
REPORT
ADDITIONAL SUBSURFACE INVESTIGATION
OPERABLE UNIT S-5
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

 **DAMES & MOORE**

SAC87.18

DECEMBER 1993
JOB NO. 00173-076-044



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December 7, 1993

Mr. Tony Landis
Region 1, Department of Toxic Substances Control
California Environmental Protection Agency
10151 Croydon Way, Suite 3
Sacramento, CA 95827

Attention: Mr. James L. Tjosvold, P.E.
Sacramento Responsible Party Unit
Site Mitigation Program

Re: Transmittal
OU S-5 Additional Subsurface Investigation Report
Union Pacific Railroad Yard
Sacramento, California
D&M Project No. 00173-076-044

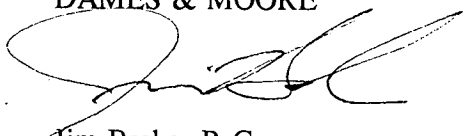
Dear Mr. Tjosvold:

Union Pacific Railroad Company (UPRR) has requested that Dames & Moore transmit the above-referenced report. The report presents the results of subsurface investigation around former boring ATB-11 in the northeastern portion of Operable Unit S-5 (the active yard).

If you have any questions, please contact Jim Brake at (916) 387-730.

Sincerely,

DAMES & MOORE



Jim Brake, R.G.
Project Manager



John Fawcett, P.E.
Lead Consultant

Enclosure

cc: Distribution List

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REPORT
ADDITIONAL SUBSURFACE INVESTIGATION
OPERABLE UNIT S-5
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

1.0 INTRODUCTION

Dames & Moore is pleased to present this Additional Subsurface Investigation Report for Operable Unit (OU) S-5 at the Union Pacific Railroad (UPRR) Yard, Sacramento, California (the site). OU S-5 is one of five operable units of soil designated for the site-based on-site geography, potential future land uses, and contaminant types. OU S-5 encompasses the currently active portion of the railyard.

This report presents a summary of sampling activities and results of soil and shallow groundwater investigation completed in OU S-5 in October 1993. Results of previous investigations in OU S-5 and the site in general are provided in the Remedial Investigation Supplement (Dames & Moore, 1992), Remedial Investigation/Feasibility Study (RI/FS) Report (Dames & Moore, 1991a), and the Addendum RI/FS Report (Dames & Moore, 1991b).

The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) directed UPRR to conduct the additional subsurface investigation in OU S-5, based on results of previous soil investigation performed in OU S-5 in December 1991. Results of that investigation are presented in Section 2.0 of this report. The purpose of this investigation was to define the lateral and vertical extent of petroleum hydrocarbon impacts in soil around the boring in which impacted soil was found in the previous investigation of OU S-5. Additionally, this investigation was intended to assess whether shallow groundwater had been impacted by petroleum hydrocarbons in this area. The area of focus in this investigation is located in the northern part of OU S-5, approximately 1,600 feet south of the intersection of the main UPRR line and Freeport Boulevard (Figure 1).

This investigation was conducted in accordance with the DTSC-approved Work Plan - Additional Investigation Active (Western) Portion of the UPRR Yard Work Plan, Sacramento, California (Dames & Moore, 1993).

Section 2.0 presents site background information, including location, site description, historical information on the active yard, and a summary of previous remedial investigations and

results. Section 3.0 provides a description of the scope of the additional subsurface investigation. Section 4.0 provides a summary of the results of the additional subsurface investigation. References are provided in Section 5.0. Appendix A provides a detailed description of field methods used in this investigation. Appendix B presents logs of soil borings drilled for this investigation. Appendix C contains tables of analytical results, and Appendix D includes laboratory analytical reports.

2.0 SITE BACKGROUND

This section presents a description of the active yard and a summary of previous active yard remedial investigations and results.

2.1 SITE LOCATION AND DESCRIPTION

The UPRR Sacramento railyard is located in south Sacramento in Section 13 of Township 8 North, Range 4 East and in Section 18 of Township 8 North, Range 5 East, Mt. Diablo Base Meridian (Figure 1). The active yard encompasses an area of approximately 31 acres on the west side of the railyard.

The active portion of the railyard is bounded by Sacramento City College, commercial property and residential property to the west, residential property to the north, commercial property to the south and the inactive yard to the east. The closest roads to the active yard include Freeport Boulevard about one-fourth mile west, Portola Way approximately 30 yards north and Sutterville Road along the southern site boundary.

The active yard is currently used primarily as a switching yard. Nine spur rail lines used for assembling and disassembling trains are located along the eastern side of the active yard. Yard activities are coordinated out of the yard office located in the southern active yard portion. Additionally, UPRR's main north-south rail line and passing rail line are located along the western side of the active yard.

2.2 HISTORICAL INFORMATION

A review of aerial photographs for the years 1937, 1953, 1961, 1968, 1972, 1976, 1981 and 1986 was conducted during the RI to evaluate historical changes to the active yard. None of the aerial photos indicate the presence of facilities in the northern portion of the active yard that was the focus of this investigation. Previously existing active yard structures were apparently located only in the central and southern portions of the yard.

2.3 PREVIOUS ACTIVE YARD INVESTIGATION

A soil investigation was previously performed in OU S-5 under the direction of the DTSC. The investigation included collection of forty-three surface soil/gravel samples, and completion of twenty shallow soil borings. Surface soil/gravel samples were analyzed for metals. Selected soil

samples collected from borings were analyzed for metals, chlorinated volatile organic compounds (VOCs), diesel-range total petroleum hydrocarbons (TPH-d), and one sample was analyzed for asbestos.

In general, shallow soils observed in previous active yard investigations were comprised of track ballast and heterogeneous fill materials underlain by native soils. Track ballast occurs dominantly in the upper 1 to 2 feet of surface materials. Fill materials extend to a depth of approximately 2 to 5 feet below ground surface, except in the northern portion of the active yard where fill material deepens to approximately 6 to 11 feet below ground surface. Beneath the fill layer, native soils consisting of sandy silts, clayey silts and silty clays were encountered to a maximum observed depth of 30 feet bgs. Groundwater was observed at a depth of approximately 25 feet bgs in each boring location.

Relatively low levels of TPH-d were reported for soil samples collected from borings in the southeast portion of OU S-5. The vertical extent of the TPH-d impacts in this portion of OU S-5 was limited to the upper five feet of material (primarily fill). However, soil samples collected from ATB-11 in the northeast portion of OU S-5 (Figure 2) had reported TPH-d concentrations of up to 8,300 milligrams per kilogram (mg/kg). TPH-d-impacted soil was encountered up to 28.5 feet below ground surface (bgs) in ATB-11.

3.0 SCOPE OF INVESTIGATIONS

This section presents a summary of the additional subsurface investigation activities conducted to supplement previous investigation in OU S-5. The subsurface investigation included drilling of soil borings, soil sample collection and analysis (Section 3.1), and in-situ groundwater sample collection and analysis (Section 3.2).

3.1 SOIL INVESTIGATION

The soil investigation was conducted to assess the lateral and vertical extent of TPH-d impacts to soil in the vicinity of ATB-11 in the northern portion of OU S-5. The soil investigation consisted of drilling and sampling seven borings (ATB-21 through ATB-27) from the ground surface to just below the water table at approximately 25 feet bgs. Figure 2 shows the locations of soil borings and their positions relative to ATB-11. Each boring was sampled using a combination of continuous coring and drive sampling at five foot intervals. Continuous coring provided a complete record of the subsurface materials penetrated by drilling while drive samples provided relatively undisturbed soil samples suitable for chemical analysis. Drilling and sample collection procedures are described in Appendix A. Logs of borings are presented in Appendix B.

A total of twenty-three soil samples (three to five per boring) were submitted to D&M Laboratories of Petaluma, California for TPH-d analysis by EPA Method 8015M. Eight of the twenty-three samples submitted were also analyzed for polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8310 because of the potential presence of PAHs in association with combusted diesel hydrocarbons. Field observations of subsurface materials and results of chemical analysis of soil samples are presented in Section 4.0.

3.2 IN-SITU GROUNDWATER SAMPLE COLLECTION AND ANALYSIS

In-situ groundwater samples were collected from the bottom of each boring in the upper portion of the first water-bearing zone. The purpose of collecting in-situ groundwater samples was to assess potential impacts to shallow groundwater. In-situ samples were collected by pushing a Hydropunch in-situ groundwater sample collection tool (Hydropunch) into undisturbed soil beneath the bottom of each boring. Details of in-situ groundwater sample collection procedures are provided in Appendix A.

A total of seven in-situ groundwater samples were collected (one per boring) and submitted to D&M Laboratories for analysis. However, the sample collected from the bottom of boring ATB-

25 was broken during transport to the lab and therefore could not be analyzed. The remaining six samples were analyzed for TPH-d by EPA 8015M and PAHs by EPA 8310. Results of chemical analysis of in-situ groundwater samples are presented in Section 4.0.

4.0 RESULTS

This section presents the results of additional subsurface investigation in OU S-5. Observations of subsurface materials made during drilling, and chemical analysis of soil and in-situ groundwater samples are presented. Logs of borings drilled for this investigation are included in Appendix B. Summary analytical results for both water and soil are provided on Table 2. Comprehensive analytical results are tabulated in Appendix C. Soil boring locations are shown on Figures 2 and 3. Soil sample depths are shown on Figures 4 and 5. Copies of analytical laboratory reports are provided in Appendix D.

4.1 SUBSURFACE OBSERVATIONS

Subsurface materials encountered during drilling of borings for this investigation consist of fill materials (primarily silty sandy gravel) and underlying native soil. Fill materials generally extend to a depth of three to five feet bgs. Native soils consist primarily of clayey silts and unconsolidated silty fine-grained sands (Figures 4 and 5). Pores and seams are common in the native soil and may provide preferential pathways for downward movement of liquid through relatively fine-grained soil. Observed stratigraphy was consistent with that observed in previous investigation at the site. A detailed description of site-wide geology can be found in the Addendum RI/FS (Dames & Moore, 1991b).

Evidence of hydrocarbon impacts to soil was observed in soil samples and cores collected from borings ATB-21, ATB-22, ATB-24, and ATB-25. No evidence of hydrocarbon impacts were observed in borings ATB-23, ATB-26, and ATB-27. Evidence of hydrocarbon impacts consisted of anomalous soil color (greenish-gray or greenish-gray mottled with yellowish-brown) and the presence of a hydrocarbon odor. Free product was not observed in any soil samples or cores collected during this investigation.

Cross-sections A-A' and B-B' (Figure 4 and Figure 5) show the estimated lateral and vertical extent of hydrocarbon impacts to soil in the area of this investigation. Variations in the vertical extent of impacts to soil were observed. In borings ATB-21 and ATB-22, evidence of impacts were not observed until approximately 16 feet bgs. Greenish-gray soil staining was observed to a depth of approximately 28 feet bgs (below the water table) in boring ATB-21. However, in boring ATB-22, the apparent impacts only extended to a depth of 18 feet bgs (approximately seven feet above the water table).

Evidence of hydrocarbon impacts in boring ATB-24 were similar to those of ATB-21 in that stained soil was not observed until approximately 17 feet bgs and extended to approximately 28 feet bgs (below the water table).

In boring ATB-25, evidence of hydrocarbon impacts observed were shallower than the impacts observed in ATB-21, ATB-22, or ATB-24. Observed impacts in ATB-25 extended from three to approximately 18 feet bgs (approximately seven feet above the water table).

4.2 LABORATORY ANALYTICAL RESULTS

A total of 23 soil samples were selected for chemical analysis. Table 1 lists the soil boring from which the sample was collected, the depth of the sample selected for chemical analysis, and the analysis performed. Table 1 also lists the analyses performed on the in-situ groundwater sample collected from each boring.

4.2.1 Soil Sample Analysis Results

Table 2 presents a summary of the results of chemical analysis of soil samples. Of the 23 soil samples analyzed, ten had reported hydrocarbon detections. However, the detections were reported as "non-target analytes" of either oil or kerosene. TPH as diesel was not reported for any of the soil samples analyzed.

TPH as oil was reported for samples collected from borings ATB-21, ATB-22, ATB-23, and ATB-24 at concentrations of 65 to 3,000 milligrams per kilogram (mg/kg) (Figures 4 and 5). The lowest concentration of 65 mg/kg was reported for the sample collected from ATB-22 at 15.0 feet bgs (the only detection in that boring; see Figure 4). The highest concentration of 3,000 mg/kg was reported for the sample collected from ATB-24 at 19.5 feet bgs (the shallowest detection in that boring; see Figure 4).

TPH as kerosene was reported only for samples collected from ATB-25. The reported concentrations decrease with sample depth ranging from 2,100 mg/kg for the sample collected at 5.5 feet bgs to 100 mg/kg for the sample collected from 15.0 feet bgs (Figure 4). Results of analysis of soil samples collected below this depth in ATB-25 were reported as non-detect.

No PAH compounds were reported for any of the soil samples analyzed.

4.2.2 In-Situ Groundwater Sample Analysis Results

Table 2 presents a summary of the results of chemical analysis of in-situ groundwater samples. Of the six samples analyzed (the sample collected from ATB-25 was broken during shipment and therefore could not be analyzed), three had reported diesel detections. Reported diesel concentrations range from 0.290 milligrams per liter (mg/L) for the sample collected beneath ATB-22 to 2.9 mg/L for the sample collected beneath ATB-24.

It is anticipated that the analysis results for the in-situ groundwater sample collected from beneath ATB-25 would have been non-detect based on the non-detect results reported for the two deepest soil samples from that boring.

No PAH compounds were reported for any of the in-situ groundwater samples analyzed.

The reason for the reported TPH as diesel detections in in-situ groundwater versus TPH as oil or TPH as kerosene in soil samples is unknown. Laboratory chromatograms for the samples with reported TPH detections are being evaluated to assess the differences between TPH detections in water and soil samples.

5.0 CONCLUSIONS

Based on the results of chemical analysis of soil samples collected from the seven borings drilled around ATB-11, this investigation has delineated the lateral and vertical extent of TPH impacts to soil in this portion of OU S-5. Results of chemical analysis of in-situ groundwater samples suggests that shallow groundwater beneath the area of TPH-impacted soil has also been impacted. Shallow groundwater impacts were shown to be limited to the area beneath the impacted soil delineated by this investigation.

6.0 REFERENCES

Dames & Moore, 1991a, Remedial Investigation/Feasibility Study (RI/FS) Report, Union Pacific Railroad Yard, Sacramento, California, May 1991.

Dames & Moore, 1991b, Addendum Remedial Investigation/Feasibility Study Report, Union Pacific Railroad Yard, Sacramento, California, November 1991.

Dames & Moore, 1992, Remedial Investigation Supplement, September 1992.

Dames & Moore, 1993, Work Plan — Additional Investigation Active (Western) Portion of the UPRR Yard, Sacramento, California, October 1993.

TABLES

TABLE 1
SUMMARY OF SOIL AND IN-SITU GROUNDWATER ANALYSIS RESULTS
SUBSURFACE ANALYSES
ADDITIONAL SUBSURFACE INVESTIGATION
OPERABLE UNIT S-5
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

Boring	Sample Depth (feet bgs)	Analysis Performed
ATB-21	15.0	TPH-d ⁽¹⁾
ATB-21	20.0	TPH-d ⁽¹⁾ and PAHs ⁽²⁾
ATB-21	25.0	TPH-d ⁽¹⁾
ATB-22	15.0	TPH-d ⁽¹⁾
ATB-22	20.0	TPH-d ⁽¹⁾ and PAHs ⁽²⁾
ATB-22	25.0	TPH-d ⁽¹⁾
ATB-23	14.5	TPH-d ⁽¹⁾
ATB-23	19.5	TPH-d ⁽¹⁾ and PAHs ⁽²⁾
ATB-23	24.5	TPH-d ⁽¹⁾
ATB-24	14.5	TPH-d ⁽¹⁾
ATB-24	19.5	TPH-d ⁽¹⁾ and PAHs ⁽²⁾
ATB-24	24.5	TPH-d ⁽¹⁾
ATB-25	5.5	TPH-d ⁽¹⁾
ATB-25	10.0	TPH-d ⁽¹⁾ and PAHs ⁽²⁾
ATB-25	15.0	TPH-d ⁽¹⁾ and PAHs ⁽²⁾
ATB-25	20.0	TPH-d ⁽¹⁾
ATB-25	25.5	TPH-d ⁽¹⁾
ATB-26	15.0	TPH-d ⁽¹⁾
ATB-26	20.5	TPH-d ⁽¹⁾ and PAHs ⁽²⁾
ATB-26	25.5	TPH-d ⁽¹⁾
ATB-27	15.0	TPH-d ⁽¹⁾
ATB-27	19.0	TPH-d ⁽¹⁾ and PAHs ⁽²⁾

TABLE 1 (continued)

SUMMARY OF SOIL AND IN-SITU GROUNDWATER ANALYSIS RESULTS
SUBSURFACE ANALYSES
ADDITIONAL SUBSURFACE INVESTIGATION
OPERABLE UNIT S-5
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

Boring	Sample Depth (feet bgs)	Analysis Performed
ATB-27	25.0	TPH-d ⁽¹⁾
ATB-21	Groundwater ⁽³⁾	TPH-d ⁽¹⁾ and PAHs ⁽²⁾
ATB-22	Groundwater ⁽³⁾	TPH-d ⁽¹⁾ and PAHs ⁽²⁾
ATB-23	Groundwater ⁽³⁾	TPH-d ⁽¹⁾ and PAHs ⁽²⁾
ATB-24	Groundwater ⁽³⁾	TPH-d ⁽¹⁾ and PAHs ⁽²⁾
ATB-26	Groundwater ⁽³⁾	TPH-d ⁽¹⁾ and PAHs ⁽²⁾
ATB-27	Groundwater ⁽³⁾	TPH-d ⁽¹⁾ and PAHs ⁽²⁾

Notes: ⁽¹⁾

⁽²⁾

⁽³⁾

TPH-d = Total Petroleum Hydrocarbons as Diesel by EPA Method 8015 M.

PAHs = Polynuclear Aromatic Hydrocarbons by EPA Method 8310.

In-situ groundwater samples collected approximately three to five feet below the base of each boring. Sample collected from boring ATB-25 was broken during shipment to the analytical laboratory and therefore was not sampled.

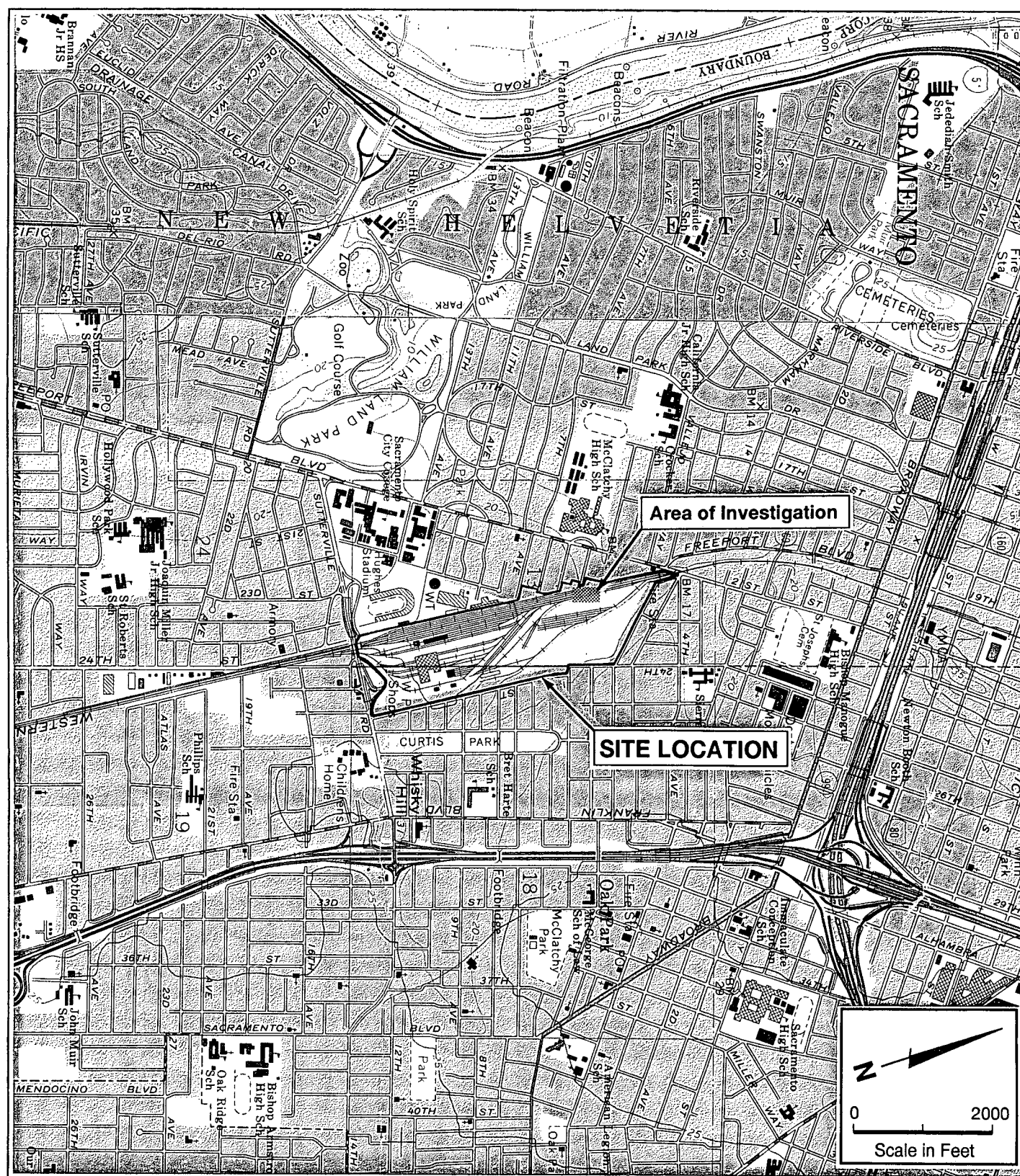
TABLE 2

SUMMARY OF CHEMICAL ANALYSIS RESULTS
SUBSURFACE ANALYSES
ADDITIONAL SUBSURFACE INVESTIGATION
OPERABLE UNIT S-5
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

Soil Sample	TPH-d ⁽¹⁾ (mg/Kg)	PAHs ⁽²⁾ (μg/Kg)	Other ⁽³⁾ (mg/Kg)
ATB-21-15.0	ND	ND	Oil - 1,900
ATB-21-20.0	ND	ND	Oil - 2,000
ATB-21-25.0	ND	ND	Oil - 100
ATB-22-15.0	ND	ND	Oil - 65
ATB-23-24.5	ND	ND	Oil - 400
ATB-24-19.5	ND	ND	Oil - 3,000
ATB-24-24.5	ND	ND	Oil - 600
ATB-25-5.5	ND	ND	Kerosene - 2,100
ATB-25-10.0	ND	ND	Kerosene - 600
ATB-25-15.0	ND	ND	Kerosene - 100
In-Situ Groundwater Sample	TPH-d ⁽¹⁾ (mg/L)	PAHs ⁽²⁾ (μg/L)	Other ⁽³⁾ (mg/L)
ATB-21W	1.10	ND	ND
ATB-22W	0.29	ND	ND
ATB-24W	2.90	ND	ND

- Notes: ⁽¹⁾ TPH-d = Total Petroleum Hydrocarbons as Diesel by EPA Method 8015 M.
⁽²⁾ PAHs = Polynuclear Aromatic Hydrocarbons by EPA Method 8310.
⁽³⁾ These detections were reported by the laboratory as non-target analytes. Diesel-range hydrocarbons may be present in the sample at levels lower than that reported for the non-target analyte.

FIGURES



REFERENCE: USGS 7.5' Quadrangle; East and West Sacramento, California, Photorevised 1980.



Quadrangle
Location

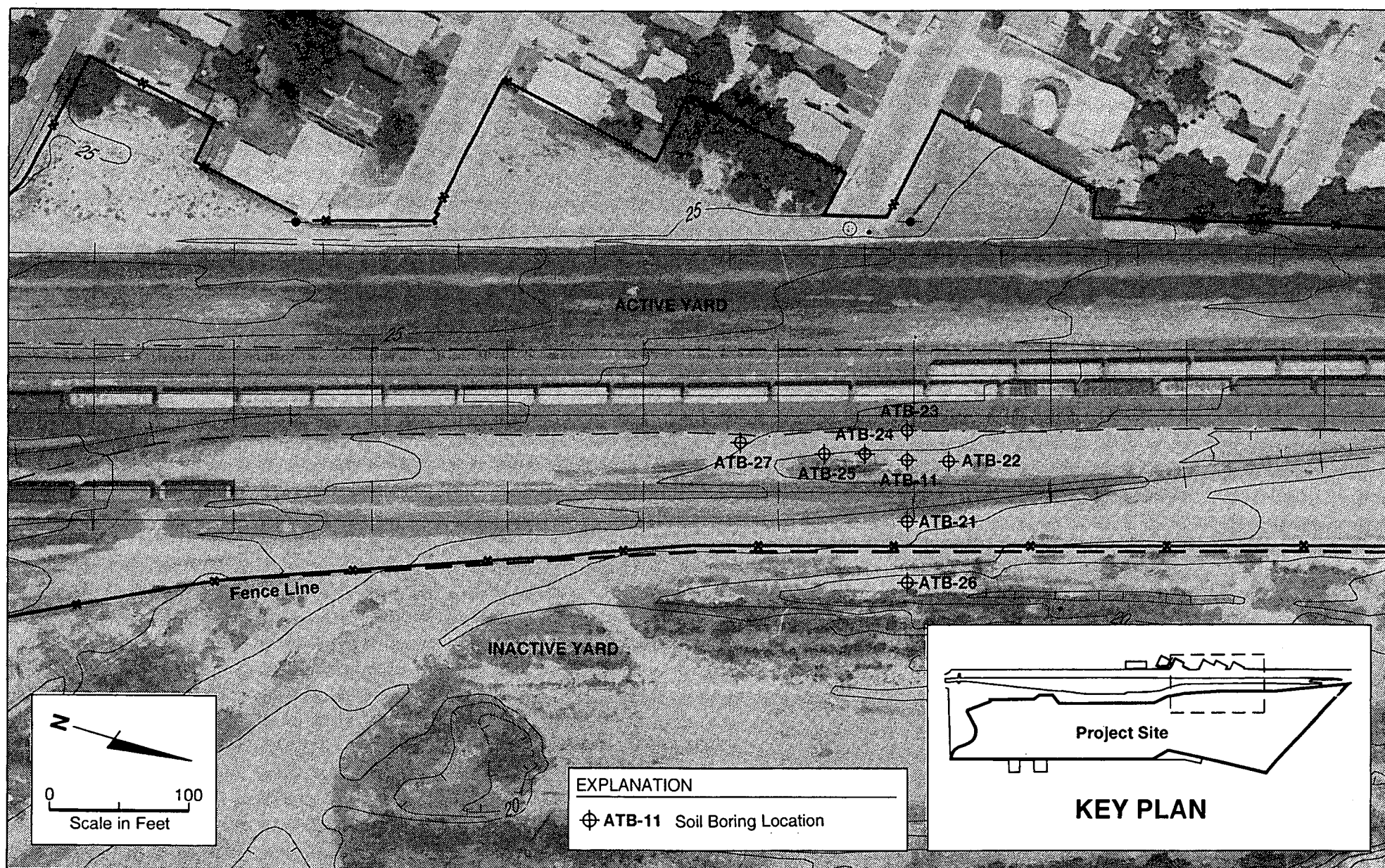
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00173-076-044

SITE VICINITY MAP

Union Pacific Railroad Yard
Sacramento, California

FIGURE 1



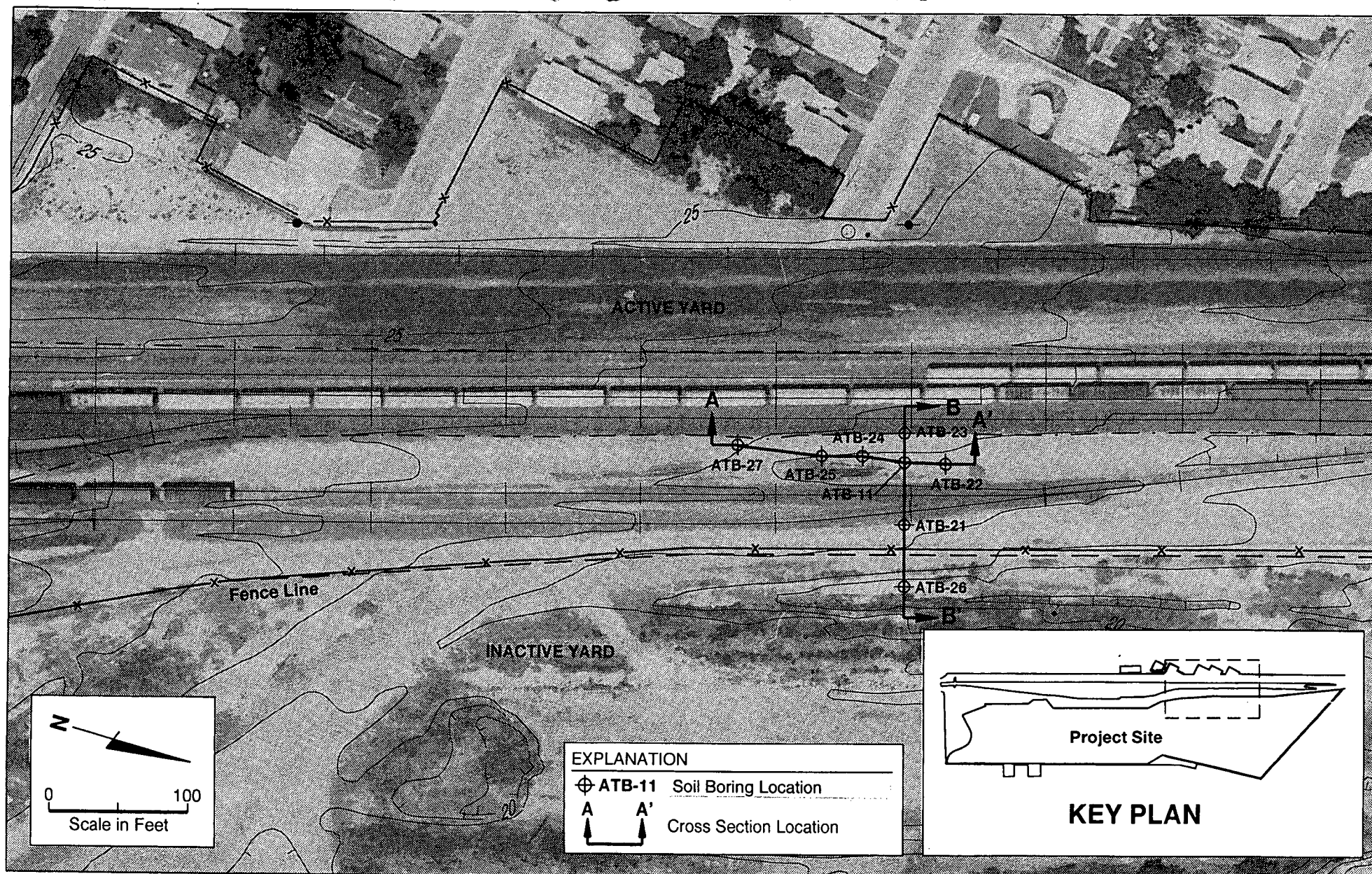
SOIL BORING LOCATIONS OPERABLE UNIT S-5

Union Pacific Railroad Yard
Sacramento, California

FIGURE 2

 **DAMES & MOORE**

00173-076-044 sjr 11/22/93 SOIL-B



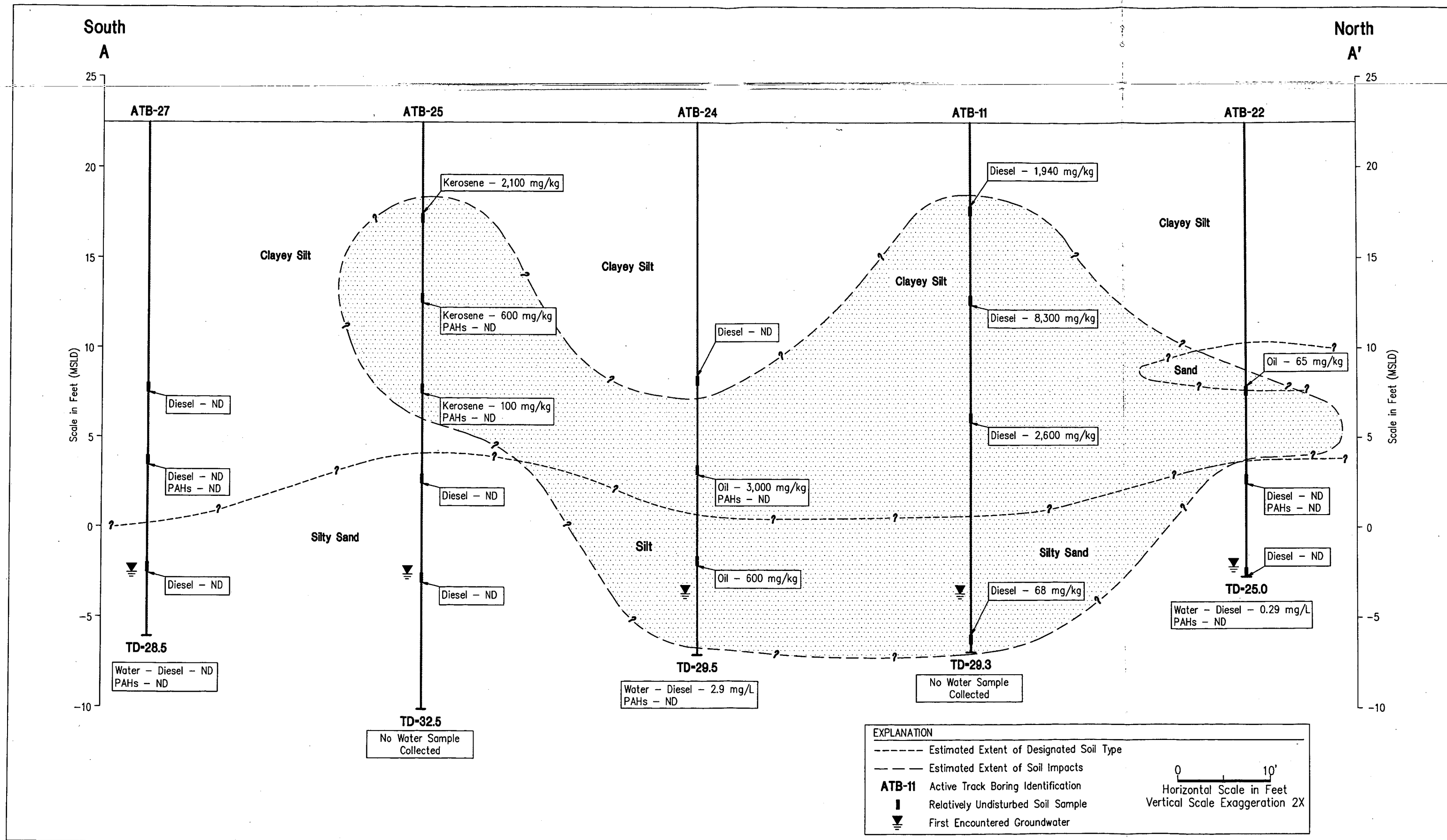
CROSS-SECTION LOCATION MAP

Union Pacific Railroad Yard
Sacramento, California

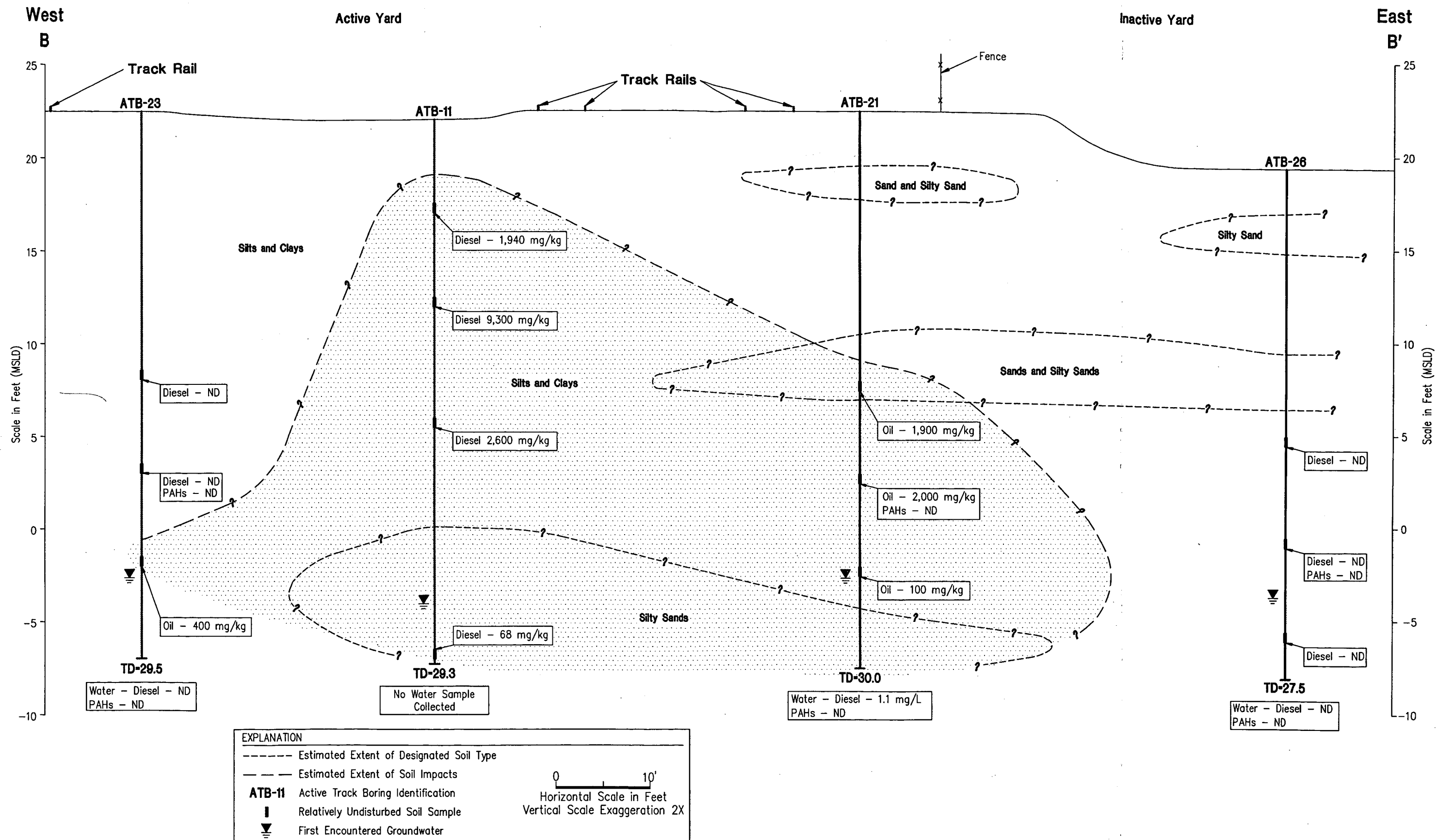
FIGURE 3

DAMES & MOORE

00173-076-044 sjr 11/29/93 x-sec



SCHEMATIC GEOLOGIC CROSS-SECTION A-A'
 Union Pacific Railroad Yard
 Sacramento, California



SCHEMATIC GEOLOGIC CROSS-SECTION B-B'
Union Pacific Railroad Yard
Sacramento, California

Appendix A

APPENDIX A
FIELD METHODS - ADDITIONAL SUBSURFACE INVESTIGATION - ACTIVE YARD
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

A.1 SOIL BORINGS

Seven soil borings were completed at the locations shown on Figure 2. Soil borings were completed to evaluate the presence of hydrocarbons in subsurface soils in the northern portion of OU S-5 around former boring ATB-11. Previous investigation performed in this area in 1991 found diesel-impacted soil at up to 8,300 mg/kg in ATB-11.

Soil borings were completed to or just beneath the water table at approximately 25 to 30 below the native soil surface using hollow stem auger drilling methods. Soils were logged according to the Unified Soil Classification System.

A.1.1 Drilling and Sampling Procedures

Drilling was conducted using a truck mounted drill rig equipped with 8-inch diameter hollow stem augers. This drilling method was performed without the introduction of drilling fluids (which may mobilize chemicals) and allowed for the collection of relatively undisturbed soil samples through the hollow stem of the auger.

Continuous soil sampling was conducted utilizing a 2 1/2-inch diameter CME five-foot long split-barrel sampler and an 18-inch driven California Modified (CM) sampler. Soil cores were logged according to the Unified Soil Classification System (USCS).

The five-foot sample barrel fits within the lead auger, extending a few inches in front of the auger head. Upon advancing the sampler five feet, the sample system was lifted from within the auger and removed from the leading end of the rod assembly. The sampler assembly was then removed, allowing the split tube to be separated and the sample removed.

A CM-sampler was used to collect and retain soil samples at selected intervals for potential chemical analyses. The CM-sampler was also used for any interval where core recovery and retention became difficult.

The CM-sampler was fitted with 2½-inch diameter six-inch long stainless steel rings. During use, the CM-sampler was driven 18 inches or until refusal into undisturbed soil. The sampler was driven using a 140-pound hammer dropping 30 inches. Hammer blows required to drive the sampler each 6-inch increment of the 18-inch interval were recorded on the boring log. The sampler was then removed from the auger, and the shoe and adapter were removed, allowing the sampler to be separated and the stainless steel sample rings to be removed.

Sample rings were separated with a clean knife. The exposed ends of the rings were covered with 2-mil Teflon sheets and secured with tight-fitting plastic end caps. Sample labels were affixed to the end caps and contained the following information: boring number; sample location; sample number; sample depth; date of sampling; time of sampling; sample collector's name; soil type (USCS); and project name.

Two rings from the 18-inch CM-sampler were retained from each sample interval. These samples have the same sample identification numbers except for postscripts "A or B". The lowest ring, Sample "A", was retained for potential chemical testing, "B" samples were retained for possible future chemical analyses or possible physical testing. Sample rings were screened with a photoionization detector (PID) to evaluate whether chemical analyses were warranted.

If the boring did not appear to have a potential for caving, the augers were removed from the borehole, and a 3% bentonite/cement grout mixture was poured down the borehole until the grout was flush with the ground surface. If it was anticipated the boring did have the potential for caving, or if groundwater was encountered, then the cement grout was tremmied through the augers until flush with the surface.

After each use, samplers were washed thoroughly with a steam cleaner. After completion of each soil boring, the augers, drill bit, drill rod, and sampling equipment were transported to the designated cleaning area where they were steam cleaned. A self-contained steam cleaning trailer was utilized for steam cleaning.

A.2 IN-SITU GROUNDWATER SAMPLE COLLECTION

In-situ groundwater samples were collected with a Hydropunch™ or similar in-situ groundwater water sample collection tool. The Hydropunch™ is designed to obtain a representative formation water sample without a permanent monitoring well installation. The tool body consists of a stainless steel outer tube, an inner sample chamber, sample chamber Teflon check balls, and a

drive point on the bottom, all of which can be dismantled for decontamination. The outside diameter of the tool is 1.66 inches and the length is 63.25 inches.

Once the target depth was reached by the drilling, the in-situ sampling tool was pushed an additional 24 to 36 inches. An upward pull on the tool opened the inlet section allowing groundwater to flow into the sample chamber. A Teflon check ball sealed the sample chamber when the inlet was closed, allowing the groundwater sample to remain in the chamber until brought to ground surface. The sample was then transferred from the sample chamber through a Teflon tube into one-liter amber glass bottles. All samples were placed on ice and kept in coolers until delivered to the laboratory for analysis.

A.3 ANALYTICAL PROCEDURES

A summary of sampling criteria, analytical parameters, and methods is provided in Table 1. A minimum of three soil samples per boring were submitted to the laboratory for chemical analyses: 1) from the area with the highest visible staining; and 2) from soil that was visibly "clean" directly below the visibly stained soil. These samples (a total of 23) were analyzed for total petroleum hydrocarbons (TPH) as diesel (EPA Method 8015 modified). Selected samples with visible staining were also analyzed for polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8310.

In-situ groundwater samples were analyzed for TPH as diesel by EPA 8015M and PAHs by EPA Method 8310.

Appendix B

**APPENDIX B
BORING LOGS**

**UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA**

SOIL BORING

ATB-21

JOB NAME:

UPRR SACRAMENTO

JOB NUMBER:

00173-076-044

DATE COMPLETED:

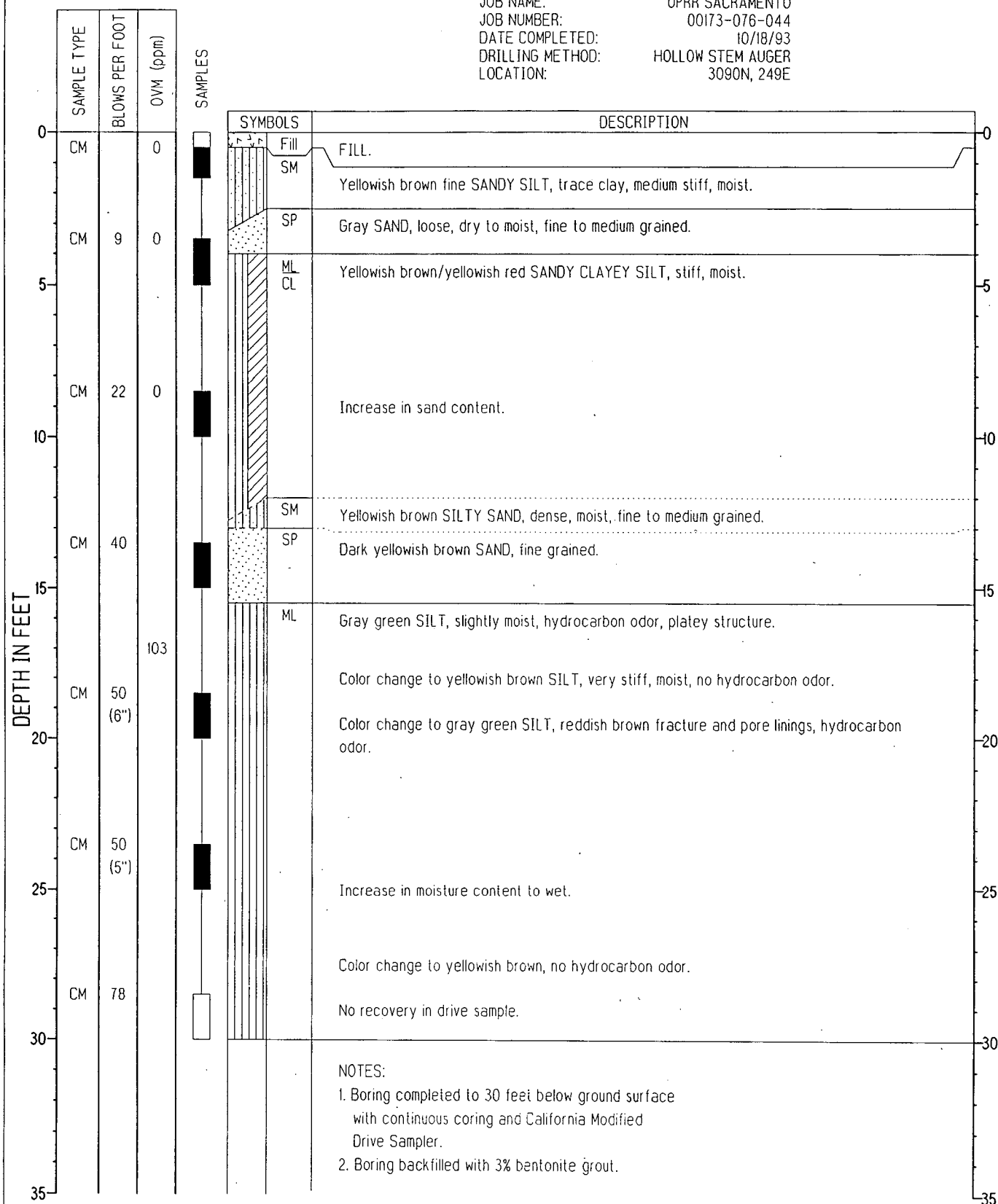
10/18/93

DRILLING METHOD:

HOLLOW STEM AUGER

LOCATION:

3090N, 249E



BORING LOG
DAMES & MOORE

SOIL BORING

ATB-22

JOB NAME:

UPRR SACRAMENTO

JOB NUMBER:

00173-076-044

DATE COMPLETED:

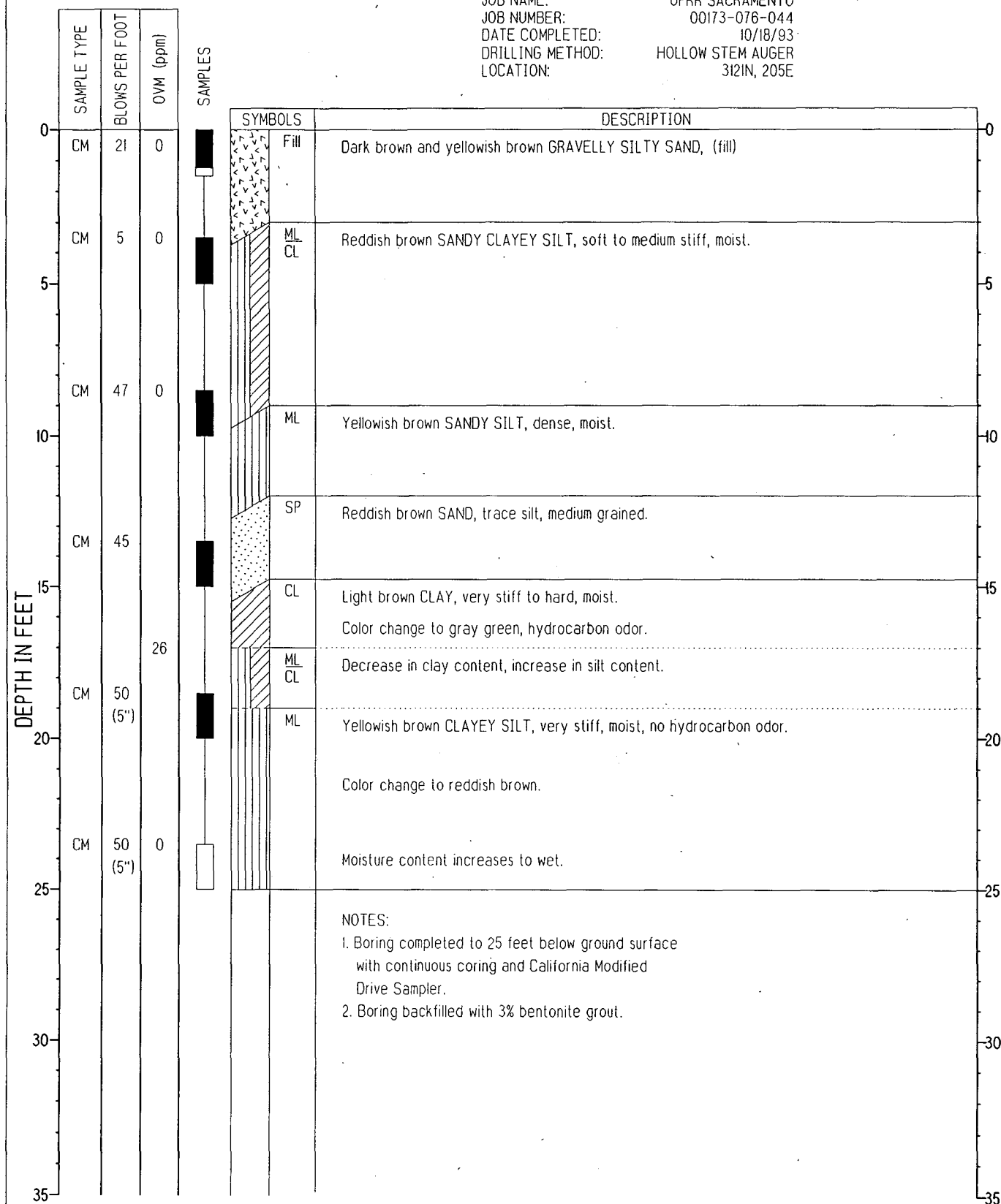
10/18/93

DRILLING METHOD:

HOLLOW STEM AUGER

LOCATION:

312IN, 205E



BORING LOG
DAMES & MOORE

SOIL BORING

ATB-23

JOB NAME:

UPRR SACRAMENTO

JOB NUMBER:

00173-076-044

DATE COMPLETED:

10/19/93

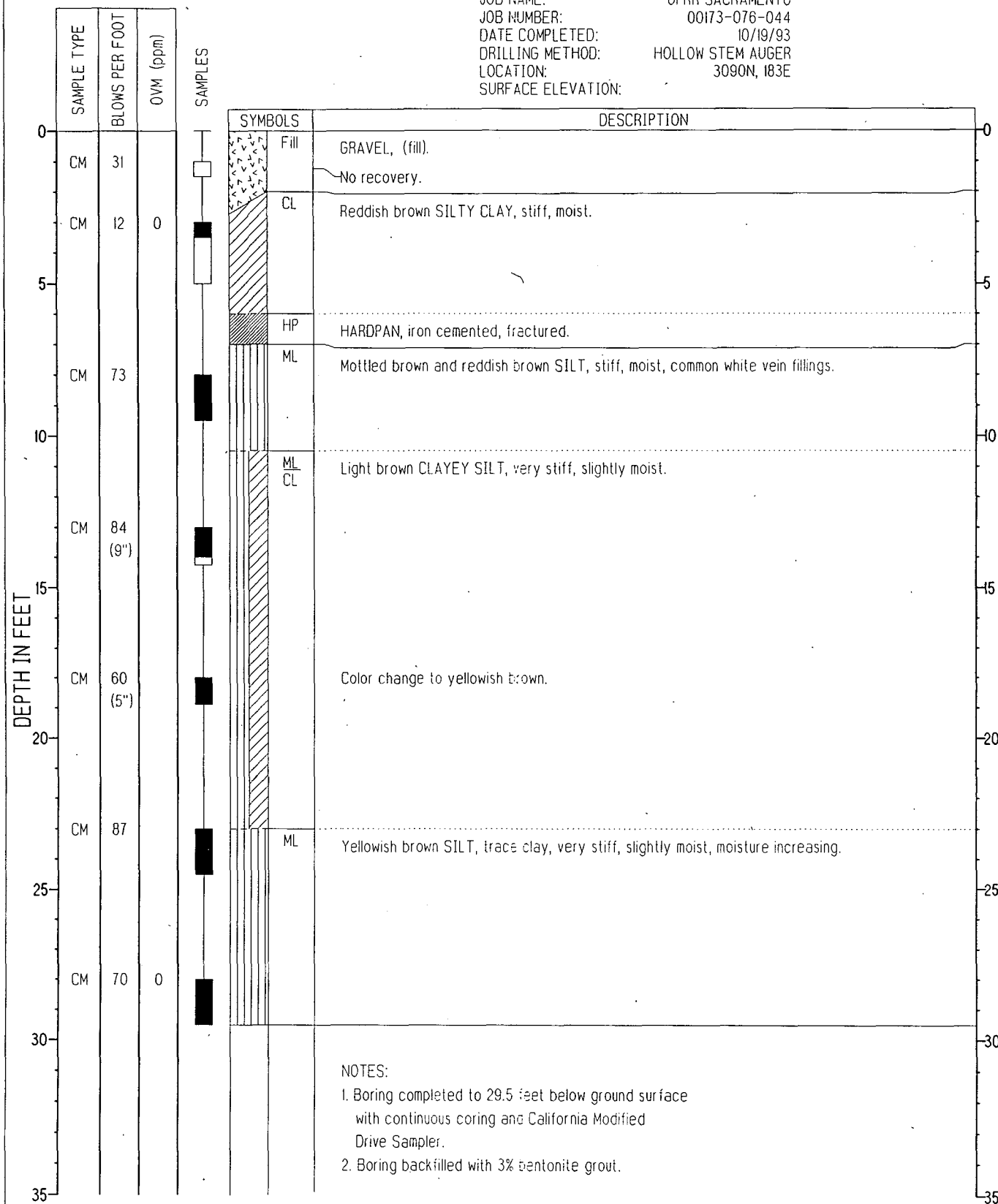
DRILLING METHOD:

HOLLOW STEM AUGER

LOCATION:

3090N, 183E

SURFACE ELEVATION:



WELL LOG
DAMES & MOORE

SOIL BORING

ATB-24

JOB NAME:

UPRR SACRAMENTO

JOB NUMBER:

00173-076-044

DATE COMPLETED:

10/19/93

DRILLING METHOD:

HOLLOW STEM AUGER

LOCATION:

3059N, 200E

DEPTH IN FEET	SAMPLE TYPE	BLOWS PER FOOT	OVN (ppm)	SAMPLES	SYMBOLS	DESCRIPTION
0					Fill	Dark brown SILTY SANDY GRAVEL, loose, dry, (fill).
CM	II				ML CL	Yellowish brown and dark brown CLAYEY SILT, stiff, moist.
5					CL ML	Dark brown SILTY CLAY.
CM	68				ML CL	Reddish brown CLAYEY SILT, very stiff, slightly moist, hard concretions. Grades to mottled yellowish brown and light brown CLAYEY SILT, very stiff, slightly moist. Color change to yellowish brown.
10						Color change to light brown, increase in clay content.
CM	76	0				Color change to yellowish/reddish brown, abundant concretions and vein, fracture, and pore fillings.
15						Color change to gray green, very slight hydrocarbon odor.
CM	51					Gray green CLAYEY SILT, very stiff, slightly moist, hydrocarbon odor.
20					ML	Gray green SILT, stiff, slightly moist, hydrocarbon odor, some concretions.
CM	61					Gray green and yellowish brown SILT, wet, hydrocarbon odors.
25						Color grades less gray green.
CM	85					
30						NOTES: 1. Boring completed to 29.5 feet below ground surface with continuous coring and California Modified Drive Sampler. 2. Boring backfilled with 3% bentonite grout.
35						

BORING LOG
DAMES & MOORE

SOIL BORING

ATB-25

JOB NAME:

UPRR SACRAMENTO

JOB NUMBER:

00173-076-044

DATE COMPLETED:

10/20/93

DRILLING METHOD:

HOLLOW STEM AUGER

LOCATION:

3029N, 200E

DEPTH IN FEET	SAMPLE TYPE	BLOWS PER FOOT	OVN (ppm)	SAMPLES	SYMBOLS	DESCRIPTION
0	CC				Fill	Dark brown SILTY SANDY GRAVEL, loose, dry, (fill).
6.1	CM	15	6.1		ML	Yellowish red, SANDY SILT, stiff, moist, hydrocarbon odor
9.5	CC		9.5		ML CL	Olive gray CLAYEY SILT, with trace sand, stiff, moist, greenish gray staining, strong hydrocarbon odor.
7.2	CM	14	7.2		ML	Greenish gray SANDY SILT, with clay, stiff, moist, poorly graded fine sand, some orange iron oxide staining, micaceous.
84.9	CC	26	84.9			Color change to greenish gray with light brown mottling, very stiff, moist, some weakly cemented zones, slight hydrocarbon odor.
10.0	CM	32	10.0		CL	Gray to greenish gray SILTY CLAY, with trace sand, very stiff, moist.
0.0	CC		0.0		SM	Brownish yellow to light brown SILTY SAND, with trace clay, very dense, moist, predominantly fine sand.
						Increase in silt content, very fine sand.
17	CM	17			ML	Brownish yellow SANDY SILT, stiff, wet.
22	CC	22			SM	Reddish/yellowish brown SILTY SAND, dense, wet, poorly graded fine sand, micaceous, trace dark brown staining, trace pores to 0.5 mm.
						Some weakly cemented zones.
						Color change to brown to brownish yellow, interbedded sand and trace silt layers.
						Weakly cemented zones.

NOTES:

- Boring completed to 30.5 feet below ground surface with continuous coring and California Modified Drive Sampler.
- Boring backfilled with 3% bentonite grout.

BORING LOG
DAMES & MOORE

SOIL BORING

ATB-26

JOB NAME:

UPRR SACRAMENTO

JOB NUMBER:

00173-076-044

DATE COMPLETED:

10/20/93

DRILLING METHOD:

HOLLOW STEM AUGER

LOCATION:

3090N, 294E

DEPTH IN FEET	SAMPLE TYPE	BLOWS PER FOOT	OVN (ppm)	SAMPLES	SYMBOLS	DESCRIPTION
0	CC				Fill	
					ML	Yellowish red, SANDY SILT, stiff, moist, trace black and orange oxide staining.
					SM	Yellowish red SILTY SAND, dense, moist.
5	CM	13	0.0		ML	Yellowish red SANDY SILT, stiff, moist, dark brown mottling.
	CC					
					SC	Yellowish red CLAYEY SAND, with silt, very dense, moist.
10	CM	18	0.0		SM	Yellowish red SILTY SAND, dense, moist, well graded fine to medium sand.
	CC					Decrease in silt content, increase in sand grain size to medium.
					SM ML	Light gray SILTY SAND/SANDY SILT, dry, weakly cemented.
15	CM	26	0.0		ML	Light brown SANDY SILT, very stiff, dry, moderately cemented, dark brown oxide staining/concretions.
	CC					Decrease in sand content.
						Color change to brownish yellow, clay lined seams.
20	CM	33	0.0			Pores to 1.0 mm., black oxide staining.
	CC					
						Moderately cemented, yellowish red mottling, very moist with wet seams.
25	CM	54				No cementation.
30						
35						

NOTES:

- Boring completed to 25.5 feet below ground surface with continuous coring and California Modified Drive Sampler
- Boring backfilled with 3% bentonite grout.

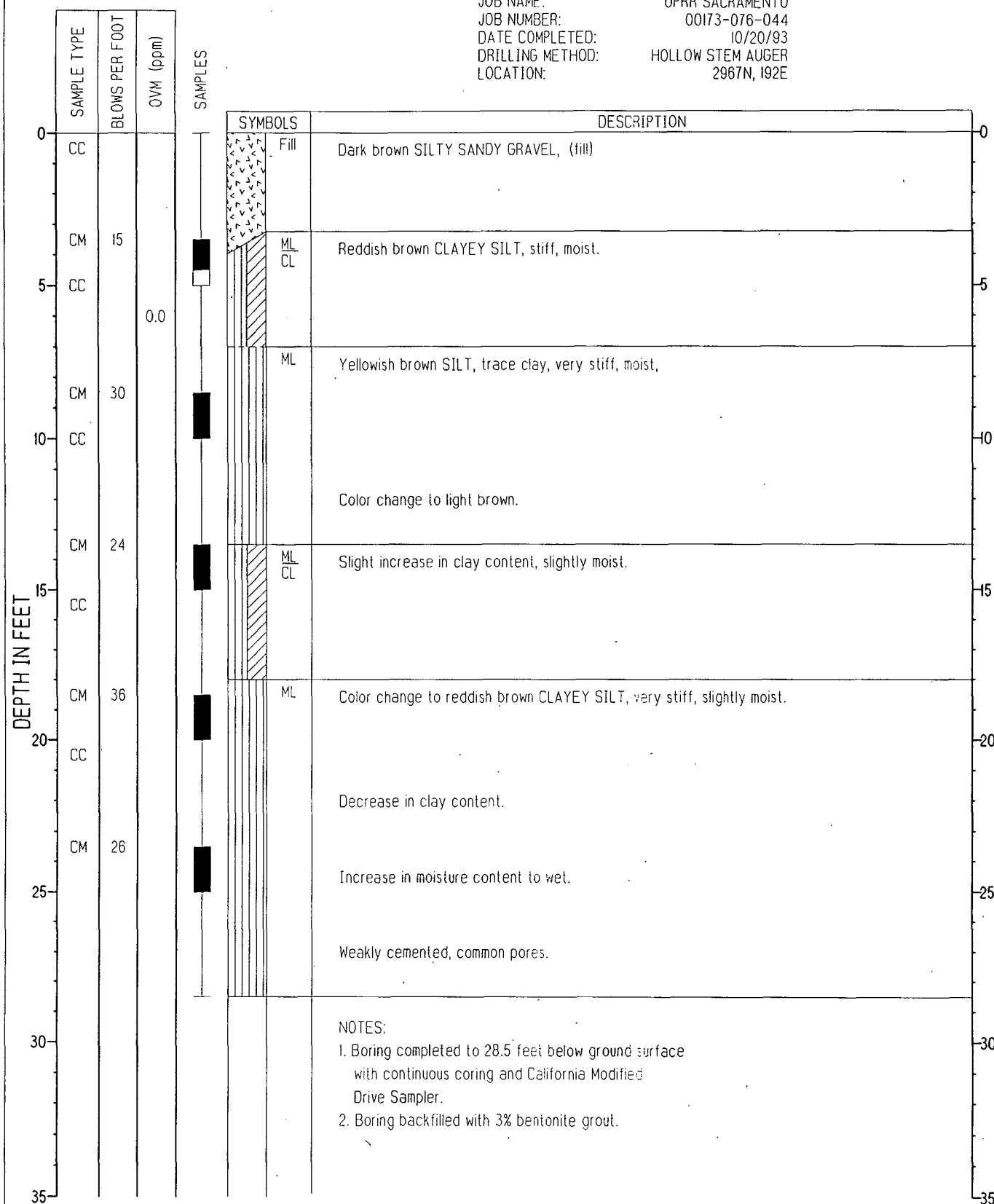
BORING LOG
DAMES & MOORE

SOIL BORING

ATB-27

JOB NAME:
JOB NUMBER:
DATE COMPLETED:
DRILLING METHOD:
LOCATION:

UPRR SACRAMENTO
00173-076-044
10/20/93
HOLLOW STEM AUGER
2967N, 192E



BORING LOG
DAMES & MOORE

Appendix
C

APPENDIX C
SOIL AND IN-SITU GROUNDWATER SAMPLE ANALYSIS RESULTS TABLES

UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

TABLE C-1
SOIL ANALYTICAL RESULTS - DIESEL RANGE TPHC (METHOD 8015 MODIFIED)
ACTIVE SITE PORTION (OU S-5)
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

SAMPLE	DATE	DEPTH	DIESEL	OIL	KEROSENE
			mg/kg (ppm)	mg/kg (ppm)	mg/kg (ppm)
ATB-21	10/18/93	15.0	< 50	1900	-
ATB-21	10/18/93	20.0	<2000	2000	-
ATB-21	10/18/93	25.0	< 100	100	-
ATB-22	10/18/93	15.0	< 10	65	-
ATB-22	10/18/93	20.0	< 5	-	-
ATB-22	10/18/93	25.0	< 5	-	-
ATB-23	10/19/93	14.5	< 5	-	-
ATB-23	10/19/93	19.5	< 5	-	-
ATB-23	10/19/93	24.5	< 150	400	-
ATB-24	10/19/93	14.5	< 5	-	-
ATB-24	10/19/93	19.5	<3000	3000	-
ATB-24	10/19/93	24.5	< 250	600	-
ATB-25	10/20/93	5.5	< 5	-	2100
ATB-25	10/20/93	10.0	< 5	-	600
ATB-25	10/20/93	15.0	< 5	-	100
ATB-25	10/20/93	20.0	< 5	-	-
ATB-25	10/20/93	25.5	< 5	-	-
ATB-26	10/20/93	15.0	< 5	-	-
ATB-26	10/20/93	20.5	< 5	-	-
ATB-26	10/20/93	25.5	< 5	-	-
ATB-27	10/20/93	15.0	< 5	-	-
ATB-27	10/20/93	19.0	< 5	-	-
ATB-27	10/20/93	25.0	< 5	-	-

OIL and KEROSENE are reported as non-target analytes.

< = Constituent below detection limit. Detection limits may vary depending on interference by other sample constituents.

- = Parameter not analyzed.

TABLE C-2
SOIL ANALYTICAL RESULTS - POLYNUCLEAR AROMATIC HYDROCARBONS (METHOD 8310)
ACTIVE SITE PORTION (OU S-5)
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

SAMPLE	ATB-21	ATB-22	ATB-23	ATB-24	ATB-25	ATB-25	ATB-26	ATB-27
DATE	10/18/93	10/18/93	10/19/93	10/19/93	10/20/93	10/20/93	10/20/93	10/20/93
DEPTH	20.0	20.0	19.5	19.5	10.0	15.0	20.5	19.0
ACENAPHTHENE	<0.200	<0.200	<0.200	<1.000	<0.200	<0.200	<0.200	<0.200
ACENAPHTHYLENE	<0.200	<0.200	<0.200	<1.000	<0.200	<0.200	<0.200	<0.200
ANTHRACENE	<0.050	<0.050	<0.050	<0.250	<0.050	<0.050	<0.050	<0.050
BENZO(A)ANTHRACENE	<0.010	<0.010	<0.010	<0.050	<0.010	<0.010	<0.010	<0.010
BENZO(A)PYRENE	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005
BENZO(B)FLUORANTHENE	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005
BENZO(G,H,I)PERYLENE	<0.010	<0.010	<0.010	<0.050	<0.010	<0.010	<0.010	<0.010
BENZO(K)FLUORANTHENE	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005
CHRYSENE	<0.010	<0.010	<0.010	<0.050	<0.010	<0.010	<0.010	<0.010
DIBENZO(A,H)ANTHRACENE	<0.010	<0.010	<0.010	<0.050	<0.010	<0.010	<0.010	<0.010
FLUORANTHENE	<0.010	<0.010	<0.010	<0.050	<0.010	<0.010	<0.010	<0.010
FLUORENE	<0.020	<0.020	<0.020	<0.100	<0.020	<0.020	<0.020	<0.020
INDENO(1,2,3-CD)PYRENE	<0.010	<0.010	<0.010	<0.050	<0.010	<0.010	<0.010	<0.010
NAPHTHALENE	<0.100	<0.100	<0.100	<0.500	<0.100	<0.100	<0.100	<0.100
PHENANTHRENE	<0.050	<0.050	<0.050	<0.250	<0.050	<0.050	<0.050	<0.050
PYRENE	<0.010	<0.010	<0.010	<0.050	<0.010	<0.010	<0.010	<0.010

All units reported as mg/kg (ppm)

< = Constituent below detection limit. Detection limits may vary depending on interference by other sample constituents.
- = Parameter not analyzed.

TABLE C-3
 WATER ANALYTICAL RESULTS - DIESEL RANGE TPHC (METHOD 8015 MODIFIED)
 ACTIVE SITE PORTION (OU S-5)
 UNION PACIFIC RAILROAD YARD
 SACRAMENTO, CALIFORNIA

SAMPLE	DATE	DIESEL
		mg/L (ppm)
ATB-21	10/18/93	1.10
ATB-22	10/18/93	0.29
ATB-23	10/19/93	<0.25
ATB-24	10/19/93	2.90
ATB-26	10/20/93	<0.50
ATB-27	10/20/93	<0.25

< = Constituent below detection limit. Detection limits may vary depending on interference by other sample constituents.
 - = Parameter not analyzed.

TABLE C-4
WATER ANALYTICAL RESULTS - POLYNUCLEAR AROMATIC HYDROCARBONS (METHOD 8310)
ACTIVE SITE PORTION (OU S-5)
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

SAMPLE DATE	ATB-21 10/18/93	ATB-22 10/18/93	ATB-23 10/19/93	ATB-24 10/19/93	ATB-26 10/20/93	ATB-27 10/20/93
ACENAPHTHENE	<10.00	<10.00	<10.00	<10.00	<10.00	<10.00
ACENAPHTHYLENE	<10.00	<10.00	<10.00	<10.00	<10.00	<10.00
ANTHRACENE	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50
BENZO(A)ANTHRACENE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
BENZO(A)PYRENE	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
BENZO(B)FLUORANTHENE	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
BENZO(G,H,I)PERYLENE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
BENZO(K)FLUORANTHENE	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
CHRYSENE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
DIBENZO(A,H)ANTHRACENE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
FLUORANTHENE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
FLUORENE	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
INDENO(1,2,3-CD)PYRENE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
NAPHTHALENE	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00
PHENANTHRENE	< 2.50	< 2.50	< 2.50	< 2.50	0.73	< 2.50
PYRENE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

All units reported as ug/L

< = Constituent below detection limit. Detection limits may vary depending on interference by other sample constituents.
- = Parameter not analyzed.

D
Appendix

APPENDIX D
LABORATORY ANALYTICAL REPORTS

UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA



3700 Lakeville Highway, Petaluma, CA 94954
P.O. Box 808024, Petaluma, CA 94975-8024
Telephone: (707) 763-8245
FAX (707) 763-4065

Jim Brake
Dames & Moore-Sacramento
8801 Folsom Blvd - Suite 200
Sacramento, CA 95826

November 4, 1993


Customer Project: 00173-076-044 UPRR-SACTO
Laboratory Job: L9310211

On October 22, 1993 we received 30 sample(s) for analysis.
Samples were analyzed by the following method(s):

Diesel (EPA 8015M)

PNA's by HPLC (EPA 8310)


Project Manager


Laboratory Director
Robert Peak

CASE NARRATIVE
FOR L9310211 - UPRR SACRAMENTO

LABELLING OF SOILS:

L9310211-12: COC ID=ATB-25-4.0-5.5
Sample Label ID=ATB-25 5.0-5.5
L9310211-13: COC ID=ATB-25-9.0-10.0
Sample Label ID=ATB-25 9.5-10.0
L9310211-14: COC ID=ATB-25-14.0-15.0
Sample Label ID=ATB-25 14.5-15.0
L9310211-16: COC ID=ATB-25-24.0-25.5
Sample Label ID=ATB-25 25.0-25.5
L9310211-17: COC ID=ATB-26-19.0-20.5
Sample Label ID=ATB-26 20.0-20.5
L9310211-18: COC ID=ATB-26-24.0-25.5
Sample Label ID=ATB-26 25.0-25.5
L9310211-19: COC ID=ATB-26-14.0-15.0
Sample Label ID=ATB-26 14.0-14.25
L9310211-20: COC ID=ATB-27-18.5-19.0
Sample Label ID=ATB-27 18.5-20.0

WATER SAMPLES:

FOUR OF THE WATER SAMPLES CONTAINED HIGH QUANTITIES OF MUD/SLUDGE:

L9310211-26 ATB-23W: 40% of the 1 Liter amber bottle was
mud/sludge.
L9310211-27 ATB 24W: 75% of the 1 Liter amber bottle was
mud/sludge.
L9310211-29 ATB-26W: 30% of the 1 Liter amber bottle was
mud/sludge.
L9310211-30 ATB-27W: 25% of the 1 Liter amber bottle was
mud/sludge.

SAMPLE ATB-25W BROKEN IN SHIPPING TO LABORATORY.

DIESEL (EPA 8015M):

Detection limits for diesel for all water samples were raised due to limited sample available for analysis and splitting sample to analyze for PAH's also. A volume of 200ml was obtained for each analysis for all samples except one, raising normal detection limits for both PAH (8310) and diesel (8015M) analyses by a factor of 5. Sample L9310211-29 ATB-26W had such limited sample that 200ml could not be aliquoted for each analysis. Therefore, one extraction was performed and extract was split for 8310 and 8015M for diesel causing the detection limits to be raised by an additional factor of 2. Detection limits for soil samples L9310211-1 (ATB-21-13.5-15.0), L9310211-2 (ATB-21-18.5-20.0), L9310211-3 (ATB-21-23.5-25.0), L9310211-4 (ATB-22-13.5-15.0), L9310211-8 (ATB-23-23.0-24.5), L9310211-10 (ATB-24-18.0-19.5), and L9310211-11 (ATB-24-23.0-24.5) were raised due to the high level of non-target analyte present, specifically waste oil. Soil samples L9310211-12 (ATB-25-4.0-5.5), L9310211-13 (ATB-25-9.5-10.0), and L9310211-14 (ATB-25-14.0-15.0) were ND for diesel but contained hydrocarbons in the range of kerosene.

PAH (EPA 8310):

Detection limits for PAH's for all water samples were raised due to limited sample available for analysis and splitting sample to analyze for diesel's also. A volume of 200ml was obtained for each analysis for all samples except one, raising normal detection limits for both PAH (8310) and diesel (8015M) analyses by a factor of 5. Sample L9310211-29 ATB-26W had such limited sample that 200ml could not be aliquoted for each analysis. Therefore, one extraction was performed and extract was split for 8310 and 8015M for diesel causing the detection limits to be raised by an additional factor of 2.

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-21-13.5-15.0
Lab Id: L9310211-1

Collected: 18-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
-----------	-------	-------	-------	-----------	----------

801505

Diesel

ND <

50.

mg/Kg

29-OCT-93 02-NOV-93

Comments:

See labnote 17.

1000 mg/kg - diesel oil

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-21-18.5-20
Lab Id: L9310211-2

Collected: 18-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
-----------	-------	-------	-------	-----------	----------

8015DS

Diesel

ND < 2000

mg/Kg

29-OCT-93

02-NOV-93

Comments:

See labnote 17. *2000 mg/Kg*

8310S

Naphthalene

ND < 100

ug/Kg

27-OCT-93

30-OCT-93

Acenaphthylene

ND < 200

ug/Kg

27-OCT-93

30-OCT-93

Acenaphthene

ND < 200

ug/Kg

27-OCT-93

30-OCT-93

Fluorene

ND < 20.

ug/Kg

27-OCT-93

30-OCT-93

Phenanthrene

ND < 50.

ug/Kg

27-OCT-93

30-OCT-93

Anthracene

ND < 50.

ug/Kg

27-OCT-93

30-OCT-93

Fluoranthene

ND < 10.

ug/Kg

27-OCT-93

30-OCT-93

Pyrene

ND < 10.

ug/Kg

27-OCT-93

30-OCT-93

Benzo(a)Anthracene

ND < 10.

ug/Kg

27-OCT-93

30-OCT-93

Chrysene

ND < 10.

ug/Kg

27-OCT-93

30-OCT-93

Benzo(b)Fluoranthene

ND < 5.0

ug/Kg

27-OCT-93

30-OCT-93

Benzo(k)Fluoranthene

ND < 5.0

ug/Kg

27-OCT-93

30-OCT-93

Benzo(a)Pyrene

ND < 5.0

ug/Kg

27-OCT-93

30-OCT-93

Dibenz(ah)Anthracene

ND < 10.

ug/Kg

27-OCT-93

30-OCT-93

Benzo(ghi)Perylene

ND < 10.

ug/Kg

27-OCT-93

30-OCT-93

Indeno(123cd)Pyrene

ND < 10.

ug/Kg

27-OCT-93

30-OCT-93

Surrogate:

2-Fluorobiphenyl

104.

%

27-OCT-93

30-OCT-93

Benzo(e)Pyrene

104.

%

27-OCT-93

30-OCT-93

Comments:

None

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-21-23.5-25
Lab Id: L9310211-3

Collected: 18-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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801505

Diesel

ND <

100

mg/Kg

29-OCT-93

29-OCT-93

Comments:

See labnote 17.

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-22-13.5-15
Lab Id: L9310211-4

Collected: 18-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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8015DS

Diesel

ND < 10.

mg/Kg

29-OCT-93 29-OCT-93

Comments:

See labnote 17.

65 mg/kg waste oil

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-22-18.5-20
Lab Id: L9310211-5

Collected: 18-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
80150s					
Diesel	ND <	5.0	mg/Kg	29-OCT-93	29-OCT-93
Comments:	None				
8310s					
Naphthalene	ND <	100	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthylene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Fluorene	ND <	20.	ug/Kg	27-OCT-93	30-OCT-93
Phenanthrene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Anthracene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Fluoranthene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Chrysene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(b)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(k)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Pyrene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Dibenz(ah)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(ghi)Perylene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Indeno(123cd)Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Surrogate:	-	-	-	-	-
2-Fluorobiphenyl	82.5	-	%	27-OCT-93	30-OCT-93
Benzo(e)Pyrene	101.	-	%	27-OCT-93	30-OCT-93
Comments:	None				

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-22-23.5-25
Lab Id: L9310211-6

Collected: 18-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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8015Ds					
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Diesel	ND <	5.0	mg/Kg	29-OCT-93	29-OCT-93
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Comments:	None				
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D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-23-13.0-14.5
Lab Id: L9310211-23

Collected: 19-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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801505					
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Diesel	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
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Comments:	None				
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D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-23-18.0-19.5
Lab Id: L9310211-7

Collected: 19-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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80150S

Diesel	ND <	5.0	mg/Kg	29-OCT-93	29-OCT-93
Comments:	None				

8310S

Naphthalene	ND <	100	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthylene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Fluorene	ND <	20.	ug/Kg	27-OCT-93	30-OCT-93
Phenanthrene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Anthracene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Fluoranthene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Chrysene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(b)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(k)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Pyrene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Dibenz(ah)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(ghi)Perylene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Indeno(123cd)Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Surrogate:					
2-Fluorobiphenyl	87.9	-	%	27-OCT-93	30-OCT-93
Benzo(e)Pyrene	110.	-	%	27-OCT-93	30-OCT-93
Comments:	None				

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-23-23.0-24.5
Lab Id: L9310211-8

Collected: 19-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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80150S

Diesel

ND < 150

mg/Kg

29-OCT-93 29-OCT-93

Comments:

See labnote 17.

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-24-13.0-14.5
Lab Id: L9310211-9

Collected: 19-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
801505					
Diesel	ND <	5.0	mg/Kg	29-OCT-93	29-OCT-93
Comments:	None				

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-24-18.0-19.5
Lab Id: L9310211-10

Collected: 19-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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801505

Diesel	ND <	3000	mg/Kg	29-OCT-93	02-NOV-93
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Comments:

See labnote 17.

83105

Naphthalene	ND <	500	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthylene	ND <	1000	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthene	ND <	1000	ug/Kg	27-OCT-93	30-OCT-93
Fluorene	ND <	100	ug/Kg	27-OCT-93	30-OCT-93
Phenanthrene	ND <	250	ug/Kg	27-OCT-93	30-OCT-93
Anthracene	ND <	250	ug/Kg	27-OCT-93	30-OCT-93
Fluoranthene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Pyrene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Anthracene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Chrysene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(b)Fluoranthene	ND <	25.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(k)Fluoranthene	ND <	25.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Pyrene	ND <	25.	ug/Kg	27-OCT-93	30-OCT-93
Dibenz(ah)Anthracene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(ghi)Perylene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Indeno(123cd)Pyrene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93

Surrogate:

2-Fluorobiphenyl	113.	-	%	27-OCT-93	30-OCT-93
Benzo(e)Pyrene	65.3	-	%	27-OCT-93	30-OCT-93

Comments:

See footnote #17

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-24-23.0-24.5
Lab Id: L9310211-11

Collected: 19-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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801505

Diesel

ND <

250

mg/Kg

29-OCT-93 02-NOV-93

Comments:

See labnote 17.

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-25-4.0-5.5
Lab Id: L9310211-12

Collected: 20-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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8015DS

Diesel

ND <

5.0

mg/Kg

29-OCT-93 02-NOV-93

Comments:

None

2100 mg/kg kerosene

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: AT8-25-9.0-10.0
Lab Id: L9310211-13

Collected: 20-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
801505					
Diesel	ND <	5.0	mg/Kg	01-NOV-93	01-NOV-93
Comments:	None				
83105					
Naphthalene	ND <	100	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthylene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Fluorene	ND <	20.	ug/Kg	27-OCT-93	30-OCT-93
Phenanthrene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Anthracene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Fluoranthene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Chrysene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(b)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(k)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Pyrene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Dibenz(ah)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(ghi)Perylene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Indeno(123cd)Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Surrogate:					
2-Fluorobiphenyl	87.9	-	%	27-OCT-93	30-OCT-93
Benzo(e)Pyrene	110.	-	%	27-OCT-93	30-OCT-93
Comments:	None				

600 mg/kg kerosene

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-25-14.0-15.0
Lab Id: L9310211-14

Collected: 20-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
801505					
Diesel	ND <	5.0	mg/Kg	29-OCT-93	29-OCT-93
Comments:	None				
8310S					
Naphthalene	ND <	100	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthylene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Fluorene	ND <	20.	ug/Kg	27-OCT-93	30-OCT-93
Phenanthrene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Anthracene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Fluoranthene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Chrysene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(b)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(k)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Pyrene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Dibenz(ah)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(ghi)Perylene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Indeno(123cd)Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Surrogate:	-	-	-	-	-
2-Fluorobiphenyl	92.7	-	%	27-OCT-93	30-OCT-93
Benzo(e)Pyrene	111.	-	%	27-OCT-93	30-OCT-93
Comments:	None				

100 mg/kg Kerosene

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-25-19.0-20.0
Lab Id: L9310211-15

Collected: 20-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
8015DS					
Diesel	ND <	5.0	mg/Kg	29-OCT-93	29-OCT-93
Comments:	None				

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-25-24.0-25.5
Lab Id: L9310211-16

Collected: 20-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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8015DS					
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Diesel	ND <	5.0	mg/Kg	01-NOV-93	01-NOV-93
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Comments:	None				
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D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-26-14.0-15.0
Lab Id: L9310211-19

Collected: 20-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
8015DS					
Diesel	ND <	5.0	mg/Kg	29-OCT-93	29-OCT-93
Comments:	None				

D&M Laboratories
ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-26-19.0-20.5
Lab Id: L9310211-17

Collected: 20-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
8015DS					
Diesel	ND <	5.0	mg/Kg	29-OCT-93	29-OCT-93
Comments:	None				
8310S					
Naphthalene	ND <	100	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthylene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Fluorene	ND <	20.	ug/Kg	27-OCT-93	30-OCT-93
Phenanthrene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Anthracene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Fluoranthene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Chrysene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(b)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(k)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Pyrene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Dibenz(ah)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(ghi)Perylene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Indeno(123cd)Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Surrogate:	-	-	-	-	-
2-Fluorobiphenyl	91.5	-	%	27-OCT-93	30-OCT-93
Benzo(e)Pyrene	112.	-	%	27-OCT-93	30-OCT-93
Comments:	None				

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-26-24.0-25.5
Lab Id: L9310211-18

Collected: 20-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
80150S					
Diesel	ND <	5.0	mg/Kg	29-OCT-93	29-OCT-93
Comments:	None				

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-27-13.5-15.0
Lab Id: L9310211-22

Collected: 20-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
8015DS					
Diesel	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
Comments:	None				

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
 Project Id: 00173-076-044 UPRR-SACTO
 Sample Id: ATB-27-18.5-19.0
 Lab Id: L9310211-20

Collected: 20-OCT-93
 Received: 22-OCT-93
 Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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8015DS

Diesel	ND <	5.0	mg/Kg	29-OCT-93	29-OCT-93
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Comments: None

8310S

Naphthalene	ND <	100	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthylene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Fluorene	ND <	20.	ug/Kg	27-OCT-93	30-OCT-93
Phenanthrene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Anthracene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Fluoranthene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Chrysene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(b)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(k)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Pyrene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Dibenz(ah)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(ghi)Perylene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Indeno(123cd)Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93

Surrogate:

2-Fluorobiphenyl	95.0	-	%	27-OCT-93	30-OCT-93
Benzo(e)Pyrene	108.	-	%	27-OCT-93	30-OCT-93

Comments: None

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-27-23.5-25.0
Lab Id: L9310211-21

Collected: 20-OCT-93
Received: 22-OCT-93
Reported: 04-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
801505					
Diesel	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
Comments:	None				

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-21W
Lab Id: L9310211-24

Collected: 18-OCT-93
Received: 22-OCT-93
Reported: 05-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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80150W

Diesel	1.1	0.25	mg/L	27-OCT-93	28-OCT-93
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Comments: See labnote 15.

8310W

Naphthalene	ND <	5.0	ug/L	25-OCT-93	28-OCT-93
Acenaphthylene	ND <	10.	ug/L	25-OCT-93	28-OCT-93
Acenaphthene	ND <	10.	ug/L	25-OCT-93	28-OCT-93
Fluorene	ND <	1.0	ug/L	25-OCT-93	28-OCT-93
Phenanthrene	ND <	2.5	ug/L	25-OCT-93	28-OCT-93
Anthracene	ND <	2.5	ug/L	25-OCT-93	28-OCT-93
Fluoranthene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Pyrene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Benzo(a)Anthracene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Chrysene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Benzo(b)Fluoranthene	ND <	0.25	ug/L	25-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	ND <	0.25	ug/L	25-OCT-93	28-OCT-93
Benzo(a)Pyrene	ND <	0.25	ug/L	25-OCT-93	28-OCT-93
Dibenz(ah)Anthracene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Benzo(ghi)Perylene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Indeno(123cd)Pyrene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93

Surrogate:

2-Fluorobiphenyl	104.	-	% Recovery	25-OCT-93	28-OCT-93
Benzo(e)Pyrene	109.	-	% Recovery	25-OCT-93	28-OCT-93

Comments: None

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-22W
Lab Id: L9310211-25

Collected: 18-OCT-93
Received: 22-OCT-93
Reported: 05-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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8015DW

Diesel	0.29	0.25	mg/L	27-OCT-93	28-OCT-93
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Comments: See labnote 15.

8310W

Naphthalene	ND <	5.0	ug/L	25-OCT-93	28-OCT-93
Acenaphthylene	ND <	10.	ug/L	25-OCT-93	28-OCT-93
Acenaphthene	ND <	10.	ug/L	25-OCT-93	28-OCT-93
Fluorene	ND <	1.0	ug/L	25-OCT-93	28-OCT-93
Phenanthrene	ND <	2.5	ug/L	25-OCT-93	28-OCT-93
Anthracene	ND <	2.5	ug/L	25-OCT-93	28-OCT-93
Fluoranthene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Pyrene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Benzo(a)Anthracene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Chrysene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Benzo(b)Fluoranthene	ND <	0.25	ug/L	25-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	ND <	0.25	ug/L	25-OCT-93	28-OCT-93
Benzo(a)Pyrene	ND <	0.25	ug/L	25-OCT-93	28-OCT-93
Dibenz(ah)Anthracene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Benzo(ghi)Perylene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Indeno(123cd)Pyrene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93

Surrogate:

2-Fluorobiphenyl	103.	-	% Recovery	25-OCT-93	28-OCT-93
Benzo(e)Pyrene	116.	-	% Recovery	25-OCT-93	28-OCT-93

Comments: None

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-23W
Lab Id: L9310211-26

Collected: 19-OCT-93
Received: 22-OCT-93
Reported: 05-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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80150W

Diesel	ND <	0.25	mg/L	27-OCT-93	28-OCT-93
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Comments:	See labnote 15.
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8310W

Naphthalene	ND <	5.0	ug/L	26-OCT-93	28-OCT-93
Acenaphthylene	ND <	10.	ug/L	26-OCT-93	28-OCT-93
Acenaphthene	ND <	10.	ug/L	26-OCT-93	28-OCT-93
Fluorene	ND <	1.0	ug/L	26-OCT-93	28-OCT-93
Phenanthrene	ND <	2.5	ug/L	26-OCT-93	28-OCT-93
Anthracene	ND <	2.5	ug/L	26-OCT-93	28-OCT-93
Fluoranthene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Pyrene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Benzo(a)Anthracene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Chrysene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Benzo(b)Fluoranthene	ND <	0.25	ug/L	26-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	ND <	0.25	ug/L	26-OCT-93	28-OCT-93
Benzo(a)Pyrene	ND <	0.25	ug/L	26-OCT-93	28-OCT-93
Dibenz(ah)Anthracene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Benzo(ghi)Perylene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Indeno(123cd)Pyrene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93

Surrogate:					
2-Fluorobiphenyl	87.1	-	% Recovery	26-OCT-93	28-OCT-93
Benzo(e)Pyrene	114.	-	% Recovery	26-OCT-93	28-OCT-93

Comments:	None
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D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-24W
Lab Id: L9310211-27

Collected: 19-OCT-93
Received: 22-OCT-93
Reported: 05-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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80150W

Diesel	2.9	0.25	mg/L	27-OCT-93	28-OCT-93
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Comments: See labnote 15

8310W

Naphthalene	ND <	5.0	ug/L	26-OCT-93	28-OCT-93
Acenaphthylene	ND <	10.	ug/L	26-OCT-93	28-OCT-93
Acenaphthene	ND <	10.	ug/L	26-OCT-93	28-OCT-93
Fluorene	ND <	1.0	ug/L	26-OCT-93	28-OCT-93
Phenanthrene	ND <	2.5	ug/L	26-OCT-93	28-OCT-93
Anthracene	ND <	2.5	ug/L	26-OCT-93	28-OCT-93
Fluoranthene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Pyrene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Benzo(a)Anthracene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Chrysene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Benzo(b)Fluoranthene	ND <	0.25	ug/L	26-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	ND <	0.25	ug/L	26-OCT-93	28-OCT-93
Benzo(a)Pyrene	ND <	0.25	ug/L	26-OCT-93	28-OCT-93
Dibenz(ah)Anthracene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Benzo(ghi)Perylene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Indeno(123cd)Pyrene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93

Surrogate:

2-Fluorobiphenyl	99.1	-	% Recovery	26-OCT-93	28-OCT-93
Benzo(e)Pyrene	110.	-	% Recovery	26-OCT-93	28-OCT-93

Comments: None

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-26W
Lab Id: L9310211-29

Collected: 20-OCT-93
Received: 22-OCT-93
Reported: 10-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
8015DW					
Diesel	ND <	0.50	mg/L	27-OCT-93	28-OCT-93
-	-				
Comments:	See labnote 15				
-	-				
8310W					
Naphthalene	ND <	10.	ug/L	26-OCT-93	28-OCT-93
Acenaphthylene	ND <	20.	ug/L	26-OCT-93	28-OCT-93
Acenaphthene	ND <	20.	ug/L	26-OCT-93	28-OCT-93
Fluorene	ND <	2.0	ug/L	26-OCT-93	28-OCT-93
Phenanthrene	0.73	5.0	ug/L	26-OCT-93	28-OCT-93
Anthracene	ND <	5.0	ug/L	26-OCT-93	28-OCT-93
Fluoranthene	ND <	1.0	ug/L	26-OCT-93	28-OCT-93
Pyrene	ND <	1.0	ug/L	26-OCT-93	28-OCT-93
Benzo(a)Anthracene	ND <	1.0	ug/L	26-OCT-93	28-OCT-93
Chrysene	ND <	1.0	ug/L	26-OCT-93	28-OCT-93
Benzo(b)Fluoranthene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Benzo(a)Pyrene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Dibenz(ah)Anthracene	ND <	1.0	ug/L	26-OCT-93	28-OCT-93
Benzo(ghi)Perylene	ND <	1.0	ug/L	26-OCT-93	28-OCT-93
Indeno(123cd)Pyrene	ND <	1.0	ug/L	26-OCT-93	28-OCT-93
-	-				
Surrogate:	-				
2-Fluorobiphenyl	102.	-	% Recovery	26-OCT-93	28-OCT-93
Benzo(e)Pyrene	110.	-	% Recovery	26-OCT-93	28-OCT-93
-	-				
Comments:	None				

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for: Dames & Moore-Sacramento
Project Id: 00173-076-044 UPRR-SACTO
Sample Id: ATB-27W
Lab Id: L9310211-30

Collected: 20-OCT-93
Received: 22-OCT-93
Reported: 05-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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8015DW

Diesel	ND <	0.25	mg/L	27-OCT-93	28-OCT-93
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Comments: See labnote 15.

8310W

Naphthalene	ND <	5.0	ug/L	26-OCT-93	28-OCT-93
Acenaphthylene	ND <	10.	ug/L	26-OCT-93	28-OCT-93
Acenaphthene	ND <	10.	ug/L	26-OCT-93	28-OCT-93
Fluorene	ND <	1.0	ug/L	26-OCT-93	28-OCT-93
Phenanthrene	ND <	2.5	ug/L	26-OCT-93	28-OCT-93
Anthracene	ND <	2.5	ug/L	26-OCT-93	28-OCT-93
Fluoranthene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Pyrene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Benzo(a)Anthracene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Chrysene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Benzo(b)Fluoranthene	ND <	0.25	ug/L	26-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	ND <	0.25	ug/L	26-OCT-93	28-OCT-93
Benzo(a)Pyrene	ND <	0.25	ug/L	26-OCT-93	28-OCT-93
Dibenz(ah)Anthracene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Benzo(ghi)Perylene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Indeno(123cd)Pyrene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93

Surrogate:

2-Fluorobiphenyl	87.3	-	% Recovery	26-OCT-93	28-OCT-93
Benzo(e)Pyrene	109.	-	% Recovery	26-OCT-93	28-OCT-93

Comments: None

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for:

Project Id:

Sample Id: Method Blank

Lab Id: WG3060-1

Reported: 01-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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TPHIDQ-W

Gas	ND <	0.050	mg/L	27-OCT-93	28-OCT-93
Mineral Spirits	ND <	0.050	mg/L	27-OCT-93	28-OCT-93
Jet Fuel	ND <	0.050	mg/L	27-OCT-93	28-OCT-93
Kerosine	ND <	0.050	mg/L	27-OCT-93	28-OCT-93
Diesel	ND <	0.050	mg/L	27-OCT-93	28-OCT-93
Waste Oil	ND <	0.50	mg/L	27-OCT-93	28-OCT-93

Comments:

None

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:

Project Id:

Sample Id: Water Spike

Lab Id: WG3060-2

Reported: 01-NOV-93

Parameter	Value	Units	Spike	Units	% Rec	Extracted	Analyzed
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TPHIDQ-W

Gas	ND <	mg/L				27-OCT-93	28-OCT-93
Mineral Spirits	ND <	mg/L				27-OCT-93	28-OCT-93
Jet Fuel	ND <	mg/L				27-OCT-93	28-OCT-93
Kerosine	ND <	mg/L				27-OCT-93	28-OCT-93
Diesel	0.850	mg/L	1	mg/L	85%	27-OCT-93	28-OCT-93
Waste Oil	ND <	mg/L				27-OCT-93	28-OCT-93

Comments:

None

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:

Project Id:

Sample Id: Water Spike Duplicat

Lab Id: WG3060-3

Reported: 01-NOV-93

Parameter	Value	Units	% Rec	RPD	Extracted	Analyzed
TPHIDQ-W: 11.1 11.1 11.1						
Gas	ND <	mg/L			27-OCT-93	28-OCT-93
Mineral Spirits	ND <	mg/L			27-OCT-93	28-OCT-93
Jet Fuel	ND <	mg/L			27-OCT-93	28-OCT-93
Kerosine	ND <	mg/L			27-OCT-93	28-OCT-93
Diesel	0.950	mg/L	95%	11.	27-OCT-93	28-OCT-93
Waste Oil	ND <	mg/L			27-OCT-93	28-OCT-93
-	-					
Comments:	None					
-	-					
-	-					
-	-					

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for:
Project Id:
Sample Id: Method Blank
Lab Id: WG3047-4

Reported: 01-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
TPH10Q-S					
Gas	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
Mineral Spirits	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
Jet Fuel	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
Kerosine	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
Diesel	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
Waste Oil	ND <	50.	mg/Kg	27-OCT-93	27-OCT-93

Comments: None

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:

Project Id:

Sample Id: Method Blank Spike

Lab Id: WG3047-5

Reported: 01-NOV-93

Parameter	Value	Units	Spike	Units	% Rec	Extracted	Analyzed
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TPH100-S

Gas	ND <	mg/Kg				27-OCT-93	27-OCT-93
Mineral Spirits	ND <	mg/Kg				27-OCT-93	27-OCT-93
Jet Fuel	ND <	mg/Kg				27-OCT-93	27-OCT-93
Kerosine	ND <	mg/Kg				27-OCT-93	27-OCT-93
Diesel	84.0	mg/Kg	100	mg/Kg	84%	27-OCT-93	27-OCT-93
Waste Oil	ND <	mg/Kg				27-OCT-93	27-OCT-93

Comments:

None

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for:

Project Id:

Sample Id: MX

Lab Id: WG3047-1

Reported: 01-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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TPHIDQ-S

Gas	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
Mineral Spirits	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
Jet Fuel	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
Kerosine	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
Diesel	ND <	5.0	mg/Kg	27-OCT-93	27-OCT-93
Waste Oil	ND <	50.	mg/Kg	27-OCT-93	27-OCT-93

Comments:

MX = L9310211-22

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:

Project Id:

Sample Id: Matrix Spike

Lab Id: WG3047-2

Reported: 01-NOV-93

Parameter	Value	Units	Spike	Units	% Rec	Extracted	Analyzed
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TPH10Q-S

Gas	ND <	mg/Kg				27-OCT-93	27-OCT-93
Mineral Spirits	ND <	mg/Kg				27-OCT-93	27-OCT-93
Jet Fuel	ND <	mg/Kg				27-OCT-93	27-OCT-93
Kerosine	ND <	mg/Kg				27-OCT-93	27-OCT-93
Diesel	78.0	mg/Kg	100	mg/Kg	78%	27-OCT-93	27-OCT-93
Waste Oil	ND <	mg/Kg				27-OCT-93	27-OCT-93

Comments:

None

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:

Project Id:

Sample Id: Matrix Spike Dup

Lab Id: WG3047-3

Reported: 01-NOV-93

Parameter	Value	Units	% Rec	RPD	Extracted	Analyzed
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TPHIDQ-S

Gas	ND <	mg/Kg			27-OCT-93	27-OCT-93
Mineral Spirits	ND <	mg/Kg			27-OCT-93	27-OCT-93
Jet Fuel	ND <	mg/Kg			27-OCT-93	27-OCT-93
Kerosine	ND <	mg/Kg			27-OCT-93	27-OCT-93
Diesel	85.0	mg/Kg	85%	8.5	27-OCT-93	27-OCT-93
Waste Oil	ND <	mg/Kg			27-OCT-93	27-OCT-93

Comments:

None

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for:

Project Id:

Sample Id: Method Blank

Lab Id: WG3100-4

Reported: 03-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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TPHIDQ-S

Gas	ND <	5.0	mg/Kg	01-NOV-93	01-NOV-93
Mineral Spirits	ND <	5.0	mg/Kg	01-NOV-93	01-NOV-93
Jet Fuel	ND <	5.0	mg/Kg	01-NOV-93	01-NOV-93
Kerosine	ND <	5.0	mg/Kg	01-NOV-93	01-NOV-93
Diesel	ND <	5.0	mg/Kg	01-NOV-93	01-NOV-93
Waste Oil	ND <	50.	mg/Kg	01-NOV-93	01-NOV-93

Comments:

None

D&M Laboratories
QUALITY CONTROL REPORT

Prepared for:
Project Id:
Sample Id: Method Blank Spike
Lab Id: WG3100-5

Reported: 03-NOV-93

Parameter	Value	Units	Spike	Units	% Rec	Extracted	Analyzed
TPHIDQ-S							
Gas	ND <	mg/Kg				01-NOV-93	01-NOV-93
Mineral Spirits	ND <	mg/Kg				01-NOV-93	01-NOV-93
Jet Fuel	ND <	mg/Kg				01-NOV-93	01-NOV-93
Kerosine	ND <	mg/Kg				01-NOV-93	01-NOV-93
Diesel	71.0	mg/Kg	100	mg/Kg	71%	01-NOV-93	01-NOV-93
Waste Oil	ND <	mg/Kg				01-NOV-93	01-NOV-93
Comments:	None						

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for:

Project Id:

Sample Id: MX

Lab Id: WG3100-1

Reported: 03-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
TPH10Q-S					
Gas	ND <	5.0	mg/Kg	01-NOV-93	01-NOV-93
Mineral Spirits	ND <	5.0	mg/Kg	01-NOV-93	01-NOV-93
Jet Fuel	ND <	5.0	mg/Kg	01-NOV-93	01-NOV-93
Kerosine	ND <	5.0	mg/Kg	01-NOV-93	01-NOV-93
Diesel	ND <	5.0	mg/Kg	01-NOV-93	01-NOV-93
Waste Oil	ND <	50.	mg/Kg	01-NOV-93	01-NOV-93

Comments:

MX = L9310211-16

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:

Project Id:

Sample Id: Matrix Spike

Lab Id: WG3100-2

Reported: 03-NOV-93

Parameter	Value	Units	Spike	Units	% Rec	Extracted	Analyzed
TPHIDQ-S							
Gas	ND <	mg/Kg				01-NOV-93	01-NOV-93
Mineral Spirits	ND <	mg/Kg				01-NOV-93	01-NOV-93
Jet Fuel	ND <	mg/Kg				01-NOV-93	01-NOV-93
Kerosine	ND <	mg/Kg				01-NOV-93	01-NOV-93
Diesel	97.0	mg/Kg	100	mg/Kg	97%	01-NOV-93	01-NOV-93
Waste Oil	ND <	mg/Kg				01-NOV-93	01-NOV-93
Comments:	None						

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:

Project Id:

Sample Id: Matrix Spike Dup

Lab Id: WG3100-3

Reported: 03-NOV-93

Parameter	Value	Units	% Rec	RPD	Extracted	Analyzed
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TPHIDQ-S

Gas	ND <	mg/Kg			01-NOV-93	01-NOV-93
Mineral Spirits	ND <	mg/Kg			01-NOV-93	01-NOV-93
Jet Fuel	ND <	mg/Kg			01-NOV-93	01-NOV-93
Kerosine	ND <	mg/Kg			01-NOV-93	01-NOV-93
Diesel	99.0	mg/Kg	99%	2.0	01-NOV-93	01-NOV-93
Waste Oil	ND <	mg/Kg			01-NOV-93	01-NOV-93

Comments:

None

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for:
Project Id:
Sample Id: Method Blank
Lab Id: WG3023-4

Collected:
Received: 27-OCT-93
Reported: 03-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
8310W					
Naphthalene	ND <	1.0	ug/L	25-OCT-93	28-OCT-93
Acenaphthylene	ND <	2.0	ug/L	25-OCT-93	28-OCT-93
Acenaphthene	ND <	2.0	ug/L	25-OCT-93	28-OCT-93
Fluorene	ND <	0.20	ug/L	25-OCT-93	28-OCT-93
Phenanthrene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Anthracene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Fluoranthene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Pyrene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Benzo(a)Anthracene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Chrysene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Benzo(b)Fluoranthene	ND <	0.050	ug/L	25-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	ND <	0.050	ug/L	25-OCT-93	28-OCT-93
Benzo(a)Pyrene	ND <	0.050	ug/L	25-OCT-93	28-OCT-93
Dibenz(ah)Anthracene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Benzo(ghi)Perylene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Indeno(123cd)Pyrene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Surrogate:	-	-	-	-	-
2-Fluorobiphenyl	104.	-	% Recovery	25-OCT-93	28-OCT-93
Benzo(e)Pyrene	111.	-	% Recovery	25-OCT-93	28-OCT-93
Comments:	None				

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:
Project Id:
Sample Id: Method Blank Spike
Lab Id: WG3023-5

Reported: 03-NOV-93

Parameter	Value	Units	Spike	Units	% Rec	Extracted	Analyzed
83100CW							
Naphthalene	16.9	ug/L	25	ug/L	67.8%	25-OCT-93	28-OCT-93
Acenaphthene	16.6	ug/L	25	ug/L	66.6%	25-OCT-93	28-OCT-93
Pyrene	2.06	ug/L	2.5	ug/L	82.6%	25-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	0.208	ug/L	.2	ug/L	104 %	25-OCT-93	28-OCT-93
Surrogate:							
2-Fluorobiphenyl	79.2	% Recovery				25-OCT-93	28-OCT-93
Benzo(e)Pyrene	117.	% Recovery				25-OCT-93	28-OCT-93
Comments:	None						

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for:
Project Id:
Sample Id: Method Blank
Lab Id: WG3023-6

Collected:
Received: 01-NOV-93
Reported: 03-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
8310W					
Naphthalene	ND <	1.0	ug/L	26-OCT-93	28-OCT-93
Acenaphthylene	ND <	2.0	ug/L	26-OCT-93	28-OCT-93
Acenaphthene	ND <	2.0	ug/L	26-OCT-93	28-OCT-93
Fluorene	ND <	0.20	ug/L	26-OCT-93	28-OCT-93
Phenanthrene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Anthracene	ND <	0.50	ug/L	26-OCT-93	28-OCT-93
Fluoranthene	ND <	0.10	ug/L	26-OCT-93	28-OCT-93
Pyrene	ND <	0.10	ug/L	26-OCT-93	28-OCT-93
Benzo(a)Anthracene	ND <	0.10	ug/L	26-OCT-93	28-OCT-93
Chrysene	ND <	0.10	ug/L	26-OCT-93	28-OCT-93
Benzo(b)Fluoranthene	ND <	0.050	ug/L	26-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	ND <	0.050	ug/L	26-OCT-93	28-OCT-93
Benzo(a)Pyrene	ND <	0.050	ug/L	26-OCT-93	28-OCT-93
Dibenz(ah)Anthracene	ND <	0.10	ug/L	26-OCT-93	28-OCT-93
Benzo(ghi)Perylene	ND <	0.10	ug/L	26-OCT-93	28-OCT-93
Indeno(123cd)Pyrene	ND <	0.10	ug/L	26-OCT-93	28-OCT-93
Surrogate:					
2-Fluorobiphenyl	82.1	-	% Recovery	26-OCT-93	28-OCT-93
Benzo(e)Pyrene	115.	-	% Recovery	26-OCT-93	28-OCT-93
Comments:	None				

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:

Project Id:

Sample Id: Method Blank Spike

Lab Id: WG3023-7

Reported: 03-NOV-93

Parameter	Value	Units	Spike	Units	% Rec	Extracted	Analyzed
8310QCW							
Naphthalene	20.3	ug/L	25	ug/L	81.2%	26-OCT-93	28-OCT-93
Acenaphthene	20.3	ug/L	25	ug/L	81.2%	26-OCT-93	28-OCT-93
Pyrene	1.87	ug/L	2.5	ug/L	74.7%	26-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	0.193	ug/L	.2	ug/L	96.5%	26-OCT-93	28-OCT-93
-	-	-	-	-	-	-	-
Surrogate:							
2-Fluorobiphenyl	87.2	% Recovery				26-OCT-93	28-OCT-93
Benzo(e)Pyrene	115.	% Recovery				26-OCT-93	28-OCT-93
-	-	-	-	-	-	-	-
Comments:	None						

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for:

Project Id:

Sample Id: MX

Lab Id: WG3023-1

Reported: 03-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
8310W					
Naphthalene	ND <	1.0	ug/L	25-OCT-93	28-OCT-93
Acenaphthylene	ND <	2.0	ug/L	25-OCT-93	28-OCT-93
Acenaphthene	ND <	2.0	ug/L	25-OCT-93	28-OCT-93
Fluorene	ND <	0.20	ug/L	25-OCT-93	28-OCT-93
Phenanthrene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Anthracene	ND <	0.50	ug/L	25-OCT-93	28-OCT-93
Fluoranthene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Pyrene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Benzo(a)Anthracene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Chrysene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Benzo(b)Fluoranthene	ND <	0.050	ug/L	25-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	ND <	0.050	ug/L	25-OCT-93	28-OCT-93
Benzo(a)Pyrene	ND <	0.050	ug/L	25-OCT-93	28-OCT-93
Dibenz(ah)Anthracene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Benzo(ghi)Perylene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Indeno(123cd)Pyrene	ND <	0.10	ug/L	25-OCT-93	28-OCT-93
Surrogate:					
2-Fluorobiphenyl	104.	-	% Recovery	25-OCT-93	28-OCT-93
Benzo(e)Pyrene	111.	-	% Recovery	25-OCT-93	28-OCT-93

Comments:

The MX is the MB sample

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:

Project Id:

Sample Id: Water Spike

Lab Id: WG3023-2

Reported: 03-NOV-93

Parameter	Value	Units	Spike	Units	% Rec	Extracted	Analyzed
8310QCW							
Naphthalene	16.9	ug/L	25	ug/L	67.8%	25-OCT-93	28-OCT-93
Acenaphthene	16.6	ug/L	25	ug/L	66.6%	25-OCT-93	28-OCT-93
Pyrene	2.06	ug/L	2.5	ug/L	82.6%	25-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	0.208	ug/L	.2	ug/L	104 %	25-OCT-93	28-OCT-93
Surrogate:							
2-Fluorobiphenyl	79.2	% Recovery				25-OCT-93	28-OCT-93
Benzo(e)Pyrene	117.	% Recovery				25-OCT-93	28-OCT-93
Comments:	None						

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:

Project Id:

Sample Id: Water Spike Duplicat

Lab Id: WG3023-3

Reported: 03-NOV-93

Parameter	Value	Units	% Rec	RPD	Extracted	Analyzed
8310QCW						
Naphthalene	18.6	ug/L	74.4%	9.6	25-OCT-93	28-OCT-93
Acenaphthene	18.7	ug/L	74.6%	12.	25-OCT-93	28-OCT-93
Pyrene	2.05	ug/L	82.0%	4.9	25-OCT-93	28-OCT-93
Benzo(k)Fluoranthene	0.203	ug/L	102 %	2.4	25-OCT-93	28-OCT-93
Surrogate:						
2-Fluorobiphenyl	99.5	% Recovery			25-OCT-93	28-OCT-93
Benzo(e)Pyrene	113.	% Recovery			25-OCT-93	28-OCT-93
Comments:	None					

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for:
Project Id:
Sample Id: Method Blank
Lab Id: WG3024-4

Collected:
Received: 27-OCT-93
Reported: 03-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
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8310S

Naphthalene	ND <	100	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthylene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Fluorene	ND <	20.	ug/Kg	27-OCT-93	30-OCT-93
Phenanthrene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Anthracene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Fluoranthene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Chrysene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(b)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(k)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Pyrene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Dibenz(ah)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(ghi)Perylene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Indeno(123cd)Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93

Surrogate:

2-Fluorobiphenyl	85.3	-	%	27-OCT-93	30-OCT-93
Benzo(e)Pyrene	106.	-	%	27-OCT-93	30-OCT-93

Comments:

None

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:
Project Id:
Sample Id: Method Blank Spike
Lab Id: WG3024-5

Reported: 03-NOV-93

Parameter	Value	Units	Spike	Units	% Rec	Extracted	Analyzed
8310QCS							
Naphthalene	1820	ug/Kg	2500	ug/Kg	72.7%	27-OCT-93	30-OCT-93
Acenaphthene	1920	ug/Kg	2500	ug/Kg	76.8%	27-OCT-93	30-OCT-93
Pyrene	193.	ug/Kg	250	ug/Kg	77.2%	27-OCT-93	30-OCT-93
Benzo(k)Fluoranthene	19.1	ug/Kg	20	ug/Kg	95.5%	27-OCT-93	30-OCT-93
Surrogate:							
2-Fluorobiphenyl	90.8	%				27-OCT-93	30-OCT-93
Benzo(e)Pyrene	115.	%				27-OCT-93	30-OCT-93
Comments:	None						

D&M Laboratories

ANALYTICAL DATA REPORT

Prepared for:

Project Id:

Sample Id: MX

Lab Id: WG3024-1

Reported: 03-NOV-93

Parameter	Value	Limit	Units	Extracted	Analyzed
8310S					
Naphthalene	ND <	100	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthylene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Acenaphthene	ND <	200	ug/Kg	27-OCT-93	30-OCT-93
Fluorene	ND <	20.	ug/Kg	27-OCT-93	30-OCT-93
Phenanthrene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Anthracene	ND <	50.	ug/Kg	27-OCT-93	30-OCT-93
Fluoranthene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Chrysene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(b)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(k)Fluoranthene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Benzo(a)Pyrene	ND <	5.0	ug/Kg	27-OCT-93	30-OCT-93
Dibenz(ah)Anthracene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Benzo(ghi)Perylene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Indeno(123cd)Pyrene	ND <	10.	ug/Kg	27-OCT-93	30-OCT-93
Surrogate:					
2-Fluorobiphenyl	95.0	-	%	27-OCT-93	30-OCT-93
Benzo(e)Pyrene	108.	-	%	27-OCT-93	30-OCT-93

Comments:

The MX is sample #L9310211-20

D&M Laboratories

QUALITY CONTROL REPORT

Prepared for:

Project Id:

Sample Id: Matrix Spike

Lab Id: WG3024-2

Reported: 03-NOV-93

Parameter	Value	Units	Spike	Units	% Rec	Extracted	Analyzed
8310QCS							
Naphthalene	1540	ug/Kg	2500	ug/Kg	61.8%	27-OCT-93	30-OCT-93
Acenaphthene	1690	ug/Kg	2500	ug/Kg	67.7%	27-OCT-93	30-OCT-93
Pyrene	182.	ug/Kg	250	ug/Kg	73.0%	27-OCT-93	30-OCT-93
Benzo(k)Fluoranthene	18.0	ug/Kg	20	ug/Kg	90.0%	27-OCT-93	30-OCT-93
Surrogate:							
2-Fluorobiphenyl	84.3	%				27-OCT-93	30-OCT-93
Benzo(e)Pyrene	111.	%				27-OCT-93	30-OCT-93
Comments:	None						

D&M Laboratories
QUALITY CONTROL REPORT

Prepared for:
Project Id:
Sample Id: Matrix Spike Dup
Lab Id: WG3024-3

Reported: 03-NOV-93

Parameter	Value	Units	% Rec	RPD	Extracted	Analyzed
8310QCS						
Naphthalene	1420	ug/Kg	56.8%	8.4	27-OCT-93	30-OCT-93
Acenaphthene	1560	ug/Kg	62.2%	8.4	27-OCT-93	30-OCT-93
Pyrene	179.	ug/Kg	71.5%	1.7	27-OCT-93	30-OCT-93
Benzo(k)Fluoranthene	17.6	ug/Kg	88.0%	2.2	27-OCT-93	30-OCT-93
Surrogate:						
2-Fluorobiphenyl	75.1	%			27-OCT-93	30-OCT-93
Benzo(e)Pyrene	107.	%			27-OCT-93	30-OCT-93
Comments:	None					

L9310 211

DAMES & MOORE CHAIN OF CUSTODY RECORD

Page 1 of 2

PROJ. NO. 00773-076 -044		PROJECT NAME Union Pacific RR - Sacramento OU S-5 Additional Investig.		NO. OF CONTAINERS		REMARKS														
SAMPLERS: <i>[Signature]</i>																				
STA. NO.	DATE	TIME	COMP	ORAS	STATION LOCATION															
ATB-21-15.5-15.0	10/18/93			X	UPRR SAC OU S-5	1	X													
ATB-21-16.5-20	"					1	X	X												
ATB-21-23.5-25	"					1	X													
ATB-22-15.5-15	10/18/93					1	X													
ATB-22-16.5-20	"					1	X	X												
ATB-22-23.5-25	"					1	X													
ATB-23-16.0-19.5	10/19/93					1	X	X												
ATB-23-23.0-24.5	"					1	X													
ATB-24-13.0-14.5	10/19/93					1	X													
ATB-24-16.0-19.5	"					1	X	X												
ATB-24-23.0-24.5	"					1	X													
ATB-25-4.0-5.5	10/20/93					1	X													
ATB-25-9.0-10.0	"					1	X	X												
ATB-25-14.0-15.0	"					1	X	X												
ATB-25-19.0-20.0	"					1	X													

COOLER CUSTODY SEALS INTACT ☐ NOT INTACT ☒ *PA*

COOLER TEMPERATURE COLD °C

RECEIVED
OCT 22 AM 9:19
1993

Relinquished by: <i>[Signature]</i>	Date / Time 10/21/93 1800	Received by: <i>[Signature]</i>	Relinquished by: <i>[Signature]</i>	Date / Time	Received by: <i>[Signature]</i>
Relinquished by: <i>[Signature]</i>	Date / Time	Received by: <i>[Signature]</i>	Relinquished by: <i>[Signature]</i>	Date / Time	Received by: <i>[Signature]</i>
Relinquished by: <i>[Signature]</i>	Date / Time	Received for Laboratory by: <i>[Signature]</i>	Date / Time	Remarks <i>Send results to D&M SAC</i>	

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

(23 Soils)

L9310211

CHAIN OF CUSTODY RECORD

Page 2 of 2

PROJ. NO. 00173-076 -044		PROJECT NAME Union Pacific RR - Sacramento OU S-5				NO. OF CON- TAINERS	REMARKS						
SAMPLERS: 15 samples													
STA. NO.	DATE	TIME	COOL	GRAB	STATION LOCATION								
ATB-25- 24.0-25.5	10/10/93			X	UPRR SAC OU S-5	1	X						25.0-25.5 DP.
ATB-26- 19.0-20.5	10/10/93					1	X	X					20.0-20.5 DP.
ATB-26- 24.0-25.5	"					1	X						Please note date of 25.0-25.5 DP.
ATB-26- 14.0-15.0	"					1	X						samples regarding holding times.
ATB-27- 18.5-19.0	10/10/93					1	X	X					19.5-20 DP.
ATB-27- 23.5-25	"					1	X						
ATB-27- 13.5-15	"					1	X						
ATB-23- 13-14.5	10/19/93					1	X						
ATB-21W	10/18/93					1	X	X					
ATB-22W	"					1	X	X					
ATB-23W	10/19/93					1	X	X	COOLER CUSTODY SEALS INTACT <input checked="" type="checkbox"/> NOT INTACT <input type="checkbox"/>				
ATB-24W	"					1	X	X	COOLER TEMPERATURE <u>COLD</u> °C				
ATB-25W	10/20/93					1	X	X					
ATB-26W	"					1	X	X					
ATB-27W	"					1	X	X					

Relinquished by: (Signature)	Date / Time 10/21/93 1800	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks: Send results to Jim Blake Dim Sac	

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

QUALITY CONTROL REPORT

In order to provide you with the means of assessing the quality of the data in our report, **D&M Laboratories** reports the results of Quality Control samples analyzed with your samples.

The Quality Control samples provide the following QC information:

The Method Blank (**MB**) monitors the level of contamination introduced by reagents or glassware. A minimum of one MB is run per batch of 20 samples or less.

The Method Blank Spike (**MBS**) measures the accuracy of analytical techniques and is not subject to matrix effects. A minimum of one MBS is run per batch of 20 samples or less.

The Matrix Spike (**MS**) measures the accuracy of the method for a matrix type. Due to the high variability within matrix types and the necessity of batching samples from varied sources, matrix spike information from one sample is not necessarily relevant to other samples on the batch. A minimum of two matrix spikes, MS and MSD, are run per batch of 20 samples or less. The sample selected for the matrix spike is designated **MX**, and may or may not have been submitted by the recipient of this report.

The Matrix Spike Duplicate (**MSD**), along with the MS, is used to monitor the precision (**RPD**) of the method and to indicate possible non homogeneity of the sample matrix.

Equations used for determining percent recovery and relative percent difference (RPD) are as follows:

$$\text{MBS \% Recovery} = (\text{MBS result} / \text{MBS spike level}) \times 100$$

$$\text{MS \% Recovery} = [(\text{MS result} - \text{MX result}) / \text{MS spike level}] \times 100$$

$$\text{RPD} = \{ | \text{MS result} - \text{MSD result} | / [(\text{MS result} + \text{MSD result}) / 2] \} \times 100$$

We continue to strive to improve the quality of service to our clients. We welcome any questions or comments you may have about this information, or about **D&M Laboratories** in general. Please contact a Project Manager for further information.

LABORATORY FOOTNOTES

SAMPLE RECEIPT

- (1) Sample containers were received broken.
- (2) The samples were not properly refrigerated during transport to the laboratory.
- (3) The samples were not properly preserved.
- (4) The information on the chain-of-custody does not match the information on the sample containers.
- (5) The samples were received after the required holding time.

BLANK RESULT

- (6) This analyte was detected in the method blank above the reporting limit.
- (7) This analyte was detected in the trip blank above the reporting limit.

SPIKE RECOVERY

- (8) The matrix spike recovery was out-of-control due to the matrix effects. The MBS recovery was acceptable.
- (9) The matrix spike recovery is not significant due to the high concentration of the analyte in the sample relative to the amount of spike added.
- (10) The method of standard additions was performed and confirmed a matrix interference.

DUPLICATE RESULT

- (11) The variation in spike recoveries reflects the nonhomogeneity of the sample.

SURROGATE RECOVERY

- (12) Accurate quantitation of the surrogate was not possible due to the extent of sample dilution.
- (13) The surrogate recovery was high due to the presence of interfering compounds in the sample.
- (14) The surrogate recovery was low due to matrix effects. The analysis was repeated with similar results.

DETECTION LIMITS

- (15) The detection limit was raised due to the insufficient amount of sample available for analysis.
- (16) The detection limit was raised due to the dilution required by high-level analytes in the sample.
- (17) The detection limit was raised due to the dilution required by high-level non-target analytes in the sample.

CHROMATOGRAPHY NOTES

- (18) These compounds co-elute; therefore, a total value is reported for both.
- (19) The sample was tentatively identified and semi-quantitated based on the best chromatographic fit from the available standards.
- (20) The sample chromatograph resembled an "aged" hydrocarbon product.
- (21) Hydrocarbons were found in the range of gasoline and diesel but did not resemble the gasoline or diesel fingerprint.

HOLDING TIME

- (22) This sample was extracted outside of the required holding time.
- (23) This sample was analyzed outside of the required holding time.