LUST 1556
PUGET POWER
KING
11/29/90

DEPARTMENT OF ECOLOGY
NWRO/TCP TANKS UNIT
INTERIM CLEANUP REPORT ☒
SITE CHARACTERIZATON
FINAL CLEANUP REPORT
OTHER
AFFECTED MEDIA: SOIL ☒
OTHER GW ☒
INSPECTOR (INT.) DATE 1-26-94

✓
SR 3/16/94 CU (soil, gw)

SUPPLEMENTAL REPORT
GEOENVIRONMENTAL SERVICES
OFF-SITE SUBSURFACE CONTAMINATION STUDY
GENERAL STORES BUILDING
RENTON SERVICE CENTER
RENTON, WASHINGTON
FOR
PUGET SOUND POWER & LIGHT

Independent Action Report Update

Site Name: PUGET SOUND POWER

Inc. #: 1556 Date of Report: 11/29/90

County: KING Date Report Rec'd: 1-6-94

Reviewed by: JOHN BAILS

Comments (please include: free prod., tank info., media, contaminant migration, GW conc. trends, PCS treated/fate?):

INTERIM SPECIAL STUDY
HYDRAULIC FLUID - INVESTIGATED
TO SEE IF CONTAMINATION HAD
MIGRATED OFF-SITE ALONG POTENTIAL
RECEPTOR PATHWAYS - UTILITY LINES.
PRE MTCA STANDARDS. (TPH 1PPM GW)
NO EVIDENCE OF HYDRAULIC FLUID
HAVING MIGRATED OFF-SITE

SUPPLEMENT TO A 1-17-90 REPORT

GeoEngineers

November 29, 1990

Geotechnical,
Geoenvironmental and
Geologic Services

Puget Sound Power & Light Company
P.O. Box 97034
Bellevue, Washington 98009-9734

Attention: Mr. Gary Reid

We are submitting six copies of our off-site subsurface contamination study in the vicinity of the General Stores Building at the Renton Service Center in Renton, Washington. Our services for this off-site study are part of our ongoing services for this project and were initially authorized verbally by Mr. Gary Reid of Puget Sound Power & Light Company on June 28, 1989. The contract terms for our services are listed in Professional Services Agreement No. BX01074A.

We appreciate the opportunity to be of continued service to Puget Sound Power & Light Company. Please call if you have any questions regarding this report or our services.

Yours very truly,

GeoEngineers, Inc.

Stephen C. Perrigo
Associate

KSK:SCP:ira

File No. 0186-106-B69

GeoEngineers, Inc.
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Redmond, WA 98052
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Fax (206) 861-6050

TABLE OF CONTENTS

List of Tables

List of Figures

APPENDIX A

List of Appendix A Figures

APPENDIX B

APPENDIX C

SUPPLEMENTAL REPORT

GEOENVIRONMENTAL SERVICES

OFF-SITE SUBSURFACE CONTAMINATION STUDY

GENERAL STORES BUILDING, RENTON SERVICE CENTER

RENTON, WASHINGTON

FOR PUGET SOUND POWER & LIGHT COMPANY

INTRODUCTION

This supplemental report presents the results of our off-site subsurface contamination study in the vicinity of the PSP&L (Puget Sound Power & Light Company) General Stores Building in Renton, Washington. The site is located at 620 South Grady Way and is shown relative to surrounding physical features on the Vicinity Map, Figure 1. The locations of the off-site explorations completed for this study along the South Grady Way right-of-way are shown on the Site Plan, Figure 2.

A previous study of the site by GeoEngineers identified and characterized the presence of hydraulic fluid contamination in the vicinity of the General Stores Building at the site. The results of that study were presented in our report titled: ***Report of Geotechnical Services, Underground Storage Tank Removal and Subsurface Contamination Study, Stores Building, Renton Service Center , Renton, Washington, for Puget Sound Power & Light Company***, dated January 17, 1990.

During our prior study, hydraulic fluid contamination was identified beneath portions of the General Stores Building and the parking area north of the building. The plume of contamination extends from the building to the northwest toward South Grady Way. Movement of the contaminant through the subsurface soils may be facilitated by migration along the alignment of buried utility lines. The backfill surrounding a sanitary sewer line, which traverses the area of known contamination and extends northwest across Grady Way, was thought to be a likely pathway for northwesterly migration of hydraulic fluid. The location of this sewer line relative to the General Stores Building and the known limits of contamination is shown in Figure 2.

SCOPE

The purpose of our supplemental exploration program was to evaluate the potential for off-site contamination beneath the South Grady Way right-of-way. The off-site subsurface contamination study conducted by GeoEngineers included the following activities:

1. Drill six exploratory borings within the South Grady Way right-of-way in the vicinity of the General Stores Building.
2. Obtain soil samples from each boring at 2.5 foot intervals and conduct field-screening for potential contamination in each soil sample.
3. Analyze one soil sample from each boring for the presence of TPH (total petroleum hydrocarbons) by EPA Method 418.1.
4. Install a 2-inch-diameter PVC monitor well casing with a flush-grade, lockable surface monument in two of the borings.
5. Develop the monitor well screens by hand bailing with a stainless steel bailer.
6. Determine the monitor well casing elevations to an accuracy of 0.01 feet using an engineer's level and an assumed site datum.
7. Measure water table elevations in the monitor wells and sample each well for free (floating) hydrocarbons.
8. Obtain a ground water sample from each monitor well for laboratory analysis of TPH by EPA Method 481.1.
9. Evaluate the field and laboratory data with regard to existing regulatory concerns.

OFF-SITE SUBSURFACE CONTAMINATION STUDY

GENERAL

The off-site subsurface contamination study was completed along the South Grady Way right-of-way in the vicinity of the General Stores Building. South Grady Way is a paved four-lane roadway with a middle turn lane. Several underground utilities are present along this portion of South Grady Way, including a buried sanitary sewer line as shown in Figure 2. A planter area is situated adjacent to South Grady Way between the sidewalk and the PSP&L facilities. The area of study discussed in this report, as shown in Figure 2, is located within South Grady Way and the planter area.

Our previous studies at the Renton Service Center form the basis of our general understanding of subsurface conditions across the PSP&L facility. Prior subsurface explorations generally encountered a thin layer of fill overlying coal mine spoils, which consist of a mixture of fragmented coal and rock spoils, with silt, sand and gravel. The source of the coal mine

spoils is likely to be former coal mine workings east of the site. Ground water is typically encountered within the coal fill at a depth of less than 10 feet beneath the ground surface. Previous ground water level measurements generally indicate a southwesterly flow direction.

EXPLORATORY BORINGS AND MONITOR WELLS

Exploratory drilling and monitor well installation were performed to evaluate the potential for off-site migration of subsurface contamination. Details of the subsurface exploration program are presented in Appendix A. One soil sample from each boring, selected on the basis of field screening results and depth, was submitted to the analytical laboratory for analysis of TPH (EPA Method 418.1). One ground water sample from each monitor well was submitted to the analytical laboratory for analysis of TPH (EPA Method 418.1). Copies of the laboratory test results are presented in Appendix B of this report.

The information gained from these exploratory borings and monitor wells was supplemented by the information gathered during two previous studies. Results of these studies are presented in our previously mentioned report dated January 17, 1990 and in our report titled: ***Report of Geotechnical Services, Subsurface Contamination Study, Former Renton Transportation Center, Renton, Washington for Puget Sound Power & Light Company***, dated July 26, 1988. Explorations conducted during these two studies include thirty-one borings, twenty-eight of which were installed as monitor wells.

Six exploratory borings were drilled within South Grady Way and the adjacent planter area on May 14 and 15, 1990. Borings B-36 through B-38 are located within South Grady Way and are referred to as "off-site" borings in this text. Borings B-34, B-35, B-37 and B-39 are located within the planter area and are referred to as "property northwest perimeter borings." A copy of the construction permit for these borings is presented in Appendix C of this report. Monitor wells were installed in two of the borings (MW-36 and MW-38). The soil borings without monitor wells (B-34, B-35, B-37 and B-39) were backfilled. The locations of all exploratory borings and monitor wells completed for this study, as well as for previous studies, are shown in Figure 2.

Monitor wells MW-36 and MW-38 were rendered inaccessible on June 27, 1990 when they were covered with asphaltic concrete during repaving of South Grady Way. Subsequent monitoring of ground water elevations in these wells has therefore not been possible.

SUBSURFACE SOIL CONDITIONS

The pavement of South Grady Way consists of approximately 4 inches of asphaltic concrete underlain by 6 to 7 inches of steel-reinforced Portland cement concrete. Fill encountered below the pavement along South Grady Way and from the ground surface in the planter area extends to depths ranging from 5 to 9 feet below grade. The fill material generally consists of coal mine spoils (fragmented coal with silt, sand and gravel), silt, silty sand and sand with silt. The fill is underlain by interlayered sand, silty sand and silt which extend to the base of the explorations.

Details of the subsurface soil conditions are presented in the boring logs in Appendix A.

GROUND WATER CONDITIONS

Off-site ground water conditions were explored by constructing monitor wells in MW-36 and MW-38. Construction details for the wells are presented in Appendix A.

Water levels were measured in MW-36 and MW-38 on May 16 and May 30, 1990. Measured water level elevations for MW-36 and MW-38 are presented in Table 1. The depth to ground water ranged from approximately 4-1/2 to 5 feet below existing grades in the wells on May 30, 1990. Water table elevations as measured on May 30, 1990 are shown on the monitor well logs in Appendix A.

SUBSURFACE CONTAMINATION

Ground Water Observations: No detectable free (floating) hydrocarbon compounds or sheen was detected during bailing and sampling of MW-36 and MW-38 on May 16, 1990. No evidence of ground water contamination in either of the wells was observed during monitoring of water table elevations on May 30, 1990.

Ground Water Chemistry: Ground water samples were obtained from MW-36 and MW-38 on May 16, 1990 for analysis of TPH by EPA Method 418.1. TPH was not present above the detection limit of 1 ppm in either ground water sample as shown in Table 2.

The MTCA (Model Toxics Control Act) will likely be the regulatory mechanism through which Ecology (State of Washington Department of Ecology) will require the mitigation and monitoring of contaminated sites in the future. The MTCA regulation (Chapter 173-340 WAC) became effective May 4, 1990. The MTCA Method A Compliance Cleanup Levels are presently in final development as part of proposed amendments to the MTCA regulation. The DRAFT MTCA Compliance Cleanup Levels (July 18, 1990) provide a sufficient basis for evaluation of existing subsurface contamination at this site, even though final cleanup levels could change somewhat. The DRAFT MTCA Compliance Cleanup Level for TPH in ground water is 1 ppm.

Soil Contamination Observations: No visible staining was observed in the soil samples obtained from the off-site borings (B-36 through B-38) completed for this project. No visible staining was observed in the soil samples obtained from the property northwest perimeter borings (B-34, B-35, B-37 and B-39). No indication of significant contamination of the soil samples was detected through field screening methods.

Soil Chemistry: One soil sample from each off-site boring (B-36 through B-38) and from each property northwest perimeter boring (B-34, B-35, B-37 and B-39) was tested for the presence of TPH by EPA Method 418.1. Soil samples were selected on the basis of field screening test results and the depth of the samples relative to the water table. Petroleum hydrocarbon contamination which migrates laterally on the water table as free (floating) product tends to accumulate within the soil matrix in the zone of water table fluctuation. TPH concentrations in the soil samples analyzed for this study range from 15 to 47 ppm. The results of TPH soil analysis are shown in Table 3.

The DRAFT MTCA Compliance Cleanup Level for TPH in soil is 200 ppm. The estimated limits of soil contamination (TPH in soil exceeding 200 ppm) are shown on Figure 2.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our off-site subsurface contamination study, it appears that the hydraulic fluid contamination present in the vicinity of the General Stores Building has not migrated into the South Grady Way right-of-way. The data from these off-site explorations were evaluated in conjunction with data from our previous studies to further define the limits of subsurface contamination. Figure 2 shows our interpretation of the limits of contamination incorporating the supplemental data from the May 1990 off-site explorations.

In our opinion, additional subsurface explorations are not required prior to commencement of site remediation activities. The existing data appears to be adequate for planning purposes.

We do not anticipate disruption of public access on these right-of-ways during the cleanup activities. However, some excavation beyond the actual limits of the contamination will be required to prevent sloughing or caving of the excavation. Cleanup excavations may extend to the edge of the sidewalk.

We recommend that the two monitor wells (MW-36 and MW-38) installed along South Grady Way be abandoned during remedial activities in accordance with current regulations. These wells have been paved over and can be located using a metal detector.

LIMITATIONS

We have prepared this supplemental report for use by PSP&L in their evaluation of off-site contamination in the vicinity of the General Stores Building. The report may be made available to the City of Renton, to regulatory agencies and to other parties authorized by PSP&L for this project. This report is not intended for use by others and the information contained herein is not applicable to other sites.

Our interpretations of subsurface conditions are based on data from widely spaced boreholes and it is possible that conditions may vary in areas which were not explored by drilling.

Within the limitations of scope our services have been executed in accordance with generally accepted practices in this area at the time this report was prepared. No other conditions, express or implied, should be understood.

We appreciate the opportunity to assist you with this project. Please call if you have any questions.

Yours very truly,

GeoEngineers, Inc.

Galan McInelly
Geologist

Stephen C. Perrigo
Associate

GWM:KSK:SCP

TABLE 1
WATER LEVEL ELEVATIONS

Well Number	Water Table Elevations (feet)		Ground Surface Elevations (feet)
	05/16/90	05/30/90	
MW-36	91.91	91.89	96.37
MW-38	91.78	91.68	96.70

Notes:
Water level elevations based on assumed datum of 100.00 feet at the location shown in Figure 2.

TABLE 2
SUMMARY OF ANALYTICAL CHEMISTRY DATA FOR GROUND WATER SAMPLES

Well Number	Sample Date	TPH (ppm)
MW-36	05/16/90	<1
MW-38	05/16/90	<1

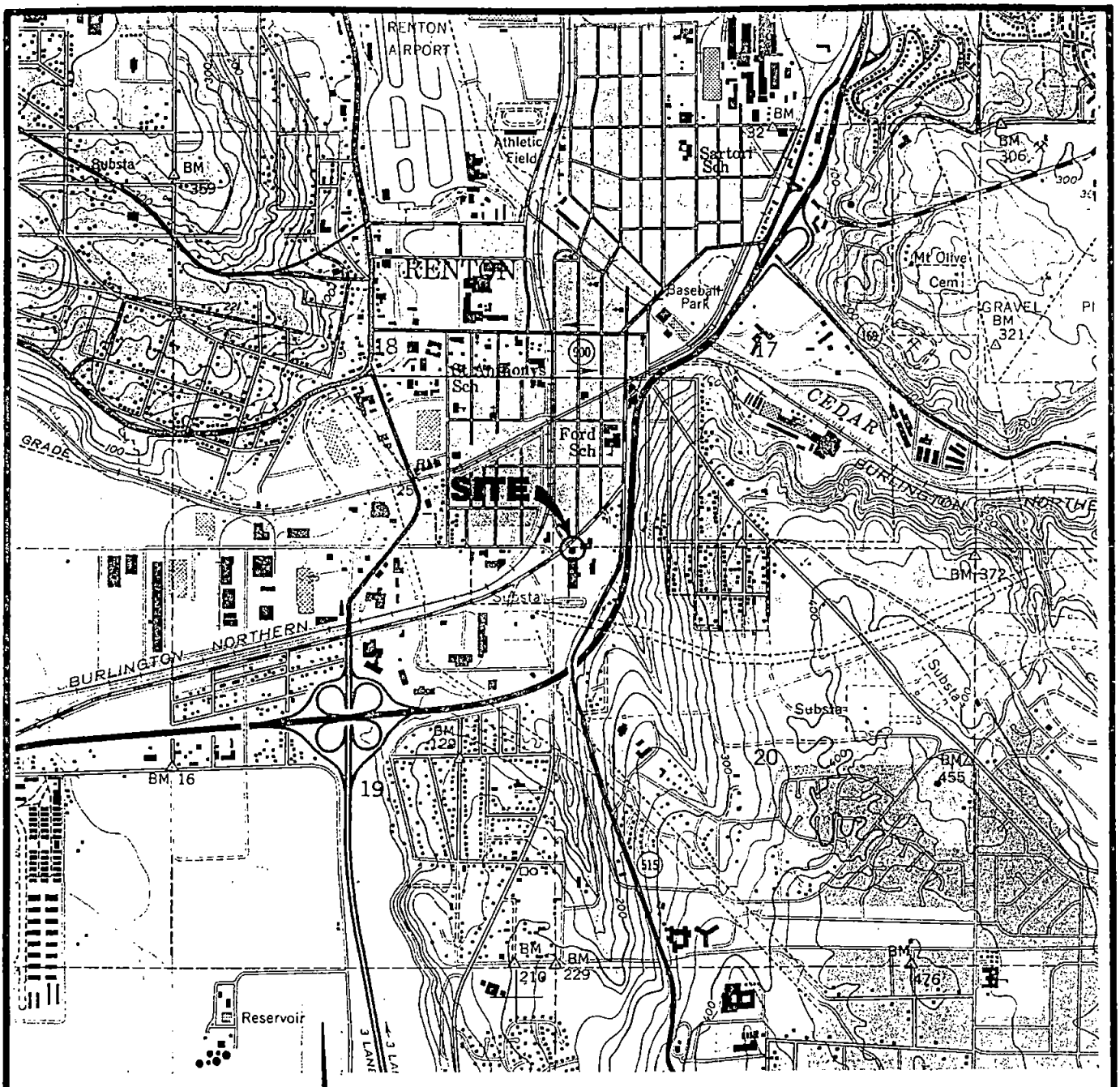
Notes:
"ppm" indicates "parts per million"
TPH (total petroleum hydrocarbons)
Analyzed by EPA Method 418.1

TABLE 3
SUMMARY OF ANALYTICAL CHEMISTRY DATA FOR SOIL SAMPLES FROM BORINGS

Boring Number	Sample Date	Sample Depth (feet)	TPH (ppm)	Field Screening Results (1)
B-34	05/15/90	5.5	19	NS
B-35	05/14/90	5.5	47	SS
MW-36	05/14/90	5.5	19	SS
B-37	05/15/90	5.5	15	NS
MW-38	05/15/90	8.0	22	NS
B-39	05/15/90	5.5	29	NS

Notes:
"ppm" indicates "parts per million"
TPH (total petroleum hydrocarbons) analyzed by EPA Method 418.1
(1) Field Screening methods described in Appendix A.
"NS" indicates "no sheen"; "SS" indicates "slight sheen"

0186.101.804 KSK:KKT 11.16.89



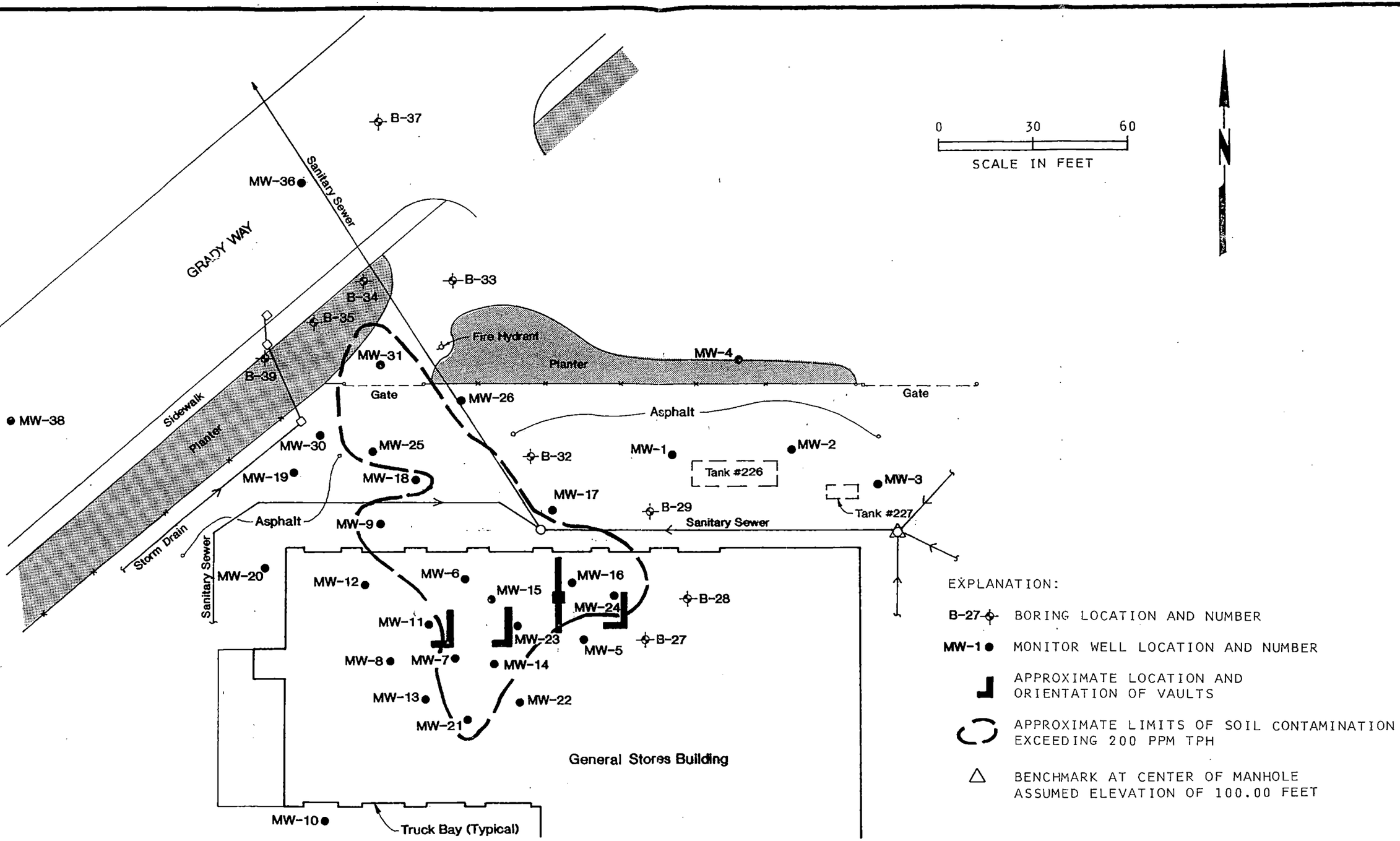
REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE MAP "RENTON, WASH."

Geo Engineers

VICINITY MAP

FIGURE 1

0186-106-804 KSK:KKT 6-20-90



REFERENCE: DRAWING ENTITLED "RENTON TRANSPORTATION CENTER REMODEL", DATED 3/4/74, BY PUGET POWER AND SITE MEASUREMENTS MADE BY GEOENGINEERS, INC.

GeoEngineers

DETAILED SITE PLAN

FIGURE 2

APPENDIX A

A P P E N D I X A

FIELD EXPLORATIONS

DRILLING AND SOIL SAMPLING PROGRAM

Subsurface conditions were explored by drilling six borings on May 14 and May 15, 1990. The borings were drilled at the locations indicated in Figure 2 to a depth of 14.0 feet using truck-mounted, hollow-stem auger equipment owned and operated by GeoBoring and Development, Inc. The drilling and soil sampling equipment was cleaned with a hot-water pressure washer between each boring. The soil sampling equipment was cleaned in a trisodium phosphate detergent wash and distilled water rinse between each sampling attempt.

A geologist from our staff determined the boring and sampling locations, examined and classified the soils encountered, and prepared a detailed log of each boring. Soils encountered were classified visually in general accordance with ASTM D-2488-83, which is described in Figure A-1. An explanation of the boring log symbols is presented in Figure A-2. The boring logs are given in Figures A-3 through A-8.

Soil samples were obtained from each boring using a split-barrel sampler (1.375-inch-ID). The sampler was driven 18 inches by a 140-pound weight falling a vertical distance of approximately 30 inches. The number of blows needed to advance the sampler the final 12 inches is indicated to the left of the corresponding sample notations on the boring logs.

One soil sample from each boring was selected for chemical analysis. Samples from the borings that were tested are denoted in our boring logs with a "CA". The soil samples were transferred to jars in the field and kept cool during transport to the testing laboratory. Chain-of-custody procedures were observed during transport of the soil samples.

FIELD SCREENING METHODS

A GeoEngineers representative conducted field screening on soil samples obtained from the exploratory borings. Field screening results are used as a general guideline to delineate areas of potential petroleum-related contamination in soils. In addition, screening results are often used as

a basis for selecting soil samples for chemical analysis. The field screening methods employed included: (1) visual examination and (2) sheen testing.

Visual screening consists of inspecting the soil for the presence of stains indicative of residual fuel hydrocarbons. Visual screening is generally more effective in detecting the presence of heavier petroleum hydrocarbons such as motor oil, or when hydrocarbon concentrations are high. Sheen screening is a more sensitive method which has been effective in detecting residual fuel hydrocarbons at levels less than regulatory cleanup guidelines.

Sheen testing involves placing soil in water and observing the water surface for signs of sheen. Because of its sensitivity, the sheen method was tested on soils obtained from a portion of the site believed to be clean and unaffected by residual fuel hydrocarbons. The results of the sheen tests on these soils were established as the background level of sheen for the site.

Sheens are classified as follows:

NS - No Sheen -	No visible sheen. Note: background samples at the site were classified NS.
SS - Slight Sheen -	Light colorless film, spotty to globular; spread is irregular, not rapid; areas of no sheen remain; film dissipates rapidly.
MS - Moderate Sheen -	Light to heavy film, may have some color or iridescence, globular to stringy; spread is irregular to flowing.
HS - Heavy Sheen -	Heavy colorful film with iridescence; stringy, spread is rapid; sheen flows off the sample; most of water surface is covered.

The results of the sheen testing on soil samples from the borings are presented on the boring logs in Figures A-3 through A-8.

Field screening results are site specific and vary with soil type, soil moisture content, temperature and type of contaminant.

MONITOR WELL CONSTRUCTION

Two-inch-diameter, Schedule 40 PVC pipe was installed in borings MW-36 and MW-38 at the completion of drilling. The lower portion of the PVC pipe is machine slotted (0.02-inch slot width) to allow entry of water, floating hydrocarbons and hydrocarbon vapors into the well casings. Medium sand was placed in the borehole annulus surrounding the slotted portion of the wells. The well casings are protected within locking flush-grade surface monuments. Monitor well construction is indicated in Figures A-5 and A-7.

The well screens for the monitor wells were developed by removing approximately five well volumes of water from the well with a stainless steel bailer.

We determined the elevation of the well casings to the nearest 0.01 foot with an engineers level on May 16, 1990. An elevation datum of 100.00 feet was assumed at the center of the manhole cover located approximately 15 feet southeast of MW-3 (Figure 2). Elevations referenced to this datum are included on the monitor well logs.

GROUND WATER SAMPLING PROGRAM

Ground water samples were collected from MW-36 and MW-38 on May 16, 1990. The water samples were collected with a stainless steel bailer after at least three well volumes of water were removed from each well casing. The water samples were transferred to liter jars in the field and kept cool during transport to the testing laboratory. Chain-of-custody procedures were observed during transport of the water samples.

The bailer was cleaned prior to each sampling attempt with a fresh water rinse, a trisodium phosphate detergent wash, and a second fresh water rinse which was followed by a distilled water rinse.

GROUND WATER ELEVATIONS

The depth to the ground water table relative to the monitor well casing rims was measured in MW-36 and MW-38 on May 16 and May 30, 1990. The site measurements were made using a weighted fiberglass tape and water-finding paste. Water table elevations were calculated by subtracting the water depth from the casing rim elevations. The water table elevations are presented in Table 1. Water table positions as measured on May 30, 1990 are shown on the monitor well logs.

CHEMICAL ANALYTICAL PROGRAM

Six soil samples from the borings and two ground water samples from the monitor wells were analyzed by Analytical Technologies, Inc. The soil samples and water samples were analyzed for TPH by freon extraction/infrared spectroscopy in accordance with EPA Method 418.1. The analytical chemistry data for the water samples are summarized in Table 2. The analytical chemistry data for the soil samples from the borings are summarized in Table 3. The laboratory data sheets are included in Appendix B.

Some of the data presented in Appendix B include the results of chemical analyses for soils samples obtained from borings B-32 and B-33 and are not pertinent to the off-site subsurface contamination study. The chemical data for borings B-32 and B-33 are included in the Analytical Technologies, Inc. report dated May 30, 1990. The results of the chemical analyses for borings B-32 and B-33 are discussed in a separate, supplemental report to PSP&L regarding on-site subsurface contamination.

SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVEL MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND MORE THAN 50% OF COARSE FRACTION PASSES NO. 4 SIEVE	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE GRAINED SOILS MORE THAN 50% PASSES NO. 200 SIEVE	SILT AND CLAY LIQUID LIMIT LESS THAN 50	INORGANIC	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILT AND CLAY LIQUID LIMIT 50 OR MORE	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC CLAY, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT

NOTES:

1. Field classification is based on visual examination of soil in general accordance with ASTM D2488-83.
2. Soil classification using laboratory tests is based on ASTM D2487-83.
3. Descriptions of soil density or consistency are based on interpretation of blowcount data, visual appearance of soils, and/or test data.

SOIL MOISTURE MODIFIERS:

Dry – Absence of moisture, dusty, dry to the touch

Moist – Damp, but no visible water

Wet – Visible free water or saturated, usually soil is obtained from below water table

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SOIL CLASSIFICATION SYSTEM

FIGURE A-1

GEI 85-88

LABORATORY TESTS:

CA Chemical Analysis

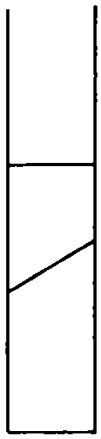
FIELD SCREENING TESTS:

Headspace vapor concentration data given in parts per million

Sheen classification system:

NS No Visible Sheen
SS Slight Sheen
MS Moderate Sheen
HS Heavy Sheen
NT Not Tested

SOIL GRAPH:



SM Soil Group Symbol (See Note 2)

Distinct Contact Between Soil Strata

Gradual or Approximate Location of Change Between Soil Strata

Water Level

Bottom of Boring

BLOW-COUNT/SAMPLE DATA:

Blows required to drive a 2.4-inch I.D. split-barrel sampler 12 inches or other indicated distances using a 300-pound hammer falling 30 inches.

22 Location of relatively undisturbed sample

12 Location of disturbed sample

17 Location of sampling attempt with no recovery

Blows required to drive a 1.5-inch I.D. (SPT) split-barrel sampler 12 inches or other indicated distances using 140-pound hammer falling 30 inches.

10 Location of sample obtained in general accordance with Standard Penetration Test (ASTM D-1586) procedures

26 Location of SPT sampling attempt with no recovery

Location of grab sample

"P" indicates sampler pushed with weight of hammer or against weight of drill rig.

NOTES:

1. The reader must refer to the discussion in the report text, the Key to Boring Log Symbols and the exploration logs for a proper understanding of subsurface conditions.

2. Soil classification system is summarized in Figure A-1.

GEI 86-88 Rev. 6/90

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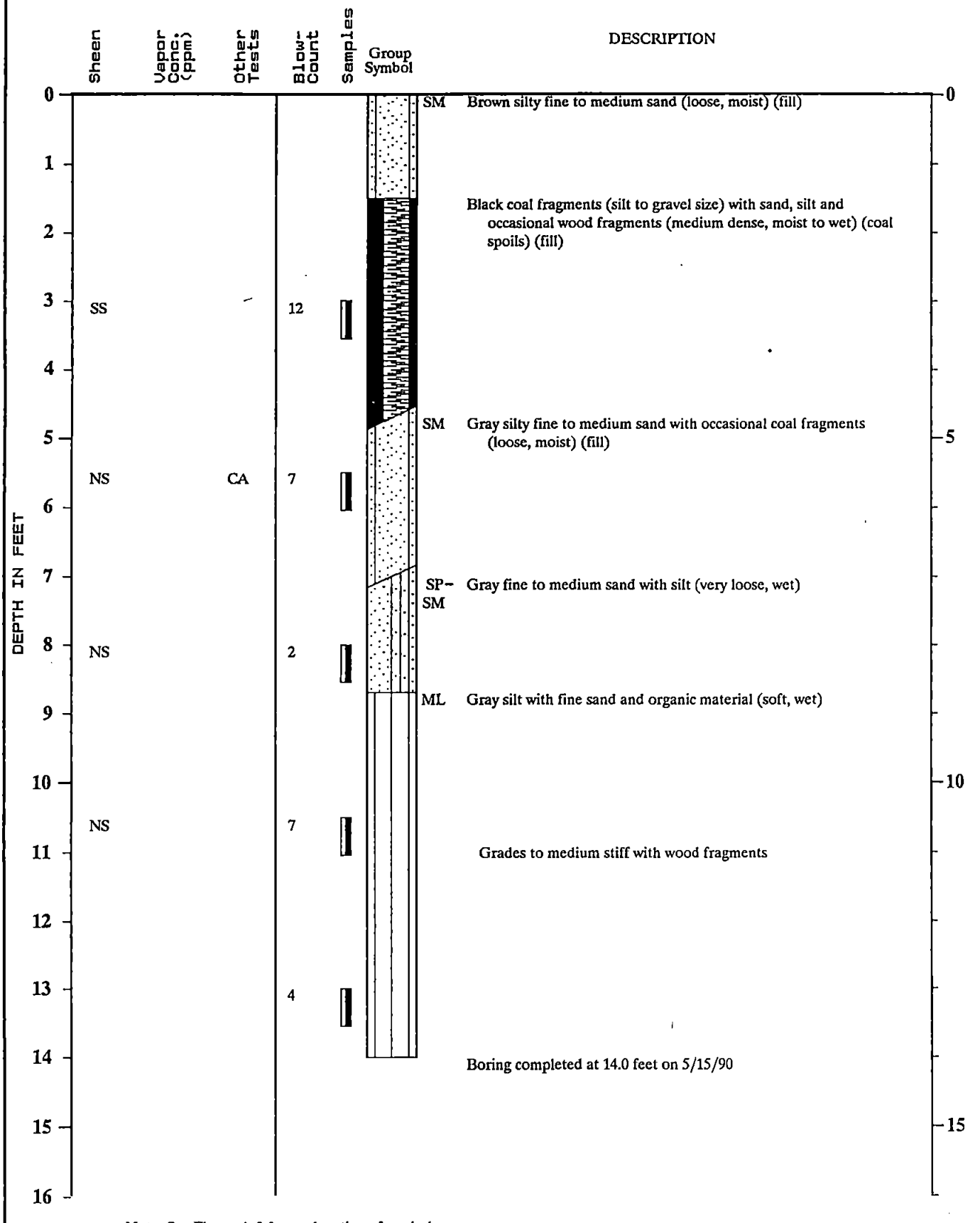
KEY TO BORING LOG SYMBOLS

FIGURE A-2

BORING B-34



Note: See Figure A-2 for explanation of symbols

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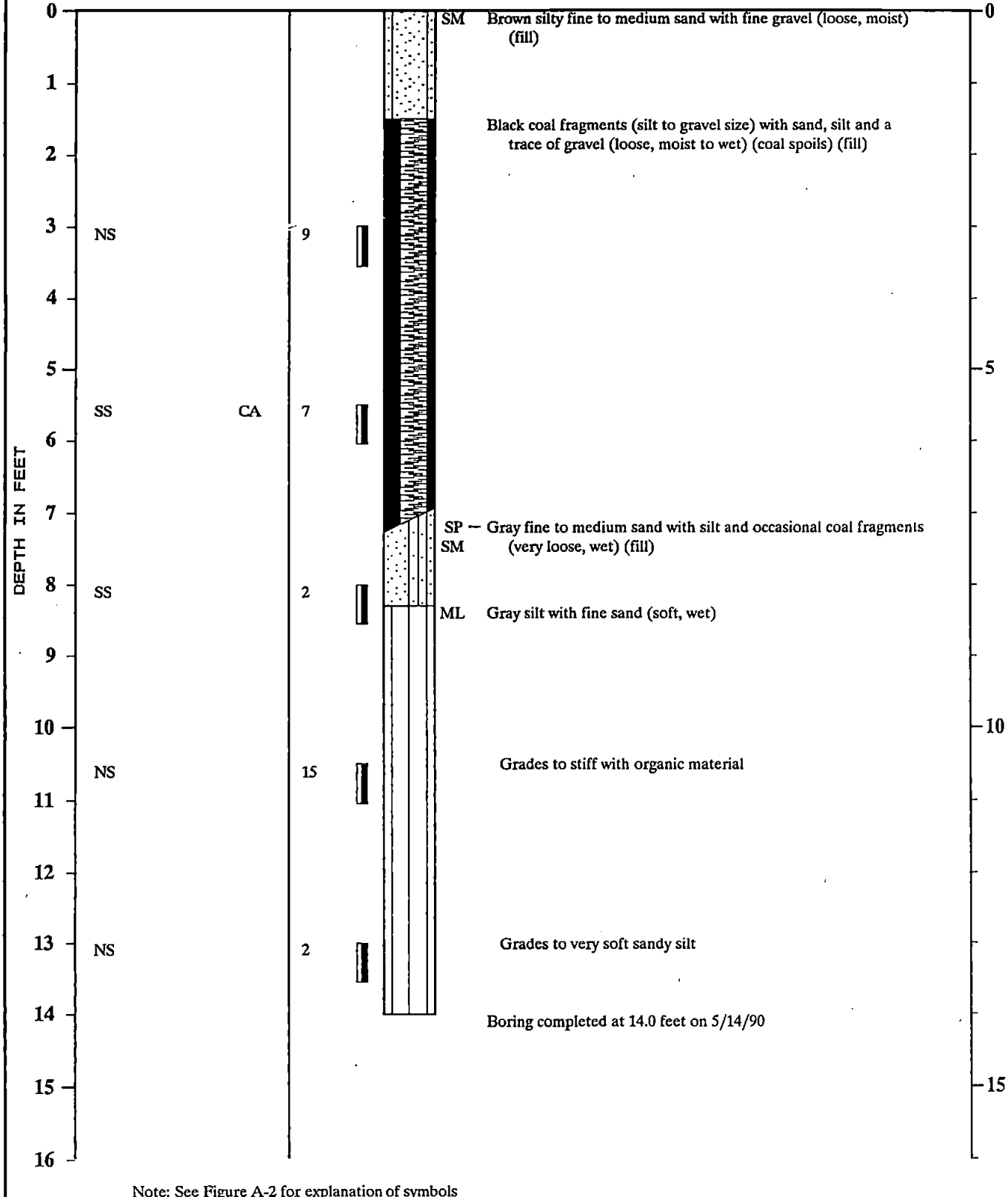
Log of Boring

Figure A-3

:GWM:KSK:KKT 9/12/90

0186-106-869

BORING B-35



Note: See Figure A-2 for explanation of symbols

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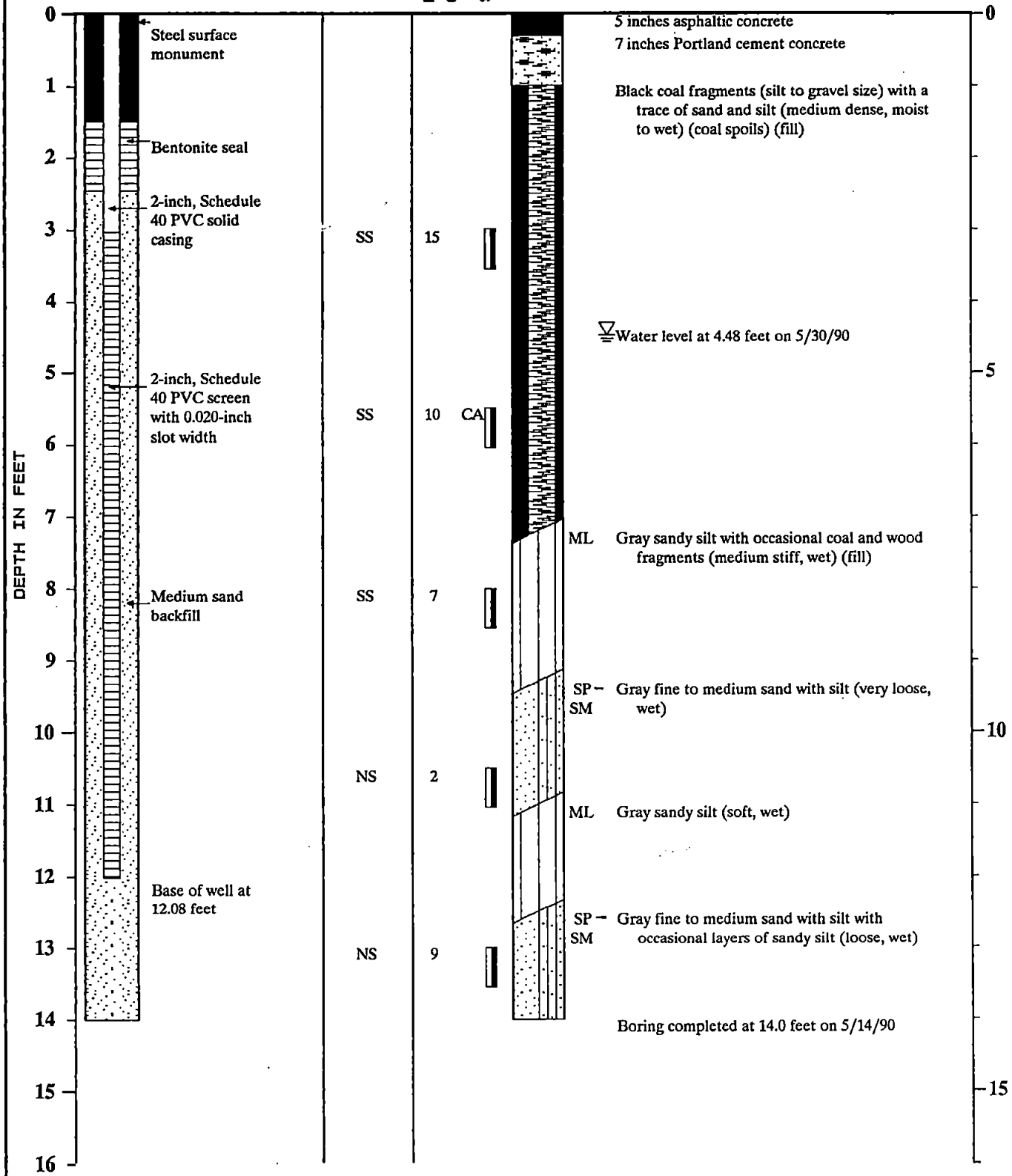
Log of Boring

Figure A-4

:GWM:KSK:KKT 9/12/90

0186-106-B69

MONITOR WELL NO. MW-36



Note: See Figure A-2 for explanation of symbols

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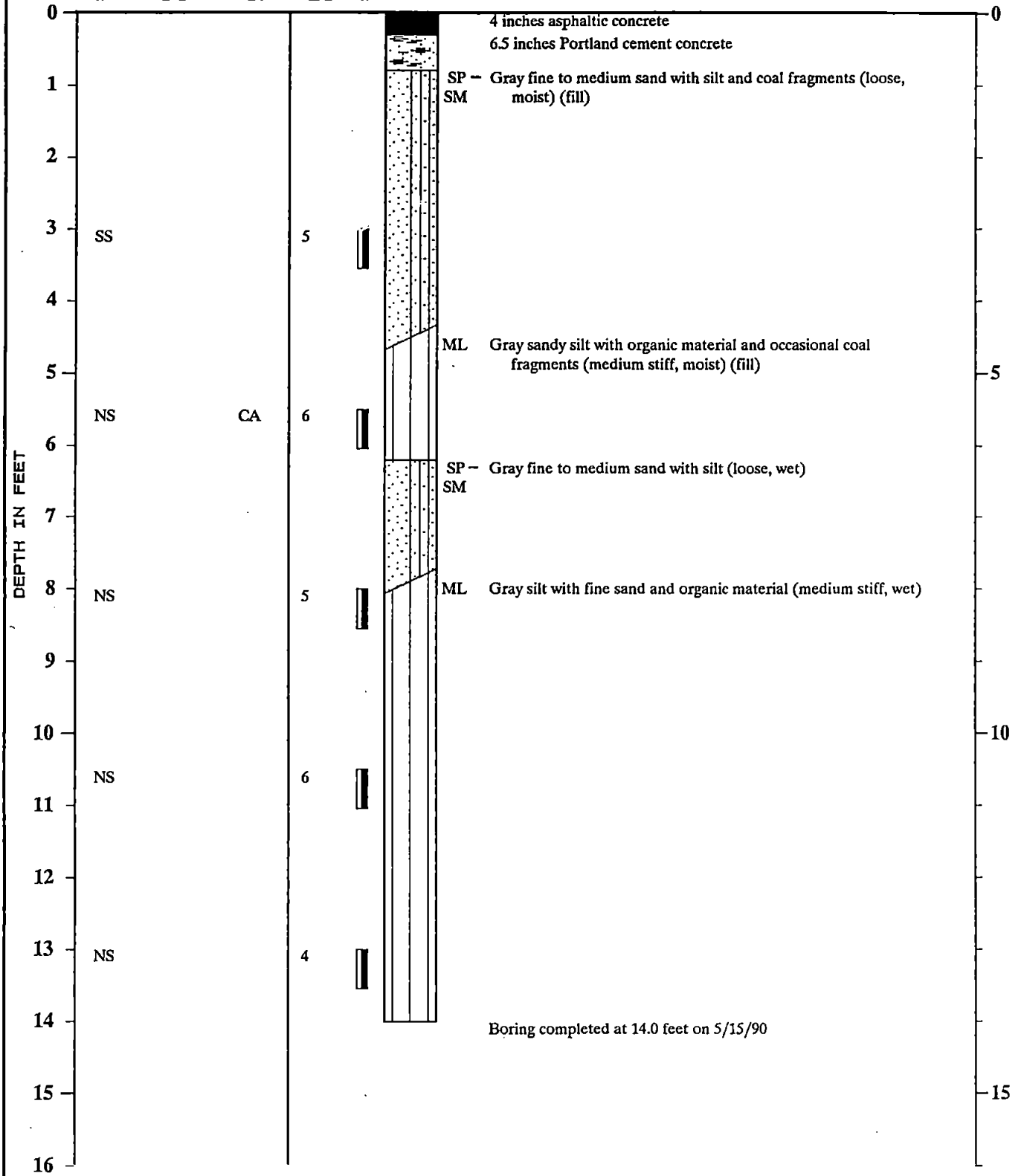
Log of Monitor Well

Figure A-5

:GWM:KSK:KKT 9/17/90

0186-106-B69

BORING B-37



Note: See Figure A-2 for explanation of symbols

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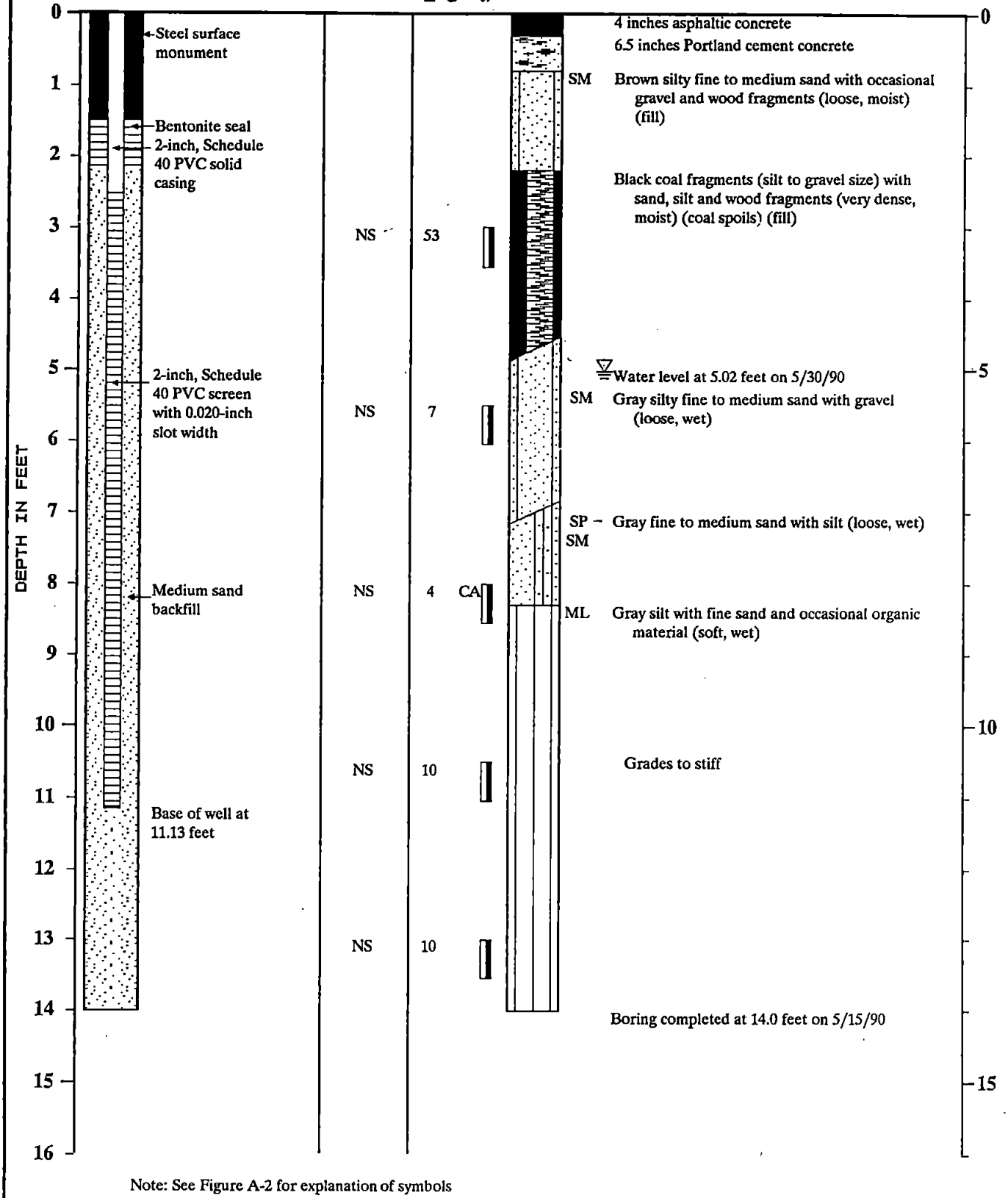
Log of Boring

Figure A-6

:GWM:KSK:KKT 9/12/90

0186-196-B69

MONITOR WELL NO. MW-38



Note: See Figure A-2 for explanation of symbols

Geo Engineers

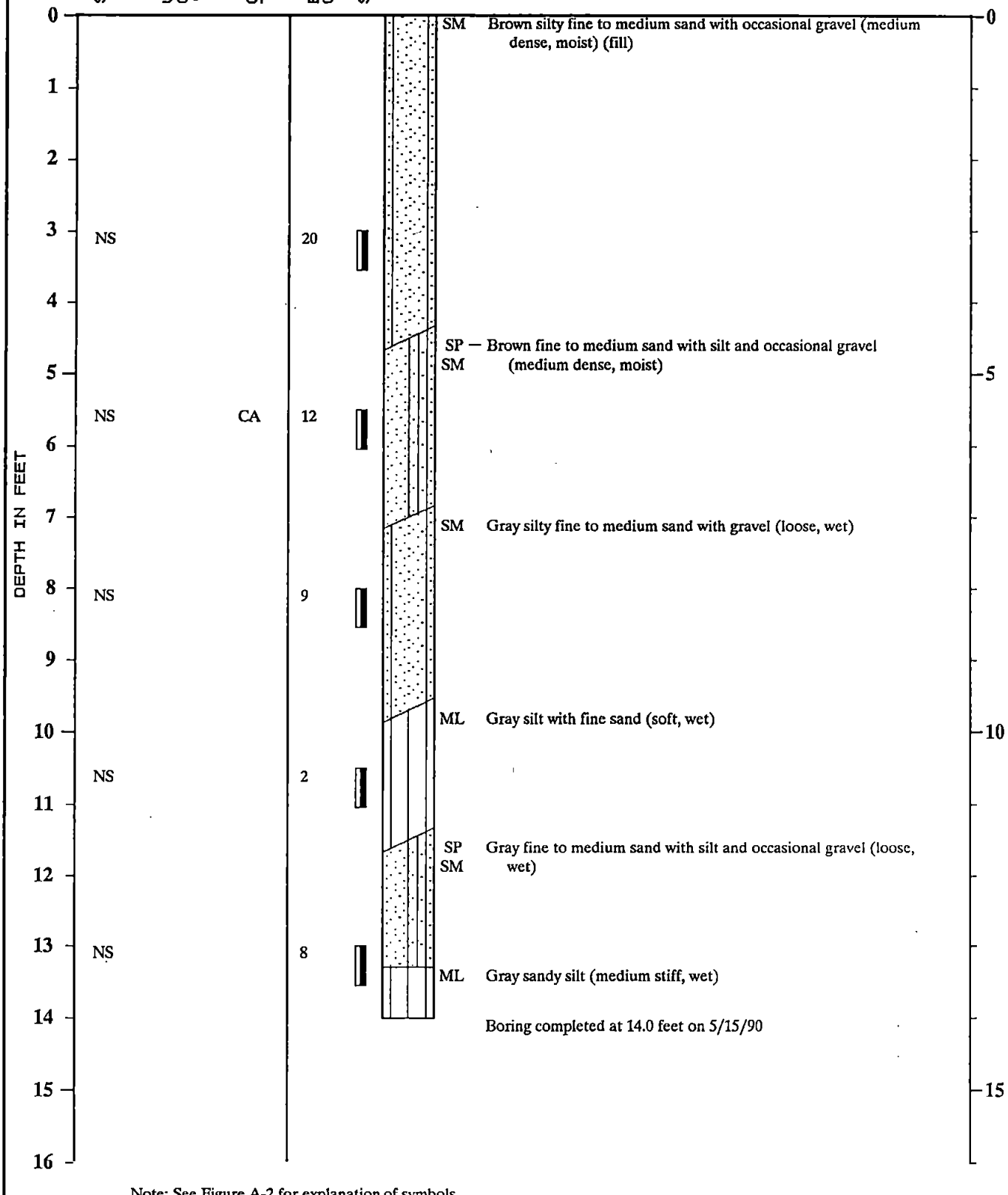
Log of Monitor Well

Figure A-7

:GWM:KSK:KKT 9/18/90

0186-106-B69

BORING B-39



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Boring

Figure A-8

APPENDIX B

Analytical Technologies, Inc. 560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 9005-138

GeoEngineers

MAY 30 1990

Routing

File

May 30, 1990

GeoEngineers, Inc.
2405-140th Ave. NE
Suite 105
Bellevue, WA 98005

Attention : Kathy Killman

Project Number : 186-106-B09

Project Name : -

On May 14, 1990 Analytical Technologies, Inc. received four soil samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Donna M. McKinney
Project Manager

Frederick W. Grothkopp
Technical Manager

FWG/tc

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 186-106-B09
PROJECT NAME : -

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9005-138-1	B-32	05/14/90	SOIL
9005-138-2	B-33	05/14/90	SOIL
9005-138-3	B-35	05/14/90	SOIL
9005-138-4	MW-36	05/14/90	SOIL

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	4

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 186-106-B09
PROJECT NAME : -

ANALYSIS	TECHNIQUE	REFERENCE	LAB
PETROLEUM HYDROCARBONS	IR	EPA 418.1	R

R = ATI - Renton
SD = ATI - San Diego
T = ATI - Tempe
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

GENERAL CHEMISTRY RESULTS

CLIENT : GEOENGINEERS, INC. SAMPLE MATRIX : SOIL
PROJECT # : 186-106-B09
PROJECT NAME : - UNITS : mg/Kg

ATI I.D. #	CLIENT I.D.	PETROLEUM HYDROCARBONS
9005-138-1	B-32	22
9005-138-2	B-33	59
9005-138-3	B-35	47
9005-138-4	MW-36	19

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GEOENGINEERS, INC. SAMPLE MATRIX : SOIL
PROJECT # : 186-106-B09
PROJECT NAME : - UNITS : mg/Kg

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
PETROLEUM HYDROCARBONS	9005-154-3	22	15	38	278	242	106
PETROLEUM HYDROCARBONS	9005-154-4	29	25	15	310	259	108
PETROLEUM HYDROCARBONS	BLANK SPIKE	N/A	N/A	N/A	297	250	119
PETROLEUM HYDROCARBONS	BLANK SPIKE	N/A	N/A	N/A	693	579	120

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.
560 Naches Avenue SW, Suite 101 Renton, WA 98055

Chain of Custody 9005-138

DATE 5/14/90 PAGE 1 OF 1

PROJECT MANAGER: Kathy Killman
COMPANY: GeoEngineers
ADDRESS: 2405 140th Ave NE. Suite 105
Bellevue, Wa. 98005
PHONE: 746-5200 SAMPLED BY: Galen McInelly

LABORATORY NUMBER:

SAMPLE DISPOSAL INSTRUCTIONS

☑ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
B-32	5/14/90	1230	Soil	-1
B-33		0915		-2
B-35		1100		-3
MW-36		1350		-4

ANALYSIS REQUEST

8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	TCLP	Priority Pollutant Metals (13)	EPTOX Metals (8) Total	EP TOX Metals (8) EP EXT	NUMBER OF CONTAINERS
											X										1
											X										1
											X	Rejected 5/16									1
											X										1

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NUMBER: 186-106-809		TOTAL NUMBER OF CONTAINERS	4
PROJECT NAME:		CHAIN OF CUSTODY SEALS Y/N/NA	N
PURCHASE ORDER NUMBER:		INTACT? Y/N/NA	NA
VIA:		RECEIVED GOOD COND./COLD	Y/Y

TAT: ☐ 24HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK ☑ 2 WKS (Normal)

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA

SPECIAL INSTRUCTIONS:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 1610	Signature: Time:	Signature: Time:
Printed Name: Galen McInelly Date: 5/14/90	Printed Name: Date:	Printed Name: Date:
Company: GeoEngineers	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time: 1710
Printed Name: Date:	Printed Name: Date:	Printed Name: V. PENNICK Date: 5/14/90
Company:	Company:	Company: Analytical Technologies, Inc.

ATI Labs: San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola (904)474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

Analytical Technologies, Inc. 560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 9005-154

GeoEngineers

JUN - 4 1990

Routing KSK

File

June 1, 1990

GeoEngineers, Inc.
2405-140th Ave. NE
Suite 105
Bellevue, WA 98005

Attention : Kathy Killman

Project Number : 186-106-B09

Project Name : -

On May 15, 1990 Analytical Technologies, Inc. received four soil samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Donna M. McKinney
Project Manager

Frederick W. Grothkopp
Technical Manager

FWG/tc

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 186-106-B09
PROJECT NAME : -

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9005-154-1	B-34	05/15/90	SOIL
9005-154-2	B-37	05/15/90	SOIL
9005-154-3	MW-38	05/15/90	SOIL
9005-154-4	B-39	05/15/90	SOIL

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	4

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 186-106-B09
PROJECT NAME : -

ANALYSIS	TECHNIQUE	REFERENCE	LAB
PETROLEUM HYDROCARBONS	IR	EPA 418.1	R

R = ATI - Renton
SD = ATI - San Diego
T = ATI - Tempe
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

GENERAL CHEMISTRY RESULTS

CLIENT : GEOENGINEERS, INC. SAMPLE MATRIX : SOIL
PROJECT # : 186-106-B09
PROJECT NAME : - UNITS : mg/Kg

ATI I.D. #	CLIENT I.D.	PETROLEUM HYDROCARBONS
9005-154-1	B-34	19
9005-154-2	B-37	15
9005-154-3	MW-38	22
9005-154-4	B-39	29

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GEOENGINEERS, INC. SAMPLE MATRIX : SOIL
PROJECT # : 186-106-B09
PROJECT NAME : -

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
PETROLEUM HYDROCARBONS	mg/Kg	9005-154-3	22	15	38	278	242	106
PETROLEUM HYDROCARBONS	mg/Kg	9005-154-4	29	25	15	310	259	108
PETROLEUM HYDROCARBONS	mg/Kg	BLANK SPIKE	N/A	N/A	N/A	297	250	119
PETROLEUM HYDROCARBONS	mg/Kg	BLANK SPIKE	N/A	N/A	N/A	693	579	120

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.
560 Naches Avenue SW, Suite 101 Renton, WA 98055

Chain of Custody

9005-154 DATE 5/15/90 PAGE 1 OF 1

PROJECT MANAGER: Kathy Killman
COMPANY: Geo Engineers
ADDRESS: 2405 140th NE. Suite 105
Bellevue, Wa. 98005
PHONE: 746-5200 SAMPLED BY: GWM

LABORATORY NUMBER:

SAMPLE DISPOSAL INSTRUCTIONS

☑ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	TCLP	Priority Pollutant Metals (13)	EPTOX Metals (8) Total	EP TOX Metals (8) EP EXT	NUMBER OF CONTAINERS
~~B-3A~~ B-34	5/15/90	1010	Soil	-1												X	Rajid 12 5/16									1
B-37	↓	0910	↓	-2												X										1
MW-38	↓	1045	↓	-3												X										1
B-39	↓	1145	↓	-4												X	Rajid 12 5/16									1

PROJECT INFORMATION

PROJECT NUMBER: 126-106-B04
PROJECT NAME:
PURCHASE ORDER NUMBER:
VIA:
TAT: ☐ 24HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK ☑ 2 WKS (Normal)

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA

SPECIAL INSTRUCTIONS:

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	4
CHAIN OF CUSTODY SEALS Y/N/NA	N
INTACT? Y/N/NA	NA
RECEIVED GOOD COND./COLD	Y/Y

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: [signature] Time: 11:07	Signature: Time:	Signature: Time:
Printed Name: Galen McInelly Date: 5/15/90	Printed Name: Date:	Printed Name: Date:
Company: GeoEngineers	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: [signature] Time: 4:05
Printed Name: Date:	Printed Name: Date:	Printed Name: V. PENNICK Date: 5/15/90
Company:	Company:	Analytical Technologies, Inc.

B - 12

AnalyticalTechnologies,Inc. 560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 9005-176

May 25, 1990

GeoEngineers, Inc.
2405-140th Ave. NE
Suite 105
Bellevue, WA 98005

Attention : Kathy Killman

Project Number : 186-106-B09

Project Name : -

On May 16, 1990 Analytical Technologies, Inc. received two water samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Mary C. Silva
Senior Project Manager

Frederick W. Grothkopp
Technical Manager

FWG/tc

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 186-106-B09
PROJECT NAME : -

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9005-176-1	MW-36	05/16/90	WATER
9005-176-2	MW-38	05/16/90	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 186-106-B09
PROJECT NAME : -

ANALYSIS	TECHNIQUE	REFERENCE	LAB
PETROLEUM HYDROCARBONS	IR	EPA 418.1	R

R = ATI - Renton
SD = ATI - San Diego
T = ATI - Tempe
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

GENERAL CHEMISTRY RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 186-106-B09
PROJECT NAME : -

SAMPLE MATRIX : WATER
UNITS : mg/L

ATI I.D. #	CLIENT I.D.	PETROLEUM HYDROCARBONS
9005-176-1	MW-36	<1
9005-176-2	MW-38	<1

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 186-106-B09
PROJECT NAME : -

SAMPLE MATRIX : WATER
UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
PETROLEUM HYDROCARBONS	9005-133-9	<1	<1	0	5.4	10	54

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

AnalyticalTechnologies,Inc.
560 Naches Avenue SW, Suite 101 Renton,WA 98055

Chain of Custody

9005-176

DATE 5/16/90 PAGE 1 OF 1

PROJECT MANAGER: Kathy Killman
COMPANY: 2405 140th Ave. NE Suite 105
ADDRESS: Bellevue, Wa. 98005
Geo Engineers
PHONE: 746-5200 SAMPLED BY: GWM

LABORATORY NUMBER:

SAMPLE DISPOSAL INSTRUCTIONS

☑ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	TCLP	Priority Pollutant Metals (13)	EPTOX Metals (8) Total	EP TOX Metals (8) EP EXT	NUMBER OF CONTAINERS
MW-36	5/16/90	1130	H2O	-1												X										
MW-38	↓	1100	↓	-2												X										

B - 18

PROJECT INFORMATION

PROJECT NUMBER: 186-106-B09
PROJECT NAME:
PURCHASE ORDER NUMBER:
VIA:
TAT: ☐ 24HR ☑ 48 HRS ☐ 72 HRS ☐ 1 WK ☐ 2 WKS (Normal)

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA

SPECIAL INSTRUCTIONS:

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	2
CHAIN OF CUSTODY SEALS Y/N/NA	NA
INTACT? Y/N/NA	NA
RECEIVED GOOD COND./COLD	Y/Y

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: [signature] Time: 1313	Signature: Time:	Signature: Time:
Printed Name: Galan McInally Date: 5/16/90	Printed Name: Date:	Printed Name: Date:
Company: Geo Engineers	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Keith Stevens Time: 1313	Signature: Time:	Signature: Time:
Printed Name: Keith Stevenson Date: 5/16/90	Printed Name: Date:	Printed Name: Date:
Company: ATI	Company:	Company: Analytical Technologies, Inc.

ATI Lab[illegible] San Die[illegible])458-[illegible] Pho[illegible]2)43[illegible] Se[illegible]228-[illegible] Pe[illegible](904)4[illegible] DISTRIBU[illegible] White Copy - ANALYTICAL TECHNOLOGIES INC. • [illegible] ORIG[illegible]

APPENDIX C

PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
CITY OF RENTON, WASHINGTON

APPLICATION ONLY - UNTIL VALIDATED

PERMIT NUMBER P-7490

Owner PUGET POWER
Address 620 S. GRADY WAY
RENTON WA. 98055 GARY REED

Location of Work 620 S. GRADY WAY

INSPECTIONS

BELLEVUE 462-3077

CONSTRUCTION PERMIT

(Public Right-of-Way)

5/7/90
Date Issued

6/7/90
Expiration Date

FEES

Sanitary Sewer/Storm Water Permits	
Right-of-Way Construction	10.00
Right-of-Way Inspection Fees	80.00
Water Inspection/Approval Fee	
Special Utility Connection Fee, Water	
Water Latecomer Fee	
Special Assessment District, Water	
Sewer Inspection/Approval Fees	
Special Utility Connection Fee, Sewer	
Sewer Latecomer Fee	
Special Assessment District, Sewer	
Special Deposit, Private Latecomer	
Special Deposit, Cash Bond	
TOTAL FEE	90.00

Reference Data : GEO ENGINEERS
EAST 140TH AVE NE SUITE 100
BELLEVUE WA 98005 746-5200

Description of Work and Number of Feet DRILL MAXIMUM OF 6 MONITORING WELLS IN GRADY WAY - SEE ATTACHED SKETCH

Contractor GEO BORING
Business License 9506
Address 2307 E. PIONEER
PUYALLUP WA. 98372
Bond ~~NOT REQ'D~~ 7596
Telephone 845-6990

IT IS UNDERSTOOD THAT THE CITY OF RENTON SHALL BE HELD HARMLESS OF ANY AND ALL LIABILITY, DAMAGE OR INJURY ARISING FROM THE PERFORMANCE OF SAID WORK.

ANY WORK PERFORMED WITHIN THE RIGHT-OF-WAY OR ON SEWER MAIN MUST BE DONE BY A LICENSED, BONDED CONTRACTOR. LOCATE UTILITIES BEFORE EXCAVATING.

277-5570
L ~~235-2631~~ FOR INSPECTION. 24 HR NOTICE
~~l between 8 AM and 9 AM for~~
~~ection in afternoon; call~~
~~re 12 Noon the day before~~
~~inspection in morning.~~
~~CIFY TIME FOR INSPECTION.~~

L 235-2620 for street signs
lighting.

APPLICANT Kathy Kill

PUBLIC WORKS DIRECTOR

BY

CALL BEFORE YOU DIG
48-HOUR LOCATORS
1-800-424-5555