 50% Failure Stress			C = Consolidation Test			PID=Photo Ionization Detector																
PL = Plastic Limit								c = Effective Cohesion			RC = Resonant Column																			
LI = Liquidity Index		Fines = % Passing No. 200 Sieve						phi = Effective Angle of Friction			CS = Cyclic Simple Shear																			

**SUMMARY OF LABORATORY TEST RESULTS**  
**Boring MCD-2**  
Main Channel Deepening Project







MCD-4		IDENTIFICATION TESTS						STRENGTH ESTIMATE			MINIATURE VANE TESTS			REMOTE VANE (ksf)	UU TRIAXIAL			MULTI-STAGE TRIAXIAL		DIRECT SHEAR TESTS				ROCK TESTS				ADDITIONAL TESTS			
DEPTH (ft)	Sample No.	MC (%)	LL (%)	PL (%)	LI	SUW (pcf)	Fines (%)	Torvane (ksf)	Pocket Pen. (ksf)	Fall Cone (ksf)	Undist. (ksf)	Remold. (ksf)	Resid. (ksf)		Undist. (ksf)	Remold. (ksf)	e50 (%)	c (ksf)	phi (deg)	Peak c (ksf)	Peak phi (deg)	Post Peak c (ksf)	Post Peak phi (ksf)	Unconf. Comp. (psi)	Youngs Modulus (psi)	TUW (pcf)	Poisson Ratio	Point Load Test (psi)			
1.5	1	139	77	57	4.02																										
2.0	2						92																								
8.0	5	57					76																								
8.5	6	55	129	56		76.0																									
12.3	7	54	86	45	0.21																										
13.3	9	56				46.1																									
14.8	10	59	91	55	0.10		90																								
15.8	12	63				35.4																									
17.4	14	62				36.4																									
20.0	17	66					70																								
20.5	18	64				42.7																		58.3							
21.0	19	70																													
<b>Identification Tests</b>		<b>Identification Tests</b>					<b>Strength Tests</b>			<b>Additional Tests</b>			<b>Additional Tests</b>																		
MC = Moisture Content		SUW = Submerged Unit Weight					UU = Unconsolidated Undrained			H = Hydrometer			K = Ko Consolidated Triaxial Test																		
LL = Liquid Limit							e50 = Strain at 50% Failure Stress			C = Consolidation Test			PID=Photo Ionization Detector																		
PL = Plastic Limit							c = Effective Cohesion			RC = Resonant Column																					
LI = Liquidity Index							phi = Effective Angle of Friction			CS = Cyclic Simple Shear																					

**SUMMARY OF LABORATORY TEST RESULTS**  
**Boring MCD-4**  
Main Channel Deepening Project





MCD-5		IDENTIFICATION TESTS						STRENGTH ESTIMATE			MINIATURE VANE TESTS			REMOTE VANE (ksf)	UU TRIAXIAL			MULTI-STAGE TRIAXIAL		DIRECT SHEAR TESTS				ROCK TESTS				ADDITIONAL TESTS		
DEPTH (ft)	Sample No.	MC (%)	LL (%)	PL (%)	LI	SUW (pcf)	Fines (%)	Torvane (ksf)	Pocket Pen. (ksf)	Fall Cone (ksf)	Undist. (ksf)	Remold. (ksf)	Resid. (ksf)		Undist. (ksf)	Remold. (ksf)	e50 (%)	c (ksf)	phi (deg)	Peak c (ksf)	Peak phi (deg)	Post Peak c (ksf)	Post Peak phi (ksf)	Unconf. Comp. (psi)	Youngs Modulus (psi)	TUW (pcf)	Poisson Ratio	Point Load Test (psi)		
1.3	2	86	81	33	1.11																									PID=0.7
1.8	3					28.9																								
4.2	6																													PID=0.6
5.0	7	49	62	35	0.51																									PID=1.2
6.8	8																													PID=0.5
7.3	9					39.9																								
10.6	11																													PID=0.9
11.1	12					39.3																								
12.4	13																													PID=1.9
13.4	15					44.7																								
15.6	17																													PID=1.3
16.6	19	50				44.8																		42.6						
17.5	20																													PID=1.2
18.5	22					46.7																								
<b>Identification Tests</b>		<b>Identification Tests</b>						<b>Strength Tests</b>			<b>Additional Tests</b>			<b>Additional Tests</b>																
MC = Moisture Content		SUW = Submerged Unit Weight						UU = Unconsolidated Undrained			H = Hydrometer			K = Ko Consolidated Triaxial Test																
LL = Liquid Limit		Fines = % Passing No. 200 Sieve						e50 = Strain at 50% Failure Stress			C = Consolidation Test			PID=Photo Ionization Detector																
PL = Plastic Limit								c = Effective Cohesion			RC = Resonant Column																			
LI = Liquidity Index								phi = Effective Angle of Friction			CS = Cyclic Simple Shear																			

**SUMMARY OF LABORATORY TEST RESULTS**  
**Boring MCD-5**  
Main Channel Deepening Project





MCD-6		IDENTIFICATION TESTS						STRENGTH ESTIMATE			MINIATURE VANE TESTS			REMOTE VANE (ksf)	UU TRIAXIAL			MULTI-STAGE TRIAXIAL		DIRECT SHEAR TESTS				ROCK TESTS				ADDITIONAL TESTS		
DEPTH (ft)	Sample No.	MC (%)	LL (%)	PL (%)	LI	SUW (pcf)	Fines (%)	Torvane (ksf)	Pocket Pen. (ksf)	Fall Cone (ksf)	Undist. (ksf)	Remold. (ksf)	Resid. (ksf)		Undist. (ksf)	Remold. (ksf)	e50 (%)	c (ksf)	phi (deg)	Peak c (ksf)	Peak phi (deg)	Post Peak c (ksf)	Post Peak phi (ksf)	Unconf. Comp. (psi)	Youngs Modulus (psi)	TUW (pcf)	Poisson Ratio	Point Load Test (psi)		
1.5	2	76	90	45	0.70																									
3.5	5						11																							
10.8	7	39				51.1	64																							
11.3	8					51.5																								
13.9	9	66	76	34	0.76																									
18.5	10					59.3															0.283	40.1								
19.0	11	32				45.1	6																							
24.6	12	31					21																							
29.5	13	30					7																							
30.0	14					59.1															0.255	38.4								
35.3	15	31					13																							
40.1	16	48	43	29	1.37		99																							
40.6	17	36				51.8	89																							
45.9	18	28					44																							
46.4	506					63.2																								
<b>Identification Tests</b>		<b>Identification Tests</b>						<b>Strength Tests</b>			<b>Additional Tests</b>			<b>Additional Tests</b>																
MC = Moisture Content		SUW = Submerged Unit Weight						UU = Unconsolidated Undrained			H = Hydrometer			K = Ko Consolidated Triaxial Test																
LL = Liquid Limit		Fines = % Passing No. 200 Sieve						e50 = Strain at 50% Failure Stress			C = Consolidation Test			PID=Photo Ionization Detector																
PL = Plastic Limit								c = Effective Cohesion			RC = Resonant Column																			
LI = Liquidity Index								phi = Effective Angle of Friction			CS = Cyclic Simple Shear																			

**SUMMARY OF LABORATORY TEST RESULTS**  
**Boring MCD-6**  
**Main Channel Deepening Project**







MCD-7		IDENTIFICATION TESTS						STRENGTH ESTIMATE			MINIATURE VANE TESTS			REMOTE VANE (ksf)	UU TRIAXIAL			MULTI-STAGE TRIAXIAL		DIRECT SHEAR TESTS				ROCK TESTS				ADDITIONAL TESTS			
DEPTH (ft)	Sample No.	MC (%)	LL (%)	PL (%)	LI	SUW (pcf)	Fines (%)	Torvane (ksf)	Pocket Pen. (ksf)	Fall Cone (ksf)	Undist. (ksf)	Remold. (ksf)	Resid. (ksf)		Undist. (ksf)	Remold. (ksf)	e50 (%)	c (ksf)	phi (deg)	Peak c (ksf)	Peak phi (deg)	Post Peak c (ksf)	Post Peak phi (ksf)	Unconf. Comp. (psi)	Youngs Modulus (psi)	TUW (pcf)	Poisson Ratio	Point Load Test (psi)			
4.2	3	26					2																								
5.2	4						90																								
8.9	5	32	34	25	0.77																										
12.6	7	27				62.5	28																								
12.6	7						28																								
17.3	9	30					10																								
23.0	11	27				59.5	16																								
27.7	12	30					7																								
33.7	13	35				50.2	99																								
38.8	15	28					17																								
44.1	16	28				59.5	42																								
49.3	18	28					83																								
54.4	19	32				56.4	90																								
59.5	21	31					67																								
64.5	22	30	35	26	0.52	60.2															0.279	32.5									
<b>Identification Tests</b> MC = Moisture Content LL = Liquid Limit PL = Plastic Limit LI = Liquidity Index		<b>Identification Tests</b> SUW = Submerged Unit Weight Fines = % Passing No. 200 Sieve				<b>Strength Tests</b> UU = Unconsolidated Undrained e50 = Strain at 50% Failure Stress c = Effective Cohesion phi = Effective Angle of Friction				<b>Additional Tests</b> H = Hydrometer C = Consolidation Test RC = Resonant Column CS = Cyclic Simple Shear				<b>Additional Tests</b> K = Ko Consolidated Triaxial Test PID=Photo Ionization Detector																	

**SUMMARY OF LABORATORY TEST RESULTS**  
**Boring MCD-7**  
**Main Channel Deepening Project**

PLATE B-7a





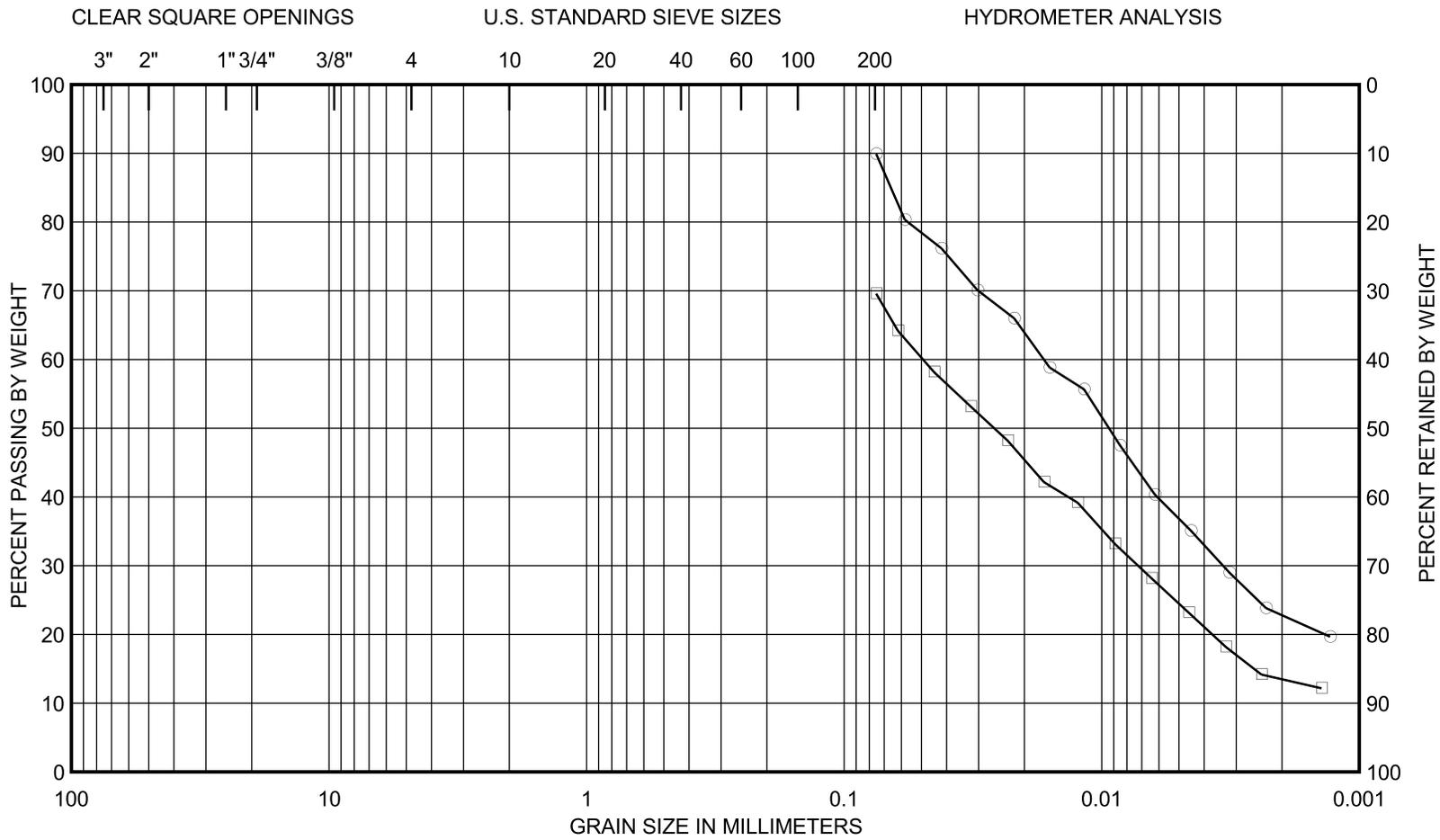


MCD-8		IDENTIFICATION TESTS						STRENGTH ESTIMATE			MINIATURE VANE TESTS			REMOTE VANE (ksf)	UU TRIAXIAL			MULTI-STAGE TRIAXIAL		DIRECT SHEAR TESTS				ROCK TESTS				ADDITIONAL TESTS			
DEPTH (ft)	Sample No.	MC (%)	LL (%)	PL (%)	LI	SUW (pcf)	Fines (%)	Torvane (ksf)	Pocket Pen. (ksf)	Fall Cone (ksf)	Undist. (ksf)	Remold. (ksf)	Resid. (ksf)		Undist. (ksf)	Remold. (ksf)	e50 (%)	c (ksf)	phi (deg)	Peak c (ksf)	Peak phi (deg)	Post Peak c (ksf)	Post Peak phi (ksf)	Unconf. Comp. (psi)	Youngs Modulus (psi)	TUW (pcf)	Poisson Ratio	Point Load Test (psi)			
1.0	101	28					4																								
4.0	104	44					78																								
7.1	1	29				48.4	45																								
7.6	2					62.9																									
11.7	4	26					21																								
16.6	5	28					12																								
21.0	6					58.0																									
21.5	7	28				60.2	16																								
26.4	8	31					7																								
30.7	9	32				57.1	56																								
31.2	10					57.3																									
35.6	11	31					26																								
40.9	13	29				62.6	64																								
45.7	15	34					95																								
46.2	14	31					59																								
<b>Identification Tests</b> MC = Moisture Content LL = Liquid Limit PL = Plastic Limit LI = Liquidity Index		<b>Identification Tests</b> SUW = Submerged Unit Weight Fines = % Passing No. 200 Sieve					<b>Strength Tests</b> UU = Unconsolidated Undrained e50 = Strain at 50% Failure Stress c = Effective Cohesion phi = Effective Angle of Friction					<b>Additional Tests</b> H = Hydrometer C = Consolidation Test RC = Resonant Column CS = Cyclic Simple Shear					<b>Additional Tests</b> K = Ko Consolidated Triaxial Test PID=Photo Ionization Detector														

**SUMMARY OF LABORATORY TEST RESULTS**  
**Boring MCD-8**  
Main Channel Deepening Project





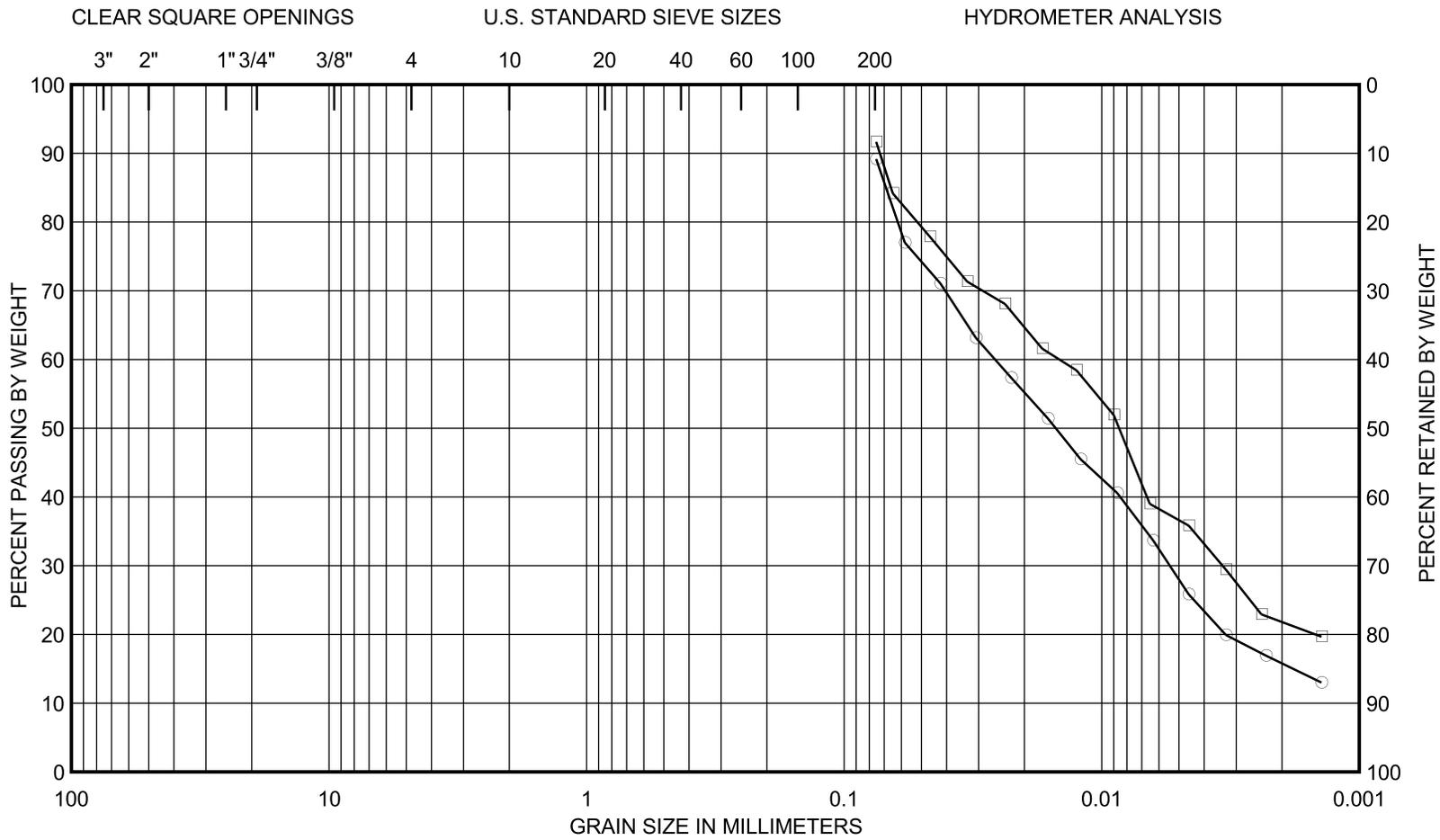


GRAVEL		SAND			SILT (nonplastic) to CLAY (plastic)
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	DEPTH (ft)	CURVE	CLASSIFICATION	Cc	Cu	D50 (mm)
10	11.5		SILT (ML)			0.0094
17	27.8		Sandy SILT (ML)			0.026

**GRAIN SIZE DISTRIBUTION CURVES**  
**Boring MCD-1**  
Main Channel Deepening Project





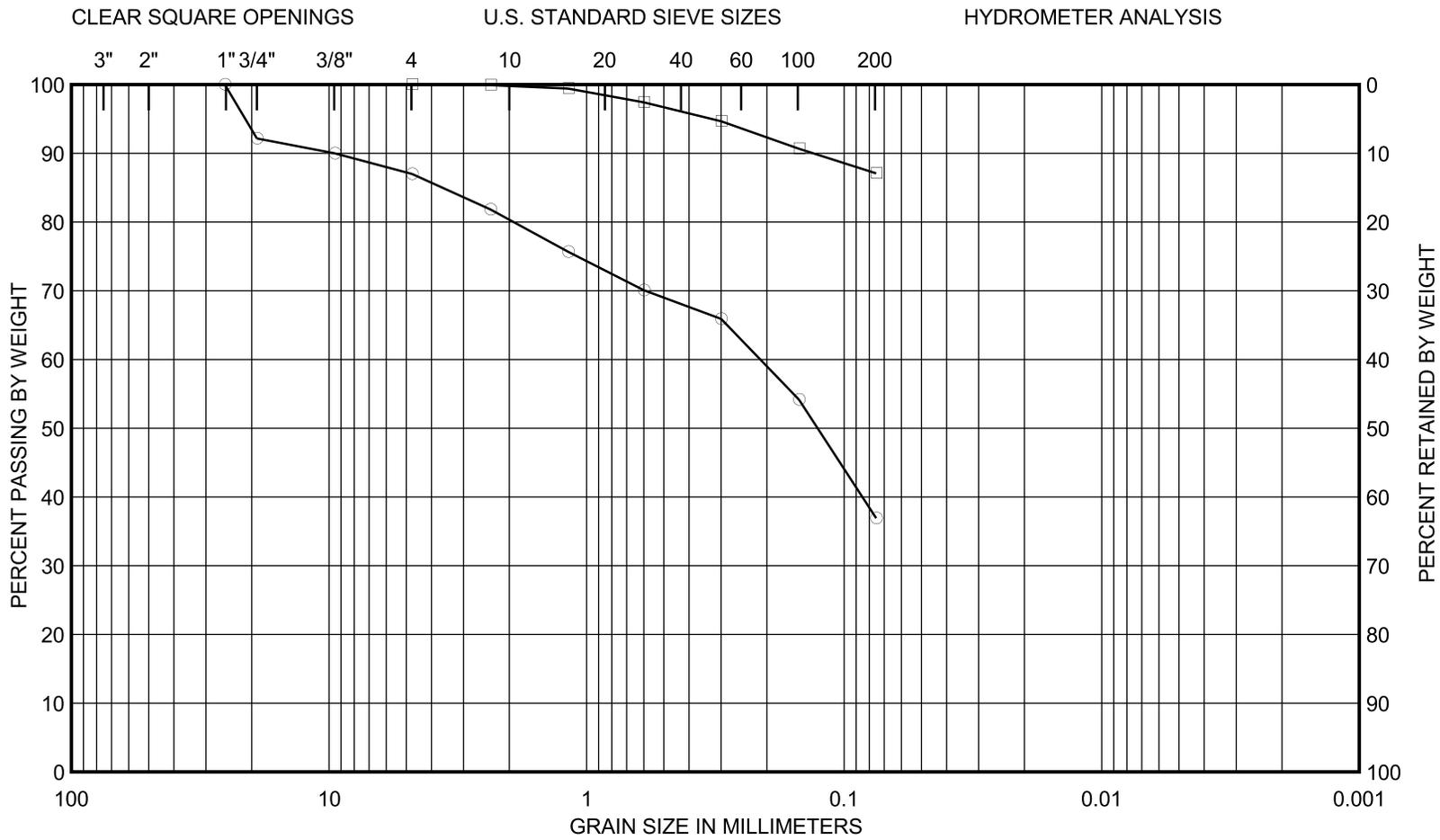
GRAVEL		SAND			SILT (nonplastic) to CLAY (plastic)
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	DEPTH (ft)	CURVE	CLASSIFICATION	Cc	Cu	D50 (mm)
10	12.3		SILT (ML)			0.015
37	36.4		SILT (ML)			0.0086

**GRAIN SIZE DISTRIBUTION CURVES**  
**Boring MCD-2**  
 Main Channel Deepening Project

PLATE B-10





GRAVEL		SAND			SILT (nonplastic) to CLAY (plastic)
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	DEPTH (ft)	CURVE	CLASSIFICATION	Cc	Cu	D50 (mm)
3	2.0	○—○	Silty Fine SAND (SM) with medium sand and fine to coarse gravel			0.13
9	14.5	□—□	SILT (ML) with a trace of fine sand			

**GRAIN SIZE DISTRIBUTION CURVES**  
**Boring MCD-3**  
 Main Channel Deepening Project

PLATE B-11

City of Los Angeles Harbor Department  
 Project No. 00-32-3701

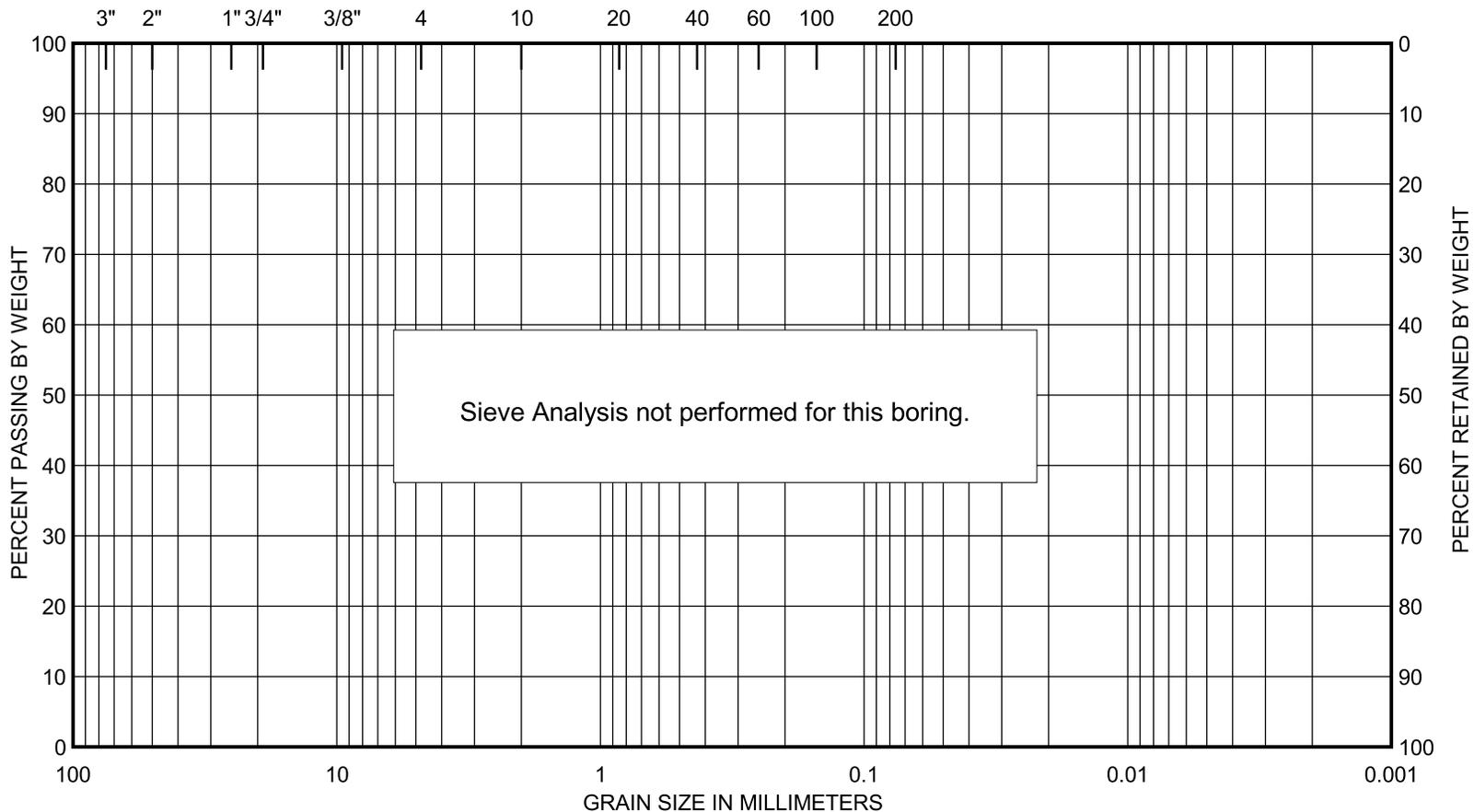




CLEAR SQUARE OPENINGS

U.S. STANDARD SIEVE SIZES

HYDROMETER ANALYSIS



GRAVEL		SAND			SILT (nonplastic) to CLAY (plastic)
COARSE	FINE	COARSE	MEDIUM	FINE	

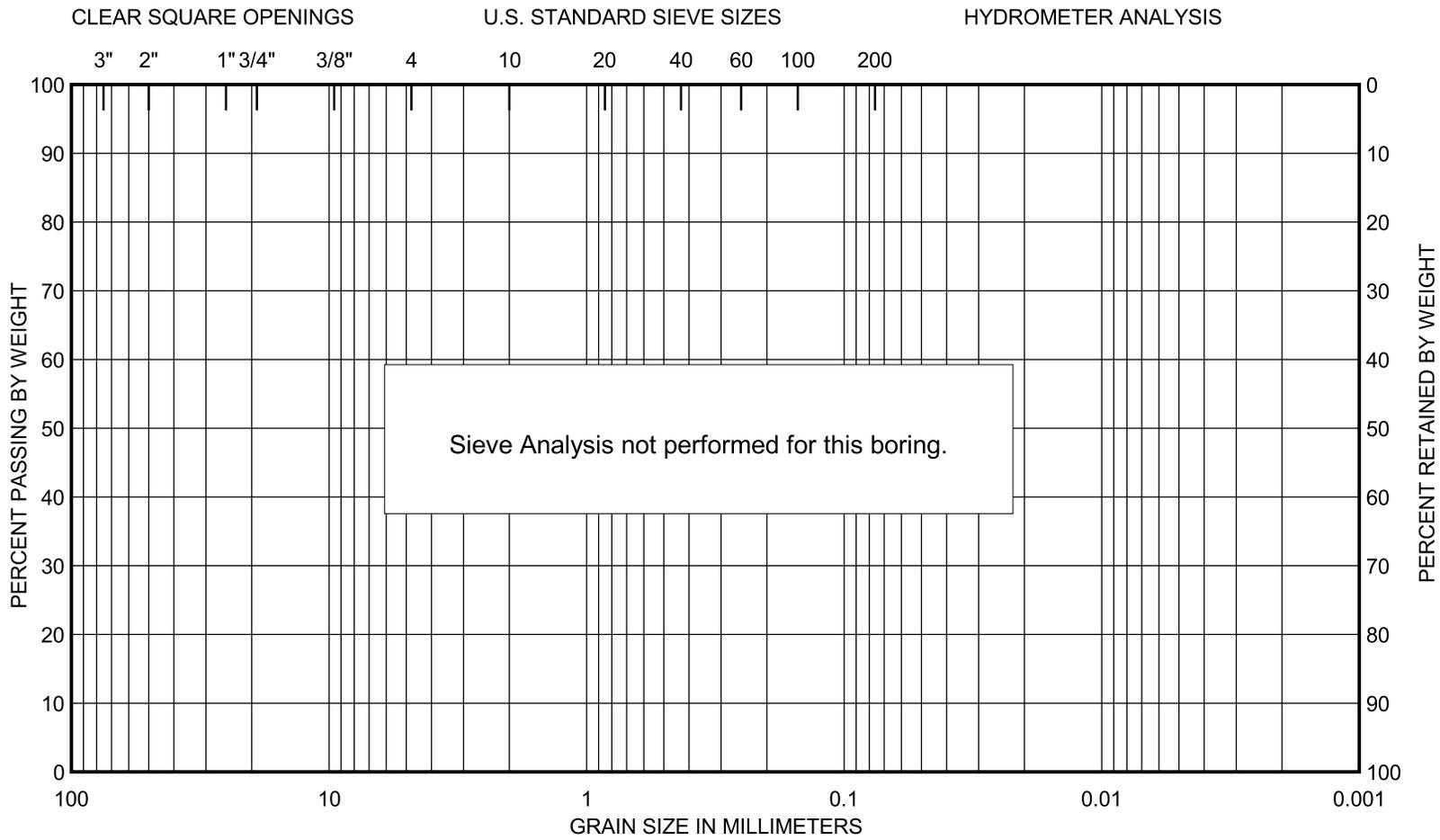
SAMPLE NO. DEPTH (ft) CURVE CLASSIFICATION Cc Cu D50 (mm)

City of Los Angeles Harbor Department  
Project No. 00-32-3701

PLATE B-12

**GRAIN SIZE DISTRIBUTION CURVES**  
**Boring MCD-4**  
Main Channel Deepening Project





GRAVEL		SAND			SILT (nonplastic) to CLAY (plastic)
COARSE	FINE	COARSE	MEDIUM	FINE	

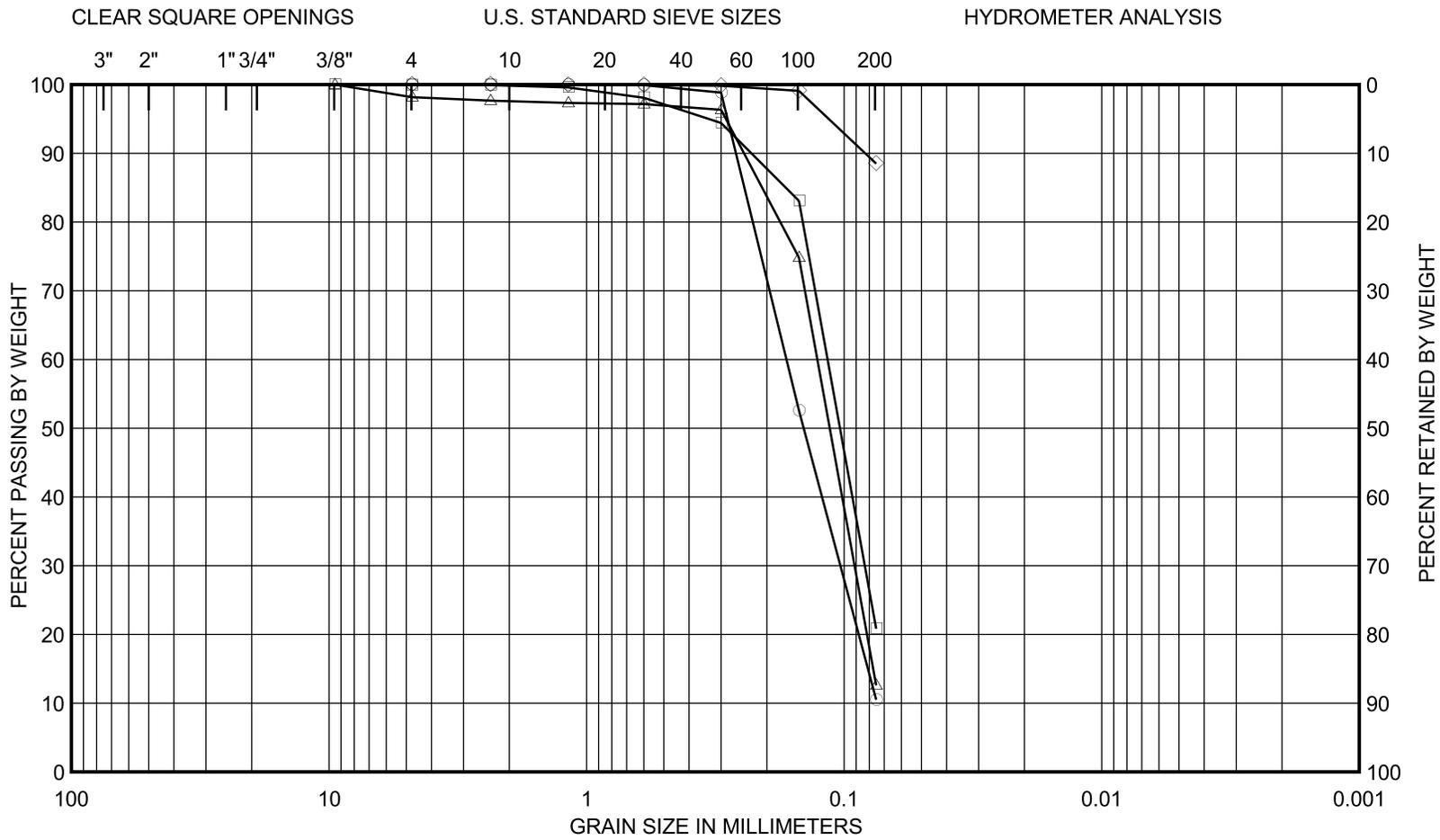
SAMPLE NO. DEPTH (ft) CURVE CLASSIFICATION Cc Cu D50 (mm)

City of Los Angeles Harbor Department  
Project No. 00-32-3701



PLATE B-13

**GRAIN SIZE DISTRIBUTION CURVES**  
**Boring MCD-5**  
Main Channel Deepening Project



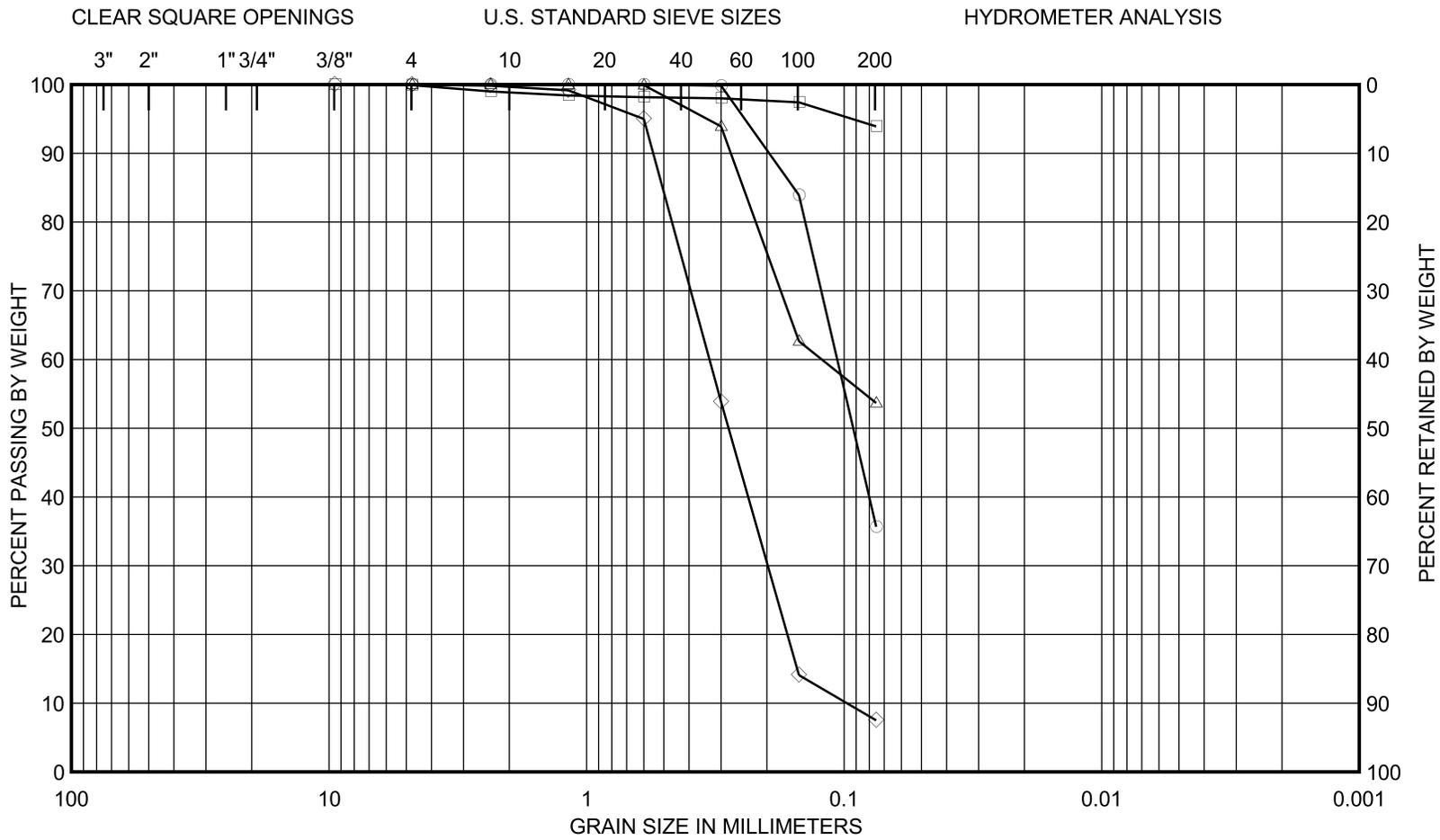
GRAVEL		SAND			SILT (nonplastic) to CLAY (plastic)
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	DEPTH (ft)	CURVE	CLASSIFICATION	Cc	Cu	D50 (mm)
5	3.5	○—○	Fine SAND with silt (SP-SM)			0.14
12	24.6	□—□	Silty Fine SAND (SM)			0.10
15	35.3	△—△	Fine SAND with silt (SP-SM)			0.11
17	40.6	◇—◇	SILT (ML) with a trace of fine sand			

**GRAIN SIZE DISTRIBUTION CURVES**  
**Boring MCD-6**  
 Main Channel Deepening Project

PLATE B-14a





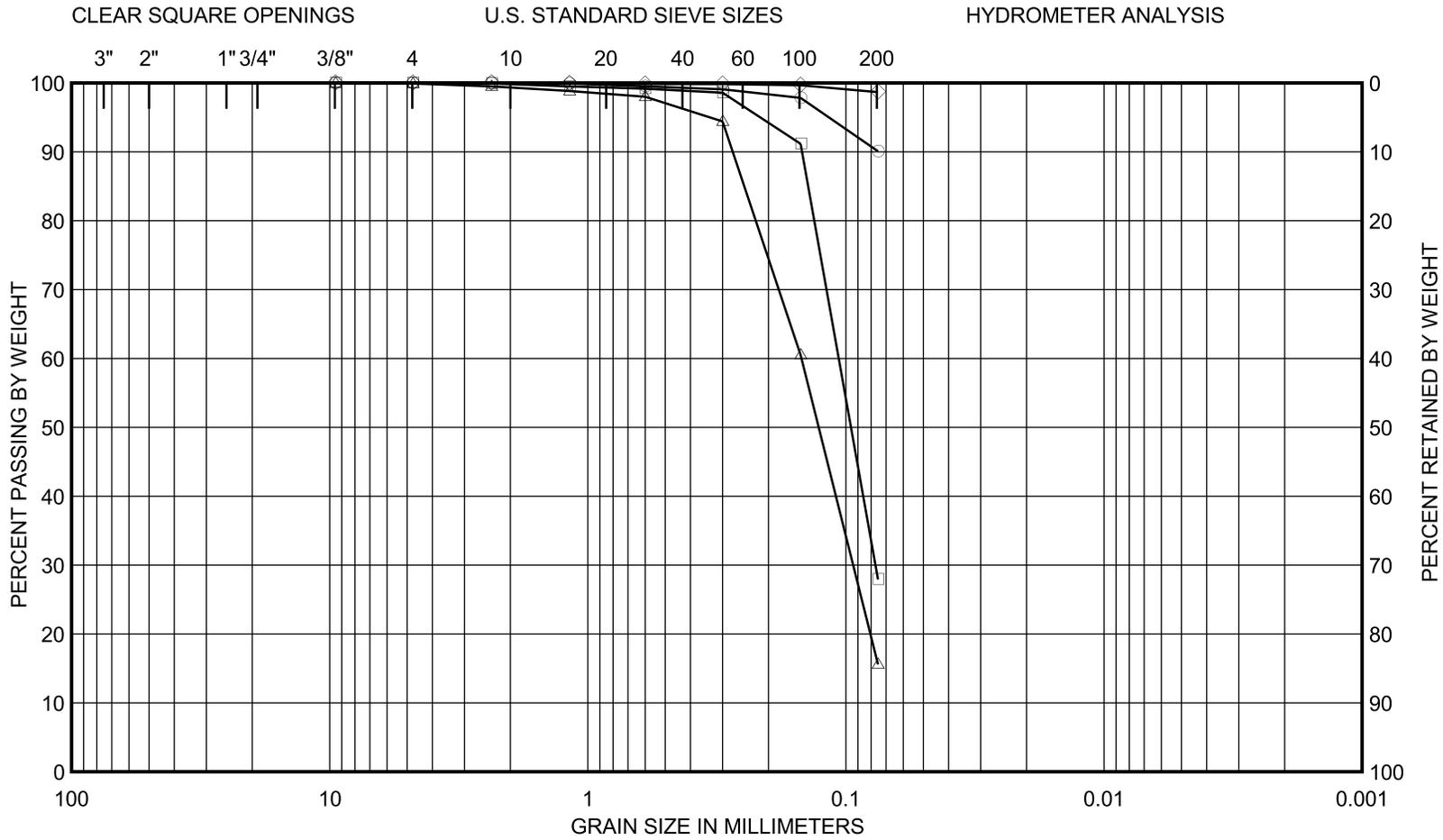
GRAVEL		SAND			SILT (nonplastic) to CLAY (plastic)
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	DEPTH (ft)	CURVE	CLASSIFICATION	Cc	Cu	D50 (mm)
20	56.4		Silty Fine SAND (SM)			0.092
23	66.9		Lean CLAY (CL) with a trace of fine sand			
27	81.5		Sandy SILT (ML)			
29	87.3		Fine to Medium SAND with silt (SP-SM)	1.2	3.4	0.28

**GRAIN SIZE DISTRIBUTION CURVES**  
**Boring MCD-6**  
 Main Channel Deepening Project

PLATE B-14b





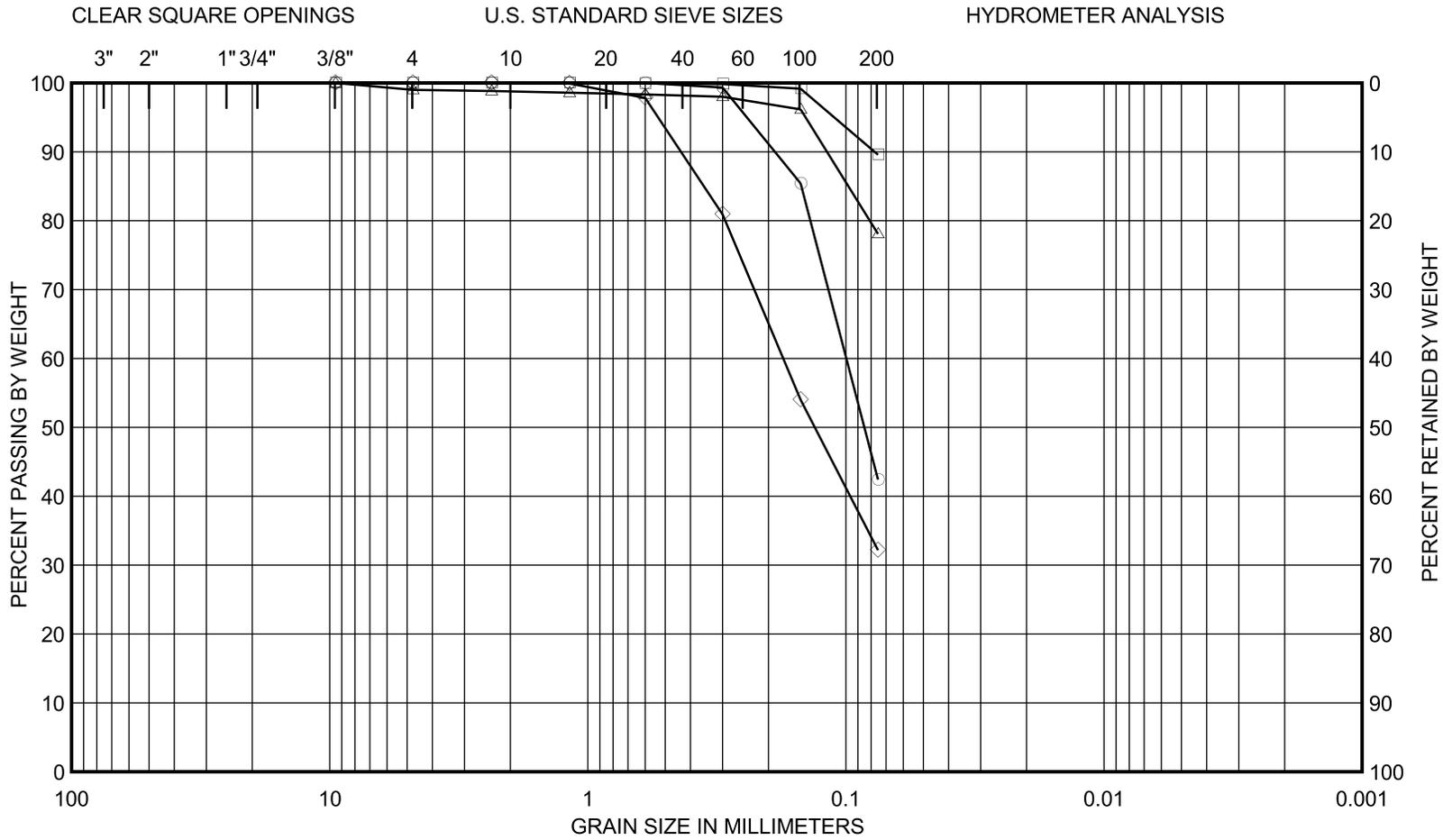
GRAVEL		SAND			SILT (nonplastic) to CLAY (plastic)
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	DEPTH (ft)	CURVE	CLASSIFICATION	Cc	Cu	D50 (mm)
4	5.2	○—○	SILT (ML) with a trace of fine sand			
7	12.6	□—□	Silty Fine SAND (SM)			0.096
11	23.0	△—△	Silty Fine SAND (SM)			0.13
13	33.7	◇—◇	SILT (ML)			

**GRAIN SIZE DISTRIBUTION CURVES**  
**Boring MCD-7**  
 Main Channel Deepening Project

PLATE B-15a





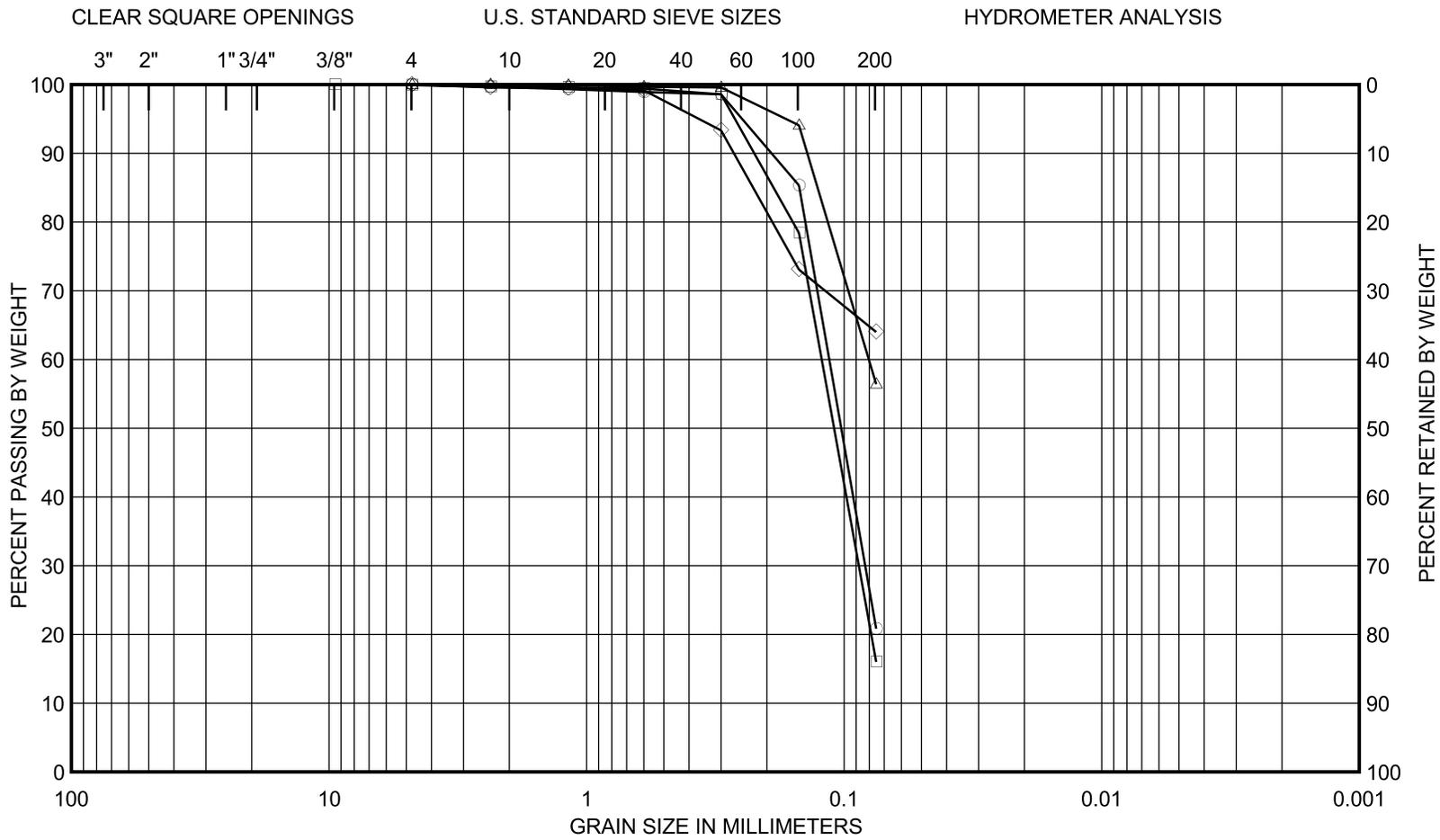
GRAVEL		SAND			SILT (nonplastic) to CLAY (plastic)
COARSE	FINE	COARSE	MEDIUM	FINE	

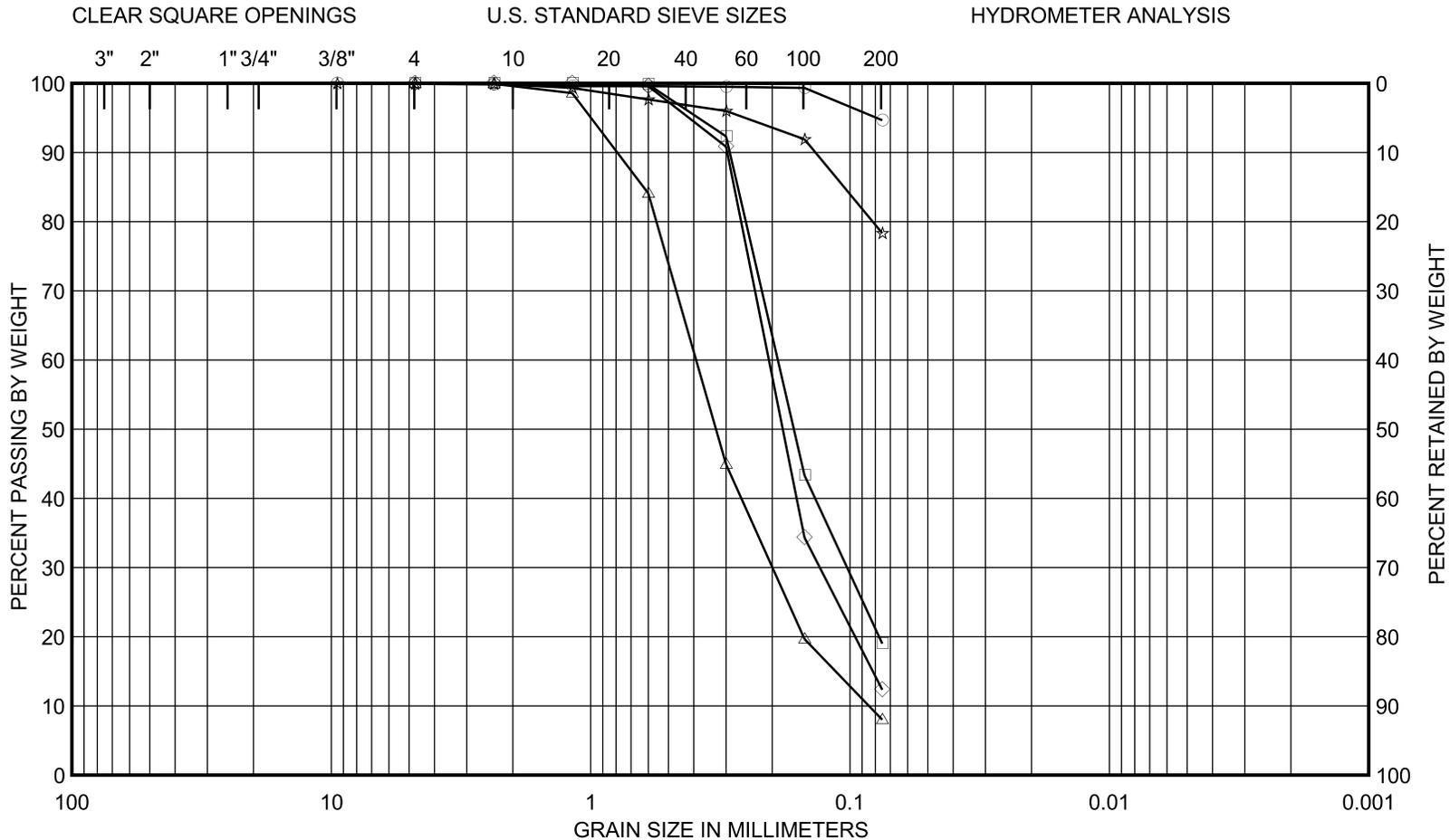
SAMPLE NO.	DEPTH (ft)	CURVE	CLASSIFICATION	Cc	Cu	D50 (mm)
16	44.1		Silty Fine SAND (SM)			0.085
19	54.4		SILT (ML) with a trace of fine sand			
24	69.6		SILT (ML) with fine sand			
27	79.6		Silty Fine SAND (SM) with trace of medium sand			0.13

**GRAIN SIZE DISTRIBUTION CURVES**  
**Boring MCD-7**  
 Main Channel Deepening Project

PLATE B-15b







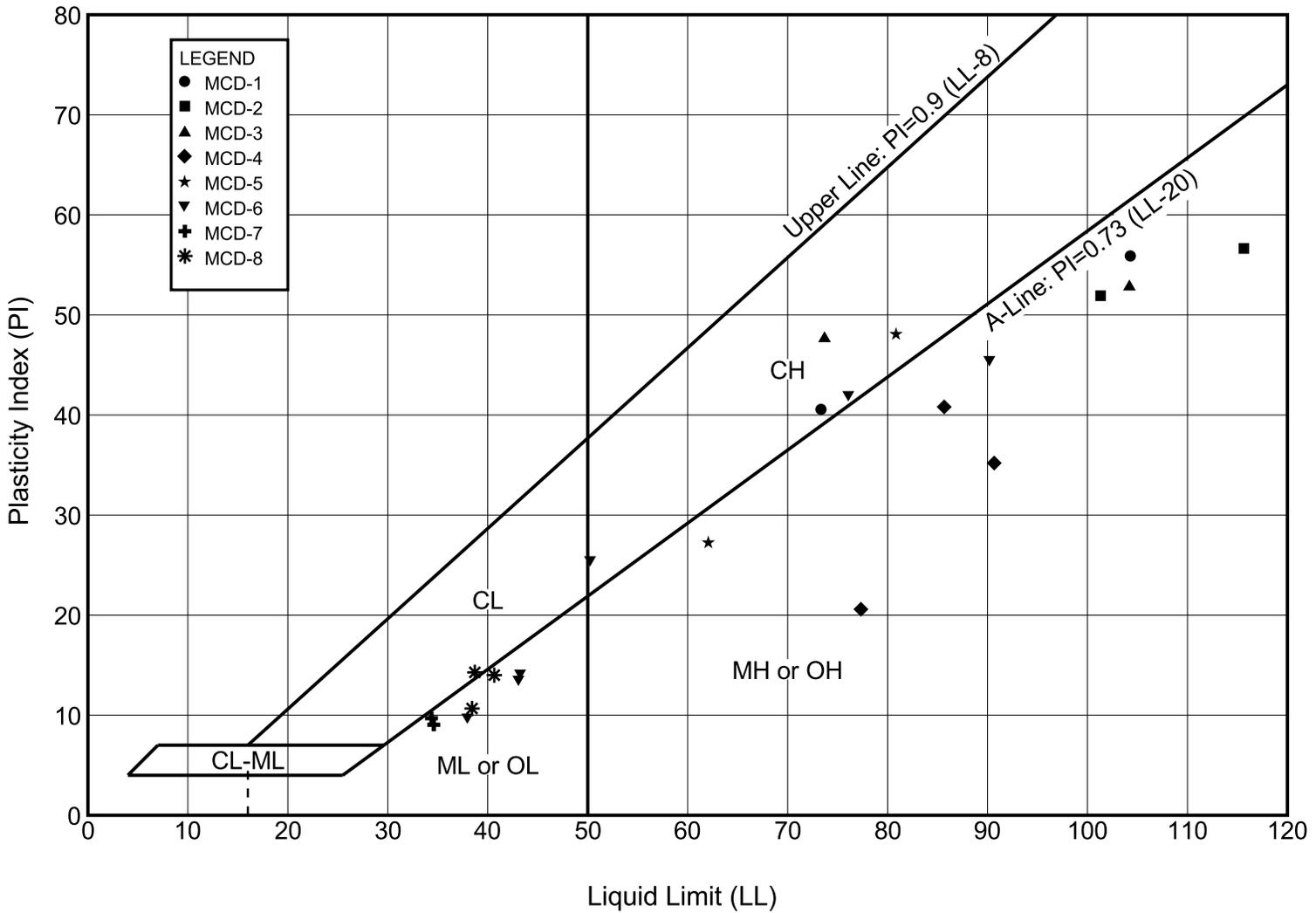
GRAVEL		SAND			SILT (nonplastic) to CLAY (plastic)
COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	DEPTH (ft)	CURVE	CLASSIFICATION	Cc	Cu	D50 (mm)
15	45.7	○—○	SILT (ML) with trace of fine sand			
16	51.0	□—□	Silty Fine SAND (SM) with trace of medium sand			0.16
22	78.1	△—△	Fine to Medium SAND (SP) with trace of silt	1.2	4.6	0.33
23	83.5	◇—◇	Fine SAND (SP) with trace of medium sand and silt			0.18
104	4.0	★—★	SILT (ML) with fine sand			

**GRAIN SIZE DISTRIBUTION CURVES**  
**Boring MCD-8**  
 Main Channel Deepening Project

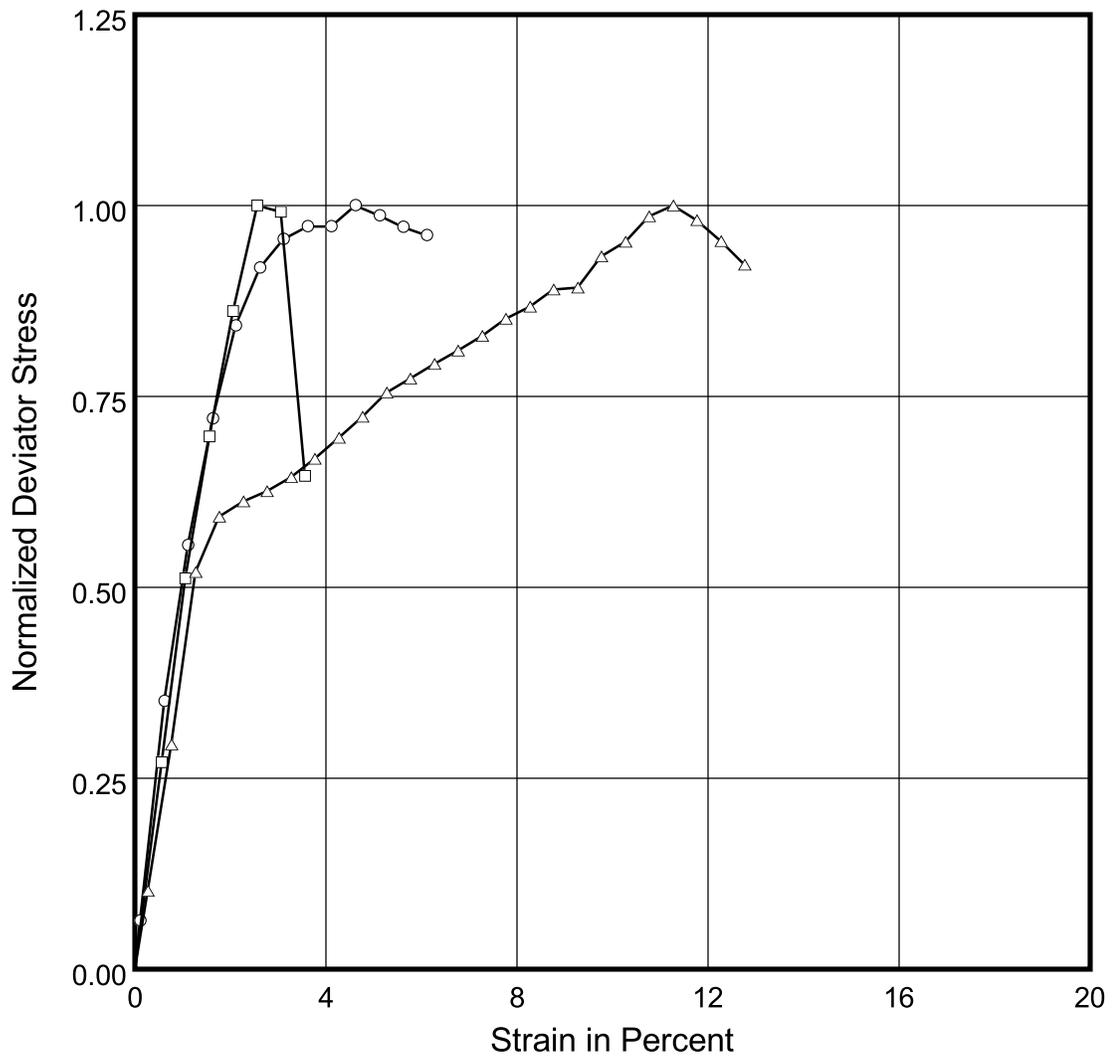
PLATE B-16b





**PLASTICITY CHART**  
**Borings MCD-1 through -8**  
**Main Channel Deepening Project**



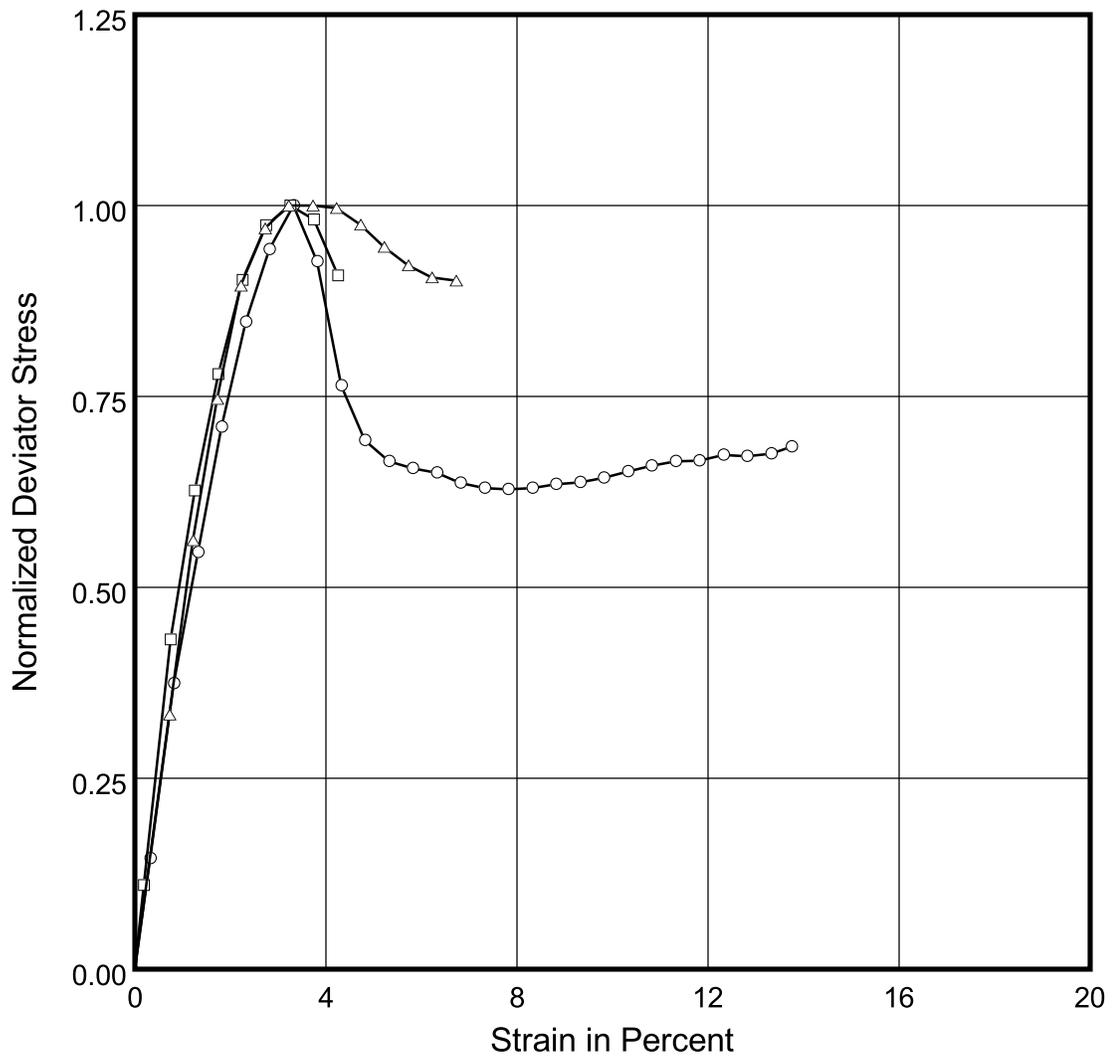


Curve	Sample No.	Depth (ft)	Test Type	Confining Pressure (psi)	Maximum Deviator Stress (ksf)	e50 (%)
○—○	10	11.5	UU	120	21.9	0.9
□—□	15	23.7	UU	120	6.2	0.8
△—△	21	37.3	UU	120	12.9	1.2

Deviator stress normalized with respect to maximum deviator stress.

**STRESS-STRAIN CURVES**  
**Unconsolidated-Undrained Triaxial Compression Test**  
**Boring MCD-1**  
 Main Channel Deepening Project



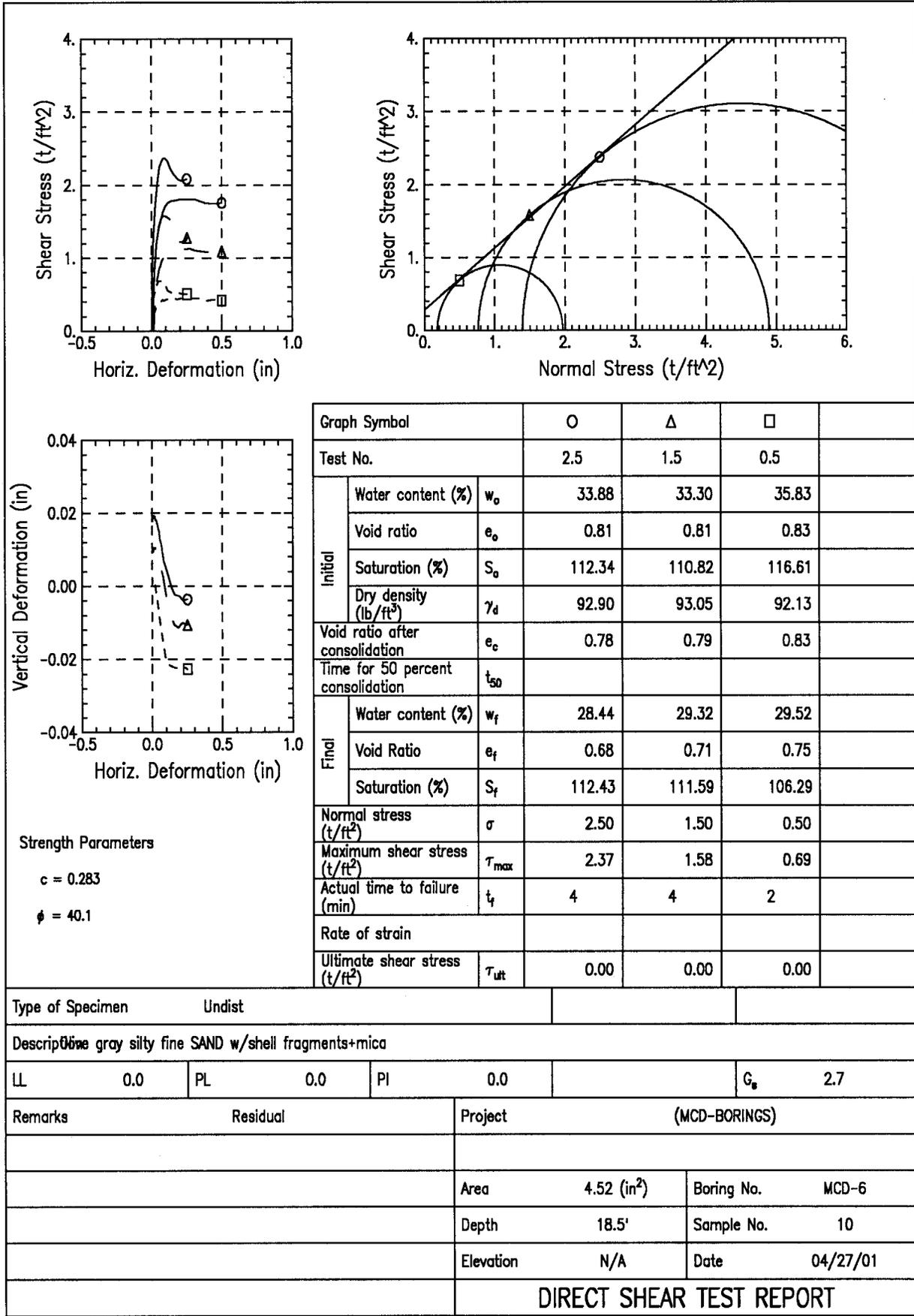


Curve	Sample No.	Depth (ft)	Test Type	Confining Pressure (psi)	Maximum Deviator Stress (ksf)	e50 (%)
○—○	10	12.3	UU	120	11.2	1.1
□—□	28	27.4	UU	120	17.0	0.9
△—△	37	36.4	UU	120	9.7	0.8

Deviator stress normalized with respect to maximum deviator stress.

**STRESS-STRAIN CURVES**  
**Unconsolidated-Undrained Triaxial Compression Test**  
**Boring MCD-2**  
 Main Channel Deepening Project



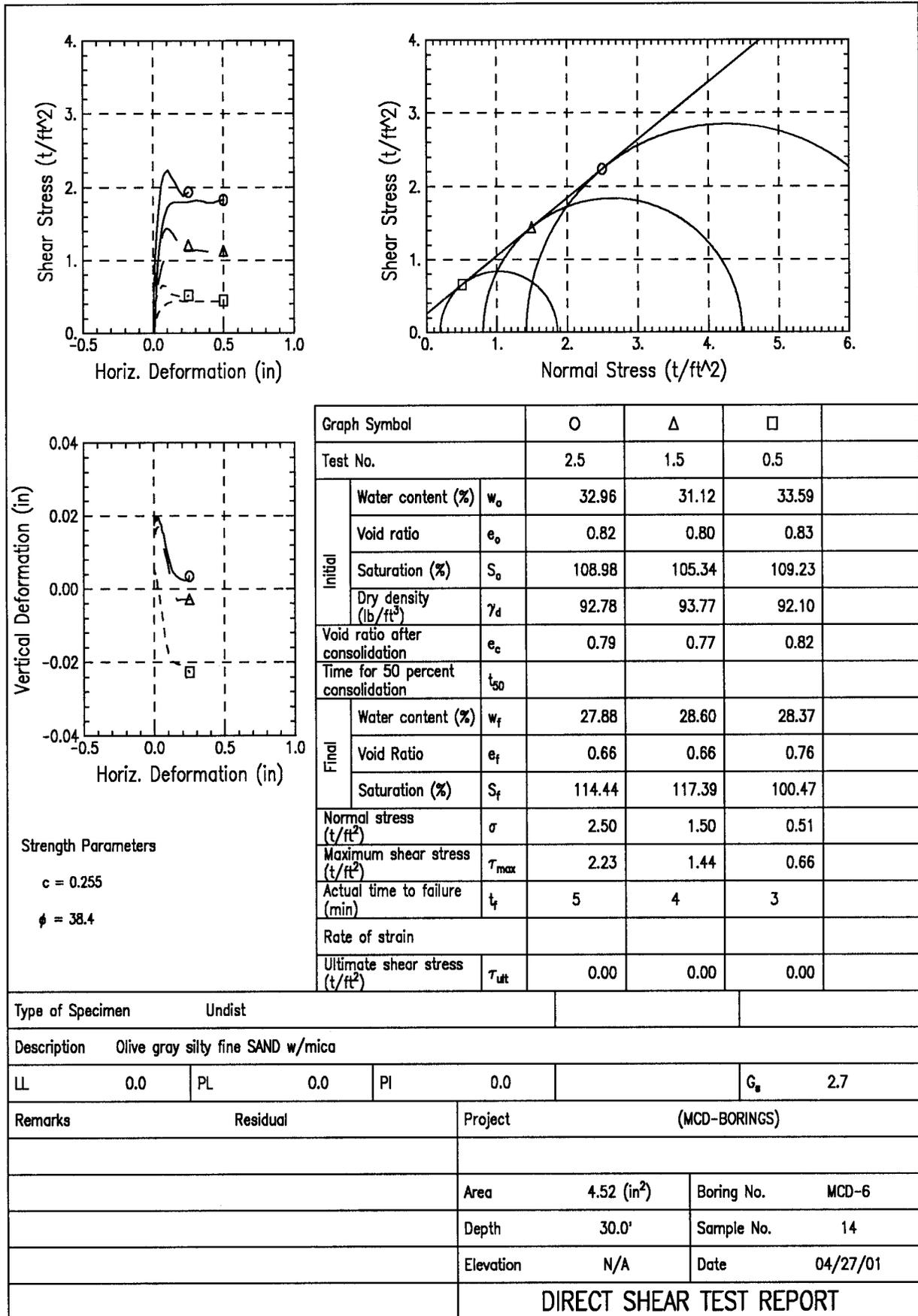


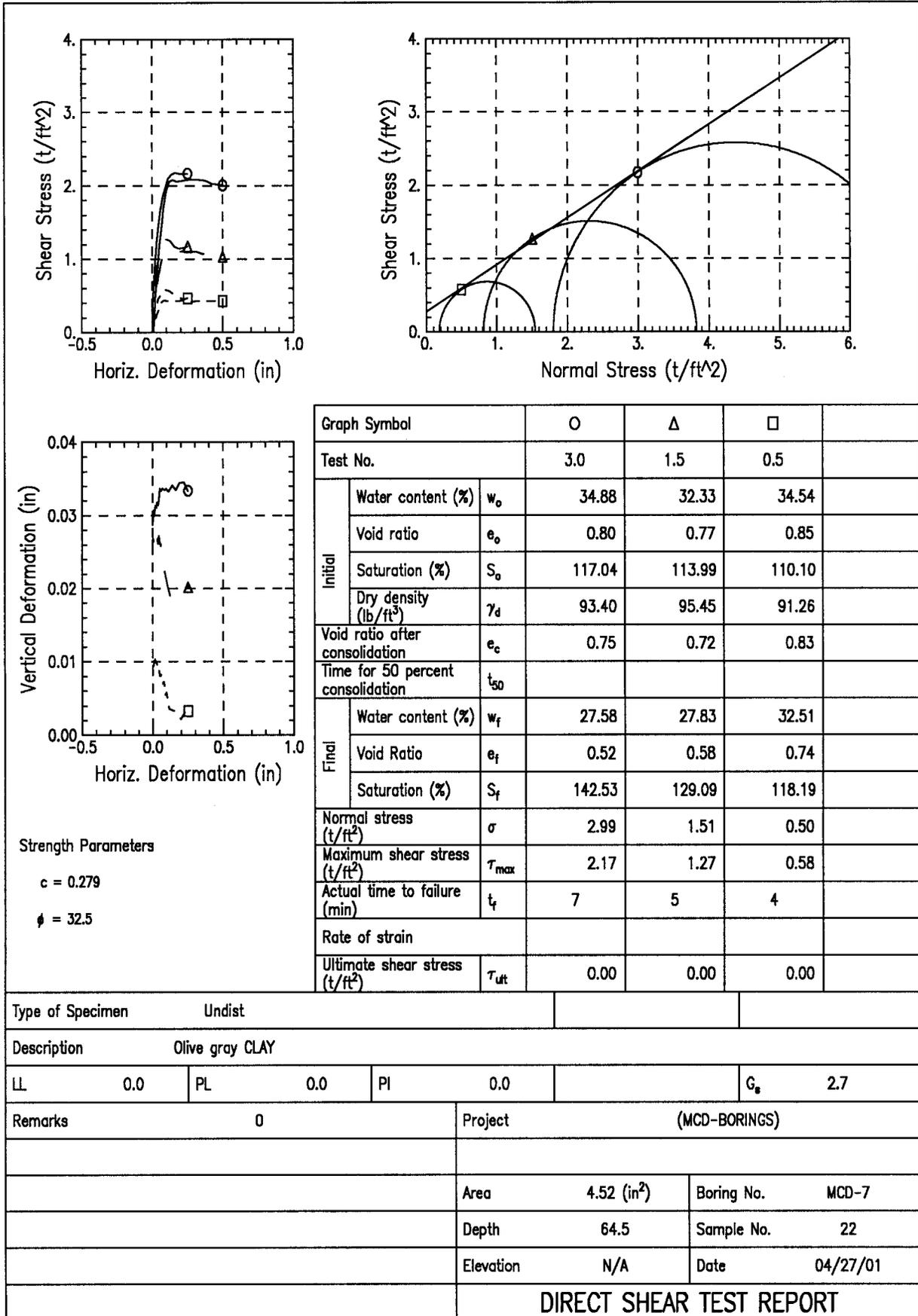
**Strength Parameters**  
 $c = 0.283$   
 $\phi = 40.1$

Graph Symbol		O	$\Delta$	$\square$
Test No.		2.5	1.5	0.5
Initial	Water content (%) $w_o$	33.88	33.30	35.83
	Void ratio $e_o$	0.81	0.81	0.83
	Saturation (%) $S_o$	112.34	110.82	116.61
	Dry density (lb/ft <sup>3</sup> ) $\gamma_d$	92.90	93.05	92.13
Void ratio after consolidation $e_c$		0.78	0.79	0.83
Time for 50 percent consolidation $t_{50}$				
Final	Water content (%) $w_f$	28.44	29.32	29.52
	Void Ratio $e_f$	0.68	0.71	0.75
	Saturation (%) $S_f$	112.43	111.59	106.29
Normal stress (t/ft <sup>2</sup> ) $\sigma$		2.50	1.50	0.50
Maximum shear stress (t/ft <sup>2</sup> ) $\tau_{max}$		2.37	1.58	0.69
Actual time to failure (min) $t_f$		4	4	2
Rate of strain				
Ultimate shear stress (t/ft <sup>2</sup> ) $\tau_{ult}$		0.00	0.00	0.00

Type of Specimen		Undist				
Description						
gray silty fine SAND w/shell fragments+mica						
LL	0.0	PL	0.0	PI	0.0	
					$G_s$	2.7
Remarks			Residual			
Project			(MCD-BORINGS)			
Area		4.52 (in <sup>2</sup> )		Boring No.		MCD-6
Depth		18.5'		Sample No.		10
Elevation		N/A		Date		04/27/01
<b>DIRECT SHEAR TEST REPORT</b>						







**Strength Parameters**

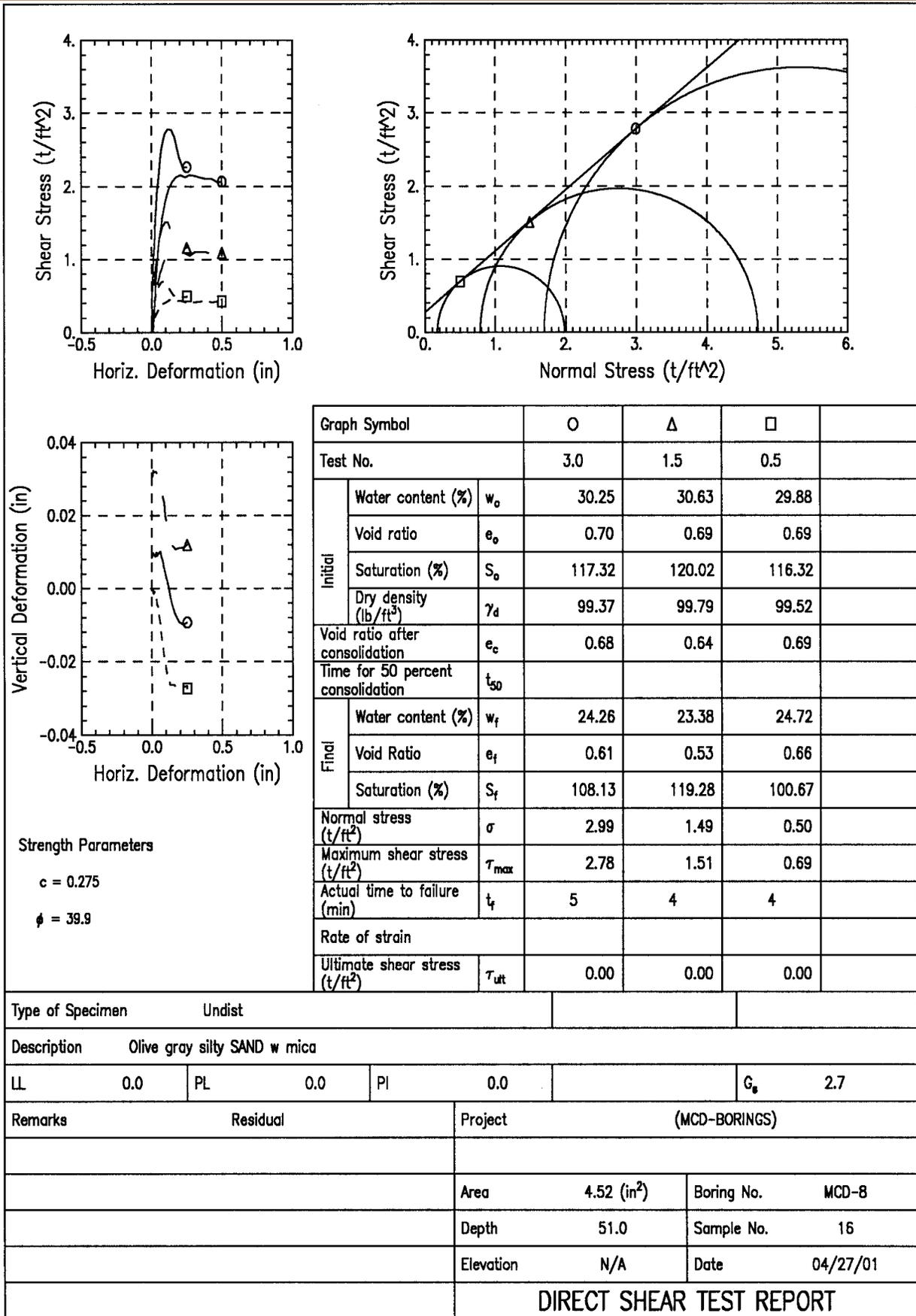
$c = 0.279$

$\phi = 32.5$

Graph Symbol		O	$\Delta$	$\square$
Test No.		3.0	1.5	0.5
Initial	Water content (%) $w_o$	34.88	32.33	34.54
	Void ratio $e_o$	0.80	0.77	0.85
	Saturation (%) $S_o$	117.04	113.99	110.10
	Dry density (lb/ft <sup>3</sup> ) $\gamma_d$	93.40	95.45	91.26
Void ratio after consolidation $e_c$		0.75	0.72	0.83
Time for 50 percent consolidation $t_{50}$				
Final	Water content (%) $w_f$	27.58	27.83	32.51
	Void Ratio $e_f$	0.52	0.58	0.74
	Saturation (%) $S_f$	142.53	129.09	118.19
Normal stress (t/ft <sup>2</sup> ) $\sigma$		2.99	1.51	0.50
Maximum shear stress (t/ft <sup>2</sup> ) $\tau_{max}$		2.17	1.27	0.58
Actual time to failure (min) $t_f$		7	5	4
Rate of strain				
Ultimate shear stress (t/ft <sup>2</sup> ) $\tau_{ult}$		0.00	0.00	0.00

Type of Specimen		Undist				
Description		Olive gray CLAY				
LL	0.0	PL	0.0	PI	0.0	
					$G_s$	2.7
Remarks			0			
Project			(MCD-BORINGS)			
Area		4.52 (in <sup>2</sup> )	Boring No.		MCD-7	
Depth		64.5	Sample No.		22	
Elevation		N/A	Date		04/27/01	
<b>DIRECT SHEAR TEST REPORT</b>						





**Strength Parameters**  
 $c = 0.275$   
 $\phi = 39.9$

Graph Symbol		O	$\Delta$	$\square$
Test No.		3.0	1.5	0.5
Initial	Water content (%) $w_o$	30.25	30.63	29.88
	Void ratio $e_o$	0.70	0.69	0.69
	Saturation (%) $S_o$	117.32	120.02	116.32
	Dry density (lb/ft <sup>3</sup> ) $\gamma_d$	99.37	99.79	99.52
Void ratio after consolidation $e_c$		0.68	0.64	0.69
Time for 50 percent consolidation $t_{50}$				
Final	Water content (%) $w_f$	24.26	23.38	24.72
	Void Ratio $e_f$	0.61	0.53	0.66
	Saturation (%) $S_f$	108.13	119.28	100.67
Normal stress (t/ft <sup>2</sup> ) $\sigma$		2.99	1.49	0.50
Maximum shear stress (t/ft <sup>2</sup> ) $\tau_{max}$		2.78	1.51	0.69
Actual time to failure (min) $t_f$		5	4	4
Rate of strain				
Ultimate shear stress (t/ft <sup>2</sup> ) $\tau_{ult}$		0.00	0.00	0.00

Type of Specimen		Undist				
Description		Olive gray silty SAND w mica				
LL	0.0	PL	0.0	PI	0.0	
					$G_s$	2.7
Remarks			Residual			
			Project (MCD-BORINGS)			
			Area	4.52 (in <sup>2</sup> )	Boring No.	MCD-8
			Depth	51.0	Sample No.	16
			Elevation	N/A	Date	04/27/01
<b>DIRECT SHEAR TEST REPORT</b>						



**APPENDIX C**  
**TOXSCAN ANALYTICAL REPORTS**



Location	Drill Dates		ToxScan Laboratory Number	Date Received
	Start	End		
MCD-1	12/11/00	12/15/00	T-19121	12/15/00 to 12/20/00
MCD-2	12/11/00	12/15/00	T-19121	12/15/00 to 12/20/00
MCD-3	11/27/00	11/27/00	T-19085	12/5/00
MCD-4	11/27/00	11/27/00	T-19085	12/5/00
MCD-5	12/11/00	12/15/00	T-19121	12/15/00 to 12/20/00
MCD-6	12/20/00	12/21/00	T-19063	12/22/00
MCD-7	12/20/00	12/21/00	T-19063	12/22/00
MCD-8	11/22/00	11/22/00	T-19065	11/28/00

**ENVIRONMENTAL TESTING SUMMARY**  
Main Channel Deepening Project  
Port of Los Angeles





42 Hangar Way • Watsonville, CA 95076-2404 • (831) 724-4522 • FAX (831) 724-3188

January 25, 2001

ToxScan Number: T-19121

Fugro West, Inc.  
4820 McGrath Street, Suite 100  
Ventura, CA 93003-7778

Attn: Philip Robins

Project Name: Main Channel Deepening  
Project Number: 00 - 32 - 3701  
Date Sampled: December 11, 2000 - December 15, 2000  
Date Received: December 15, 2000 - December 20, 2000  
Matrix: Soil

Please find the enclosed test results for the parameters requested for analyses. The samples were analyzed within holding time using the following methods:

- Organochlorine Pesticides & PCBs by EPA Method 8081
- Semivolatiles by EPA Method 8270C
- Total Arsenic by hydride AA by EPA Method 7061
- Total Mercury by Cold Vapor AA by EPA Method 7471
- Total Metals (Sb,Ba,Be,Cd,Cr,Co,Cu,Pb,Mo,Ni,Ag,Tl,V,Zn) by EPA Method 6020
- Total Recoverable Petroleum Hydrocarbons by EPA Method 1664
- Total Selenium by hydride AA by EPA Method 7741
- Volatile Organic Compounds by EPA Method 8260, conducted by McCampbell Analytical Inc.

The samples were received intact and were handled with the proper chain-of-custody procedures. Appropriate QA/QC guidelines were employed during the analyses on a minimum of a 5% basis. QC results were within limits and are reported with or following the data for each analysis.

The lower recoveries for Antimony in the QC results for this batch are attributed to matrix interference. The Antimony SRM for both the water and sediment matrix were recovered within limits indicating no analytical problems were associated with this data set.

If you have any questions or require any additional information, please feel free to call.

Sincerely,

Philip D. Carpenter, Ph.D.  
President

Enclosures

*This cover letter is an integral part of the report.*

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 22, 2000  
Date Analyzed: January 05, 2001  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19121

Client Sample ID: 7 @ 8.0 MCD-11  
ToxScan Lab ID: 19121-03

<u>Analyte</u>	<u>Wet Wt. Sample Value</u>	<u>Wet Wt. Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	ND	8.0
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	ND	160
Aroclor-1260	ND	160
Total PCB'S	ND	160

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 22, 2000  
Date Analyzed: January 05, 2001  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19121

Client Sample ID: 7 @ 10 MCD-12  
ToxScan Lab ID: 19121-08

<u>Analyte</u>	<u>Wet Wt. Sample Value</u>	<u>Wet Wt. Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	ND	8.0
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	ND	160
Aroclor-1260	ND	160
Total PCB'S	ND	160

ND = Not Detected

Client: Fugro West, Inc.  
 Method: EPA 8081  
 Date Extracted: December 22, 2000  
 Date Analyzed: January 05 & 08, 2000  
 Matrix: Soil  
 Units: ug/Kg (ppb)

ToxScan Number: T-19121

Client Sample ID: 7 @ 5.3 MCD-13  
 ToxScan Lab ID: 19121-12

<u>Analyte</u>	<u>Wet Wt. Sample Value</u>	<u>Wet Wt. Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	220	32
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	1100	160
Aroclor-1260	ND	160
Total PCB'S	1100	160

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 22, 2000  
Date Analyzed: January 05, 2001  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19121

Client Sample ID: 9 @ 7.3 MCD-5  
ToxScan Lab ID: 19121-18

<u>Analyte</u>	<u>Wet Wt. Sample Value</u>	<u>Wet Wt. Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	ND	8.0
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	ND	160
Aroclor-1260	ND	160
Total PCB'S	ND	160

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 22, 2000  
Date Analyzed: January 05, 2001  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19121

Client Sample ID: Method Blank  
ToxScan Lab ID: MB122200

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	ND	8.0
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	ND	160
Aroclor-1260	ND	160
Total PCB'S	ND	160

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 22, 2000  
Date Analyzed: January 05, 2001  
Matrix: Soil

ToxScan Number: T-19121

Quality Control Report

Surrogate recoveries expressed as percentages:

<u>Sample ID</u>	<u>Tetrachloro-m-xylene</u>	<u>Decachlorobiphenyl</u>	<u>QC Limits</u>
Lab Control Sample	77	83	50-150
Method Blank	80	82	50-150
7 @ 8.0 MCD-11	84	82	50-150
7 @ 10 MCD-12 (MS)	82	83	50-150
7 @ 10 MCD-12 (MSD)	82	80	50-150
7 @ 10 MCD-12	77	78	50-150
7 @ 5.3 MCD-13	66	78	50-150
9 @ 7.3 MCD-5	78	87	50-150

MS = Matrix Spike

MSD = Matrix Spike Duplicate

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 22, 2000  
Date Analyzed: January 05, 2001  
Matrix: Soil

ToxScan Number: T-19121

Quality Control Report

QA/QC on sample 7 @ 10 MCD-12

Spike recoveries expressed as percentages:

<u>Spiked Compound</u>	<u>MS % REC</u>	<u>MSD %REC</u>	<u>% RPD</u>	<u>QC LIMITS</u>	
				<u>% REC</u>	<u>%RPD</u>
Lindane	80	75	6	46-127	50
Heptachlor	88	85	3	35-130	31
Aldrin	88	83	6	34-132	43
Dieldrin	88	84	5	31-134	38
Endrin	93	89	4	42-139	45
4,4'-DDT	89	86	3	23-134	50

MS = Matrix Spike

MSD = Matrix Spike Duplicate

RPD = Relative Percent Difference

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 22, 2000  
Date Analyzed: January 05, 2001  
Matrix: Soil

ToxScan Number: T-19121

Quality Control Report

Spike recoveries expressed as percentages:

<u>Spiked Compound</u>	<u>LCS % REC</u>	<u>QC LIMITS % REC</u>
Lindane	75	46-127
Heptachlor	88	35-130
Aldrin	85	34-132
Dieldrin	89	31-134
Endrin	93	42-139
4,4'-DDT	89	23-134

LCS = Laboratory Control Sample

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00  
Matrix: Soil  
Units: ug/Kg (ppb) as received

ToxScan Number: T-19121

Client Sample ID: 10@3.1 MCD-11

ToxScan Lab ID: 19121-04

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00  
Matrix: Soil  
Units: ug/Kg (ppb) as received

ToxScan Number: T-19121

Client Sample ID: 10@3.1 MCD-11

ToxScan Lab ID: 19121-04

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	1000
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	ND	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00  
Matrix: Soil  
Units: ug/Kg (ppb) as received

ToxScan Number: T-19121

Client Sample ID: 8@12 MCD-12

ToxScan Lab ID: 19121-09

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00  
Matrix: Soil  
Units: ug/Kg (ppb) as received

ToxScan Number: T-19121

Client Sample ID: 8@12 MCD-12

ToxScan Lab ID: 19121-09

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	1000
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	ND	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00  
Matrix: Soil  
Units: ug/Kg (ppb) as received

ToxScan Number: T-19121

Client Sample ID: 9@6.9 MCD-13

ToxScan Lab ID: 19121-13

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00  
Matrix: Soil  
Units: ug/Kg (ppb) as received

ToxScan Number: T-19121

Client Sample ID: 9@6.9 MCD-13

ToxScan Lab ID: 19121-13

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	1000
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	ND	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
 Method: EPA 8270C  
 Date Extracted: 12/20/00  
 Date Analyzed: 12/29/00  
 Matrix: Soil  
 Units: ug/Kg (ppb) as received

ToxScan Number: T-19121

Client Sample ID: 10@10.5 MCD-5

ToxScan Lab ID: 19121-19

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00  
Matrix: Soil  
Units: ug/Kg (ppb) as received

ToxScan Number: T-19121

Client Sample ID: 10@10.5 MCD-5

ToxScan Lab ID: 19121-19

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	1000
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	130	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/30/00  
Matrix: Soil  
Units: ug/Kg (ppb) as received

ToxScan Number: T-19121

Client Sample ID: 4@3.1 MCD-1

ToxScan Lab ID: 19121-24

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/30/00  
Matrix: Soil  
Units: ug/Kg (ppb) as received

ToxScan Number: T-19121

Client Sample ID: 4@3.1 MCD-1

ToxScan Lab ID: 19121-24

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	1000
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	ND	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00  
Matrix: Soil  
Units: ug/Kg (ppb) as received

ToxScan Number: T-19121

Client Sample ID: 18@19.5 MCD-2

ToxScan Lab ID: 19121-29

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00  
Matrix: Soil  
Units: ug/Kg (ppb) as received

ToxScan Number: T-19121

Client Sample ID: 18@19.5 MCD-2

ToxScan Lab ID: 19121-29

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	1000
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	ND	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19121

ToxScan Lab ID: Method Blank

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19121

ToxScan Lab ID: Method Blank

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	1000
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	ND	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00 - 12/30/00  
Matrix: Soil

ToxScan Number: T-19121

Quality Control Report:

Surrogate recoveries expressed as percentages

<u>Sample Identification</u>	<u>S1</u>	<u>S2</u>	<u>S3</u>	<u>S4</u>	<u>S5</u>	<u>S6</u>
10@3.1 MCD-11	71	74	80	83	76	91
8@12 MCD-12	74	76	89	85	75	97
9@6.9 MCD-13	78	81	83	90	83	101
10@10.5 MCD-5	66	75	80	80	45	91
4@3.1 MCD-1	71	77	85	90	65	95
18@19.5 MCD-2	76	82	81	89	68	96
Method Blank	78	75	75	86	84	92
Laboratory Control Sample	77	81	77	80	82	96
10@3.1 MCD-11 MS	78	81	83	85	81	95
10@3.1 MCD-11 MSD	74	78	79	81	81	90

MS = Matrix Spike  
MSD = Matrix Spike Duplicate

<u>Surrogates:</u>	<u>QC Limits</u>
S1 = 2-Fluorophenol (S.S.)	25-121
S2 = Phenol-d5 (S.S.)	24-120
S3 = Nitrobenzene-d5 (S.S.)	23-120
S4 = 2-Fluorobiphenyl (S.S.)	30-120
S5 = Tribromophenol (S.S.)	19-122
S6 = Terphenyl-d14 (S.S.)	18-137

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/29/00  
Matrix: Soil

ToxScan Number: T-19121

Quality Control Report:

Spike recoveries expressed as percentages

<u>Spiked Compound</u>	<u>LCS % Rec</u>	<u>QC LIMITS % Rec</u>
Phenol	82	26-120
2-Chlorophenol	80	25-120
1,4-Dichlorobenzene	82	28-120
N-Nitrosodipropylamine	82	41-126
1,2,4-Trichlorobenzene	78	38-120
4-Chloro-3-methylphenol	82	26-120
Acenaphthene	84	31-137
2,4-Dinitrotoluene	80	28-120
4-Nitrophenol	78	11-120
Pentachlorophenol	72	17-120
Pyrene	96	35-142

LCS = Laboratory Control Sample

Client: Fugro West, Inc.  
Method: EPA 8270C  
Date Extracted: 12/20/00  
Date Analyzed: 12/30/00  
Matrix: Soil

ToxScan Number: T-19121

Quality Control Report:

Spike recoveries expressed as percentages

Client ID: 10@3.1 MCD-11

ToxScan ID: 19121-04

<u>Spiked Compound</u>	<u>MS % Rec</u>	<u>MSD % Rec</u>	<u>RPD</u>	<u>QC LIMITS</u>	
				<u>% Rec</u>	<u>RPD</u>
Phenol	82	78	5	26-120	35
2-Chlorophenol	78	76	3	25-120	50
1,4-Dichlorobenzene	78	78	0	28-120	27
N-Nitrosodipropylamine	86	82	5	41-126	38
1,2,4-Trichlorobenzene	80	80	0	38-120	23
4-Chloro-3-methylphenol	86	88	2	26-120	33
Acenaphthene	88	80	10	31-137	19
2,4-Dinitrotoluene	80	78	3	28-120	47
4-Nitrophenol	76	72	5	11-120	50
Pentachlorophenol	58	54	7	17-120	47
Pyrene	94	92	2	35-142	36

MS = Matrix Spike

MSD = Matrix Spike Duplicate

RPD = Relative Percent Difference

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 1/9/2000 - 1/24/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19121

Total Metals

<u>Client</u> <u>Sample ID</u>	<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Wet Wt.</u> <u>Sample</u> <u>Value</u>	<u>Wet</u> <u>Reporting</u> <u>Limit</u>
1 @ 0.5 MCD-11	19121-01	Antimony	ND	1.0
		Arsenic	4.9	1.0
		Barium	100	10
		Beryllium	ND	1.0
		Cadmium	ND	1.0
		Chromium	37	1.0
		Cobalt	6.0	1.0
		Copper	50	1.0
		Lead	32	1.0
		Mercury	0.23	0.20
		Molybdenum	1.1	1.0
		Nickel	18	1.0
		Selenium	ND	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	58	1.0
		Zinc	99	10

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 1/9/2000 - 1/24/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19121

Total Metals

<u>Client</u> <u>Sample ID</u>	<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Wet Wt.</u> <u>Sample</u> <u>Value</u>	<u>Wet</u> <u>Reporting</u> <u>Limit</u>
2 @ 3.4 MCD-12	19121-06	Antimony	ND	1.0
		Arsenic	1.7	1.0
		Barium	120	10
		Beryllium	ND	1.0
		Cadmium	ND	1.0
		Chromium	21	1.0
		Cobalt	3.5	1.0
		Copper	7.7	1.0
		Lead	4.0	1.0
		Mercury	ND	0.20
		Molybdenum	ND	1.0
		Nickel	8.0	1.0
		Selenium	ND	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	43	1.0
		Zinc	30	10

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 1/9/2000 - 1/24/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19121

Total Metals

<u>Client</u> <u>Sample ID</u>	<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Wet Wt.</u> <u>Sample</u> <u>Value</u>	<u>Wet</u> <u>Reporting</u> <u>Limit</u>
1 @ 0.5 MCD-13	19121-10	Antimony	ND	1.0
		Arsenic	5.4	1.0
		Barium	100	10
		Beryllium	ND	1.0
		Cadmium	ND	1.0
		Chromium	45	1.0
		Cobalt	6.6	1.0
		Copper	65	1.0
		Lead	46	1.0
		Mercury	0.43	0.20
		Molybdenum	1.0	1.0
		Nickel	20	1.0
		Selenium	ND	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	56	1.0
		Zinc	130	10

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 1/9/2000 - 1/24/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19121

Total Metals

<u>Client</u> <u>Sample ID</u>	<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Wet Wt.</u> <u>Sample</u> <u>Value</u>	<u>Wet</u> <u>Reporting</u> <u>Limit</u>
1 @ 0.5 MCD-5	19121-16	Antimony	ND	1.0
		Arsenic	5.5	1.0
		Barium	120	10
		Beryllium	ND	1.0
		Cadmium	ND	1.0
		Chromium	44	1.0
		Cobalt	5.5	1.0
		Copper	110	1.0
		Lead	21	1.0
		Mercury	ND	0.20
		Molybdenum	1.7	1.0
		Nickel	23	1.0
		Selenium	ND	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	52	1.0
		Zinc	85	10

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 1/9/2000 - 1/24/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19121

Total Metals

<u>Client</u> <u>Sample ID</u>	<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Sample</u> <u>Value</u>	<u>Reporting</u> <u>Limit</u>
8 @ 7.7 MCD-1	19121-25	Antimony	1.2	1.0
		Arsenic	6.6	1.0
		Barium	37	10
		Beryllium	ND	1.0
		Cadmium	2.6	1.0
		Chromium	59	1.0
		Cobalt	3.8	1.0
		Copper	37	1.0
		Lead	2.9	1.0
		Mercury	ND	0.20
		Molybdenum	11	1.0
		Nickel	44	1.0
		Selenium	4.3	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	100	1.0
		Zinc	72	10

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 1/9/2000 - 1/24/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19121

Total Metals

Client	ToxScan		Wet Wt.	Wet
<u>Sample ID</u>	<u>Lab ID</u>	<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
30 @ 30.5 MCD-2	19121-31	Antimony	ND	1.0
		Arsenic	4.5	1.0
		Barium	52	10
		Beryllium	ND	1.0
		Cadmium	1.5	1.0
		Chromium	64	1.0
		Cobalt	6.4	1.0
		Copper	42	1.0
		Lead	3.9	1.0
		Mercury	ND	0.20
		Molybdenum	7.4	1.0
		Nickel	47	1.0
		Selenium	1.1	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	73	1.0
		Zinc	87	10

## EXPLANATION OF ACRONYMS FOR PROJECT # T-19121

The following is a glossary for acronyms that may be used in this report.

<u>Abbreviation</u>	<u>Definition</u>
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NA	Not Applicable
ND	None Detected
REP	Replicate
RPD	Relative Percent Difference
SRM	Standard Reference Material
TOC	Total Organic Carbon

### QC FOR PROJECT # 19121

#### MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY:

Matrix: Soil

<u>Analyte</u>	<u>Sample</u>	<u>Spike Amount ppm</u>	<u>MS % Rec</u>	<u>MSD % Rec</u>	<u>RPD</u>
Antimony	19121-16	2.9	60	53	12
Arsenic	19121-16	0.29	84	102	19
Barium	19121-16	14	87	75	15
Beryllium	19121-16	0.29	97	96	1
Cadmium	19121-16	0.29	96	99	3
Chromium	19121-16	2.9	79	76	4
Cobalt	19121-16	2.9	76	77	1
Copper	19121-16	2.9	90	80	12
Lead	19121-16	1.4	93	82	13
Mercury	19121-16	0.50	71	68	4
Molybdenum	19121-16	2.9	77	77	0
Nickel	19121-16	2.9	110	94	16
Selenium	19121-16	10	67	78	15
Silver	19121-16	0.29	104	104	0
Thallium	19121-16	2.9	78	78	0
Vanadium	19121-16	2.9	80	79	1
Zinc	19121-16	2.9	85	80	6

## QC FOR PROJECT # T-19121

### LABORATORY METHOD BLANK SUMMARY

Applicable Matrix: Sediment

#### Total Metals

<u>Analyte</u>	<u>Amount</u>	<u>Reporting Limit mg/L</u>	<u>EPA Method Number</u>
Antimony	ND	1.0	6020
Arsenic	ND	0.10	7061
Barium	ND	10	6020
Beryllium	ND	1.0	6020
Cadmium	ND	1.0	6020
Chromium	ND	1.0	6020
Cobalt	ND	1.0	6020
Copper	ND	1.0	6020
Lead	ND	1.0	6020
Mercury	ND	0.20	7471
Molybdenum	ND	1.0	6020
Nickel	ND	1.0	6020
Selenium	ND	1.0	7741
Silver	ND	1.0	6020
Thallium	ND	1.0	6020
Vanadium	ND	1.0	6020
Zinc	ND	10	6020

## QC FOR PROJECT # T-19121

### SRM SUMMARY:

Matrix: Sediment

Total Metals

<u>Analyte</u>	<u>SRM Value Found</u> <u>mg/Kg</u>	<u>Certified SRM Value</u> <u>mg/Kg</u>	<u>% Recovery</u>	<u>SRM</u>
Antimony	0.827	1.02	81	MESS-3
Arsenic	21.8	21.2	103	MESS-3
Beryllium	1.78	2.30	77	MESS-3
Cadmium	0.242	0.240	101	MESS-3
Chromium	74.2	105	71	MESS-3
Cobalt	13.2	14.4	92	MESS-3
Copper	32.2	33.9	95	MESS-3
Lead	21.6	21.1	102	MESS-3
Mercury	ND	0.0910	70	MESS-3
Molybdenum	2.45	2.78	88	MESS-3
Nickel	39.9	46.9	85	MESS-3
Selenium	ND	0.720	86	MESS-3
Silver	0.181	0.180	101	MESS-3
Thallium	0.671	0.900	75	MESS-3
Vanadium	182	243	75	MESS-3
Zinc	152	159	96	MESS-3

MESS-3 = National Research Council Canada, marine sediment.

QC FOR PROJECT # T-19121

Concentrations of the following are in ug/L

SRM SUMMARY:

Matrix: Water

Total Metals

<u>Analyte</u>	<u>Amount Found</u>	<u>Dilution</u>	<u>Corrected Value</u>	<u>SRM</u>	<u>Certified Value</u>	<u>% Recovery</u>
Antimony	226	1	226	ERA 9991	226	99
Arsenic	9.80	20	196	ERA 9977	200	98
Barium	805	1	805	ERA 9991	842	96
Beryllium	647	1	647	ERA 9991	786	82
Cadmium	602	1	602	ERA 9991	611	99
Chromium	589	1	589	ERA 9991	683	86
Cobalt	785	1	785	ERA 9991	919	85
Copper	233	1	233	ERA 9991	281	83
Lead	164	1	164	ERA 9991	175	94
Mercury	5.66	1	5.66	ERA 9977	6.27	90
Molybdenum	541	1	541	ERA 9991	550	98
Nickel	2200	1	2200	ERA 9991	2570	85
Selenium	10.5	20	209	ERA 9977	200	105
Silver	178	1	178	ERA 9991	194	92
Thallium	403	1	403	ERA 9991	459	88
Vanadium	3460	1	3460	ERA 9991	4160	83
Zinc	118	1	118	ERA 9991	122	96

ERA 9977 = Environmental Resource Associates, WasteWatR Lot No. 9977

Client: Fugro West, Inc.  
 Method: EPA Method(s) 1664  
 Date Completed: 1/9/2001  
 Matrix: Soil  
 Units: mg/Kg

ToxScan Number: T-19121

<u>Client Sample ID</u>	<u>ToxScan Lab ID</u>	<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
1 @ 0.5 MCD-11	19121-01	TRPH- Gravimetric (SGT- HEM)	300	100
3 @ 4.3 MCD-11	19121-02	TRPH- Gravimetric (SGT- HEM)	ND	100
7 @ 8.0 MCD-11	19121-03	TRPH- Gravimetric (SGT- HEM)	ND	100
10 @ 3.1 MCD-11	19121-04	TRPH- Gravimetric (SGT- HEM)	ND	100
12 @ 15.9 MCD-11	19121-05	TRPH- Gravimetric (SGT- HEM)	ND	100
2 @ 3.4 MCD-12	19121-06	TRPH- Gravimetric (SGT- HEM)	ND	100
4 @ 6.8 MCD-12	19121-07	TRPH- Gravimetric (SGT- HEM)	ND	100
7 @ 10 MCD-12	19121-08	TRPH- Gravimetric (SGT- HEM)	ND	100
8 @ 12 MCD-12	19121-09	TRPH- Gravimetric (SGT- HEM)	ND	100

Client: Fugro West, Inc.  
 Method: EPA Method(s) 1664  
 Date Completed: 1/9/2001  
 Matrix: Soil  
 Units: mg/Kg

ToxScan Number: T-19121

<u>Client</u> <u>Sample ID</u>	<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Sample</u> <u>Value</u>	<u>Reporting</u> <u>Limit</u>
1 @ 0.5 MCD-13	19121-10	TRPH- Gravimetric (SGT- HEM)	430	100
4 @ 2.5 MCD-13	19121-11	TRPH- Gravimetric (SGT- HEM)	470	100
7 @ 5.3 MCD-13	19121-12	TRPH- Gravimetric (SGT- HEM)	610	100
9 @ 6.9 MCD-13	19121-13	TRPH- Gravimetric (SGT- HEM)	ND	100
13 @ 10.5 MCD-13	19121-14	TRPH- Gravimetric (SGT- HEM)	ND	100
15 @ 13.2 MCD-13	19121-15	TRPH- Gravimetric (SGT- HEM)	ND	100
1 @ 0.5 MCD-5	19121-16	TRPH- Gravimetric (SGT- HEM)	140	100
4 @ 2.3 MCD-5	19121-17	TRPH- Gravimetric (SGT- HEM)	150	100
9 @ 7.3 MCD-5	19121-18	TRPH- Gravimetric (SGT- HEM)	ND	100

Client: Fugro West, Inc.  
 Method: EPA Method(s) 1664  
 Date Completed: 1/9/2001  
 Matrix: Soil  
 Units: mg/Kg

ToxScan Number: T-19121

<u>Client</u> <u>Sample ID</u>		<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Wet Wt.</u> <u>Sample</u> <u>Value</u>	<u>Wet</u> <u>Reporting</u> <u>Limit</u>
10 @ 10.5	MCD-5	19121-19	TRPH- Gravimetric (SGT- HEM)	ND	100
14 @ 12.9	MCD-5	19121-20	TRPH- Gravimetric (SGT- HEM)	ND	100
18 @ 6.1	MCD-5	19121-21	TRPH- Gravimetric (SGT- HEM)	ND	100
1 @ 0.5	MCD-1	19121-23	TRPH- Gravimetric (SGT- HEM)	ND	100
4 @ 3.1	MCD-1	19121-24	TRPH- Gravimetric (SGT- HEM)	ND	100
8 @ 7.7	MCD-1	19121-25	TRPH- Gravimetric (SGT- HEM)	ND	100
1 @ 0.5	MCD-2	19121-26	TRPH- Gravimetric (SGT- HEM)	ND	100
11 @ 13.3	MCD-2	19121-28	TRPH- Gravimetric (SGT- HEM)	ND	100
24 @ 23.6	MCD-2	19121-30	TRPH- Gravimetric (SGT- HEM)	ND	100

QC FOR PROJECT # T-19121

LABORATORY METHOD BLANK SUMMARY

Applicable Matrix: Sediment

<u>Analyte</u>	<u>Amount</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>EPA Method Number</u>
TRPH-Gravimetric (SGT- HEM)	ND	100	mg/Kg	1664

QC FOR PROJECT # T-19121

LABORATORY PRECISION SUMMARY:

Matrix: Soil

<u>Analyte</u>	<u>REP 1</u>	<u>REP 2</u>	<u>Units</u>	<u>RPD</u>
TRPH-Gravimetric (SGT-HEM) 19121-30	ND	ND	mg/Kg	NA



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: #T.19121	Date Sampled: 12/11-12/13/2000
		Date Received: 12/20/2000
	Client Contact: Doug Clark	Date Extracted: 12/20/2000
	Client P.O: #013739	Date Analyzed: 12/20/2000

12/27/2000

Dear Doug:

Enclosed are:

- 1). the results of 4 samples from your #T.19121 project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,  
  
Edward Hamilton, Lab Director



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
 Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mcccampbell.com> E-mail: main@mcccampbell.com

Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: #T.19121	Date Sampled: 12/11-12/13/2000
		Date Received: 12/20/2000
	Client Contact: Doug Clark	Date Extracted: 12/20/2000
	Client P.O: #013739	Date Analyzed: 12/23/2000

**Volatile Organics By GC/MS**

EPA method 8260

Lab ID	56424A
Client ID	T-19121-02-B
Matrix	S

Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	ND<30	5.0	25	trans-1,3-Dichloropropene	ND	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	ND	1.0	5.0
Bromobenzene	ND	1.0	5.0	Ethylbenzene	ND	1.0	5.0
Bromochloromethane	ND	1.0	5.0	Hexachlorobutadiene	ND	5.0	25
Bromodichloromethane	ND	1.0	5.0	Iodomethane	ND	1.0	5.0
Bromoform	ND	1.0	5.0	Isopropylbenzene	ND	1.0	5.0
Bromomethane	ND	1.0	5.0	p-Isopropyl toluene	ND	1.0	5.0
n-Butyl benzene	ND	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	ND	1.0	5.0
sec-Butyl benzene	ND	1.0	5.0	Methylene Chloride <sup>(e)</sup>	ND<70	1.0	5.0
tert-Butyl benzene	ND	1.0	5.0	Methyl ethyl ketone <sup>(f)</sup>	ND	2.0	10
Carbon Disulfide	ND	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	ND	1.0	5.0
Carbon Tetrachloride	ND	1.0	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	ND	1.0	5.0	Naphthalene	ND	5.0	5.0
Chloroethane	ND	1.0	5.0	n-Propyl benzene	ND	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(c)</sup>	ND	1.0	5.0	Styrene <sup>(h)</sup>	ND	1.0	5.0
Chloroform	ND	1.0	5.0	1,1,1,2-Tetrachloroethane	ND	1.0	5.0
Chloromethane	ND	1.0	5.0	1,1,2,2-Tetrachloroethane	ND	1.0	5.0
2-Chlorotoluene	ND	1.0	5.0	Tetrachloroethene	ND<15	1.0	5.0
4-Chlorotoluene	ND	1.0	5.0	Toluene <sup>(i)</sup>	ND	1.0	5.0
Dibromochloromethane	ND	1.0	5.0	1,2,3-Trichlorobenzene	ND	5.0	25
1,2-Dibromo-3-chloropropane	ND	2.0	10	1,2,4-Trichlorobenzene	ND	5.0	25
Dibromomethane	ND	1.0	5.0	1,1,1-Trichloroethane	ND	1.0	5.0
1,2-Dichlorobenzene	ND	1.0	5.0	1,1,2-Trichloroethane	ND	1.0	5.0
1,3-Dichlorobenzene	ND	1.0	5.0	Trichloroethene	ND	1.0	5.0
1,4-Dichlorobenzene	ND	1.0	5.0	Trichlorofluoromethane	ND	1.0	5.0
Dichlorodifluoromethane	ND	1.0	5.0	1,2,3-Trichloropropane	ND	1.0	5.0
1,1-Dichloroethane	ND	1.0	5.0	1,2,4-Trimethylbenzene	ND	1.0	5.0
1,2-Dichloroethane	ND	1.0	5.0	1,3,5-Trimethylbenzene	ND	1.0	5.0
1,1-Dichloroethene	ND	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	ND	5.0	25
cis-1,2-Dichloroethene	ND	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	ND	1.0	5.0
trans-1,2-Dichloroethene	ND	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	ND	1.0	5.0	<b>Comments:</b>			
1,3-Dichloropropane	ND	1.0	5.0	<b>Surrogate Recoveries (%)</b>			
2,2-Dichloropropane	ND	1.0	5.0	Dibromofluoromethane	108		
1,1-Dichloropropene	ND	1.0	5.0	Toluene-d8	102		
cis-1,3-Dichloropropene	ND	1.0	5.0	4-Bromofluorobenzene	97		

\* water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

Edward Hamilton, Lab Director



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Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: #T.19121	Date Sampled: 12/11-12/13/2000
		Date Received: 12/20/2000
	Client Contact: Doug Clark	Date Extracted: 12/20/2000
	Client P.O.: #013739	Date Analyzed: 12/23/2000

**Volatile Organics By GC/MS**

EPA method 8260

Lab ID	56425
Client ID	T-19121-07-B
Matrix	S

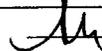
Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	ND<30	5.0	25	trans-1,3-Dichloropropene	ND	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	ND	1.0	5.0
Bromobenzene	ND	1.0	5.0	Ethylbenzene	ND	1.0	5.0
Bromochloromethane	ND	1.0	5.0	Hexachlorobutadiene	ND	5.0	25
Bromodichloromethane	ND	1.0	5.0	Iodomethane	ND	1.0	5.0
Bromoform	ND	1.0	5.0	Isopropylbenzene	ND	1.0	5.0
Bromomethane	ND	1.0	5.0	p-Isopropyl toluene	ND	1.0	5.0
n-Butyl benzene	ND	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	ND	1.0	5.0
sec-Butyl benzene	ND	1.0	5.0	Methylene Chloride <sup>(e)</sup>	ND<70	1.0	5.0
tert-Butyl benzene	ND	1.0	5.0	Methyl ethyl ketone <sup>(f)</sup>	ND	2.0	10
Carbon Disulfide	ND	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	ND	1.0	5.0
Carbon Tetrachloride	ND	1.0	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	ND	1.0	5.0	Naphthalene	ND	5.0	5.0
Chloroethane	ND	1.0	5.0	n-Propyl benzene	ND	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(c)</sup>	ND	1.0	5.0	Styrene <sup>(k)</sup>	ND	1.0	5.0
Chloroform	ND	1.0	5.0	1,1,1,2-Tetrachloroethane	ND	1.0	5.0
Chloromethane	ND	1.0	5.0	1,1,2,2-Tetrachloroethane	ND	1.0	5.0
2-Chlorotoluene	ND	1.0	5.0	Tetrachloroethene	ND<15	1.0	5.0
4-Chlorotoluene	ND	1.0	5.0	Toluene <sup>(l)</sup>	ND	1.0	5.0
Dibromochloromethane	ND	1.0	5.0	1,2,3-Trichlorobenzene	ND	5.0	25
1,2-Dibromo-3-chloropropane	ND	2.0	10	1,2,4-Trichlorobenzene	ND	5.0	25
Dibromomethane	ND	1.0	5.0	1,1,1-Trichloroethane	ND	1.0	5.0
1,2-Dichlorobenzene	ND	1.0	5.0	1,1,2-Trichloroethane	ND	1.0	5.0
1,3-Dichlorobenzene	ND	1.0	5.0	Trichloroethene	ND	1.0	5.0
1,4-Dichlorobenzene	ND	1.0	5.0	Trichlorofluoromethane	ND	1.0	5.0
Dichlorodifluoromethane	ND	1.0	5.0	1,2,3-Trichloropropane	ND	1.0	5.0
1,1-Dichloroethane	ND	1.0	5.0	1,2,4-Trimethylbenzene	ND	1.0	5.0
1,2-Dichloroethane	ND	1.0	5.0	1,3,5-Trimethylbenzene	ND	1.0	5.0
1,1-Dichloroethene	ND	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	ND	5.0	25
cis-1,2-Dichloroethene	ND	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	ND	1.0	5.0
trans-1,2-Dichloroethene	ND	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	ND	1.0	5.0	<b>Comments:</b>			
1,3-Dichloropropane	ND	1.0	5.0	<b>Surrogate Recoveries (%)</b>			
2,2-Dichloropropane	ND	1.0	5.0	Dibromofluoromethane			104
1,1-Dichloropropene	ND	1.0	5.0	Toluene-d8			99
cis-1,3-Dichloropropene	ND	1.0	5.0	4-Bromofluorobenzene			111

\*water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPL extracts in ug/L

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

 Edward Hamilton, Lab Director



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<http://www.mccampbell.com> E-mail: main@mccampbell.com

Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: #T.19121	Date Sampled: 12/11-12/13/2000
		Date Received: 12/20/2000
	Client Contact: Doug Clark	Date Extracted: 12/20/2000
	Client P.O.: #013739	Date Analyzed: 12/23/2000

**Volatile Organics By GC/MS**

EPA method 8260							
Lab ID		56426					
Client ID		T-19121-11-B					
Matrix		S					
Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	ND<30	5.0	25	trans-1,3-Dichloropropene	ND	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	ND	1.0	5.0
Bromobenzene	ND	1.0	5.0	Ethylbenzene	ND	1.0	5.0
Bromochloromethane	ND	1.0	5.0	Hexachlorobutadiene	ND	5.0	25
Bromodichloromethane	ND	1.0	5.0	Iodomethane	ND	1.0	5.0
Bromoform	ND	1.0	5.0	Isopropylbenzene	ND	1.0	5.0
Bromomethane	ND	1.0	5.0	p-Isopropyl toluene	ND	1.0	5.0
n-Butyl benzene	ND	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	ND	1.0	5.0
sec-Butyl benzene	ND	1.0	5.0	Methylene Chloride <sup>(e)</sup>	ND<70	1.0	5.0
tert-Butyl benzene	ND	1.0	5.0	Methyl ethyl ketone <sup>(f)</sup>	ND	2.0	10
Carbon Disulfide	6.9	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	ND	1.0	5.0
Carbon Tetrachloride	ND	1.0	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	ND	1.0	5.0	Naphthalene	ND	5.0	5.0
Chloroethane	ND	1.0	5.0	n-Propyl benzene	ND	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(c)</sup>	ND	1.0	5.0	Styrene <sup>(k)</sup>	ND	1.0	5.0
Chloroform	ND	1.0	5.0	1,1,1,2-Tetrachloroethane	ND	1.0	5.0
Chloromethane	ND	1.0	5.0	1,1,2,2-Tetrachloroethane	ND	1.0	5.0
2-Chlorotoluene	ND	1.0	5.0	Tetrachloroethene	ND<15	1.0	5.0
4-Chlorotoluene	ND	1.0	5.0	Toluene <sup>(l)</sup>	ND	1.0	5.0
Dibromochloromethane	ND	1.0	5.0	1,2,3-Trichlorobenzene	ND	5.0	25
1,2-Dibromo-3-chloropropane	ND	2.0	10	1,2,4-Trichlorobenzene	ND	5.0	25
Dibromomethane	ND	1.0	5.0	1,1,1-Trichloroethane	ND	1.0	5.0
1,2-Dichlorobenzene	ND	1.0	5.0	1,1,2-Trichloroethane	ND	1.0	5.0
1,3-Dichlorobenzene	ND	1.0	5.0	Trichloroethene	ND	1.0	5.0
1,4-Dichlorobenzene	ND	1.0	5.0	Trichlorofluoromethane	ND	1.0	5.0
Dichlorodifluoromethane	ND	1.0	5.0	1,2,3-Trichloropropane	ND	1.0	5.0
1,1-Dichloroethane	ND	1.0	5.0	1,2,4-Trimethylbenzene	ND	1.0	5.0
1,2-Dichloroethane	ND	1.0	5.0	1,3,5-Trimethylbenzene	ND	1.0	5.0
1,1-Dichloroethene	ND	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	ND	5.0	25
cis-1,2-Dichloroethene	ND	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	ND	1.0	5.0
trans-1,2-Dichloroethene	ND	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	ND	1.0	5.0	<b>Comments:</b>			
1,3-Dichloropropane	ND	1.0	5.0	<b>Surrogate Recoveries (%)</b>			
2,2-Dichloropropane	ND	1.0	5.0	Dibromofluoromethane	106		
1,1-Dichloropropene	ND	1.0	5.0	Toluene-d8	101		
cis-1,3-Dichloropropene	ND	1.0	5.0	4-Bromofluorobenzene	101		

\*water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

 Edward Hamilton, Lab Director



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<http://www.mccampbell.com> E-mail: main@mccampbell.com

Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: #T.19121	Date Sampled: 12/11-12/13/2000
		Date Received: 12/20/2000
	Client Contact: Doug Clark	Date Extracted: 12/20/2000
	Client P.O: #013739	Date Analyzed: 12/23/2000

**Volatile Organics By GC/MS**

EPA method 8260

Lab ID	56427
Client ID	T-19121-17-B 100-5 54627
Matrix	S

Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	ND<30	5.0	25	trans-1,3-Dichloropropene	ND	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	ND	1.0	5.0
Bromobenzene	ND	1.0	5.0	Ethylbenzene	ND	1.0	5.0
Bromochloromethane	ND	1.0	5.0	Hexachlorobutadiene	ND	5.0	25
Bromodichloromethane	ND	1.0	5.0	Iodomethane	ND	1.0	5.0
Bromoform	ND	1.0	5.0	Isopropylbenzene	ND	1.0	5.0
Bromomethane	ND	1.0	5.0	p-Isopropyl toluene	ND	1.0	5.0
n-Butyl benzene	ND	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	ND	1.0	5.0
sec-Butyl benzene	ND	1.0	5.0	Methylene Chloride <sup>(e)</sup>	ND<70	1.0	5.0
tert-Butyl benzene	ND	1.0	5.0	Methyl ethyl ketone <sup>(f)</sup>	ND	2.0	10
Carbon Disulfide	8.1	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	ND	1.0	5.0
Carbon Tetrachloride	ND	1.0	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	ND	1.0	5.0	Naphthalene	ND	5.0	5.0
Chloroethane	ND	1.0	5.0	n-Propyl benzene	ND	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(h)</sup>	ND	1.0	5.0	Styrene <sup>(k)</sup>	ND	1.0	5.0
Chloroform	ND	1.0	5.0	1,1,1,2-Tetrachloroethane	ND	1.0	5.0
Chloromethane	ND	1.0	5.0	1,1,2,2-Tetrachloroethane	ND	1.0	5.0
2-Chlorotoluene	ND	1.0	5.0	Tetrachloroethene	ND<15	1.0	5.0
4-Chlorotoluene	ND	1.0	5.0	Toluene <sup>(l)</sup>	ND	1.0	5.0
Dibromochloromethane	ND	1.0	5.0	1,2,3-Trichlorobenzene	ND	5.0	25
1,2-Dibromo-3-chloropropane	ND	2.0	10	1,2,4-Trichlorobenzene	ND	5.0	25
Dibromomethane	ND	1.0	5.0	1,1,1-Trichloroethane	ND	1.0	5.0
1,2-Dichlorobenzene	ND	1.0	5.0	1,1,2-Trichloroethane	ND	1.0	5.0
1,3-Dichlorobenzene	ND	1.0	5.0	Trichloroethene	ND	1.0	5.0
1,4-Dichlorobenzene	ND	1.0	5.0	Trichlorofluoromethane	ND	1.0	5.0
Dichlorodifluoromethane	ND	1.0	5.0	1,2,3-Trichloropropane	ND	1.0	5.0
1,1-Dichloroethane	ND	1.0	5.0	1,2,4-Trimethylbenzene	ND	1.0	5.0
1,2-Dichloroethane	ND	1.0	5.0	1,3,5-Trimethylbenzene	ND	1.0	5.0
1,1-Dichloroethene	ND	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	ND	5.0	25
cis-1,2-Dichloroethene	ND	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	ND	1.0	5.0
trans-1,2-Dichloroethene	ND	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	ND	1.0	5.0	<b>Comments:</b>			
1,3-Dichloropropane	ND	1.0	5.0	<b>Surrogate Recoveries (%)</b>			
2,2-Dichloropropane	ND	1.0	5.0	Dibromofluoromethane		104	
1,1-Dichloropropene	ND	1.0	5.0	Toluene-d8		100	
cis-1,3-Dichloropropene	ND	1.0	5.0	4-Bromofluorobenzene		108	

\* water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

Edward Hamilton, Lab Director



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Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: #T-19121	Date Sampled: 12/14-12/15/00
		Date Received: 12/21/00
	Client Contact: Doug Clark	Date Extracted: 12/21/00
	Client P.O: #01741	Date Analyzed: 12/21/00

01/02/01

Dear Doug:

Enclosed are:

- 1). the results of 2 samples from your #T-19121 project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Edward Hamilton, Lab Director



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Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: #T-19121	Date Sampled: 12/14-12/15/00
		Date Received: 12/21/00
	Client Contact: Doug Clark	Date Extracted: 12/21/00
	Client P.O.: #01741	Date Analyzed: 12/23/00

**Volatile Organics By GC/MS**

EPA method 8260

Lab ID	56600
Client ID	1 @ 0.5 MCD-1
Matrix	S

Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	ND<95	5.0	25	trans-1,3-Dichloropropene	ND	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	ND	1.0	5.0
Bromobenzene	ND	1.0	5.0	Ethylbenzene	ND	1.0	5.0
Bromochloromethane	ND	1.0	5.0	Hexachlorobutadiene	ND	5.0	25
Bromodichloromethane	ND	1.0	5.0	Iodomethane	ND	1.0	5.0
Bromoform	ND	1.0	5.0	Isopropylbenzene	ND	1.0	5.0
Bromomethane	ND	1.0	5.0	p-Isopropyl toluene	ND	1.0	5.0
n-Butyl benzene	ND	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	ND	1.0	5.0
sec-Butyl benzene	ND	1.0	5.0	Methylene Chloride <sup>(e)</sup>	ND<85	1.0	5.0
tert-Butyl benzene	ND	1.0	5.0	Methyl ethyl ketone <sup>(i)</sup>	ND	2.0	10
Carbon Disulfide	6.4	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	ND	1.0	5.0
Carbon Tetrachloride	ND	1.0	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	ND	1.0	5.0	Naphthalene	ND	5.0	5.0
Chloroethane	ND	1.0	5.0	n-Propyl benzene	ND	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(c)</sup>	ND	1.0	5.0	Styrene <sup>(k)</sup>	ND	1.0	5.0
Chloroform	ND	1.0	5.0	1,1,1,2-Tetrachloroethane	ND	1.0	5.0
Chloromethane	ND	1.0	5.0	1,1,2,2-Tetrachloroethane	ND	1.0	5.0
2-Chlorotoluene	ND	1.0	5.0	Tetrachloroethene	ND<10	1.0	5.0
4-Chlorotoluene	ND	1.0	5.0	Toluene <sup>(l)</sup>	5.5	1.0	5.0
Dibromochloromethane	ND	1.0	5.0	1,2,3-Trichlorobenzene	ND	5.0	25
1,2-Dibromo-3-chloropropane	ND	2.0	10	1,2,4-Trichlorobenzene	ND	5.0	25
Dibromomethane	ND	1.0	5.0	1,1,1-Trichloroethane	ND	1.0	5.0
1,2-Dichlorobenzene	ND	1.0	5.0	1,1,2-Trichloroethane	ND	1.0	5.0
1,3-Dichlorobenzene	ND	1.0	5.0	Trichloroethene	ND	1.0	5.0
1,4-Dichlorobenzene	ND	1.0	5.0	Trichlorofluoromethane	ND	1.0	5.0
Dichlorodifluoromethane	ND	1.0	5.0	1,2,3-Trichloropropane	ND	1.0	5.0
1,1-Dichloroethane	ND	1.0	5.0	1,2,4-Trimethylbenzene	ND	1.0	5.0
1,2-Dichloroethane	ND	1.0	5.0	1,3,5-Trimethylbenzene	ND	1.0	5.0
1,1-Dichloroethene	ND	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	ND	5.0	25
cis-1,2-Dichloroethene	ND	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	ND	1.0	5.0
trans-1,2-Dichloroethene	ND	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	ND	1.0	5.0	<b>Comments:</b>			
1,3-Dichloropropane	ND	1.0	5.0	<b>Surrogate Recoveries (%)</b>			
2,2-Dichloropropane	ND	1.0	5.0	Dibromofluoromethane			105
1,1-Dichloropropene	ND	1.0	5.0	Toluene-d8			96
cis-1,3-Dichloropropene	ND	1.0	5.0	4-Bromofluorobenzene			111

\*water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L  
 ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

Edward Hamilton, Lab Director



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
 Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: #T-19121	Date Sampled: 12/14-12/15/00
		Date Received: 12/21/00
	Client Contact: Doug Clark	Date Extracted: 12/21/00
	Client P.O: #01741	Date Analyzed: 12/23/00

**Volatile Organics By GC/MS**

EPA method 8260

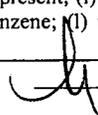
Lab ID	56601
Client ID	7 @ 7.9 MCD-2
Matrix	S

Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	ND<95	5.0	25	trans-1,3-Dichloropropene	ND	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	ND	1.0	5.0
Bromobenzene	ND	1.0	5.0	Ethylbenzene	ND	1.0	5.0
Bromochloromethane	ND	1.0	5.0	Hexachlorobutadiene	ND	5.0	25
Bromodichloromethane	ND	1.0	5.0	Iodomethane	ND	1.0	5.0
Bromoform	ND	1.0	5.0	Isopropylbenzene	ND	1.0	5.0
Bromomethane	ND	1.0	5.0	p-Isopropyl toluene	ND	1.0	5.0
n-Butyl benzene	ND	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	ND	1.0	5.0
sec-Butyl benzene	ND	1.0	5.0	Methylene Chloride <sup>(e)</sup>	ND<85	1.0	5.0
tert-Butyl benzene	ND	1.0	5.0	Methyl ethyl ketone <sup>(i)</sup>	ND	2.0	10
Carbon Disulfide	13	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	ND	1.0	5.0
Carbon Tetrachloride	ND	1.0	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	ND	1.0	5.0	Naphthalene	ND	5.0	5.0
Chloroethane	ND	1.0	5.0	n-Propyl benzene	ND	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(c)</sup>	ND	1.0	5.0	Styrene <sup>(k)</sup>	ND	1.0	5.0
Chloroform	ND	1.0	5.0	1,1,1,2-Tetrachloroethane	ND	1.0	5.0
Chloromethane	ND	1.0	5.0	1,1,2,2-Tetrachloroethane	ND	1.0	5.0
2-Chlorotoluene	ND	1.0	5.0	Tetrachloroethene	ND<10	1.0	5.0
4-Chlorotoluene	ND	1.0	5.0	Toluene <sup>(l)</sup>	65	1.0	5.0
Dibromochloromethane	ND	1.0	5.0	1,2,3-Trichlorobenzene	ND	5.0	25
1,2-Dibromo-3-chloropropane	ND	2.0	10	1,2,4-Trichlorobenzene	ND	5.0	25
Dibromomethane	ND	1.0	5.0	1,1,1-Trichloroethane	ND	1.0	5.0
1,2-Dichlorobenzene	ND	1.0	5.0	1,1,2-Trichloroethane	ND	1.0	5.0
1,3-Dichlorobenzene	ND	1.0	5.0	Trichloroethene	ND	1.0	5.0
1,4-Dichlorobenzene	ND	1.0	5.0	Trichlorofluoromethane	ND	1.0	5.0
Dichlorodifluoromethane	ND	1.0	5.0	1,2,3-Trichloropropane	ND	1.0	5.0
1,1-Dichloroethane	ND	1.0	5.0	1,2,4-Trimethylbenzene	ND	1.0	5.0
1,2-Dichloroethane	ND	1.0	5.0	1,3,5-Trimethylbenzene	ND	1.0	5.0
1,1-Dichloroethene	ND	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	ND	5.0	25
cis-1,2-Dichloroethene	ND	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	ND	1.0	5.0
trans-1,2-Dichloroethene	ND	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	ND	1.0	5.0	<b>Comments:</b>			
1,3-Dichloropropane	ND	1.0	5.0	<b>Surrogate Recoveries (%)</b>			
2,2-Dichloropropane	ND	1.0	5.0	Dibromofluoromethane		105	
1,1-Dichloropropene	ND	1.0	5.0	Toluene-d8		96	
cis-1,3-Dichloropropene	ND	1.0	5.0	4-Bromofluorobenzene		111	

\*water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L  
 ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

 Edward Hamilton, Lab Director



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## QC REPORT

### VOCs (EPA 8240/8260)

Date: 12/23/00-12/24/00 Matrix: Soil

Extraction: N/A

Compound	Concentration: ug/kg			%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	

SampleID: 12220033

Instrument: GC-10

Toluene	0.000	95.0	96.0	100.00	95	96	1.0
Benzene	0.000	100.0	101.0	100.00	100	101	1.0
Chlorobenzene	0.000	97.0	99.0	100.00	97	99	2.0
Trichloroethane	0.000	87.0	89.0	100.00	87	89	2.3
1,1-Dichloroethene	0.000	107.0	108.0	100.00	107	108	0.9

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{Amount Spiked}} \cdot 100$$

$$\text{RPD} = \frac{(MS - \text{MSD})}{(MS + \text{MSD})} \cdot 100$$

RPD means Relative Percent Deviation



42 Hangar Way • Watsonville, CA 95076-2404 • (831) 724-4522 • FAX (831) 724-3188

January 05, 2001

ToxScan Number: T-19085

Fugro West, Inc.  
5855 Olivas Park Drive  
Ventura, CA 93003-7672

Attn: Philip Robins

Project Name: None  
Project Number: 00-32-3701  
Date Sampled: November 27, 2000  
Date Received: December 05, 2000  
Matrix: Soil

Please find the enclosed test results for the parameters requested for analyses. The samples were analyzed within holding time using the following methods:

Organochlorine Pesticides & PCBs by EPA Method 8081  
Semivolatiles by EPA Method 8270C  
Total Arsenic by hydride AA by EPA Method 7061  
Total Mercury by Cold Vapor AA by EPA Method 7471  
Total Metals (Sb, Ba, Be, Cd, Cr, Co, Cu, Pb, Mo, Ni, Ag, Tl, V, Zn) by EPA Method 6020  
Total Recoverable Petroleum Hydrocarbons by EPA Method 1664  
Total Selenium by hydride AA by EPA Method 7741  
Volatile Organic Compounds by EPA Method 8260, conducted by McCampbell Analytical

The samples were received intact and were handled with the proper chain-of-custody procedures. Appropriate QA/QC guidelines were employed during the analyses on a minimum of a 5% basis. QC results were within limits and are reported with or following the data for each analysis.

EPA 8081: Due to a mishap in the laboratory, the samples were extracted one day beyond the 14 day hold time. The sample used for the mercury and selenium spiking appears to have had interferences which resulted in lower recoveries. The SRMs for both mercury and selenium were recovered at 103 and 94 percent of the certified value which are well within limits for these SRMs.

If you have any questions or require any additional information, please feel free to call.

Sincerely,

Philip D. Carpenter, Ph.D.  
President

*This cover letter is an integral part of the report.*

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 12, 2000  
Date Analyzed: December 23, 2000  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19085

Client Sample ID: S-1 @ 1.5' MCD4  
ToxScan Lab ID: 19085-01

<u>Analyte</u>	<u>Wet Wt. Sample Value</u>	<u>Wet Wt. Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	28	8.0
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	ND	160
Aroclor-1260	ND	160
Total PCB'S	ND	160

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 12, 2000  
Date Analyzed: December 24, 2000  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19085

Client Sample ID: S-2 @ 1.5' MCD3  
ToxScan Lab ID: 19085-03

<u>Analyte</u>	<u>Wet Wt. Sample Value</u>	<u>Wet Wt. Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	ND	8.0
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	ND	160
Aroclor-1260	ND	160
Total PCB'S	ND	160

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/08/00  
Date Analyzed: 12/15/00  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19085

Client Sample ID: S-1 @ 1.5' MCD4

ToxScan Lab ID: 19085-01

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc. ToxScan Number: T-19085  
 Method: EPA 8270  
 Date Extracted: 12/08/00  
 Date Analyzed: 12/15/00  
 Matrix: Soil  
 Units: ug/Kg (ppb)

Client Sample ID: S-1 @ 1.5' MCD4

ToxScan Lab ID: 19085-01

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	500
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	250	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc. ToxScan Number: T-19085  
 Method: EPA 8270  
 Date Extracted: 12/08/00  
 Date Analyzed: 12/15/00  
 Matrix: Soil  
 Units: ug/Kg (ppb)

Client Sample ID: S-2 @ 1.5' MCD3

ToxScan Lab ID: 19085-03

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/08/00  
Date Analyzed: 12/15/00  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19085

Client Sample ID: S-2 @ 1.5' MCD3

ToxScan Lab ID: 19085-03

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	500
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	ND	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 12/21/2000 - 1/4/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19085

Total Metals

<u>Client</u> <u>Sample ID</u>	<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Wet Wt.</u> <u>Sample</u> <u>Value</u>	<u>Wet</u> <u>Reporting</u> <u>Limit</u>
S-1 @ 1.5' MCD4	19085-01	Antimony	ND	1.0
		Arsenic	ND	5.0
		Barium	82	10
		Beryllium	ND	1.0
		Cadmium	ND	1.0
		Chromium	40	1.0
		Cobalt	4.5	1.0
		Copper	30	1.0
		Lead	6.9	1.0
		Mercury	ND	0.20
		Molybdenum	3.0	1.0
		Nickel	25	1.0
		Selenium	ND	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	44	1.0
		Zinc	67	10

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 12/21/2000 - 1/4/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19085

Total Metals

<u>Client</u> <u>Sample ID</u>	<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Wet Wt.</u> <u>Sample</u> <u>Value</u>	<u>Wet</u> <u>Reporting</u> <u>Limit</u>
S-3 @ 4.0' MCD4	19085-02	Antimony	ND	1.0
		Arsenic	8.5	5.0
		Barium	100	10
		Beryllium	ND	1.0
		Cadmium	ND	1.0
		Chromium	53	1.0
		Cobalt	7.1	1.0
		Copper	52	1.0
		Lead	25	1.0
		Mercury	0.51	0.20
		Molybdenum	2.3	1.0
		Nickel	27	1.0
		Selenium	ND	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	69	1.0
		Zinc	100	10

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 12/21/2000 - 1/4/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19085

Total Metals

<u>Client</u>	<u>ToxScan</u>	<u>Analyte</u>	<u>Wet Wt. Sample Value</u>	<u>Wet Reporting Limit</u>
<u>Sample ID</u>	<u>Lab ID</u>			
S-2 @ 1.5' MCD3	19085-03	Antimony	ND	1.0
		Arsenic	ND	5.0
		Barium	96	10
		Beryllium	ND	1.0
		Cadmium	ND	1.0
		Chromium	18	1.0
		Cobalt	2.3	1.0
		Copper	6.1	1.0
		Lead	1.8	1.0
		Mercury	ND	0.20
		Molybdenum	2.2	1.0
		Nickel	9.9	1.0
		Selenium	ND	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	32	1.0
		Zinc	25	10

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 12/21/2000 - 1/4/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19085

Total Metals

<b>Client</b>	<b>ToxScan</b>		<b>Sample</b>	<b>Reporting</b>
<b>Sample ID</b>	<b>Lab ID</b>	<b>Analyte</b>	<b>Value</b>	<b>Limit</b>
S-6 @ 9' MCD3	19085-04	Antimony	1.2	1.0
		Arsenic	14	5.0
		Barium	60	10
		Beryllium	ND	1.0
		Cadmium	5.2	1.0
		Chromium	71	1.0
		Cobalt	4.8	1.0
		Copper	41	1.0
		Lead	4.0	1.0
		Mercury	ND	0.20
		Molybdenum	15	1.0
		Nickel	71	1.0
		Selenium	ND	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	130	1.0
		Zinc	84	10

Client: Fugro West, Inc.  
 Method: EPA Method(s) 1664  
 Date Completed: 12/20/2000  
 Matrix: Soil  
 Units: mg/Kg

ToxScan Number: T-19085

<u>Client Sample ID</u>	<u>ToxScan Lab ID</u>	<u>Analyte</u>	<u>Wet Wt. Sample Value</u>	<u>Wet Reporting Limit</u>
S-1 @ 1.5' MCD4	19085-01	TRPH- Gravimetric (SGT- HEM)	ND	100
S-3 @ 4.0' MCD4	19085-02	TRPH- Gravimetric (SGT- HEM)	180	100
S-2 @ 1.5' MCD3	19085-03	TRPH- Gravimetric (SGT- HEM)	110	100
S-6 @ 9' MCD3	19085-04	TRPH- Gravimetric (SGT- HEM)	ND	100



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: #T-19085	Date Sampled: 11/27/00
		Date Received: 12/08/00
	Client Contact: Doug Clark	Date Extracted: 12/08/00
	Client P.O: #013708	Date Analyzed: 12/08/00

12/15/00

Dear Doug:

Enclosed are:

- 1). the results of 2 samples from your #T-19085Tm project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,  
  
Edward Hamilton, Lab Director



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Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: #T-19085	Date Sampled: 11/27/00
		Date Received: 12/08/00
	Client Contact: Doug Clark	Date Extracted: 12/08/00
	Client P.O: #013708	Date Analyzed: 12/09-12/10/00

**Volatile Organics By GC/MS**

EPA method 8260

Lab ID	55381
Client ID	T-19085-01-B MD-4 sites
Matrix	S

Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	ND	5.0	25	trans-1,3-Dichloropropene	ND	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	ND	1.0	5.0
Bromobenzene	ND	1.0	5.0	Ethylbenzene	ND	1.0	5.0
Bromochloromethane	ND	1.0	5.0	Hexachlorobutadiene	ND	5.0	25
Bromodichloromethane	ND	1.0	5.0	Iodomethane	ND	1.0	5.0
Bromoform	ND	1.0	5.0	Isopropylbenzene	ND	1.0	5.0
Bromomethane	ND	1.0	5.0	p-Isopropyl toluene	ND	1.0	5.0
n-Butyl benzene	ND	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	ND	1.0	5.0
sec-Butyl benzene	ND	1.0	5.0	Methylene Chloride <sup>(e)</sup>	ND<10	1.0	5.0
tert-Butyl benzene	ND	1.0	5.0	Methyl ethyl ketone <sup>(f)</sup>	ND	2.0	10
Carbon Disulfide	ND	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	ND	1.0	5.0
Carbon Tetrachloride	ND	1.0	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	ND	1.0	5.0	Naphthalene	ND	5.0	5.0
Chloroethane	ND	1.0	5.0	n-Propyl benzene	ND	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(e)</sup>	ND	1.0	5.0	Styrene <sup>(k)</sup>	ND	1.0	5.0
Chloroform	ND	1.0	5.0	1,1,1,2-Tetrachloroethane	ND	1.0	5.0
Chloromethane	ND	1.0	5.0	1,1,2,2-Tetrachloroethane	ND	1.0	5.0
2-Chlorotoluene	ND	1.0	5.0	Tetrachloroethene	ND<10	1.0	5.0
4-Chlorotoluene	ND	1.0	5.0	Toluene <sup>(l)</sup>	160	1.0	5.0
Dibromochloromethane	ND	1.0	5.0	1,2,3-Trichlorobenzene	ND	5.0	25
1,2-Dibromo-3-chloropropane	ND	2.0	10	1,2,4-Trichlorobenzene	ND	5.0	25
Dibromomethane	ND	1.0	5.0	1,1,1-Trichloroethane	ND	1.0	5.0
1,2-Dichlorobenzene	ND	1.0	5.0	1,1,2-Trichloroethane	ND	1.0	5.0
1,3-Dichlorobenzene	ND	1.0	5.0	Trichloroethene	ND	1.0	5.0
1,4-Dichlorobenzene	ND	1.0	5.0	Trichlorofluoromethane	ND	1.0	5.0
Dichlorodifluoromethane	ND	1.0	5.0	1,2,3-Trichloropropane	ND	1.0	5.0
1,1-Dichloroethane	ND	1.0	5.0	1,2,4-Trimethylbenzene	ND	1.0	5.0
1,2-Dichloroethane	ND	1.0	5.0	1,3,5-Trimethylbenzene	ND	1.0	5.0
1,1-Dichloroethene	ND	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	ND	5.0	25
cis-1,2-Dichloroethene	ND	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	ND	1.0	5.0
trans-1,2-Dichloroethene	ND	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	ND	1.0	5.0	<b>Comments:</b>			
1,3-Dichloropropane	ND	1.0	5.0	<b>Surrogate Recoveries (%)</b>			
2,2-Dichloropropane	ND	1.0	5.0	Dibromofluoromethane		105	
1,1-Dichloropropene	ND	1.0	5.0	Toluene-d8		99	
cis-1,3-Dichloropropene	ND	1.0	5.0	4-Bromofluorobenzene		121	

\* water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

Edward Hamilton, Lab Director



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Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: #T-19085	Date Sampled: 11/27/00
		Date Received: 12/08/00
	Client Contact: Doug Clark	Date Extracted: 12/08/00
	Client P.O.: #013708	Date Analyzed: 12/09-12/10/00

**Volatile Organics By GC/MS**

EPA method 8260

Lab ID	55382
Client ID	T-19085-03-B MD-3 S2015'
Matrix	S

Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	ND	5.0	25	trans-1,3-Dichloropropene	ND	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	ND	1.0	5.0
Bromobenzene	ND	1.0	5.0	Ethylbenzene	ND	1.0	5.0
Bromochloromethane	ND	1.0	5.0	Hexachlorobutadiene	ND	5.0	25
Bromodichloromethane	ND	1.0	5.0	Iodomethane	ND	1.0	5.0
Bromoform	ND	1.0	5.0	Isopropylbenzene	ND	1.0	5.0
Bromomethane	ND	1.0	5.0	p-Isopropyl toluene	ND	1.0	5.0
n-Butyl benzene	ND	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	ND	1.0	5.0
sec-Butyl benzene	ND	1.0	5.0	Methylene Chloride <sup>(e)</sup>	ND<10	1.0	5.0
tert-Butyl benzene	ND	1.0	5.0	Methyl ethyl ketone <sup>(f)</sup>	ND	2.0	10
Carbon Disulfide	ND	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	ND	1.0	5.0
Carbon Tetrachloride	ND	1.0	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	ND	1.0	5.0	Naphthalene	ND	5.0	5.0
Chloroethane	ND	1.0	5.0	n-Propyl benzene	ND	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(c)</sup>	ND	1.0	5.0	Styrene <sup>(k)</sup>	ND	1.0	5.0
Chloroform	ND	1.0	5.0	1,1,1,2-Tetrachloroethane	ND	1.0	5.0
Chloromethane	ND	1.0	5.0	1,1,2,2-Tetrachloroethane	ND	1.0	5.0
2-Chlorotoluene	ND	1.0	5.0	Tetrachloroethene	ND<10	1.0	5.0
4-Chlorotoluene	ND	1.0	5.0	Toluene <sup>(l)</sup>	7.0	1.0	5.0
Dibromochloromethane	ND	1.0	5.0	1,2,3-Trichlorobenzene	ND	5.0	25
1,2-Dibromo-3-chloropropane	ND	2.0	10	1,2,4-Trichlorobenzene	ND	5.0	25
Dibromomethane	ND	1.0	5.0	1,1,1-Trichloroethane	ND	1.0	5.0
1,2-Dichlorobenzene	ND	1.0	5.0	1,1,2-Trichloroethane	ND	1.0	5.0
1,3-Dichlorobenzene	ND	1.0	5.0	Trichloroethene	ND	1.0	5.0
1,4-Dichlorobenzene	ND	1.0	5.0	Trichlorofluoromethane	ND	1.0	5.0
Dichlorodifluoromethane	ND	1.0	5.0	1,2,3-Trichloropropane	ND	1.0	5.0
1,1-Dichloroethane	ND	1.0	5.0	1,2,4-Trimethylbenzene	ND	1.0	5.0
1,2-Dichloroethane	ND	1.0	5.0	1,3,5-Trimethylbenzene	ND	1.0	5.0
1,1-Dichloroethene	ND	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	ND	5.0	25
cis-1,2-Dichloroethene	ND	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	ND	1.0	5.0
trans-1,2-Dichloroethene	ND	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	ND	1.0	5.0	<b>Comments:</b>			
1,3-Dichloropropane	ND	1.0	5.0	<b>Surrogate Recoveries (%)</b>			
2,2-Dichloropropane	ND	1.0	5.0	Dibromofluoromethane		105	
1,1-Dichloropropene	ND	1.0	5.0	Toluene-d8		99	
cis-1,3-Dichloropropene	ND	1.0	5.0	4-Bromofluorobenzene		111	

\*water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

 Edward Hamilton, Lab Director

## EXPLANATION OF ACRONYMS FOR PROJECT # T-19085

The following is a glossary for acronyms that may be used in this report.

<u>Abbreviation</u>	<u>Definition</u>
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NA	Not Applicable
ND	None Detected
REP	Replicate
RPD	Relative Percent Difference
SRM	Standard Reference Material
TOC	Total Organic Carbon

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 12, 2000  
Date Analyzed: December 23, 2000  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19085

Client Sample ID: Method Blank  
ToxScan Lab ID: MB121200

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	ND	8.0
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	ND	160
Aroclor-1260	ND	160
Total PCB'S	ND	160

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 12, 2000  
Date Analyzed: December 23, 2000  
Matrix: Soil

ToxScan Number: T-19085

Quality Control Report

Surrogate recoveries expressed as percentages:

<u>Sample ID</u>	<u>Tetrachloro-m-xylene</u>	<u>Decachlorobiphenyl</u>	<u>QC Limits</u>
Method Blank	94	81	50-150
Lab Control Sample	88	87	50-150
S-1 @ 1.5' MCD4	88	81	50-150
S-2 @ 1.5' MCD3	87	84	50-150

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 12, 2000  
Date Analyzed: December 23, 2000  
Matrix: Soil

ToxScan Number: T-19085

Quality Control Report

Spike recoveries expressed as percentages:

<u>Spiked Compound</u>	<u>LCS % REC</u>	<u>QC LIMITS % REC</u>
Lindane	80	46-127
Heptachlor	88	35-130
Aldrin	88	34-132
Dieldrin	89	31-134
Endrin	96	42-139
4,4'-DDT	88	23-134

LCS = Laboratory Control Sample

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/8/00  
Date Analyzed: 12/12/00  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19085

ToxScan Lab ID: Method Blank

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/8/00  
Date Analyzed: 12/12/00  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19085

ToxScan Lab ID: Method Blank

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	500
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	ND	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/08/00  
Date Analyzed: 12/12/00 - 12/15/00  
Matrix: Soil

ToxScan Number: T-19085

Quality Control Report:

Surrogate recoveries expressed as percentages

<u>Sample Identification</u>	<u>S1</u>	<u>S2</u>	<u>S3</u>	<u>S4</u>	<u>S5</u>	<u>S6</u>
S-1 @ 1.5' MCD4	83	78	84	82	75	92
S-2 @ 1.5' MCD3	79	76	82	86	63	96
Method Blank	82	80	83	79	73	93
Laboratory Control Sample	80	78	80	77	83	88

<u>Surrogates:</u>	<u>QC Limits</u>
S1 = 2-Fluorophenol (S.S.)	25-121
S2 = Phenol-d5 (S.S.)	24-120
S3 = Nitrobenzene-d5 (S.S.)	23-120
S4 = 2-Fluorobiphenyl (S.S.)	30-120
S5 = Tribromophenol (S.S.)	19-122
S6 = Terphenyl-d14 (S.S.)	18-137

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/8/00  
Date Analyzed: 12/12/00  
Matrix: Soil

ToxScan Number: T-19085

Quality Control Report:

Spike recoveries expressed as percentages

<u>Spiked Compound</u>	<u>LCS % Rec</u>	<u>QC LIMITS % Rec</u>
Phenol	72	26-120
2-Chlorophenol	74	25-120
1,4-Dichlorobenzene	72	28-120
N-Nitrosodipropylamine	72	41-126
1,2,4-Trichlorobenzene	80	38-120
4-Chloro-3-methylphenol	80	26-120
Acenaphthene	86	31-137
2,4-Dinitrotoluene	82	28-120
4-Nitrophenol	82	11-120
Pentachlorophenol	80	17-120
Pyrene	86	35-142

LCS = Laboratory Control Sample

QC FOR PROJECT # 19085

MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY:

Matrix: Soil

<u>Analyte</u>	<u>Sample</u>	<u>Spike Amount ppm</u>	<u>MS % Rec</u>	<u>MSD % Rec</u>	<u>RPD</u>
Antimony	19091-10	2.9	70	64	9
Arsenic	19088-01	10	97	89	9
Barium	19091-10	14	90	30	100
Beryllium	19091-10	0.29	106	104	2
Cadmium	19091-10	0.29	116	105	10
Chromium	19091-10	2.9	115	111	4
Cobalt	19091-10	2.9	102	102	0
Copper	19091-10	2.9	112	114	2
Lead	19091-10	1.4	100	88	13
Mercury	19091-10	1.0	21	16	27
Molybdenum	19091-10	2.9	102	100	2
Nickel	19091-10	2.9	110	111	1
Selenium	19096-03	5.0	54	69	24
Silver	19091-10	0.29	116	109	6
Thallium	19091-10	2.9	98	99	1
Vanadium	19091-10	2.9	91	95	4
Zinc	19091-10	2.9	83	94	12

## QC FOR PROJECT # T-19085

### LABORATORY METHOD BLANK SUMMARY

Applicable Matrix: Sediment

Total Metals

<u>Analyte</u>	<u>Amount</u>	<u>Reporting Limit mg/L</u>	<u>EPA Method Number</u>
Antimony	ND	1.0	6020
Arsenic	ND	5.0	7061
Barium	ND	10	6020
Beryllium	ND	1.0	6020
Cadmium	ND	1.0	6020
Chromium	ND	1.0	6020
Cobalt	ND	1.0	6020
Copper	ND	1.0	6020
Lead	ND	1.0	6020
Mercury	ND	0.020	7471
Molybdenum	ND	1.0	6020
Nickel	ND	1.0	6020
Selenium	ND	1.0	7741
Silver	ND	1.0	6020
Thallium	ND	1.0	6020
Vanadium	ND	1.0	6020
Zinc	ND	10	6020

## QC FOR PROJECT # T-19085

### SRM SUMMARY:

Matrix: Sediment

Total Metals

<u>Analyte</u>	<u>SRM Value Found mg/Kg</u>	<u>Certified SRM Value mg/Kg</u>	<u>% Recovery</u>	<u>SRM</u>
Antimony	0.759	1.02	74	MESS-3
Arsenic	19.6	21.2	93	MESS-3
Beryllium	1.71	2.30	74	MESS-3
Cadmium	0.217	0.240	91	MESS-3
Chromium	79.3	105	76	MESS-3
Cobalt	13.8	14.4	96	MESS-3
Copper	32.9	33.9	97	MESS-3
Lead	23.9	21.1	113	MESS-3
Mercury	0.0935	0.0910	103	MESS-3
Molybdenum	2.86	2.78	103	MESS-3
Nickel	46.7	46.9	100	MESS-3
Selenium	0.642	0.720	94	MESS-3
Silver	0.172	0.180	96	MESS-3
Thallium	0.959	0.900	107	MESS-3
Vanadium	191	243	79	MESS-3
Zinc	167	159	105	MESS-3

MESS-3 = National Research Council Canada, marine sediment.

## QC FOR PROJECT # T-19085

Concentrations of the following are in ug/L

### SRM SUMMARY:

Matrix: Water

Total Metals

<u>Analyte</u>	<u>Amount Found</u>	<u>Dilution</u>	<u>Corrected Value</u>	<u>SRM</u>	<u>Certified Value</u>	<u>% Recovery</u>
Antimony	24.3	10	243	ERA 9977	227	107
Arsenic	10.9	20	217	ERA 9977	200	108
Barium	78.6	10	786	ERA 9977	673	117
Beryllium	19.2	10	192	ERA 9977	220	87
Cadmium	13.4	10	134	ERA 9977	120	112
Chromium	38.6	10	386	ERA 9977	413	94
Cobalt	61.0	10	610	ERA 9977	663	91
Copper	41.6	10	416	ERA 9977	447	93
Lead	70.2	10	702	ERA 9977	660	106
Molybdenum	24.4	10	244	ERA 9977	227	107
Nickel	51.7	10	517	ERA 9977	567	91
Selenium	0.353	20	7.06	ERA 9977	200	101
Silver	8.04	10	80.4	ERA 9977	102	79
Thallium	10.7	10	107	ERA 9977	93.3	115
Vanadium	15.3	10	153	ERA 9977	160	96
Zinc	35.4	10	354	ERA 9977	340	104

ERA 9977 = Environmental Resource Associates, WasteWatR Lot No. 9977

QC FOR PROJECT # T-19085

LABORATORY METHOD BLANK SUMMARY

Applicable Matrix: Sediment

<u>Analyte</u>	<u>Amount</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>EPA Method Number</u>
TRPH-Gravimetric (SGT- HEM)	ND	100	mg/Kg	1664



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## QC REPORT

### VOCs (EPA 8240/8260)

Date: 12/09/00-12/10/00 Matrix: Soil

Extraction: N/A

Compound	Concentration: ug/kg			%Recovery		RPD
	Sample	MS	MSD	MS	MSD	

SampleID: 120884

Instrument: GC-10

Surrogate	0.000	83.0	83.0	100.00	83	83	0.0
Toluene	0.000	87.0	93.0	100.00	87	93	6.7
Benzene	0.000	90.0	102.0	100.00	90	102	12.5
Chlorobenzene	0.000	93.0	105.0	100.00	93	105	12.1
Trichloroethane	0.000	73.0	84.0	100.00	73	84	14.0
1,1-Dichloroethene	0.000	79.0	92.0	100.00	79	92	15.2

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{AmountSpiked}} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 100$$

RPD means Relative Percent Deviation



42 Hangar Way • Watsonville, CA 95076-2404 • (831) 724-4522 • FAX (831) 724-3188

January 10, 2001

ToxScan Number: T-19063

Fugro West, Inc.  
5855 Olivas Park Drive  
Ventura, CA 93003-7672

Attn: Philip Robins

Project Name: Sewer Line Crossing  
Project Number: 00 32 3701  
Date Sampled: November 20, 2000 - November 21, 2000  
Date Received: November 22, 2000  
Matrix: Soil

Please find the enclosed test results for the parameters requested for analyses. The samples were analyzed within holding time using the following methods:

Organochlorine Pesticides & PCBs by EPA Method 8081  
Semivolatiles by EPA Method 8270C  
Total Arsenic by hydride AA by EPA Method 7061  
Total Mercury by Cold Vapor AA by EPA Method 7471  
Total Metals (Sb, Ba, Be, Cd, Cr, Co, Cu, Pb, Mo, Ni, Ag, Tl, V, Zn) by EPA Method 6020  
Total Recoverable Petroleum Hydrocarbons by EPA Method 1664  
Total Selenium by hydride AA by EPA Method 7741  
Volatile Organic Compounds by EPA Method 8260, conducted by McCampbell Analytical

The samples were received intact and were handled with the proper chain-of-custody procedures. Appropriate QA/QC guidelines were employed during the analyses on a minimum of a 5% basis. QC results were within limits and are reported with or following the data for each analysis.

If you have any questions or require any additional information, please feel free to call.

Sincerely,

Philip D. Carpenter, Ph.D.  
President

Enclosures

*This cover letter is an integral part of the report.*

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 04, 2000  
Date Analyzed: December 08, 2000  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19063

Client Sample ID: 8@13.1' MCD-7  
ToxScan Lab ID: 19063-03

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	ND	8.0
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	ND	160
Aroclor-1260	ND	160
Total PCB'S	ND	160

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 04, 2000  
Date Analyzed: December 09, 2000  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19063

Client Sample ID: 6@4.0' MCD-6  
ToxScan Lab ID: 19063-06

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	ND	8.0
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	ND	160
Aroclor-1260	ND	160
Total PCB'S	ND	160

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/12/00  
Matrix: Soil  
Units: ug/L (ppb)

ToxScan Number: T-19063

Client Sample ID: 2@2.0' MCD-7

ToxScan Lab ID: 19063-02

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
 Method: EPA 8270  
 Date Extracted: 12/04/00  
 Date Analyzed: 12/12/00  
 Matrix: Soil  
 Units: ug/L (ppb)

ToxScan Number: T-19063

Client Sample ID: 2@2.0' MCD-7

ToxScan Lab ID: 19063-02

Analyte	Sample Value	Reporting Limit
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	500
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	600 *
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	140	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

\* Reporting limit raised due to matrix interference

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00  
Matrix: Soil  
Units: ug/L (ppb)

ToxScan Number: T-19063

Client Sample ID: 3@2.0' MCD-6

ToxScan Lab ID: 19063-05

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00  
Matrix: Soil  
Units: ug/L (ppb)

ToxScan Number: T-19063

Client Sample ID: 3@2.0' MCD-6

ToxScan Lab ID: 19063-05

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	500
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	380	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 12/11/2000 - 1/8/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19063

Total Metals

<u>Client</u> <u>Sample ID</u>	<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Wet Wt.</u> <u>Sample</u> <u>Value</u>	<u>Wet</u> <u>Reporting</u> <u>Limit</u>
1 @ 1' MCD-7	19063-01	Antimony	ND	1.0
		Arsenic	1.1	1.0
		Barium	25	10
		Beryllium	ND	1.0
		Cadmium	ND	1.0
		Chromium	9.4	1.0
		Cobalt	2.8	1.0
		Copper	4.3	1.0
		Lead	2.4	1.0
		Mercury	ND	0.20
		Molybdenum	ND	1.0
		Nickel	4.7	1.0
		Selenium	ND	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	23	1.0
		Zinc	19	10

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 12/11/2000 - 1/8/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19063

Total Metals

<u>Client</u> <u>Sample ID</u>	<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Wet Wt.</u> <u>Sample</u> <u>Value</u>	<u>Wet</u> <u>Reporting</u> <u>Limit</u>
1 @ 1.0' MCD-6	19063-04	Antimony	ND	1.0
		Arsenic	6.4	1.0
		Barium	ND	10
		Beryllium	ND	1.0
		Cadmium	ND	1.0
		Chromium	ND	1.0
		Cobalt	ND	1.0
		Copper	ND	1.0
		Lead	ND	1.0
		Mercury	ND	0.20
		Molybdenum	ND	1.0
		Nickel	ND	1.0
		Selenium	ND	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	2.8	1.0
		Zinc	ND	10

Client: Fugro West, Inc.  
Method: EPA Method(s) 1664  
Date Completed: 12/7/2000  
Matrix: Soil  
Units: mg/Kg

ToxScan Number: T-19063

<u>Client</u> <u>Sample ID</u>	<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Sample</u> <u>Value</u>	<u>Reporting</u> <u>Limit</u>
1 @ 1' MCD-7	19063-01	TRPH- Gravimetric (SGT- HEM)	110	100
2 @ 2.0' MCD-7	19063-02	TRPH- Gravimetric (SGT- HEM)	ND	100
8 @ 13.1' MCD-7	19063-03	TRPH- Gravimetric (SGT- HEM)	ND	100
1 @ 1.0' MCD-6	19063-04	TRPH- Gravimetric (SGT- HEM)	ND	100
3 @ 2.0' MCD-6	19063-05	TRPH- Gravimetric (SGT- HEM)	370	100
6 @ 4.0' MCD-6	19063-06	TRPH- Gravimetric (SGT- HEM)	300	100



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<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: T-19063	Date Sampled: 11/21/00
		Date Received: 12/05/00
	Client Contact: Doug Clark	Date Extracted: 12/05/00
	Client P.O: #013689	Date Analyzed: 12/05/00

12/12/00

Dear Doug:

Enclosed are:

- 1). the results of 1 samples from your T-19063 project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,  
  
Edward Hamilton, Lab Director



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
 Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: T-19063	Date Sampled: 11/21/00
		Date Received: 12/05/00
	Client Contact: Doug Clark	Date Extracted: 12/05/00
	Client P.O.: #013689	Date Analyzed: 12/06/00

**Volatile Organics By GC/MS**

EPA method 8260

Lab ID	55018
Client ID	1 @ 1.0' MCD 66
Matrix	S

Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	ND<65	5.0	25	trans-1,3-Dichloropropene	ND	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	ND	1.0	5.0
Bromobenzene	ND	1.0	5.0	Ethylbenzene	ND	1.0	5.0
Bromochloromethane	ND	1.0	5.0	Hexachlorobutadiene	ND	5.0	25
Bromodichloromethane	ND	1.0	5.0	Iodomethane	ND	1.0	5.0
Bromoform	ND	1.0	5.0	Isopropylbenzene	ND	1.0	5.0
Bromomethane	ND	1.0	5.0	p-Isopropyl toluene	ND	1.0	5.0
n-Butyl benzene	ND	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	ND	1.0	5.0
sec-Butyl benzene	ND	1.0	5.0	Methylene Chloride <sup>(e)</sup>	ND<20	1.0	5.0
tert-Butyl benzene	ND	1.0	5.0	Methyl ethyl ketone <sup>(i)</sup>	ND	2.0	10
Carbon Disulfide	ND	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	ND	1.0	5.0
Carbon Tetrachloride	ND	1.0	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	ND	1.0	5.0	Naphthalene	ND	5.0	5.0
Chloroethane	ND	1.0	5.0	n-Propyl benzene	ND	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(c)</sup>	ND	1.0	5.0	Styrene <sup>(k)</sup>	ND	1.0	5.0
Chloroform	ND	1.0	5.0	1,1,1,2-Tetrachloroethane	ND	1.0	5.0
Chloromethane	ND	1.0	5.0	1,1,2,2-Tetrachloroethane	ND	1.0	5.0
2-Chlorotoluene	ND	1.0	5.0	Tetrachloroethene	ND	1.0	5.0
4-Chlorotoluene	ND	1.0	5.0	Toluene <sup>(l)</sup>	11	1.0	5.0
Dibromochloromethane	ND	1.0	5.0	1,2,3-Trichlorobenzene	ND	5.0	25
1,2-Dibromo-3-chloropropane	ND	2.0	10	1,2,4-Trichlorobenzene	ND	5.0	25
Dibromomethane	ND	1.0	5.0	1,1,1-Trichloroethane	ND	1.0	5.0
1,2-Dichlorobenzene	ND	1.0	5.0	1,1,2-Trichloroethane	ND	1.0	5.0
1,3-Dichlorobenzene	ND	1.0	5.0	Trichloroethene	ND	1.0	5.0
1,4-Dichlorobenzene	ND	1.0	5.0	Trichlorofluoromethane	ND	1.0	5.0
Dichlorodifluoromethane	ND	1.0	5.0	1,2,3-Trichloropropane	ND	1.0	5.0
1,1-Dichloroethane	ND	1.0	5.0	1,2,4-Trimethylbenzene	ND	1.0	5.0
1,2-Dichloroethane	ND	1.0	5.0	1,3,5-Trimethylbenzene	ND	1.0	5.0
1,1-Dichloroethene	ND	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	ND	5.0	25
cis-1,2-Dichloroethene	ND	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	ND	1.0	5.0
trans-1,2-Dichloroethene	ND	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	ND	1.0	5.0	<b>Comments:</b>			
1,3-Dichloropropane	ND	1.0	5.0	<b>Surrogate Recoveries (%)</b>			
2,2-Dichloropropane	ND	1.0	5.0	Dibromofluoromethane		106	
1,1-Dichloropropene	ND	1.0	5.0	Toluene-d8		107	
cis-1,3-Dichloropropene	ND	1.0	5.0	4-Bromofluorobenzene		82	

\*water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L  
 ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

 Edward Hamilton, Lab Director

## EXPLANATION OF ACRONYMS FOR PROJECT # T-19063

The following is a glossary for acronyms that may be used in this report.

<u>Abbreviation</u>	<u>Definition</u>
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NA	Not Applicable
ND	None Detected
REP	Replicate
RPD	Relative Percent Difference
SRM	Standard Reference Material
TOC	Total Organic Carbon

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 04, 2000  
Date Analyzed: December 08, 2000  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19063

Client Sample ID: Method Blank  
ToxScan Lab ID: MB120400

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	ND	8.0
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	ND	160
Aroclor-1260	ND	160
Total PCB'S	ND	160

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 04, 2000  
Date Analyzed: December 09, 2000  
Matrix: Soil

ToxScan Number: T-19063

Quality Control Report

QA/QC on sample 6@4.0' MCD-6

Spike recoveries expressed as percentages:

<u>Spiked Compound</u>	<u>MS % REC</u>	<u>MSD %REC</u>	<u>% RPD</u>	<u>QC LIMITS</u>	
				<u>% REC</u>	<u>%RPD</u>
Lindane	83	80	3	46-127	50
Heptachlor	88	90	3	35-130	31
Aldrin	90	93	3	34-132	43
Dieldrin	90	91	1	31-134	38
Endrin	99	100	1	42-139	45
4,4'-DDT	93	94	1	23-134	50

MS = Matrix Spike

MSD = Matrix Spike Duplicate

RPD = Relative Percent Difference

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 04, 2000  
Date Analyzed: December 08, 2000  
Matrix: Soil

ToxScan Number: T-19063

Quality Control Report

Spike recoveries expressed as percentages:

<u>Spiked Compound</u>	<u>LCS % REC</u>	<u>QC LIMITS % REC</u>
Lindane	73	46-127
Heptachlor	85	35-130
Aldrin	85	34-132
Dieldrin	86	31-134
Endrin	92	42-139
4,4'-DDT	87	23-134

LCS = Laboratory Control Sample

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19063

ToxScan Lab ID: Method Blank

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19063

ToxScan Lab ID: Method Blank

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	500
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	ND	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00 - 12/12/00  
Matrix: Soil

ToxScan Number: T-19063

Quality Control Report:

Surrogate recoveries expressed as percentages

<u>Sample Identification</u>	<u>S1</u>	<u>S2</u>	<u>S3</u>	<u>S4</u>	<u>S5</u>	<u>S6</u>
2@2.0' MCD-7	68	75	90	84	76	89
2@2.0' MCD-6	69	66	71	73	65	81
Method Blank	76	77	83	75	68	90
Laboratory Control Sample	70	66	76	73	73	90
2@2.0' MCD-7 MS	73	77	79	74	73	89
2@2.0' MCD-7 MSD	77	73	75	78	78	88

MS = Matrix Spike  
MSD = Matrix Spike Duplicate

<u>Surrogates:</u>	<u>QC Limits</u>
S1 = 2-Fluorophenol (S.S.)	21-120
S2 = Phenol-d5 (S.S.)	10-120
S3 = Nitrobenzene-d5 (S.S.)	35-120
S4 = 2-Fluorobiphenyl (S.S.)	43-120
S5 = Tribromophenol (S.S.)	10-123
S6 = Terphenyl-d14 (S.S.)	33-141

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00  
Matrix: Soil

ToxScan Number: T-19063

Quality Control Report:

Spike recoveries expressed as percentages

<u>Spiked Compound</u>	<u>LCS % Rec</u>	<u>QC LIMITS % Rec</u>
Phenol	62	26-120
2-Chlorophenol	70	25-120
1,4-Dichlorobenzene	70	28-120
N-Nitrosodipropylamine	66	41-126
1,2,4-Trichlorobenzene	86	38-120
4-Chloro-3-methylphenol	82	26-120
Acenaphthene	84	31-137
2,4-Dinitrotoluene	80	28-120
4-Nitrophenol	76	11-120
Pentachlorophenol	68	17-120
Pyrene	94	35-142

LCS = Laboratory Control Sample

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00  
Matrix: Soil

ToxScan Number: T-19063

Quality Control Report:

Spike recoveries expressed as percentages

Client ID: 2@2.0' MCD-7

ToxScan ID: 19063-02

<u>Spiked Compound</u>	<u>MS % Rec</u>	<u>MSD % Rec</u>	<u>RPD</u>	<u>QC LIMITS</u>	
				<u>% Rec</u>	<u>RPD</u>
Phenol	68	70	3	12-120	42
2-Chlorophenol	76	76	0	27-123	40
1,4-Dichlorobenzene	78	76	3	36-120	28
N-Nitrosodipropylamine	78	70	11	15-120	38
1,2,4-Trichlorobenzene	84	78	7	39-120	28
4-Chloro-3-methylphenol	78	78	0	23-120	42
Acenaphthene	84	88	5	46-120	31
2,4-Dinitrotoluene	78	76	3	24-120	38
4-Nitrophenol	74	78	5	10-120	50
Pentachlorophenol	60	70	15	9-120	50
Pyrene	104	90	14	26-127	31

MS = Matrix Spike

MSD = Matrix Spike Duplicate

RPD = Relative Percent Difference

### QC FOR PROJECT # 19063

#### MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY:

Matrix: Soil

<u>Analyte</u>	<u>Sample</u>	<u>Spike Amount ppm</u>	<u>MS % Rec</u>	<u>MSD % Rec</u>	<u>RPD</u>
Antimony	19063-01	2.9	106	106	0
Arsenic	19063-01	0.29	109	113	4
Barium	19063-01	14	78	86	10
Beryllium	19063-01	0.29	108	108	0
Cadmium	19063-01	0.29	97	110	13
Chromium	19063-01	2.9	89	94	5
Cobalt	19063-01	2.9	89	90	1
Copper	19063-01	2.9	86	88	2
Lead	19063-01	1.4	105	101	4
Mercury	19070-01	1.0	100	112	11
Molybdenum	19063-01	2.9	90	93	3
Nickel	19063-01	2.9	88	90	2
Selenium	19063-01	0.14	62	73	16
Silver	19063-01	0.29	102	99	3
Thallium	19063-01	2.9	105	108	3
Vanadium	19063-01	2.9	85	96	12
Zinc	19063-01	2.9	89	93	4

## QC FOR PROJECT # T-19063

### LABORATORY METHOD BLANK SUMMARY

Applicable Matrix: Sediment

#### Total Metals

<u>Analyte</u>	<u>Amount</u>	<u>Reporting Limit mg/L</u>	<u>EPA Method Number</u>
Antimony	ND	1.0	6020
Arsenic	ND	1.0	7061
Barium	ND	10	6020
Beryllium	ND	1.0	6020
Cadmium	ND	1.0	6020
Chromium	ND	1.0	6020
Cobalt	ND	1.0	6020
Copper	ND	1.0	6020
Lead	ND	1.0	6020
Mercury	ND	0.50	7471
Molybdenum	ND	1.0	6020
Nickel	ND	1.0	6020
Selenium	ND	1.0	7741
Silver	ND	1.0	6020
Thallium	ND	1.0	6020
Vanadium	ND	1.0	6020
Zinc	ND	10	6020

## QC FOR PROJECT # T-19063

### SRM SUMMARY:

Matrix: Sediment

Total Metals

<u>Analyte</u>	<u>SRM Value Found</u> <u>mg/Kg</u>	<u>Certified</u> <u>SRM Value</u> <u>mg/Kg</u>	<u>%</u> <u>Recovery</u>	<u>SRM</u>
Antimony	1.01	1.02	99	MESS-3
Arsenic	18.4	21.2	87	MESS-3
Beryllium	2.11	2.30	92	MESS-3
Cadmium	0.293	0.240	122	MESS-3
Chromium	81.3	105	77	MESS-3
Cobalt	13.7	14.4	95	MESS-3
Copper	32.3	33.9	95	MESS-3
Lead	20.8	21.1	98	MESS-3
Mercury	0.102	0.0910	111	MESS-3
Molybdenum	2.81	2.78	101	MESS-3
Nickel	43.4	46.9	92	MESS-3
Selenium	0.603	0.720	84	MESS-3
Silver	0.188	0.180	104	MESS-3
Thallium	0.716	0.900	80	MESS-3
Vanadium	205	243	84	MESS-3
Zinc	165	159	104	MESS-3

MESS-3 = National Research Council Canada, marine sediment.

### QC FOR PROJECT # T-19063

Concentrations of the following are in ug/L

#### SRM SUMMARY:

Matrix: Water

Total Metals

<u>Analyte</u>	<u>Amount Found</u>	<u>Dilution</u>	<u>Corrected Value</u>	<u>SRM</u>	<u>Certified Value</u>	<u>% Recovery</u>
Antimony	263	1	263	ERA 9991	226	116
Arsenic	10.1	20	201	ERA 9977	200	101
Barium	849	1	849	ERA 9991	842	101
Beryllium	801	1	801	ERA 9991	786	102
Cadmium	645	1	645	ERA 9991	611	106
Chromium	627	1	627	ERA 9991	683	92
Cobalt	836	1	836	ERA 9991	919	90
Copper	245	1	245	ERA 9991	281	87
Lead	166	1	166	ERA 9991	175	95
Mercury	5.95	1	5.95	ERA 9977	6.27	95
Molybdenum	517	1	517	ERA 9991	550	94
Nickel	2270	1	2270	ERA 9991	2570	88
Selenium	10.1	20	201	ERA 9977	200	101
Silver	186	1	186	ERA 9991	194	96
Thallium	457	1	457	ERA 9991	459	100
Vanadium	3610	1	3610	ERA 9991	4160	87
Zinc	126	1	126	ERA 9991	122	103

ERA 9977 = Environmental Resource Associates, WasteWatR Lot No. 9977

QC FOR PROJECT # T-19063

LABORATORY METHOD BLANK SUMMARY

Applicable Matrix: Sediment

<u>Analyte</u>	<u>Amount</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>EPA Method Number</u>
TRPH-Gravimetric (SGT- HEM)	ND	100	mg/Kg	1664

QC FOR PROJECT # T-19063

LABORATORY PRECISION SUMMARY:

Matrix: Soil

<u>Analyte</u>	<u>REP 1</u>	<u>REP 2</u>	<u>Units</u>	<u>RPD</u>
TRPH-Gravimetric (SGT-HEM)				
19063-06	301	297	mg/Kg	1



McCAMPBELL ANALYTICAL INC.

110 2nd Ave. South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

### QC REPORT

### VOCs (EPA 8240/8260)

Date: 12/05/00-12/06/00 Matrix: Soil

Extraction: TTLC

Compound	Concentration: ug/kg			%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	

SampleID: 112300

Instrument: GC-10

Surrogate	0.000	98.0	99.0	100.00	98	99	1.0
Toluene	0.000	97.0	94.0	100.00	97	94	3.1
Benzene	0.000	108.0	102.0	100.00	108	102	5.7
Chlorobenzene	0.000	102.0	99.0	100.00	102	99	3.0
Trichloroethane	0.000	74.0	74.0	100.00	74	74	0.0
1,1-Dichloroethene	0.000	81.0	82.0	100.00	81	82	1.2

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{AmountSpiked}} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 2 \cdot 100$$

RPD means Relative Percent Deviation



42 Hangar Way • Watsonville, CA 95076-2404 • (831) 724-4522 • FAX (831) 724-3188

January 10, 2001

ToxScan Number: T-19065

Fugro West, Inc.  
5855 Olivas Park Drive  
Ventura, CA 93003-7672

Attn: Philip Robins

Project Name: Sewer Line Crossing  
Project Number: 00 32 3701  
Date Sampled: November 22, 2000  
Date Received: November 28, 2000  
Matrix: Soil

Please find the enclosed test results for the parameters requested for analyses. The samples were analyzed within holding time using the following methods:

Organochlorine Pesticides & PCBs by EPA Method 8081  
Semivolatiles by EPA Method 8270C  
Total Arsenic by hydride AA by EPA Method 7061  
Total Mercury by Cold Vapor AA by EPA Method 7471  
Total Metals (Sb,Ba,Be,Cd,Cr,Co,Cu,Pb,Mo,Ni,Ag,Tl,V,Zn) by EPA Method 6020  
Total Recoverable Petroleum Hydrocarbons by EPA Method 1664  
Total Selenium by hydride AA by EPA Method 7741  
Volatile Organic Compounds by EPA Method 8260, conducted by McCampbell Analytical

The samples were received intact and were handled with the proper chain-of-custody procedures. Appropriate QA/QC guidelines were employed during the analyses on a minimum of a 5% basis. QC results were within limits and are reported with or following the data for each analysis.

If you have any questions or require any additional information, please feel free to call.

Sincerely,

Philip D. Carpenter, Ph.D.  
President

Enclosures

*This cover letter is an integral part of the report.*

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 04, 2000  
Date Analyzed: December 08, 2000  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19065

Client Sample ID: 103@2.0 MCD8  
ToxScan Lab ID: 19065-02

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	ND	8.0
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	ND	160
Aroclor-1260	ND	160
Total PCB'S	ND	160

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19065

Client Sample ID: 105 @ 4.5 MCD8

ToxScan Lab ID: 19065-03

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19065

Client Sample ID: 105 @ 4.5 MCD8

ToxScan Lab ID: 19065-03

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	500
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	170	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
 Method: EPA Method(s) 6020 7061 7471 7741  
 Date Completed: 12/11/2000 - 1/8/2001  
 Matrix: Soil  
 Units: mg/kg

ToxScan Number: T-19065

Total Metals

<u>Client</u> <u>Sample ID</u>	<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Wet Wt.</u> <u>Sample</u> <u>Value</u>	<u>Wet</u> <u>Reporting</u> <u>Limit</u>
102 @ 1.5 MCD8	19065-01	Antimony	ND	1.0
		Arsenic	2.9	1.0
		Barium	49	10
		Beryllium	ND	1.0
		Cadmium	ND	1.0
		Chromium	12	1.0
		Cobalt	3.6	1.0
		Copper	4.4	1.0
		Lead	1.8	1.0
		Mercury	ND	0.20
		Molybdenum	ND	1.0
		Nickel	6.4	1.0
		Selenium	ND	1.0
		Silver	ND	1.0
		Thallium	ND	1.0
		Vanadium	31	1.0
		Zinc	25	10

Client: Fugro West, Inc.  
Method: EPA Method(s) 1664  
Date Completed: 12/7/2000  
Matrix: Soil  
Units: mg/Kg

ToxScan Number: T-19065

<u>Client</u> <u>Sample ID</u>		<u>ToxScan</u> <u>Lab ID</u>	<u>Analyte</u>	<u>Sample</u> <u>Value</u>	<u>Reporting</u> <u>Limit</u>
102 @ 1.5	MCD8	19065-01	TRPH- Gravimetric (SGT- HEM)	210	100
103 @ 2.0	MCD8	19065-02	TRPH- Gravimetric (SGT- HEM)	ND	100
105 @ 4.5	MCD8	19065-03	TRPH- Gravimetric (SGT- HEM)	ND	100
106 @ 5.0	MCD8	19065-04	TRPH- Gravimetric (SGT- HEM)	ND	100



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: T-19065	Date Sampled: 11/22/00
		Date Received: 12/05/00
	Client Contact: Doug Clark	Date Extracted: 12/05/00
	Client P.O: #013690	Date Analyzed: 12/005/00

12/12/00

Dear Doug:

Enclosed are:

- 1). the results of 1 samples from your T-19065 project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,  
  
Edward Hamilton, Lab Director



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Toxscan 42 Hangar Way Watsonville, CA 95076	Client Project ID: T-19065	Date Sampled: 11/22/00
		Date Received: 12/05/00
	Client Contact: Doug Clark	Date Extracted: 12/05/00
	Client P.O: #013690	Date Analyzed: 12/06/00

**Volatile Organics By GC/MS**

EPA method 8260

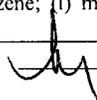
Lab ID	55019
Client ID	106 @ 5.0 MCD 8
Matrix	S

Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	ND<30	5.0	25	trans-1,3-Dichloropropene	ND	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	ND	1.0	5.0
Bromobenzene	ND	1.0	5.0	Ethylbenzene	ND	1.0	5.0
Bromochloromethane	ND	1.0	5.0	Hexachlorobutadiene	ND	5.0	25
Bromodichloromethane	ND	1.0	5.0	Iodomethane	ND	1.0	5.0
Bromoform	ND	1.0	5.0	Isopropylbenzene	ND	1.0	5.0
Bromomethane	ND	1.0	5.0	p-Isopropyl toluene	ND	1.0	5.0
n-Butyl benzene	ND	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	ND	1.0	5.0
sec-Butyl benzene	ND	1.0	5.0	Methylene Chloride <sup>(e)</sup>	ND<15	1.0	5.0
tert-Butyl benzene	ND	1.0	5.0	Methyl ethyl ketone <sup>(i)</sup>	ND	2.0	10
Carbon Disulfide	ND	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	ND	1.0	5.0
Carbon Tetrachloride	ND	1.0	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	ND	1.0	5.0	Naphthalene	ND	5.0	5.0
Chloroethane	ND	1.0	5.0	n-Propyl benzene	ND	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(c)</sup>	ND	1.0	5.0	Styrene <sup>(k)</sup>	ND	1.0	5.0
Chloroform	ND	1.0	5.0	1,1,1,2-Tetrachloroethane	ND	1.0	5.0
Chloromethane	ND	1.0	5.0	1,1,2,2-Tetrachloroethane	ND	1.0	5.0
2-Chlorotoluene	ND	1.0	5.0	Tetrachloroethene	ND	1.0	5.0
4-Chlorotoluene	ND	1.0	5.0	Toluene <sup>(l)</sup>	45	1.0	5.0
Dibromochloromethane	ND	1.0	5.0	1,2,3-Trichlorobenzene	ND	5.0	25
1,2-Dibromo-3-chloropropane	ND	2.0	10	1,2,4-Trichlorobenzene	ND	5.0	25
Dibromomethane	ND	1.0	5.0	1,1,1-Trichloroethane	ND	1.0	5.0
1,2-Dichlorobenzene	ND	1.0	5.0	1,1,2-Trichloroethane	ND	1.0	5.0
1,3-Dichlorobenzene	ND	1.0	5.0	Trichloroethene	ND	1.0	5.0
1,4-Dichlorobenzene	ND	1.0	5.0	Trichlorofluoromethane	ND	1.0	5.0
Dichlorodifluoromethane	ND	1.0	5.0	1,2,3-Trichloropropane	ND	1.0	5.0
1,1-Dichloroethane	ND	1.0	5.0	1,2,4-Trimethylbenzene	ND	1.0	5.0
1,2-Dichloroethane	ND	1.0	5.0	1,3,5-Trimethylbenzene	ND	1.0	5.0
1,1-Dichloroethene	ND	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	ND	5.0	25
cis-1,2-Dichloroethene	ND	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	ND	1.0	5.0
trans-1,2-Dichloroethene	ND	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	ND	1.0	5.0	<b>Comments:</b>			
1,3-Dichloropropane	ND	1.0	5.0	<b>Surrogate Recoveries (%)</b>			
2,2-Dichloropropane	ND	1.0	5.0	Dibromofluoromethane		108	
1,1-Dichloropropene	ND	1.0	5.0	Toluene-d8		108	
cis-1,3-Dichloropropene	ND	1.0	5.0	4-Bromofluorobenzene		75	

\*water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L  
 ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

 Edward Hamilton, Lab Director

## EXPLANATION OF ACRONYMS FOR PROJECT # T-19065

The following is a glossary for acronyms that may be used in this report.

<u>Abbreviation</u>	<u>Definition</u>
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NA	Not Applicable
ND	None Detected
REP	Replicate
RPD	Relative Percent Difference
SRM	Standard Reference Material
TOC	Total Organic Carbon

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 04, 2000  
Date Analyzed: December 08, 2000  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19065

Client Sample ID: Method Blank  
ToxScan Lab ID: MB120400

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Aldrin	ND	8.0
alpha-BHC	ND	8.0
beta-BHC	ND	8.0
delta-BHC	ND	8.0
gamma-BHC	ND	8.0
alpha-Chlordane	ND	8.0
gamma-Chlordane	ND	8.0
4,4'-DDD	ND	8.0
4,4'-DDE	ND	8.0
4,4'-DDT	ND	8.0
Dieldrin	ND	8.0
Endosulfan I	ND	16
Endosulfan II	ND	16
Endosulfan Sulfate	ND	16
Endrin	ND	16
Endrin Aldehyde	ND	16
Endrin Ketone	ND	16
Heptachlor	ND	8.0
Heptachlor Epoxide	ND	8.0
Methoxychlor	ND	80
Toxaphene	ND	160
Aroclor-1016	ND	160
Aroclor-1221	ND	160
Aroclor-1232	ND	160
Aroclor-1242	ND	160
Aroclor-1248	ND	160
Aroclor-1254	ND	160
Aroclor-1260	ND	160
Total PCB'S	ND	160

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 04, 2000  
Date Analyzed: December 08, 2000  
Matrix: Soil

ToxScan Number: T-19065

Quality Control Report

Surrogate recoveries expressed as percentages:

<u>Sample ID</u>	<u>Tetrachloro-m-xylene</u>	<u>Decachlorobiphenyl</u>	<u>QC Limits</u>
Lab Control Sample	85	84	50-150
Method Blank	88	86	50-150
103@2.0 MCD8	84	83	50-150

Client: Fugro West, Inc.  
Method: EPA 8081  
Date Extracted: December 04, 2000  
Date Analyzed: December 08, 2000  
Matrix: Soil

ToxScan Number: T-19065

Quality Control Report

Spike recoveries expressed as percentages:

<u>Spiked Compound</u>	<u>LCS % REC</u>	<u>QC LIMITS % REC</u>
Lindane	73	46-127
Heptachlor	85	35-130
Aldrin	85	34-132
Dieldrin	86	31-134
Endrin	92	42-139
4,4'-DDT	87	23-134

LCS = Laboratory Control Sample

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19065

ToxScan Lab ID: Method Blank

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
Phenol	ND	200
Bis(2-chloroethyl)ether	ND	1000
2-Chlorophenol	ND	200
1,3-Dichlorobenzene	ND	100
1,4-Dichlorobenzene	ND	100
Benzyl alcohol	ND	1000
1,2-Dichlorobenzene	ND	100
2-Methylphenol	ND	200
Bis(2-chloroisopropyl)ether	ND	200
Hexachloroethane	ND	200
N-Nitrosodipropylamine	ND	1000
4-Methylphenol	ND	200
Nitrobenzene	ND	500
Isophorone	ND	500
2-Nitrophenol	ND	200
2,4-Dimethylphenol	ND	200
Bis(2-chloroethoxy)methane	ND	1000
2,4-Dichlorophenol	ND	100
Benzoic acid	ND	1000
1,2,4-Trichlorobenzene	ND	100
Naphthalene	ND	100
4-Chloroaniline	ND	500
Hexachlorobutadiene	ND	200
4-Chloro-3-methylphenol	ND	100
2-Methylnaphthalene	ND	100
Hexachlorocyclopentadiene	ND	200
2,4,6-Trichlorophenol	ND	100
2,4,5-Trichlorophenol	ND	100
2-Chloronaphthalene	ND	100
2-Nitroaniline	ND	200
Acenaphthylene	ND	100
Dimethylphthalate	ND	100
2,6-Dinitrotoluene	ND	100
Acenaphthene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00  
Matrix: Soil  
Units: ug/Kg (ppb)

ToxScan Number: T-19065

ToxScan Lab ID: Method Blank

<u>Analyte</u>	<u>Sample Value</u>	<u>Reporting Limit</u>
3-Nitroaniline	ND	200
2,4-Dinitrophenol	ND	500
Dibenzofuran	ND	100
2,4-Dinitrotoluene	ND	100
4-Nitrophenol	ND	500
Fluorene	ND	100
4-Chlorophenyl phenyl ether	ND	100
Diethylphthalate	ND	100
4-Nitroaniline	ND	200
4,6-Dinitro-2-methylphenol	ND	500
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	100
4-Bromophenyl phenyl ether	ND	100
Hexachlorobenzene	ND	100
Pentachlorophenol	ND	500
Phenanthrene	ND	100
Anthracene	ND	100
Carbazole	ND	200
Di-n-butylphthalate	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Butyl benzyl phthalate	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
3,3'-Dichlorobenzidine	ND	200
Bis(2-ethylhexyl)phthalate	ND	100
Di-n-octylphthalate	ND	1000
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenzo(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100

ND = Not Detected

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00 - 12/12/00  
Matrix: Soil

ToxScan Number: T-19065

Quality Control Report:

Surrogate recoveries expressed as percentages

<u>Sample Identification</u>	<u>S1</u>	<u>S2</u>	<u>S3</u>	<u>S4</u>	<u>S5</u>	<u>S6</u>
105 @ 4.5 MCD8	64	66	74	78	65	95
Method Blank	76	77	83	75	68	90
Laboratory Control Sample	70	66	76	73	73	90

MS = Matrix Spike  
MSD = Matrix Spike Duplicate

<u>Surrogates:</u>	<u>QC Limits</u>
S1 = 2-Fluorophenol (S.S.)	21-120
S2 = Phenol-d5 (S.S.)	10-120
S3 = Nitrobenzene-d5 (S.S.)	35-120
S4 = 2-Fluorobiphenyl (S.S.)	43-120
S5 = Tribromophenol (S.S.)	10-123
S6 = Terphenyl-d14 (S.S.)	33-141

Client: Fugro West, Inc.  
Method: EPA 8270  
Date Extracted: 12/04/00  
Date Analyzed: 12/11/00  
Matrix: Soil

ToxScan Number: T-19065

Quality Control Report:

Spike recoveries expressed as percentages

<u>Spiked Compound</u>	<u>LCS % Rec</u>	<u>QC LIMITS % Rec</u>
Phenol	62	26-120
2-Chlorophenol	70	25-120
1,4-Dichlorobenzene	70	28-120
N-Nitrosodipropylamine	66	41-126
1,2,4-Trichlorobenzene	86	38-120
4-Chloro-3-methylphenol	82	26-120
Acenaphthene	84	31-137
2,4-Dinitrotoluene	80	28-120
4-Nitrophenol	76	11-120
Pentachlorophenol	68	17-120
Pyrene	94	35-142

LCS = Laboratory Control Sample

QC FOR PROJECT # 19065

MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY:

Matrix: Soil

<u>Analyte</u>	<u>Sample</u>	<u>Spike Amount ppm</u>	<u>MS % Rec</u>	<u>MSD % Rec</u>	<u>RPD</u>
Antimony	19063-01	2.9	106	106	0
Arsenic	19063-01	0.29	109	113	4
Barium	19063-01	14	78	86	10
Beryllium	19063-01	0.29	108	108	0
Cadmium	19063-01	0.29	97	110	13
Chromium	19063-01	2.9	89	94	5
Cobalt	19063-01	2.9	89	90	1
Copper	19063-01	2.9	86	88	2
Lead	19063-01	1.4	105	101	4
Mercury	19070-01	1.0	100	112	11
Molybdenum	19063-01	2.9	90	93	3
Nickel	19063-01	2.9	88	90	2
Selenium	19063-01	0.14	62	73	16
Silver	19063-01	0.29	102	99	3
Thallium	19063-01	2.9	105	108	3
Vanadium	19063-01	2.9	85	96	12
Zinc	19063-01	2.9	89	93	4

QC FOR PROJECT # T-19065

LABORATORY METHOD BLANK SUMMARY

Applicable Matrix: Sediment

Total Metals

<u>Analyte</u>	<u>Amount</u>	<u>Reporting Limit mg/L</u>	<u>EPA Method Number</u>
Antimony	ND	1.0	6020
Arsenic	ND	1.0	7061
Barium	ND	10	6020
Beryllium	ND	1.0	6020
Cadmium	ND	1.0	6020
Chromium	ND	1.0	6020
Cobalt	ND	1.0	6020
Copper	ND	1.0	6020
Lead	ND	1.0	6020
Mercury	ND	0.50	7471
Molybdenum	ND	1.0	6020
Nickel	ND	1.0	6020
Selenium	ND	1.0	7741
Silver	ND	1.0	6020
Thallium	ND	1.0	6020
Vanadium	ND	1.0	6020
Zinc	ND	10	6020

QC FOR PROJECT # T-19065

SRM SUMMARY:

Matrix: Sediment

Total Metals

<u>Analyte</u>	<u>SRM Value Found</u> <u>mg/Kg</u>	<u>Certified</u> <u>SRM Value</u> <u>mg/Kg</u>	<u>%</u> <u>Recovery</u>	<u>SRM</u>
Antimony	1.01	1.02	99	MESS-3
Arsenic	18.4	21.2	87	MESS-3
Beryllium	2.11	2.30	92	MESS-3
Cadmium	0.293	0.240	122	MESS-3
Chromium	81.3	105	77	MESS-3
Cobalt	13.7	14.4	95	MESS-3
Copper	32.3	33.9	95	MESS-3
Lead	20.8	21.1	98	MESS-3
Mercury	0.102	0.0910	111	MESS-3
Molybdenum	2.81	2.78	101	MESS-3
Nickel	43.4	46.9	92	MESS-3
Selenium	0.603	0.720	84	MESS-3
Silver	0.188	0.180	104	MESS-3
Thallium	0.716	0.900	80	MESS-3
Vanadium	205	243	84	MESS-3
Zinc	165	159	104	MESS-3

MESS-3 = National Research Council Canada, marine sediment.

QC FOR PROJECT # T-19065

Concentrations of the following are in ug/L

SRM SUMMARY:

Matrix: Water

Total Metals

<u>Analyte</u>	<u>Amount Found</u>	<u>Dilution</u>	<u>Corrected Value</u>	<u>SRM</u>	<u>Certified Value</u>	<u>% Recovery</u>
Antimony	263	1	263	ERA 9991	226	116
Arsenic	10.1	20	201	ERA 9977	200	101
Barium	849	1	849	ERA 9991	842	101
Beryllium	801	1	801	ERA 9991	786	102
Cadmium	645	1	645	ERA 9991	611	106
Chromium	627	1	627	ERA 9991	683	92
Cobalt	836	1	836	ERA 9991	919	90
Copper	245	1	245	ERA 9991	281	87
Lead	166	1	166	ERA 9991	175	95
Mercury	5.95	1	5.95	ERA 9977	6.27	95
Molybdenum	517	1	517	ERA 9991	550	94
Nickel	2270	1	2270	ERA 9991	2570	88
Selenium	10.1	20	201	ERA 9977	200	101
Silver	186	1	186	ERA 9991	194	96
Thallium	457	1	457	ERA 9991	459	100
Vanadium	3610	1	3610	ERA 9991	4160	87
Zinc	126	1	126	ERA 9991	122	103

ERA 9977 = Environmental Resource Associates, WasteWatR Lot No. 9977

**QC FOR PROJECT # T-19065**

LABORATORY METHOD BLANK SUMMARY

Applicable Matrix: Sediment

<u>Analyte</u>	<u>Amount</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>EPA Method Number</u>
TRPH-Gravimetric (SGT- HEM)	ND	100	mg/Kg	1664

QC FOR PROJECT # T-19065

LABORATORY PRECISION SUMMARY:

Matrix: Soil

<u>Analyte</u>	<u>REP 1</u>	<u>REP 2</u>	<u>Units</u>	<u>RPD</u>
TRPH-Gravimetric (SGT-HEM)				
19063-06	301	297	mg/Kg	1



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## QC REPORT

### VOCs (EPA 8240/8260)

Date: 12/05/00-12/06/00 Matrix: Soil

Extraction: TTLC

Compound	Concentration: ug/kg			%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	

SampleID: 112300

Instrument: GC-10

Surrogate	0.000	98.0	99.0	100.00	98	99	1.0
Toluene	0.000	97.0	94.0	100.00	97	94	3.1
Benzene	0.000	108.0	102.0	100.00	108	102	5.7
Chlorobenzene	0.000	102.0	99.0	100.00	102	99	3.0
Trichloroethane	0.000	74.0	74.0	100.00	74	74	0.0
1,1-Dichloroethene	0.000	81.0	82.0	100.00	81	82	1.2

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{Amount Spiked}} \cdot 100$$

$$\text{RPD} = \frac{(MS - \text{MSD})}{(MS + \text{MSD})} \cdot 2 \cdot 100$$

RPD means Relative Percent Deviation