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PHASE 1
REMEDIAL INVESTIGATION REPORT
UNION PACIFIC RAILROAD
OGDEN, UTAH

PREPARED FOR
UNION PACIFIC RAILROAD
1416 DODGE STREET
OMAHA, NEBRASKA 68179

1-28-99
REVISIONS TO DRAFT

ENVIRONMENTAL
DECISION GROUP, INC.

Innovative Services • Advanced Technology

A Safety-Kleen Company

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1416 DODGE STREET
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Revised January 28, 1999
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Abbreviations Used In This Document

AOI	Area of interest
AST	Aboveground storage tank
bbls	Barrels
BGS	Below ground surface
BRA	Baseline risk assessment
BTEX	Benzene, toluene, ethylbenzene, and xylene
COC	Contaminant of concern
DERR	Division of Environmental Response and Remediation
DQO	Data quality objective
DRO	Diesel range organics
D&RGW	Denver and Rio Grande Western Railroad
EPA	U.S. Environmental Protection Agency
ERA	Ecological risk assessment
GRO	Gasoline range organics
LES	Laidlaw Environmental Services (Now EDG, Inc. - a Safety-Kleen company)
LUST	Leaking underground storage tank
MCL	Maximum Contaminant Level
NPL	National Priority List
NRM	Nevada Railroad Materials
NTU	Nephelometric turbidity unit
OD	Outside diameter
OUR&D	Ogden Union Railway and Depot Company
PAH	Polynuclear aromatic hydrocarbons
PCB	Polychlorinated biphenyls
PID	Photoionization detector
PQL	Practical quantitation limit
QA/QC	Quality assurance/quality control
QAPP	Quality assurance project plan
RAL	Remedial Action Level
RI/FS	Remedial Investigation/Feasibility Study
RBC	Risk-based concentration
SAP	Sampling and analysis plan
SOP	Standard operating procedures
SPRR	Southern Pacific Railroad
SVOC	Semi-volatile organic compound
TPH	Total petroleum hydrocarbons
UDEQ	Utah Department of Environmental Quality
UPRR	Union Pacific Railroad
UST	Underground storage tank
VOC	Volatile organic compounds

1. INTRODUCTION

Union Pacific Railroad (UPRR) is in the process of entering into a voluntary agreement with the Utah Department of Environmental Quality (UDEQ) and the U. S. Environmental Protection Agency Region VIII (EPA), to investigate and address contamination associated with UPRR's Ogden Railyard in Ogden, Utah. The investigative process for this project is to be ~~similar to~~ consistent with the remedial investigation/feasibility study (RI/FS) process under Superfund. This RI is being conducted by UPRR to address the concerns provided by the regulatory agencies in these documents:

- UDEQ, 1996, UDEQ letter to UPRR regarding a Voluntary Agreement and Investigation Work for the Ogden Railyard, December 20, 1996, from B. Johnson, CERCLA Branch Manager.
- Verbal comments provided by the EPA Region VIII and UDEQ representatives to UPRR and Laidlaw representatives at the meeting and site walk conducted on April 22, 1997.
- Lockheed Martin Services Group, 1997, A Sampling and Analysis Approach for the Ogden Railyard, Ogden, Utah: Prepared for U.S. EPA, March 24, 1997.

1.1. PURPOSE

An initial phase (Phase 1) of the RI assessment for the railyard was conducted by UPRR to determine if environmental contamination is present in 31 areas of interest (AOIs) located throughout the site. Collection and testing of the environmental samples from these AOIs followed procedures outlined in a Phase 1 Workplan (LES, 1997a) and three subsequent workplan addendums (LES, 1997b, 1997c, 1998).

The purpose of the Phase 1 portion of the RI is to identify those AOIs which either; (1) contain detected concentrations of contaminants above pre-determined screening levels, and consequently will be subject to further investigation in Phase 2 of the RI, or (2) do not contain contaminant concentrations above the screening levels and thus will not be subject to further investigation. The purpose of this report is to present the results of the Phase 1 sampling, and to identify which AOIs need to be further investigated under Phase 2 to determine the full extent of contamination.

Screening Levels were established as numerical points of comparison for site chemical data to identify those AOIs which would be subject to the full RI/FS process, and eliminate those that do not require additional work. Initially, EPA Region III Risk-Based Soil Screening Concentrations for an industrial setting were used for soil. For groundwater, MCLs were used as the screening level concentrations if available. If an MCL was not available, the EPA's removal Action Levels (RALs) were used. If neither and MCL nor RAL was available for an analyte, the EPA Region III Tap Water concentration

was used as the screening level concentration for water. These screening level concentrations are presented in Table 10 of the Phase 1 workplan.

On November 23, 1998, the EPA presented a revised set of screening level concentrations to be applied to the Ogden site (USEPA, 1998). These revised screening level concentrations were derived by the EPA using the following assumptions, and have been used for comparisons to site data presented in this document.

- Target Risk Level 1E-6
- Target HQ 0.1
- Land Use Soil - Commercial/Industrial
  Water - Residential
- Inhalation Exposure Based on ingestion exposure only.

1.2. Site Background

1.2.1. Site Description

The property known as the Ogden Railyard is located on the western edge of the city of Ogden, Utah. The yard extends from Riverdale Road on the south, to the Ogden River (20th Street) on the north, the Weber River on the west, and Wall Avenue on the east. The site is elongated in a north-south direction over a distance of 3.4 miles. The mean elevation above sea level across the site is about 4,300 feet. Most of the site consists of a flat, open yard, with both railroad-related facilities and private industrial facilities located at various positions along the perimeter. The western border of the site contains wildlife habitat areas adjacent to the Weber River. Figure 1 shows the location of the site and the AOIs that were subject to investigation under the Phase 1 sampling program.

The five Regions shown on Figure 1 were the five original AOIs identified by Lockheed in their August 1997 *Aerial Photographic Analysis, Ogden Railroad Yard Site, Ogden Utah* report. On the annotated photo scene (frame 5093-261) which accompanied the document, Lockheed identified 31 separate AOIs within the five original AOIs. To avoid confusion, the five original AOIs are referred to as Regions in this report and in the Phase 1 workplan. Each of the five Regions contain one or more of the numbered AOIs.

1.2.2. Site History

The site was first used as a rail yard by the Transcontinental Railroad in 1869. Since that time, four railroad companies; UPRR, Southern Pacific Railroad (SPRR), Denver Rio Grande Western Railroad (DRGW), and the Ogden Union Railway and Depot Company (OUR&D), built and operated on various portions of the site. With the completion of the UPRR-SPRR merger in 1996, the entire yard is now under the ownership of UPRR.

Previous facilities located at the site include: coal yards, freight houses, passenger service depots, switching yards, machine shops, boiler shops, transfer tracks, oil/water treatment plants, fuel storage tanks, cold storage houses, warehouses, offices, turntables, and roundhouses. Use of the various facilities at the site have declined significantly and the majority of the old shop buildings have been demolished.

1.2.3. PREVIOUS INVESTIGATIONS

Previous investigations at the site were conducted at 21 specific locations in the rail yard. Sixteen~~Most~~ of the previous investigations were related to underground storage tanks (USTs). Eleven~~Ten~~ of these USTs ~~locations~~ are included in one or more of the AOIs. The remaining five of the previous investigations are associated with the following ~~Three other investigations were CERCLA driven and centered around three of the~~ AOIs;

- Ogden Pond Area (AOI #27),
- Southern Pacific Transport Treatment Facility (AOI #34), ~~and~~
- Oil Sludge Location (AOI #26)~~.~~,
- DRGW Rip Track AREA (AOI #35),
- Former DRGW Roundhouse and Salvage Yard area (AOI#36).

~~Additional non-CERCLA activities were conducted at the DRGW Rip Track Area (AOI #35), and the Former DRGW Roundhouse and Salvage Yard area (AOI #36).~~ The previous investigations are summarized in the subsections below.

1.2.3.1. UST Sites

~~Eighteen~~ Sixteen UST sites were previously investigated ~~removed from~~ at various locations in the rail yard. The tanks contained diesel, waste oil, heating oil, or gasoline. The locations of the USTs are shown on Plates 1 through 4, and are listed in Table 1-A. All of the tanks were removed with the exception of SPRRUST-2, which is located beneath a structure.

Two of the tanks, UST-1 and UST-5, were clean closures; no releases were found. Based on acceptable results of soil and groundwater assessment and remediation, the DERR has ~~given~~granted UST-10 a "no further action" status on April 3, 1997. The remaining ~~15~~ 13 tank sites require additional work ranging from additional investigation to groundwater monitoring. Additional investigative work for ~~all of the~~ these 13 UST sites was conducted as part of the Phase 1 investigation.

1.2.3.2. Ogden Pond, AOI #27

The area of the Ogden Pond is located between the railyard and the Weber River. The area covers approximately 10 acres and includes the location of a former 3/4-acre pond. A preliminary assessment report prepared by the UDEQ (1993) examined oily extrusions on the ground surface and an oily sheen

on the pond surface. Subsequent investigative work by the UDEQ (1994a), E&E (1994), and USPCI (1995) delineated and characterized the contamination.

As a results of the investigations referenced above, t~~T~~he area was found to contain a mixture of construction debris and oily sludge. The source of the contaminant appeared to be waste sludge from oil/water separation. Constituents of concern (COCs) in soil have been identified as; low pH, lead, total petroleum hydrocarbons (TPH), benzene, toluene, ethyl benzene, xylenes, naphthalene, and benzo(a)pyrene. Previous work in the area included the installation of a single monitoring well (OG~~B~~P-1); excavation of 20 test pits; and collection of sediment, surface water and source samples. The well log for OGP-1 is provided in Appendix B. The previous sampling locations and locations of the test pits are shown in Figure 1-A. Logs of the test pits are contained in Appendix A-A. Figure 3 shows the estimated horizontal extent of TPH contamination as determined by USPCI (1995). ~~,~~

Contaminated soil in the immediate area of the pond was remediated under ~~and~~ an Administrative Order on Consent (AOC) for Removal Actions, between the EPA and OUR&D. Between November 1995 and April 1996, ~~of~~ 9,972 tons of sludge and contaminated soil were excavated. The excavated pond was back-filled with 12,000 cubic yards of native soil, borrowed from an area 500 yards to the south (USPCI, 1996). Analytical testing of two backfill samples showed TPH concentrations were less than 2.0 mg/kg, and total lead concentrations were 9.9 mg/kg and 13.0 mg/kg (USPCI, 1996).

The results of previous analytical testing in AOI 27 for soil and groundwater (well OGP-1) are provided in Tables 2-A through 5-A. Sampling locations referenced in the tables are shown on Figure 1-A.

1.2.3.3. Southern Pacific Transport (SPT) Treatment Facility, AOI #34

The SPT Treatment facility is located at the northern end of the rail yard complex, adjacent to the northeast bank of the Weber River. The SPRR facility treated industrial waste water from the shops and locomotive fueling facility. The facility is no longer used to treat water, but continues to handle runoff from the shop area.

Existing structures at the facility include ~~three unlined evaporation ponds,~~ a concrete evaporation pond, ~~two~~ one pump building~~s~~, a treatment building, two water ponds~~sludge pits~~ and two ~~skimming tanks~~oil ponds. The facility was previously investigated by E&E (1990) for the US EPA, and by the UDEQ (1992a). Environmental samples were collected to characterize the soil, lagoon water, groundwater~~surface water~~, sediment, and source contaminant concentrations. Analytical results for the sampling locations shown on Figure 6-A are shown in Tables 6-A and 7-A for the UDEQ (1992a) testing. Constituents of concern (COCs) have been identified as~~:~~ vinyl chloride in the groundwater, and~~,~~ fluorene, and other polynuclear aromatic hydrocarbons (PAHs) in the soil and groundwater.

1.2.3.4. Oil Sludge Location, AOI #26

The Oil Sludge area is located in Region 2 on the western edge of the railroad property. The location borders the eastern side of the Fort Buenaventura State Park, and covers approximately two acres. The

contaminant source consisted of a 15,000 to 30,000 ton pile of semi-solid sludge, that probably came from an oil/water separator in the railyard.

The area was previously investigated during a 1992 Preliminary Assessment (UDEQ, 1992b). A subsequent site inspection was conducted by the UDEQ Division of Environmental Response and Remediation (DERR) (UDEQ, 1994b) under CERCLA authority. Part of the UDEQ investigation involved the collection of source, sediment, and water samples. Prior to the field portion of the 1994 UDEQ investigation the sludge had been removed, but areas of sludge and heavily-stained soil remained. A monitoring well (STMW-1, shown on Figure 3) was installed at the north end of the area by UPRR in December 1994.

1.2.3.5. DRGW Rip Track Area, AOI #35

The DRGW Rip Track area is located at the northern limit of the rail yard (Plate 1). Stained surface soils near the Section House and the Oil and Tool House were investigated by Morrison-Knudsen (1988) in response to an environmental audit. One monitoring well (OB-1)was installed. A construction diagram for this well is included in Appendix B-A, and the approximate location of the well is shown on Plate 1. This well could not be located in the field.

Approximately 16 tons of oil-stained soil were removed from an area near the Oil and Tool House to a depth of six feet. The soil had elevated concentrations of petroleum-related organic compounds. The excavated soil was transported to ET Technologies for disposal (Morrison-Knudsen, 1988).

Twenty tons of soil were removed from the location of an above-ground kerosene storage tank, located near the Section House. The excavation extended to a depth of 2 feet below the ground surface, and all soil exhibiting organic vapor concentrations greater than 5 ppm were removed (Morrison-Knudsen, 1988). The excavated soil was transported to ET Technologies for disposal.

Two 250-gallon USTs (East tank and West tank) were removed from the east side of the Carmen's Building (Plate 1). Morrison-Knudsen (1988) determined that the West tank had not leaked, and that hydrocarbon leakage from the East tank was contained in the soil zone and had not impacted groundwater.

1.2.3.6. Former DRGW Roundhouse and Salvage Yard, AOI #36

A former Denver & Rio Grande Railroad (DRGW) roundhouse and a salvage yard occupied portions of the railroad property between 20th and 21st Streets west of Union Ave. This property has received prior Phase I and Phase II assessments to facilitate a possible transfer to Weber County (Sergent, Hauskins & Beckwith; 1992a, 1992b). The consultants installed two monitor wells (MW-1, MW-2, shown on Plate 1), drilled several soil borings, and collected surface soil samples on the property. Logs of the monitoring wells are contained in Appendix B. The field investigations concentrated on the west end and southeast corner of the property (areas with visible soil staining). The former roundhouse occupied part of the west end of the property, and the salvage yard operated at the southeast corner.

Soil and groundwater samples were tested for volatile organic compounds (VOCs). Soil samples were also tested for TPH, oil & grease, and lead. Lead values in the soil samples ranged from 2 to 1,400 ppm. TPH concentrations ranged from non-detect to 260 ppm. Oil and grease ranged from 860 to 11,000 ppm.

1.3. REPORT ORGANIZATION

The remainder of this report is organized into the following sections:

- The extent and nature of the investigations conducted in the individual AOIs,
- Physical characteristics of the site, including hydrology and subsurface soils as determined from the Phase 1 field work,
- The type and nature of contamination identified in each AOI, and
- Conclusions and recommendations for Phase 2 work. The Phase 2 work will include contaminant fate and transport analyses, and a baseline risk assessment.

2. STUDY AREA INVESTIGATION

The potential environmental contamination in the AOIs investigated was evaluated through the collection and analysis of environmental samples. These samples were collected from various environmental media in each of the AOIs. Table 9 of the Phase 1 Workplan specified the number and types of samples to be collected in each AOI, and the types of analytical testing to be performed. Addendums 1 and 2 to the Phase 1 RI Workplan contained additional AOIs identified and investigated during the Phase 1 RI.

The data obtained under this Phase 1 investigation includes soil and water analytical results, geoprobe boring and monitoring well logs (Appendices A and B), groundwater and product level gauging measurements, land survey data, historical information on railroad activities, previous environmental assessments, public information on water wells and hydrology-geology, and on-site observations.

The various suites of compounds determined by geochemical analysis include; volatile organic compounds (VOCs) by Method 8260, polynuclear aromatic hydrocarbons by Method 8270B, polychlorinated biphenols (PCBs) and pesticides by Method 8080, total petroleum hydrocarbons - diesel range and gasoline range organics (TPH-DRO and GRO) by Method 8015 modified, oil/grease (O&G) by Method 9071, mercury by Method 7470 and 7471, other RCRA metals by 6010 and 7000 series, and pH by Method 9040-water and 9045-soil.

2.1. SURFACE-WATER AND SEDIMENT INVESTIGATIONS

Paired surface-water and sediment samples were collected from the surface drainage features associated with AOIs 9, 10, and 29. Additional surface-water and sediment samples were collected from the 21st Street Pond in AOI 33 and from selected locations along the east bank of the Weber River. Surface water samples were also collected from ponded water in several of the AOIs. Sampling locations are shown on Plates 1 through 4. Stream sediment samples are indicated by an "S" or "SE". Surface-water samples are indicated by an "SW".

All surface-water and sediment samples were collected as specified in the Phase 1 Workplan, with the following exceptions.

1. Two surface water samples specified for AOI 28 were not collected because of the lack of water.
2. Two surface water samples specified for the down stream reach of AOI 10 were not collected, because the drainage was dry. The paired sediment and water samples to be

collected from the upstream reach of the drainage were not collect because the portion of the drainage east of the railyard is contained in an underground culvert.

2.2. GEOLOGICAL INVESTIGATIONS

Geoprobe borings used to collect soil samples in the AOIs were usually advanced no deeper than 10 feet. Thus the nature of the shallow soils in the rail yard has been generally characterized.~~thoroughly observed.~~ Plates 1 through 4 show the lateral density of subsurface soil samples collected at each AOI. At each geoprobe location, samples were retrieved for observation and analytical testing from depths of 2 to 4 feet, and over an additional two-foot interval. The deeper two-foot interval began at depths which ranged from five to nine feet BGS, based upon the depth of groundwater saturation.

Two deeper geoprobe holes were drilled for stratigraphic information at AOIs 21 and 34. The objective of advancing these two deeper borings was to identify a subsurface clay layer or aquitard that would potentially limit downward migration of potential dense non-aqueous phase liquid (DNA~~L~~PL). Boring 21-B5D intersected clay at 18 feet and remained in the clay to termination of the hole at 40 feet. Boring 34-B39D encountered clay at a depth of 32 feet, which continued as a massive unit to the total boring depth of 48 feet. The horizontal and vertical extent of this clay layer will be more adequately defined during Phase 2.

2.3. SOIL AND VADOSE ZONE INVESTIGATIONS

The soil sample analyses at the AOIs include surface grab samples (SG, top two inches of soil), and subsurface samples collected from geoprobe borings and monitor well borings. Soil samples are identified by AOI number - boring number - sequence number - depth in feet (e.g., 30-B4-2-4).

Additional surface soil samples were collected as ecology-based surface samples (ES), and background surface samples (BG). Ecology based samples were collected in riparian habitat areas. Background samples were collected to represent the "natural" characteristics of the soil and railyard fill. Sampling locations are shown on Plates 1 through 4. The "ES" samples and analytical data generated will be used for developing the Ecological Risk Assessment portion of the Baseline Risk Assessment (BRA) for the site. Additional ecological samples will be collected during Phase 2 of the remedial investigation.

All soil samples were collected as specified in the Phase 1 Workplan and workplan addendums with the following exceptions.

1. Sampling locations for the surface soil samples and boring locations for AOI 21 were relocated around the perimeter of the Atlas Steel facility. The Atlas Steel site is privately held property, and access to the site was denied to the field investigation team.

2. The specified surface soil samples from the interior of the roundtable structure (AOI 38) were not collected. This structure has a concrete bottom, and no soil was present.
3. Borings B1, B2, and B3 in AOI 12 were terminated short of the target depth (water table), because the geoprobe was unable to push the sampling tube through buried concrete and other obstructions.

2.4. GROUNDWATER INVESTIGATIONS

Representative groundwater samples were collected from geoprobe borings and monitoring wells. Samples collected from geoprobe borings are identified with an AOI number and boring number (e.g. 38-B3). Samples from monitoring wells are identified by the well designation (e.g. 34-MW1). Additional water samples were collected from storm sewers (ST), and waste water lines (WW). Sampling locations are shown on Plates 1 through 4.

All groundwater samples were collected as specified in the Phase 1 Workplan and workplan addendums with the following exceptions.

1. The required groundwater samples were not collected from AOI 12. Subsurface obstructions prevented the geoprobe reaching the water table.
2. Groundwater samples were not collected from the geoprobe borings in AOIs 30, 22b, 22a, and 38 in which free-phase hydrocarbon was detected on the groundwater surface. One-inch diameter piezometers were placed in these borings to gauge the hydrocarbon thickness.

The Phase 1 geoprobe boring logs and monitoring well logs for active wells are located in Appendices A and B, respectively. Also included in Appendix B are the available logs for the monitoring wells that were drilled during earlier assessments within the railyard, and which still exist. Most of the recent monitoring well borings were logged from cuttings on auger flights unless split spoons of soil samples were retrieved. Th~~ose~~ Phase 1 geoprobe borings that were drilled solely to collect a groundwater sample required no soil cores; consequently these borings were logged only by drilling resistance and groundwater characteristics, as noted on the logs.

Table 8-A lists and inventory of all active, abandoned, and lost monitoring wells for the site. Available logs of abandoned wells and wells that could not be located are provided in Appendix B-A.

2.5. FIELD PROCEDURES

The ~~general~~ field methods used for this Phase 1 investigation are discussed in Section 7 of the Phase 1 Workplan. SOPs for the collection of field samples are contained in Appendix A of the Workplan.

Sample collection methodology is described briefly in the subsections below. All samples were placed in sample collection containers provided by the analytical laboratories. Filled sample containers were placed in coolers chilled with ice, and delivered under chain of custody by over-night courier to the analytical laboratory. Groundwater samples collected under the sampling plan in Addendum 3 (LES, 1998) for vinyl chloride analysis, were hand-delivered to a local testing laboratory. The soil and groundwater samples were analyzed by the various analytical methods listed in Table 9-A.

2.5.1. SOIL SAMPLING PROCEDURES

Surface soil and sediment samples were collected with a hand-held trowel. The trowel was decontaminated following the collection of each sample.

All subsurface soil samples were collected with a geoprobe, with the exception of the soil samples collected from borings in which monitoring wells were installed. Geoprobe borings proposed in the Phase 1 workplan were completed from September through November 1997. Additional geoprobe samples were collected under Addendum 3 to the Phase 1 workplan in March and May 1998. Geoprobe drilling was completed by Earthprobe of Bountiful, Utah. An LES geologist observed and documented all probing and sampling activities, and collected samples for laboratory analysis.

Soil samples collected with the geoprobe were collected using a closed piston sampler. The sampler was mounted on the end of a probe rod and driven into the subsurface by the probing machine. At the desired sampling depth, the sampler was mechanically opened and the probe rod was further advanced to fill the sampler. The sampler was then closed and the 1 and ½-inch diameter soil sample retrieved. The sampler was decontaminated between sampling runs.

Geoprobe soil samples were collected of the subsurface soil at depths of 2 to 4 feet, and of the 2-foot interval above the water table (generally in the range of 6 to 8 feet or 7 to 9 feet). All soil samples were screened with a PID, and visually inspected. Resultant PID determinations are included on the boring logs (Appendix A) at the corresponding sample depth. Because soil subsurface soil samples were collected from discrete depths, as shown on the boring logs in Appendix A, all soil samples were representative of the targeted depths and were not affected by cave-in material. Each geoprobe boring was backfilled with hydrated bentonite the same day it was drilled.

Soil samples were collected from the borings for the newly installed monitoring wells located in AOIs 13, 22a, 30, 34, 38, SPRR-3 and SPRR-5. The depths from which the samples were collected are shown on the well completion diagrams in Appendix B. Soil samples were collected with a 2-foot long split spoon sampler advanced below the auger flights. All soil samples were screened with a PID, and visually inspected. Resultant PID determinations are included on the well logs (Appendix B) at the corresponding sample depth. The split spoon sampler was decontaminated between sampling runs.

~~Most of the surface soil and water samples were also collected during this period. With few exceptions, the soil and water sampling procedures in the workplan were followed for the proposed geoprobe borings for each AOI. Soil sampling exceptions include no surface sample collection if the ground surface was asphalt or concrete (unless a sample was taken under the pavement), and the typical deletion of a deep soil sample where groundwater saturation was above 3-5 feet bgs. In the latter case, the intermediate depth sample was considered representative of the groundwater interface zone.~~

2.5.2. WATER SAMPLING PROCEDURES

Surface water samples were collected by immersing the sample collection containers in the surface water body. Groundwater samples were collected from the geoprobe screen point (41-inch maximum exposed screen length)and from site monitoring wells. Water samples were not retrieved from borings or monitor wells where light nonaqueous phase liquid (LNAPL) was encountered. At the discretion of the investigator, 1-inch diameter, PVC piezometers with 10-foot screens were set in 22 ~~a number~~ of these geoprobe borings for later free-phase product measurements and product sample retrieval.- The borings converted to piezometers are marked with a "P" on the plates.

2.5.2.1. Geoprobe Water Samples

~~Many of the AOI investigations required additional geoprobe borings to adequately assess subsurface conditions. Most of the additional borings were drilled in March and May of 1998 as part of Addendum 3 to the Phase 1 Workplan. Soil samples were not collected from many of these borings because the additional subsurface information was needed for groundwater conditions only. Most of the groundwater samples were analyzed for a specific compound of interest (vinyl chloride) based on the previous Phase 1 results, rather than for the entire analytical suite designated for the AOI.~~
Water samples were collected from the geoprobe borings using a Geoprobe System Groundwater Sampler (GW sampler). The GW sampler is driven to the subsurface target depth on the leading end of a probe rod. Groundwater samples are obtained by means of inserting a ¼ inch OD polyethylene tubing down the inside diameter of the probe rod into the sampler screen, and the water sample is pumped to the surface with a peristaltic pump. Dedicated tubing is used for the collection of each water sample. A minimum of three tubing volumes are evacuated before the water sample is collected. Under the workplan sampling protocol for geoprobe borings in AOIs 1, 8, 12, 13, 20, 22A, 35,and 36, groundwater samples were only collected if visual or elevated PID measurements (above background) of the soil sample collected above the water table, indicated the presence of potential contamination.

2.5.2.2. Monitoring Well Water Samples

Under the Phase 1 field program, 38 monitoring wells were installed at the site. New monitoring wells were completed within the various groundwater plumes and near the boundaries of the plumes as they have been defined thus far. All but two of the wells are screened in the upper alluvial aquifer. The remaining two wells (34-MW3D and 30-MW6D) are screened at the clay layer below the upper alluvial aquifer, in order to test for the presence of dense nonaqueous phase liquid (DNAPL). The newly installed site wells were completed in June 1998. The most recently measured fluid depths and elevations are displayed in Table 1.

Monitoring wells were completed with a hollow-stem auger drilling rig, operated by Earthcore Inc. of Salt Lake City. Borings for each well were drilled with 8-inch OD augers. Once the total depth of the well was reached, 2-inch diameter PVC well casing was placed through the hollow stem of the auger. All connections between PVC well components are threaded. Well screens consist of a ten-foot length of 0.010 slot screen, with the exception of wells 34-MW3D and 30-MW6D which have a five-foot length of 0.010 screen. Filter pack sand (10-20 Colorado Silica Sand) was added through the hollow stem of the augers as the augers were withdrawn from the hole. Two to four inches of fine sand (16-40) was placed on top of the completed filter pack to prevent infiltration of the bentonite seal. A two-foot thick layer of 3/8-inch bentonite chips was hydrated above the sand pack. Any remaining void to within 1 foot of the ground surface was filled with neat cement. The top of the well from a depth of one foot to the surface, was filled with concrete, which also anchored the protective well casing. The completed depths of the well screen, filter pack, and bentonite seal for each well are shown on the well completion diagrams in appendix B.

Groundwater samples were collected from the newly constructed site wells and the previously existing wells within the yard. Prior to sample collection, all wells were purged of at least three well volumes, using dedicated disposable bailers. The volumes of water purged and results of stabilization parameters (pH, temperature, conductivity, turbidity) for each well are contained on the well sampling and stabilization forms presented in Appendix C-A.

2.5.3. SURVEYING

Following completion of the drilling activities, a site survey was conducted by Mountain West Surveyors of Roy, Utah. Horizontal coordinates were established for all borings and well locations. The locations are relative to a site benchmark location and are also tied to state plane coordinates. Surface elevations and measuring point elevations were determined for monitoring wells to +/- 0.01 feet mean sea level.

3. PHYSICAL CHARACTERISTICS OF THE STUDY AREA

The information for this section consists of a summary of observations made during the Phase 1 investigation, along with information published in reports of the geology and hydrology of the Ogden area. The published studies include; Feth et al, 1966, and Anderson et al, 1994.

3.1. IMPLICATIONS OF THE REGIONAL GEOLOGY

The Ogden railyard is constructed upon Holocene (Recent) floodplain deposits of the Weber River. These alluvial deposits overlie lacustrine and fluvial sediments of the late Pleistocene Lake Bonneville Group. The Lake Bonneville Group occupies the uppermost 200 to 350 feet of an estimated 6,000 vertical feet of Quaternary and possibly Pliocene unconsolidated fluvial and lacustrine strata that have been deposited in the Great Salt Lake Basin in the vicinity of the railyard. The exact thickness and the depth range of the Lake Bonneville Group lithology at Ogden is ~~difficult to establish~~ uncertain because of difficulties in discerning the stratigraphic break between the lower Alpine Formation deposits of the Lake Bonneville Group, and the earlier pre-Lake Bonneville Group basin-fill sediments. ~~regional correlation problems.~~

The Lake Bonneville Group deposits around Ogden consist of unconsolidated sediments that make up the Weber Delta, the largest delta deposited in ancient Lake Bonneville. The unconsolidated fluvial and lacustrine deposits of the Weber Delta form most of the land surface between the abrupt slope of the Wasatch Front mountains east of Ogden, and the shoreline of the Great Salt Lake, about 12 miles west of the Front. Since the fall of the old lake level at the end of the Pleistocene Epoch, the Weber Delta has been in a state of degradation by the river systems crossing it. The Weber River has incised a 500-foot deep valley into the head of the Weber Delta sedimentary prism upstream of the railyard.

Precambrian and early Paleozoic rocks crop out in the mountains of the Wasatch Front. In the valley these same rocks, and perhaps later Paleozoic to Tertiary rocks, form the basement floor for the basin-fill sediments. The topographic contrast between the Wasatch Front highland and the Great Salt Lake Basin valley is the result of continuous regional tectonic disturbance from normal faulting beginning in the mid-late Tertiary Period (basin and range faulting). This structural activity is responsible for most of the basic drainage and basin controls that produced Lake Bonneville, the Weber Delta, and the attending river systems, past and current. The northward jog of the Weber River in the vicinity of the Ogden railyard may be the result of late tectonic faulting of the basement west of the Wasatch Front or perhaps large scale slumping/growth faulting of the unconsolidated sediments.

The Alpine Formation comprises most of the Lake Bonneville Group mapped in the Ogden area, and its fine grained facies underlie the floodplain deposits at the railyard. A thin blanket of coarse grained

alluvium belonging to the younger Provo Formation covers portions of the Alpine Formation on the higher benches east and south of the railyard, but these are of little consequence to the railyard study. Most of the sand and gravel facies of the Alpine Formation occur within 1-1.5 miles of the mountains of the Wasatch Front, and they provide a zone of important infiltration and groundwater recharge for the Weber Delta (water) district. At greater distances from the Front, the finer grained, clayey facies of the Alpine Formation is predominant and prevents much of the downward seepage of surface and shallow groundwater to deeper aquifers. A state water well (DNR, Division of Water Rights, driller's log (B-6-1, 29cbb - 1961), located near the north end of the railyard (Plate 1), describes a thick clayey section from 45 to 170 feet deep. These fine grained deposits likely belong to the Alpine Formation underlying the Recent alluvium.

3.2. LOCAL PHYSIOGRAPHY - GEOMORPHOLOGY

The railyard occupies the floodplain on the east side of the Weber River. Before reaching the railyard the river suddenly departs from a westward course and flows to the north. The river parallels the Wasatch Front for nearly five miles, then the channel turns westward again at the north end of the railyard and joins the Ogden River about a mile downstream. The elevation of floodplain and river declines about 60 feet between the southern extremity of the railyard at the Riverdale Overpass and the northern, downstream end of the railyard at 21st Street.

The floodplain at the railyard currently has a rather flat, even surface; the gentle contours of the original floodplain as well as creek channels such as Strongs Creek and Burch Creek have been buried and re-channeled by fill to provide an even surface for railroad tracks. All the creeks crossing the railyard to the Weber River now flow predominantly through buried culverts. Sandy gravel fill has been used as a foundation for railbeds and for leveling and filling as the railyard spread north and south from its 1870s origin around Union Depot. Much of the fill has likely been borrowed from elsewhere on the floodplain. In the Phase 1 soil borings, the bottom of the sandy gravel fill is often difficult to distinguish from natural coarse alluvium.

Most of the railyard activity occurs on the uppermost or *depositional* terrace of the floodplain. The river level is typically from 7 to 15 feet below the railyard surface or uppermost terrace level; the greater elevation difference occurs in the southern part of the railyard. The Weber River has begun to degrade its floodplain, and a slightly lower *erosional* terrace has been cut near the river in parts of the study area. Much of the lower terrace is covered by woods or brushy fields. The lower terrace surface can be found adjacent to the railyard, between river and yard, from AOI-12 to AOI-30 (Durbano Metals). AOI-26, 28, 27, 24, and possibly AOI-5, 20, and 30 are located on the lower terrace.

The elevation may suddenly drop up to 5-6 feet between terraces, but often the scarp is indistinct or very subdued (Some of the elevation difference between the upper and lower terrace may be due to fill and railbed construction~~.~~). In the north part of the railyard these terrace distinctions are obscured or nonexistent. As published maps show, the Weber River floodplain alluvial cover continues east of the

railyard until it reaches the unconformable contact with the exposed lacustrine deposits of the Alpine Formation within the city of Ogden.

At the north end of the railyard the Weber River floodplain merges with that of the Ogden River along the railroad right-of-way. The ramps and overpasses for 20th and 21st Streets cross the northbound tracks running between the two rivers. The ramps and roads are constructed on the floodplain and cover portions of the old D&RGW track system. The 21st Street Pond (at AOI-33) is a borrow pit for material used to build the ramps.

3.3. RAILYARD GEOLOGY

Observations of the near-surface alluvial stratigraphy and hydrogeology come from the Phase 1 drilling program as well as from previous monitor well borings completed during previous LUST investigations at the UPRR railyard. Other data for the north end of the railyard (SPRR and D&RGW yards) derives from environmental assessment reports of drilling during the late 1980s and early 1990s by various environmental consultants and the EPA's Field Investigation Team (FIT). Most of the past and current drilling has produced information about the upper 10 to 15 feet of the floodplain alluvial sequence. Few borings advanced deeper than~~beyond~~ 15 feet to penetrate the remaining thickness of ~~through the remaining~~ coarse-grained alluvium, and ~~to~~ intersect the underlying clayey section.

Commonly soil borings encountered a thin layer of fill underlying all or part of a single fining-upwards sequence of Recent unconsolidated fluvial alluvium. The complete section of graded bedding is composed of clay and silty clay facies that grades downward through fine sand to coarse sand and gravel - a typical section associated with point bar and overbank deposits.

~~The sandy units are often well sorted. The sandy gravel is a mix of coarse to very coarse sand and pebble fractions, and the clay content is usually minor. Most of the sand and gravel is subangular to subrounded. Much of the sand and gravel clasts are lithic with silica-based minerals. A number of borings have intersected sections where fines are absent or where both fines and sand units are absent and only sandy gravel is present. The Phase 1 borings infrequently intersected a thick clayey section without gradation to coarser materials. These shallow clay horizons appear discontinuous and rarely extend to adjacent borings. Observations of core and cuttings do not yet reveal any systematic broad lithofacies changes that would be mappable in the shallow subsurface of the railyard.~~

The sandy gravel and gravely sand is typically dominated by medium to very coarse-grained sand, and granule to pebble fractions. The clay content is usually minor. Most of the sand and gravel is subangular to subrounded, and clasts are lithic and composed of silica-based minerals. A number of borings intersected beds where fines are completely absent or where only gravel and the coarsest sand fractions are present. Infrequently, a clayey section (less than 3 feet thick) was penetrated without notable gradation to coarser material. These shallow clay units appear to be discontinuous and rarely

extend horizontally to neighboring borings. The overall section of the near-surface alluvium reflects a crude fining-upward sequence of deposits. Observations of the core and cuttings do not yet reveal any systematic, broad lithofacies changes to fine grained sediment that would significantly influence large scale groundwater movement in the railyard.

According to Feth et al (1966) the Recent alluvium along the Weber River is not expected to be much more than 40 feet thick and is likely underlain by the fine-grained facies of the Alpine Formation. All the shallow geoprobe and monitor well borings were completed in the Recent fluvial sediments; none intersected any older geologic formation or bedrock.

A 842-foot deep water well (B-6-1, 29cbb - 1961) located on private property in Section 29, just northeast of AOI-1, intersected 125 feet of clayey sediment (interpreted as Alpine Formation) beginning at 45 feet BGS. Two deeper geoprobe holes were drilled for stratigraphic information at AOIs 21 and 34. Boring 21-B5D intersected clay at 18 feet and remained in clay to the total depth of 40 feet. Boring 34-B39D cut into similar clay at 32 feet which continued as a massive unit throughout the remainder of the 48-foot hole. The deep clay encountered in the two geoprobe borings may be the Alpine Formation. The thick clay horizon which underlies the unconfined alluvial aquifer~~shallow alluvium~~ at the railyard may represent a barrier to downward migration of contaminants to the lower water baring zones. In any case, the clay is likely to be a permeability barrier for the uppermost alluvial aquifer if it is found to be continuous across the site. This permeability barrier, if continuous, would likely prevent further downward migration of any dense nonaqueous phase liquid contaminants.

3.4. REGIONAL HYDROGEOLOGY

The principal groundwater zones of economic importance in the Weber Delta (water) district are the Delta and Sunset aquifers. These widespread confined aquifers are part of the underlying fluvo-lacustrine pre-Lake Bonneville Group sediments. The shallowest of these, the Sunset aquifer, is at least 200 feet deep and in most places ranges from 250-400 feet BGS or more. It is mapped only west (downgradient) of the railyard. The more extensive Delta aquifer is typically from 500 to 700 feet BGS and occurs under the railyard. Within a mile and a half of the Wasatch Front, the coarse grained facies of the Lake Bonneville Group and pre-Lake Bonneville Group sediments (beach, long-shore, and fluvial sand-gravel deposits) provide a permeable path for the bulk of recharge to these regional groundwater reservoirs, both from surface sources and subsurface mountain front flow.

Part of this recharge comes from infiltration through the bed of the Weber River along its course in the vicinity of the Wasatch Front, about 5 miles upstream from the railyard. The Weber River looses about 16,000 acre-feet of water annually to infiltration and groundwater recharge in this area. At a distance from the Front, the nearly impervious clayey beds above the Delta and Sunset aquifers in these same formations provide confining conditions. Deep artesian wells in Section 29 at the northern end of the railyard (B-6-1~~,~~ 29cbb - 1961, and B-6-1~~,~~ 29abb - 1939) are presumably screened in the

Delta aquifer at 800-840 feet and 455-464 feet, respectively. The water levels are recorded at above ground surface (artesian conditions) in both wells.

From~~In~~ published evaluations of the water supplies of the Weber Delta district, the shallow alluvial~~Recent alluvium~~ aquifer is not currently used as a ~~considered to be an important aquifer~~ source of potable water, although the Weber River Basin Water District is considering the utilization of surface water from the Weber River, downstream of the railyard, for potable water supplies. The groundwater in the near-surface aquifer at the railyard has a potential effect on surface water because it is both recharged from the river and discharged to the river, depending on water table conditions at various times of the year. Recharge to the deeper aquifers from the near-surface Recent floodplain aquifers that cross the Weber Delta is considered to be a very minor increment of the total recharge budget. The estimated recharge to deep aquifers from combined irrigation seepage, canal losses, and floodplains is 6,000 acre-feet out of a total recharge of 70,000 acre-feet for the entire Weber Delta district.

3.5. SITE HYDROGEOLOGY

During the Phase 1 investigation, nearly all the railyard geoprobe borings intersected groundwater before reaching a depth 10 feet. Levels of groundwater in existing monitor wells were typically less than 12 feet BGS and most were less than 10 feet BGS. Groundwater on the upper terrace was usually encountered in geoprobe borings between 4 and 9 feet BGS with the saturation level becoming shallower at the eastern side of the railyard. On the lower terrace, groundwater typically was encountered between 3 and 6 feet BGS or less.

Groundwater typically occurs within the sandy gravel sequence of the shallow alluvium. The rapid water incursion into the tank removal excavations at LUST sites SPRR3 and SPRR5 (USTs removed in June 1997) indicates good permeability for the sandy gravel. The speedy recharge into most Geoprobe screens during pumping for water samples also confirmed the good overall permeability. However, some geoprobe borings did encounter slow water yields during sampling where the clay content was greater than usual. The dearth of widespread facies changes suggest that lateral anisotropic permeability may be relatively minor in the uppermost aquifer sediments of the floodplain, at least in the areas investigated.

The shallow groundwater is mostly unconfined, and the floodplain alluvium represents the uppermost aquifer in the area. There are some local perched zones over minor clayey lenses in the coarse alluvium above the main water table. The excavation for the removal of UST SPRR3 encountered a strong temporal flow from a perched zone above a thin clay lens at about four feet below ground surface (bgs). Some perched saturation also occurs over buried foundations of demolished railroad buildings.

Several groundwater gauging events were conducted from 1990 to 1993 for monitor wells at the UPRR LUST sites in AOI-13, 30, 32, and -37 (USPCI; 1992a, 1992b). Data from these gauging events

indicate that the groundwater gradient in Regions 3 to 5 (south half of railyard) is typically north-northwest (Figure 3-A). The river course here is northward, and the groundwater flow is roughly subparallel to the river.

In 1988, Morrison-KnudsenE consultants collected water table measurements from monitor wells that still exist directly north of the SPRR water treatment compound (AOI-34) at the northern end of the railyard. Here the slope of the water table turns westward in connection with the westward bend of the Weber River, and the flow remains subparallel to the river flow direction (Morrison-Knudsen, 1988).

The groundwater gauging results collected during the Phase 1 investigation (Table 1) reflect a similar gradient pattern as the previous measurements, although some of the UPRR wells gauged in previous years are missing because they were abandoned during past soil remediation excavations or accidentally destroyed. The present gradient is near-parallel to the river flow direction in the northern portion of the railyard (see Plates 5, 8, and 9). Groundwater flow in the southern portion of the yard flows more directly toward the river. The good well control around AOI-34 shows the groundwater gradient again turning westward with the bend of the Weber River and maintaining its near-parallel slope with the gradient of the river. Near the 21st Street overpass the gradient flow becomes influenced by the Ogden River.

In summary, the groundwater in the floodplain sediments at the railyard is principally within permeable sandy gravel facies between 4 and 10 feet BGS, depending on the floodplain surface elevation. Groundwater levels have fluctuated from several tenths to over a foot between monitoring events in LUST monitor wells within the railyard between 1990 and 1995. The subparallel relation of groundwater flow to the river course suggests that the Weber River was only gaining very slightly or not at all when the measurements were taken during the Phase 1 field program.

3.6. SURFACE-WATER HYDROLOGY

Three intermittent drainages pass westward through the railyard to the Weber River. The drainages flow through culverts under the sections of track, and flow in open ditches from the tracks to the river. The water source for the drainages is mostly from storm water runoff, originating in the developed portion of the city adjoining the east side of the railyard. Surface water and sediment samples were collected from all three drainages (AOI 29 - Strong's Creek, AOI 10 - unnamed drainage, and AOI 9 - Burch Creek) as part of the Phase 1 investigation.

One permanent surface-water body, the 21st Street Pond (AOI 33), is located on the northern edge of the site. This pond was formed as a borrow pit for highway overpass construction, and is used for recreational purposes. The adjacent Ogden River supplies water to the pond through two culverts that link the pond to the Ogden River.

4. NATURE OF AOI CONTAMINATION

The following subsections individually discuss the results of the sampling conducted at each of the site AOIs. Each subsection contains a description of the AOI, sampling results, and conclusions based upon those results. The analytical results are summarized in relevant tables (see "Tables" section) for each AOI or regional sample type. All detected analytes are contained in the tables. The concentrations above ~~industrial~~ screening levels (Table 2) are also marked (indicated by an "x"). The complete laboratory data package and data review can be found in Appendix C.

Areas of Interest designated by numbers 1 through 31, were identified by Lockhead (197~~9~~7b) as being in and around the vicinity of the rail yard. This Phase 1 investigation covered only those AOIs that were located on the railroad's property. Thus, some of the AOIs identified by Lockhead (1979b) were not included as part of this study (e.g. AOI #7 - TCE Plume). AOIs 32 though 38 were added during the course of the Phase 1 investigation, to include additional areas identified for investigation.

4.1. AOI-1 - FORMER SPRR DIESEL ASTs

4.1.1. SITE DESCRIPTION

AOI-1 encompasses the location of the two above ground storage tanks (ASTs) that functioned as the central diesel fuel supply for locomotive refueling at the SPRR railyard (see Figure 1 - Region 1). Each tank held about 10,000 bbls, and both were empty during the geoprobe investigation. The tanks were later demolished for scrap in the Spring of 1998, and no evidence of significant leakage was observed on the tank pads after removal. Each tank was surrounded by an intact, earthen spill berm. Surface staining from petroleum product was not observed around the ASTs. No historical releases directly from the ASTs have been reported.

4.1.2. RESULTS

Four geoprobe borings were located around the tanks as shown in Plate 1. Target contaminants are diesel-related compounds. The sandy and clayey ~~S~~soil and the groundwater samples were analyzed for TPH- DRO, VOCs, and PAHs. -The three soil samples taken from each boring, showed no detected concentrations of analytes above screening levels ~~except for TPH DRO in 1 B1~~ (Table AOI-1 - Soil Results ~~and Figure 4~~).

Because the soil at the water table in borings 1-B1 and 1-B4 had traces of volatiles detected by PID analysis and a slight odor, water samples were retrieved for analyses from the geoprobe borings (Table AOI-1 - Water Results). Boring 1-B1 is downgradient of the tanks and if a release at the tanks had occurred, the plume would have been directed towards this boring location. There were no analyte concentrations that exceeded screening levels in the water sample results.

4.1.3. Conclusions

The TPH detections in soil ~~in the two~~ samples from 1-B1 ~~that exceed the 500 mg/kg screening level concentration,~~ are below Utah's Tier 1 screening level of 5,000 mg/kg, which is also the TPH screening level for the Ogden site for areas with an identifiable petroleum storage tank source. ~~A determination will be made as to whether this site meets the Tier 1 criteria standards (UAC R311-211-3). If it does,~~ Because of the AST source of the diesel contamination and lack of detected contaminant concentrations above screening levels, no further work is recommended~~should be performed~~ at this AOI.

4.2. AOI-2 - RAIL LINE TO GRANARY

4.2.1. Site Description

AOI-2 encompasses a granary adjacent to the eastern edged of the railyard. Rail cars are parked and shuttled in and out of the track system at a granary loading/unloading facility on the northwest side of the granary in Region 2 (Figure 1). No staining from petroleum releases was observed on the ground surface, nor was there evidence of any pesticide storage or handling to provide a source of release of those materials. Old, souring grain spillage was common along all the trackage in the delivery area. Target contaminants are pesticide compounds.

4.2.2. Results

Three soil grab samples were collected along the tracks and at unloading points as indicated on Plate 2. They are identified as R2-SG10 to R2-SG12. Each sample was analyzed for VOCs and pesticides, and results are displayed on Table AO-2 - Soil Results.

4.2.3. Conclusions

Although one pesticide was detected (4,4-DDE at 0.270 mg/kg) in one of the soil samples (R2-SG11) for this AOI, all analyte values fell below screening level concentrations (17 mg/kg for 4,4-DDE), thus no additional work is recommended for this AOI on UPRR property. Additional work may be required by the EPA to be conducted by the owner/operator of the granary.

4.3. AOI-5 - RAILROAD TIE STORAGE AND HANDLING

4.3.1. SITE DESCRIPTION

The NRM tie storage facility covers several acres in Region 2 (Figure 1). -Treated wooden ties and concrete ties are delivered and stored here for subsequent distribution throughout the railroad system. ~~Railroad personnel confirmed that creosote treatment has never occurred at this facility.~~ NRM and CXT (wholesale company for NRM) have been operating the site for about the past five years. No creosote treatment of ties has occurred at the site since occupancy by NRM (personal communication with Bart Peterson, Manager CXT, 801-621-6407). Historical aerial photographs dating from 1987 back to 1958 (Lockheed, 1997b) show no evidence of cross-tie storage or use at the site prior to occupancy by NRM. The contaminants of concern for the Phase 1 investigation are wood preservative chemicals (PAHs).

4.3.2. RESULTS

Four soil grab samples were collected and analyzed for PAHs. The samples were collected within the active areas of the open warehousing facility as shown on Plate 2. They are identified as R2-SG6 through R2-SG9. None of the analytes were detected above the screening level concentrations (Table AOI-5 - Soil Results).

4.3.3. CONCLUSIONS

The absence of contaminants above screening level concentrations in all soil ~~or water~~ sample results indicate that no further work is necessary at this AOI.

4.4. AOI-8 - REFRIGERATOR CAR MAINTENANCE

4.4.1. SITE DESCRIPTION

This AOI encompasses an area of the yard in Region 3, where refrigerator cars are routinely parked along two parallel tracks for cleaning and refrigeration equipment maintenance (Figure 1). The railbed surface has been built above the lower terrace floodplain in this location. There are no ground surfaces showing visible contamination, nor are there any specific locations where contaminant discharge is likely to occur within the maintenance zone. The target contaminants are hydrocarbons related to refrigerants.

4.4.2. RESULTS

Three geoprobe borings were located along the service tracks as shown on Plate 3. These are identified as 8-B1 through 8-B3. Three soil samples were collected from each boring and analyzed for VOCs, TPH-DRO, and metals. None of the analytes in the soil samples were detected at concentrations above screening levels with the exception of the surface soil samples for arsenic at boring locations 8-B1 (13 mg/kg) and 8-B2 (5.7 mg/kg) (Table AOI-8 - Soil Results, Figure 7). No evidence of contamination was observed at the water table, thus groundwater samples were not taken.

4.4.3. CONCLUSION

The absence of contaminants above screening level concentrations in ~~all~~ soil ~~or water~~ sample results indicate that no further work is necessary at this AOI. Arsenic in the surface soils at two of the sampling locations (Figure 7), are above the RBC for arsenic. Additional delineation of arsenic may be required in this AOI if these concentrations exceed the clean-up level for arsenic eventually determined for the site.

4.5. AOI-9 - BURCH CREEK

4.5.1. SITE DESCRIPTION

Burch Creek is a permanent stream that flows westward across the southern portion of the railyard in Region 4 (Figure 1). The creek flows through a buried culvert under the railyard track network and railyard access roads. The stream reach between the west access road and the Weber River is open. East (or upstream) of the railyard, part of the stream drainage flows within an industrial-commercial

area (Plate 4). Two 10,000 gallon ASTs that store diesel fuel set about 30 feet north of the creek on the west side of the railyard tracks next to the railyard access road. Overfilling caused a diesel spill at these tanks several years ago; the release was reported to the DEQ and the affected soil excavated from the site. The creek was not directly affected by this contamination as documented in the release report.

4.5.2. RESULTS

This AOI evaluation includes two geoprobe borings at the ASTs and five paired stream sediment and stream water sample locations (Plate 4). The geoprobe borings were located on the east and west sides of the ASTs and are identified as 9-B1 and 9-B2. The stream sample locations include samples in Burch Creek east and upstream of the railyard, a location downstream of the railyard at the ASTs, and at a site near the mouth of the creek at the Weber River. The stream sediment samples are identified as R4-S5 and R4-S7 and S8, the stream water samples are labeled as R4-SW5 through R4-SW7 and SW8.- Diesel-related compounds were the contaminants of concern. - The samples were analyzed for VOCs, PAHs, TPH-DRO, and metals.

Three soil samples were collected from each geoprobe boring. Because significant contamination was not observed at the water table, groundwater samples were not collected. None of the analytes exceeded the screening level concentrations (Table AOI-9 - Soil Results). The low levels of residual diesel detected in both borings are remnants of the diesel release.

No analytes exceeded the screening level concentrations in ~~either~~ the ~~surface water samples (Table AOI-9 - Water Results) or~~ stream sediment samples (Table AOI-9 - Soil Results). ~~The traces of analytes detected in the stream sediment samples appear to be distributed throughout the drainage sampled, without preference for locations upstream or downstream of the railyard. These trace quantities of analytes are not likely related to railyard sources.~~ Arsenic and methylene chloride concentrations in the surface water samples exceeded the screening level concentrations for these analytes (Table AOI-9 - Water Results, and Figure 4-A). Two sets of VOC analysis were conducted for the surface water samples (R4-SW5, R4-SW7, R4-SW8) from this AOI. The initial surface water samples were collected on 9/20/97 (Analytical batch 6461 Appendix C). The VOC holding time for the samples was exceeded, so the surface waters were re-sampled on 10/11/97 (Analytical batch 6923, Appendix C). The methylene chloride exceedances detected in the 9/20/97 samples appear to have originated from an up-gradient off-site source for two reasons:

1. The methylene chloride concentrations in the 9/20/97 surface water samples increase in concentration in the upgradient direction. The highest concentration of methylene chloride, 740 ug/l, on the eastern end of the drainage where Burch Creek enters the railyard property.
2. The methylene chloride concentrations in the 10/11/97 samples are all below the screening level , and are two orders of magnitude less than the 9/2097 concentrations.

4.5.3. CONCLUSIONS

The absence of contaminants above screening level concentrations in all soil and sediment ~~or water~~ sample results indicates that no further work is necessary at this AOI for soil contamination. All detected arsenic concentrations in water samples at this AOI and through out the site, exceed the EPA's revised RBC screening level for arsenic. Additional delineation of arsenic as a contaminant of concern will be based upon review of the arsenic screening level (0.045 ug/l) and the laboratory PQL for arsenic (2 ug/l) by the EPA, in addition to the clean-up level for arsenic to be determined for the site.

The methylene chloride detections described in section 4.5.2, indicate an up-gradient, off-site point source. Periodic sampling of the Burch Creek drainage may be warranted by the EPA to identify the source.

4.6. AOI-10 - STORM DRAIN AND SLOUGH

4.6.1. SITE DESCRIPTION

AOI-10 is a minor, ephemeral drainage ditch that diverts surface water under the railyard via a culvert that opens under the refrigerator repair tracks at AOI-8 (~~Figure 1 - Region~~Plate 3). The shallow slough winds across the meadow of the lower terrace floodplain south of the former pond restoration in AOI-27 and becomes poorly defined as the Weber River is approached. It carries water only during very wet weather cycles and was dry during the field investigation. The extension of the drainage east of the railyard could not be located; recent extensive urban (commercial/industrial) development has obliterated the small natural creek channel. The diversion of the upstream catchment drainage leaves the slough in AOI-10 dry most of the time.

4.6.2. RESULTS

Because surface water was not available to sample, only sediment samples were taken from the ditch (Figure 7~~Plate 3~~). They were analyzed for VOCs, PAHs, and metals. The contaminants of concern were diesel and metals that may have been carried into the slough from general railroad operations. Sediment samples R3-S5 and R3-S7 were collected at the culvert outlet next to AOI-8 and about midway between the culvert and the Weber River, respectively. No sample was collected east of the railyard because the drainage no longer exists in this area. A surface water sample and stream sediment sample, R3-S3 and R3-SW3, were taken where the channel meets the Weber River. The surface water sample probably represents water from the Weber River, as the upstream reaches of the slough were dry.

4.6.3. CONCLUSION

All sample results were below screening level concentrations (Tables AOI-10 - Soil Results and Water Results) with the exception of arsenic in sediment sample R3-S5 and in surface water sample R3-SW3. -No further work is recommended for this AOI, unless it is determined that the detected arsenic concentrations in the sediment samples pose an ecological risk to the Weber River..

4.7. AOI-12 - OIL\WATER SEPARATOR

4.7.1. SITE DESCRIPTION

AOI-12 encompasses a sub-grade oil/water separator and its associated storage tank, which are located at the south end of the railyard in Region 5 (Figure 1). The belt stripper-type separator sets on the west side of the railyard within 30 feet of the Weber River. The Weber River embankment is steep here, and the water runs about 12-15 feet below the terrace step where the oil/water separator is located. Much of the terrace and embankment adjacent to the river has been built up to prevent washouts along the railyard. Extensive boulders and concrete fill prevented the deep penetration of several geoprobe borings around the separator.

4.7.2. RESULTS

Five geoprobe borings (12-B1 through 12-B5), two more than proposed in the workplan, were completed at and near the oil/water separator as shown on Plate 4. In addition to these five borings, six additional borings were begun and abandoned due to auger refusal at 3 to4 feet bgs. These six borings were not logged. None of the borings (12-B1, B2, and B3) completed adjacent to the oil/water separator and recovery tank, successfully reached groundwater because of refusal due to boulders or buried concrete debris. However, none of the soil cores from these holes contained any visible petroleum contamination, odor, nor detectable PID readings.

The remaining two borings, 12-B4 and B5, were located just east of the separator along the track used for mobile locomotive refueling and minor engine servicing. This track is equipped with a drip pan and a service pit. Boring 12-B4 advanced to semi-saturated conditions before meeting refusal at a depth of 9.5 feet. This depth was not sufficient for the collection of a groundwater sample. Saturated conditions were encountered in boring 12-B5, but a groundwater sample was not collected because there was no evidence of soil contamination at the saturated zone.~~Although saturated conditions were encountered in each boring, no groundwater samples were collected due to poor yield from the formation.~~

Thirteen soil samples were collected from the five borings and analyzed for VOCs, TPH-DRO, and PAHs. The contaminants of interest were diesel and heavier hydrocarbons. In addition to the boring samples, a stream sediment sample and surface water sample, R5-S2 and R5-SW2, were collected in the Weber River about 200 feet downstream from the separator (Table - Weber River Surface Water). As Table AOI-12 - Soil Results indicate, none of the analytes were detected above screening level concentrations.

4.7.3. CONCLUSIONS

The absence of analytes above the screening level concentrations in the soil samples indicates that no further work will be required at this AOI for soil contamination. Soil contamination was noted in boring B4 thus dictating the collection of a water sample under the Phase 1 sampling protocol. However, for the reason stated above in section 4.7.2, a sample was not collected. Ggroundwater samples will be collected during Phase 2 of the RI to determine if groundwater has been impacted in this AOI.

4.8. AOI-13 - RIP TRACKS (RAIL CAR MAINTENANCE AREA)

4.8.1. SITE DESCRIPTION

The RIP (repair-in-place or repair-intervention-paint) tracks are a series of tracks devoted to maintenance and repair of railroad cars (Figure 1 - Region 3). This repair facility has been operating at this site since 1955. Most of the ground surface between the tracks is paved with concrete. Much of the work on the RIP tracks involves welding, metal work, general mechanics, and lubrication. Locomotives are not serviced or fueled in this area. In addition to the investigation of the RIP tracks working area, further assessment was performed for a diesel release from two former USTs (Tanks 3 and 4) located about 100 feet west of the repair tracks. This work augmented the previous LUST investigation phases already reported to the DERR that included monitor well installations and product recovery (skimming).

4.8.2. RESULTS

RIP tracks working area investigation

~~-~~Four geoprobe borings (13-B1, 13-B2, 13-B3, and 13-B7) were drilled between the maintenance tracks in the RIP working area (Plate 3). Three of the four borings had to penetrate concrete pavement, and surface soil samples in 13-B1 and B2 were collected just beneath the concrete layer. The target contaminants were general petroleum-based hydrocarbons and metals. Soil samples from

borings 13-B1, B2, and B3 were analyzed for VOCs, TPH-DRO, and metals. Contamination was not observed in the soil cores, thus no groundwater samples were taken.

Boring 13-B7 was drilled at the independent request of UPRR solely for a water sample located next to a track repair excavation; no soil samples were collected. This water sample was analyzed for VOCs and metals as were two surface water samples from the excavation, 13-SW1 and SW2.

Three soil samples each were taken from 13-B1, B2, and B3. There were no analyte concentrations above screening levels with the exception of arsenic (13-B2, 5.8 mg/kg) (Table AOI-13 - Soil Results). ~~Similarly,~~ T~~t~~he surface water ~~sample~~ samples and the groundwater sample from 13-B7 ~~also~~ had no VOC concentrations above screening levels (Table AOI-13 - Water Results). Chromium, barium, arsenic, and lead exceeded their screening levels in the unfiltered water sample from 13-B7. No metals were above screening levels in the surface water samples.

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The 12,000 and 8,000 gallon USTs (Tanks 3 and 4, respectively, locations shown on Plates3 and 5) were closed by removal in August 1990 and three monitor wells, MW16, MW17, and MW18, were installed in November 1990 (Appendix B). In 1992-1993 a small amount of diesel product (about 40 gallons) was skimmed from well MW16, installed on the site of Tank-3. Since 1993, the free-phase product layer has never been thicker than 0.01 feet. Dissolved VOC constituents from diesel (benzene, TPH) have been found in the wells downgradient from Tank-3, MW18 and MW17 (Plate 5~~Figure 9~~). The current investigation at the LUST site emphasized defining the downgradient extent of the dissolved diesel constituents in groundwater.

Three geoprobe borings, 13-B4, B5, and B6, and two new monitor wells, 13-MW1 and MW2, were located as shown on Plate 5 to trace the extent of the dissolved plume. Because of the long distance from the release source, soil samples were not collected from borings 13-B5 and B6, and only groundwater samples were retrieved; these borings were sited in the natural wooded area of the lower terrace floodplain west of the railyard. No VOC, PAH, or TPH-DRO concentrations above screening levels were found in the soil sample from the saturation zone in boring 13-B4 (Table AOI-13 - Soil Results).

Benzene was detected above the screening level (~~5~~2.3 µg/L) in groundwater samples from 13-B4, MW2, MW17, and MW18. The detected concentrations are well below the Utah Tier 1 screening level of 10,000~~300~~ µg/L (Table AOI-13 - Water Results). As can be seen on Plate 5, these sample points are within about 100 feet west to northwest (downgradient) of the release source. The absence of benzene in the outlying borings, B5 and B6, and well MW1 indicate their locations beyond the fringe of the dissolved benzene plume.

The TPH-DRO value was exceeded in MW16 (located on the release source). Naphthalene, phenanthrene, 2-mehtylnaphthalene, and bis(2-ethylhexyl)phthalate were~~was~~ also exceeded in MW16. The compound 2,6-dinitrotoluene was exceeded in MW-18. Lead, arsenic, barium, chromium, and

cadmium were above screening levels in the October 1997 unfiltered water sample from MW18 but were absent in the June 1998 unfiltered sample. No free-phase diesel product was present in any of the borings or wells. In May-June 1998 the water levels at the LUST site (upper terrace) were about 10 feet bgs.

4.8.3. CONCLUSIONS

Additional work in this AOI will address the groundwater impact at the LUST site, under the DEQ-DERR LUST corrective action guidelines. Additional monitoring of groundwater at this AOI may be required for metals.

4.9. AOI-17 - SURPLUS STORAGE AND SALVAGE

4.9.1. SITE DESCRIPTION

The non-railroad property included in AOI-17 is an independent salvage facility (Figure 1 - Region 1, and Plate 1). The open salvage yard is adjacent to the railyard, and the property appears to warehouse old industrial equipment such as vehicles, machinery, scrap metal and wood, etc. It was previously a slaughter house. The perimeter of the property is fenced off from the railyard, and the east fence line parallels the railyard access road and railroad tracks used typically for parking rail cars. No surface contamination from petroleum products, chemicals, or metals was observed in the railyard adjacent to the fence. The contaminants of concern in this AOI are metals.

4.9.2. RESULTS

Four surface soil grab samples, 17-SG1 to SG4, were collected on railyard property along the fence line as indicated on Plate 1. Each sample was analyzed for TPH-DRO and metals (Table AOI-17 - Soil Results). The analytical results revealed no detected concentrations above screening levels, except for arsenic at concentrations of 5.9 to 11 mg/kg.

4.9.3. CONCLUSION

Potential contamination at the off-site AOI does not appear to have affected UPRR property, and no further work is required at this AOI. Additional delineation of arsenic in the surface soil may be required depending upon the clean-up level for arsenic eventually determined for the site.

4.10. AOI-18 - DYCE CHEMICAL COMPANY

4.10.1. SITE DESCRIPTION

The Dyce Chemical facility sets adjacent to the north end of the AOI-17 salvage yard (Figure 1 - Region 1). The Dyce company buildings and delivery/pickup area are located on non-railroad property between the railyard and the Weber River. The company manufactures and handles organic chemicals and unspecified acids, and bases. Numerous drums of chemicals are stored on the Dyce property in an apparent orderly and prescribed manner. There were no obvious environmental problems observed on or off of the Dyce property from the handling, transportation, and storage of chemicals.

Tank cars for delivery or pickup at Dyce are typically parked on railyard property on the siding tracks leading to the entry gate to the Dyce company grounds on the north side of the facility. The investigation consisted of two surface soil grab samples, 18-SG1 and SG2, a single geoprobe boring, 18-B1, and a surface water and stream sediment sample from the Weber River, R1-SW2 and R1-S2, that assessed the area north and east of the gate to Dyce where releases may have occurred at parked rail cars. Both soil and water samples were analyzed for VOCs, and the pH of the boring water sample was also measured. The stream samples are also part of the regional sampling program and include PAHs, metals, and pesticides.

4.10.2. RESULTS

Boring 18-B1 was located near the Dyce gate about 30 feet east of the Weber River (Plate 1). The groundwater sample is downgradient to sidegradient of the Dyce operation and the parked tank cars. The water sample and three soil samples retrieved from the boring had no values above the screening levels (Tables AOI-18 - Soil Results and Water Results). The pH of the groundwater measured 7.9 units. As well, the results from the two surface grab samples and the stream samples had no analytes detected above screening level concentrations.

4.10.3. CONCLUSION

No impact to the river is occurring from the activities in the railyard at Dyce Chemical. None of the detected analytes in the soil and water samples exceeded screening level concentrations; thus no additional work is recommended at this AOI for the tested analytes. During Phase 2, a list of chemicals that are handled at Dyce Chemical will be obtained and reviewed. Collection of additional samples maybe required for chemical compounds that were not included in teh previous Phase 1 analysis.

4.11. AOI-19 - FORMER UNION PACIFIC RAILROAD LAUNDRY

4.11.1. SITE DESCRIPTION

The building housing the former laundry operations that once serviced the entire UPRR passenger rail system is on the east side of the railyard near the south end of Union Station (Figure 1 - Region 2). The laundry operated until the 1960s. Target contaminants for the Phase 1 investigation were chlorinated solvents and benzene that may have been used during laundering, although the laundry reportedly only used steam and water for cleaning.

4.11.2. RESULTS

Two geoprobe borings, 19-B1 and B2, were drilled to groundwater at the west side of the building (Plate 2). Three soil samples were taken from each boring and analyzed for VOCs. Water samples were not collected because of the absence of observed soil contaminants (Table AOI-19 - Soil Results).

4.11.3.CONCLUSION

The absence of analytes that exceed screening level concentrations indicates that no further work is required at this AOI.

4.12. AOIs 20, 21, 22B, 26, 28, 29, 30 - FORMER UPRR MAINTENANCE AREA

These AOIs in Region 2 (Figure 1 and Figure 3) are contiguous, and evidence thus far shows that groundwater contamination plumes cross between two or more adjacent AOIs. Consequently, each AOI investigation will be discussed separately below, but the texts will be kept as a group to better depict relationships between the adjacent AOIs. The contaminants of interest in each AOI reflect the past railroad operations and present salvage activities, and variously include constituents from diesel fuel and heavier hydrocarbons, solvents, and metals.

4.13. AOI-20, FORMER UPRR DIESEL ASTs

4.13.1.SITE DESCRIPTION

The remnants of the pads for two ASTs in AOI-20 can be found just north of the Durbano repair shop in adjacent AOI-30. The ASTs were removed in the 1970s; they were part of the UPRR maintenance

and fueling operations that were once carried out in AOIs 30 and 22B. Each tank appears to have held at least 10,000 bbl of diesel fuel. The land in AOI-20 is currently unused except for scattering of miscellaneous construction debris. No surface contamination from petroleum products was observed during the field work. The contaminants of concern are diesel-related compounds.

The assessment included three geoprobe borings, 30-B9, B10, and B11, located as shown on Figure 2. (In the field, the borings and samples were incorrectly identified with the prefix "30" rather than "20" and kept within the numbering scheme for AOI-30.) Three soil samples and a water sample were collected from each boring. The samples were analyzed for TPH-DRO, metals, and PAHs.

4.13.2. RESULTS

Each boring advanced through more than 5 feet of fill including clinker and coal before reaching native sandy gravel. Boring B11 intersected aged petroleum staining (old diesel) in sandy gravel at the water table (saturation depth about 7 feet). Free product was no t present. This AOI is hydrologically down gradient from AOI-30 and the subsurface diesel/oil groundwater and soil contamination found at the north end of that AOI (see AOI-30 section below for further discussion of assessment results).

As Table AOI-20 - Soil Results shows, the results of the soil samples analyses were below screening level concentrations with the exception of arsenic (Figure 2). T~~t~~he highest soil-DRO result at 6 feet in B11 (2,000 mg/kg) ~~was the sole analyte above a screening level in the soil sample suite (Plate 2). However, this DRO result~~ does not exceed the Utah's Tier 1 5,000 mg/L screening level. This sample was taken where the contamination was observed at the zone of water saturation. The elevated results for the oil/grease analysis for the same sample, 4,600 mg/kg, indicates that much of the residual compounds may be heavier hydrocarbons.

The only groundwater hydrocarbon exceedance also occurred in B11 with 92 mg/L~~ppm~~ DRO (Table AOI-20 - Water Results and Plate 6). This water sample did have a hydrocarbon film which likely became part of the sample aliquot. The groundwater DRO result contrasts with the absence of analytes above screening levels of any of the more soluble semivolatiles such as naphthalene.–

The low values of the PAH compounds suggest degradation has left only the heavier hydrocarbons.

The water sample result from B9 detected lead in excess of the screening level. Additional groundwater exceedances were detected for metals (As, Ba, Cr, Cd, Pb) in the groundwater samples form the borings as shown on Plate 6. There may be a connection with contamination found in the borings and the monitor well at the north end of AOI-30 (see borings 30-B7, B8, B19, B32, B28, and MW-5) with that found in AOI-20 in 30-B11.

4.13.3. CONCLUSIONS

Because of the elevated groundwater DRO concentration in 30-B11, which is not associated with a petroleum storage tank ~~exceeds the screening level~~, this AOI will be considered in the Phase 2 workplan. This DRO detection may be tied to the residuals and groundwater impact found in nearby 30-MW5. Boring B11 sets east of the former AST pads. Borings B9 and B10 are closer to the actual tank pads and would reflect any leaks from the tanks themselves. Additional monitoring of metals in the groundwater may be required.

4.14. AOI-21, ATLAS STEEL SALVAGE YARD

4.14.1. SITE DESCRIPTION

AOI-21 encompasses a non-railroad property block that is entirely surrounded by UPRR property. Since the 1980s the property has been used as a metals salvage yard. The buildings on the northeast end of the Atlas Steel land have existed for several decades. A 1960 railyard map shows the property then under use by the Colorado By-Products Company, another salvage company. AOI-21 is located immediately south and hydrologically upgradient of the former UPRR engine and rail car maintenance and fueling center (AOIs 22B and 30).

A former drum storage area is reported to have existed in the 1940s just south of AOI-21. This activity has yet to be confirmed, and no evidence of past storage remains. As a consequence, this area was not sampled.

4.14.2. METHODS

Atlas Steel personnel did not permit sampling within the scrap yard, and the proposed Phase 1 boring and grab sample locations for this AOI had to be revised (Workplan Addendum 2, LES 1997c). The investigation of AOI-21 included nine geoprobe borings, one monitor well, and three surface soil grab samples, all located around the perimeter of the Atlas Steel property (Figure 2). The number of borings exceeded the two borings originally proposed for this AOI. The sample points are identified as 21-B1 to 21-B7 (geoprobe borings), R2-SG16, R-SG17, and R2-SG18 (surface grab samples),and monitor well, 21-MW1. In addition to the above borings which are specific to AOI-21, three of geoprobe borings completed as part of the investigation of AOI-22B, provide data relevant to the assessment of AOI-21 ~~These include~~ (22B-B16, 22B-B20, and 22B-B21, Figure 2).

The geoprobe borings include two twinned borings, 21-B1A and 21-B3A, next to earlier borings 21-B1 and 21-B3. These two later borings (21-B1A, 21-B3A) were drilled under the Addendum 3 workplan

(LES, 1998) specifically ~~for~~to obtain groundwater samples that were not collected from the earlier borings. Boring 21-B5D was a 40-foot deep stratigraphic hole to determine the depth of the clay interface that underlies the sand and gravel in the area (see Section 3.3). 21-MW1 is a 13-foot monitor well screened from 3 to 13 feet.

The original contaminants of concern were TPH-DRO and metals, but the investigation of adjacent AOIs 22B and 30 revealed a dissolved vinyl chloride plume near the north side of AOI-21. As a consequence, groundwater samples from additional borings~~sites~~ drilled later in the Phase 1 program (Addendum 3, borings 21-B4 through 21-B7) were analyzed either for vinyl chloride or VOCs.

4.14.3.RESULTS

Soil samples were taken from the initial three geoprobe borings, 21-B1 to B3, as shown on the logs and analyzed for TPH-DRO and metals (Table AOI-21 - Soil Results). These sample results, as well as the three surface grab samples, had no analyte detections above screening levels other ~~than a single~~ lead and arsenic~~value of 2,200 mg/kg, in a surface grab sample~~ (Figure 2). The~~is~~ surface sample with the highest lead detection, SG17 (2,200 mg/kg), was collected between the track and salvage yard fence on the northwest side of the AOI. Mine waste rock showing copper, zinc, and lead oxide minerals or metal sulfides commonly occurs along the track that bounds the north side of AOI-21. This material is present as either spillage from ore cars or as part of the track ballast, and it could be the cause of ~~sporadic~~, elevated metal values in surface soil samples.

Water samples for metals and DRO in 21-B1, 21-B2 and 2~~2~~1-B3 all fell below screening levels except for the metals ~~a trace of~~ cadmium, barium, chromium, ~~in 21-B1~~ and ~~minor~~ lead ~~concentrations above screening levels in all three borings~~ (Table AOI-21 - Water Results, and Plate 6). ~~The 0.0053 mg/L cadmium value barely exceeds the 0.005 mg/L screening level. The dissolved cadmium could have come from the salvage yard.~~

Follow-up sampling (Addendum 3) for dissolved vinyl chloride in geoprobe boring samples in AOI-22B and AOI-30 led to the discovery of elevated concentrations at or near the north boundary of the Atlas salvage yard in borings 22B-B16, 22B-B20, 30-B27, and 30-B31 (see Figure 3 and Tables AOI-22b and AOI-30 - Water Results). Water samples from borings 21-B1A and 21-B7, located on the salvage yard boundary, had minor vinyl chloride quantities above screening levels. These levels of vinyl chloride are upgradient of the higher concentrations in AOI-22B and AOI-30.

The higher vinyl chloride value in 22B-B20 (270 ug/L) is virtually on the property boundary and is surrounded by lower values in the railyard. Vinyl chloride was not detected~~is entirely absent~~ in the boring and well samples on the south side of the Atlas facility (borings 21-B3A, 21-B4, 21-B5D, 21-B6) suggesting a source may be within the salvage yard. The full VOC suite from the monitor well sample (21-MW1) showed no analytes above screening levels, and most results were below detection limits. This well is a permanent monitoring point to establish the upgradient limit of the vinyl chloride plume to the north.

The stratigraphic boring 21-B5D encountered massive clay at 18 feet bgs that continued to 40 feet bgs. ~~The deep water sample taken from a screen at the clay interface had no detectable vinyl chloride.~~ The test hole did not breach into any deep aquifer zone below the clay.

4.14.4. CONCLUSIONS

The vinyl chloride in groundwater along the north side of AOI-21 may be tied to the plume in AOIs 22B and 30 and may have an independent source in the salvage yard or the railyard, or both. In any case, the vinyl chloride plume will be considered further in the Phase 2 workplan, as will additional delineation of lead in surface soils near sample R2-SG17, and metals in the groundwater.

4.15. AOI-22B, FORMER UPRR ROUNDHOUSE

4.15.1. SITE DESCRIPTION

The UPRR roundhouse serviced steam locomotives and the early years of diesel locomotives. Engine maintenance operations decreased steadily from the middle 1950s to the early 1970s, and the roundhouse was finally demolished in 1974. Now only the concrete foundations remain at ground level. No railroad operations are currently active in this area. Remnants of a diesel fueling dispenser rack are present along the northern end of the boundary between AOI-22B and AOI-30; the groundwater impacted by a release from the fueling operation will be discussed in this section, but the plume extends into AOIs 22B and 30. The nature of the past railroad activities suggested that the contaminants of concern for both soil and water samples include TPH-DRO, VOCs, PAHs, PCBs, and metals.

4.15.2. METHODS

The assessment of the contamination found on this AOI included samples and observations from twenty two geoprobe borings, 22B-B1 through B22, and four monitor wells, 30-MW3, MW4, MW6 and MW6D. The number of borings originally proposed for this AOI was four. As can be seen on Figure 2, additional borings in AOI-30 and AOI-21 extend the groundwater contamination found in 22B into the adjacent AOIs. Geoprobe borings 22B-B3 and B17 were converted into 1-inch diameter piezometers with 10-feet of screen (0.010 slot), when free-phase diesel/oil product was encountered in the borings. -Monitor wells 30-MW6 and 6D are shallow (13 feet) and deep (21.5 feet) wells, respectively, and both are located within the vinyl chloride plume extending between AOIs 22A and

30. 30-MW6D is screened at the underlying clay permeability boundary at about 19 feet bgs to test for dense nonaqueous phase liquids (DNAPL).

Soil samples were collected and logged from geoprobe borings 22B-B1 through 22B-B7. The remaining borings (22B-B-8 through 22B-B22) were drilled under the Addendum 3 workplan and were completed to obtain groundwater samples only. Soil samples were not collected from these later borings.

4.15.3.RESULTS

All analytes except for arsenic~~TPH-DRO~~ in the surface and boring soil sample program are below exceedance levels (Table AOI-22b - Soil Results). The TPH-DRO levels in four of the seven original geoprobe borings exceed 500 mg/kg, but fall below Utah's Tier 1 screening level of 5,000 mg/kg for DRO (Figure 2). As the hydrocarbon in this AOI cannot be attributed to a UST, the 5,000 mg/kg screening level concentration may not apply. Soil samples were not collected from most of the later geoprobe holes (22b-B8 through 22b-B22), which were drilled solely to evaluate groundwater contamination.

Groundwater results from the boring and well samples revealed impacts of free-phase LNAPL, metals, dichloroethene, and dissolved vinyl chloride (Plates 6 and 8, Figure 3, and Table AOI-22B - Water Results).

Two small areas of free-phase product occur at the piezometers 22B-B3 and B17 (Plate 8~~6~~). The 0.8 feet of product found in 22B-B3 is part of a small plume at the former fueling dispenser rack, and the product has an old diesel odor. Free-phase product was only found in this well; the extent of the plume is limited by the borings 22B-B13, 30-B23, 30-B24, and 30-MW3. Water samples from these locations contained no product, and only 30-MW3 had a dissolved DRO exceedance (see also Table AOI-30 - Water Results). The product in 22B-B17 measured less than 0.01 feet. The product appeared to be a diesel/oil mixture. The plume is small and is limited by the borings 22B-B16, B18, B20 and B22. The source of this plume is unknown at this time.

The dissolved vinyl chloride plume extends westward from the south end of the roundhouse complex into AOI-30 (Figure 3). The highest vinyl chloride concentration occurs across the old refueling track and is defined by 22B-B19, 30-MW6 and 6D, and 30-B21. Lower concentrations of vinyl chloride appear to follow the trace of the old roundhouse around to the north. The vinyl chloride plume may extend southward or upgradient onto Atlas Steel property as defined by borings 30-B27, 21-B7, 22B-B18 and 22B-B20. The vinyl chloride plume is bounded to the east by 22B-B14 and B15 and to the north (downgradient) by 30-MW4, 22B-B13, 22B-B4, and 22B-B16. There was no DNAPL observed at the clay permeability boundary in 30-MW6D.

4.15.4. CONCLUSIONS

The LNAPL accumulations and dissolved vinyl chloride will be addressed in the Phase 2 workplan. The aged diesel product at the former fuel dispenser and in the vicinity of 22B-B17 has been adequately delineated. The downgradient (north to northwest) limits of the vinyl chloride plume have been established. The plume has not migrated eastward off of railroad property as shown by the absence of vinyl chloride in the eastern-most borings B14 and B15. Additional Phase 2 work will also be conducted for total 1,2-dichloroethene and 1,1-dichloroethene in the groundwater at this AOI.

4.16. AOI-26, SLUDGE RECLAMATION AREA

4.16.1. SITE DESCRIPTION

This AOI encompasses an area of a former pile of sludge, from the former UPRR oil reclamation plant. The reclamation plant was located north of the "roundabout track", and adjacent to the north side of AOI-30 (Figure 1). The petroleum-based sludge waste was excavated from AOI-26 and shipped off-site for disposal in 1993. About 29,000 tons of sludge soil were~~as~~ removed from an elongate area between the roundabout tracks and the Fort Buenaventura Park boundary.

Part way through the reclamation and restoration of the site, the DERR performed a site inspection and produced a report of the investigation (DERR report dated April 19, 1994, EPA ID UTD988075339). The DERR's soil, surface water, groundwater from remediation pits, and waste characterization analyses indicated volatiles, semivolatiles, and metal contamination remained. The waste characterization revealed low levels of benzene (0.007 mg/L), toluene (0.011 mg/L), as well as sporadic detections of phenols, fluorene, methylnaphthalene, dimethylphthalate, phenanthene, and pyrene. The erratic results from the four sludge samples show that the sludge was a heterogeneous mixture of hydrocarbons. The water results (ponded groundwater in the remedi~~elam~~ation pits) had few detectable volatile or semivolatile analytes. The most notable were the semivolatiles; 2,4-dinitrophenol, pentachlorophenol, and benzo-k-fluoranthene. No vinyl chloride was detected.

Subsequent to the reclamation, a 2-inch diameter monitoring well, STMW-1 was installed within the northern half of the reclaimed area in December 1994 (Appendix B). At present the reclaimed land is a grassy meadow. The area is on the lower terrace of the Weber River floodplain, and groundwater is only 2 to 4 feet bgs. The Park pond and surface water connection with the nearby Weber River is about 300 feet west of the AOI.

4.16.2. METHODS

The Phase 1 investigation consisted of six geoprobe borings, 26-B1 to 26-B6, and the installation of one monitor well, 26-MW1, in addition to the existing ST-MW-1 well. Four borings were originally

proposed for the assessment. Soil and water samples were taken from borings 26-B1 through B4 and wells 26-MW1 and STMW-1 and analyzed for VOCs, TPH-DRO, and PAHs. Soils were also analyzed for oil/grease. Because of the shallow groundwater, only two soil samples were collected from B3 and B4. Borings 26-B5 and B6 were drilled only to retrieve groundwater for dissolved vinyl chloride analysis.

4.16.3. RESULTS

The soil sample results show one exceedance for benzo-a-pyrene in the sample collected at 2 feet bgs in 26-B1 (Table AOI-26 - Soil Results and Figure 2). This boring is located in the area of the former excavation, and the soil below one foot deep had a pervasive black petroliferous stain. A DRO value of 780 mg/kg was detected in the 2-foot sample from 26-B2. ~~exceeds 500 mg/kg, but is less than the Tier 1, 5,000 mg/kg action level.~~ This sample also had pervasive petroleum staining. ~~The elevated~~ ~~o~~Oil and~~/~~ grease concentrations above the screening levels were detected in borings B1 and B2 (Figure 2). ~~values from these two samples and others taken from borings B1 and B2 indicate that most of the contamination may be related to heavy hydrocarbons with little solubility or volatility.~~

The groundwater results reveal elevated vinyl chloride from 26-B1, B2, B6, and wells STMW-1 and 26-MW1 at concentrations above the screening level (Table AOI-26 - Water Results). All of these sample points except 26-MW1 are within the reclaimed area where some residual soil contaminants remain (Plate 6). The ~~trace of~~ vinyl chloride in 26-MW1 (0.0038 mg/L) is just within the fence boundary of the park (Figure 3). No vinyl chloride was detected in water samples from the other borings (26-B3, 26-B4, 30-B13) in the park that are between the sludge remediation area and the river.

Groundwater from boring 26-B2~~1~~ contained a single DRO value exceeded the screening level with a value of 430 mg/L. None of the other water samples had detectable DRO concentrations. Minor contaminant concentrations above the screening level for lead, arsenic, and PAHs occurred in groundwater samples from B2, B3 and B4 (Plate 6).

4.16.4. CONCLUSIONS

This AOI will be further evaluated for the vinyl chloride in groundwater, and the PAH, DRO, grease and oil, and metal exceedances which occur in the former sludge removal area. ~~The vinyl chloride and DRO concentrations above screening levels in AOI 26 will be evaluated further in the Phase 2 workplan.~~

4.17. AOI-28, ROUNDHOUSE DRAINAGE DITCH

4.17.1. SITE DESCRIPTION

AOI-28 is a slough on Fort Buenaventura Park property that channels water westward from a culvert under the roundabout track to the main diversion canal from the Weber River that supplies the park pond (Plate 2). The drainage comes from an undefined source within the old UPRR railyard facilities east of the roundabout track. The surface water flowed through the slough most of the time during the Phase 1 assessment, and the water was without odor or sheen. The channel cuts across the lower floodplain terrace.

4.17.2. RESULTS

The assessment consisted of three stream sediment samples, 28-S1 to S3, and one surface water sample, 28-SW1 (Plate 2). In addition, the soil and water results from a boring for the AOI-30 assessment drilled within 30 feet of the slough, 30-B12, can also be included in the assessment of this AOI. The stream samples were analyzed for VOCs, PAHs and metals. The samples from the boring also included TPH-DRO.

Analytical results for stream sediment and boring soil samples all were below screening levels (Table AOI-28 - Soil Results). An ~~U~~unfiltered surface water sample 28-SW1, collected on 10/10/97, contained arsenic, barium, and lead above the ~~value of 0.265 mg/L, exceeding the 0.015 mg/L lead action level; and an arsenic value at the~~ screening level concentrations ~~of 0.050 mg/L~~ (Table AOI-28 - Water Results). A filtered lead water sample (28-ST1) collected in August 1998 had ~~no detectable lead at the 0.001 mg/L detection~~only arsenic above the screening level.

4.17.3. CONCLUSION

Additional work will be conducted on this AOI in Phase 2 to investigate the source of lead and arsenic detected in the surface~~unfiltered~~ water sample.

4.18. AOI-29, STRONGS CREEK

4.18.1. SITE DESCRIPTION

Surface water flow in Strongs Creek emerges from a culvert just north of the former UPRR roundhouse complex and continues as an open drainage that discharges west and north to the Weber

River (Plate 2~~Figure 1~~). Channel flow was always present during the Phase 1 investigation. The culvert runs westward under the railyard. East of the railyard, the stream flow remains largely confined to culverts within the city. Much of the flow appears to come from the city storm drain system. Parts of the open and enclosed creek are down groundwater gradient from AOI-22B and AOI-30 and their associated diesel and vinyl chloride groundwater plumes. The intent, in part, of this AOI investigation will be to determine if any impact has occurred to the stream from railyard operations.

4.18.2. RESULTS

Three paired stream sediment and surface water samples collected from Strongs Creek (Plate 2). They include R2-S6, S7 and S9 (sediment) and R2-SW6, SW7 and SW9 (unfiltered water). Each sample from Strongs Creek (R2-S6, S7 and SW6-SW8) was analyzed for VOCs, PAHs, and metals. Two additional paired samples were collected at the mouth of the creek , S9 and SW9, which also included pesticide analysis.

The results of the sediment and water sample analyses, as shown in Tables AOI-29 - Soil Results and Water Results, do not reveal any contaminant concentrations above the screening levels, with the exception of all detected concentrations of arsenic and one detection of bis(2-ethylhexyl)phthalate. Trace concentrations of various semivolatiles are present in the stream sediments, but they are below screening level concentrations by an order of magnitude or more.

4.18.3.CONCLUSIONS

~~The absence of analytes above screening level concentrations indicates that n~~No further work is recommended for~~will be required art~~ this AOI, until clean-up levels for arsenic are determined for the site. The bis(2-ethylhexyl)phthalate detection in the R2-SW7 sample is attributed to induced contamination in the method blank for this sample.

4.19. AOI-30, CURRENT DURBANO SALVAGE YARD AND FORMER UPRR MAINTENANCE AREA

4.19.1. SITE DESCRIPTION

AOI-30 encompasses ~~an~~ the former UPRR RIP-track rail-car maintenance area, and part of the general maintenance and fueling operations, associated with the roundhouse activities in adjacent AOI-22B. These maintenance and fueling operations ceased in the mid-1960s, and were moved to the southern part of the railyard in AOI-13 or transferred to Salt Lake City. As maintenance operations were winding down, a UPRR oil/water treatment and recycling facility began operation in AOI-30 in the early 1960s. The oil/water separation and recycling operations involved ASTs, process tanks, piping networks, and settling and holding ponds. An 8,200 gallon UST (UST #8) was located near the north side of the remaining office building. In the early 1970s the oil/water treatment and recycling activities ceased and the facility was dismantled. The UST, which reportedly held diesel, was removed in July 1990.

The current Durbano Metals salvage and recycling operation began in the mid-1970s, and it occupies the same area as the former oil recycling facility. The salvage company leases the property from UPRR. A roofed extension of the Durbano garage at the north end of AOI-30 now partially covers the former site of the two reclamation lagoons used during oil reclamation. Temporary piles of sorted and unsorted metal salvage also lie over areas where oil reclamation processing once took place. The only structures remaining from former railroad operations are the office building now occupied by Durbano Metals and a shop building, now used as Durbano's repair shop, that once sat next to the two former holding lagoons at the north end of the oil recycling operation (Figure 2).

Former UPRR RIP tracks and a former refueling rack were located just east of the current metals storage area in the salvage yard. The former refueling track parallels the boundary with AOI-22B. The diesel product plume associated with the refueling rack was discussed with the investigation results of AOI-22B. This plume is spread across both AOIs

The soil contamination and groundwater impact observed during the 1990 removal of UST#8 initiated a LUST site assessment (Utah facility ID 1200256 - see Figure 2). USPCI installed nine monitor wells around the site and excavated over 500 yards of contaminated soil. During the assessment and remediation it was determined that the soil/water contamination went well beyond the limits of what could reasonably be caused releases from the UST, and that other sources of contamination were likely. ~~A letter dated July 1, 1998 has been submitted to the DERR on behalf of UPRR to remove this LUST site from the DERR active LUST files because of the on-site contamination unrelated to the UST and the current RI/FS.~~ Only two of the nine original monitor wells currently remain on-site (MW1 and MW2 - logs in Appendix B); the others were abandoned during over-excavation or were lost during salvage yard activities (Table 8, locations shown on Plate 2).

The nature of the past activities in this AOI indicates the contaminants of concern are from diesel fuel, oil and grease, solvents, and metals.

4.19.2. METHODS

The Phase 1 investigation at AOI-30 included 30 geoprobe borings, 30-B1 to B33 (excluding 30-B9 to B11 which were drilled in AOI-20), seven monitor wells (30-MW1 to MW6 and MW6D), and five surface grab samples, (R2-SG1 through SG5) (Figure 2). Nine borings were originally proposed, but additional borings and wells were necessary to further characterize the groundwater and soil conditions. All soil and groundwater samples were analyzed for TPH-DRO, VOCs, PAHs, and metals. Soil samples were also analyzed for oil/grease.

The shallow water table at borings 30-B12, B13, and B14 limited soil sample collection to only two per boring. Borings B14 through B33 were advanced for groundwater testing only (no soil samples), and were sampled for dissolved vinyl chloride or LNAPL. Five of the geoprobe borings (30-B7, B8, B16, B26, and B33) were converted to piezometers because they encountered free-phase product. The product plume gauged by piezometer 22B-B3 straddles the AOI line and can be considered part of the evaluation of both AOI-30 and AOI-22B.

4.19.3. RESULTS

There were few soil samples with analytes above the screening levels despite the numerous analyte concentrations that were above the detection limit (Table AOI-30 - Soil Results). The analytes detected were spread throughout all sample depths (Figure 2). The locations of the eight borings with soil sample results and the surface grab samples are spread across the AOI, and their sample results are representative of the past uses of various petroleum products in the area. The TPH-DRO values ~~above the 500 mg/kg screening level~~ are all below the 5,000 mg/kg Tier 1 screening level, although the Tier 1 level cannot be applied to this AOI. ~~All come from subsurface samples. The elevated oil/grease results reflect the dominance of the heavier hydrocarbon fractions in the soil residue. For analytes other than DRO, only 30-B6 had a minor exceedance of benzo-a-pyrene in the surface sample.~~ Analytes detected above screening levels include arsenic, chromium, lead, grease and oil, and one detection of benzo(a)pyrene (Figure 2). With the exception of sample 30-B1 (350 mg/kg), all other detected arsenic concentrations in the soil are in the range of 5.8 to 28 mg/kg.

Results of groundwater sampling included detections of VOCs, PAHs, metals, TPH-DRO and dissolved vinyl chloride (Table AOI-30 - Water Results and Plate 6). Only three of the eight DRO values exceed the 10 mg/L screening level. These three well samples are close to the fringe of free product plumes. As shown on Figure 3, the dissolved vinyl chloride is spread over the central and southern portions of the AOI with two loci of concentration at 30-B1 and 30-B21/30-MW6. The latter concentration appears to be the larger and is spread between AOI-22B and AOI-30. The ~~larger~~ dissolved plume does not extend westward across the roundabout tracks to the park property.

Based on dissolved solubility limits for vinyl chloride, the detected concentrations do not indicate the presence of a DNAPL at the clay permeability boundary. Monitor well 30-MW6D is screened at the clay interface at 18-19 feet bgs; no evidence of DNAPL was observed, and the dissolved vinyl chloride value of 0.51 mg/L is still too low to suspect free-phase product accumulation.

The other analytes exceeding the screening levels (other than vinyl chloride and DRO) occur sporadically in different wells or borings and show no obvious patterns of contaminant impact other than being a part of the general impacted area in AOI-30. These analytes include arsenic, barium, cadmium, chromium, benzene, 1,2-dichloroethene, 1,1-dichloroethene, and PAHs. ~~benzo-a-pyrene, naphthalene, and tetrachloroethene.~~ Most of the concentrations are less than an order of magnitude above the screening level concentrations.

The zones of free-phase diesel accumulation are shown on Plate 8. Most of the product has an odor of old diesel. The plumes at 22B-B3 and at 30-B16 and B26 are along the track where locomotive refueling was once carried out, and the product is likely the result of spillage or a leakage associated with the former refueling facility. The product thicknesses in the monitor wells and piezometers are recorded on Table 1. The former holding lagoons at the north end of the AOI were at the site of the LNAPL plume found in piezometers 30-B7, B8 and B32. Thicknesses of hydrocarbon here ranged from 0.04 to 0.67 feet. The LNAPL is likely the remains of buried sludge after the ponds were reclaimed. The water sample results of the borings and wells around these plumes show little partitioning of soluble petroleum constituents or volatiles from these free-phase product pools. The static water levels were 7 to 9 feet bgs during the June 1998 sample event (Table 1).

4.19.4. CONCLUSIONS

The combined data from the groundwater and soil analytical results and boring logs and field-PID results show that much of the AOI has residual contamination which has impacted the water table. The petroleum hydrocarbons, in both soil and groundwater, are old with little remaining volatiles or soluble constituents. The hydrocarbon plume has been largely delineated by geoprobe borings and monitor wells and the product is old and weathered. The absence of the intermediate products of solvent degradation indicates that solvent impact to groundwater occurred many years ago and only dissolved vinyl chloride remains. The elevated vinyl chloride, the LNAPL accumulations, metal, PAH and VOC exceedances, and overall site characterization will be addressed further in the Phase 2 workplan.

4.20. AOIs 22A AND 38 - FORMER SPRR MAINTENANCE AREA

These two adjacent AOIs in Region 1 (Figure 1) contain groundwater contaminant plumes that may extend across their common AOI boundary and have related sources. The nature of the railroad

activities in each AOI were similar. As a result each AOI investigation will be discussed separately, but the texts will be kept in sequence for continuity

4.21. AOI-22A, FORMER SPRR ROUNDHOUSE

4.21.1. SITE DESCRIPTION

SPRR carried out primary engine maintenance for both diesel and steam locomotives in the roundhouse which was built in 1906 (Figure 1). The entire roundhouse was retired and dismantled in 1954, and only vestiges of the turn-table remain on-site. Most of the SPRR diesel maintenance then transferred to the former machine shop area in adjacent AOI-38. Some diesel fueling continued north and west of the old turn-table until a few years ago, and remnants of the old fuel dispenser rack endure along the west side of the present soda-ash transfer building. Data collected during the investigation resulted in an expansion of the original perimeter of AOI-22A to encompass the old fueling dispenser racks and the area around the soda-ash facility. Historical investigations have disclosed that an oil/water separation facility once existed on the land now occupied by the soda-ash facility.

In the 1960s, SPRR eventually replaced this oil/water treatment facility by the waste water treatment facility in AOI-34. The relatively new soda-ash transfer facility, operated by a non-railroad company, is the only current activity on this AOI other than active tracks for parking and passing trains. Raw soda-ash (trona) spillage is common on the tracks. The nature of the previous railroad activities indicate contaminants of concern are diesel fuel, lubrication oils, solvents, and polychlorinated biphenols (PCBs).

4.21.2. METHODS

The investigation of this AOI included twelve geoprobe borings, 22A-B1 though 22A-B12, and four monitor wells, 22A-MW1 to MW4 (Figure 4). Five borings were originally proposed for the AOI investigation. Four of the geoprobe borings (B4, B5, B7, and B11) were converted to 1-inch piezometers to gauge free-phase product. Soil samples from the initial five geoprobe borings were analyzed for TPH-DRO, VOCs, PAHs, PCBs, metals, and oil/grease. Additional borings and monitor wells were drilled under Addendum 3, to further identify dissolved vinyl chloride and diesel free-phase product in groundwater. For the initial five borings, groundwater samples were analyzed for TPH-DRO, VOCs, PAHs, PCBs, and metals. Samples from later borings and wells were selected for VOCs and vinyl chloride. Two surface grab samples specified in the workplan to be collected from the

interior of the turntable were not collected.. The turntable basin has a concrete floor with no soil accumulation.

4.21.3.RESULTS

The absence of analytes above screening levels in soil samples~~above action levels in~~from the four ~~three~~ borings around the turn-table (~~,~~22A-B1, -B2, ~~and~~ -B3, and -B4), as well as in nearby monitor well 38-MW4, indicates that~~little~~ subsurface contamination does not exist above screening level concentrations at the turn-table with the exception of arsenic (Table AOI-22A - Soil Results and Figure 4). Buried concrete foundations prevented full completion of the geoprobe borings in parts of the former roundhouse area. Water samples were not taken from the three borings because no soil contamination was detected. A water sample was not collected from boring 22a-B4 because of the presence of free product. The water sample from 38-MW1 had no detected parameters above screening level concentrations (Table AOI-22A -Water Results).

The investigation north and northwest of the former roundhouse encountered aged diesel fuel at the former fuel dispenser rack. The DRO and elevated oil/grease concentrations (11,000 mg/kg) above the water table at 22A-B4 and B5 indicate that the initial groundwater impact from diesel and oil occurred at the fuel dispenser when the dispenser was in operation. The absence of volatiles in the soil, suggests the condition of the petroleum hydrocarbons is highly weathered.

Piezometer 22A-B4 had up to two feet of floating product; B5 contained about 0.01 feet. Boring B5 is downgradient of B4. Thin LNAPL layers were also found in 22A-B6, B7, and B11, and piezometers were installed in borings B7 and B11. Borings 22A-B8, B9, and B10 did not intersect free-phase product, but the groundwater had a pronounced diesel odor and petroleum films. The extent of the LNAPL plume is well defined by the borings and monitoring wells installed during the Phase 1 investigation (Plate 9). The free-phase diesel is likely perched on the clay layer identified in borings 22A-B4 and 22A-B5 at a depth of 5 feet BGS.

~~Dissolved vinyl chloride and benzene were detected above action levels in groundwater samples from 22A-B9~~Metals and VOCs were detected at various concentrations above screening levels in the groundwater samples at this AOI (Table AOI-22A - Water Results, ~~and~~ Plate 7, Figure 8). However, with the exception arsenic and barium, contaminants were not detected in 22A-MW4, which indicates that neither the dissolved vinyl chloride plume nor the product plume has migrated off of railroad property. The DRO in the other three monitor wells remains ~~well~~ below the 10 mg/L screening level. These wells are close to the fringe of the free-phase product plume (Plate 9), and the low levels of dissolved petroleum constituents suggest that there is little soluble material left in the floating product to partition to water. Static water levels are 7 to 10 feet bgs.

~~Minor quantities~~ Low levels of dissolved vinyl chloride above screening levels occur in 22A-B9 and 22A-MW1, MW2, and MW3 (Figure 5). The highest concentration of vinyl chloride was detected in

monitoring well 22a-MW1 (430 ug/L). Vinyl chloride was not detected in an groundwater sample from near-by geoprobe boring 22a-B8. The source was likely the degradation of solvents released during maintenance activities near the roundhouse. The dissolved vinyl chloride plume in AOI-22A appears to be contiguous with the vinyl chloride detected to the west in 34-MW6, 34-MW5, 34-B40, 34-B41, 34-B42, and 34-B20.

4.21.4. CONCLUSIONS

The diesel LNAPL plume has been delineated by boring and monitor wells, and has not spread eastward off railroad property. Further work on the LNAPL, ~~and~~ dissolved vinyl chloride plumes, and additional VOC contamination in groundwater, will be addressed further in the Phase 2 workplan. Additional delineation of arsenic in soil and groundwater, and barium and lead in groundwater, may be required depending upon the associated clean-up levels developed for the site.

4.22. AOI-38, FORMER SPRR ENGINE MAINTENANCE AREA AND MACHINE SHOP

4.22.1. SITE DESCRIPTION

AOI-38 encompasses the area of the former SPRR shops area, including the machine shop, tin and tank shop, power house, and storehouse. This AOI provided engine servicing for both steam and diesel locomotives since 1906. The only remaining buildings are the machine shop which is scheduled for demolition and an auto/truck repair shop for railroad vehicles. The remnants of a locomotive transfer table still remain on the north side of the machine shop. Past service operations included diesel fueling. The fuel dispenser rack was located on the west side of the machine shop. All of the SPRR maintenance facilities in AOI-38 were retired in 1988 when the operations were moved to Salt Lake City. The only current railroad operations in AOI-38 are minor vehicle maintenance in the auto shop and a few remaining active tracks for parking rail cars.

In the early-1970s, a rupture of the diesel fuel service pipe line leading from the former main diesel storage tanks in AOI-1 to the fuel dispensers in AOI-22A resulted in a free-phase diesel plume on the groundwater at the north end of AOI-38. The SPRR response included the recovery of diesel from a caisson well that is still located on the northeast end of the AOI. In the 1970s, the main diesel fuel pipe line leading to the fuel dispensers at the machine shop was replaced after multiple leaks were found along the old line. The approximate location of the buried fuel line is shown~~indicated~~ on Plate 9. A secondary line also extended to a heating oil tank at the machine shop.

In June 1997 a 70 gallon heating oil UST (identified as SPRR4 in release documents submitted to the DERR) was removed from a location between the machine shop and the transfer table (Figure 4). The tank excavation intersected product-impacted soil. Later investigation showed the tank to be interred within the remains of the diesel release associated with the fuel line near the machine shop. This UST is unregulated because of it small size, and the contamination in the tank berth will be addressed as

part of the overall hydrocarbon contamination found in the AOI. The past railyard operations suggest that diesel fuel, oil/grease, solvents, and metals may have provided contaminants at this AOI.

4.22.2. METHODS

The investigation at AOI-38 included thirty-four geoprobe borings and ten monitor wells (Plate 1). Eight borings were originally scheduled for the assessment, but more subsurface information had to be collected to characterize the site. Ten borings were converted to piezometers to gauge free-phase product encountered. The piezometers include 38-B1, -B3, -B11, -B12, -B21, -B22, -B23, -B24, -B25, and -B28. Soil and water samples from the first twelve borings, 38-B1 to -B12, and all the monitor wells were analyzed for TPH-DRO, VOCs, PAHs, PCBs, and metals. The geoprobe borings from B13 to B34 further investigated the free-phase product plume or the dissolved vinyl chloride plume, and most groundwater analyses were limited to vinyl chloride. The water analyses from a few of the latter borings (B19, B20, B29, B03, B31) included VOCs and other analytes as indicated on Table AOI-38 (Water Results). No soil samples were retrieved from these borings. Less than 0.01 foot of product had accumulated in the caisson well.

4.22.3. RESULTS

The soil sample results reveal that many analytes are above detection limits, but, aside from ~~one~~ lead and arsenic~~ value~~, only TPH-DRO and grease and oil concentrations are above screening levels in subsurface samples (Table AOI-38 - Soil Results and Figure 4). All the DRO concentrations exceeding 500 mg/kg are in subsurface samples and reflect the presence of the groundwater diesel plume to be discussed below. ~~Only o~~One soil sample (from 38-B1) exceeded Utah's 5,000 mg/kg Tier 1 screening level. A product sample from piezometer 38-B25 reveals that the LNAPL is diesel. The oil/grease results shows that much of the residue is composed of heavy hydrocarbons.

The sample from 6 feet in 38-B6 had 8,400 mg/kg lead. This boring was located next to the old boiler building foundation, and it may have intersected some metal debris buried along the foundation wall. The substrate had pervasive diesel staining throughout.

The water sample results had a number of concentrations above screening levels for VOCs, PAHs, metals, ~~benzene, naphthalene,~~ TPH-DRO, ~~trichloroethene,~~ and vinyl chloride (Table AOI-38 - Water Results, Figure 5, and Plate 7). A few metal values also exceeded their screening level concentrations. Benzene is detected in scattered boring and well samples on the downgradient (western) fringe of the diesel plume. The PAH~~naphthalene~~ and DRO exceedances are associated with the diesel plume~~, and six of the ten DRO values detected do not exceed the 10 mg/L screening level~~.

There is a small~~minor~~ vinyl chloride plume at the southeast end of the machine shop (Figure 5) and two of the groundwater samples with vinyl chloride concentrations above screening levels, also have trichloroethene concentrations above the screening level (38-MW9, 38_B10) (Figure 5). The highest

concentration of dissolved vinyl chloride is located southeast of the building. The plume but has been spread downgradient under the shop. The limits of the vinyl chloride plume have been defined by boring samples.

The free-phase diesel plume has been largely defined by geoprobe borings and monitor wells (Plate 9). Hydrocarbon-related contamination appears to be spacially associated with the underground pipeline. The plume at the north end of the AOI is continuous with that at the south end. The shape of the plume follows the general trend of the fuel lines. Product thicknesses in wells and piezometers ranges from less than .01 feet to over 5 feet, and the plume is thickest along the pipe line from 38-MW1 to 38-B23(P). The product thickness decreases quickly east of the pipe line, but tapers more gently to the west and northwest with the groundwater gradient. The diesel may also extend across borings 38-B5 and B6 as water in these borings did contain product blebs. The depth to groundwater in June 1998 typically ranged from 6 to 8 feet bgs.

4.22.4. CONCLUSIONS

The free-phase diesel plume has been largely delineated by geoprobe borings and monitor wells. From evidence of the composition and smearing of residuals in some of the borings and wells near the product front, the extent of the product pool appears to be degrading and shrinking. The dissolved vinyl chloride plume is minor and limited in extent. The near-absence of the intermediate products of solvent degradation indicates that solvent impact to groundwater occurred many years ago. The free-phase diesel product plume and the dissolved vinyl chloride plume~~concentrations~~ will be addressed in the Phase 2 workplan. Additional delineation will also be conducted in the soil and groundwater for the metal, PAH and VOC constituents detected above screening level concentrations.

4.23. AOI-23 - MUCKING LINES

4.23.1. SITE DESCRIPTION

This AOI encompasses an area of track, designated by Lockheed as the mucking lines, which lies southwest of Union Station along the west side of the former passenger platforms in Region 2 (Figure 1). Archival photos show parked rail cars on holding tracks and buildings that may have belonged to the UPFE (Union Pacific Fruit Express) for cold storage refrigeration. Old railroad maps do not label anything called "mucking lines". Inquiries to present and retired railroad personnel have not revealed the nature of or past location of the mucking lines. At present, most of the tracks in the AOI have been removed, and little evidence of past activities remain.

4.23.2. RESULTS

Three soil grab samples, R2-SG13 to SG15, were collected in the designated area (Plate 2 and Table AOI-23 - Soil Results). The samples were analyzed for metals, TPH-DRO, and PCBs. One lead value at 2,000 mg/kg exceeded the ~~1,000~~400 mg/kg screening level (Figure 6). The arsenic screening level was exceeded in all three samples.

4.23.3. CONCLUSIONS

All other analyte values were below their respective screening level concentrations. No PCBs were detected. No further work is currently recommended for this AOI. However additional sampling may be necessary to further evaluate lead and arsenic concentrations in the surface soil, if the detected ~~2,000 mg/kg~~ concentrations falls above the risk-based cleanup level that will be developed during Phase 2.

4.24. AOI-27 - 1996 POND CLOSURE (OGDEN POND)

4.24.1. SITE DESCRIPTION

AOI-27 encompasses and area west of the rail tracks that was formerly used for sludge disposal. A shallow pond had formed in a surface depression in this area. The past site investigation and sludge removal at this AOI has been presented in three reports that include: the DERR Preliminary Assessment Report for site UTD988075271, dated February 17, 1993; the DERR Analytical Results Report of the site investigation, dated April 20, 1994; and the USPCI/Laidlaw final report on the remediation of the site dated June 13, 1996. The site is located on the west side of the railyard in Region 3 (Figure 1).

The DERR site investigation characterized the petroleum-based sludge waste that formed the bottom of the shallow pond located within a few hundred feet of the Weber River. The stiff, black material had inconsistent, elevated concentrations of VOCs (2-butanone, 4-methyl-2-pentanone, tetrachloroethene, toluene, and ethylbenzene), semivolatiles (1-chloropropane, 2,4-dinitrophenol, pentachlorophenol, benzo-k-fluoranthene, phenol, 1,2,4-trichlorobenzene, methylnaphthalene, fluoranthene, pyrene, and phenanthrene), lead and other metals. The pH of the wet sludge was between 0 and 1 pH units. The surface water samples from the pond revealed that few organic substances were partitioning to water. In one water sample collected from the former pond, lead exceeded the current Phase 1 screening levels with a concentration of 0.396 mg/L

In November-December 1995 USPCI excavated 9,900 tons of soil-sludge from the shallow, swampy, one acre pond. The excavation removed the sludge down to a depth of four to seven feet below the bottom of the pond, where clean substrate was encountered. All visible sludge was removed from

within the pond boundary, and the excavation was backfilled with clean soil. Small outlying pods of sludge remain on the north and northeast side of the former pond. A monitor well, OGP-1, was installed on the north-northwest side of the pond (downgradient from the pond) in December 1994 (log in Appendix B).

The current condition of the AOI is a grassy and brushy meadow that readily becomes wet and swampy during wet weather. The area is near the river on the lower terrace floodplain where the water table is strongly influenced by river flow. The water table fluctuations can range from near-surface to 6 to 8 feet bgs. The origin and time of placement of the sludge is uncertain. The aerial photography suggests that it may have been in place for several decades.

4.24.2. RESULTS

The proposed five geoprobe borings for this AOI were amended to seven, and groundwater samples were retrieved from six of the borings (Figure 7). Both soil and groundwater samples from the borings were analyzed for TPH-DRO, VOCs, PAHs, metals, and pH. The monitor well, OGP-1, was also sampled. Surface water samples could not be collected because of dry conditions.

Although the soil sample analyses detected numerous organic compounds and metals, only lead, arsenic, and 1,2-dibromoethane~~DRO~~ were detected above screening levels. The 1,2-dibromoethane~~se~~ detections occurred in ~~three~~ soil samples from ~~the same~~ boring 27-B2 along with arsenic (Table AOI-27 - Soil Results). This boring, 27-B2, advanced directly into sludgy soil, and the samples were, in part, composed of bits of pure sludge. The pH of the soil was 0.8. (The sludge clogged the geoprobe screen and prevented the retrieval of groundwater for a sample from this boring.) In contrast, the other borings were located around the perimeter of the former pond and pods of sludge, where they intersected soil without sludge residue. All arsenic detections are above the screening level (Figure 7). There were no additional analyte detections above screening levels with the exception of one lead value (650 mg.kg 27-B7)., and the soil pH from both the unsaturated and saturated zone remained slightly alkaline (7.3 to 9.09).

The groundwater results revealed no analytes above screening levels with the exception of arsenic, barium, and chromium (Table AOI-27 - Water Results). Collectively, only five organic compounds were above detection levels. The pH measurements ranged from 6.5 to 7.2.

4.24.3. CONCLUSIONS

The locations of the borings and monitoring well cover the downgradient and cross-gradient groundwater migration routes to the river, from the former pond and sludge remnants. The few detected contaminants and the absence of any organic compounds above screening levels indicates that the river is not endangered by impact from migration of organic contaminants in groundwater from this

AOI. The remaining sludge contamination~~pods~~ will be discussed in the Phase 2 workplan. Additional delineation of metals in soil and groundwater will be conducted if the detected concentrations are above the clean-up levels to be determined for the site. Surface water samples will be collected from the former pond area, if there is an accumulation of surface water in the future.

4.25. AOI-32 - OIL\WATER SEPARATOR AND LUST SITE

4.25.1. SITE DESCRIPTION

An oil/water separator facility in Region 3 is surrounded by the track network near the current operations office of the UPRR railyard (Figure 1). The belt stripper oil separator facility is similar to that in AOI-12. Currently, the buildings near the separator serve as a staging area for track maintenance crews. In the past, this AOI was used for caboose maintenance, and fuel oil was dispensed to heating systems in the cabooses.

The 6,000 gallon UST formerly used to store the fuel oil for the cabooses was removed in 1990. The site is now identified as Utah LUST facility 1200409 and UPRR UST-2. The tank berth was located about 150 feet south of the oil/water separator (Figure 7). Since closure, the site has undergone a site investigation that included the installation of three monitor wells shown on Plate 3 (MW-13, MW-14, MW-15, November 1990) and soil over-excavation (September 1992). The soil contamination was successfully removed from all but the northeast end of the excavation where a steam line prevented further digging (Figure 7 for tank excavation location). Two of the monitor wells had to be abandoned in 1992 during the overexcavation, and one well remaining well, MW14, was ~~could not be~~ located and sampled~~. This well is assumed to be buried under road base gravel~~ (Appendix B for log).

The Phase 1 investigation assessed the conditions around the oil/water separator with three geoprobe borings, and performed an extended assessment of the soil and groundwater conditions around the former tank berth with four geoprobe borings (Figure 7). The soil and groundwater samples in borings located at the oil/water separator, 32-B1, B2, and B5, and around the LUST 32-B3, B4, B6, and B7, were analyzed for TPH-DRO, VOCs, and PAHs. The soil samples from B1, B2, and B5 also were analyzed for oil/grease.

4.25.2. RESULTS

The soil results show no analyte values above screening levels. ~~except for a single~~ Detected DRO concentrations ranged from 5.2 to~~value of~~ 670 mg/kg, west of the tank excavation (Table AOI-32 - Soil Results and Figure 7). ~~This value is significantly below the 5,000 mg/kg, Tier 1 screening level, however.~~ Traces of several PAHs and VOCs were present below screening levels. Oil and grease was not detected in soil samples collected near the oil/water separator, at concentrations above 700 mg/kg.

At the specific request of the DERR, the boring 32-B6 was located on the northeast corner of the former excavation where diesel residuals were left in place. The DRO results at 2 feet and 6 feet were both below the 5 mg/kg detection limit. The low level concentrations of DRO in borings 32-B3 and 32-B4 are due to spillage during caboose refueling. B3 and B4 were located between the caboose tracks where refueling was carried out.

~~There were no~~ ~~G~~groundwater analytes were detected above screening level concentrations in borings 32-B1 and 32-B5 near the oil-water separator, and in 32-B7 at the UST site (Table AOI-32 - Water Results, Figure 7). ~~Most of the PAH and VOC compounds were below detection limits, and the traces of analytes detected, remained an order of magnitude below screening level concentrations.~~

4.25.3. CONCLUSIONS

Additional monitoring of groundwater for PAHs will be conducted at the LUST site. Benzo(a)anthracene and benzo(a)pyrene are the only remaining COCs associated with the LUST site that remain above screening levels. Additional delineation will be conducted for the groundwater contaminants associated with the oil-water separator. ~~The absence of any soil or groundwater contaminants above screening levels at both the oil/water separator and the LUST site suggests that no further work is necessary for the RI/FS. Significant soil or groundwater impact has not occurred at the oil/water separator, and the LUST site has been satisfactorily remediated to prevent groundwater impact. An additional attempt will be made to locate well MW-14 during the Phase 2 investigation. If found, the well will be sampled.~~

4.26. AOI-33 - 21ST STREET POND

4.26.1. SITE DESCRIPTION

AOI-33 is a man-made lake, that was excavated in the mid-1970s concurrently with the construction of the 21st Street overpass (Figure 1 - Region 1). The pond is a borrow pit for the soil forming the overpass ramps. The lake site was once a farm field bordered on the south by a small D&RGW maintenance yard (AOI-35). The railroad activities ceased in AOI-35 a few years after the lake was built. The environmental concerns stem from a noted seep of possible hydrocarbons, at the southeast end of the lake.

4.26.2. RESULTS

Three surface water samples were collected from the pond as well as one shoreline soil sample (Plate 1). Two of the water samples, 33-SW1 and SW2, and the shoreline sample, 33-SG1, were located at

the southeast end of the lake where a possible hydrocarbon sheen, associated with seeps, has been detected. Both of the water samples contained a pale blue film. Another water sample, 33-SW3, was collected at the west side of the lake for a background reference sample. To test for any groundwater pathways to the pond from the old D&RGW operations to the south, four geoprobe borings were located along the south side of the lake between the lake and 21st Street. All the water and soil samples were analyzed for TPH, VOCs, and PAHs.

Although none of the soil results reported values above screening levels, several VOCs and PAHs were detected, most of them from the shoreline soil sample 33-SG1 (Plate 1), and from the soil sample at the saturation zone at 7 feet in boring 33-B1 (Table AOI-33 - Soil Results). The shoreline soil was a water-saturated sample of silt, sand, and gravel, that also had a bluish discoloration. Boring 33-B1 was located on top of the berm embankment on the maintenance access road around the pond. The boring location is about 10 feet above pond level and due south of the shoreline sample and seeps. Boring 33-B1 was drilled to intersect the groundwater path to the seeps.

Surface water samples SW1 and SW2 contained detectable VOCs (benzene, ethylbenzene, and xylenes) and PAHs (naphthalene, etc.) below screening level concentrations (Table AOI-33 - Water Results and Plate 8~~9~~). Surface water sample SW3~~,~~ (Plate 1, background sample) at the opposite end of the lake, had no detectable analytes, with the exception of a laboratory induced detection of methylene chloride.

VOCs and PAHs were detected above detection levels in groundwater samples from borings 33-B1, B2, B3, and B4. The groundwater sample from boring B1, located on the berm directly over the probable groundwater path to the seep, contained levels of benzene (0.15 mg/L), ethylbenzene, carbazole, and naphthalene above screening levels. DRO was also detected in this sample, ~~but is below the 10~~ at a concentration of 1.4 mg/L. ~~screening level.~~

Benzene was also detected in water samples from borings B2 and B4 at concentrations above the screening level. These borings are offset of the main seepage area. The 33-B3 sample, located at the southeast corner of the lake and beyond influence from groundwater flow from the south, had no analyte detections above screening levels.

4.26.3. Conclusions

The groundwater seepage into the southeast end of the 21st Street Pond is impacted by benzene, ethylbenzene, carbazole, and naphthalene above screening levels. Groundwater probably migrates northward to the pond through native alluvium and through the overlying fill. The contaminant source may ultimately be from the former D&RGW yard or soil making up the ramp and lake embankment berm.

Additional work will be conducted at this AOI during Phase 2. This work will include an attempt to define the source of the ~~benzene and naphthalene~~ contamination in the seeps.

4.27. AOI-34 - SPRR WASTE WATER TREATMENT PLANT

4.27.1. SITE DESCRIPTION

AOI-34, located in Region 1, encompasses the fenced-in compound of the active SPRR waste water treatment plant (the plant) as well as land north and east of the compound as indicated on Figures 1 and Plate 1. The area of the AOI has expanded from the original Phase 1 workplan to include the old monitoring well field north of the water treatment plant and, and dissolved vinyl chloride detected at the eastern end of the plant. The southwest perimeter of the plant compound is within 40 to 100 feet of the Weber River channel.

The waste water treatment plant was constructed in the 1960s to replace a smaller water treatment plant formerly located in AOI-22A. Before construction of the holding ponds and sludge pits, an irrigation canal ran southward across the present east side of the plant to the Weber River. Remnants of this canal still can be seen north of the 21st Street extension and between the plant and the river. Former "trainmen's" buildings were once located just east of the present plant gate. These structures were demolished in the 1980s. Construction of unlined waste water pits on the north side of the plant began in the early 1960s, and by 1980 the concrete-lined pond on the southeast end of the plant was completed. Two 12,000 gallon USTs were also installed in the plant compound for sludge storage. Former railroad employees have indicated that sludge was sometimes dried on the open ground within the compound, and some of it was buried as the plant was constructed. When the two USTs in the plant were closed in 1997, remnants of the buried sludge could be seen in the tank excavations.

Waste water is transferred to the plant by a sub-grade industrial sewer line that extends eastward from the compound gate, then southward to split into several tributary lines that serviced waste streams from the former roundhouse and machine shop maintenance areas in AOIs 22A and 38. The pipe still carries water, but the absence of railroad activities produces little waste for treatment. None of the lined sludge pits at the plant are operating.

A City of Ogden storm sewer line is buried along the old, unpaved 21st Street extension and passes east to west along the north side of the plant compound fence. The brick-lined sewer carries surface water from the city east of the railyard to an outlet at the Weber River located several hundred feet west of the plant. The sewer was built prior to 1920 and has interior dimensions are 3 feet wide and 4 feet high. The level of flow in a manhole at the northeast end of the water treatment compound is about 9.7 feet below grade; thus the water flow in the conduit is below the local static groundwater level. The porous nature of the brick walls allows groundwater to enter the sewer and become part of the flow.

A large-diameter, steel,~~modern~~ underground sanitary sewer line from the city of Riverdale passes northward just outside the eastern end of the plant fence (Figure 8). This pipe line conveys sewage waste to a sanitary sewage plant several miles to the north.

Since 1988, parts of this AOI have been the subject of several environmental investigations by SPRR consultants, the US EPA Field Investigation Team (FIT), and the UDEQ-DERR. During 1988 and 1989, nine~~ten~~ monitor wells were installed north of the plant compound, between the plant and the river. The wells are shown on Plate 1 and listed in Table 8-A. Eight~~Nine~~ of these wells still exist and were sampled and gauged as part of the Phase 1 sampling.

At this AOI, soil and groundwater contamination would include compounds related to diesel and the heavier range organics, solvent-related compounds, and metals. The contaminants may have originated from sludge disposal on-site, leakage from lined ponds or piping leading to the ponds, or releases from tanks.

4.27.2. METHODS

The Phase 1 Workplan ~~in~~ proposed 7 geoprobe borings in AOI 34. Forty-three borings were completed in and around this AOI during Phase 1 (Plate 1). These borings are identified as 34-B1 through 34-B43. After completion of the geoprobe boring survey, 6 monitor wells, 34-MW1 to 34-MW6, were installed east and south of the plant. These wells were installed to delineate dissolved-phase groundwater contamination identified during the geoprobe survey. The new wells bring the total number of monitor wells at the AOI to 15.

Because of the dissolved vinyl chloride found in a number of the geoprobe borings, one well (34-MW3D) was completed to sample deeper groundwater and soil at the clay permeability interface. This well was completed in an area of higher vinyl chloride concentrations, detected in a number of the shallow groundwater samples located at the northeast end of the plant.

In addition to the subsurface investigation, surface water and stream sediment samples were collected along the Weber River southwest of the plant. Early Phase 1 samples include paired sediment and river water samples R1-S3 and S4 and R1-SW3 and SW4, respectively. Later, additional river samples 34-SW1 through SW3 were taken along the same stretch of water.

All Phase 1 soil and water samples were analyzed for VOCs, TPH-DRO, PAHs and metals. In addition, the surface water samples were run for pesticides and selected subsurface soil samples were analyzed for oil/grease.

4.27.3. GEOPROBE SURVEY AND MONITOR WELL RESULTS

Although metals and organics were detected in the soil samples, all were below screening level concentrations with the exception of arsenic (8.2 - 11 mg/Kg) (Table AOI-34 - Soil Results). Two

borings, 34-B2 and B6, intersected buried sludge at eight feet. DROs were not detected above 500 mg/kg, and oil/grease did not exceed 5,000 mg/kg in these samples. The analytical results suggest little volatile or soluble organic compounds remain in the buried sludge. The sample from boring B2, located where the waste water transport pipe enters the compound, had the sole trace of vinyl chloride detected in any soil sample.

The water sample results revealed detections of metals, VOCs and PAHs above their screening levels (Table AOI-34 - Water Results, Figure 8, and Plate 7~~9~~). All detected concentrations of arsenic in the water samples were above the screening level of 0.045 ug/L. The detected concentrations range from 3.1 to 140 ug/L. Concentrations of addtional metals in the groundwater samples that exceed the screening levels are shown on Plate 7.

No free-phase product was found in any of the borings or wells. Dissolved vinyl chloride was detected in groundwater samples from several borings. Thirty eight groundwater samples (not including duplicates) contained vinyl chloride in excess of the 0.002 mg/L MCL~~screening level~~. ~~Minor~~

Ceoncentrations of 1,1-dichloroethene, 1,1-dichloroethane, 1,2-dichloroethene, chloroethane ~~in 34-B3~~ and tetrachloroethene ~~in 34-MW4~~ were detected above screening levels (Plate 7), and probably represent remnant products of solvent degradation leading to vinyl chloride. Semi-VOCs were detected above screening levels in water samples from SP-MW-02 (bis 2-ethylhexly phthalate 0.021 mg/L) and from 34-B6 (2-methylnaphthalene 0.22 mg/L). Methylene chloride detections in 34-B3 and 34-MW-1A area associated with method blank contamination.

No evidence of DNAPLs were found in the sample from 34-MW3D, collected at the gravel/clay interface at 21 feet bgs. The solubility limit of vinyl chloride and the relatively low levels of dissolved vinyl chloride detected in groundwater samples, suggest that there is no DNAPL source. This well boring and the deep exploratory geoprobe boring 34-B39D intersected the clay interface at about 21 feet. After penetrating several feet of the clay, both holes advanced into a 2 to 4 foot thick sand unit, then re-entered massive clay that remained to 48 feet bgs in 34-B39D. The deep water sample from 34-MW3D was collected through a 5-foot screen set at 20 to 25 feet bgs; the screen was set to span the thin lower sand zone as well as the top of the clay zone (see log). VC was not detected in the groundwater sample collected from well 34-MW3. The VC concentration in the groundwater sample from 34-MW3D was 6.4 ug/L.

As can be seen on Figure 8, the dissolved vinyl chloride plume appears to have three areas of higher concentrations, none of which exceed 0.6 mg/L. Two of the elevated vinyl chloride areas are located at the east end of the plant compound, and are mostly outside of the plant's water treatment operations. Minor benzene concentrations above the screening level are also associated with these areas. There were no known railroad activities that may have acted as a source for solvent dispersion east of the plant compound other than a possible leak in the waste water pipe or an unobserved/undocumented release from a railroad tank car many years ago. The westward to northwestward groundwater gradient may have caused dissolved vinyl chloride to migrate to the area of the plant. The plant does not appear to be a significant source of impact.

A third vinyl chloride plume lies southeast of the plant and its eastern end approaches the traces of vinyl chloride found in AOI-22A. The long narrow trend of vinyl chloride, as seen in 34-B20, B42, B25, B41, B40, and MW6 suggests a migration path from a source within AOI-22A.

The minor DRO detections in 34-B6 and R1-B1W1 are likely related to dissolved constituents partitioning from sludge residuals such as found in the soil at B6 and the tank excavations. The DRO detection east of the plant in 34-MW6 represents the western fringe of the dissolved plume partitioning from the free-phase diesel plume at the former dispenser in AOI-22A.

4.27.4. Surface Water and River Sediment Results

The geoprobe survey and well array has delineated the limits of the vinyl chloride plume in all directions. The geoprobe boring samples along the Weber River contain no detectable vinyl chloride. Additionally, vinyl chloride was not detected in the five river water samples. The plume appears to be migrating to the west-northwest with the groundwater gradient, and does not appear to be impacting the Weber river.

4.27.5. Storm Sewer Sample Results

Water runoff samples were retrieved from three manholes on the storm sewer and analyzed for VOCs. These are samples 34-ST1, ST2, and ST3 (Plate 1). The water samples were tested to determine if vinyl chloride impacted groundwater is leaking into the storm sewer. Sample ST1, taken near the eastern corner of the plant, and ST2, taken at the sewer discharge into the river, both contained dissolved vinyl chloride slightly above the 0.002 mg/L MCL~~screening level~~ (Table AOI-34 - Water Results). The lack of vinyl chloride in sample ST3, collected from the storm sewer east and upgradient of the railyard, indicates that the detected vinyl chloride is likely entering the sewer line in the railyard from a groundwater source near the plant. As previously mentioned, the static groundwater table is above the flow level in the sewer. The water in the sewer at ST1 also had a sheen whereas the water at ST3 had none.

4.27.6. Industrial Sewer Line Sample Results

The industrial sewer line network leading to the plant from the machine shop area was sampled from manholes at and near AOIs 34 and 38. Seven water samples (WW1 through WW7) were collected from manholes along the sewer line (Plate 1). The entire pipe line is underground. Parts of the line were dry, and the low levels of flowing water appeared clear and without obvious hydrocarbon contamination. No industrial waste water has been discharged to the sewer since the late 1980s, and the current flow is now from surface runoff. All water samples were analyzed for VOCs.

All VOC analytes were below screening levels except for four analytes in the sample from ~~a single value from 1,1,1 trichloroethane in~~ 38-WW7, located in the pipe line north of the machine shop in AOI 38 (Table - Waste Water Results, Plate 7). Most analytes values were below detection levels. The few analytes detected appeared to be degradation products of solvents.

4.27.7. CONCLUSIONS

Groundwater has been impacted by solvent-related compounds over a widespread area. The plume is delineated and remains on railroad property. There are no other analytes above screening levels associated with the vinyl chloride in most of the water samples. The relatively low levels of vinyl chloride and the near-absence of higher order solvent compounds indicates that free-phase solvent accumulations are not expected. The original source of solvent may have been past releases associated with former maintenance operations. DNAPL has not accumulated at the permeability interface, and detectable quantities of dissolved vinyl chloride in groundwater are not reaching the river. Water carrying vinyl chloride in amounts slightly above screening levels is entering the river at the storm sewer outlet.

The industrial sewer line does not likely to be a current source of impact for vinyl chloride or other hydrocarbon compounds in groundwater. However, the vinyl chloride concentrations directly east of the plant may be due to a previous pipe line leak in that area when waste water was carrying solvents in the past.

Additional investigations will be conducted in this AOI under Phase 2.

4.28. AOI-35 - FORMER D&RGW RIP TRACK AREA

4.28.1. SITE DESCRIPTION

This AOI is located at the north end of the present railyard in Region 1, the former D&RGW rip track area was a small maintenance facility and siding yard that was active during the steam and diesel locomotive eras. Operations at the yard ceased in the mid to late 1980s (Figure 1). In 1988, two consultants (Environmental Science and Engineering, Inc. and MKE) conducted an audit, site assessment, and subsequent soil remediation in the former yard because of a possible transfer of railroad property.

The remediation effort included the excavation of soils with kerosene residue (20 tons) and lubrication oil residue (16 tons) at a carmen's building (section house) and an oil house, respectively. One 250 gallon UST at the carmen's building was associated with a minor release of kerosene that did not reach the water table. A groundwater result from a former monitor well installed at the tank site (well OB-1) showed that oil/grease and all VOCs (except acetone - suspected laboratory contaminant), including

vinyl chloride and other solvent derivatives, were below detection limits. This well could not be located during the Phase 1 field work.

At present there are no railroad activities at the former D&RGW maintenance area. All buildings and tracks have been removed, and much of the area has been graded. A large AST once set in the present 21st Street right-of-way. The tank was probably used for diesel storage, and it was removed in the early 1970s before the new 21st Street route was constructed. Several grain silos have recently been built in the former yard for railroad freight pickup. Burlington Northern Railroad now holds rail cars on the track network that remains between the former maintenance yard and the Weber River. The 21st Street overpass covers part of the historic railyard area.

Contaminants of concern at the railyard are the typical materials used for railroad maintenance including diesel fuel, oil products, and PCBs.

4.28.2. RESULTS

Four geoprobe borings, 35-B1 through 35-B4, were located in the central and eastern portions of the former railyard (Figure 1). Five borings were originally proposed, but the grain silos prevented completion of the boring locations planned at the western end of the yard, at the site of the oil house. All soil boring samples were analyzed for TPH-DRO and PAHs. Soil samples from B1, B2, and B3 were analyzed for PCBs. VOCs and metals were also tested for in borings B3 and B4. Selections of additional analyses were based on the location of former operations in the yard, and as a check for any subsurface contaminant continuity with the seeps at the 21st Street Pond.

Groundwater samples were retrieved from borings 35-B3 and 35-B4. The samples were analyzed for DRO, VOCs, PAHs, PCBs, and metals. The locations of these borings are due south of the seeps at the 21st Street Pond, and the presence of contaminated groundwater could indicate a source for the impact at the pond. The same analytical suite was also determined for a surface water sample, 35-SW1. This sample was from a large puddle near 35-B3. The puddle had the odor and reddish brown color distinctive to soda ash (trona) spillage mixed in water.

All soil sample results are below screening levels with the exception of arsenic, which ranges from 6.1 to 12 mg/Kg (Table AOI-35 - Soil Results). A number of PAH compounds were detected, but most are from the surface soil samples at the boring sites.

The groundwater sample results reveal only one~~two hydrocarbon~~ compounds above screening levels~~detection limits~~ out all of the analytes measured (Table AOI-35 - Water Results, vinyl chloride 0.0043 mg/L). The rest of the exceedances on Table AOI-35 - Water Results were detected in the surface water sample 35-Sw1 (Plate 7). ~~These include vinyl chloride at 0.0043 mg/L, which slightly exceeds the 0.002 mg/L screening level, and 1,2-dichloroethene, another solvent derivative (Plate 7). Arsenic in the surface water sample (35-SW1) slightly exceeded the 0.050 mg/L screening level.~~

4.28.3. CONCLUSIONS

The absence of VOCs in groundwater from 35-B3 and B4 suggests that these borings are not in the path of groundwater contamination leading to the 21st Street Pond. The absence of PAHs and VOCs in the deep soil samples from all of the borings also suggests minimal groundwater impact in the yard. This AOI will be further investigated in the Phase 2 work, to determine the source of contamination detected in the surface water sample. Additional delineation may be required for the groundwater vinyl chloride detection in 35-B2.

The former AST site, now on the 21st Street right-of-way, was about 200 feet east of the present parks department headquarters on the north side of 21st Street, and within 100-200 feet of the southwest edge of the lake. This tank site was not part of the RI/FS investigation, but its position near the southwest end of the lake makes it unlikely that a previous hydrocarbon release from it would be seeping from the bank at the southeast end of the lake hundreds of feet away.

4.29. AOI-36 - FORMER D&RGW ROUNDHOUSE AND SALVAGE YARD

4.29.1. SITE DESCRIPTION

This AOI encompasses the area of the former D&RGW roundhouse and an adjacent salvage yard, located between 21st Street and 20th Street, at the northeast end of the railyard in Region 1 (Figure 1). At present, the 21st Street ramp and overpass covers a portion of the former engine maintenance area including the site of the small D&RGW roundhouse which was demolished in the 1950s. An auto salvage yard existed for several decades at the east end of the railroad property. The salvage operation appears to have discontinued in the 1980s. Nothing remains of the railroad facility or the salvage operation.

The property comprising AOI-36 has undergone two environmental assessments in addition to its inclusion into the present RI/FS. As part of a possible property transfer in 1992, two investigation phases were conducted for the City of Ogden Corporation by Sergent, Hauskins, and Beckwith (SHB) consultants. Two monitor wells, 36-MW1 and MW2, were installed on the western half of the property (Appendix B). The wells still exist and were sampled as part of this Phase 1 investigation. The Phase 2 report of the SHB study is dated May 28, 1992. In 1997, the area became the subject of another possible property transfer to Weber County Public Works for use as a solid waste transfer station.

Concurrent with this Phase 1 investigation, the EPA Region VIII technical assistance and response team, URS Operating Services, Inc., conducted a site investigation for Weber County under contract

68-W5-0031. Five additional monitor wells were installed. Logs of the URS wells are provided in Appendix B. A site assessment report dated March 2, 1998 was prepared by URS (1998).

~~The conclusions of the URS (1998) study indicate that contamination from metals, particularly lead, and hydrocarbons (TPH and PAHs) is restricted to the upper 3 feet of soil. No impact from TPH or PAH was found in groundwater samples, and all VOCs remained below federal MCLs. Lead in two water samples exceeds the federal MCL.~~

The Phase 1 investigation included four geoprobe borings, 36-B1 through 36-B4, and water samples from the two existing monitor wells, MW1 and MW2 (Plate 1). No contamination was observed at the zone of saturation in the geoprobe borings, and, consequently, no water samples were retrieved from the borings. The soil sample analyses included VOCs, TPH-DRO, oil/grease, and metals. The water samples from the monitor wells were analyzed for VOCs, TPH-DRO, and metals. Field work completed by URS (1998) included collection of 31 surface soil samples and completion of 11 soil borings (URS, 1998, Figure 2).

4.29.2. RESULTS

~~All VOC analytes from the soil and water sample analyses were below screening levels (Table AOI-36 - Soil Results, and Table AOI-36 - Water Results). Lead and chromium were detected in samples from both MW-1 and MW-2 at concentrations exceeding the screening levels. Cadmium was also detected above the screening level concentration in well MW-1.~~

~~Lead in surface soils at the site ranged from 7 to 2,970 mg/kg. Dibenzo(a,h)anthracene, benzo(a)pyrene, and oil & grease were detected above screening level concentrations in four of the soil samples.~~

Comparisons of detected contaminant concentrations to screening levels in the soil and groundwater samples collected by LES are shown in Table AOI-36 - Soil Results and Table AOI-36 Water Results in the table section. Table 9-A lists the results of soil samples collected by URS (1998) for analytes that exceed the soil screening levels. Table 10-A lists the results of groundwater samples collected by URS (1998) for analytes that exceed the water screening levels.

In the table referenced above, all soil analytes were below screening level concentrations with the exception of metals (As, Pb), oil and grease, and PAHs (Figure 5-A). TRPH (EPA method 418.1) analysis of soil samples was reported by URS (19998). The TRPH concentration in surface soils ranged from <20 to 6,130 mg/Kg. TRPH in the subsurface ranged from <2 to 2,020 Mg/Kg (URS 1998, Table 2).

Groundwater contaminant concentrations above screening levels are shown on Plate 7. The groundwater exceedances include metals in six of the wells and one detection of 1,1,2,2-tetrachloroethene (2 ug/L) in well MW-3. Wells MW-1 and MW-2 were sampled by both LES and URS. The URS (1998) results are reported under GW-01 for well MW-1, and under GW-02 for well MW-2. The data shown on Plate 7 for wells MW-1 and MW-2 are the highest concentrations detected.

4.29.3. CONCLUSIONS

Further work in this AOI for hydrocarbon-related contaminants in the soil will be conducted during Phase 2. Additional work involving metals in soil and groundwater will be based upon the site-specific clean-up levels to be developed for these contaminants. ~~will be dependent upon a pending transfer of the property to Weber County. The extent of contamination on this site (potential Weber County Waste Transfer Station) is minimal. Identified oil contamination (metals & hydrocarbon compounds) above screening levels is confined to the surface soils, with the exception of one lead detection. These contaminants are non-volatile, and if the contaminate areas are covered with concrete or isolated by other means, any exposure pathway may be eliminated; thus soil remediation may not be required.~~

4.30. AOI-37 - UNDERGROUND STORAGE TANK RELEASE

4.30.1. SITE DESCRIPTION

The soil and groundwater conditions have previously been investigated at this diesel release since 1990. The DERR facility ID for this is 1200255. The site is isolated from other contamination sources in Region 4 (Figure 1). Five m~~M~~onitoring wells were previously installed (Table 8-A), and three of the wells (RIV-MW-10, RIV-MW-11, RIV-MW-12) were abandoned when most of the contaminated soil was excavated in October 1992. Two of the original five wells, MW1 and MW2, remain and their logs are presented in Appendix B. Free-phase product does not exist. All reporting on site activities has been completed and submitted to the DERR LUST section. The DERR has requested that groundwater and soil conditions near the tank site be better defined before closure can be granted (DERR letter to USPCI dated May 19, 1997). Additional DERR requests were that (1) the work should include soil samples east of the excavation sidewall, where some diesel residuals remain, and (2) impacts to groundwater must be better defined northwest and west of the tank site.

The site was further investigated during the Phase 1 investigation by three geoprobe borings, 37-B1 through B3, and two monitor wells, 37-MW3 and MW4 (Figure 6). The two existing wells, MW1 and MW2, were also sampled. Each soil and water sample was analyzed for TPH-DRO, VOCs, and PAHs. VOCs were not on the proposed sampling protocol for this site but were added because of standard DERR LUST site assessment protocols.

4.30.2. RESULTS

From the soil samples collected, TPH-DRO concentrations were detected up to 3,000 mg/Kg~~exceeded the DERR 500 mg/kg screening level~~ in the intermediate and deep samples from the geoprobe borings around the perimeter of the former excavation (Table AOI-37 - Soil Results and Figure 6). However, none of the DRO exceeded the ~~RI~~ screening level concentration of 5,000 mg/kg (Utah Tier 1 Guideline for UST site). All other detected soil contaminant concentrations fell below industrial screening levels.

Dissolved TPH-DRO in groundwater samples from geoprobe boring 37-B1 and well MW1 exceeded the 10 mg/L screening level (Table AOI-37 - Water Results and Plate 5). All other analyte results remained below their screening level concentrations with the exception of 2-methylnaphthalene and bis(2-ethylhexyl)phthalate.. Samples from the outer wells, MW3 and MW4, contained no detectable analytes except for two PAHs.

4.30.3. CONCLUSIONS

Groundwater in the immediate area of the excavation remains impacted with DROs, 2-methylnaphthalene and bis(2-ethylhexyl)phthalate, although the phthalate detections maybe related to associated method blank contamination. ~~but~~ ~~o~~Other VOCs and PAHs of concern are below screening level concentrations. The absence of contaminants in MW3 and MW4 show that the extent of the groundwater plume is restricted to the area around the tank and that no receptors are threatened by the downgradient limits of the plume. The age of the release (greater than 10 years ago), the mitigation of the source, and the removal of most of the soil residuals suggest that the concentration gradient of the groundwater plume has stabilized or has begun to reduce. The low levels or absence of volatiles and soluble VOCs and PAHs in water samples collected close to the tank berth also reflect age-related dissipation of the dissolved constituents.

Any further effort should include a risk-based corrective action analysis of the site conditions with a goal of site closure under the DERR LUST program. Plans for further work at this site will be considered in the Phase 2 workplan.

4.31. SPRR3 LUST SITE

4.31.1. SITE DESCRIPTION

The LUST site is located in Region 1 just west of AOI-38 near the former main Southern Pacific railyard access road (Figure 1). UPRR removed a 1,000 gallon gasoline UST in June 1997. Observations and sampling during the UST closure confirmed that gasoline released from the tank or

dispenser piping had infiltrated through sandy gravel substrate to the water table. The tank had been out of service for more than 10 years.

The assessment of the site included four geoprobe borings (SPRR3-B1 through SPRR3- B4), and three monitor wells (SPRR3-MW1, -MW2, -MW3) (Plate 1). One geoprobe boring next to the former tank excavation, SPRR3-B1, was completed as a piezometer. Both soil and groundwater samples were analyzed for the gasoline range organic compounds TPH-GRO and VOCs.

4.31.2.RESULTS

Although the BTEX compounds were detected in several intermediate and deep soil samples, none exceeded the screening level concentrations. ~~The sample from except from MW3 exceeded t~~The GRO and DRO soil sample results are all less than the screening levels (Table SPRR3 - Soil Results). ~~and Figure 4). The 1,100 mg/kg GRO result does not exceed Utah's 1,500 mg/kg Tier 1 screening level.~~ No additional VOC analytes were detected above the soil screening levels.

The water sample results show benzene, vinyl chloride, and naphthalene above screening level concentrations in several water samples (Table SPRR3 - Water Results, Figure 5, and Plate 7). Benzene exceeds 0.005 mg/L in all water samples. TPH-GRO is detected but ~~does~~ remains below the 10 mg/L screening level. The concentration gradient indicates plume migration to the northwest, in the direction of the groundwater gradient (Plate 9). The source of the vinyl chloride in B4, upgradient of the LUST site, may be to the east within AOI-38. Chloroethene was exceeded in the water sample from SPRR-B4, and methylene chloride was exceeded in SPRR-B3.

About 0.2 feet of free-phase gasoline developed in the piezometer installed at SPRR3-B1 shortly after installation. This piezometer is set adjacent to the former tank excavation. Initially, the three monitor wells had no free-phase product, and water samples were collected as noted. About two months later, each well had accumulated gasoline product ranging from 0.1 to 0.25 feet in thickness (Plate 9). The product is thickest in the downgradient wells to the north and west.

4.31.3.CONCLUSIONS

The dissolved benzene, ~~and~~ free-product plume~~s~~, and hydrocarbon constituents in groundwater indicate that the LUST site requires further work under the LUST regulations. This site will be further investigated in the Phase 2 work.

4.32. SPRR5 LUST SITE

4.32.1. Site Description

The LUST site is located in Region 1 at the Southern Pacific Railroad B&B shop yard (bridges and buildings shop) at the corner of 21st Street and Pacific Avenue (Figure 1). UPRR removed this 850 gallon gasoline UST in June 1997 (LES, 1997d). Observations and sampling during the UST closure confirmed that gasoline released from the tank or dispenser piping, had infiltrated through sandy gravel substrate to the water table.

The assessment of the site included three geoprobe borings, SPRR5-B1 to -B3, and three monitor wells, SPRR5-MW1 to -MW3 (Plate 1). Both soil and groundwater samples were analyzed for gasoline range organic compounds (TPH-GRO and VOCs).

4.32.2. Results

Although gasoline-related compounds were detected in a number of the intermediate and deep soil samples from geoprobe borings and well borings, none exceeded the screening level concentrations ~~except for GRO in SPRR5-B2~~ (Table SPRR5 - Soil Results~~ and Figure 4~~). The highest GRO result (710 mg/kg)~~ GRO result~~ does not exceed Utah's 1,500 mg/kg Tier 1 screening level.

The water sample results show benzene, ethylbenzene, toluene, xylene, and TPH-GRO above screening levels in several water samples (Table SPRR5 - Water Results and Plate 7~~9~~). Benzene exceeds 0.0023~~5~~ mg/L in all geoprobe-boring water samples, but is below detection in the monitor well samples which are located at greater distances from the former UST site. Similarly, toluene and ethylbenzene are absent in the monitor well samples but are present in two of the three boring samples close to the UST site.

~~The traces~~Concentrations of 1,2-dichloroethene and vinyl chloride above the screening levels in water (MW-2 and MW-3) are degradation products of solvent, probably resulting from prior maintenance work at the B&B shop. Vinyl chloride concentrations are shown on Figure 8. TPH-GRO is also present above the 10 mg/L screening level in two~~one~~ boring samples (Plate 7).

4.32.3. Conclusions

The identified ~~benzene plume~~hydrocarbon contamination in the groundwater indicates that the LUST site requires further work under the LUST regulations. This site will be further investigated in the Phase 2 work.

4.33. ECOLOGY-BASED SOIL SAMPLES

4.33.1. DESCRIPTION

Six surface soil samples were collected in the wooded and riparian habitat area near the east bank of the Weber River. The sample locations are in areas that have not been significantly disturbed or altered by human activities for a decade or more. The sampled areas were chosen to be representative of the current state of natural conditions west of the railyard, where railroad operations are not known to have occurred.

4.33.2. RESULTS

The samples are numbered by region "R" and with an "ES" - e.g., R2-ES1. Each sample was analyzed for VOCs, PAHs, metals, and pesticides. No surface water samples were collected because standing water was not present in these areas during the sampling. See Table - "Ecology Samples" for results, and Plates 1 through 4 for locations.

All analytical results were below screening levels. Most of the organics were undetected or fell orders of magnitude below screening level concentrations. Traces of PAHs were detected in R1-ES1 and R2-ES1 which are respectively located next to the SPRR waste water treatment plant (AOI-34) and west of the UPRR maintenance area in AOI-30.

4.33.3. CONCLUSIONS

If additional ecological or habitat areas are identified to exist within the railyard, these locations will be sampled in Phase 2.

4.34. BACKGROUND SOIL SAMPLES

4.34.1. DESCRIPTION

Sixteen surface-soil background samples were collected throughout the railyard complex. The samples were collected from areas thought to represent the current conditions of the railyard soil and fill, where railroad operations are removed from known or suspected contaminant sources.

4.34.2. RESULTS

The samples are numbered by region "R" and with a "BG" or "SG" - e.g., R2-BG1 or R1-SG2. Each sample was analyzed for VOCs, PAHs, and metals. See Table - "Background Samples" for results, and Plates 1 through 4 for locations. (Note that samples R2-SG1 through R2-SG18 are not background samples, but are a part of the AOI assessments in Region 2, and the results are in the appropriate Tables for those AOIs.)

All analytes detected in the background samples were below screening levels except for benzo(a)pyrene in R1-SG2, lead in R1-S1, R2-BG2, R2-BG8, and all arsenic detections. ~~This s~~Sample R1-SG2 was collected along the eastern edge of AOI-22A, where previous petroleum impacts are known to have occurred (See AOI-22A discussion). The sample was part of a suite of grab samples along Pacific Avenue in Region 1 to test for lead and other metals that could possibly provide airborne contaminants in areas adjacent to the railyard. These samples include R1-SG1 -SG2, -SG3, -SG12,and -SG13. All detected lead concentrations from these samples were below the ~~1,000~~400 mg/kg screening level.

4.34.3. CONCLUSIONS

Additional background samples will be collected during Phase 2 to support the baseline risk assessment.

4.35. WEBER RIVER SURFACE WATER AND STREAM SEDIMENT SAMPLES

4.35.1. DESCRIPTION

Seventeen pairs of surface-water and stream-sediment samples were collected from the channel along the east bank of the Weber River (See Plates 1 through 4). Sample points on the river are interspersed along the entire length of the railyard. Most of the sediment samples consisted of fine to coarse sand or silty clay. They are identified with an R (region number) and either SW (surface water) or with S or SE (sediment) - e.g., R1-SW2 and R1-S2. These samples were analyzed for VOCs, PAHs, metals, and pesticides.

Also, three additional river water samples for vinyl chloride analysis were taken in AOI-34 and are identified as 34-SW1, -SW2, -SW3. At the mouth of tributary drainages flowing through the railyard, three samples were collected to define the conditions at the confluence of the drainage, as well as upgradient and downgradient of the confluence. The Table for the Weber River samples excludes the tributary-mouth sample results, which are included with the respective AOIs for each tributary.

4.35.2. RESULTS

None of the stream sediment sample results had values exceeding ~~either~~ the ~~industrial or the residential~~ screening levels (Table - Weber River Sediment Samples). A number of organics were detected but most were estimated concentrations below the quantitation limits. Although the organic compound detections are spread out throughout the sampled length of the Weber River, the majority of the detections are located in the river adjacent to the northern or downstream portions of the railyard in Regions 1 and 2.

The Weber River water sample results revealed no analytes above screening levels except for acetone, methylene chloride, 2,6-dinitrotoluene, 1,2-dibromo-3-chloropropane, and arsenic (Table - Weber River Water Samples). ~~All but one of the detectable organic compounds were below quantitation limits.~~ For the Weber River water samples, concentrations detected above screening levels are shown on Plate 7 (R1-SW1, R1-SW2), Plate 6 (R2-SW2, R2-SW8, R2-SW10), Plate 5 (R3-SW1, R5-SW1, R5-SW2), and Figure 4-A (R4-SW4, R4-SW6).

4.35.3. CONCLUSIONS

Additional surface water samples will be collected for the VOC contaminants that were detected above screening levels. Samples will be collected at up-stream and down-stream locations, as well as at the original sampling locations, to verify the Phase 1 exceedances. No additional sampling is recommended for arsenic.

4.36. OGDEN RIVER SURFACE WATER AND STREAM SEDIMENT SAMPLE

One stream sediment and surface water sample pair was collected from the Ogden River. The sampling location is shown on Plate 1 (R1-S7, R1-SW7).the samples were tested for metals, VOCs, SVOCs, pesticides and PCBs. Results of the detected concentrations are shown on the tables for Ogden River Sediment Sample and Ogden River Water Sample (tables section). None of the analytes were detected above screening level concentrations. No additional sampling of the Ogden River is planned.

4.37. 33RD STREET SLOUGH

4.37.1. DESCRIPTION

As the Phase 1 field program proceeded, another slough was discovered in Region 3 and sampled in March 1998 (Plate 3). Surface water is gathered in storm sewers in the city of Ogden east of the railyard and is then channeled under the railyard at 33rd Street. A subgrade culvert ends west of the tracks, and the water flow then flows in an open slough to the Weber River, a few hundred feet to the west. Water appeared to be flowing in the slough most of the time. West of the railyard, the slough passes through a non-railroad landfill in that area before emptying into the Weber River.

A single pair of sediment and surface water samples, R3-S6 and R3-SW6, was analyzed for VOCs, PAHs, metals, and pesticides. The samples were collected about 50 feet west of the mouth of the culvert.

4.37.2. RESULTS

There were no analytes exceeding the industrial action level from the sediment sample (Tables - 33rd Street Slough Soil Results~~ and Water Results~~). The sediment contained traces of several PAHs as J qualified values. There were no organic compounds detected in the water sample. Arsenic and barium were detected above screening levels (Tables - 33rd Street Slough Water Results) in the water sample (Plate 5).

4.37.3. CONCLUSIONS

the R3-SW6 water sample was collected at the point where the drainage exits from a culvert that runs beneath the tracks. This culvert extends from the sampling point to the eastern property boundary. Consequently, the metal exceedances detected in the groundwater sample originated from an upgradient, off-site, source. No additional work is recommended for this area unless site specific clean-up levels for arsenic and barium are established at concentrations less than the detected concentrations in this area.

5. SUMMARY AND CONCLUSSIONS

5.1. SUMMARY

Thirty-one~~Twenty-nine~~ AOIs and LUST sites were investigated under Phase 1 of the Ogden railyard RI. At each AOI, a combination of surface soil, subsurface soil, groundwater, and surface water samples were collected according to the sample testing protocols presented in Table 9 of the Phase 1 Workplan. These samples were then tested for a specific target suite of analytes, that were based upon the type of suspected contamination in each AOI.

The most prevalent contaminants detected in samples from the railyard AOIs were hydrocarbon related compounds related to spills, leaks, and UST sites. The hydrocarbon contamination includes dissolved constituents in the groundwater, free-phase product plumes, and vadose zone soil contamination. All of the detected PAHs in the railyard are believed to be related to hydrocarbon occurrences.

Groundwater at several locations in the railyard is significantly impacted by dissolved vinyl chloride. The Phase 1 investigation has delineated a plume of dissolved vinyl chloride in Region 2 (AOIs22b, 30, & 26), and in Region 1 (AOIs 34 & 22a).

Additional soil and groundwater contamination identified in the railyard consists of metals and halogenated VOCs. All detected concentrations of arsenic in the water samples area above the RBC screening level of 0.045 ug/L. PCBs were not detected in any of the site samples. Pesticides were only detected in one of the site samples, which was located near the granary in AOI 2.

5.2. CONCLUSIONS

Detected concentrations of contaminants in the AOI samples, were compared to the screening level concentrations for soil and water presented in Table 2 of this document. As a result of detected concentrations being below the screening levels for all detected contaminants, the following 3~~11~~ AOIs will not be subject to further investigation under phase 2 of the RI. Based on the comparisons with the screening level concentrations, the detected contaminant concentrations in these AOIs are believed to be below levels that would present a risk to human health and the environment.

- ~~AOI 1 Former SPRR diesel ASTs~~
- AOI 2 UPRR property adjacent to the off-site granary

- AOI 5 Railroad tie storage and handling area
- AOI 19 Former UPRR laundry
- ~~AOI 8 Refrigeration car maintenance area~~
- ~~AOI 9 Burch creek drainage~~
- ~~AOI 10 Un-named storm drain and slough~~
- ~~AOI 17 UPRR property adjacent to a surplus storage and salvage site~~
- ~~AOI 18 UPRR property adjacent to the Dyce Chemical facility~~
- ~~AOI 29 Strongs creek drainage~~
- ~~AOI 23 "Mucking" line area~~
- ~~AOI 32 Oil/water separator and LUST site, Region 3~~

In addition to the above list, the following AOIs are conditionally recommended for no~~will not be subject to~~ further investigation under the Phase 2 work, based upon the specific condition listed below for each AOI. ~~because it is being transfer to Weber County. Any additional work in this former AOI will conducted by the county under a voluntary action.~~

- ~~AOI 36 Former D&RGW roundhouse and salvage yard~~
- AOI 1 Former SPRR diesel ASTs - No additional work is needed if the regulatory agencies accept the application of UTAH Tier 1 screening levels for this AOI.
- AOI 8 Refrigeration car maintenance area - The only COC detected above screening level concentrations is arsenic in the soils at concentrations of 5.7 to 13 mg/Kg. The cleanup level for arsenic should be determined before any additional sampling is conducted, if warranted.
- AOI 9 Burch Creek drainage - The cleanup level for arsenic should be determined before any additional water sampling is conducted, if warranted. An off-site methylene chloride source may warrant investigation by the EPA.
- AOI 10 Unnamed storm drain and slough - The cleanup level for arsenic should be determined before any additional water sampling is conducted, if warranted.
- AOI 17 Surplus storage and salvage area - The only COC detected above screening level concentrations is arsenic in the soils at concentrations of 5.9 to 11 mg/Kg. The cleanup level for arsenic should be determined before any additional sampling is conducted, if warranted.
- AOI 23 "Mucking" line area - The cleanup level for arsenic and lead should be determined before any additional sampling is conducted, if warranted.
- AOI 29 Strongs Creek drainage - The cleanup level for arsenic should be determined before any additional water or soil sampling is conducted, if warranted.
- 33rd Street Slough An upgradient, off-site, source may warrant investigation by the EPA for the detected exceedances of arsenic and barium.

Further comparisons of the detected contaminant concentrations to the screening level concentrations, shows that one or more contaminants in either or both the soil and groundwater samples from the following 20~~17~~ AOIs, exceed the screening level(s).

- AOI 12 Oil/Water separator, Region 5
- AOI 13 Lust site in Rip Track area
- AOI 18 Dyce Chemical
- AOI 20 Former UPRR diesel ASTs
- AOI 21 UPRR property around Atlas Steel salvage yard
- AOI 22a Former SPRR roundhouse
- AOI 22b Former UPRR roundhouse
- AOI 26 Sludge reclamation area
- AOI 27 Ogden Pond Area
- AOI 28 Roundhouse drainage ditch
- AOI 30 Durbano Metals salvage yard
- AOI 32 Oil-Water separator and UST site
- AOI 33 21st Street pond
- AOI 34 Former SPRR waste water treatment plant
- AOI 35 Former D&RGW rip track area
- AOI 36 Former D&RGW roundhouse and salvage yard
- AOI 37 UST release
- AOI 38 Former SPRR machine shop
- SPRR3 UST release
- SPRR5 UST release

These AOIs are thus identified as the AOIs within the railyard that will be subject to a Phase 2 investigation. Under Phase 2 of the RI, the full extent of the identified contamination will be delineated in each AOI.

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Utah Department of Environmental Quality (UDEQ), 1994a, Analytical Results Report Ogden Union Railway Depot UT988075271; May 25, 1994, 16 p. + Append.

UDEQ Department of Environmental Response & Remediation (DERR), 1994b, Analytical Results Report Union Pacific Railroad Yard UTD988075339; April 19, 1994, 16 p. + Append.

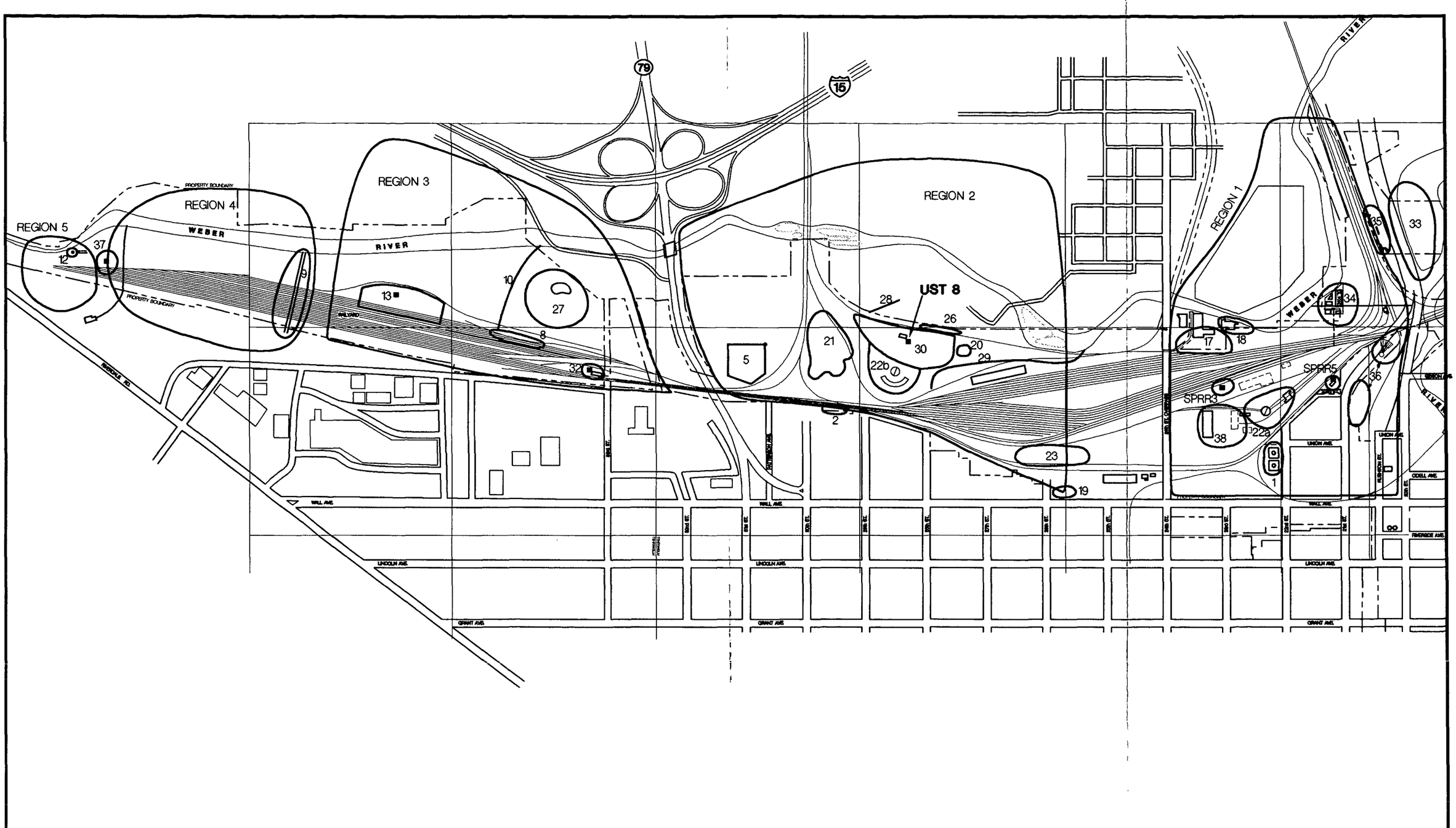
UDEQ, 1993, Preliminary Assessment Ogden Union Railway Depot Site, UTD988075271; February 17, 1993, 7 p. + Append.

UDEQ, 1992a, Analytical Results Report Southern Pacific Transport, Weber County Utah, UTD000716407, April 7, 1992, 22p. + Append.

UDEQ, 1992b, Preliminary Assessment, Union Pacific Railroad Yard, 1992.

URS, 1998, Analytical Results Report, Weber County Solid Waste Transfer Station, Ogden, Utah; URS Operating Systems, START, EPA Region VIII, March 2, 1998, 41 p. + Append.

FIGURES



LEGEND

(30) RI/FS AREA OF INTEREST

■ LUST LOCATIONS

North

0 1200

FEET

	BY	DATE
DRAWN	WRB	12/3/98
CHECKED		
APPROVED		
APPROVED		
APPROVED		

ENVIRONMENTAL DECISION GROUP, INC.

Innovative Services • Advanced Technology

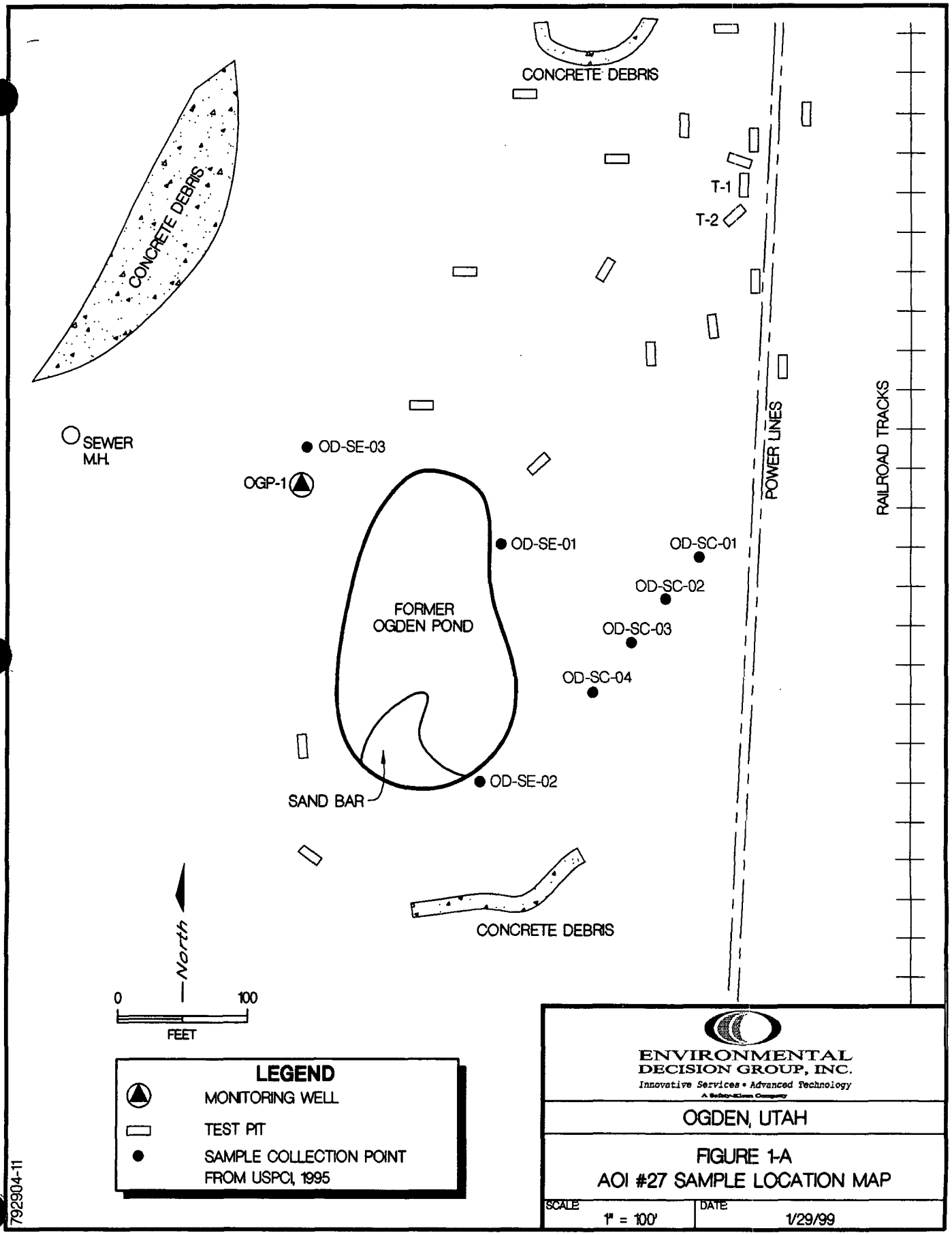
A Safety-Kleen Company

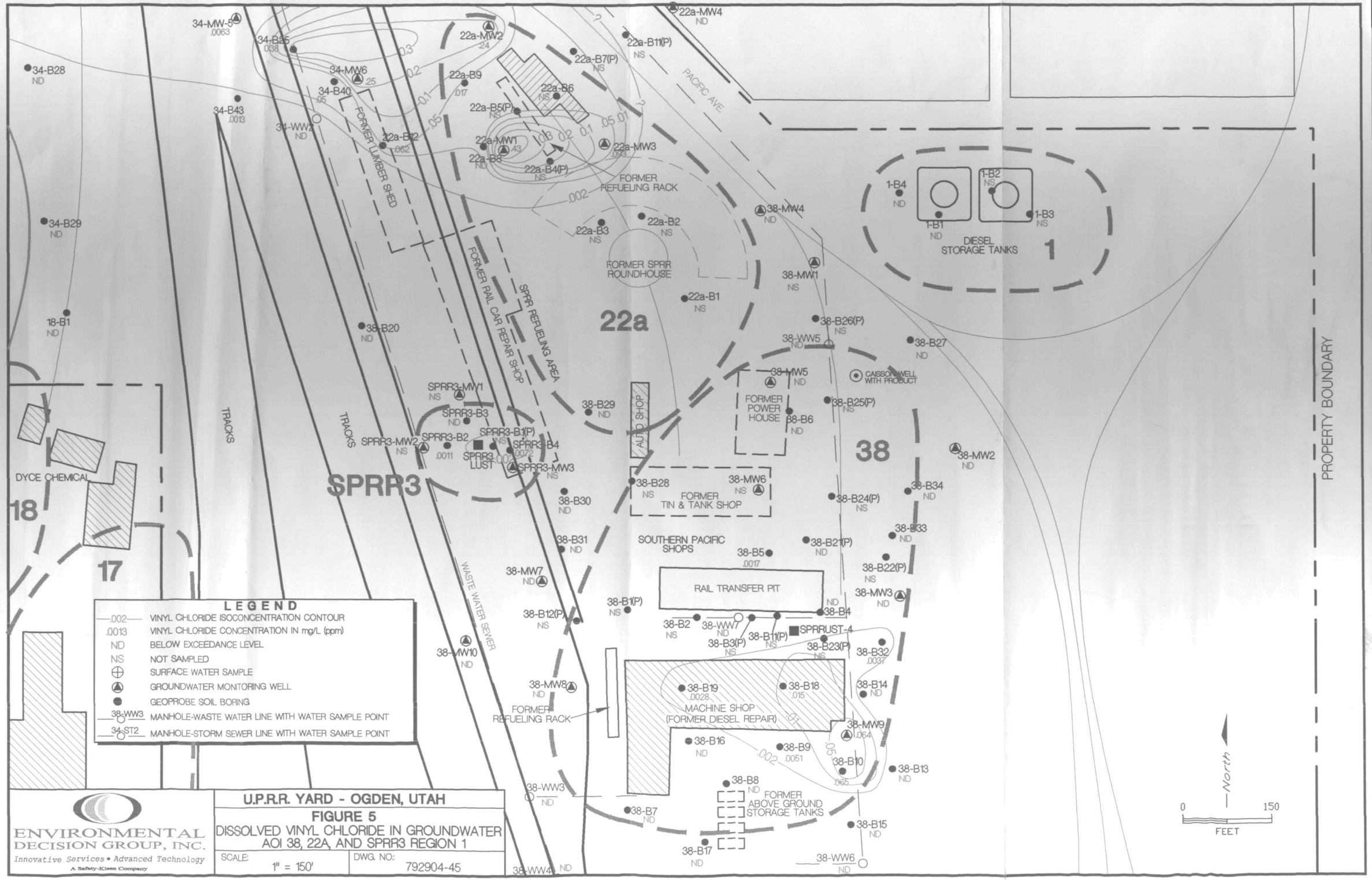
OGDEN RAILYARD - OGDEN, UTAH

FIGURE 1
AREA OF INTEREST LOCATIONS

SCALE: 1" = 1200'

DWG. NO: 792904-33


CONCRETE DEBRIS
CONCRETE DEBRIS
T-1
T-2
SEWER M.H.
OD-SE-03
OGP-1
OD-SE-01
OD-SC-01
OD-SC-02
OD-SC-03
OD-SC-04
FORMER OGDEN POND
OD-SE-02
SAND BAR
POWER LINES
RAILROAD TRACKS
CONCRETE DEBRIS
North
0
100
FEET
LEGEND
MONITORING WELL
TEST PIT
SAMPLE COLLECTION POINT FROM USPCI, 1995
ENVIRONMENTAL DECISION GROUP, INC.
Innovative Services • Advanced Technology
OGDEN, UTAH
FIGURE 1-A
AOI #27 SAMPLE LOCATION MAP
SCALE
1" = 100'
DATE
1/29/99
792904-11


34-MW-5
.0063
34-B35
.038
34-B28
ND
34-MW6
.25
34-B40
.95
34-B43
.0013
34-WW2
ND
22a-MW2
.24
22a-B9
.017
22a-B5(P)
NS
22a-B12
.062
22a-MW1
.43
22a-B8
ND
22a-B4(P)
NS
22a-B7(P)
NS
22a-B11(P)
NS
22a-B6
NS
22a-MW3
.033
22a-MW4
ND
PACIFIC AVE
FORMER LUMBER SHED
FORMER REFUELING RACK
22a-B3
NS
22a-B2
NS
FORMER SPRR ROUNDHOUSE
22a-B1
NS
22a
34-B29
ND
18-B1
ND
38-B20
ND
FORMER RAIL CAR REPAIR SHOP
SPRR REFUELING AREA
38-MW4
ND
38-MW1
NS
1-B4
ND
1-B2
NS
1-B1
ND
1-B3
NS
DIESEL STORAGE TANKS
1
38-B26(P)
NS
38-WW5
ND
38-B27
ND
38-MW5
ND
CAISSON WELL WITH PRODUCT
FORMER POWER HOUSE
38-B6
ND
38-B25(P)
NS
38
38-MW2
ND
SPRR3-MW1
NS
SPRR3-B3
ND
38-B29
ND
AUTO SHOP
TRACKS
TRACKS
SPRR3-MW2
NS
SPRR3-B2
.0011
SPRR3-B1(P)
NS
SPRR3-B4
.0072
SPRR3 LUST
SPRR3-MW3
NS
SPRR3
38-B28
NS
38-MW6
NS
FORMER TIN & TANK SHOP
38-B24(P)
NS
38-B34
ND
38-B33
ND
38-B30
ND
38-B31
ND
SOUTHERN PACIFIC SHOPS
38-B5
.0017
38-B21(P)
ND
38-B22(P)
NS
38-MW3
ND
DYCE CHEMICAL
18
17
38-MW7
ND
RAIL TRANSFER PIT
38-B1(P)
NS
38-B12(P)
NS
38-B4
ND
38-B2
NS
38-WW7
ND
38-B3(P)
NS
38-B11(P)
NS
SPRRUST-4
38-B23(P)
NS
38-B32
.0037
WASTE WATER SEWER
38-MW10
ND
38-MW8
ND
38-B19
.0028
38-B18
.015
38-B14
ND
MACHINE SHOP (FORMER DIESEL REPAIR)
FORMER REFUELING RACK
38-MW9
.064
38-B16
ND
38-B9
.0051
38-B10
.065
38-B13
ND
38-WW3
ND
38-B8
ND
FORMER ABOVE GROUND STORAGE TANKS
38-B7
ND
38-B15
ND
38-B17
ND
38-WW6
ND
38-WW4
ND
PROPERTY BOUNDARY
North
0
150
FEET
LEGEND
.002 VINYL CHLORIDE ISOCONCENTRATION CONTOUR
.0013 VINYL CHLORIDE CONCENTRATION IN mg/L (ppm)
ND BELOW EXCEEDANCE LEVEL
NS NOT SAMPLED
SURFACE WATER SAMPLE
GROUNDWATER MONITORING WELL
GEOPROBE SOIL BORING
38-WW3 MANHOLE-WASTE WATER LINE WITH WATER SAMPLE POINT
34-ST2 MANHOLE-STORM SEWER LINE WITH WATER SAMPLE POINT
ENVIRONMENTAL DECISION GROUP, INC.
Innovative Services • Advanced Technology
A Safety-Kleen Company
U.P.R.R. YARD - OGDEN, UTAH
FIGURE 5
DISSOLVED VINYL CHLORIDE IN GROUNDWATER
AOI 38, 22A, AND SPRR3 REGION 1
SCALE: 1" = 150'
DWG. NO: 792904-45

Color Map(s)

The following pages contain color that does not appear in the scanned images.

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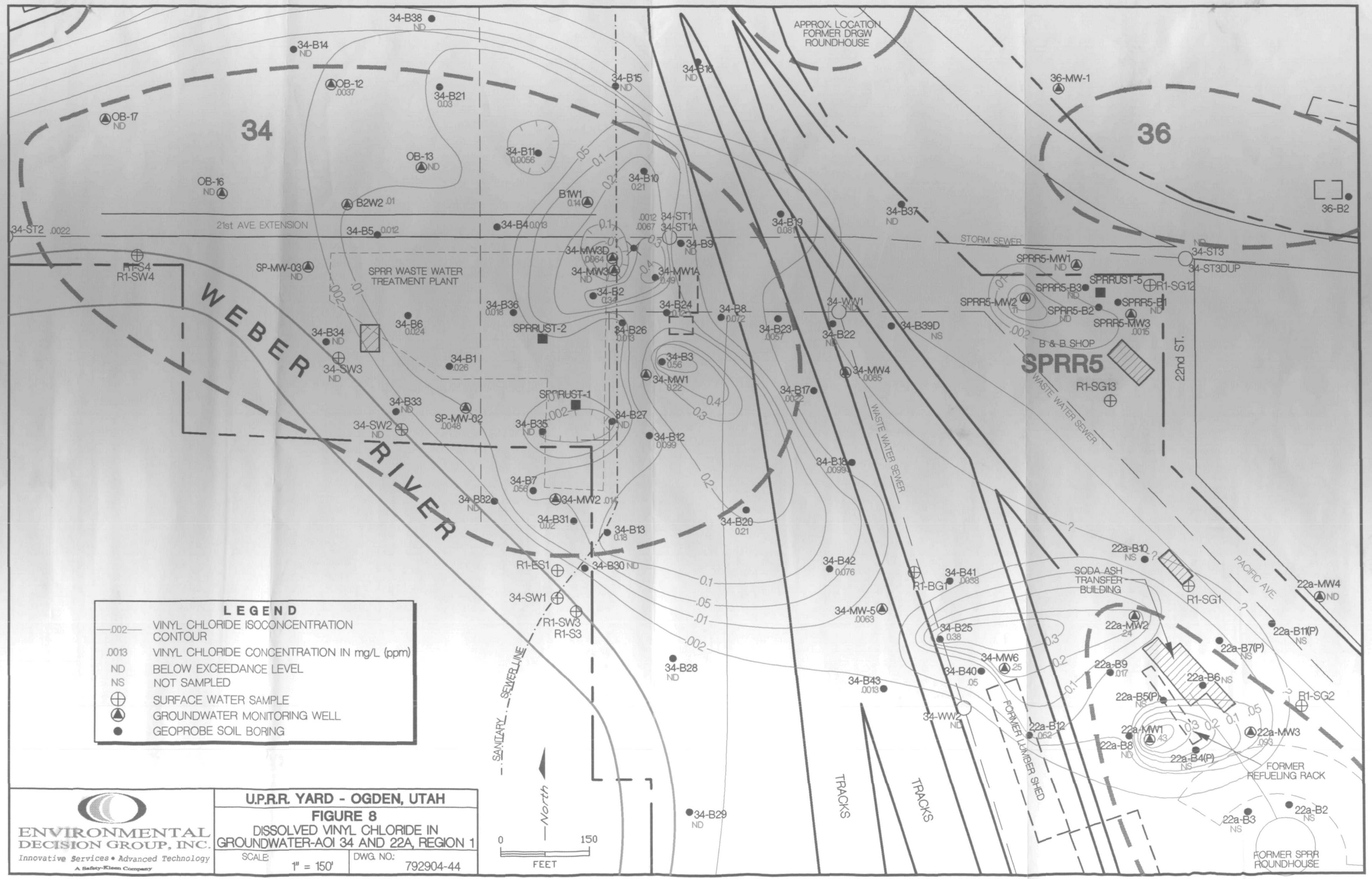

LEGEND

—.002—	VINYL CHLORIDE ISOCONCENTRATION CONTOUR
.0013	VINYL CHLORIDE CONCENTRATION IN mg/L (ppm)
ND	BELOW EXCEEDANCE LEVEL
NS	NOT SAMPLED
⊕	SURFACE WATER SAMPLE
▲	GROUNDWATER MONITORING WELL
●	GEOPROBE SOIL BORING

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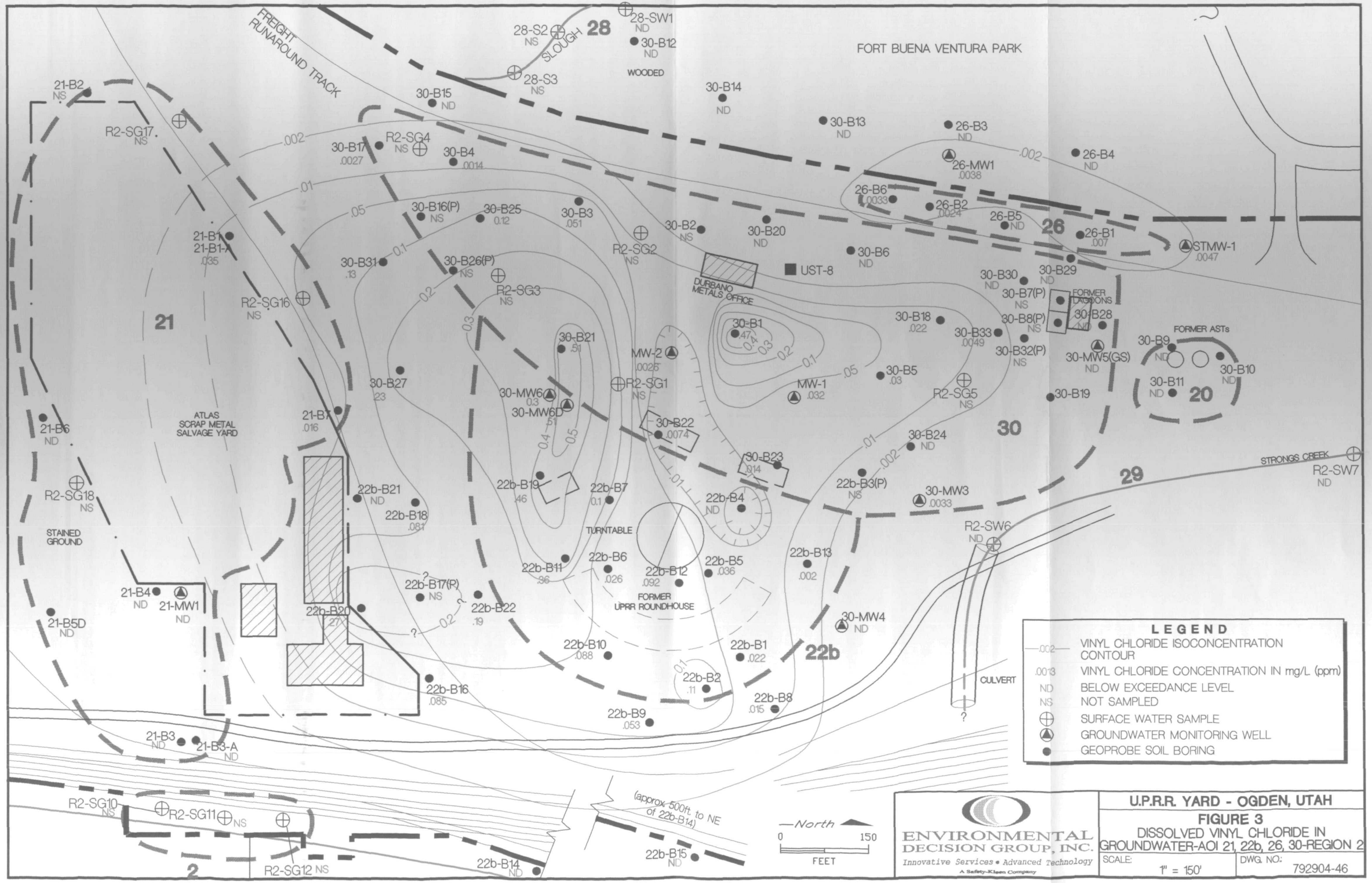
U.P.R.R. YARD - OGDEN, UTAH

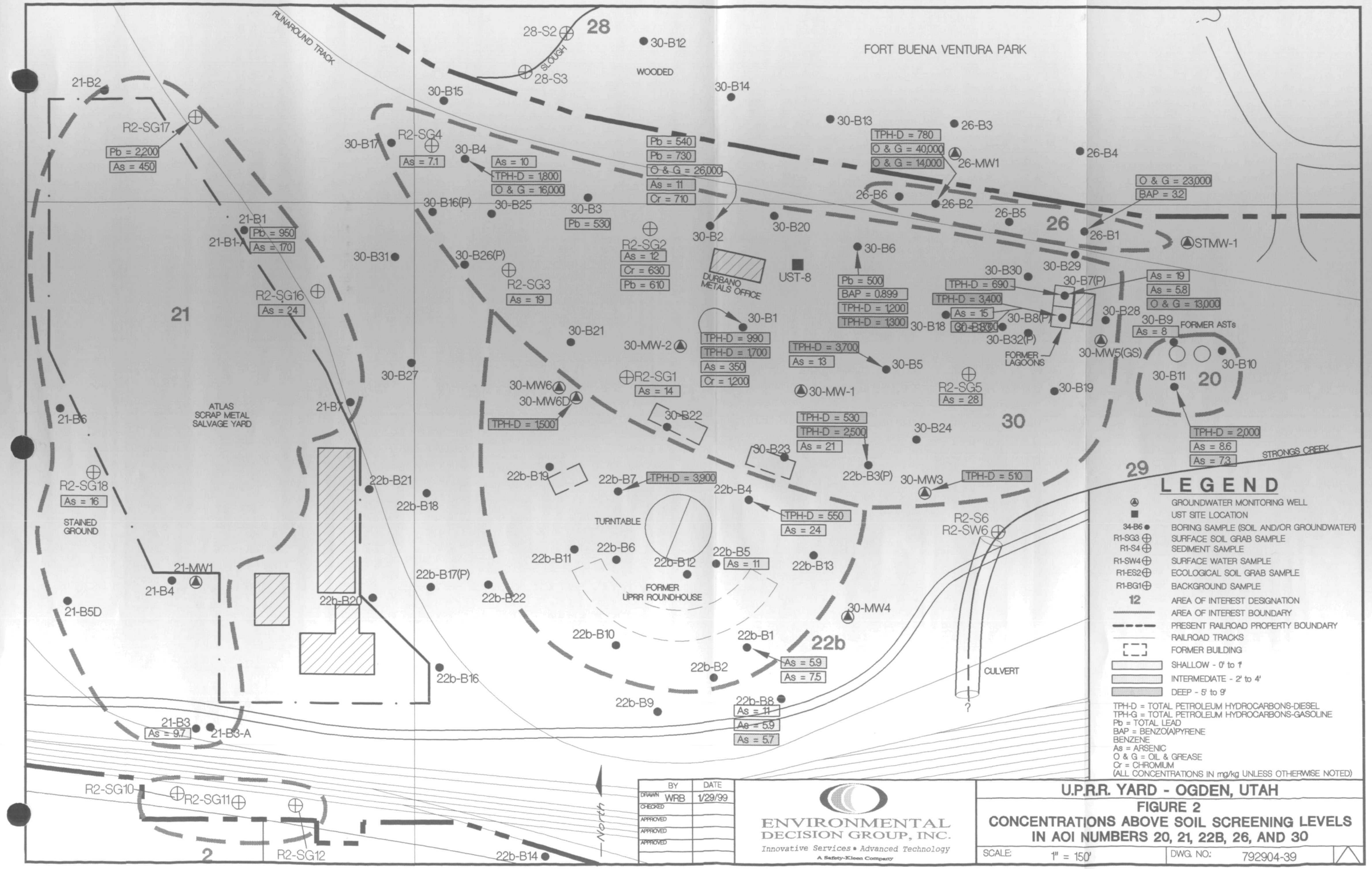
FIGURE 8

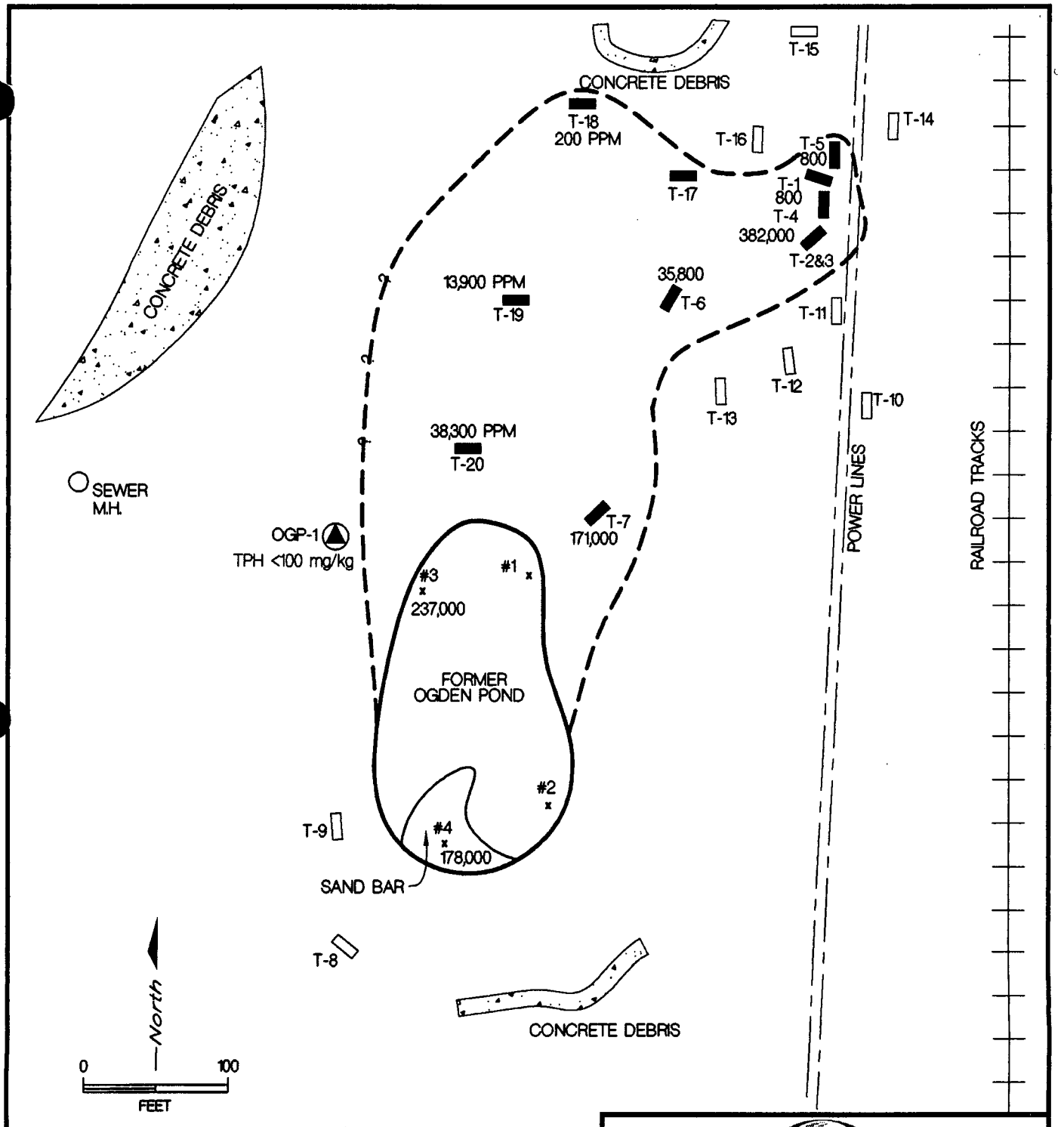
DISSOLVED VINYL CHLORIDE IN GROUNDWATER-AOI 34 AND 22A, REGION 1

SCALE: 1" = 150'

DWG. NO: 792904-44


FREIGHT RUNAROUND TRACK
SLOUGH
28
28-S2 NS
28-SW1 ND
30-B12 ND
WOODED
28-S3 NS
FORT BUENA VENTURA PARK
21-B2 NS
R2-SG17 NS
30-B15 ND
30-B14 ND
30-B13 ND
26-B3 ND
26-MW1 .0038
26-B4 ND
30-B17 .0027
R2-SG4 NS
30-B4 .0014
26-B6 .0033
26-B2 .0024
26-B5 ND
26
26-B1 .007
STMW-1 .0047
30-B16(P) NS
30-B25 0.12
30-B3 .051
30-B2 NS
30-B20 ND
30-B6 ND
21-B1 21-B1-A .035
30-B31 .13
30-B26(P) NS
R2-SG2 NS
UST-8
DURBANO METALS OFFICE
30-B30 ND
30-B29 ND
30-B7(P) NS
FORMER LAGOONS
30-B8(P) NS
30-B28 ND
R2-SG16 NS
R2-SG3 NS
21
30-B1 .47
30-B18 .022
30-B33 .0049
30-B32(P) NS
FORMER ASTs
30-B9 ND
30-MW5(GS) ND
30-B10 ND
30-B21 .51
MW-2 .0025
30-B5 .03
MW-1 .032
30-B11 ND
20
30-B27 .23
R2-SG1 NS
R2-SG5 NS
30-B19
30-MW6 0.3
30-MW6D .51
21-B7 .016
ATLAS SCRAP METAL SALVAGE YARD
30-B22 .0074
30-B24 ND
30
21-B6 ND
30-B23 .014
STRONGS CREEK
R2-SW7 ND
29
22b-B19 .46
22b-B7 0.1
22b-B4 ND
22b-B3(P) NS
30-MW3 .0033
R2-SG18 NS
22b-B21 ND
22b-B18 .061
STAINED GROUND
TURNTABLE
R2-SW6 ND
22b-B11 .96
22b-B6 .026
22b-B12 .092
22b-B5 .036
22b-B13 .002
21-B4 ND
21-MW1 ND
22b-B17(P) NS
22b-B22 .19
FORMER UPRR ROUNDHOUSE
30-MW4 ND
21-B5D ND
22b-B20 .27
22b-B10 .088
22b-B1 .022
22b
22b-B2 .11
CULVERT
22b-B16 .085
22b-B8 .015
22b-B9 .053
21-B3 ND
21-B3-A ND
R2-SG10 NS
R2-SG11 NS
(approx. 500ft. to NE of 22b-B14)
North
0 150
FEET
2
R2-SG12 NS
22b-B14 ND
22b-B15 ND
LEGEND
.002 VINYL CHLORIDE ISOCONCENTRATION CONTOUR
.0013 VINYL CHLORIDE CONCENTRATION IN mg/L (ppm)
ND BELOW EXCEEDANCE LEVEL
NS NOT SAMPLED
SURFACE WATER SAMPLE
GROUNDWATER MONITORING WELL
GEOPROBE SOIL BORING
ENVIRONMENTAL DECISION GROUP, INC.
Innovative Services • Advanced Technology
A Safety-Kleen Company
U.P.R.R. YARD - OGDEN, UTAH
FIGURE 3
DISSOLVED VINYL CHLORIDE IN GROUNDWATER-AOI 21, 22b, 26, 30-REGION 2
SCALE: 1" = 150'
DWG. NO: 792904-46


FORT BUENA VENTURA PARK
RUNAROUND TRACK
SLOUGH
WOODED
28
26
21
20
30
29
22b
2
ATLAS SCRAP METAL SALVAGE YARD
STAINED GROUND
TURNTABLE
FORMER UPRR ROUNDHOUSE
DURBANO METALS OFFICE
UST-8
FORMER LAGOONS
FORMER ASTs
STRONGS CREEK
CULVERT
North
28-S2
28-S3
30-B12
30-B15
30-B14
30-B13
26-B3
26-B4
26-B6
26-B2
26-B5
26-B1
STMW-1
21-B2
R2-SG17
Pb = 2,200
As = 450
30-B17
R2-SG4
As = 7.1
30-B4
As = 10
TPH-D = 1,800
O & G = 16,000
Pb = 540
Pb = 730
O & G = 26,000
As = 11
Cr = 710
TPH-D = 780
O & G = 40,000
O & G = 14,000
26-MW1
O & G = 23,000
BAP = 3.2
30-B16(P)
30-B25
30-B3
Pb = 530
30-B2
30-B20
21-B1
Pb = 950
21-B1-A
As = 170
30-B31
30-B26(P)
R2-SG2
As = 12
Cr = 630
Pb = 610
R2-SG3
As = 19
30-B6
Pb = 500
BAP = 0.899
TPH-D = 1,200
TPH-D = 1,300
30-B30
30-B29
30-B7(P)
TPH-D = 690
TPH-D = 3,400
As = 15
30-B18
30-B8(P)
30-B32(P)
30-B28
As = 19
As = 5.8
O & G = 13,000
30-B9
As = 8
30-B10
30-B11
R2-SG16
As = 24
30-B1
TPH-D = 990
TPH-D = 1,700
As = 350
Cr = 1,200
30-B21
30-MW-2
30-B27
30-MW6
30-MW6D
TPH-D = 1,500
R2-SG1
As = 14
30-B22
TPH-D = 3,700
As = 13
30-B5
30-MW-1
R2-SG5
As = 28
30-MW5(GS)
30-B19
21-B7
21-B6
TPH-D = 530
TPH-D = 2,500
As = 21
30-B24
TPH-D = 2,000
As = 8.6
As = 7.3
30-B23
22b-B3(P)
30-MW3
TPH-D = 510
R2-SG18
As = 16
22b-B21
22b-B18
22b-B19
22b-B7
TPH-D = 3,900
22b-B4
TPH-D = 550
As = 24
R2-S6
R2-SW6
22b-B11
22b-B6
22b-B12
22b-B5
As = 11
22b-B13
22b-B17(P)
22b-B22
22b-B20
21-MW1
21-B4
21-B5D
30-MW4
22b-B10
22b-B1
As = 5.9
As = 7.5
22b-B2
22b-B16
22b-B9
22b-B8
As = 11
As = 5.9
As = 5.7
21-B3
As = 9.7
21-B3-A
R2-SG10
R2-SG11
R2-SG12
22b-B14
LEGEND
GROUNDWATER MONITORING WELL
UST SITE LOCATION
34-B6 BORING SAMPLE (SOIL AND/OR GROUNDWATER)
R1-SG3 SURFACE SOIL GRAB SAMPLE
R1-S4 SEDIMENT SAMPLE
R1-SW4 SURFACE WATER SAMPLE
R1-ES2 ECOLOGICAL SOIL GRAB SAMPLE
R1-BG1 BACKGROUND SAMPLE
12 AREA OF INTEREST DESIGNATION
AREA OF INTEREST BOUNDARY
PRESENT RAILROAD PROPERTY BOUNDARY
RAILROAD TRACKS
FORMER BUILDING
SHALLOW - 0' to 1'
INTERMEDIATE - 2' to 4'
DEEP - 5' to 9'
TPH-D = TOTAL PETROLEUM HYDROCARBONS-DIESEL
TPH-G = TOTAL PETROLEUM HYDROCARBONS-GASOLINE
Pb = TOTAL LEAD
BAP = BENZO(A)PYRENE
BENZENE
As = ARSENIC
O & G = OIL & GREASE
Cr = CHROMIUM
(ALL CONCENTRATIONS IN mg/kg UNLESS OTHERWISE NOTED)
BY DATE
DRAWN WRB 1/29/99
CHECKED
APPROVED
APPROVED
APPROVED
ENVIRONMENTAL DECISION GROUP, INC.
Innovative Services • Advanced Technology
A Safety-Kleen Company
U.P.R.R. YARD - OGDEN, UTAH
FIGURE 2
CONCENTRATIONS ABOVE SOIL SCREENING LEVELS IN AOI NUMBERS 20, 21, 22B, 26, AND 30
SCALE: 1" = 150'
DWG. NO: 792904-39



LEGEND

- MONITORING WELL
- TEST PIT WITH TPH <100 mg/kg
- TEST PIT SHOWING HYDROCARBONS
- APPROXIMATE EXTENT OF CONTAMINATION FROM USPCI, 1995

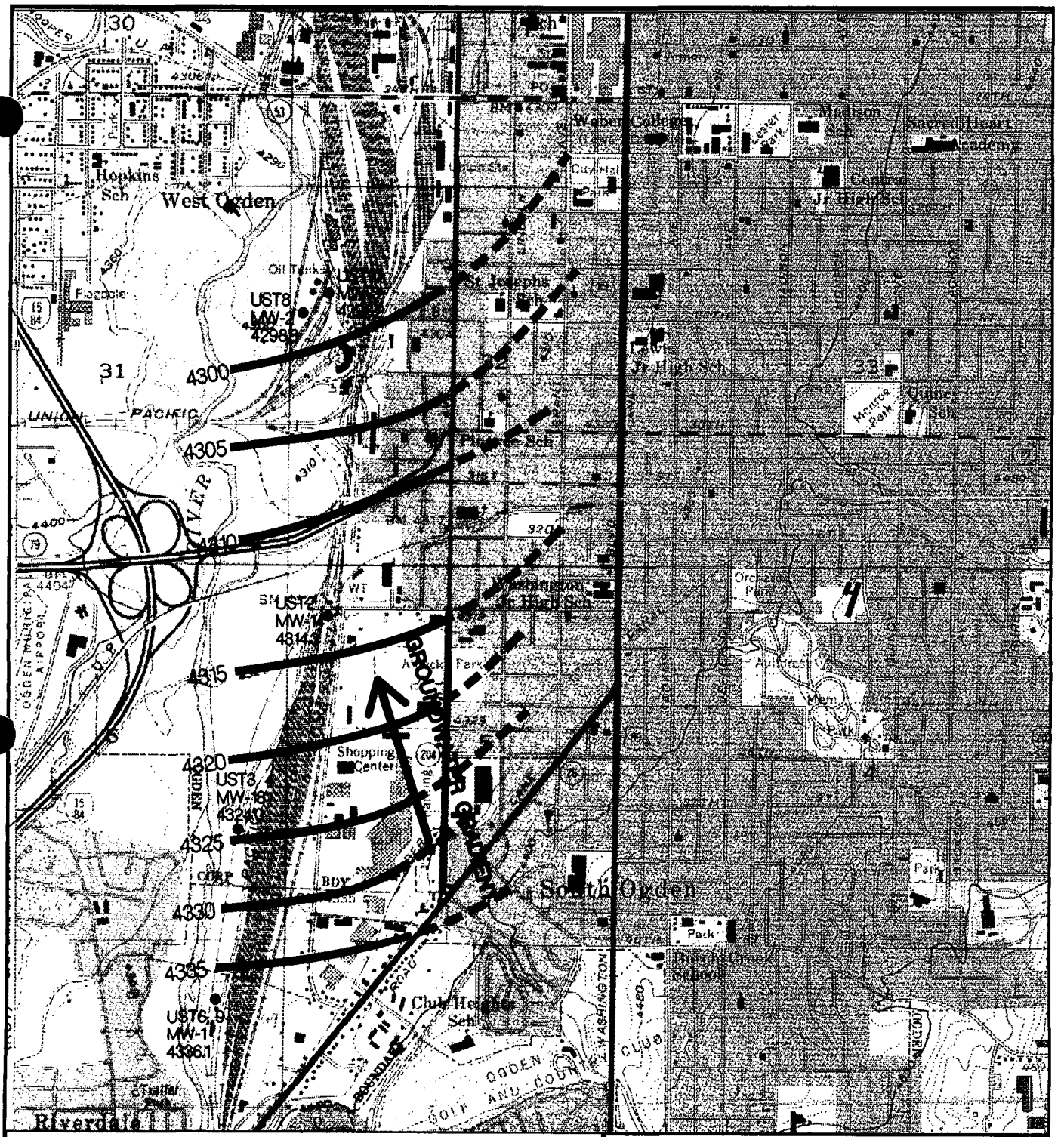
ENVIRONMENTAL DECISION GROUP, INC.
Innovative Services • Advanced Technology

OGDEN, UTAH

FIGURE 2-A
AOI #27 HYDROCARBON EXTENT MAP

SCALE	DATE
1" = 100'	1/29/99

792904-12



LEGEND

North

● APPROXIMATE LOCATION OF WATER WELL

■4310■ GROUNDWATER ELEVATION CONTOUR

0 2000

FEET

ENVIRONMENTAL DECISION GROUP, INC.

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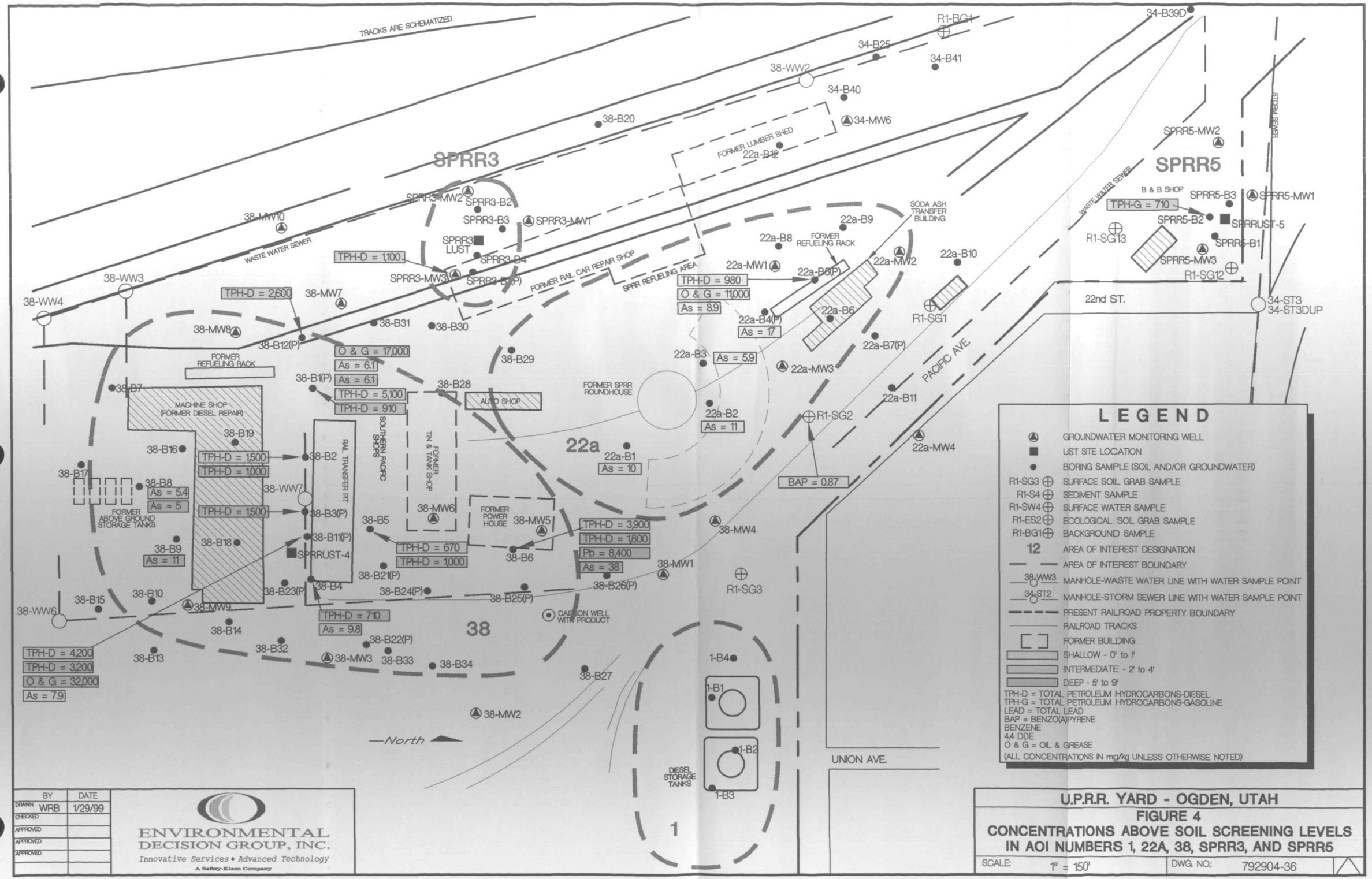
UPRR RAILYARD - OGDEN, UTAH

FIGURE 3-A

POTENTIOMETRIC GRADIENT MAP

LUST MONITOR WELLS - 11/6/90 DATA

SCALE	DATE
1" = 2000'	1/29/99



BY	DATE
DRAWN WRB	1/29/99
CHECKED	
APPROVED	
APPROVED	
APPROVED	

ENVIRONMENTAL DECISION GROUP, INC.
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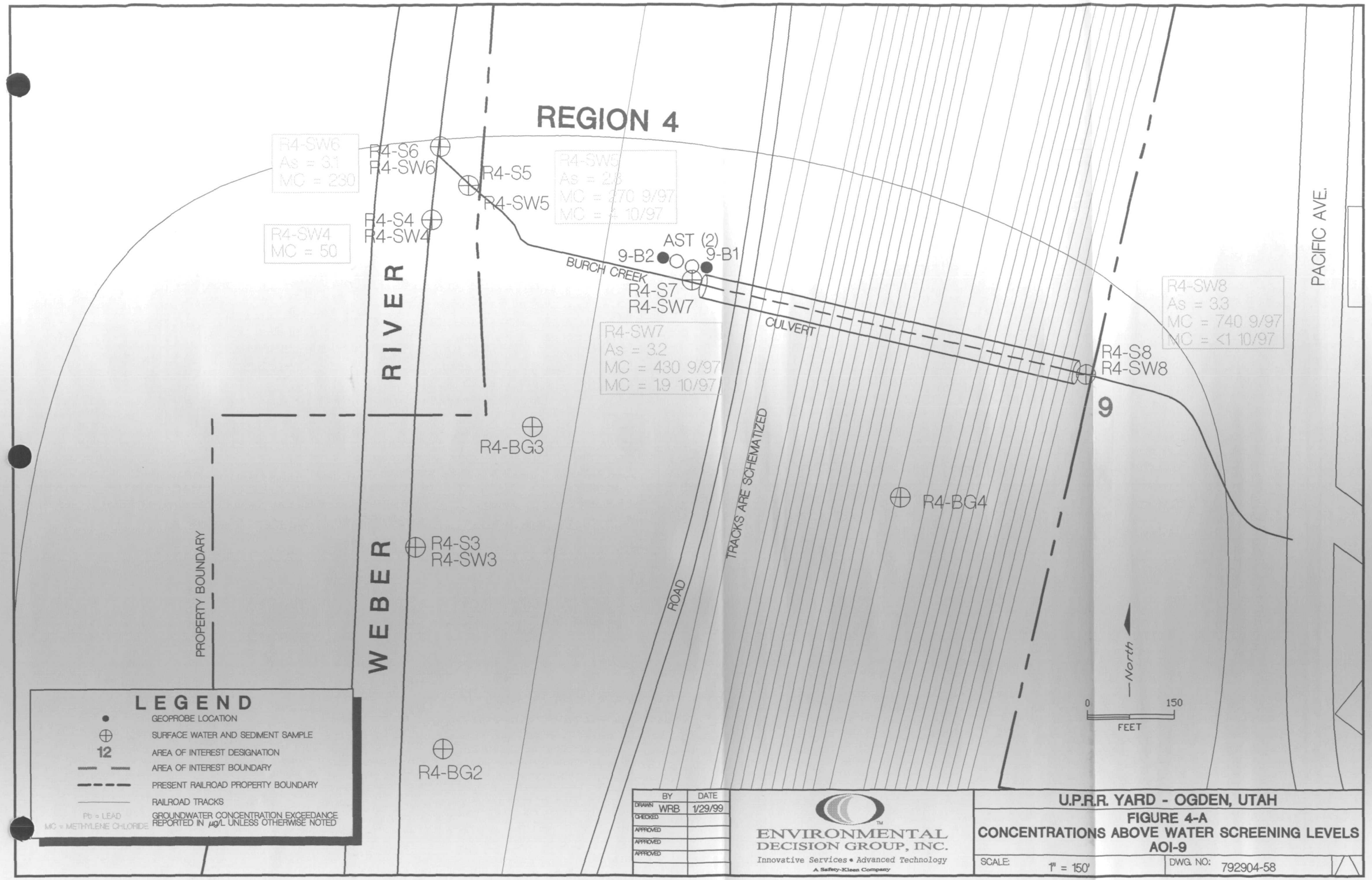
U.P.R.R. YARD - OGDEN, UTAH

FIGURE 4

CONCENTRATIONS ABOVE SOIL SCREENING LEVELS IN AOI NUMBERS 1, 22A, 38, SPRR3, AND SPRR5

SCALE: 1" = 150' | DWG. NO.: 792904-36



	BY	DATE
DRAWN	WRB	1/29/99
CHECKED		
APPROVED		
APPROVED		
APPROVED		

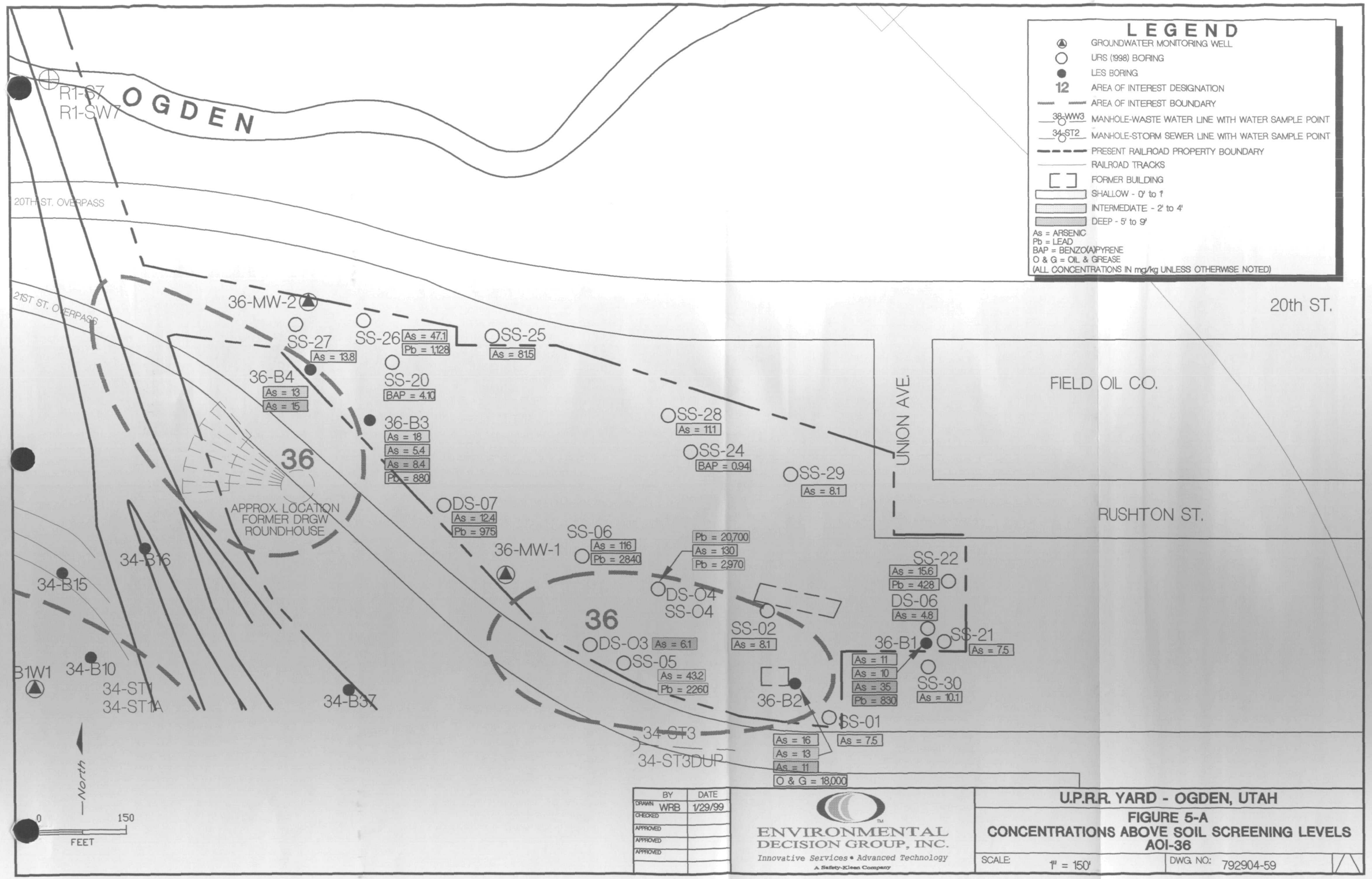
ENVIRONMENTAL DECISION GROUP, INC.
Innovative Services • Advanced Technology
A Safety-Kleen Company

U.P.R.R. YARD - OGDEN, UTAH

FIGURE 4-A
CONCENTRATIONS ABOVE WATER SCREENING LEVELS
AOI-9

SCALE: 1" = 150'

DWG. NO: 792904-58



	BY	DATE
DRAWN	WRB	1/29/99
CHECKED		
APPROVED		
APPROVED		
APPROVED		

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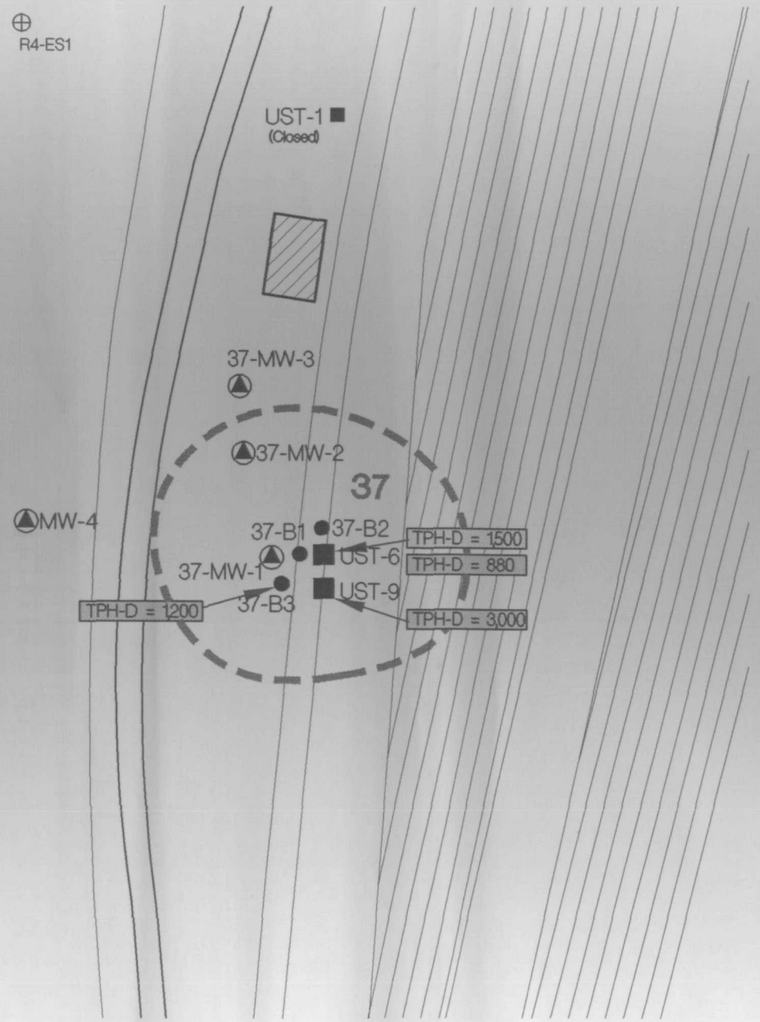
A Safety-Kleen Company

U.P.R.R. YARD - OGDEN, UTAH

FIGURE 5-A
CONCENTRATIONS ABOVE SOIL SCREENING LEVELS
AOI-36

SCALE: 1" = 150'

DWG. NO: 792904-59

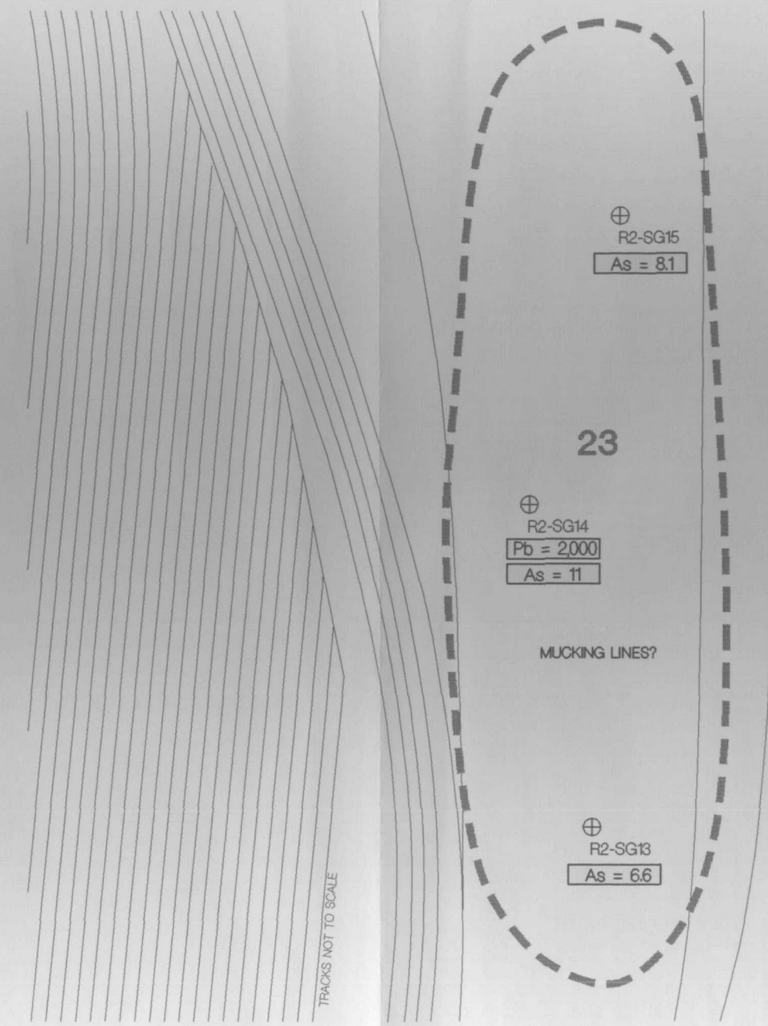


AREA OF INTEREST #37
SOUTH YARD AREA

LEGEND

▲	GROUNDWATER MONITORING WELL
■	UST SITE LOCATION
34-B6 ●	BORING SAMPLE (SOIL AND/OR GROUNDWATER)
R1-SG3 ⊕	SURFACE SOIL GRAB SAMPLE
R1-S4 ⊕	SEDIMENT SAMPLE
R1-SW4 ⊕	SURFACE WATER SAMPLE
R1-ES2 ⊕	ECOLOGICAL SOIL GRAB SAMPLE
R1-BG1 ⊕	BACKGROUND SAMPLE
12	AREA OF INTEREST DESIGNATION
— —	AREA OF INTEREST BOUNDARY
— — —	PRESENT RAILROAD PROPERTY BOUNDARY
—	RAILROAD TRACKS
[ ]	FORMER BUILDING
	SHALLOW - 0' to 1'
	INTERMEDIATE - 2' to 4'
	DEEP - 5' to 9'

TPH-D = TOTAL PETROLEUM HYDROCARBONS-DIESEL
TPH-G = TOTAL PETROLEUM HYDROCARBONS-GASOLINE
Pb = TOTAL LEAD
As = ARSENIC
(ALL CONCENTRATIONS IN mg/kg UNLESS OTHERWISE NOTED)



AREA OF INTEREST #23
NORTH CENTRAL YARD AREA

North

	BY	DATE
DRAWN	WRB	1/29/99
CHECKED		
APPROVED		
APPROVED		
APPROVED		

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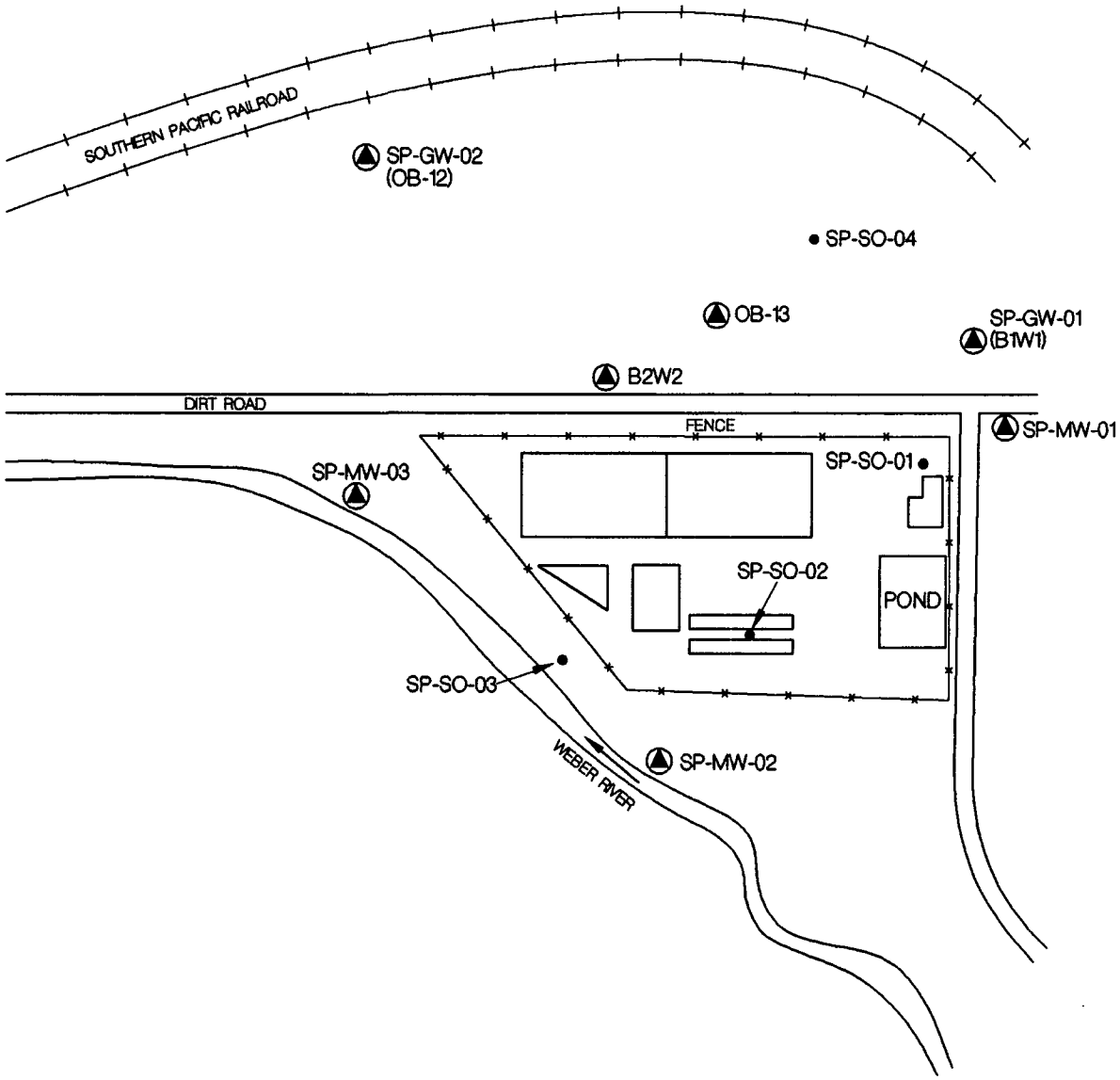
Innovative Services • Advanced Technology
A Safety-Kleen Company

U.P.R.R. YARD - OGDEN, UTAH

FIGURE 6
CONCENTRATIONS ABOVE SOIL SCREENING LEVELS IN AOI NUMBERS 23 AND 37

SCALE: 1" = 150'

DWG. NO: 792904-38



ADAPTED FROM UDEQ, 1992a

LEGEND

- MONITORING WELL
- SAMPLE LOCATION

North

ENVIRONMENTAL DECISION GROUP, INC.
Innovative Services • Advanced Technology
A Safety-Kleen Company

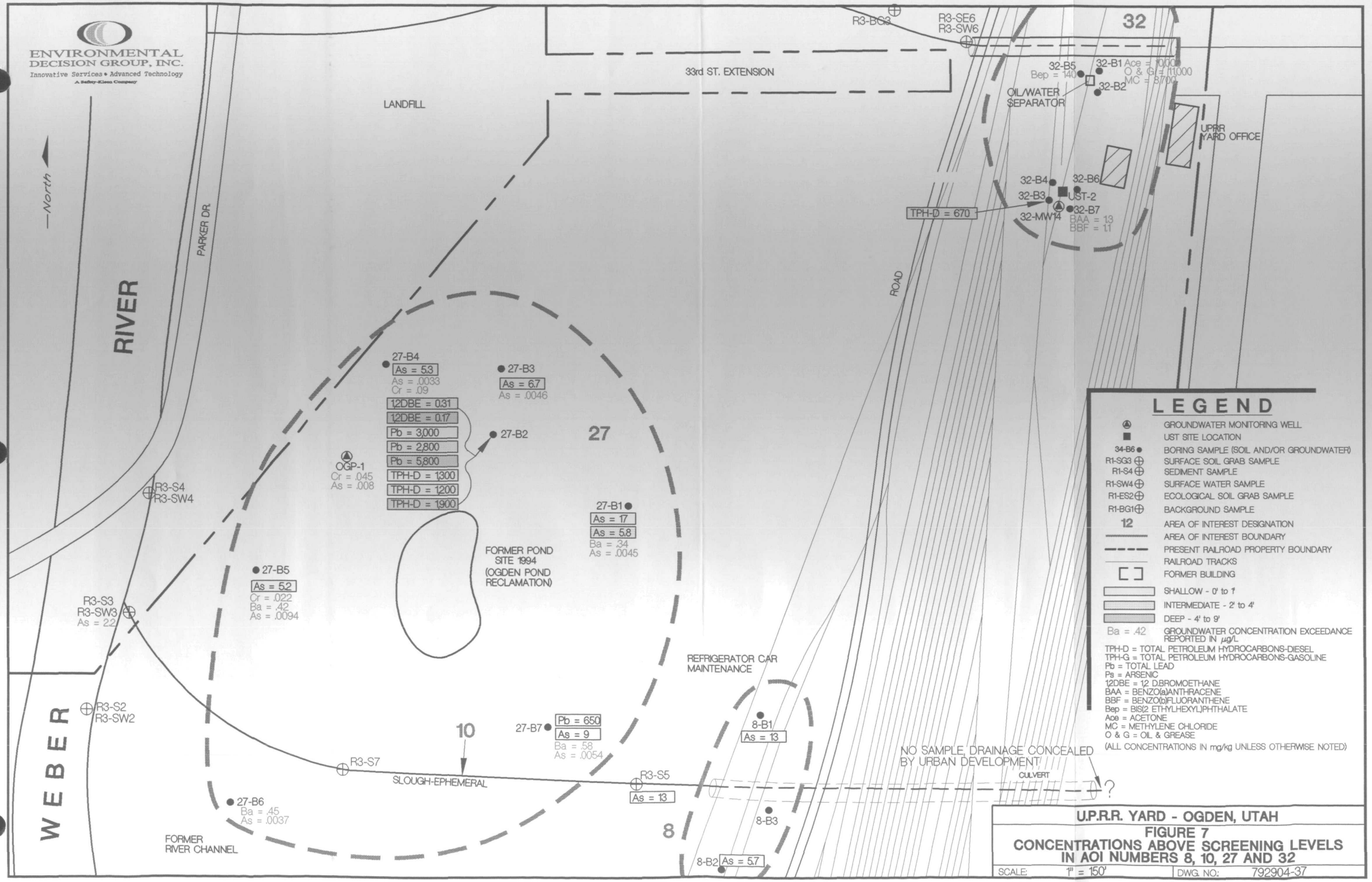
OGDEN, UTAH

FIGURE 6-A
SPT TREATMENT FACILITY - AOI #34
SAMPLE LOCATIONS MAP

SCALE:	DATE:
NTS	1/29/99

792904-13

ENVIRONMENTAL DECISION GROUP, INC.
Innovative Services • Advanced Technology
A Safety-Kleen Company



U.P.R.R. YARD - OGDEN, UTAH

FIGURE 7
CONCENTRATIONS ABOVE SCREENING LEVELS IN AOI NUMBERS 8, 10, 27 AND 32

SCALE: 1" = 150' | DWG. NO: 792904-37

TARGET SHEET

EPA REGION VIII

SUPERFUND DOCUMENT MANAGEMENT SYSTEM

DOCUMENT NUMBER: 2010001

SITE NAME: OGDEN RAILROAD YARD

DOCUMENT DATE: 01/28/1999

DOCUMENT NOT SCANNED

Due to one of the following reasons:

- ☐ PHOTOGRAPHS
- ☐ 3-DIMENSIONAL
- ☐ OVERSIZED
- ☐ AUDIO/VISUAL
- ☐ PERMANENTLY BOUND DOCUMENTS
- ☐ POOR LEGIBILITY
- ☐ OTHER
- ☐ NOT AVAILABLE
- ☑ TYPES OF DOCUMENTS NOT TO BE SCANNED
  (Data Packages, Data Validation, Sampling Data, CBI, Chain of Custody)

DOCUMENT DESCRIPTION:

TABLES (See Table of Contents)

Contact the Superfund Records Center to view available document.
(303) 312-6473

TARGET SHEET

EPA REGION VIII

SUPERFUND DOCUMENT MANAGEMENT SYSTEM

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- ☐ NOT AVAILABLE
- ☐ TYPES OF DOCUMENTS NOT TO BE SCANNED
  (Data Packages, Data Validation, Sampling Data, CBI, Chain of Custody)

DOCUMENT DESCRIPTION:

PLATES (See Table of Contents)

Contact the Superfund Records Center to view available document.
(303) 312-6473

APPENDIX A

BORING 1-B1

DATE DRILLED: 11/4/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	5	2100	0	0	0
2-2	19	3100	0	0	0
3-6	23	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
CL	Silty clay: old HC residue on surface, decreases with depth, trace to weak diesel odor, dark brown-gray, moist
SC	Clay with scattered sand and gravel: dark brown-gray, weak diesel odor, wet below 6-7 feet.

Notes: Groundwater encountered at 6-8 feet
Water sample collected, no odor

BORING 1-B2

DATE DRILLED: 11/4/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	1	0
2-2	2	ND	0	0	0
3-4	3	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Silty and sandy fill: no HC odor
SC	Sandy clay and clayey sand - grades to fg sand: natural color, no stain or HC odor
GW	Sand and sandy gravel: no HC odor or stain, wet below 5 feet.

Notes: Groundwater encountered at 5-6 feet
No water sample collected

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 1-B1 AND 1-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 1-B3

DATE DRILLED: 11/4/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	1	0
2-2	0	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS — DESCRIPTION

- FILL — Silty and sandy fill: no HC odor
- SP — Sand: cg-vcg, natural color, no HC odor or stain, wet below 3.5 feet

Notes: Groundwater encountered at 3-4 feet
No water sample collected

BORING 1-B4

DATE DRILLED: 11/4/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	
2-2	0	ND	0	1	
3-8	1	ND	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS — DESCRIPTION

- FILL — Silty and sandy fill: no HC odor
- SC — Clayey sand: sand fg, dark brown, underlies fill of coal and sandy gravel, no HC odor or stain
- SP — Sand: mg-cg, grades from silt-clayey sand above, trace HC odor, wet, no staining

Notes: Groundwater encountered at 6-8 feet
Water sample collected

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 1-B3 AND 1-B4
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 8-B1

DATE DRILLED: 9/19/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	7.4	0		0
2-2	0	8.3	0		0
3-8	0	0	0		0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sand and gravel fill: no HC odor or staining, natural color - dark brown to beige
	SP	Sand: mg-cg, natural color, no HC odor or staining, wet

Notes: Groundwater encountered between 8 and 10 feet. No contamination observed at saturation zone.

BORING 8-B2

DATE DRILLED: 9/19/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	0	0		1
2-2	0	0	0		0
3-7	0	8.4	0		0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sand and gravel fill: no HC odor or staining, natural color - dark brown to beige
	ML	Clayey silt with fg-mg sand: natural color - dark brown, no HC odor or stain.
	GW	Gravelly sand: common pebbles, natural color, no HC odor or staining, wet

Remarks: Groundwater encountered between 7 and 9 feet. No contamination observed at saturation zone.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 782904

LOG OF BORINGS 8-B1 AND 8-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 8-B3

DATE DRILLED: 9/19/97

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	14	0		0
2-2	0	22	0		0
3-8	0	19	0		0

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Asphalt and sandy gravel road base
	CL	Silty clay with scattered sand and pebbles: natural color, no HC odor or stain.
	GW	Gravelly sand: common pebbles, natural color - beige, no HC odor or staining, sand cg to vcg, wet

Remarks: Groundwater saturation encountered between 8 and 10 feet.
No contamination observed at saturation zone.

BORING 9-B1

DATE DRILLED: 9/17/97

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	0	0	0	
2-2	5	210	0	0	
3-7	6	16	0	0	

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sand and gravel fill: no HC odor or staining.
	SP	Sand: fg-mg, grading to coarser with depth, well sorted, natural med. brown color, weak old diesel odor, no staining.
	GW	Gravelly sand: common pebbles, natural color - beige-brown, no HC odor or staining, grades from sand above - fining upwards alluvium, wet at 7 to 9 feet.

Remarks: Groundwater saturation encountered at 7 to 8 feet.
No hydrocarbon odor at saturation zone.

LAIDLAW ENVIRONMENTAL SERVICES Inc. UPRR Ogden Railyard Proj. 792804	LOG OF BORINGS 8-B3 AND 9-B1 Ogden Railyard Ogden, UT	GEOPROBE BORING

BORING 12-B1

DATE DRILLED: 9/17/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	
2-2	0	ND	0	0	
3-8	0	ND	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS: GP

DESCRIPTION: Gravelly sand: common pebbles and minor silt, no HC odor or stain, drill refusal at 9 feet before saturated conditions intersected, cobbles increasing at bottom of boring.

Remarks: Groundwater not encountered at bottom of boring. Drill refusal before saturated conditions are intersected.

BORING 9-B2

DATE DRILLED: 9/17-18/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	0	0	0	
2-2	0	8.5	0	0	
3-7	0	8.2	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS: GW

DESCRIPTION: Gravelly sand: common pebbles, natural color - beige, no HC odor or staining, sand cg to vcg - sand predominant at 2 to 4 feet, wet at 7 to 9 feet.

Remarks: Groundwater saturation encountered at 7 to 8 feet. No contamination observed at saturation zone.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 12-B1 AND 9-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 12-B2

DATE DRILLED: 9/17/97

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	
2-2	0	ND	0	0	

5

10

15

SAMPLES

SYMBOLS

DESCRIPTION

GP — Gravelly sand: common silt decreasing with depth, no HC odor or stain, drill refusal at 7 feet before saturated conditions intersected.

Remarks: Groundwater not encountered at bottom of boring - drill refusal prohibits advance to saturation.

BORING 12-B3

DATE DRILLED: 9/17/97

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	
2-2	0	ND	0	0	

5

10

15

SAMPLES

SYMBOLS

DESCRIPTION

GW — Gravelly sand: common silt decreasing with depth, no HC odor or stain, drill refusal at 3.5 feet before saturated conditions intersected.

Remarks: Groundwater not encountered; drill refusal on coarse fill material (??). Two additional offsets meet with refusal at approximately the same depth.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 12-B2 AND 12-B3
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 12-B4

DATE DRILLED: 9/19/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		9.0	0	0	
2-2		100	0	0	
3-8		410	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	Fill	Sand and gravel fill for railbed
	GW	Gravelly sand: common pebbles and minor clay, weak diesel odor, drill refusal at three different sites before subsaturated moisture reached at 9-9.5 ft.

Remarks: Groundwater encountered at bottom of boring; insufficient quantity for water sample collection. Drill refusal at 9.5 feet

BORING 12-B5

DATE DRILLED: 9/19/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		18	0	0	
2-2		0	0	1	
3-8		11	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Gravel and sand fill for railbed
	GW	Gravelly sand: scattered pebbles, sand cg-vcg, no HC odor or staining throughout, wet at 9 ft, clay layer at bottom of run.

Remarks: Groundwater saturation encountered at about 9 ft.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 12-B4 AND 12-B5
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 13-B1

DATE DRILLED: 9/18/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	1	12	0	0	0
2-4	12	8	0	0	0
3-8	0	5.8	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
	Concrete
FILL	Sand and gravel fill: trace HC odor, small pockets of old HC staining
SP	Sand: mg-cg, natural color, no HC odor or staining, wet at bottom.

Notes: Groundwater encountered between 9 and 10 feet. No contamination observed at saturation zone.

BORING 13-B2

DATE DRILLED: 9/18/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	7.1	0	0	0
2-4	0	5.1	0	0	0
3-8	1	0	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
	Concrete
SC	Sand with minor clay: No HC odor or stain.
CL	Silty clay with scattered sand and fine gravel: sand cg-vcg, patches natural organics, no HC stain or odor.
SP	Sand: cg-vcg, trace clay, dark gray, common natural organics, wet at 9-10 ft.

Notes: Groundwater encountered between 9 and 10 feet. No contamination observed at saturation zone.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 13-B1 AND 13-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 13-B3

DATE DRILLED: 9/19/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	16	0	0	0
2-2	0	11	0	0	0
3-9	0	7.2	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sand and gravel fill: No to trace HC odor, no HC staining
	SP	Sand: mg-cg, gray-brown, no HC odor or stain, wet below 9 feet.

Notes: Groundwater encountered below 9.5 feet. No contamination observed at saturation zone.

BORING 13-B4

DATE DRILLED: 9/20/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	0
2-2	0	ND	0	0	0
3-8	5	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sand and gravel fill: No HC odor
	GW	Gravelly sand with trace silt and clay: Dark brown, no HC odor.
	SW	Sand: mg-cg, trace clay, no HC stain, weak diesel odor, moist

Notes: Groundwater encountered below 9-10 feet. Weak to moderate diesel odor from water. Water sample collected.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 13-B3 AND 13-B4
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 13-B5

DATE DRILLED: 9/20/97

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-4	0	ND	0	0	0

SAMPLES

SYMBOLS		DESCRIPTION
	GW	Sand and gravel: Natural colors, no stain or odor, moist to wet, boring located on lower terrace.

Notes: Groundwater encountered at about 5-6 feet. Trace to weak diesel odor from water. No surface soil sample. Water sample collected.

BORING 13-B6

DATE DRILLED: 9/20/97

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS

SAMPLES

SYMBOLS		DESCRIPTION
	GW	Sand and gravel: Natural colors, no stain or odor, moist to wet, boring located on lower terrace.

Notes: Groundwater encountered at about 5-6 feet. Trace old diesel odor from water. No soil samples Water sample collected.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 13-B5 AND 13-B6
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 13-B7

DATE DRILLED: 3/16/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES
5							
10							
15							

SYMBOLS	DESCRIPTION
	Sand and gravel: No soil sample collected, boring located 5 feet west of western-most repair track. Logged from drilling characteristics only.

Notes: Groundwater encountered at about 6 feet.
Water has no odor, good return, cloudy gray-brown
Analysis for 8260, TPH, metals

BORING 18-B1

DATE DRILLED: 10/15/97

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES
	1-0	0		0			
	2-2	0		0			
5	3-6	0		0			
10							
15							

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel: no HC odor, fill
	CL	Silty clay: upper contact mixed with sandy gravel fill, no HC odor or stain
	GW	Gravelly sand: wet, no HC odor or stain

Notes: Groundwater encountered at 6-8 feet
Water sample collected, no HC odor

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 13-B7 AND 18-B1
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 19-B1

DATE DRILLED: 10/10/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0		0		
2-2	0		0		
3-7	0		0		

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sand and fine gravel with clay: road base, no HC odor
	ML	Silt and vfg sand: no HC stain or odor, black natural organics
	SP	Sand: fg-cg, well sorted, fining down, no HC odor or stain, wet at 8 feet

Notes: Groundwater encountered at about 8 feet.
No water sample collected

BORING 19-B2

DATE DRILLED: 10/10/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0		0		
2-2	0		0		
3-7	0		0		

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy loam: no HC odor
	SW	Sand with fine gravel: no HC stain or odor, scattered coal
	GW	Sand grading to gravel: no HC odor or stain, wet at 8 feet

Notes: Groundwater encountered at about 8 feet.
No water sample collected

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 19-B1 AND 19-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 21-B1

DATE DRILLED: 10/9/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	150			4
2-2	0	ND			0
3-8	0	ND			0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sand and gravel with scattered gravel-size ore spillage: common CuOx ore, slag, fill and ballast material
	SW	*Sand and fine gravel: natural color, no HC odor* or staining, perched water about 3-4 feet, principal saturation below 6-7 feet

Notes: Groundwater encountered at about 7 feet.
Water has no odor or sheen.
Water sample collected

BORING 21-B1A

DATE DRILLED: 5/20/98

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	SW	Sand and gravel with scattered gravel-size ore spillage: common CuOx ore, slag, fill and ballast material
		Sand and fine gravel: natural color, no HC odor or staining, perched water about 3-4 feet, principal saturation below 6-7 feet

Notes: Groundwater encountered at about 7 feet.
Water has no odor or sheen, sample collected for 8260.
Twin of 21-B1 for water sample

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 21-B1 AND 21-B1A
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 21-B2

DATE DRILLED: 10/9/97

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND			0
2-2	0	ND			0
3-6	0	ND			0

SAMPLES

SYMBOLS		DESCRIPTION
	SP	Sand: fill, windblown, well sorted, fg-mg, clean
		Sand: generally well sorted, fg-mg, no HC odor or staining, wet below 7 feet

Notes: Groundwater encountered at about 7 feet.
Water has no odor or sheen.
Water sample collected

BORING 21-B3

DATE DRILLED: 10/9/97

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND			1
2-2	0	ND			0
3-7	0	ND			0

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Railroad gravel fill: ballast and gravel
	CL	Clay grading to fg sand at about 3.5 feet: brown, no odor or HC staining
	SW	Sand: increasing size fraction at depth, grades from above, natural color, no odor or HC stain
	GW	Gravelly sand: grades from finer sand above, natural color, no odor or HC stain, wet

Notes: Groundwater encountered at about 7-8 feet.
Water sample collected, no HC odor

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 21-B2 AND 21-B3
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 21-B3A

DATE DRILLED: 5/19/98

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES

DEPTH IN FEET: 5, 10, 15

SYMBOLS		DESCRIPTION
	FILL	Railroad gravel fill: ballast and gravel
	CL	Clay grading to fg sand at about 3.5 feet: brown, no odor or HC staining
	SW	Sand: increasing size fraction at depth, grades from above, natural color, no odor or HC stain
	GW	Sandy gravel: grades from finer sand above, natural color, no odor or HC stain, wet

Notes: Groundwater encountered about 7-8 feet.
Water sample collected for 8260
Twin boring of 21-B3, drilled for water sample

BORING 21-B4

DATE DRILLED: 5/20/98

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES

DEPTH IN FEET: 5, 10, 15

SYMBOLS		DESCRIPTION
	SW	Sand and sandy gravel with possible clayey matrix: logged solely from drilling characteristics, no soil samples collected

Notes: Groundwater encountered about 6-8 feet, slow recovery
Water sample collected for 8260
Water had no odor.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 21-B3A AND 21-B4
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 21-B5D

DATE DRILLED: 5/20/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
5						
10		0				
15		0				
20		0				
25		0				
30		0				
35		0				
40		0				
45						
50						

SAMPLES SYMBOLS		DESCRIPTION
		Sand and gravel mix: typical uppermost alluvial sequence, no samples
		Probable sand - lost sample: absence of sample in spoon indicates wet, well sorted sand
	GW	Sandy gravel: no HC odor, wet, no clay, natural colors, grades from well sorted mg-vcg sand to sandy gravel
	CL	Clay: medium brown, low to moderate plasticity, massive, moist trace silt, no HC odor
		Silty clay facies - limited vertical extent, gradational above and below

Notes: Strat hole only, no soil samples for analyses collected.
Groundwater encountered at about 7 feet.
Water sample collected with screen at 7 to 9 feet.
Lithologies logged from 2-foot split spoon samples collected at every 4-foot interval.

LAIDLAW ENVIRONMENTAL SERVICES Inc. UPRR Ogden Railyard Proj. 792904	LOG OF BORING 21-B5D Ogden Railyard Ogden, UT	GEOPROBE BORING

BORING 21-B6

DATE DRILLED: 5/20/98

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS

5

10

15

SAMPLES

SYMBOLS		DESCRIPTION
	SW	Sand and sandy gravel with possible clayey matrix: logged solely from drilling characteristics, no soil samples collected

Notes: Groundwater encountered about 6-8 feet, good recovery
Water sample collected for 8260
Water had no odor.

BORING 21-B7

DATE DRILLED: 5/20/98

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS

5

10

15

SAMPLES

SYMBOLS		DESCRIPTION
		Sand and sandy gravel: logged solely from drilling characteristics, no soil samples collected

Notes: Groundwater encountered about 7-9 feet, good recovery
Water sample collected for 8260
Water had trace odor.

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UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 21-B6 AND 21-B7
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22A-B1

DATE DRILLED: 10/13/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	1	0
2-2	0	ND	0	0	0
3-7	0	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Sandy gravel fill
CL	Clay with minor silt, grades to fg sand: probable fill, no HC odor or staining
SP	Sand: mg-cg, no HC odor or stain, wet at 7-8 feet

Notes: Groundwater encountered at 7-8 feet.
No water sample collected.

BORING 22A-B2

DATE DRILLED: 10/13/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	1
2-2	0	ND	0	0	0
3-7	1	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Sandy gravel fill, scattered coal
CL	Clay with minor silt: probable fill, no HC odor or staining
SP	Sand: mg-cg, no HC odor or stain, wet at 7-8 feet, fining both up and down in sample interval

Notes: Groundwater encountered at 7-8 feet.
No water sample collected

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LOG OF BORINGS 22A-B1 AND 22A-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22A-B3

DATE DRILLED: 10/13/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	15	0	0	1
2-2	0	0	0	0	0
3-7	0	0	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Sandy gravel fill, scattered coal
CL	Clay with minor silt: probable fill, no HC odor or staining
SP	Sand: mg-cg, no HC odor or stain, wet at 7-8 feet, fining both up and down in sample interval

Notes: Groundwater encountered at 7-8 feet.
No water sample collected

BORING 22A-B4

DATE DRILLED: 10/13/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	81	0	2	1
2-2	2	200	0	0	0
3-7	13	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Sandy gravel fill
SP	Sand: mg-cg, pervasive old HC stain, trace HC odor
CL	Silty clay: Trace-weak HC odor, wet, minor scattered staining

Notes: Groundwater encountered at 7-8 feet.
No water sample collected, free product present.
Piezometer constructed.

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LOG OF BORINGS 22A-B3 AND 22A-B4
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22A-B5

DATE DRILLED: 10/13/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	8.9	0	0	0
2-2	43	980	0	0	1
3-8	28	380	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel fill
	GW	Sandy gravel: pervasive product coating, black product may be perched on clay layer below
	CL	Silty clay: moderate HC odor, wet, gray-brown

Notes: Groundwater encountered at 7-8 feet
No water sample collected, free product present.
Piezometer constructed.

BORING 22A-B6

DATE DRILLED: 3/16/98

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
	Sandy gravel or sand: No sample collected, soil log based solely on drilling characterisitcs

Notes: Groundwater encountered at 7-8 feet
Product encountered-diesel odor
No water sample, no piezometer constructed.

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LOG OF BORINGS 22A-B5 AND 22A-B6
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22A-B7

DATE DRILLED: 3/16/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sandy gravel or sand: No sample collected, soil log based solely on drilling characterisitcs
10									
15									

Notes: Groundwater encountered at 7-8 feet
Product encountered-diesel odor, no water sample
Piezometer constructed, screened from 3-13 feet.

BORING 22A-B8

DATE DRILLED: 3/17/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sandy gravel or sand: No sample collected, soil log based solely on drilling characterisitcs
10									
15									

Notes: Groundwater encountered at 6-8 feet
Water sample collected, analyzed for 8260
Good water return, moderate odor, sheen

LAIDLAW ENVIRONMENTAL SERVICES Inc. UPRR Ogden Railyard Proj. 792904	LOG OF BORINGS 22A-B7 AND 22A-B8 Ogden Railyard Ogden, UT	GEOPROBE BORING

BORING 22A-B10

DATE DRILLED: 3/17/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sandy gravel or sand: No sample collected, soil log based solely on drilling characterisitcs
10									
15									

Notes: Groundwater encountered at 6-8 feet
No water sample collected
Water has strong odor, sheen, no product

BORING 22A-B9

DATE DRILLED: 3/17/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sandy gravel or sand: No sample collected, soil log based solely on drilling characterisitcs
10									
15									

Notes: Groundwater encountered at 6-8 feet
Water sample collected, analyzed for 8260
Good water return, strong odor, sheen

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LOG OF BORINGS 22A-B10 AND 22A-B9
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22A-B11

DATE DRILLED: 3/17/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sandy gravel or sand: No sample collected, soil log based *solely on drilling characterisitcs*
10									
15									

Notes: Groundwater encountered at 6-8 feet
Abundant product blebs-diesel odor, no water sample
Piezometer constructed, screened from 3-13 feet.

BORING 22A-B12

DATE DRILLED: 5/19/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 7-9 feet
Water sample collected for 8260.
Good water return, no odor,

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Proj. 792904

LOG OF BORINGS 22A-B11 AND 22A-B12
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22B-B1

DATE DRILLED: 9/23/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		80	0	1	1
2-2		ND	0	0	0
3-8		24	0	1	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Road base gravel fill with minor clay/silt: no HC odor
	SP	Sand: mg-cg, minor clay as matrix, possible fill next to building foundation, no HC odor but may host old HC staining.
	SC	Clayey sand: old petroleum staining observed at saturated zone.

Notes: Groundwater encountered at about 7 feet.
Trace HC odor in water; no sheen.
Water sample collected, slow water recovery

BORING 22B-B2

DATE DRILLED: 9/24/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	33	0	0	1
2-2	1	55	0	0	1
3-8	0	47	0	0	1

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Silty sand: Fill, black, no HC odor
	SC	Clayey and silty sand: possible fill next to building foundation, no HC odor but may have HC staining.
	CL	Silty clay grading to fg-mg sand: no odor or stain, wet
	SW	

Notes: Groundwater encountered at about 7 feet.
Water has no odor or sheen.
Water sample collected

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UPRR Ogden Railyard
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LOG OF BORINGS 22B-B1 AND 22B-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22B-B3

DATE DRILLED: 9/24/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	85	0	0	1
2-2	112	530	0	0	0
3-8	123	2500	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Silty sand with taconite pellet debris: Fill, overlies stained soil
CL	Silty clay: dark brown, moderate diesel odor
GW	Sandy gravel: diesel sheen on grains, wet, moderate to strong diesel odor, grades from silty sand above.

Notes: Groundwater encountered at about 7 feet.
Free diesel product at water table.
No water sample collected.
Piezometer constructed.

BORING 22B-B4

DATE DRILLED: 9/24/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	38	0	0	2
2-2	124	550	0	0	0
3-8	84	230	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Silty sand and gravel fill with scattered metal and wood debris
CL	Silty clay: grades from fill above, moderate to strong diesel odor.
	Silty clay continues to 8 feet, dark brown, wet, strong odor

Notes: Groundwater encountered at about 7 feet.
Water sample collected, weak to moderate odor and sheen

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UPRR Ogden Railyard
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LOG OF BORINGS 22B-B3 AND 22B-B4
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22B-B5

DATE DRILLED: 9/24/97

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		82	0	0	1
2-2		120	0	0	0
3-8		87	0	0	0

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Silty sand and gravel fill
	SC	Sandy clay: weak HC odor
	SM	Silty sand: wet, weak odor

Notes: Groundwater encountered at about 7 feet.
Water sample collected, weak HC odor, slight sheen
Slow water recovery

BORING 22B-B6

DATE DRILLED: 10/6/97

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	92	0	1	1
2-2	0	17	0	0	0
3-8	0	9.5	0	0	0

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Silty gravel fill: sooty, dark gray to black
	SP	Sand: well sorted, mg-cg, no HC odor or stain, natural colors
	GW	Sandy gravel: natural colors, no HC odor, moist to wet

Notes: Groundwater encountered at about 7 feet.
Water sample collected, no HC odor

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LOG OF BORINGS 22B-B5 AND 22B-B6
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22B-B7

DATE DRILLED: 10/6/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	2	1
2-2	120		0	1	0
3-8	478	ND	0	0	1

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Silty gravel fill
	GM	Sandy gravel with silt: moderate diesel odor, no staining
	GW	Sandy gravel: strong diesel odor, diesel sheen on grains

Notes: Groundwater encountered at about 6-7 feet.
Water sample collected, trace HC odor.

BORING 22-B8

DATE DRILLED: 3/11/98

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
	Sand and sandy gravel with possible clay: logged soley from drilling characterisitcs, no samples collected

Notes: Groundwater encountered at 7-8 feet
Water sample collected for vinyl chloride only
Good water return

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LOG OF BORINGS 22B-B7 AND 22B-B8
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22A-B10

DATE DRILLED: 3/11/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 7-8 feet
Water sample collected for vinyl chloride only
Good water return

BORING 22B-B9

DATE DRILLED: 3/11/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 7-8 feet
Water sample collected for vinyl chloride only
Good water return

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UPRR Ogden Railyard
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LOG OF BORINGS 22A-B10 AND 22B-B9
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22B-B11

DATE DRILLED: 3/11/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 7-8 feet
Water sample collected for vinyl chloride only
Good water return

BORING 22B-B12

DATE DRILLED: 3/11/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 7-8 feet
Water sample collected for vinyl chloride only
Good water return

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UPRR Ogden Railyard
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LOG OF BORINGS 22B-B11 AND 22B-B12
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22B-B13

DATE DRILLED: 3/11/98

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS

SAMPLES

SYMBOLS	DESCRIPTION
	Sand and sandy gravel with possible clay: logged solely from drilling characterisitcs, no samples collected

Notes: Groundwater encountered at 7-8 feet
Water sample collected for vinyl chloride and 8260
Good water return; weak diesel odor

BORING 22B-B14

DATE DRILLED: 3/13/98

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS

SAMPLES

SYMBOLS	DESCRIPTION
	Sand and sandy gravel: logged solely from drilling characteristics, no samples collected

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return

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LOG OF BORINGS 22B-B13 AND 22B-B14
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22B-B15

DATE DRILLED: 3/13/98

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS

5

10

15

SAMPLES

SYMBOLS

DESCRIPTION

Sand and sandy gravel: logged solely from drilling characteristics, no samples collected

Notes: Groundwater encountered at 8-9 feet, screen at 11-13 ft
Water sample collected for vinyl chloride only
Good water return

BORING 22B-B16

DATE DRILLED: 3/14/98

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS

5

10

15

SAMPLES

SYMBOLS

DESCRIPTION

Sand and sandy gravel: logged solely from drilling characteristics, no samples collected

Notes: Groundwater encountered at 7-8 feet
Water analysis for vinyl chloride, 8260
Good water return, moderate odor, brown color

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UPRR Ogden Railyard
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LOG OF BORINGS 22B-B15 AND 22B-B16
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22B-B17

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater/product encountered
No water analysis
Piezometer constructed, screened from 3-13 feet
Piezometer wellhead subsequently damaged by grader, ~~repaired on 5/20/98~~

BORING 22B-B18

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 8 feet
Water analysis for vinyl chloride only
Good water return, no odor

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UPRR Ogden Railyard
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LOG OF BORINGS 22B-B17 AND 22B-B18
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22B-B19

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 6-7 feet
Water analysis for vinyl chloride only
Good water return, no odor

BORING 22B-B20

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 6 feet
Water analysis for vinyl chloride only
Good water return, no odor, light brown color

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UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 22B-B19 AND 22B-B20
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 22B-B21

DATE DRILLED: 5/20/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
5						
10						
15						

SAMPLES

SYMBOLS	DESCRIPTION
	Sand and sandy gravel: logged solely from drilling characteristics, no samples collected

Notes: Groundwater encountered at 8 feet
Water analysis for 8260
Good water return, no odor

BORING 22B-B22

DATE DRILLED: 5/20/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
5						
10						
15						

SAMPLES

SYMBOLS	DESCRIPTION
	Sand and sandy gravel: logged solely from drilling characteristics, no samples collected

Notes: Groundwater encountered at 6-7 feet
Water analysis for 8260
Good water return, trace to no odor

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UPRR Ogden Railyard
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LOG OF BORINGS 22B-B21 AND 22B-B22
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 26-B1

DATE DRILLED: 10/8/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	8.4	0	0	
2-2	33	370	0	3	
3-8	17	ND	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Silty loam fill
	CL	Clayey silt and sand: pervasive black petroleum residue, weak HC odor
	SP	Sand: grades from above, mg-cg, pervasive aged petroleum coating, weak odor, wet

Notes: Groundwater encountered at about 5 feet.
Water sample collected, weak odor, sheen

BORING 26-B2

DATE DRILLED: 10/8/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	0	0	1	
2-2	46	780	0	0	
3-8	50	280	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Silty loam fill
	GW	Sandy gravel: abrupt change from uncontaminated earth to to pervisive petroleum coatings at 3.5 feet - upper sandy gravel is likely backfill, weak HC odor Staining dercreases to spotty at depth, weak to moderate odor, wet at about 5 feet

Notes: Groundwater encountered at about 5 feet.
Water sample collected, moderate odor, product blebs

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LOG OF BORINGS 26-B1 AND 26-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 26-B3

DATE DRILLED: 10/9/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	110	0	0	
2-2	0	120	0	1	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Sandy gravel fill
SM	Silty sand: loamy, brown to black nat. soil org., natural colors, no HC odor or staining, clean, wet below 3 feet

Notes: Groundwater encountered at about 3 feet.
Water sample collected, no HC odor

BORING 26-B4

DATE DRILLED: 10/9/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	50	0	0	
2-2	0	7.4	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Silty and clayey loam: black, no HC odor or staining, clean, forest soil
GW	Sandy gravel: natural alluvium, wet below 3 feet no HC odor or staining, clean

Notes: Groundwater encountered at about 3 feet.
Water sample collected, no HC odor

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LOG OF BORINGS 26-B3 AND 26-B4
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 26-B5

DATE DRILLED: 3/11/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: loamy soil near-surface, logged solely from drilling characterisitcs, no samples collected
10									
15									

Notes: Groundwater encountered at 3 feet
Water sample collected for vinyl chloride only
Good water return; trace HC odor

BORING 26-B6

DATE DRILLED: 3/11/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: loamy soil near-surface, logged solely from drilling characterisitcs, no samples collected
10									
15									

Notes: Groundwater encountered at 3 feet
Water sample collected for vinyl chloride only
Good water return; trace HC odor, water medium gray

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LOG OF BORINGS 26-B5 AND 26-B6
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 27-B1

DATE DRILLED: 9/22/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	39	0	0	1
2-2	0	39	0	1	0
3-6	0	5.8	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
GW	Sandy gravel: scattered sludge remnants as crusts of surface ooze, scattered old construction debris, partial fill
SP	Sand and minor silt and clay fractions: loam, medium-dark brown, nat. soil org, no HC odor
SW	Sand with scattered gravel: no staining or HC odor, wet

Notes: Groundwater encountered at about 6-7 feet. Water sample collected, no odor or sheen.

BORING 27-B2

DATE DRILLED: 9/22/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	1	1300	0	1	1
2-2	3	1200	0	1	1
3-4	4	1900	0	1	1

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
SM	Sandy silt: sludge seep material abundant, sample is tarry
SW	Sand: uncertain grainsize fractions, dark brown to black with abundant tarry sludge, very acidic, nearly pervasive throughout boring

Notes: No water sample collected because tarry material would foul water retrieval plumbing.

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UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 27-B1 AND 27-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 27-B3

DATE DRILLED: 9/22/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		5.4	0	0	0
2-2		5.5	0	0	0
3-4		43	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
ML	Silty loam: no surface contamination, clean
SP	Sand: well sorted, no odor, scattered small clots of sludge similar to that in 27-B1
SM	Silty sand: sand vfg, fining downwards, old HC odor, no staining of visible petroleum HCs, wet

Notes: Water sample collected, moderate HC odor from water, no sheen.

BORING 27-B4

DATE DRILLED: 9/22/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		8.2	0	0	0
2-2		17	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
ML	Silty loam: no surface contamination, clean, no odor
GW	Sandy gravel: no stain or tarry clots, moderate to strong odor, wet below 3 feet

Notes: Water sample collected, moderate HC odor from water, trace sheen.

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LOG OF BORINGS 27-B3 AND 27-B4
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 27-B5

DATE DRILLED: 9/22/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	0
2-2	0	5	0	0	0
3-4	0	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
SM	Silty loam soil: no surface sludge, no odor
	Silty and sand: loamy, grades to mg-cg sand, clean, no odor
SP	
GW	Sandy gravel: no odor or visible HC contamination, wet

Notes: Water sample collected, weak HC odor from water, no sheen.

BORING 27-B6

DATE DRILLED: 9/22/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	27	0	1	1
2-2	0	89	0	0	0
3-4	0	42	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
ML	Silty loam: no surface sludge, no odor
SP	Sand: fg-cg, well sorted, fractions from 4 to 6 feet are predominantly mg-cg, wet below 4 feet, no odor or staining

Notes: Water sample collected, no HC odor from water, no sheen.

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LOG OF BORINGS 27-B5 AND 27-B6
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 27-B7

DATE DRILLED: 10/6/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	64	0	1	1
2-2	0	ND	0	0	0
3-6	0	5.1	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Silty loam: no surface sludge, no odor
SP	Sand: mg-cg, well sorted, no sludge or HC odor
GW	Sandy gravel: well sorted, no sludge or HC odor, wet

Notes: Water sample collected, no HC odor from water, no sheen.

BORING 30-B1

DATE DRILLED: 10/6/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	8.3	0	2	3
2-2	373	890	0	0	0
3-6	217	1700	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Silty gravel fill
CL	Silty clay: no HC staining, weak diesel-gasoline odor
SW	Sand: fg-mg, grades from above, diesel odor, no HC stain
GW	Sandy gravel: moderate-strong diesel odor, trace staining, wet

Notes: Groundwater encountered at about 7 feet. Water sample collected, strong HC odor, sheen

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LOG OF BORINGS 27-B7 AND 30-B1
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B2

DATE DRILLED: 10/6/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	20	0	3	2
2-2	47	310	0	0	1
3-6		99	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Silty gravel fill with old HC stain, common metal scrap
	CL	Clayey silt: pervasive black stain - old petroleum residue
	SW	Sand: fg-mg, grades from above, diesel odor, HC stain
	GW	Sandy gravel: dripping petroleum product, wet

Notes: Groundwater encountered at about 7 feet.
No water sample collected, product present.
No piezometer constructed because of salvage yard activities.

BORING 30-B3

DATE DRILLED: 10/6/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	190	0	3	1
2-2	4	8.1	0	0	1
3-6	2	ND	0	0	1

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Silty gravel fill: common metal scrap
	SP	Sand and scattered gravel: common coal and clinker
	GM	Sandy gravel with silt: spotty oily coatings, HC very old, HC odor trace to none

Notes: Groundwater encountered at about 7 feet.
Water sample collected, moderate HC odor, sheen

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LOG OF BORINGS 30-B2 AND 30-B3
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B4

DATE DRILLED: 10/7/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		20	0	2	1
2-2		1800	0	0	1
3-8		280	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel fill: common metal scrap
	ML	Silt with minor clay: moderate HC odor
	GW	Sandy gravel: Petrleum coatings, strong diesel (?) odor, wet

Notes: Groundwater encountered at about 7 feet.
Water sample collected, strong odor, sheen

BORING 30-B5

DATE DRILLED: 10/7/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		11	0	2	1
2-2		18	0	0	0
3-8		3700	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
		Sandy gravel fill: common metal scrap
	ML	Silt with clay: trace HC odor
	SM	Silt and fg sand: moderate diesel odor, wet, trace sheen

Notes: Groundwater encountered at about 8-7 feet.
Water sample collected, strong odor, sheen

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LOG OF BORINGS 30-B4 AND 30-B5
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B6

DATE DRILLED: 10/7/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		120	0	4	1
2-2		1200	0	2	1
3-8		1300	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel fill: common metal scrap
	ML	Silt with clay: HC odor and staining, wood debris
	SM	Silt and fg sand: moderate diesel odor, wet,

Notes: Groundwater encountered at about 7 feet.
Water sample collected, strong odor, sheen

BORING 30-B7

DATE DRILLED: 10/7/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		95	0	2	1
2-2		690	0	0	1
3-8			0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel fill: common metal scrap
	GM	Silty sand and gravel: strong HC odor, petroleum coating at depth - possible product, wet below 7 feet

Notes: Groundwater encountered at about 7 feet.
No water sample collected, free product present

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LOG OF BORINGS 30-B6 AND 30-B7
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B8

DATE DRILLED: 10/7/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		170	0	1	2
2-2		44	0	0	0
3-8		3400	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy and clinker-debris fill: trace diesel odor
	GW	Sandy gravel: product coating with weak odor

Notes: Groundwater encountered at about 7 feet.
No water sample collected, product present

BORING 30-B9

DATE DRILLED: 10/8/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	1
2-2	0	ND	0	0	0
3-8	0	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Silty loam grading to underlying fill of sand, clinker, coal, other fine debris and gravel: no HC odor
	GW	Sandy gravel: natural colors, no HC odor or staining, wet below 7.5 feet

Notes: Groundwater encountered below 7.5 feet.
Water sample collected, trace diesel odor.
This boring is located within AOI-20 at the north end of AOI-30.

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LOG OF BORINGS 30-B8 AND 30-B9
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B10

DATE DRILLED: 10/8/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	1
2-2	0	ND	0	0	0
3-8	2	41	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Silty loam grading to underlying fill of sand and gravel with clinker, coal: no HC odor
GW	Sandy gravel: natural colors, no HC odor or staining, wet below 7.5 feet

Notes: Groundwater encountered below 7.5 feet.
Water sample collected, trace diesel odor.
This boring is located within AOI-20 at the north end of AOI-30.

BORING 30-B11

DATE DRILLED: 10/8/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	0
2-2	2	72	0	0	1
3-8	145	2000	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Silty loam grading to underlying fill of sand, clinker, and coal: no HC odor
GW	Sandy gravel: pervasive petroleum coating, strong diesel odor, wet below 7.5 feet

Notes: Groundwater encountered below 7.5 feet
Water sample collected, moderate diesel odor, trace sheen.
Slow water recovery.
This boring is located within AOI-20 at the north end of AOI-30.

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UPRR Ogden Railyard
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LOG OF BORINGS 30-B10 AND 30-B11
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B12

DATE DRILLED: 10/9/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	15	0	0	0
2-3	1	ND	0	0	0

SAMPLES

DEPTH IN FEET: 5, 10, 15

SYMBOLS		DESCRIPTION
	SW	Sand: loam, brown - nat. soil org, no HC odor or staining, clean, forest soil
		Gravelly sand: medium to dark gray, natural colors and natural organic odor, wet

Notes: Groundwater encountered at about 2-3 feet.
Water sample collected, no HC odor

BORING 30-B13

DATE DRILLED: 10/9/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	0
2-1	0	ND	0	0	0

SAMPLES

DEPTH IN FEET: 5, 10, 15

SYMBOLS		DESCRIPTION
	SM	Sand-silt: loam, no HC odor or staining, clean, roots, forest soil
	SW	Gravelly sand: medium to dark gray, natural color and natural organic odor, wet at 2 feet

Notes: Groundwater encountered at about 2 feet.
Water sample collected, no HC odor

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LOG OF BORINGS 30-B12 AND 30-B13
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B14

DATE DRILLED: 3/11/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel with sandy loam: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 3 feet.
Water sample collected for vinyl choride only
Good water return

BORING 30-B15

DATE DRILLED: 3/11/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel fill and native: logged only from drilling characteristics, no samples collected
10									
15									

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UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 30-B14 AND 30-B15
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B16

DATE DRILLED: 3/11/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 6 feet.
No water sample collected, oily-aged free-phase product
Piezometer constructed, screen from 3-13 feet, stick-up wellhead

BORING 30-B17

DATE DRILLED: 3/11/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 6 feet.
Water sample collected, water has HC sheen and weak odor
Water for vinyl chloride and 8260 analysis

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UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 30-B16 AND 30-B17
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B18

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 8 feet.
Water sample collected, water has weak odor, gray color
Water for vinyl chloride only

BORING 30-B19

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 7 feet.
Water has good return, moderate odor, gray color
Analyses for vinyl chloride and 8260

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 30-B18 AND 30-B19
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B20

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 7 feet.
Water has good return, weak odor
Analyses for vinyl chloride only

BORING 30-B21

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 7 feet.
Water has moderate odor, light gray color, good return
Analyses for vinyl chloride only

LAIDLAW ENVIRONMENTAL SERVICES Inc. UPRR Ogden Railyard Proj. 792904	LOG OF BORINGS 30-B20 AND 30-B21 Ogden Railyard Ogden, UT	GEOPROBE BORING

BORING 30-B22

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 7 feet.
Water has good return, moderate odor
Analyses for vinyl chloride and 8260

BORING 30-B23

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 7 feet.
Water has moderate odor, sheen, good return
Analyses for vinyl chloride and 8260

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 30-B22 AND 30-B23
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B24

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 9 feet.
Water has strong odor, sheen, product blebs but no product layer, good water return
Analysis for vinyl chloride

BORING 30-B25

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 7-8 feet.
Water sample collected, water has weak, cloudy
Analyses for vinyl chloride

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LOG OF BORINGS 30-B24 AND 30-B25
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B26

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater/product encountered at about 7.5 feet.
No water sample collected.
Piezometer constructed, screen from 3-13 feet

BORING 30-B27

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 6 feet.
Water has weak odor, good return
Water analysis for 8260

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LOG OF BORINGS 30-B26 AND 30-B27
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B28

DATE DRILLED: 3/16/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 6 feet.
Water has trace odor, good return
Water analysis for vinyl chloride only

BORING 30-B29

DATE DRILLED: 3/16/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 7 feet.
Water has no odor, good return, medium brown color
Water analysis for vinyl chloride only

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 30-B28 AND 30-B29
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B30

DATE DRILLED: 3/13/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 8 feet.
Water sample collected, water has strong HC sheen and moderate HC odor
Water for vinyl chloride only

BORING 30-B31

DATE DRILLED: 5/20/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 8 feet.
Water sample collected, good recovery, trace odor
Water analysis for 8260

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LOG OF BORINGS 30-B30 AND 30-B31
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 30-B32

DATE DRILLED: 5/20/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Black product encountered at about 7.5 feet.
No water sample collected.
Piezometer constructed, screen from 3-13 feet

BORING 30-B33

DATE DRILLED: 5/20/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged only from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 8 feet.
Water had good recovery, moderate odor, product blebs and sheen, cloudy
Water analysis for 8260

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LOG OF BORINGS 30-B32 AND 30-B33
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 32-B1

DATE DRILLED: 9/20/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	
2-2	28	68	0	1	
3-8	12	14	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel fill with clay matrix at depth: no HC odor or staining, dark brown to beige
	GC	Sandy gravel with minor clay: scattered pet. staining, weak HC odor, becoming wet below 9 feet, clay matrix may increase with depth.

Notes: Groundwater encountered at about 7-8 feet.
Diesel odor detected in groundwater.
Water sample collected, slow water return.

BORING 32-B2

DATE DRILLED: 9/23/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	1	
2-2	1	5.2	0	0	
3-8	13	ND	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel fill with minor clay/silt: no HC odor or staining, dark brown to beige
	GC	Sandy gravel with scattered clayey zones: possible fill, trace HC odor
	SC	Silty and clayey sand: weak old diesel odor, moist to wet

Notes: Groundwater encountered at about 6-8 feet.
Trace diesel odor detected in groundwater.
Water sample collected.

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UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 32-B1 AND 32-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 32-B3

DATE DRILLED: 9/23/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	5.2	0	0	
2-2	0	870	0	0	
3-8	14	ND	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel fill with minor clay/silt: no HC odor or staining, dark brown to beige
	GC	Sandy gravel with scattered clayey zones: moderate diesel odor, diesel sheen on grains.
	SC	Silty clay with sand: fg sand, pervasive diesel odor, wet below 7 feet

Notes: Groundwater encountered at about 7-8 feet.
Weak diesel odor detected in groundwater, no sheen
Water sample collected.

BORING 32-B4

DATE DRILLED: 9/23/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	19	0	1	
2-2	187	380	0	0	
3-8	291	77	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel fill with minor clay/silt: no HC odor or staining, dark brown to beige
	GC	Sandy gravel with scattered clayey zones: pervasive old diesel odor and coatings.
	SW	Gravelly sand: no stain, weak to moderate diesel odor, wet

Notes: Groundwater encountered at about 7-8 feet.
Trace diesel odor detected in groundwater, no sheen
Water sample collected.

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UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 32-B3 AND 32-B4
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 32-B5

DATE DRILLED: 9/23/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		10	0	1	
2-2		240	0	0	
3-8		350	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Road base gravel fill with minor clay/silt: no HC odor
	CL	Silty clay with scattered gravel units: weak diesel odor.
	SW	Gravelly sand: no stain, moderate diesel odor, wet, grades from silty clay above.

Notes: Groundwater encountered at about 7-8 feet.
Weak to moderate diesel odor detected in groundwater
Water sample collected.
No PID results

BORING 32-B6

DATE DRILLED: 9/23/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	22	0	0	
2-2	0	ND	0	0	
3-8	0	ND	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Road base gravel fill: no HC odor
	SW	Sand with scattered gravel: no diesel odor or stain, sand cg-vcg,

Notes: Groundwater encountered at about 7-8 feet.
No water sample collected.

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UPRR Ogden Railyard
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LOG OF BORINGS 32-B5 AND 32-B6
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 32-B7

DATE DRILLED: 9/23/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	18	0	0	
2-2	0	ND	0	0	
3-8	0	25	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Road base gravel fill with minor clay/silt: no HC odor
	SW	*Sand: possible fill earth, no HC odor or visible contamination*

Notes: Groundwater encountered at about 6-8 feet.
Moderate diesel odor in water; sheen is present.
Water sample collected.

BORING 33-B1

DATE DRILLED: 11/5/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	
2-2	0	ND	0	0	
	0				
3-7	2	ND	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	ML	*Silty-sandy loam: clean, no HC odor or staining*
		Silt: light to medium brown, no HC odor or stain, *homogeneous, dry, vfg sand increasing at depth.*
	SW	Sand: grades from above to mg-cg sand to sand gravel at bottom of boring, gravel is wet, trace HC?? odor, possible trace HC?? staining

Notes: Groundwater encountered at 7-8 feet.
Water sample collected, possible trace HC odor.

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LOG OF BORINGS 32-B7 AND 33-B1
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 33-B2

DATE DRILLED: 11/5/97

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
		0				
5	1-5	0	ND	0	0	
	2-7	0	ND	0	0	
10						
15						

SAMPLES

SYMBOLS		DESCRIPTION
	SP	Sandy loam: clean, no HC odor or staining
		Sand: mg-vcg, dry, no HC odor or stain
	SW	Sand grading to sand gravel: gravel is wet, trace HC?? or musty odor

Notes: Groundwater encountered at about 8 feet.
Water sample collected, possible trace HC?? odor.
No surface soil sample - clean native soil

BORING 33-B3

DATE DRILLED: 11/5/97

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
		0				
5	1-5	0	ND	0	0	
10						
15						

SAMPLES

SYMBOLS		DESCRIPTION
	SW	Sandy loam: clean, no HC odor or staining
		Gravelly sand: wet below 5 feet, trace musty odor

Notes: Groundwater encountered at about 7 feet.
Water sample collected, trace musty odor.
No soil retrieval at 2 to 4 feet.
No surface soil sample - clean native soil

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UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 33-B2 AND 33-B3
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 33-B4

DATE DRILLED: 11/5/97

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
	0				
1-4	0	ND	0	0	
2-7	0	ND	0	0	

SAMPLES

SYMBOLS	DESCRIPTION
SM	Sandy loam: clean, no HC odor or staining
	Silty sand grading to gravelly sand: sand grades from vfg to vcg, wet below 7 feet, no HC odor or staining, moderately well sorted within gradation.
SW	

Notes: Groundwater encountered below 7 feet.
Water sample collected, trace musty odor.

BORING 34-B1

DATE DRILLED: 11/3/97

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	0	ND	0	0	1
2-2	0	ND	0	0	0
3-8	0	ND	0	0	0
4-10	11	ND	0	0	0

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Sandy gravel fill : clean, no HC odor
SM	Silt and vfg sand: no HC odor or stain, natural color
SW	Sand: no HC odor or stain, natural color, dry, grades to sandy gravel below
GW	Sandy gravel: trace HC odor, no stain, natural color, wet

Notes: Groundwater encountered at about 10 feet
Water sample collected, weak HC odor

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UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 33-B4 AND 34-B1
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B2

DATE DRILLED: 11/3/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	0	ND	0	0	1
2-2	0	ND	0	0	0
3-8	227	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS

DESCRIPTION

FILL — Sandy loam fill : clean, no HC odor

SP — Sand: fg-mg, natural color, no HC odor

GW — Sandy gravel: natural color at 6-7 feet, scattered HC coatings and weak HC odor at 8-10 feet, wet at 8-10 feet

Notes: Groundwater encountered at 8-10 feet
Water sample collected, weak HC odor, sheen

BORING 34-B3

DATE DRILLED: 11/3/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	0	ND	0	0	1
2-2	0	ND	0	0	0
3-8	2	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS

DESCRIPTION

FILL — Silty and clayey sand: Fill??, clay matrix, old black-brown HC residue, no HC odor

SP — Sand: fg-vfg, natural color, no HC odor or stain

GW — Sandy gravel: natural color, no HC odor or stain, wet

Notes: Groundwater encountered at 8-10 feet
Water sample collected, no HC odor or sheen

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UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 34-B2 AND 34-B3
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B4

DATE DRILLED: 11/3/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	0	ND	0	0	1
2-2	0	ND	0	0	0
3-8	0	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Sand: fg-mg, no HC odor
ML	Clayey silt: dark brown, no HC odor or stain
SC	Clayey sand: dark brown, no HC odor or stain, wet

Notes: Groundwater encountered at 8-10 feet
Water sample collected, trace HC odor

BORING 34-B5

DATE DRILLED: 11/3/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	0	ND	0	0	1
2-2	0	ND	0	0	0
3-8	76	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Sandy loam fill : clean, no HC odor
SC	Sand and minor silt/clay: natural color, no HC odor or stain
SP	Sand: mg, grading through gravelly sand to sandy gravel, wet in gravels, moderate HC odor
GW	

Notes: Groundwater encountered at 8-10 feet
Water sample collected, moderate HC odor, sheen

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UPRR Ogden Railyard
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LOG OF BORINGS 34-B4 AND 34-B5
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B6

DATE DRILLED: 11/4/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	0	ND	0	0	0
2-2	0	ND	0	0	1
3-8	23	300	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sand and silt: clean, no HC odor
	SP	Sand: vfg-fg and grading to cg-vcg and sandy gravel, no HC odor or stain at 2-4 feet, HC increasing with depth to scattered HC staining and weak odor
	GW	Sandy gravel: moderate HC odor, scattered staining, wet

Notes: Groundwater encountered at 9-11 feet
Water sample collected, weak HC odor

BORING 34-B7

DATE DRILLED: 11/4/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	0	ND	0	0	0
2-2	0	ND	0	0	0
3-8	0	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy and silty loam: no HC odor
	SP	Sand: fg-mg and grading to cg-vcg and sandy gravel, no HC odor or stain, overall moderatly well sorted within gradations
	GW	Sandy gravel: no HC odor or staining, wet

Notes: Groundwater encountered at 9-10 feet
Water sample collected, trace odor

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UPRR Ogden Railyard
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LOG OF BORINGS 34-B6 AND 34-B7
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B8

DATE DRILLED: 3/10/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium with possible clayey matrix: No samples collected, logged solely from drilling characteristics.
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Slow water return

BORING 34-B9

DATE DRILLED: 3/10/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
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LOG OF BORINGS 34-B8 AND 34-B9
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B10

DATE DRILLED: 3/10/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 7-8 feet
Water sample collected for vinyl chloride only
Good water return

BORING 34-B11

DATE DRILLED: 3/10/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium with possible clayey matrix at depth, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 7-8 feet
Water sample collected for vinyl chloride only
Slow water return

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UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 34-B10 AND 34-B11
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B12

DATE DRILLED: 3/10/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 7-8 feet
Water sample collected for vinyl chloride only
Good water return

BORING 34-B13

DATE DRILLED: 3/11/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 34-B12 AND 34-B13
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B14

DATE DRILLED: 3/11/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 7-8 feet
Water sample collected for vinyl chloride only
Good water return

BORING 34-B15

DATE DRILLED: 3/12/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 34-B14 AND 34-B15
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B16

DATE DRILLED: 3/12/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return

BORING 34-B17

DATE DRILLED: 3/12/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 34-B16 AND 34-B17
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B18

DATE DRILLED: 3/12/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return

BORING 34-B19

DATE DRILLED: 3/12/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 9-10 feet
Water sample collected for vinyl chloride only
Good water return

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
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LOG OF BORINGS 34-B18 AND 34-B19
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B20

DATE DRILLED: 3/12/98

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS

SAMPLES

SYMBOLS

DESCRIPTION

Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return

BORING 34-B21

DATE DRILLED: 3/12/98

DEPTH IN FEET

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS

SAMPLES

SYMBOLS

DESCRIPTION

Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
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LOG OF BORINGS 34-B20 AND 34-B21
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B22

DATE DRILLED: 3/12/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics, clayey zone below 7 feet.
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Slow water return

BORING 34-B23

DATE DRILLED: 3/12/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics, clayey zone below 7-8 feet and likely extends to below 10 feet. Note: Very poor water return at 8-11 feet, good at 11-14 feet
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return below 11 feet

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UPRR Ogden Railyard
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LOG OF BORINGS 34-B22 AND 34-B23
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B24

DATE DRILLED: 3/12/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 8-9 feet, screen at 11-13 feet
Water sample collected for vinyl chloride only
Good water return

BORING 34-B25

DATE DRILLED: 3/12/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 9-10 feet
Water sample collected for vinyl chloride only
Good water return

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 34-B24 AND 34-B25
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B26

DATE DRILLED: 3/12/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return

BORING 34-B27

DATE DRILLED: 3/12/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 34-B26 AND 34-B27
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B28

DATE DRILLED: 3/13/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Good water return

BORING 34-B29

DATE DRILLED: 3/13/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 8 feet
Water sample collected for vinyl chloride only
Good water return

LAIDLAW ENVIRONMENTAL SERVICES Inc. UPRR Ogden Railyard Proj. 792904	LOG OF BORINGS 34-B28 AND 34-B29 Ogden Railyard Ogden, UT	GEOPROBE BORING

BORING 34-B30

DATE DRILLED: 3/13/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 7 feet
Water sample collected for vinyl chloride only
Good water return
Several probe refusals on boulders or concrete before successful boring.

BORING 34-B31

DATE DRILLED: 3/13/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics, possible clayey zone at depth
10									
15									

Notes: Groundwater encountered at 8-9 feet
Water sample collected for vinyl chloride only
Slow water return

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 34-B30 AND 34-B31
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B32

DATE DRILLED: 3/13/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 3-4 feet
Water sample collected for vinyl chloride only
Good water return

BORING 34-B33

DATE DRILLED: 3/13/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 3-4 feet
Water sample collected for vinyl chloride and 8260
Good water return, weak HC odor and trace sheen, water medium green-gray

LAIDLAW ENVIRONMENTAL SERVICES Inc. UPRR Ogden Railyard Proj. 792904	LOG OF BORINGS 34-B32 AND 34-B33 Ogden Railyard Ogden, UT	GEOPROBE BORING

BORING 34-B34

DATE DRILLED: 3/13/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
5						
10						
15						

SAMPLES

SYMBOLS	DESCRIPTION
	Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics

Notes: Groundwater encountered at 3-4 feet
Water sample collected for vinyl chloride and 8260
Good water return, trace HC odor, no sheen, water light gray to near-clear

BORING 34-B35

DATE DRILLED: 3/13/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
5						
10						
15						

SAMPLES

SYMBOLS	DESCRIPTION
	Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics

Notes: Groundwater encountered at 6-7 feet
Water sample collected for vinyl chloride only
Slow water return

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 34-B34 AND 34-B35
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B36

DATE DRILLED: 3/13/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics, possible clayey zone from 7 to 11 feet.
10									
15									

Notes: Groundwater encountered at 7-9 feet, screen at 11-13 ft
Water sample collected for vinyl chloride only
Good water return, weak HC odor, sheen
Good GW recovery is about 5 feet below level of nearby pond.

BORING 34-B37

DATE DRILLED: 3/14/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics, possible clayey matrix from 7 to 11 feet.
10									
15									

Notes: Groundwater encountered at 7-9 feet, screen at 11-13 ft
Water sample collected for vinyl chloride only
Good water return, no HC odor

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UPRR Ogden Railyard
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LOG OF BORINGS 34-B36 AND 34-B37
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B38

DATE DRILLED: 5/19/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 7-9 feet
Water sample collected for 8260.
Good water return, weak diesel odor, cloudy

BORING 34-B40

DATE DRILLED: 5/19/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 7-9 feet
Water sample collected for 8260.
Good water return, no odor,

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UPRR Ogden Railyard
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LOG OF BORINGS 34-B38 AND 34-B40
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B39D

DATE DRILLED: 5/19/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
5						
10		0				
15		0				
20		0				
25		0				
30		0				
35		0				
40		0				
45		0				
50		0				

SAMPLES

SYMBOLS	DESCRIPTION
GW	Sand and gravel mix: typical uppermost alluvial sequence, no samples, becomes water-saturated between 8 and 10 feet.
SP	Sand and silt: sand fg-cg, well sorted, grades upward to silt and vfg sand, no hydrocarbon (HC) odor, wet, natural colors, no HC staining
GW	
SP	Sandy gravel: no HC odor, wet, no clay, natural colors
GW	Sand: mg-vcg and fine gravel, wet, no HC odor, grades to coarse sandy gravel.
CL	Clay: medium brown, low to moderate plasticity, massive, moist trace silt, no HC odor, grades sharply to lithology below
SM	Silt and sand: sand vfg, well sorted, wet, no HC odor, grades to clay below
CL	Clay: medium brown, moderate plasticity, soft, moist, massive, no HC odor, continues unchanged to bottom of boring.

Notes: Strat hole only, no samples for analyses collected.
Logged from 2-foot split spoon samples every 4 feet.

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UPRR Ogden Railyard
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LOG OF BORING 34-B39D
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B41

DATE DRILLED: 5/19/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 7-9 feet
Water sample collected for 8260.
Good water return, no odor,

BORING 34-B42

DATE DRILLED: 5/19/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 7-9 feet
Water sample collected for 8260.
Good water return, no odor,

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UPRR Ogden Railyard
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LOG OF BORINGS 34-B41 AND 34-B42
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 34-B43

DATE DRILLED: 5/19/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
									Sand and sandy gravel alluvium: No samples collected, logged solely from drilling characteristics
5									
10									
15									

Notes: Groundwater encountered at 7-9 feet
Water sample collected for 8260.
Good water return, no odor,

LAIDLAW ENVIRONMENTAL SERVICES Inc. UPRR Ogden Railyard Proj. 792904	LOG OF BORING 34-B43 Ogden Railyard Ogden, UT	GEOPROBE BORING

BORING 35-B1

DATE DRILLED: 11/4/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	
2-2	0	ND	0	0	
3-8	0	ND	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy fill: no HC odor or staining,
	SC	Sand: fg-mg, grading from clayey sand above, moist, no HC odor
	SP	Sand, grading to sandy gravel: no HC odor or stain, wet
	GW	

Notes: Groundwater encountered at about 7-8 feet.
No water sample collected.

BORING 35-B2

DATE DRILLED: 11/4/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0	0	
2-2	0	ND	0	0	
3-7	0	ND	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy loam: no HC odor or staining,
	SM	Silty sand: natural brown color, no HC odor or staining
	SP	Sand: mg-cg, grades from above, moist to wet, no HC stain or odor

Notes: Groundwater encountered at about 7-9 feet
No water sample collected.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 35-B1 AND 35-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 35-B3

DATE DRILLED: 11/4/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	9.7	0	0	
2-2	0	ND	0	0	
3-8	3	ND	0	0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Silty clay and sand: dark brown trona spillage stain
	SW	Sand: fg-mg, grading from silty clay with vfg sand above, No HC odor or stain
	SP	Sand, grading to gravelly sand: no HC odor or stain, wet

Notes: Groundwater encountered at about 7-8 feet.
Water sample collected, trace HC odor.
Boring located within stained soil from trona spillage - surface puddles and soil have reddish brown color and characteristic odor.

BORING 35-B4

DATE DRILLED: 11/6/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0				
2-2	0				
3-7	1				

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Silty and sandy loam: dark brown, no HC odor or staining
	SM	Silt and vfg sand: natural color, no HC odor or stain
	GW	Sandy gravel, no HC odor or stain, wet

Notes: Groundwater encountered at about 8 feet.
Water sample collected, trace HC odor

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 35-B3 AND 35-B4
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 36-B1

DATE DRILLED: 11/5/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0		0		0
2-2	0	ND	0		0
3-7	0		0		2

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel fill: scattered metal debris
		Sand and gravel with scattered asphalt: fill earth, possible coal and clinker
	CL	Clay with minor silt and vfg sand: wet, no HC odor, natural brown

Notes: Groundwater encountered at about 8 feet.
No water sample collected

BORING 36-B2

DATE DRILLED: 11/5/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0		1
2-2	0	87	0		1
3-7	0	ND	0		0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy loam with gravel: fill earth, no HC odor
		Silty sand with scattered debris: fill earth, bricks
	CL	Clay with minor silt and vfg sand: wet, no HC odor, natural dark brown

Notes: Groundwater encountered at about 8 feet.
No water sample collected

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UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 36-B1 AND 36-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 36-B3

DATE DRILLED: 11/5/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0		1
2-2	0	ND	0		0
3-7	0	ND	0		0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel: fill, scattered metal debris
		Sand with scattered debris: fill earth, bricks, no HC odor or stain
	GW	Sandy gravel: grades from sand above, wet, no HC odor,

Notes: Groundwater encountered at about 8 feet.
No water sample collected

BORING 36-B4

DATE DRILLED: 11/5/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0		1
2-2	0	ND	0		0
3-7	0	ND	0		0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel: fill, scattered mixed debris
		Sand with brick debris: fill earth, bricks, no HC odor or stain
	GW	Sandy gravel: wet, no HC odor, natural color

Notes: Groundwater encountered at about 8 feet.
No water sample collected

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 36-B3 AND 36-B4
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 37-B1

DATE DRILLED: 9/16/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	0		0	
2-2	0	28		0	
3-7	53	3000		0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Sandy gravel fill: no HC odor or staining, natural color - dark brown to beige
SC	Clayey silt with vfg sand: no HC odor or staining. Sand increasing with depth. Part of soil may be pit fill from previous overexcavation - boring sited very near edge of pit.
SWGW	Sandy gravel: grades from above - fining upwards alluvial sequence, old diesel odor with common gray-black HC staining on sand and gravel grains, wet at 8 feet.

Notes: Groundwater encountered at about 8 feet.
Diesel contamination observed at saturation zone.
Water sample has diesel odor.

BORING 37-B2

DATE DRILLED: 9/16/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	0		0	
2-4	78	1500		0	
3-8	85	880		0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Sandy gravel fill: no HC odor or staining, natural color - dark brown to beige
CL	Clay with minor silt: weak diesel odor, no staining.
SWGW	Sandy gravel: grades from above - fining upwards alluvial sequence, weak diesel odor, gray - possible minor HC coatings, wet below 9 feet.

Notes: Groundwater encountered at about 9 feet.
Diesel odor observed at saturation zone.
Water sample has weak diesel odor.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 37-B1 AND 37-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 37-B3

DATE DRILLED: 9/17/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	0		0	
2-4	5	8.7		0	
3-8	117	1200		0	

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Sandy gravel fill: no HC odor or staining, natural color - dark brown to beige
SW	Sand and fine gravel fraction - natural colors - beige, gray, no stain or HC odor until sample until core at 8 to 10 feet. Wet at 8 to 10 feet, weak diesel odor at saturated zone.

Notes: Groundwater saturation encountered at about 8 feet.
Diesel odor observed at saturation zone.
Water sample has weak diesel odor.

BORING 38-B1

DATE DRILLED: 10/13/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-4	71	5100	0	0	1
2-7	87	910	0	0	1

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
	Concrete
SWGW	Sandy gravel: common product saturation, black product, *moderate diesel odor, voids from construction*
	Becomes sandy at depth, uncertain lithology, pervasive product coating

Notes: Groundwater encountered at about 7-8 feet
No water sample collected, free product present.
Piezometer constructed.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
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LOG OF BORINGS 37-B3 AND 38-B1
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B2

DATE DRILLED: 10/13/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-4		1500	0	0	0
2-6		1000	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
CL	Concrete Silty clay: Strong HC odor
GW	Sandy gravel: moderate diesel odor, product coating

Notes: Groundwater encountered at about 7-8 feet
No water sample collected, free product present.

BORING 38-B3

DATE DRILLED: 10/13/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-4	18	410	0	0	0
2-6	81	1500	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
CL	Concrete Silty clay: moderate diesel odor
SC	Silty clay with vfg sand: strong diesel odor, product saturation

Notes: Groundwater encountered at about 7-8 feet
No water sample collected, free product present.
Piezometer constructed.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 38-B2 AND 38-B3
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B3

DATE DRILLED: 10/13/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-4	18	410	0	0	0
2-8	81	1500	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
	Concrete
CL	Silty clay: moderate diesel odor
SC	Silty clay with vfg sand: strong diesel odor, product saturation

Notes: Groundwater encountered at about 7-8 feet
No water sample collected, free product present.
Piezometer constructed.

BORING 38-B4

DATE DRILLED: 10/13/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	37	300	0	0	1
2-8	75	710	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
	Concrete
SWGW	Sandy gravel: pervasive old diesel coating, wet below 6 feet

Notes: Groundwater encountered at 6-8 feet
Water sample collected, moderate HC odor.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 38-B3 AND 38-B4
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B5

DATE DRILLED: 10/14/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	28	670	0	0	0
2-6	54	1000	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
		Concrete
	CL	Clay with silt: brown, moderate diesel odor
	SP	Sand: fg, grading to sandy gravel, wet, product coating

Notes: Groundwater encountered at 6-8 feet
Water sample collected, strong HC odor, product wisps and films.
Slow water recovery

BORING 38-B6

DATE DRILLED: 10/14/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	28	3900	0	0	0
2-6	33	1800	0	0	3

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
		Concrete
	SW	Sand: black petroleum coating, moderate diesel odor
	CL	Clay: pervasive petroleum coating
	GW	Sandy gravel: abrupt change from clay above, pervasive petroleum coating, scattered product blebs

Notes: Groundwater encountered at 6-8 feet
Water sample collected, strong HC odor, scattered product wisps and films, no product layer developed

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UPRR Ogden Railyard
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LOG OF BORINGS 38-B5 AND 38-B6
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B7

DATE DRILLED: 10/14/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	14	210	0	0	0
2-6	19	31	0	0	1

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
	Concrete
CL	Silty clay: weak-moderate diesel odor, no staining, underlies sandy gravel fill (?)
SWGW	Sandy gravel: weak diesel odor, no staining, natural colors, wet

Notes: Groundwater encountered at 6-8 feet
Water sample collected, weak HC odor,
no product or sheen.

BORING 38-B8

DATE DRILLED: 10/14/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	44	370	0	0	0
2-6	114	370	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
	Concrete
CL	Silty clay: weak-moderate diesel odor, no staining, probable fill (?)
SWGW	Sandy gravel: moderate diesel odor, no staining, natural colors, wet

Notes: Groundwater encountered at 6-8 feet
Water sample collected, trace odor,
no sheen.

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UPRR Ogden Railyard
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LOG OF BORINGS 38-B7 AND 38-B8
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B10

DATE DRILLED: 10/14/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	0	ND	0	0	0
2-8	0	ND	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Track ballast and gravel
	SP	Sand: mg-cg, no HC odor or stain, well sorted
	SW	Gravelly sand: wet, no HC odor

Notes: Groundwater encountered at 6-8 feet
Water sample collected, trace odor,

BORING 38-B9

DATE DRILLED: 10/14/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	9		0	0	0
2-8	5	190	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
		Concrete
	SP	Sand: mg-vcg, trace HC odor, no staining,
	CL	Silty clay: dark brown-gray, wet, trace HC odor

Notes: Groundwater encountered at 6-8 feet
Water sample collected, trace odor,
dark gray color

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 38-B10 AND 38-B9
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B11

DATE DRILLED: 10/15/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0		280	0	0	0
2-2		4200	0	0	0
3-8		3200	1	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Clayey gravel: black, possible old HC residue, no HC odor
	CL	Silty clay: weak to moderate diesel odor, grades sand below
	GW	Sandy gravel: wet, product saturation

Notes: Groundwater encountered at 6-8 feet
No water sample collected, product present.
Piezometer constructed.

BORING 38-B12

DATE DRILLED: 11/6/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-7	178	2800	0	0	0

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Sandy gravel fill
	SW	Sand and fine gravel: moderate diesel odor, moist to wet, diesel product on cuttings, lithology uncertain at upper levels

Notes: Groundwater encountered at 6-8 feet
No water sample collected, free product present.
Piezometer constructed - screen 4-14 feet.

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UPRR Ogden Railyard
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LOG OF BORINGS 38-B11 AND 38-B12
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B13

DATE DRILLED: 3/10/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: No samples collected, logged solely from drilling characteristics
10									
15									

Notes: Groundwater encountered at 6-8 feet
Water sample collected for vinyl chloride only
Good water return

BORING 38-B14

DATE DRILLED: 3/10/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel with possible clay: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 6-8 feet
Water sample collected for vinyl chloride only
Slow water return

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 38-B13 AND 38-B14
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B15

DATE DRILLED: 3/10/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 6-8 feet
Water sample collected for vinyl chloride only
Good water return

BORING 38-B15

DATE DRILLED: 3/10/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 6-8 feet
Water sample collected for vinyl chloride only
Good water return

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UPRR Ogden Railyard
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LOG OF BORINGS 38-B15 AND 38-B16
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B17

DATE DRILLED: 3/10/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel with possible clay: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 6-8 feet
Water sample collected for vinyl chloride only
Slow water return; water has weak HC odor and dark gray-black color.

BORING 38-B18

DATE DRILLED: 3/10/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel with possible clay: logged solely from drilling characteristics, no samples collected
10									
15									

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 38-B17 AND 38-B18
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B19

DATE DRILLED: 3/10/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel with possible clay: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 6-7 feet
Water sample collected for vinyl chloride and 8260
Good water return; water has moderate diesel odor

BORING 38-B20

DATE DRILLED: 3/12/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel with possible clay: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at 6-7 feet
Water sample collected for vinyl chloride, 8260, 8270, DRO.
Good water return; water has moderate diesel odor

LAIDLAW ENVIRONMENTAL SERVICES Inc. UPRR Ogden Railyard Proj. 792904	LOG OF BORINGS 38-B19 AND 38-B20 Ogden Railyard Ogden, UT	GEOPROBE BORING

BORING 38-B21

DATE DRILLED: 3/16/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected Notes: Groundwater encountered at 5-7 feet Water sample collected for vinyl chloride *Good water return; water has strong diesel odor, sheen and product blebs.* Piezometer constructed, screened from 3-13 feet.
10									
15									

BORING 38-B22

DATE DRILLED: 3/16/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected Notes: Groundwater encountered at about 4-5 feet No water sample, product encountered-diesel odor, Water has strong diesel odor and sheen, abundant product blebs. Piezometer constructed, screened from 3-13 feet
10									
15									

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 38-B21 AND 38-B22
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B23

DATE DRILLED: 3/16/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 4 feet
No water sample, black product encountered, old diesel odor
Piezometer constructed, screened from 3-13 feet

BORING 38-B24

DATE DRILLED: 3/16/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 4 feet
No water sample, product encountered-diesel odor, Water has strong diesel odor and sheen, abundant product blebs.
Piezometer constructed, screened from 3-13 feet

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 38-B23 AND 38-B24
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B25

DATE DRILLED: 3/16/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected.
10									Notes: Groundwater encountered at about 4-5 feet No water sample, product layer encountered-diesel odor, Water has strong diesel odor and sheen, abundant product blebs. Piezometer constructed, screened from 3-13 feet
15									

BORING 38-B26

DATE DRILLED: 3/16/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel with possible clay: logged solely from drilling characteristics, no samples collected
10									Notes: Groundwater encountered at about 4-5 feet No water sample, product layer encountered-diesel odor, Water has strong diesel odor and sheen, abundant product blebs. Water has very slow return rate. Piezometer constructed, screened from 3-13 feet
15									

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 38-B25 AND 38-B26
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B27

DATE DRILLED: 3/16/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel, minor clay: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 8 feet
Water sample collected for 8260
Good water return; water has sheen and weak product odor

BORING 38-B28

DATE DRILLED: 3/16/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characteristics, no samples collected
10									
15									

Notes: Groundwater encountered at about 4-5 feet
No water sample, product layer encountered-diesel odor,
Water has strong diesel odor and sheen, abundant product blebs.
Piezometer constructed, screened from 3-13 feet

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 38-B27 AND 38-B28
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B29

DATE DRILLED: 3/17/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characterisitcs, no samples collected
10									
15									

Notes: Groundwater encountered at about 5-6 feet
Water sample has moderate-strong odor, sheen, good return. Sampled for 8260

BORING 38-B30

DATE DRILLED: 3/17/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characterisitcs, no samples collected
10									
15									

Notes: Groundwater encountered at about 6 feet
Water sample collected for 8260
Good water return; water has sheen and strong product odor

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 38-B29 AND 38-B30
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B31

DATE DRILLED: 3/17/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel: logged solely from drilling characterisitcs, no samples collected
10									
15									

Notes: Groundwater encountered at about 5-8 feet
Water sample collected for 8260 and vinyl chloride
Good water return; water has sheen and strong product odor

BORING 38-B32

DATE DRILLED: 5/19/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium with possible clayey matrix above 10 feet, log derived solely from drilling characteristics
10									
15									

Notes: Poor recovery of groundwater until screen set at 12-14 feet, trace odor.
~~Water sample collected for 8260.~~

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 38-B31 AND 38-B32
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 38-B33

DATE DRILLED: 5/19/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium with possible clayey matrix above 10 feet, log derived solely from drilling characteristics
10									
15									

Notes: Good recovery of groundwater, screen set at 9-13 feet.
Water sample collected for 8260.
Good water return, no odor

BORING 38-B34

DATE DRILLED: 5/19/98

DEPTH IN FEET	SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES	SYMBOLS	DESCRIPTION
5									Sand and sandy gravel alluvium with possible clayey matrix above 10 feet, log derived solely from drilling characteristics
10									
15									

Notes: Good recovery of groundwater, screen set at 9-13 feet.
Water sample collected for 8260.
Good water return, moderate diesel odor and sheen

LAIDLAW ENVIRONMENTAL SERVICES Inc. UPRR Ogden Railyard Proj. 792904	LOG OF BORINGS 38-B33 AND 38-B34 Ogden Railyard Ogden, UT	GEOPROBE BORING

BORING SPRR3-B1

DATE DRILLED: 10/10/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	12	0		
2-2	211	15	0		
3-7	344	32	0		

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Sandy gravel fill: no HC odor or staining
ML	Clayey silt and vfg sand: natural color, weak to moderate gasoline odor, perched water above thin clay seam
SWGW	Sandy gravel: grades from finer sand above, natural color, moderate-strong gasoline odor, wet

Notes: Groundwater encountered at about 8 feet.
No water sample collected, gasoline product in boring.
Piezometer constructed.

BORING SPRR3-B2

DATE DRILLED: 10/10/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	3	8	0		
2-7	212	89	0		

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
	Asphalt pavement, no sample
ML	Silt with natural organic stringers: brown to black, no HC odor or staining
SWGW	Sandy gravel: probably gradational from above, no stain, moderate gasoline odor, wet at approx. 8 feet

Notes: Groundwater encountered at about 8 feet.
Water sample collected, moderate gasoline odor, sheen.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 782904

LOG OF BORINGS SPRR3-B1 AND SPRR3-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING SPRR3-B3

DATE DRILLED: 10/10/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES
1-2	14	69	0			■
2-7	317	100	0			■

DEPTH IN FEET: 5, 10, 15

SYMBOLS		DESCRIPTION
		Asphalt pavement, no sample
	ML	Silt: well sorted, trace gasoline odor
	SWGW	Sandy gravel: probably gradational from above, no stain, moderate gasoline odor, wet at approx. 8 feet

Notes: Groundwater encountered at about 8 feet.
Water sample collected, moderate gasoline odor, sheen and scattered product wisps

BORING SPRR3-B4

DATE DRILLED: 3/17/98

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS	SAMPLES

DEPTH IN FEET: 5, 10, 15

SYMBOLS		DESCRIPTION
		Sandy gravel and sand: probably similar alluvium as SPRR3-B3, log derived solely from drilling characteristics, no soil sample collected

Notes: Groundwater encountered at about 8 feet.
Water has strong gasoline odor, sheen, no measurable product layer when drilled
Water analyzed for 8260.

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS SPRR3-B3 AND SPRR3-B4
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING 2PRR5-B1

DATE DRILLED: 10/10/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	ND	0		
2-2	2	ND	0		
3-7	1200	ND	0		

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Road gravel fill: gravel and sand
	ML	Silt, minor clay and vfg sand: natural color, no odor or HC staining
	SP	Sand: increasing size fraction at depth, grades from above, natural color, no odor or HC stain
	GW	Sandy gravel: grades from finer sand above, natural color, moderate-strong gasoline odor, wet

Notes: Groundwater encountered at about 8 feet.
Water sample collected, moderate gasoline odor

BORING SPRR5-B2

DATE DRILLED: 10/10/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-0	0	9.2	0		
2-2	53	710	0		
3-7	>2000	78	0		

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS		DESCRIPTION
	FILL	Road gravel fill: gravel and sand
	ML	Silt: natural color, moderate gasoline odor, no HC stain
	SP	Sand and silt: increasing size fraction at depth, grades from above, natural color, strong gasoline odor
	GW	Sandy gravel: grades from finer sand above, natural color, moderate-strong gasoline odor, wet

Notes: Groundwater encountered at about 8 feet.
Water sample collected, trace gasoline odor

LAIDLAW ENVIRONMENTAL SERVICES Inc.
UPRR Ogden Railyard
Proj. 792904

LOG OF BORINGS 2PRR5-B1 AND SPRR5-B2
Ogden Railyard
Ogden, UT

GEOPROBE BORING

BORING SPRR5-B3

DATE DRILLED: 10/10/97

SAMPLE NUMBER	PID (ppm)	TPH (ppm)	VOCs	PAHs	METALS
1-2	9	7.5	0		
2-7	4	3.7	0		

DEPTH IN FEET: 5, 10, 15

SAMPLES

SYMBOLS	DESCRIPTION
FILL	Road gravel fill: gravel and sand, no sample
SM	Silt and vfg sand: trace gasoline odor, no HC stain, natural color
SP	Silty sand grading to fg sand: no HC odor or stain, becomes wet about 8 feet

Notes: Groundwater encountered at about 8 feet.
Water sample collected, no gasoline odor

LAIDLAW ENVIRONMENTAL SERVICES Inc. UPRR Ogden Railyard Proj. 792904	LOG OF BORING SPRR5-B3 Ogden Railyard Ogden, UT	GEOPROBE BORING

APPENDIX B

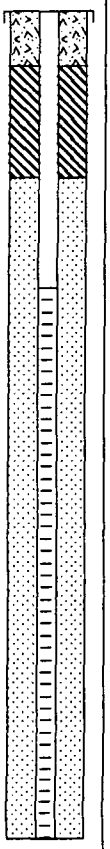
LOG

BORING NO. AOI-13

WELL NO. 13-MW1

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/6/98	DATE COMP: 6/6/98	SURF. EL:4331.154-Ref	WELL TD: 15.0
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP): 10.83

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Grade level completion - drive-over cap			
		SW	Sand and gravel: minor sporadic clay content, no HC odor or stain, *becomes wet below 7-8 feet (logged from auger flights)*			
			Top screen - 4326.15			
	10			0	13-MW1-8	ND DRO
			Bottom screen - 4316.15			
	20					

▼ -DEPTH TO FREE PRODUCT

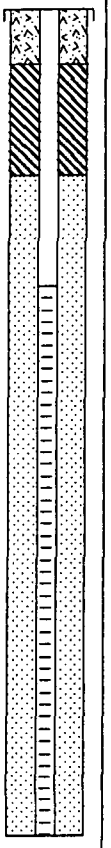
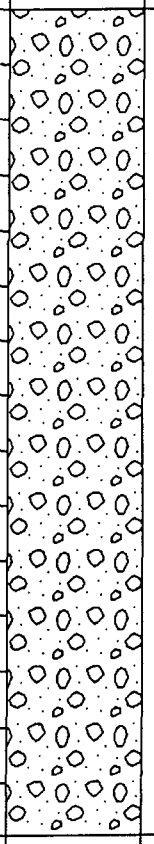
LOG

BORING NO. AOI-13

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

WELL NO. 13-MW2

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/6/98	DATE COMP: 6/6/98	SURF. EL:4331.266-Ref WELL TD: 15.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 10.64

WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				Grade level completion - drive-over cap			
			SW	Sand and gravel: minor sporadic clay content, no HC odor or stain, becomes wet below 7-8 feet (logged from auger flights) top screen - 4326.27 bottom screen - 4316.27	0	13-MW2-8	ND DRO
	10						
	20						

▼ -DEPTH TO FREE PRODUCT

WELL LOG

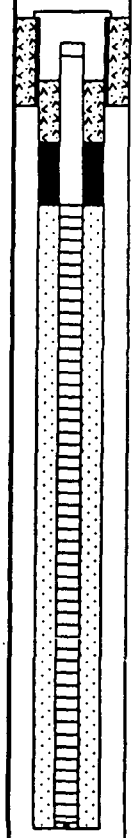
USPCI

Remedial Services

A01-13

BORING NO. RIV-MW-16

CLIENT: UNION PACIFIC RAILROAD			JOB NUMBER: 96120
PROJECT: RIVERDALE YARD		LOCATION: RIVERDALE UT.	
DRILLED BY: P. C. EXPLOR.	DRILLER: TRENT JENSEN		METHOD: HOLLOW-STEM AUGER
DATE START: 11/3/90	DATE COMP: 11/3/90	SURF. EL:4333.68 MSL	TD: 15.0' BGS
LOGGED BY: SCOTT SCHULEIN	APPROVED BY:		DEPTH TO WATER: 9.63

WELL COMP	DEPTH (ft)	DESCRIPTION	GRAPHIC LOG USCS CODE	OVM	SAMPLE NUMBER	TPH ppm
	0	0.0 to 0.5 ASPHALT.	AS	ND		
		0.5 TO 3.0 SANDY GRAVELS, BROWN, CLEAN FILL.				
		3.0 TO 10.0 SANDY GRAVEL, GRAY, MOIST.		ND		
	5		GM			
		DEPTH TO WATER 11/6/90		53		
	10	10.0 TO 15.0 SANDY GRAVEL, HYDROCARBON SCHEEN ON THE SAMPLES, WET, GRAY.			MW-16A	307
	15			228		
		THE COMPLETED DEPTH OF THIS WELL IS 13.0 FEET DUE TO THE FLOWING SANDS.				
	20					

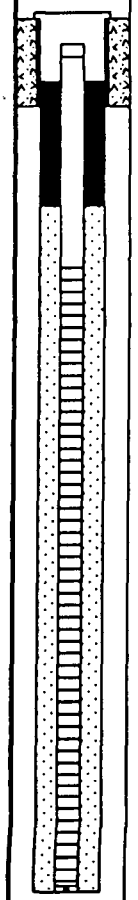
WELL LOG

USPCI
Remedial Services

A01-13

BORING NO. RIV-MW-17

CLIENT: UP RAILROAD			JOB NUMBER: 96120
PROJECT: RIVERDALE YARD		LOCATION: RIVERDALE UT.	
DRILLED BY: P. C. EXPLOR.	DRILLER: TRENT JENSEN		METHOD: HOLLOW-STEM AUGER
DATE START: 11/4/90	DATE COMP: 11/4/90	SURF. EL:4333.48 MSL	TD: 15.0' BGS
LOGGED BY: SCOTT SCHULEIN	APPROVED BY:		DEPTH TO WATER: 9.52



WELL COMP	DEPTH (ft)	DESCRIPTION	GRAPHIC LOG USCS CODE	OVM	SAMPLE NUMBER	TPH ppm
	0	0.0 to 0.5 ASPHALT.	AS			
		0.5 TO 6.5 SANDY GRAVELS, BROWN, CLEAN FILL.	SP	ND		
	5					
		6.5 TO 10.0 SANDY GRAVEL, SOME CLAY, POORLY SORTED, SLIGHT HYDROCARBON ODOR, GRAY.			MW-17A	67
		DEPTH TO WATER 11/6/90				
	10	10.0 TO 15.0 CLAYEY SAND, FINE GRAINED, STRONG HYDROCARBON ODOR, GRAY, SILTY CLAY.	OL	24	MW-17B COMPOSIT	66
	15	THE COMPLETED DEPTH OF THIS WELL IS 14.0 FEET DUE TO THE FLOWING SANDS.				
	20					

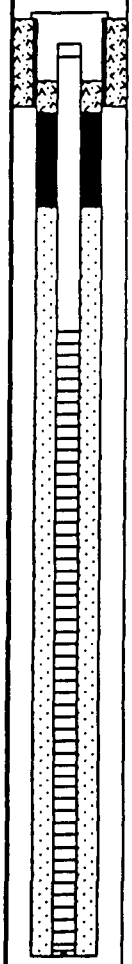
WELL LOG

USPCI
Remedial Services

A01-13

BORING NO. RIV-MW-18

CLIENT: UP RAILROAD			JOB NUMBER: 96120
PROJECT: RIVERDALE YARD		LOCATION: OGDEN/RIVERDALE, UT	
DRILLED BY: P. C. EXPLORATION	DRILLER: TRENT JENSEN		METHOD: HOLLOW-STEM AUGER
DATE START: 11/5/90	DATE COMP: 11/5/90	SURF. EL:4333.25 MSL	TD: 15.0' BGS
LOGGED BY: SCOTT SCHULEIN	APPROVED BY:		DEPTH TO WATER: 9.59



WELL COMP	DEPTH (ft)	DESCRIPTION	GRAPHIC LOG USCS CODE	OVM	SAMPLE NUMBER	TPH ppm
	0	0.0 to 0.5 ASPHALT.	AS			
		0.5 TO 2.0 SANDY GRAVELS, BROWN, CLEAN FILL.	SP			
		2.0 TO 4.5 SANDY GRAVEL, POORLY SORTED, GRAY, SLIGHT HYDROCARBON ODOR FROM 4.0 TO 4.5'.	GP			
	5	4.5 TO 12.0 SILTY CLAY SOME SAND, DARK GRAY, HYDROCARBON ODOR.	ML	41	MW-18A	<10
	10	DEPTH TO WATER 11/6/90				
		12.0 TO 15.0 SILTY CLAY, SAND LENSES, GRAY, WET, STRONG HYDROCARBON ODOR.		478	MW-18B	12
	15	THE COMPLETED DEPTH OF THIS WELL IS 15.0 FEET.				
	20					

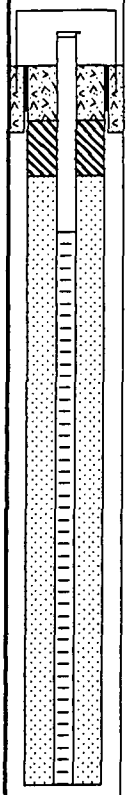
LOG

BORING NO. AOI-2)

WELL NO. 21-MW1

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/5/98	DATE COMP: 6/5/98	SURF. EL:4312.206-Ref WELL TD: 13.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 11.19



WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				Above ground well completion			
			SC	Sand with partial minor clay matrix: sand fg-mg, no odor, natural colors - no staining, wet below 3.5 feet top screen - 4307.31			
	10		SW	Sand and gravel: unconsolidated, natural colors, wet, no HC odor (logged from auger flights) bottom screen - 4297.31	0		
	20						

▼ -DEPTH TO FREE PRODUCT

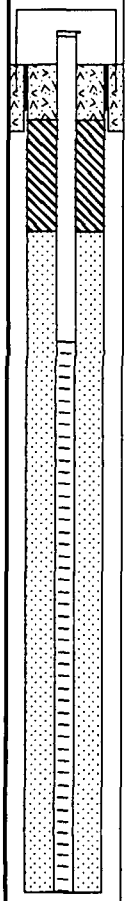
LOG

BORING NO. AOI-22A

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

WELL NO. 22A-MW1

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/2/98	DATE COMP: 6/2/98	SURF. EL:4293.116-Ref	WELL TD: 15.0
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP): 11.86

WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				Above ground well completion			
			SW	Sand & sandy gravel: Unconsolidated sandy alluvial sequences,			
				top screen - 4285.47			
				6-7.5 ft: sand mg-cg, trace HC staining, moderate diesel odor, scattered clayey lens', wet below 7.5 feet	23	MW1-6	ND DRO
			SW	Sand and gravel: medium brown, wet, grades to increasing sand at depth, moderate diesel odor,			
	10				17	MW1-10	76 DRO
				bottom screen - 4275.47			
	20						

▼ =DEPTH TO FREE PRODUCT

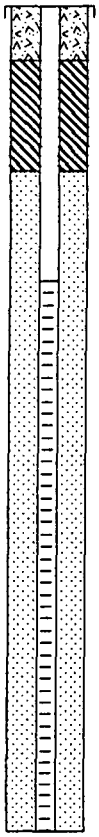
LOG

BORING NO. AOI-22A

WELL NO. 22A-MW2

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/2/98	DATE COMP: 6/2/98	SURF. EL:4289.99-Ref	WELL TD: 15.0
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP): 10.10

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Grade level completion - drive-over cap			
		CL	Silty clay: Dark brown, No HC odor, clat sticky, soft, moist Top screen - 4284.99 7-8.5 ft: Clayey sand and gravel, no odor, dark brown-gray, wet	0	MW2-7	ND DRO
	10	SC	Sand and gravel: Wet, no HC odor, grades from clayey alluvium above Bottom screen - 4274.99	0		
	20					

▼ =DEPTH TO FREE PRODUCT

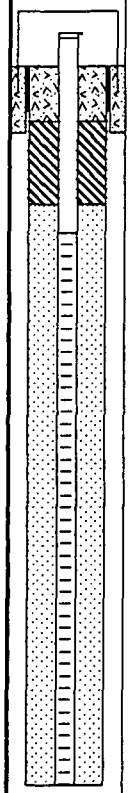
LOG

BORING NO. AOI-22A

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

WELL NO. 22A-MW3

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/3/98	DATE COMP: 6/3/98	SURF. EL:4292.732-Ref WELL TD: 13.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 10.67

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		SC	Sand with minor clayey matrix and silt: pervasive diesel odor below 4 feet Top Screen - 4287.73	78	MW3-5	430 DRO
	10	SW	Sand and gravel: dark brown, wet, pervasive diesel odor Bottom Screen - 4277.73			
	20					

▼ -DEPTH TO FREE PRODUCT

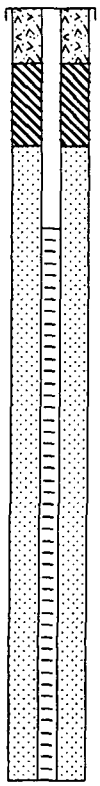
LOG

BORING NO. AOI-22A

WELL NO. 22A-MW4

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/3/98	DATE COMP: 6/3/98	SURF. EL:4287.455-Ref WELL TD: 14.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 7.18

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
		asph.	Grade level completion - drive-over cap			
		SC	Sand with slight to moderate clay matrix: trace diesel odor Top Screen - 4283.46	5	MW4-5	220 DRO
	10	SW	Sand and gravel: Typical coarse alluvium, wet, no HC odor, Bottom Screen - 4273.46			
	20					

▼ =DEPTH TO FREE PRODUCT

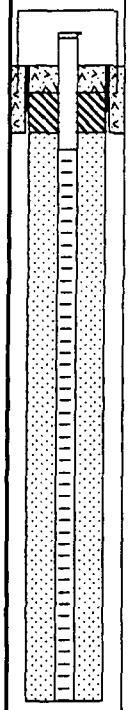
LOG

BORING NO. AOI-26

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

WELL NO. 26-MW1

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/5/98	DATE COMP: 6/5/98	SURF. EL:4303.249	WELL TD: 11.5
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP): 6.83

WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				Above ground well completion			
			SW	Sand and gravel: unconsolidated, natural colors, wet below 2.5 feet, no HC odor or stain Top Screen - 4299.75 Bottom Screen - 4289.75			
	10						
	20						

▼ -DEPTH TO FREE PRODUCT

USPCI

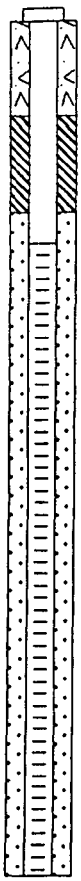
A subsidiary of
Union Pacific Corporation

LOG

A01-26

WELL NO. STMW-1

CLIENT: *Union Pacific Railroad*			JOB NO.: *98437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *HSA*
START DATE: *12/13/94*	COMP. DATE: *12/13/94*	SURF. EL.: *FT.*	TD: *13.5 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
						
		0'-3' Sandy silt, brown, moist, no odor	ML			
		3'-7' Clayey silt w/rock fragments, no odor Water @ 4'-5', sandy, silty	CL			
		No recovery	ML			
		9' Rocks, stream gravel, no odor, wet	GM			
		Total Depth 13.5'				

5
10
15
20

JOB NUMBER: 98437

USPCI LOG

A subsidiary of
Union Pacific Corporation

A01-27

WELL NO. OGP-1

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *HSA*
START DATE: *12/13/94*	COMP. DATE: *12/13/94*	SURF. EL.: *FT.*	TD: *18 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		0'-2' Silty clay to clayey silt, no odor, rootlets, worms, moist River cobble in sample, 50% recovery	CL			
		2'-4' River sandy gravel to gravelly sand, coarse grained sand, no odor, no fines, moist	GW	0 ppm		
		4'-6' Poor recovery, river gravel		0 ppm	OGP-1 @ 3.5'	<100 mg/kg
	5	6'-8' Poor 50% recovery, river gravel				
		7' Sewer odor		5 ppm	OGP-1 @ 7'	<100 mg/kg
		8'-10' Very coarse grained sand w/pebbles, sewer odor, wet, minor fines	SP	3 ppm		
	10	10'-12' Sand w/gravel, sand fine to very coarse grained, gravel to 1"	GW			
		12'-18' No samples, river gravel becomes very large @ 16'-18'				
	15					
		Total Depth 18'				
	20					

JOB NUMBER: 96437

USPCI

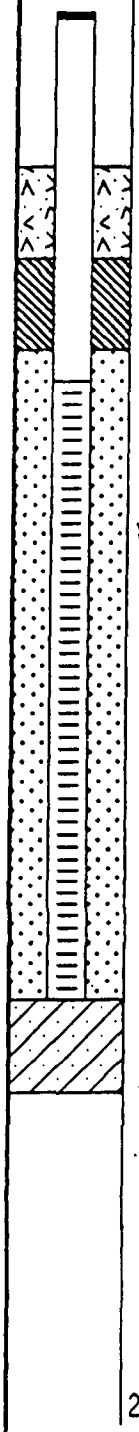
A subsidiary of
Union Pacific Corporation

LOG

A01-30

WELL NO. MW-1

CLIENT: Union Pacific Railroad			JOB NO.: 98120-077
PROJECT: Riverdale, Utah		LOCATION: T 8	
DRILLED BY: Layne	DRILLER: Jerry/Clint	METHOD: 8" HSA	
START DATE: 9-14-93	COMP. DATE: 9-14-93	SURF. EL.: FT. est.	TD: 15.0 FT. BGS
LOGGED BY: Ken Rose			D. T. WATER: 6.0 FT. BGS



DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
	Brown fine to coarse sand w/some gravel and metal debris, dry, no staining	GW			
	Brown, light brown fine to med. sand w/some coarse sand, trace gravel, damp, no odor				
5					
	Water encountered at ~8'				
	Sample from 7' to 8.5' Brown, light brown med. to coarse sand, some fine sand and gravel, wet, no odor or sheen			MW-1 8.0' 1600	
	Cobbles at 9' Brown sand and gravel w/some cobbles, wet, no odor	GP			
10					
	Decreased cobbles at 12' Brown sand w/some gravel, trace cobbles, wet, no odor				
15	Boring completed to 15' Groundwater encountered at ~8' Monitor well installed to 13.5', 10' screen 2 bags of #10-20 silica 1 bag bentonite chips				
20					

JOB NUMBER: 98120-077

USPCI

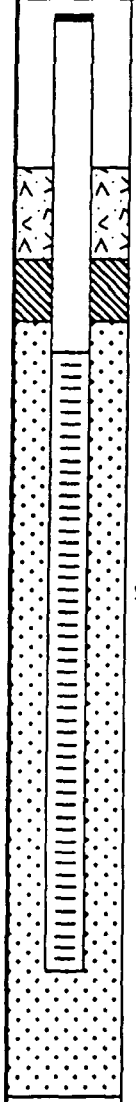
A subsidiary of
Union Pacific Corporation

LOG

A01-30

WELL NO. MW-2

CLIENT: *Union Pacific Railroad*			JOB NO.: *98120-077*
PROJECT: *Riverdale, Utah*		LOCATION: *T 8*	
DRILLED BY: *Layne*	DRILLER: *Jerry*		METHOD: *8" HSA (Mobil B-80)*
START DATE: *9-15-93*	COMP. DATE: *9-15-93*	SURF. EL.: *FT. est.*	TD: *15.0 FT. BGS*
LOGGED BY: *Ken Rose*			D. T. WATER: *7.0 FT. BGS*



WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
		Brown sand and gravel w/some metal debris, trace silt, dry, no odor or staining	GW			
		As above, increased sand at 2'				
	5	Brownish gray (stained) gravel and cobbles w/some sand, v.moist, strong diesel odor (4.5')	GP			
		Encounter groundwater at ~7'				
		As above, wet, strong odor				
	10	Brownish gray gravel and cobbles w/trace sand, wet, slight odor (11')				
		As above				
	15	Boring completed to 15' Groundwater encountered at ~7' Monitor well installed to 13' 10' (0.020") screen 2.5 bags of #10-20 silica 1 bag of bentonite chips Above ground well				
	20					

JOB NUMBER: 98120-077

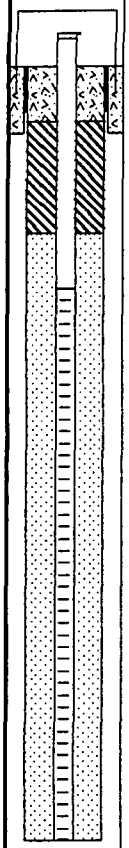
LOG

BORING NO. AOI-30

WELL NO. 30-MW3

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/4/98	DATE COMP: 6/4/98	SURF. EL:4306.122-Ref WELL TD: 14.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 11.8

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		SW	Sand with minor gravel fraction: probable fill, no odor			
		SW	Sand and gravel: unconsolidated sand and gravel and sandy alluvial sequences, pervasive black stain and product blebs below 7 feet. Gravel fraction increases with depth. Top Screen - 4299.76 Bottom Screen - 4289.76	55	30-MW3-6	510 DRO
	10					
	20					

▼ =DEPTH TO FREE PRODUCT

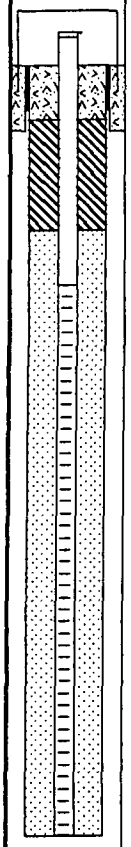
LOG

BORING NO. AOI-30

WELL NO. 30-MW4

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/4/98	DATE COMP: 6/4/98	SURF. EL:4306.489-RefWELL TD: 14.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 11.14



WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		SC	Sand with minor clay matrix: sand fg-mg, well sorted, homogeneous, medium brown, trace diesel odor, wet below 6 feet Top Screen - 4300.34	11	30-MW4-6	ND DRO
	10					
		SW	Sand and gravel: unconsolidated, natural colors, wet, no HC odor Bottom Screen - 4290.34			
	20					

▼ =DEPTH TO FREE PRODUCT

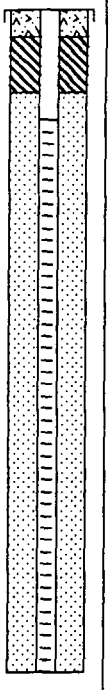
LOG

BORING NO. HOI-30

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

WELL NO. 30-MW5

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/5/98	DATE COMP: 6/5/98	SURF. EL:4301.917-Ref	WELL TD: 12.0
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP): 7.95

WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				Above ground well completion			
	10		SW	Sand and gravel: unconsolidated, pervasive staining and coatings of old petroleum product below 5 feet Top screen - 4300.18 Bottom screen - 4290.18	89		
	20						

▼ -DEPTH TO FREE PRODUCT

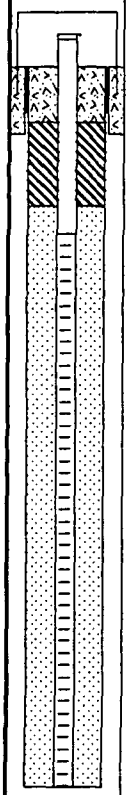
LOG

BORING NO. AOI-30

WELL NO. 30-MW6

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/5/98	DATE COMP: 6/5/98	SURF. EL:4308.593-Ref WELL TD: 13.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 8.81

WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				*Above ground well completion*			
			SW	Sand and gravel: unconsolidated, pervasive HC stain below 2 feet, This well adjacent to 30-MW6D - see MW6D log for further details *Top screen - 4303.41* Bottom screen - 4293.41			
	10						
	20						

▼ =DEPTH TO FREE PRODUCT

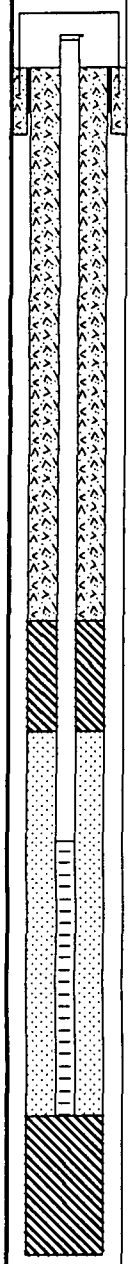
LOG

BORING NO. AOI-30

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

WELL NO. 30-MW6D

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/5/98	DATE COMP: 6/5/98	SURF. EL:4308.652-Ref WELL TD: 19.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 8.05



WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		SW	Sand and gravel: unconsolidated, pervasive HC stain below 1-2 feet, moderate diesel odor			
		SP	Sand with minor gravel fraction: pervasive HC staining and product film, moist to wet with depth	56	MW6D-5	1500 DRO
				82		
	10	SW	▽ Sand and gravel: Pervasive product staining diminishing with depth, wet,			
			12 ft: sand and gravel - lower limit of staining or odor, none below 12 feet	0		
			Top screen - 4292.55			
		SP	Sand: cg-vcg, no stain or odor, wet	2	MW6D-17	ND DRO
		CL	Clay: sharp upper contact, moderately stiff with good plasticity, minor vfg sand and silt content, moist, massive, gray-brown	0		
	20		Bottom screen - 4287.55	0		

▼ =DEPTH TO FREE PRODUCT

WELL LOG

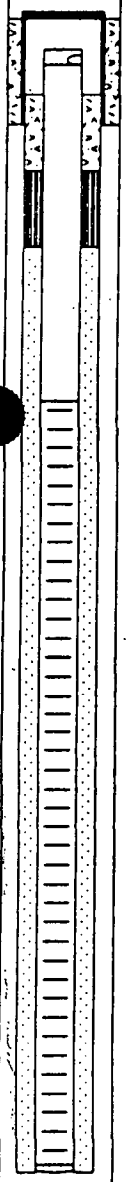
A01-32

USPCI

Remedial Services

BORING NO. RIV-MW-14

CLIENT: UNION PACIFIC RAILROAD			JOB NUMBER: 96120
PROJECT: RIVERDALE YARD		LOCATION: RIVERDALE UT.	
DRILLED BY: P. C. EXPLOR.	DRILLER: TRENT JENSEN		METHOD: HOLLOW-STEM AUGER
DATE START: 11/2/90	DATE COMP: 11/2/90	SURF. EL: 4323.19 MSL	TD: 15.0' BGS
LOGGED BY: SCOTT SCHULEIN	APPROVED BY:		DEPTH TO WATER: 8.84



WELL COMP	DEPTH (ft)	DESCRIPTION	GRAPHIC LOG USCS CODE	OVM	SAMPLE NUMBER	TPH ppm
	0	0.0 to 3.0 FILL, ROAD BASE GRAVELS.	AF	2		
		3.0 TO 5.0 CLAY, GRAY.	ML			
	5	5.0 TO 6.0 SAND, FINE GRAINED, BROWN.	SW	ND	MW-14A	<10
		6.0 TO 15.0 SANDY GRAVELS SOME CLAY, GRAY, WET. WATER LEVEL 11/6/90	GW	15	MW-14B	42
	10					
	15	THE COMPLETED DEPTH OF THIS WELL IS 15.0 FEET.				

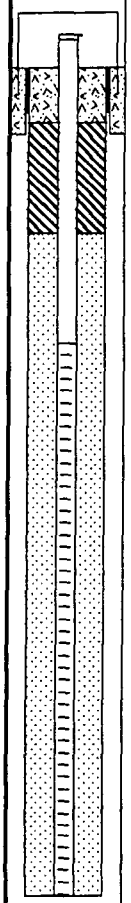
LOG

BORING NO. 40I-34

WELL NO. 34-MW1

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/1/98	DATE COMP: 6/1/98	SURF. EL:4288.388-Ref WELL TD: 15.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 11.72

WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				Above ground well completion			
			SW	Sand and gravel: Entire boring is unconsolidated sandy gravel and sandy alluvial sequences, no odor or staining, natural colors, wet at 7-8 feet Top screen - 4281.24 Bottom screen - 4271.24	0		
	10						
	20						

▼ -DEPTH TO FREE PRODUCT

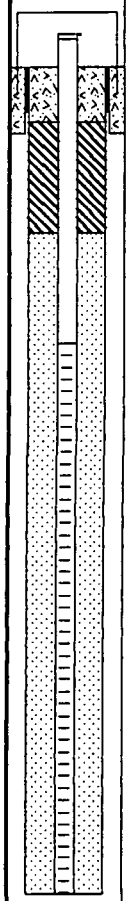
LOG

BORING NO. AOI-34

WELL NO. 34-MW2

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/1/98	DATE COMP: 6/1/98	SURF. EL:4288.496 Ref WELL TD: 15.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 12.84

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		SW	Sand and gravel: Entire boring is unconsolidated sand and gravel and sandy alluvial sequences, no odor or staining, natural colors, wet below 8 feet.			
			Top screen - 4281.24			
	10			0		
		ML	Sandy and silty clay: medium brown, wet, no odor			
			Bottom screen - 4271.24			
	20					

▼ =DEPTH TO FREE PRODUCT

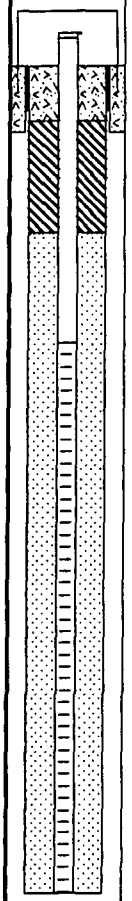
LOG

BORING NO. 701-34

WELL NO. 34-MW3

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/1/98	DATE COMP: 6/1/98	SURF. EL:4287.920 Ref WELL TD: 15.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 11.4

WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				Above ground well completion			
			SW	Sand and gravel: Entire boring is sand and gravel - most of sand and gravel is washed fill installed along nearby sanitary sewer, no HC odor or staining, all natural colors, wet below 7-8 feet.	0		
				Top screen - 4281.26			
	10			▽			
				Bottom screen - 4271.26			
	20						

▼ -DEPTH TO FREE PRODUCT

LOG

BORING NO. 701-34

WELL NO. 34-MW3D

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/1/98	DATE COMP: 6/1/98	SURF. EL:4287.949 Ref WELL TD: 25.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP):

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		SW	Sand and gravel: Alluvium - unconsolidated sand with gravel fractions ranging to pebbles and fine cobbles, becomes wet at 8 feet, *no sample spoons above 10 feet. Cuttings have no odor or* staining, natural colors, composition is mostly silica-base lithic clasts to quartzose grains, clay and silt fractions minor or none throughout sand and gravel sequences. Numerous gradational sequences. Alluvium typical of sequence previously drilled in railyard	0		
	10	SW	10-11.5: sand and gravel grading down to mg-vcg sand, wet, no odor	0		
		SW	15-16.5: coarse gravel fraction grades down to fine gravel fraction, pebbles subround to angular.	0		
	20	SW	Top screen - 4265.97	0		
		CL	Clayey sand grading down to silty clay: gradational from sandy gravel above. Clay medium brown, soft, wet, no odor			
		SP	Sand: well sorted gradational sequence ranging from vfg to cg, wet, no odor	0	MW3D-24	NO EXC
		CL	Bottom screen - 4260.97 ▼ =DEPTH TO FREE PRODUCT	0		VOCS

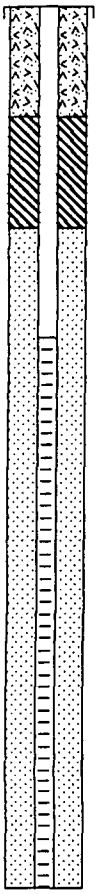
LOG

BORING NO.

WELL NO. 34-MW4

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/1/98	DATE COMP: 6/1/98	SURF. EL:4288.722 Ref WELL TD: 16.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 9.99



WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Grade level well completion - drive-over cap			
		asph	Asphalt pavement			
		SW	Sand: Scattered gravel fractions, sand well sorted, fg-cg, becomes wet at 8 feet, no odor or stain Top screen - 4282.72	0		
	10					
		SP	Sand and gravel: Typical coarse alluvial deposit, natural colors, no odor or staining,			
		CL	Sandy clay: medium brown, wet, loose, no odor, sand vfg-fg Bottom screen - 4272.72			
	20					

▼ =DEPTH TO FREE PRODUCT

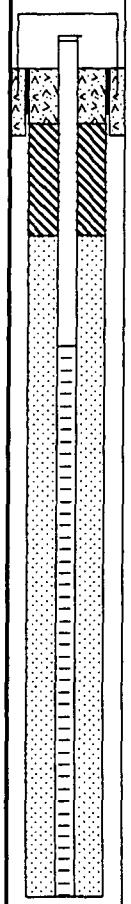
LOG

BORING NO. AOI-34

WELL NO. 34-MW5

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/2/98	DATE COMP: 6/2/98	SURF. EL:4291.68 Ref / WELL TD: 15.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 11.76

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			*Above ground well completion*			
		SW	Sand and gravel: Typical sandy alluvial sequences, no odor or staining, natural colors, wet at 7.5 feet Top screen - 4284.21 7-7.5 ft: Sand and gravel,natural colors, wet, no odor Bottom screen - 4274.21	0		
	10					
	20					

▼ =DEPTH TO FREE PRODUCT

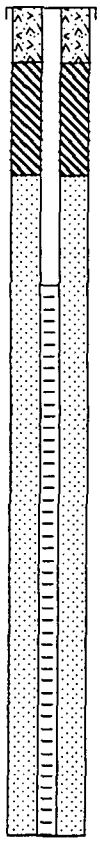
LOG

BORING NO. AOI-34

WELL NO. 34-MW6

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/2/98	DATE COMP: 6/2/98	SURF. EL:4289.779 Ref WELL TD: 15.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 9.08

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Grade level well completion - drive-over cap			
	10	SW	Sand and gravel: Typical coarse alluvial deposit, no odor or staining, natural colors, wet below 8 feet Top screen - 4284.78 6-7.5 ft: fg-mg sand, well sorted, moist, no odor or staining Bottom screen - 4274.78	0	34-MW6-6	ND DRO
	20					

▼ =DEPTH TO FREE PRODUCT

A01-36

LOG OF TEST BORING NO. MW-1

PROJECT Ogden City Corp./Phase II E.A.
Ogden, Utah

JOB NO. E92-2119 DATE 04-09-92

RIG TYPE CME-75
BORING TYPE 4 1/4" I.D. Hollow Stem Auger
SURFACE ELEV.
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	HNU reading	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								SM	moist medium dense	SILTY SAND with some fine gravel at surface to 6"; fine sand, nonplastic, brown
5				C	19		0			
								SP	saturated loose	GRAVELLY SAND with trace silt; fine to coarse sand, subround, brown
10										
15										Stopped drilling at 13' Set 2" Schedule 40 PVC 0.020" slotted PVC pipe from 13' to 3' Set 2" Schedule 40 blank PVC pipe from 3' to surface 10-20 sand, 13' to 2' No. 8 Enviroplug bentonite 2' to 1' Sakrete 1' to surface
20										
25										

GROUNDWATER

DEPTH	HOUR	DATE
5.0		4-9-92

SAMPLE TYPE

A - Auger cuttings.
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
D - 3 1/4" O.D. 2.42" I.D. tube sample.
C - California split spoon sample

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX - ALBUQUERQUE - SANTA FE
SALT LAKE CITY - EL PASO - TUCSON - RENO/SPARKS

A01-36

LOG OF TEST BORING NO. MW-2

PROJECT Ogden City Corp./Phase II E.A.
Ogden, Utah

JOB NO. E92-2119 DATE 04-09-92

RIG TYPE CME-75
BORING TYPE 4 1/4" I.D. Hollow Stem Auger
SURFACE ELEV.
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	HNU reading	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								SM	moist medium dense	**SILTY SAND** with some fine gravel at surface to 6"; fine sand, nonplastic, coal dust at surface to approximately 3", brown
5			■	C	4		0			
			■					SP	moist loose	**GRAVELLY SAND** with trace silt; fine to coarse sand, brown
▽									saturated	
10							0			
15							0			
20										Stopped drilling at 15' Set 2" Schedule 40 PVC 0.020" slotted PVC pipe from 15' to 5' Set 2" Schedule 40 blank PVC pipe from 5' to surface 10-20 sand, 15' to 4' No. 8 Enviroplug bentonite 4' to 2' Sakrete 2' to surface
25										

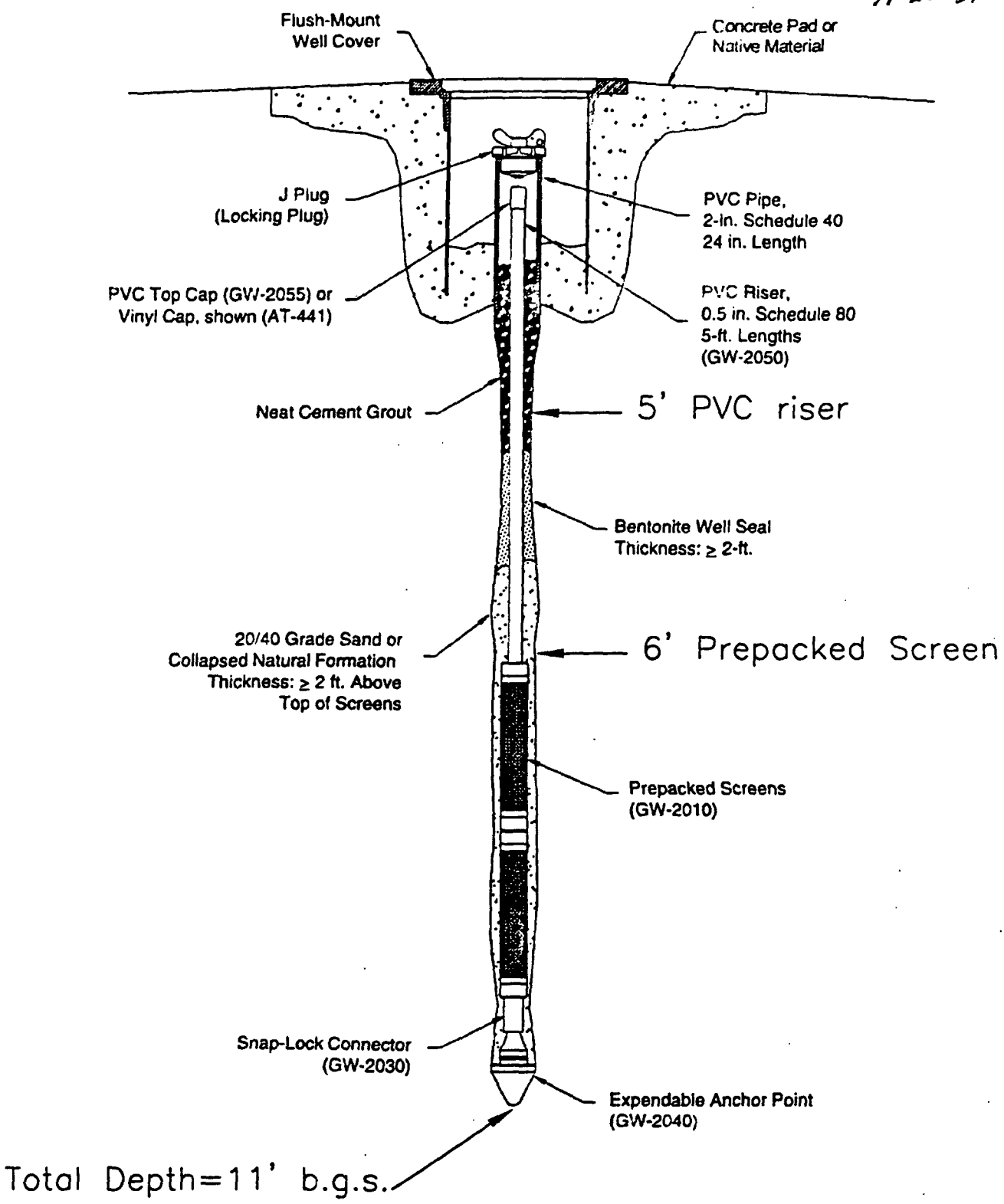
GROUNDWATER

	DEPTH	HOUR	DATE
▽	8.0		4-9-92
▽			

SAMPLE TYPE
A - Auger cuttings.
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
D - 3 1/4" O.D. 2.42" I.D. tube sample.
C - California split spoon sample

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · ALBUQUERQUE · SANTA FE
SALT LAKE CITY · EL PASO · TUCSON · RENO/SPARKS

AOI-36



Analytical Results Report

UOS Job No. 75-70901

Weber County Transfer Station
Ogden, Utah

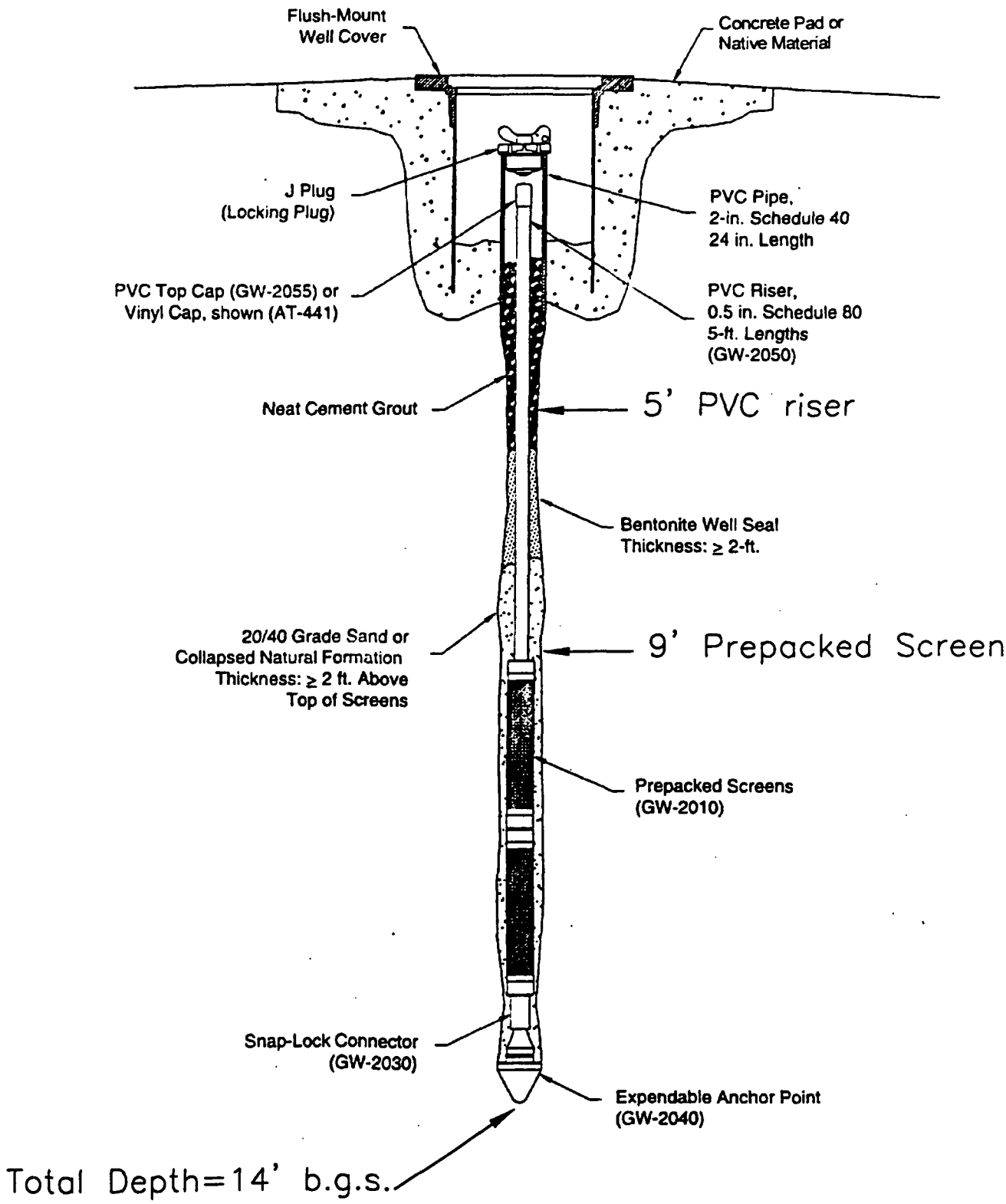
Well Construction – MW3,4,5&7

Figure 5

February 1998

URS OPERATING SERVICES

AOI-36



Analytical Results Report

UOS Job No. 75-70901

Weber County Transfer Station
Ogden, Utah

Well Construction – MW6

Figure 4

February 1998

URS OPERATING SERVICES

USPCI

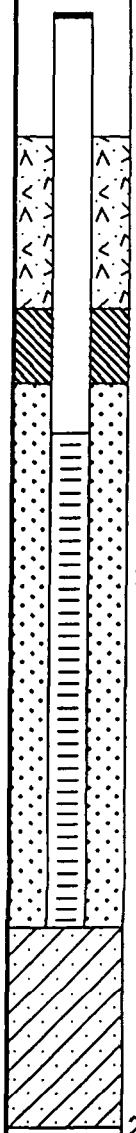
A subsidiary of
Union Pacific Corporation

LOG

A01-37

WELL NO. MW-1

CLIENT: *Union Pacific Railroad*			JOB NO.: *98120-077*
PROJECT: *Riverdale, Utah*		LOCATION: *T 6&9*	
DRILLED BY: *Layne*	DRILLER: *Jerry/Clint*		METHOD: *8" HSA*
START DATE: *9-13-93*	COMP. DATE: *9-14-93*	SURF. EL.: *FT. est.*	TD: *20.0 FT. BGS*
LOGGED BY: *Ken Rose*			D. T. WATER: *9.0 FT. BGS*



DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
	Light gray gravel w/some sand and cobbles Dry, some metal debris Dark brown gravel w/coarse sand and gravel Some cobbles, damp, no odor	GW			
5	As above, becomes moist at 6' Slight diesel odor at 7'				
	Wet at ~9', strong diesel odor, visible sheen				
10	Cobbles from 9.5' to 11.5'	GP			
	Dark grayish brown gravel w/some coarse sand and cobbles, trace fine to med.sand, wet, slight odor	GW			
15	As above, wet, slight odor				
20	Boring completed to 20.0' BGS Groundwater encountered at ~9' Well installed to 18', 10' (0.02") screen 2.5 bags of #10-20 silica 1 bucket bentonite chips				
25					

JOB NUMBER: 98120-077

USPCI

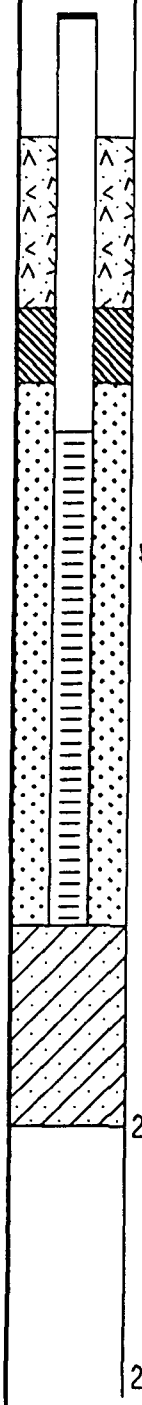
A subsidiary of
Union Pacific Corporation

LOG

A01-37

WELL NO. MW-2

CLIENT: *Union Pacific Railroad*			JOB NO.: *98120-077*
PROJECT: *Riverdale, Utah*		LOCATION: *T 8&9*	
DRILLED BY: *Layne*	DRILLER: *Jerry/Clint*	METHOD: *8" HSA*	
START DATE: *9-14-93*	COMP. DATE: *9-14-93*	SURF. EL.: *FT. est.*	TD: *20.0 FT. BGS*
LOGGED BY: *Ken Rose*			D. T. WATER: *8.5 FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
	5 10 15 20 25	Light gray gravel and cobbles, some wood and metal debris, dry, no staining Brown coarse sandy gravel with some cobbles, moist, no odor Increased cobbles encountered from 7.5' to 10' Wet at 8.5', strong diesel odor Dark grayish brown coarse sand and gravel w/some cobbles, wet, strong odor Gray med. to coarse sand w/some gravel, trace cobbles, wet, slight odor (15'-18') Increased cobbles at 18', wet, slight odor As above, wet, slight odor Boring completed to 20' Groundwater encountered at ~8.5' Monitor well installed to 18' (0.020") Screen, 10', 3 bags of #10-20 silica sand 1 bag bentonite chips Well construction identical to MW-1	GP			

JOB NUMBER: 98120-077

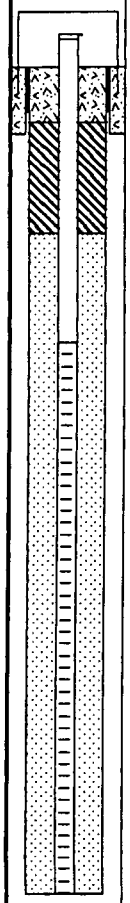
LOG

BORING NO. AOI-37

WELL NO. 37-MW3

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/6/98	DATE COMP: 6/6/98	SURF. EL:4345.31 Ref	WELL TD: 15.0
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP): 11.45

WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				Above ground well completion			
			SW	Sand and gravel: Entire boring is sand and gravel, no HC odor or staining, all natural colors, wet below 7-8 feet.	0		
				Top screen - 4338.51			
	10			▽			
				Bottom screen - 4328.51			
	20			▼ -DEPTH TO FREE PRODUCT			

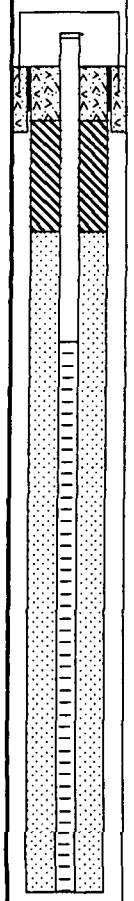
LOG

BORING NO. AOI-37

WELL NO. 37-MW4

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/6/98	DATE COMP: 6/6/98	SURF. EL:4344.052 Ref WELL TD: 15.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 12.33

WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				Above ground well completion			
			SW	Sand: Scattered gravel-rich beds, sand mg-vcg, no HC odor or staining, all natural colors, wet below 6-7 feet.	0		
				Top screen - 4336.19			
				9 ft: gravel increases from 9-11 feet			
	10			minor clay in matrix below 11 feet			
				▽			
				Bottom screen - 4326.19			
	20						

▼ =DEPTH TO FREE PRODUCT

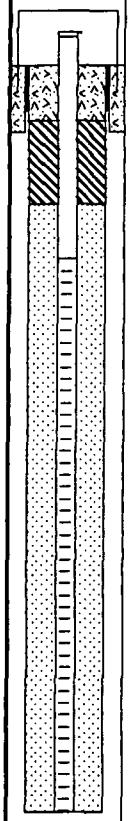
LOG

BORING NO. AOI-38

WELL NO. 38-MW1

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/2/98	DATE COMP: 6/2/98	SURF. EL:4293.101 Ref	WELL TD: 13.5
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP):

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		CL	Clayey sand Top screen - 4287.45			
		SP	Sand with fine gravel: dark brown, moderate diesel odor			
	10	SW	Sand and gravel: moderate to strong diesel odor, dark brown-gray coating, product blebs and sheen on soil and pebbles Bottom screen - 4277.45			
	20					

▼ -DEPTH TO FREE PRODUCT

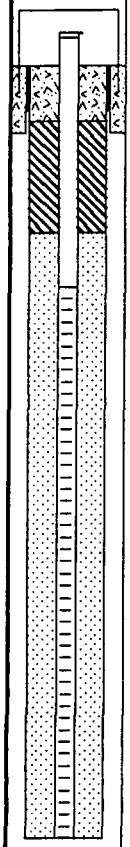
LOG

BORING NO. AOI-38

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

WELL NO. 38-MW2

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/2/98	DATE COMP: 6/2/98	SURF. EL:4293.965 Ref	WELL TD: 14.0
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP): 9.49

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		CL	Sand and clay: medium brown, no HC odor, moist Top screen - 4287.61			
		SC	Sand and gravel: scattered minor clay, no HC odor, wet, natural colors with possible staining on fines	0		
	10			3	MW2-10	ND DRO
			Bottom screen - 4277.61			
	20					

▼ -DEPTH TO FREE PRODUCT

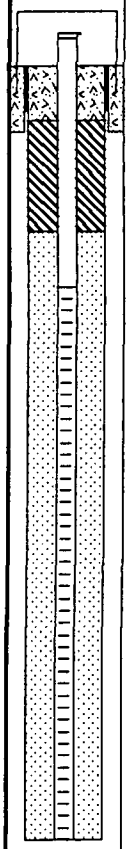
LOG

BORING NO. FOI-38

WELL NO. 38-MW3

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/2/98	DATE COMP: 6/2/98	SURF. EL:4294.359 Ref WELL TD: 14.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 8.93



WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		CL	Silty clay and clay: scattered vfg sand, no HC odor, dark brown with black mottles, moist-wet at 7 feet Top screen - 4287.83	0	38-MW3-8	ND DRO
	10	SW	Sand and gravel: wet, no HC odor, natural colors, strong water flow below 11 feet Bottom screen - 4277.83			
	20					

▼ =DEPTH TO FREE PRODUCT

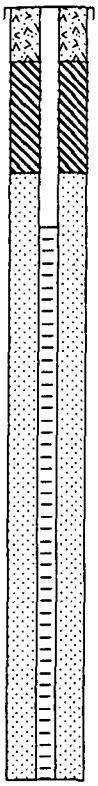
LOG

BORING NO. AOI-38

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

WELL NO. 38-MW4

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/2/98	DATE COMP: 6/2/98	SURF. EL:4290.542	WELL TD: 14.0
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP): 7.97



WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Grade level wellhead with drive-over cap			
		CL	Clay to sandy clay with gravel: no HC odor, medium brown Top screen - 4286.54			
	10	SW	Sand and gravel: wet, no HC odor, natural colors, strong water flow below 10 feet Bottom screen - 4276.54	0	MW4-10	ND DRO
	20					

▼ =DEPTH TO FREE PRODUCT

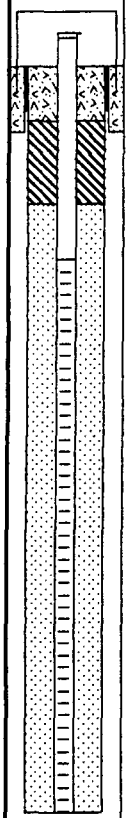
LOG

BORING NO. AOI-38

WELL NO. 38-MW5

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/2/98	DATE COMP: 6/2/98	SURF. EL:4293.167 Ref / WELL TD: 13.5
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 9.76



WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		CL	Clayey sand and silty clay: trace HC odor, medium to dark brown, wet below 7-8 feet, no staining Top screen - 4287.58	4	38-MW5-7	ND DRO
	10					
		SW	Sand and gravel: wet, no HC odor, natural colors, minor partial clay in matrix Bottom screen - 4277.58			
	20					

▼ -DEPTH TO FREE PRODUCT

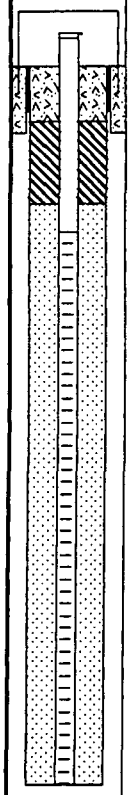
LOG

BORING NO. AOI-38

WELL NO. 38-MW6

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/2/98	DATE COMP: 6/2/98	SURF. EL:4293.341	WELL TD: 13
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP):

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		CL	Clayey sand and silty clay: brown to dark gray, moderate to strong diesel odor below 5 feet Top screen - 4287.93			
	10	SW	Sand andvel: wet with diesel product blebs and sheen, running free product from soil, strong odor Bottom screen - 4277.93	167		
	20					

▼ -DEPTH TO FREE PRODUCT

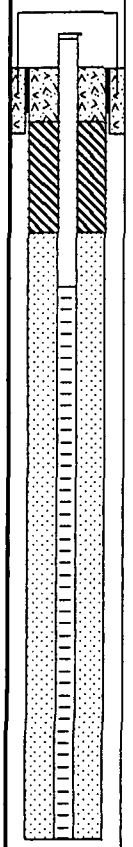
LOG

BORING NO. AOI-38

WELL NO. 38-MW7

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/2/98	DATE COMP: 6/2/98	SURF. EL:4294.062 Ref WELL TD: 14
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 9.55



WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		CL	Clayey and silty sand: scattered gravel clasts, dark gray, moderate to strong diesel odor Top screen - 4287.71			
	10	SW	Sand and gravel: wet, pervasive diesel coating, sheen, strong odor Bottom screen - 4277.71	206	38-MW7-7	62
	20					

▼ -DEPTH TO FREE PRODUCT

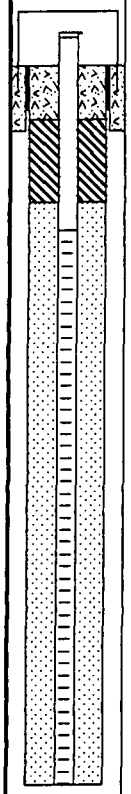
LOG

BORING NO. AOI-38

WELL NO. 38-MW8

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/2/98	DATE COMP: 6/2/98	SURF. EL:4294.587 Ref WELL TD: 13
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 9.27

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		CL	Clayey and silty sand and sand: strong diesel odor, loose when wet, sand mg-cg, well sorted Top screen - 4289.22			
	10	SW	Sand and gravel: partial diesel coatings, medium to dark gray, strong odor Bottom screen - 4279.22	260	38-MW8-8	160 DRO
	20					

▼ =DEPTH TO FREE PRODUCT

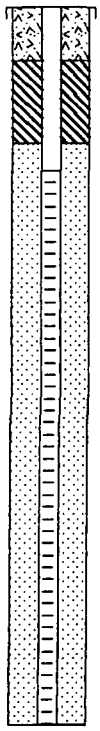
LOG

BORING NO. AOI-38

WELL NO. 38-MW9

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/3/98	DATE COMP: 6/3/98	SURF. EL:4290.804 Ref WELL TD: 13.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 5.1

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Grade level wellhead with drive-over cap			
		CL	Sand with loose cayey matrix: well sorted, medium brown, Slite HC odor - solvent type (?) Top screen - 4287.80	16	38-MW9-5	ND DRO
	10	SW	Sand and gravel: wet, no HC odor, natural colors Bottom screen - 4277.80			
	20					

▼ =DEPTH TO FREE PRODUCT

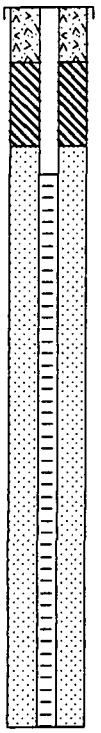
LOG

BORING NO. AOI-38

WELL NO. 38-MW10

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/4/98	DATE COMP: 6/4/98	SURF. EL:4291.008 Ref WELL TD: 13.0
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 6.53

WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				Grade level wellhead with drive-over cap			
			asph	Aspalt			
			SC	Sand with minor, partial clay matrix: pervasive diesel odor Top screen - 4288.01	188	MW10-5	ND
	10		SW	Sand and gravel: wet, slight-moderate diesel odor Bottom screen - 4278.01			
	20						

▼ -DEPTH TO FREE PRODUCT

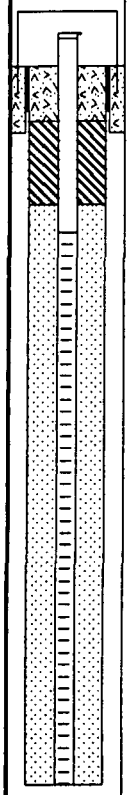
LOG

BORING NO.

WELL NO. SPRR3-MW1

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/3/98	DATE COMP: 6/3/98	SURF. EL:4292.416 Ref	WELL TD: 13
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP): 9.64

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Above ground well completion			
		CL	Silty sand with clayey matrix: gray, pervasive gasoline odor below 4 feet, wet below 4 feet Top screen - 4287.04	392	MW1-6	150 GRO
	10	SW	Sand and gravel: trace to no clay, unconsolidated, permeable - stong water flow, typical coarse alluvium in railyard, moderate gasoline odor Bottom screen - 4277.04			
	20					

▼ =DEPTH TO FREE PRODUCT

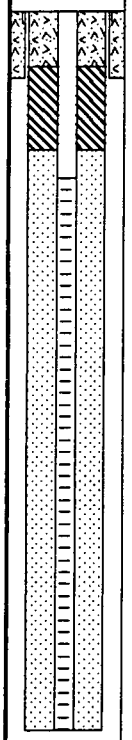
LOG

BORING NO.

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

WELL NO. SPRR3-MW2

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/3/98	DATE COMP: 6/3/98	SURF. EL:4290.168 Ref / WELL TD: 13
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 10.7

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Grade level wellhead - drive-over cap			
		CL	Sand with silt and partial clayey matrix: pervasive gasoline odor below 4 feet, wet below 4 feet Top screen - 4287.17	670	MW2-5	49 GRO
	10	SW	Sand and gravel: trace to no clay, unconsolidated, permeable - stong water flow, typical coarse alluvium in railyard, moderate gasoline odor Bottom screen - 4277.17			
	20					

▼ -DEPTH TO FREE PRODUCT

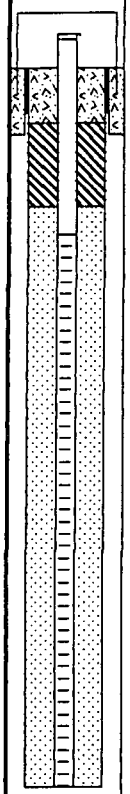
LOG

BORING NO.

WELL NO. SPRR3-MW3

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/3/98	DATE COMP: 6/3/98	SURF. EL:4293.852 Ref	WELL TD: 13.0
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP): 7.46

WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				Above ground completion			
			CL	Sand with silt and partial clayey matrix: pervasive odor of mostly diesel (?) below 3 feet, trace to no staining Top screen - 4288.29	47	MW3-5	48 GRO
	10		SW	Sand and gravel: Wet, typical railyard coarse alluvium, trace to no clay, permeable, slight diesel odor, no staining or coating Bottom screen - 4278.29			
	20						

▼ -DEPTH TO FREE PRODUCT

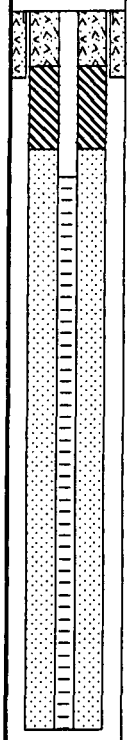
LOG

BORING NO.

WELL NO. SPRR5-MW1

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/4/98	DATE COMP: 6/4/98	SURF. EL:4285.939	WELL TD: 13
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP): 8.03

WELL COMP	DPT	GRAPHIC LOG USCS CODE		DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
				Grade level wellhead, drive-over cap			
			SC	Sand with minor clay or silt in matrix: no HC odor or staining Top screen - 4282.94 ▽	2	MWI-8	ND GRO
	10		SW	Sand and gravel: wet, trace to no clay, unconsolidated, permeable - stong water flow, typical coarse alluvium in railyard, no gasoline odor Bottom screen - 4272.94			
	20			▼ -DEPTH TO FREE PRODUCT			

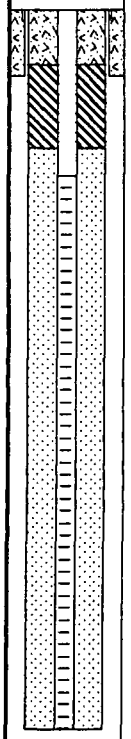
LOG

BORING NO.

WELL NO. SPRR5-MW2

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.		JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD	LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE	METHOD: AUGER/ODEX
DATE START: 6/4/98	DATE COMP: 6/4/98	SURF. EL:4285.951 Ref / WELL TD: 13
LOGGED BY: ED ULLMER	PROD. DEPTH:	INITIAL SWD (MP): 7.85

WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Grade level wellhead, drive-over cap			
		SC	Sand with minor clay or silt in matrix: no HC odor or staining Top screen - 4282.95			
		SW	Sand and gravel: wet, unconsolidated, permeable - typical coarse alluvium in railyard, no odor or staining Bottom screen - 4272.95	0	MW2-8	ND GRO
	10					
	20					

▼ =DEPTH TO FREE PRODUCT

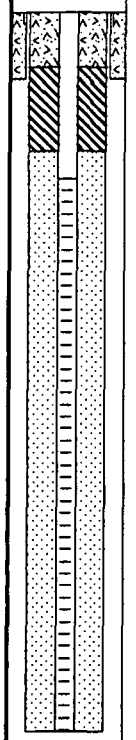
LOG

BORING NO.

WELL NO. SPRR5-MW3

ENVIRONMENTAL DECISION GROUP, Inc.
a Safety-Kleen Company

CLIENT: UNION PACIFIC RESOURCES CO.			JOB NUMBER: 792904
PROJECT: RI/FS OGDEN RAILYARD		LOCATION: OGDEN, UTAH	
DRILLED BY: EARTHCORE	DRILLER: KERN/NATTALE		METHOD: AUGER/ODEX
DATE START: 6/4/98	DATE COMP: 6/4/98	SURF. EL:4285.991	WELL TD: 13
LOGGED BY: ED ULLMER	PROD. DEPTH:		INITIAL SWD (MP): 7.84



WELL COMP	DPT	GRAPHIC LOG USCS CODE	DESCRIPTION	PID ppm	SAMPLE NUMBER	TPH mg/kg
			Grade level wellhead, drive-over cap			
		SC	Sand with minor clay or silt in matrix: no HC odor or staining Top screen - 4282.99	0	MW3-8	ND GRO
	10	SW	Sand and gravel: wet, unconsolidated, permeable - typical coarse alluvium in railyard, no odor or staining Bottom screen - 4272.99			
	20					

▼ =DEPTH TO FREE PRODUCT

APPENDIX A-A

USPCI LOG

A subsidiary of
Union Pacific Corporation

TRENCH NO. 1

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/13/94*	COMP. DATE: *12/13/94*	SURF. EL.: *FT.*	TD: *6.5 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		Trench ~ 12' long Sparse vegetation				
		Fill, tar, tar paper, brick Strong odor - methane/heavy oil Appears to be roofing debris?	Fill	3ppm		
		2.5' Black gravel zone, rounded, well sorted, saturated w/tar? Some free product, more paper, some rafts of gravel-tar This zone extends laterally only above 8' grades into black clay w/tar odor.	GW	17ppm		
	5	4' Native soil, grayish brown sandy clay w/minor gravels Strong HC odor, weather diesel? some orange staining Gray river cobbles	CL		418.1 @ 6'	800 mg/kg
	10	Groundwater flowing into trench from bottom, has dark orange/black sheen, weathered diesel odor				

JOB NUMBER: 96437

USPCI LOG

A subsidiary of
Union Pacific Corporation

TRENCH NO. 2

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/13/94*	COMP. DATE: *12/13/94*	SURF. EL.: *FT.*	TD: *6 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		Native soil, med brown sandy clay, minor gravels, no stain or odor	CL			
		15' laterally in trench Bunker 'C' solidified in chunks @ surface				
		Black sandy clay, strong methane odor, some HC odor				
		Top of contm varies laterally from 1.5 to 3' bgs			2'	
		Solid 5' deep solid tar from surface at east end of trench				
		Strong diesel (weathered), odor, orange/black odor sheen				
	5	Black hard coal-like solid tar layer just above water Water level drops to 6' only 5' laterally in trench Gray cobbles, poorly sorted, strong diesel odor				
	10					

JOB NUMBER: 96437

USPCI LOG

A subsidiary of
Union Pacific Corporation

TRENCH NO. 3

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/13/94*	COMP. DATE: *12/13/94*	SURF. EL.: *FT.*	TD: *3 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		Trench 5' long Only 5' east of Trench 2				
		At ~3' black solid tar mixed w/soil and gravel w/strong acrid odor on stockpile Headspace 337 ppm Sample of plastic black odiferous material	Fill	300 ppm		
	5					
	10					

JOB NUMBER: 96437

USPCI LOG

A subsidiary of
Union Pacific Corporation

TRENCH NO. 4

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/13/94*	COMP. DATE: *12/13/94*	SURF. EL.: *FT.*	TD: *6 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		Trench ~6' long Trench 4 btw 1 and 3				
		Native sandy clay, med brown Black sandy clay, strong HC odor (not acrid) Some debris - paper, canvas No groundwater	CL			
	5					
		BOT				
	10					

JOB NUMBER: 96437

USPCI LOG

A subsidiary of
Union Pacific Corporation

TRENCH NO. 5

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/13/94*	COMP. DATE: *12/13/94*	SURF. EL.: *FT.*	TD: *6 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		Dark brown to black sandy clay, concrete debris No HC odor, maybe some minor HC contamination				
		Sample just above water			Grab @ 2.5'	
		Perch water seeping into hole	CL			
	5	River cobble @ water table, no odor				
	10					

JOB NUMBER: 96437

USPCI LOG

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TRENCH NO. 6

CLIENT: *Union Pacific Railroad*			JOB NO.: *98437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *5.5 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		Silty clay w/debris and rounded clasts	CL			
		Perched water entering hole (lots)				
					418.1 @ 3'	25,500
		5' down very tarey w/branches roofing felt and concrete				
	5	5.5' deep, ~10' long, lots of odor			418.1 @ 5'	35,800
	10					

JOB NUMBER: 98437

USPCI LOG

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Union Pacific Corporation

TRENCH NO. 7

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *4 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		4'x10' - 2-1/2 top feet				
		Black tar, acrid HC odor coarse grained sand beneath Water entering hole from below w/product very thick sheen, greenish brown	SP		418.1 @ 3.5'	171,000
	5					
	10					

JOB NUMBER: 96437

USPCI LOG

A subsidiary of
Union Pacific Corporation

TRENCH NO. 8

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *5.5 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		Southern area				
		0-1' Topsoil, dk brown, lots of roots	Topsoil			
		Horizontally stratified sands, fine grained to very coarse grained to 5'	SP			
	5	River gravel @ 5', becomes large at 5.5' No odor, looks clean, sample just above water, no odor	GW		@5	<100
	10					

JOB NUMBER: 96437

USPCI LOG

A subsidiary of
Union Pacific Corporation

TRENCH NO. 9

CLIENT: *Union Pacific Railroad*		JOB NO.: *96437*	
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:	METHOD: *Backhoe*	
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *6 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*	D. T. WATER: *FT. BGS*	

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		West side of pond				
		0-1' Brown silty sand, roots, no odor	SM			
		1'-3.5' Silty sand to clay, no odor, moist, brown w/clasts	SC			
		3.5'-5' Gray sand coarse grained to fine grained, no odor	SP		[illegible] @ [illegible]	400 [illegible]
	5	5'-5.5' River gravel, water Total depth 6', lots of water, minor sheen	GW			
	10					

JOB NUMBER: 96437

USPCI LOG

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TRENCH NO. 10

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *5 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		8' x 5' deep				
		0-6" Topsoil w/roots Silty sand becomes more sandy and coarser w/depth	SP			
		River gravel @ 5', no odor Sample just above water collected	GW		418.1 @ 4.5'	<100 mg/kg
	5					
	10					

JOB NUMBER: 96437

USPCI LOG

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TRENCH NO. 11

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *4 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		8' x 4' deep				
		0-6" Topsoil silty sand	SM			
		Boulder conglomerate, clast supported, lots of big clasts and water matrix is coarse grained sand	SP			
		Total Depth = 4'			418.1 @ 4'	<100 mg/kg
	5					
	10					

JOB NUMBER: 96437

USPCI LOG

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TRENCH NO. 12

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *4 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		0-6" Topsoil silty sand Silty sand continues down to 2'	SM			
		Pebbly sand followed by conglomerate (cobble) Lots of water No odor, no HC evidence	SP		418.1 @ 2'	<100 mg/kg
		Total Depth = 4'				
	5					
	10					

JOB NUMBER: 96437

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TRENCH NO. 13

CLIENT: *Union Pacific Railroad*		JOB NO.: *96437*	
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:	METHOD: *Backhoe*	
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *3 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*	D. T. WATER: *FT. BGS*	

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		2-1/2' deep x 5' long				
		No odor, no sheen 1' Clayey silty sand (topsoil) roots	SC			
		Coarse grained gravelly sand to 3', coarsens w/depth No odor	SP		9[illegible] 2.5	<100
	5					
	10					

JOB NUMBER: 96437

USPCI LOG

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TRENCH NO. 14

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *5.5 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		0~6" Silty sandy topsoil, no odor				
		Silty fine grained sand to 5', no odor	SM		418 1 @ 4.5'	<100 mg/kg
	5	5'-5.5' River gravel, no odor Water, no sheen	GW			
		Total Depth = 5.5'				
	10					

JOB NUMBER: 96437

USPCI LOG

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TRENCH NO. 15

CLIENT: *Union Pacific Railroad*		JOB NO.: *96437*	
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:	METHOD: *Backhoe*	
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *5.5 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*	D. T. WATER: *FT. BGS*	

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		0-6" Silty sandy topsoil, no odor 6"-2.5' Silty fine grained sand, no odor	SM			
		2.5'-3' Gravel layer	GW			
		3'-4.5' Silty sand, no odor	SM		418.1 @ 4'	<100 mg/kg
	5	4.5'-5.5' Gravel Water, no sheen	GW			
		Total Depth = 5.5'				
	10					

JOB NUMBER: 96437

USPCI LOG

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TRENCH NO. 16

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *5.5 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		0-2.5' Topsoil, dk black w/roots and debris, no odor	Topsoil			
		2.5'-4.5' Silty sand, dk brown mottled w/clasts and debris, no odor	SM		4:8.1 @ 4'	<100 mg/kg
	5	4.5'-5.5' River gravel, cobble conglomerate, no odor Water, no sheen	GW			
		Total Depth = 5.5'				
	10					

JOB NUMBER: 96437

USPCI LOG

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TRENCH NO. 17

CLIENT: *Union Pacific Railroad*			JOB NO.: *98437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *4 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		0-8" Topsoil 8"-2' Black silty sand, minor debris, strong odor	SM			
		2'-4' Fine grained sand, moderate odor Water, has oily layer	SW			
	5					
	10					

JOB NUMBER: 98437

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TRENCH NO. 18

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *5 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
	▼	0-6" Topsoil, roots, dk brown silty sand	Topsoil			
		6"-2.5' Fill--clasts, debris, wood, bricks, no odor, dk brown-black			[illegible] @2	200 [illegible]
		2.5'-5' Fine grained silty sand, no odor, tan Water, no sheen	SM			
	5					
	10					

JOB NUMBER: 96437

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TRENCH NO. 19

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *6.5 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
	▼	0-6" Topsoil, roots and debris.	Topsoil			
		6"-2.5' Fill w/tar chunks (roofing) w/bricks, wood, debris, brown Veins of solid tar, slight odor			418 @ 2'	3,900 mg/kg
	5	2.5'-6.5' Clastic silty sand, brown w/river cobbles, no odor Water, sheen	SM/GW			
	10					

JOB NUMBER: 96437

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TRENCH NO. 20

CLIENT: *Union Pacific Railroad*			JOB NO.: *96437*
PROJECT: *Ogden Ponds*		LOCATION: *Ogden, Utah*	
DRILLED BY:	DRILLER:		METHOD: *Backhoe*
START DATE: *12/14/94*	COMP. DATE: *12/14/94*	SURF. EL.: *FT.*	TD: *5.5 FT. BGS*
LOGGED BY: *Steve Brinkman*	MEAS. PT. EL.: *FT.*		D. T. WATER: *FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH mg/kg
		0-8" Topsoil, tan silty sand 8"-2.5' Fill w/roofing material and tar stringers perched water, no sheen apparent	Topsoil			
		2.5'-5.5' Gray-brown silty sand, cobble conglomerate matrix supported	SM		418.1 @ 2.5'	
	5				418.1 @ 5'	38,300 mg/kg
		Total Depth = 5.5'				
	10					

JOB NUMBER: 96437

APPENDIX B-A

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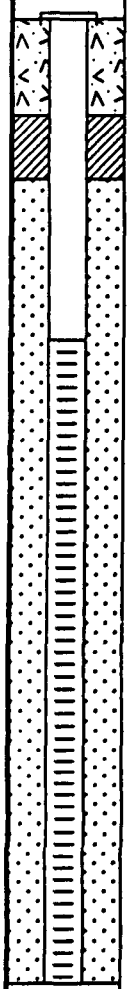
AOT-30

BORING NO. RIV-MW-7

WELL NO. RIV-MW-7

CLIENT: UNION PACIFIC RAILROAD			JOB NO.: 96120-077
PROJECT: UST #8		LOCATION: RIVERDALE, UTAH	
DRILLED BY: PC EXPLORATION	DRILLER: T JENSON	METHOD: H.S.AUGER	
START DATE: 10/31/90	COMP. DATE: 10/31/90	SURF. EL.: 4303.62 FT.	TD: 15 FT. BGS
LOGGED BY: SCOTT SCHULEIN	MEAS. PT. EL.: 4303.62 FT.	D. T. WATER: 4.81 FT. BGS	

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
		0.0 to 3.0' FILL, BLACK PELLETS.	FILL			
	5 10 15	3.0 to 15' GRAVEL, BLACK, CLAYEY, SANDY, WELL ROUNDED, DIESEL ODOR.	GC		MW-7A	
		END OF BORING.				
	20					

JOB NUMBER: 96120-077

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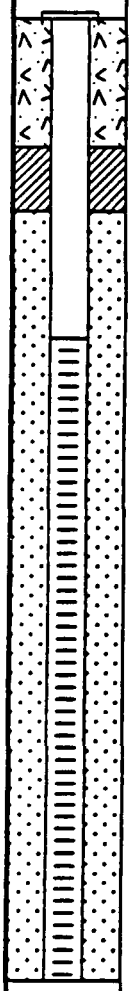
H02-30

BORING NO. RIV-MW-8

WELL NO. RIV-MW-8

CLIENT: *UNION PACIFIC RAILROAD*			JOB NO.: *96120-077*
PROJECT: *UST #8*		LOCATION: *RIVERDALE, UTAH*	
DRILLED BY: *PC EXPLORATION*	DRILLER: *T JENSON*	METHOD: *H.S.AUGER*	
START DATE: *10/31/90*	COMP. DATE: *10/31/90*	SURF. EL.: *4303.58 FT.*	TD: *15 FT. BGS*
LOGGED BY: *SCOTT SCHULEIN*	MEAS. PT. EL.: *4303.58 FT.*	D. T. WATER: *4.78 FT. BGS*	

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
		0.0 to 5.0' FILL MATERIAL, BLACK, METAL BALLS, ROCKS, STICKS, GRAVEL, TAGONITE.	FILL		MW-8A	
	5	5.0 to 9.0' GRAVEL, BLACK, CLAYEY SANDY, STRONG HYDROCARBON ODOR.	GC			
		9.0 to 11.5' SAND AND GRAVEL, GRAY, MEDIUM TO COARSE GRAINED.			MW-8B	
	10	GRAVEL.	GP			
	15	END OF BORING.				
	20					

JOB NUMBER: 96120-077

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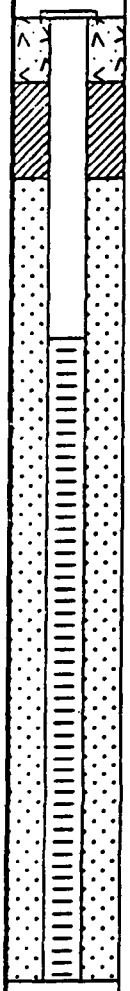
BORING NO. RIV-MW-9

WELL NO. RIV-MW-9

CLIENT: UNION PACIFIC RAILROAD		JOB NO.: 96120-077
PROJECT: UST #8	LOCATION: RIVERDALE, UTAH	
DRILLED BY: PC EXPLORATION	DRILLER: T JENSON	METHOD: H.S.AUGER
START DATE: 11/1/90	COMP. DATE: 11/1/90	SURF. EL.: 4303.49 FT. TD: 15 FT. BGS
LOGGED BY: SCOTT SCHULEIN	MEAS. PT. EL.: 4303.49 FT.	D. T. WATER: 4.74 FT. BGS

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
		0.0 to 4.0' SAND, BROWN.	SP			
	5 10 15	4.0 to 15' GRAVEL, GRAY, CLAYEY, SANDY, MOIST, STRONG HYDROCARBON ODOR.	GC		MW-9A	
		END OF BORING.				
	20					

JOB NUMBER: 96120-077

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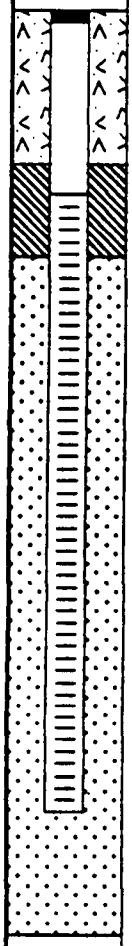
WELL NO. MW-3

CLIENT: *Union Pacific Railroad*			JOB NO.: *98120-077*
PROJECT: *Riverdale, Utah*		LOCATION: *T 8*	
DRILLED BY: *Layne*	DRILLER: *Jerry*	METHOD: *8"*	
START DATE: *9-15-93*	COMP. DATE: *9-15-93*	SURF. EL.: *FT. est.*	TD: *15.0 FT. BGS*
LOGGED BY: *Ken Rose*			D. T. WATER: *7.0 FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
	5	Grayish brown sand and gravel w/some metal debris, dry, no odor (fill) Encounter round pellets at ~8" Dark gray, gray sand (1.5', stained), some gravel and metal debris, moist, strong HC odor (70 blows for 15")	GW		MW-3, T8 4' 1045 (2 jars)	
	10	Encounter cobbles at ~8.5' Wet at ~7' Dark gray, gray (stained) gravel and cobbles, trace sand, wet, strong diesel odor As above, wet, strong HC odor As above, wet, strong HC odor	GP			
	15	Boring completed to 15' Groundwater encountered at ~7' Monitor well installed to 13', 10' screen 3.5 bags silica sand #10-20 1 bag bentonite chips Flush mount well				
	20					

JOB NUMBER: 98120-077

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LOG

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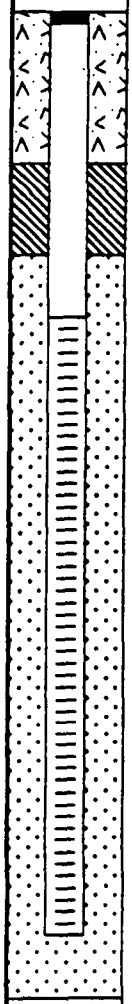
WELL NO. MW-4

CLIENT: *Union Pacific Railroad*			JOB NO.: *98120-077*
PROJECT: *Riverdale, Utah*		LOCATION: *T 8*	
DRILLED BY:	DRILLER:		METHOD:
START DATE:	COMP. DATE:	SURF. EL.: *FT. est.*	TD: *18.0 FT. BGS*
LOGGED BY: *Ken Rose*			D. T. WATER: *8.5 FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
	5	Light gray, gray sand and gravel, w/some silt and metal debris, dry, no odor (fill) Dark gray (stained) coarse sand and gravel w/some metal debris, moist, strong diesel odor	SW		MW-4 5' 1330	
		Encounter cobbles at 8.0' (8'-8')	GP			
		Gray coarse sand and gravel w/some cobbles, wet, slight odor (8'-9.5')	GW			
	10	Gray fine to coarse sand w/some gravel, trace cobbles, wet, v.slight odor (9.5'-11.5')	GP		MW-4 11' 1400	
		Encounter cobbles at 11.5' (11.5'-13')	GP			
	15	Gray fine to coarse sand w/some gravel, trace cobbles, wet, no odor (13' to 18')	GW			
	20	Boring completed to 18' Groundwater encountered at ~8.5' Flush mount well				

JOB NUMBER: 98120-077

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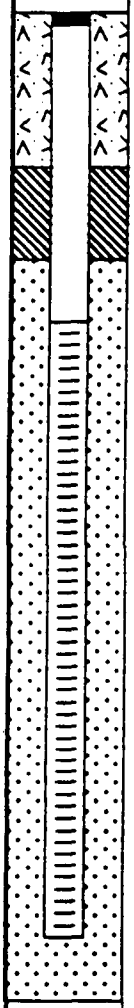
WELL NO. MW-5

CLIENT: *Union Pacific Railroad*			JOB NO.: *98120-077*
PROJECT: *Riverdale, Utah*		LOCATION:	
DRILLED BY:	DRILLER:		METHOD: *8" HSA*
START DATE: *9-15-93*	COMP. DATE: *9-15-93*	SURF. EL.: *FT. est.*	TD: *18.0 FT. BGS*
LOGGED BY: *Ken Rose*			D. T. WATER: *6.5 FT. BGS*

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
		Light grayish brown sand and gravel, trace silt and cobbles, dry, no odor (fill), some metal debris Dark gray, gray (stained) coarse sand and gravel,moist, strong HC odor	GW			
	5	Encounter cobbles at 4.0' Dark gray cobbles w/some sand and gravel Wet at 8.5', strong diesel odor				
	10	As above	GP			
	15	As above				
	20	Boring completed to 18' Groundwater encountered at ~8.5' Monitor well installed to 15', 10' screen 3 bags silica sand (#10-20) 1 bag bentonite pellets Flush mount well				

JOB NUMBER: 98120-077

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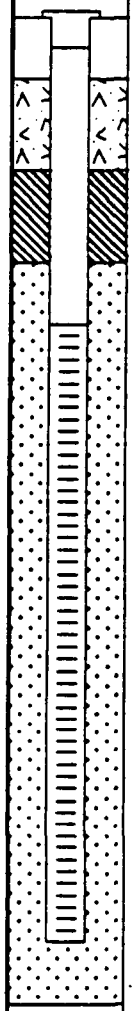
WELL NO. MW-6

CLIENT: Union Pacific Railroad			JOB NO.: 98120-077
PROJECT: Riverdale, Utah		LOCATION: T 8	
DRILLED BY: Layne	DRILLER: Jerry		METHOD: 8" HSA
START DATE: 9-18-93	COMP. DATE: 9-18-93	SURF. EL.: FT. est.	TD: 18.0 FT. BGS
LOGGED BY: Ken Rose			D. T. WATER: 8.0 FT. BGS



WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
		Light grayish brown sand and gravel w/some silt and metal debris, dry Dark gray (stained) fine to coarse sand w/some gravel and metal debris, moist, strong HC odor	GW			
	5	Encounter cobbles at 5.5' As above, becomes wet at 8.0'	GP			
	10	Dark gray (stained) gravel and cobbles, trace sand, wet, strong diesel odor				
	15	As above				
		Boring completed to 18.0' Groundwater encountered at 8.0' Monitor well installed to 15', 10' screen 3 bags of #10-20 silica 1 bucket bentonite chips				
	20					

JOB NUMBER: 98120-077

WELL LOG

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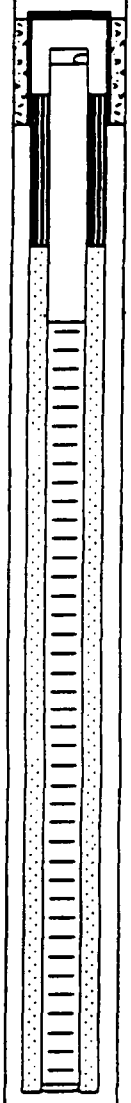
USPCI

Remedial Services

BORING NO. RIV-MW-13

CLIENT: UNION PACIFIC RAILROAD			JOB NUMBER: 96120
PROJECT: RIVERDALE YARD		LOCATION: RIVERDALE UT.	
DRILLED BY: P. C. EXPLOR.	DRILLER: TRENT JENSEN		METHOD: HOLLOW-STEM AUGER
DATE START: 11/2/90	DATE COMP: 11/2/90	SURF. EL: 4323.45 MSL	TD: 15.0' BGS
LOGGED BY: SCOTT SCHULEIN	APPROVED BY:		DEPTH TO WATER: 9.11

WELL COMP	DEPTH (ft)	DESCRIPTION	GRAPHIC LOG USCS CODE	OVM	SAMPLE NUMBER	TPH ppm
	0	0.0 to 2.0 FILL. ROAD BASE GRAVELS.	AF			
		2.0 TO 7.0 SANDY GRAVEL. BROWN.	GP	ND ND		
	5					
		7.0 TO 10.0 SANDY GRAVEL. GRAY. POORLY. SORTED. HYDROCARBON ODOR. WATER LEVEL 11/6/90		106 57		
	10	10.0 TO 15.0 SANDY GRAVELS LITTLE CLAY. GRAY. WET. HYDROCARBON ODOR.	GW		MW-13A COMPOSIT	2000
	15	NOTE: SAMPLE RIV-MW-13A WAS TAKEN AS A COMPOSIT SAMPLE FROM THE CUTTINGS AT 12.0 FEET. FLOWING SANDS CAUSED THE WELL TO BE COMPLETED AT A TOTAL DEPTH OF 14.0 FEET.				

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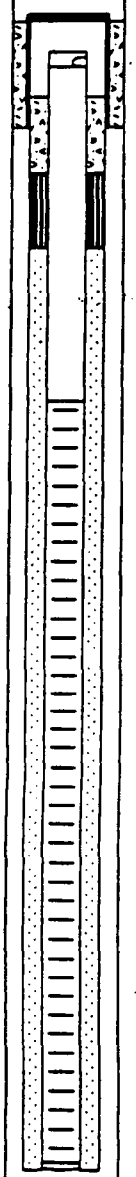
WELL LOG

USPCI

Remedial Services

BORING NO. RIV-MW-15

CLIENT: UNION PACIFIC RAILROAD			JOB NUMBER: 96120
PROJECT: RIVERDALE YARD		LOCATION: RIVERDALE UT.	
DRILLED BY: P. C. EXPLOR.	DRILLER: TRENT JENSEN		METHOD: HOLLOW-STEM AUGER
DATE START: 11/2/90	DATE COMP: 11/2/90	SURF. EL: 4323.16 MSL	TD: 15.0' BGS
LOGGED BY: SCOTT SCHULEIN	APPROVED BY:		DEPTH TO WATER: 8.81



WELL COMP	DEPTH (ft)	DESCRIPTION	GRAPHIC LOG USCS CODE	OVM	SAMPLE NUMBER	TPH ppm
	0	0.0 to 3.0 FILL, SAND, BROWN.	AF			
		3.0 TO 4.0 SANDY GRAVELS, WELL ROUNDED, GRAY.	GW	139		
		4.0 TO 5.0 CLAYEY SAND, GRAY, HYDROCARBON ODOR.	SC	257	MW-15A	1900
	5	5.0 TO 7.0 CLAY SLIGHTLY SANDY, GRAY.	ML		MW-15B	740
		7.0 TO 15.0 SANDY GRAVEL, BUFF TO GRAY.	GW			
		WATER LEVEL 11/6/90			MW-15C	78
	10					
	15	THE COMPLETED DEPTH OF THIS WELL IS 15.0 FEET.				

AOI-35

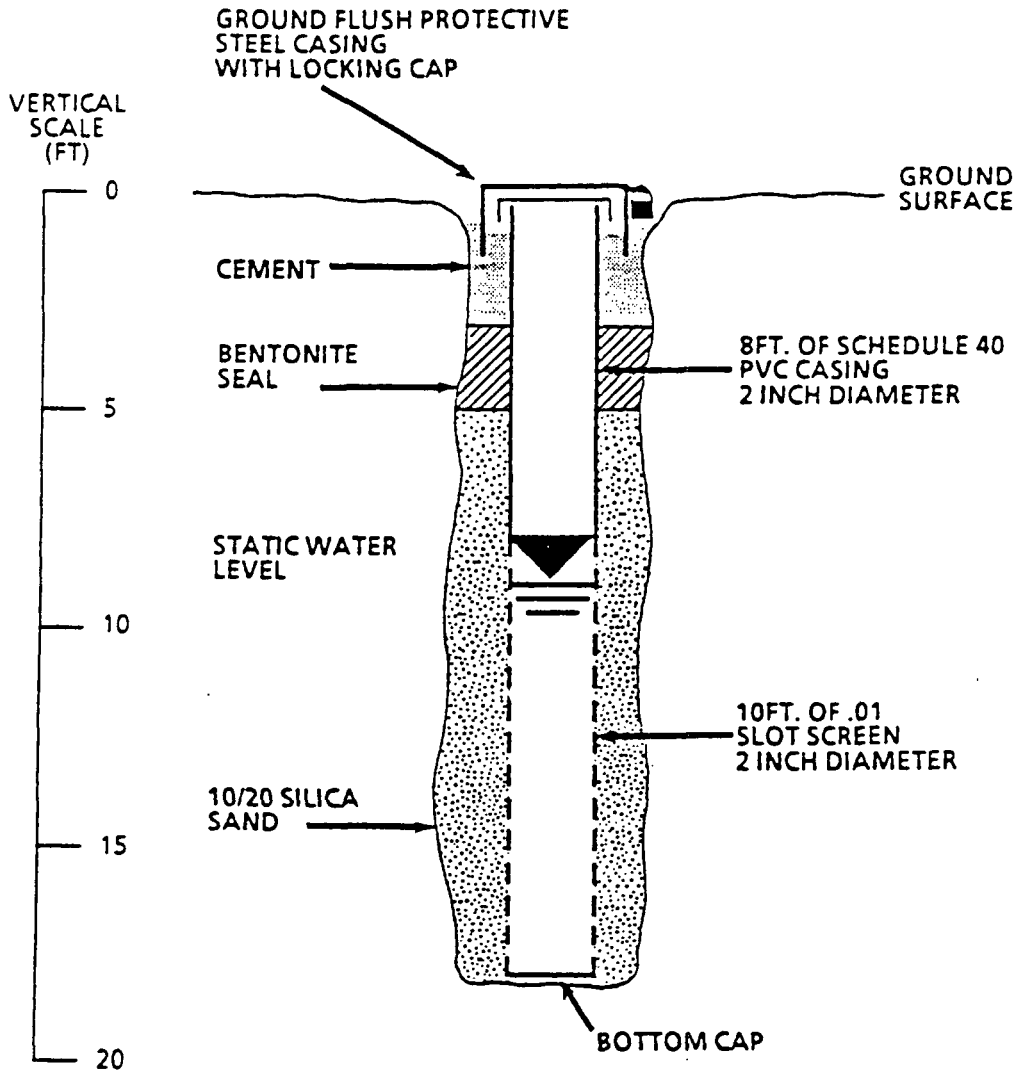


Figure 2
CONSTRUCTION DETAILS OF
MONITORING WELL OB-1

WELL LOG

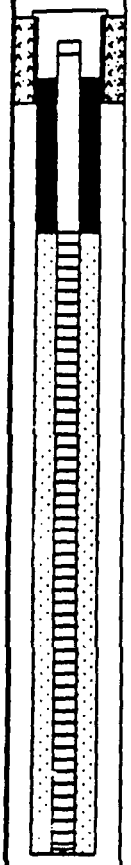
USPCI

Remedial Services

AOI-37

BORING NO. RIV-MW-10

CLIENT: UP RAILROAD			JOB NUMBER: 96120
PROJECT: RIVERDALE YARD		LOCATION: RIVERDALE UT.	
DRILLED BY: P. C. EXPLOR.	DRILLER: TRENT JENSEN		METHOD: HOLLOW-STEM AUGER
DATE START: 11/1/90	DATE COMP: 11/1/90	SURF. EL:	TD: 15.0' BGS
LOGGED BY: SCOTT SCHULEIN	APPROVED BY:		DEPTH TO WATER: 8.74

WELL COMP	DEPTH (ft)	DESCRIPTION	GRAPHIC LOG USCS CODE	OVM	SAMPLE NUMBER	TPH ppm
	0	0.0 to 5.0 SAND, CLAY, GRAVEL, GRAY, STRONG HYDROCARBON ODOR, WET.	SP			
	5	5.0 TO 15.0 SANDY AND CLAYEY GRAVELS, GRAY, MOIST WELL ROUNDED, POORLY SORTED, HYDROCARBON ODOR.	GC		MW-10A MW-10B	
	10					
	15	THE COMPLETED DEPTH OF THIS WELL IS 13.5 FEET. FLOWING SANDS PREVENTED THE COMPLETION AT THE TOTAL DEPTH DRILLED OF 15.0 FEET.				
	20					

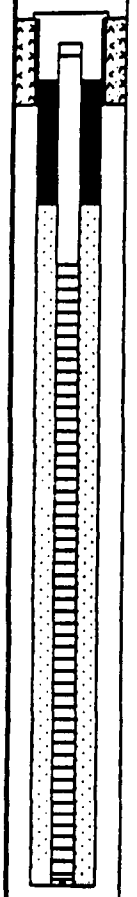
WELL LOG

AOI-37

USPCI
Remedial Services

BORING NO. RIV-MW-11

CLIENT: UP RAILROAD			JOB NUMBER: 96120
PROJECT: RIVERDALE YARD		LOCATION: RIVERDALE UT.	
DRILLED BY: P. C. EXPLOR.	DRILLER: TRENT JENSEN		METHOD: HOLLOW-STEM AUGER
DATE START: 11/2/90	DATE COMP: 11/2/90	SURF. EL:	TD: 15.0' BGS
LOGGED BY: SCOTT SCHULEIN	APPROVED BY:		DEPTH TO WATER: 8.17

WELL COMP	DEPTH (ft)	DESCRIPTION	GRAPHIC LOG USCS CODE	OVM	SAMPLE NUMBER	TPH ppm
	0	0.0 to 0.5 SAND, FINE GRAINED, BROWN.	SP			
		0.5 TO 3.0 GRAVELLY SAND, CLAY, GRAY, HYDROCARBON ODOR.				
		3.0 TO 9.0 CLAYEY SAND, LITTLE GRAVEL, CLAY LENSES, HYDROCARBON ODOR.	GC	31	MW-11A	
	5					
		9.0 TO 15.0 GRAVELLY SANDS, SAND IS VERY FINE GRAINED, CLAY, GRAVEL CONTENT INCREASES WITH DEPTH.		40 97		
	10					
	15	THE COMPLETED DEPTH OF THIS WELL IS 14.0 FEET. FLOWING SANDS PREVENTED THE COMPLETION AT THE TOTAL DEPTH DRILLED OF 15.0 FEET.				
	20					

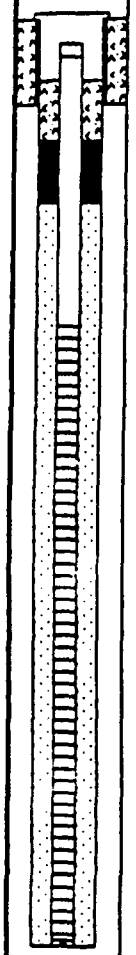
WELL LOG

USPCI
Remedial Services

AOI-37

BORING NO. RIV-MW-12

CLIENT: UP RAILROAD			JOB NUMBER: 96120
PROJECT: RIVERDALE YARD		LOCATION: RIVERDALE UT.	
DRILLED BY: P. C. EXPLOR.	DRILLER: TRENT JENSEN		METHOD: HOLLOW-STEM AUGER
DATE START: 11/2/90	DATE COMP: 11/2/90	SURF. EL:	TD: 15.0' BGS
LOGGED BY: SCOTT SCHULEIN	APPROVED BY:		DEPTH TO WATER: 9.24

WELL COMP	DEPTH (ft)	DESCRIPTION	GRAPHIC LOG USCS CODE	OVM	SAMPLE NUMBER	TPH ppm
	0	0.0 to 1.0 SAND, FINE GRAINED, BROWN.	AF			
		1.0 TO 3.0 SANDY GRAVEL, BLACK.	GP	116		
		3.0 TO 4.0 SANDY GRAVEL, GRAY, POORLY, SORTED, HYDROCARBON ODOR.		86		
	5	4.0 TO 8.0 CLAYEY SANDS, SOME GRAVEL, GRAY, HYDROCARBON ODOR.		62 82 115	MW-12A	
		8.0 TO 15.0 SANDY GRAVELS, SOME CLAY, WET, ODOR.	GC			
	10	THE COMPLETED DEPTH OF THIS WELL IS 15.0 FEET. NOTE: SAMPLE RIV-MW-12A WAS TAKEN AS A COMPOSIT SAMPLE FROM THE CUTTINGS AT 7.0 FEET.				
	15					
	20					

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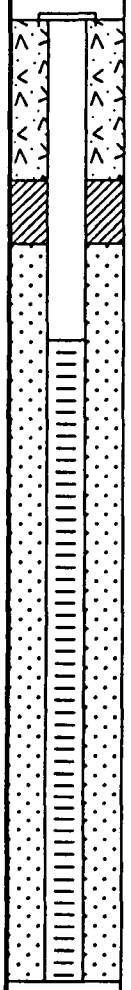
BORING NO. UST-10 RIV-MW-1

WELL NO. RIV-MW-1

CLIENT: UNION PACIFIC RAILROAD			JOB NO.: 96120-077
PROJECT: UST #10		LOCATION: RIVERDALE, UTAH	
DRILLED BY: PC EXPLORATION	DRILLER: T JENSON	METHOD: H.S.AUGER	
START DATE: 10/30/90	COMP. DATE: 10/30/90	SURF. EL.: 4301.2 FT.	TD: 15 FT. BGS
LOGGED BY: SCOTT SCHULEIN	MEAS. PT. EL.: 4301.02 FT.	D. T. WATER: 5.83 FT. BGS	



WELL DIAGRAM	OPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
		0.0 to 4.5' BACKFILL, BLACK, ASPHALT-LIKE MATERIAL, COAL, SLIGHT HYDROCARBON ODOR.	FILL			
	5	4.5 to 6.5' SANDSTONE, BROWN, FINE GRAINED, WITH LITTLE OR NO CLAY, MOIST.	SP		MW1	
		6.5 to 8.5' GRAVEL AND COARSE GRAINED SANDSTONE, WITH SOME CLAY AND SILTSTONE, POORLY SORTED, WET.	SW			
	10	8.5 to 13.5' CLAY. ENCOUNTERED WATER AT APPROXIMATELY 11'.	CL			
		13.5 to 15' GRAVEL.	GP			
	15	END OF BORING.				
	20					

JOB NUMBER: 96120-077

UST#-10

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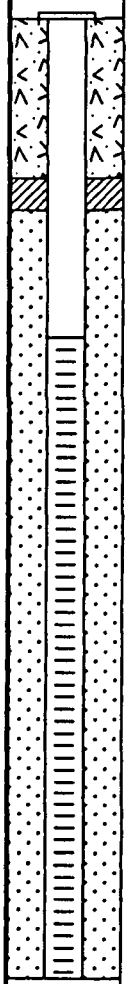
LOG

BORING NO. RIV-MW-2
WELL NO. RIV-MW-2

CLIENT: UNION PACIFIC RAILROAD			JOB NO.: 96120-077
PROJECT: UST #10		LOCATION: RIVERDALE, UTAH	
DRILLED BY: PC EXPLORATION	DRILLER: T JENSON	METHOD: H.S.AUGER	
START DATE: 10/30/90	COMP. DATE: 10/30/90	SURF. EL.: 4300.23 FT.	TD: 15 FT. BGS
LOGGED BY: SCOTT SCHULEIN	MEAS. PT. EL.: 4300.23 FT.	D. T. WATER: 5.05 FT. BGS	

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
		0.0 to 4.0' BACKFILL, BLACK, COAL AND BROKEN ASPHALT.	FILL			
		4.0 to 5.0' CLAY, BROWN, SANDY.	CL			
	5	5.0 to 15' SAND WITH GRAVEL, BROWN, FINE-GRAINED, ASSUMED TO BE WELL ROUNDED RIVER ROCK.	GW		MW2	
	10					
	15	END OF BORING.				
	20					

JOB NUMBER: 96120-077

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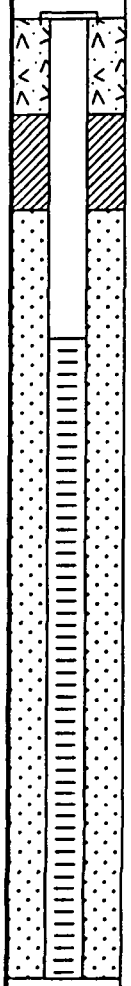
BORING NO. RIV-MW-3 (UST-10)

WELL NO. RIV-MW-3

CLIENT: UNION PACIFIC RAILROAD			JOB NO.: 96120-077
PROJECT: UST #10		LOCATION: RIVERDALE, UTAH	
DRILLED BY: PC EXPLORATION	DRILLER: T JENSON		METHOD: H.S.AUGER
START DATE: 10/30/90	COMP. DATE: 10/30/90	SURF. EL.: 4300.54 FT.	TD: 15 FT. BGS
LOGGED BY: SCOTT SCHULEIN	MEAS. PT. EL.: 4300.54 FT.		D. T. WATER: 5.35 FT. BGS



WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	TPH ppm
		0.0 to 4.0' BACKFILL, BLACK, ORGANIC, WITH COAL, WHITE STAINING, CLEAN SAND AND CLAY STRINGERS.	FILL		MW-3A	
	5 10	4.0 to 11' SANDSTONE, MOIST, WITH CLAY STRINGERS, ROOTS ERODED SANDSTONE TO A CLAYEY SAND, WET.	GC		MW-3B	
	15	11 to 15' SAND AND GRAVEL, POORLY SORTED.	GW			
	20	END OF BORING.				

JOB NUMBER: 96120-077

APPENDIX C-A

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: Ogden Railyard Phase 1

LAIDLAW Project Number:

Measuring Point (MP) Location: top of inside 2" well riser

Well No. 13-MW16

Well Depth: (Below MP): Feet 12.35

Casing Diameter: Inches 2"

Sampling Date: 10/7/97

Depth To Ground Water (Below MP): Feet 8.85

Sample ID No. 13-MW16

Method Of Well Development:

Time: ☑AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☑ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance:

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: slight hydrocarbon odor

☑ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any):

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOC, PAH & TPH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
11:53	7.9	300.4	19.89	678	1.0	
12:00	7.8	259.6	19.50	540	2.0	
12:05	7.8	304.1	19.42	510	3.0	
12:10	Sampled	well				

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: 12.35 - 8.85 = 3.50' x 0.167 .59 gallons per well volume

Slight Product Film

[Comments may continue on back]

Form Completed By: E. Allen

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:

LAIDLAW Project Number:

Measuring Point (MP) Location: top of inside riser

Well No. 13-MW17

Well Depth: (Below MP): Feet 14.32

Casing Diameter: Inches 2"

Sampling Date: 10/8/97

Depth To Ground Water (Below MP): Feet 8.80'

Sample ID No. 13-MW17

Method Of Well Development:

Time: ☑AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☑ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: cloudy

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: slight petroleum odor

☑ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any): none

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: NO

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOCs & PNA / TPH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.) turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
10:50	8.0	350	20.10	875	1.0	
10:55	7.8	400	18.52	430	1.75	Bailed dry
11:13	7.9	500	18.20	425	2.75	Bailed dry
11:22	7.9	500	18.22	400	3.50	
11:30	Sample	Collected.				

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: 14.32 - 8.80 = 5.52' x 0.167 = .92 gallons per well volume.

slow to recharge.

[Comments may continue on back]

Form Completed By: E. Allman

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:

LAIDLAW Project Number:

Measuring Point (MP) Location: top of inside riser

Well No. 13-MW18

Well Depth: (Below MP): Feet 13.59

Casing Diameter: Inches 2"

Sampling Date: 10/8/97

Depth To Ground Water (Below MP): Feet 10.54

Sample ID No. 13-MW18

Method Of Well Development:

Time: ☒AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: cloudy

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: slight Pet. odor

☒ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any): None

☒ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: No

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOCs & PNA/TPH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
11:35	8.0	500	19.0		1.00	
11:45	8.0	400	19.0		2.0	
12:00	8.0	400	19.0		3.0	
12:15	Sample	collected				

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: 13.59 - 10.54 = 3.05' X 0.167 = .5 gallons per well volume

[Comments may continue on back]

Form Completed By: E. Allen

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:

LAIDLAW Project Number:

Measuring Point (MP) Location: Top of inner riser

Well Depth: (Below MP): Feet 12.48

Well No. A01-26 R2-STMW1

Casing Diameter: Inches 2"

Sampling Date: 10/9/97

Depth To Ground Water (Below MP): Feet 7.33

Sample ID No. R2-STMW1

Method Of Well Development:

Time: ☐AM, ☒PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance:

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor:

☒ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any):

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: VOC, TPH, PNA

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected:

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature ~~(Centigrade)~~ F°	Water ~~Level~~ ~~(Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
12:01	6.88	400	61 61.2	702	1.0	
12:10	6.96	500	63.4	268	2.0	
12:16	6.73	500	63.4	206	3.0	
12:20	6.83	600	63.5	231	4.0	
12:30	6.75	700	64.2	632	5.0	
12:35	6.80	600	64.7	364	6.0	
12:45	Collected	Sample				

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: 12.48' − 7.33 = 5.15 x .167 = .86 gal / well volume

[Comments may continue on back]

Form Completed By: E. Ullmer

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:	LAIDLAW Project Number:
Measuring Point (MP) Location:	Well No. 27-0GP-1
Well Depth: (Below MP): Feet 18.78	
Casing Diameter: Inches	Sampling Date:
Depth To Ground Water (Below MP): Feet 11.20	Sample ID No.
Method Of Well Development:	Time: ☒AM, ☐PM
☐ Tap ☐ Submersible Pump ☐ Bladder Pump	Riser Elevation (MP):
☒ Bailer ☐ Centrifugal Pump ☐ Other	Top of Screen Elevation:
Sampling Collection Method:	Sample Appearance:
☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample	Odor:
☒ Bailer Type: ○ Teflon ○ Stainless Steel	Sampling Problems (if any):
○ ABS Plastic ○ PVC	
Pump Intake Or Bailer Set At Feet Below MP	Decontamination Performed:
Tubing Type (if Used):	
Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests	Samples Collected:

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
4:15	8.3	780	15.52	275.00	1.0	
4:20	8.2	840	14.50	154.00	2.0	
4:25	8.2	885	14.92	25.10	3.0	
4:30	8.0	804	14.81	17.50	4.0	
4:35	8.0	800	14.80	15.13	5.0	
4:45	Sample Collected					

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: 18.78 - 11.20 = 7.58' X .167 = 1.27 gal / well vol.

[Comments may continue on back]

Form Completed By: E. Allen Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: Ogden Railyard Phs. 1

LAIDLAW Project Number:

Measuring Point (MP) Location:

Well No. R2-30-MW1

Well Depth: (Below MP): Feet 12.86

Casing Diameter: Inches 2"

Sampling Date: 10/9/97

Depth To Ground Water (Below MP): Feet 8.44

Sample ID No. R2-30-MW1

Method Of Well Development:

Time: ☐AM, ☑PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☑ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: Clay

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: No odor

☑ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any): none

☑ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: No

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOC, TPH, PAH, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water ~~Level~~ (~~Nearest~~ 0.01 Ft.) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
2:30	7.2	850	18.0	556	1.0	
2:40	7.2	850	18.0	869	2.0	
2:50	7.2	900	18.0	997	3.0	
Collected Sample at		2:58				

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: 12.86 - 8.44 = 4.42 x .167 = .78 gal / well volume.

[Comments may continue on back]

Form Completed By: E. Ullman

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:

LAIDLAW Project Number:

Measuring Point (MP) Location:

Well No. R2-30-mw2

Well Depth: (Below MP): Feet 13.29

Casing Diameter: Inches

Sampling Date: 10/9/97

Depth To Ground Water (Below MP): Feet 8.47

Sample ID No. R2-30-mw2

Method Of Well Development:

Time: ☐AM, ☑PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☑ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: murky

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: slight product film on bailer

☑ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any): none

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOC, TPH, PNA, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level~~ (~~Nearest 0.01 Ft.~~) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1:23	6.9	850	18.5	167	1.0	
1:44	6.9	900	18.5	206	2.0	
1:55	6.9	750	19.0	227	3.0	
2:04	6.9	700	18.0	56.6	4.0	
2:15	Collected	Sample				

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: 13.29 - 8.47 = 4.82 x .167 = .80 gal / well volume

slight product film, odor

[Comments may continue on back]

Form Completed By: E. Ullmer

Witnessed By:

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: | USPCI Project Number

Measuring Point (MP) Location:

Well No. A01-34 R1-SP-MW02

Well Depth (Below MP): 30.40

Casing diameter (Inches): 2.0 | Sampling Date: 10/12/97

Depth To Ground Water in feet (Below MP): 11.41 | Sample ID No. R1-SP-

Method Of Well Development: | Time: ☐AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump | Riser Elevation (MP):

☐ Bailer ☐ Centrifugal Pump ☐ Other | Top of Screen Elevation:

Sampling Collection Method: | Sample Appearance:

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample | Odor: Slight Pet odor

☐ Bailer Type: ○ Teflon ○ Stainless Steel | Sampling Problems (if any):

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP | Decontamination Performed:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests | Samples Collected:

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
2:17	6.8	400	13.0	105.0	.5	
2:20	6.6	500	13.0	79.0	2.0	
2:25	6.6	500	12.5	200	4.0	
2:30	6.6	500	12.0	284	6.0	
2:35	6.6	400	12.0	209	7.5	
2:40	6.6	400	12.0	227	10.0	
2:45	Collected	Sample				

At Least Well Bore Volumes Were Evacuated Before Sampling | Discharge Rate = GPM x 0.00223 = cfs

Comments: 30.40 - 11.41 = 18.99 = 3.17 gal/ow

Add HCL to VOC vials - mention on COC

[Comments may continue on back]

Form Completed By: E. Allen | Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:

LAIDLAW Project Number:

Measuring Point (MP) Location:

Well No. A01-34
R1-SP-MW03

Well Depth: (Below MP): Feet 29.50

Casing Diameter: Inches 2"

Sampling Date: 10/12/97

Depth To Ground Water (Below MP): Feet 11.70

Sample ID No. R1-SD-MW03

Method Of Well Development:

Time: ☑AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☑ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: clear

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: slight Pet. odor

☑ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any): None

● ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: None

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOC, PNA, TPH, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
9:54	7.5	70	14.0	10.30	1.0	
9.58	7.1	100	13.5	33.2	2.0	
10:02	7.1	120	13.5	55.0	4.0	
10:07	7.1	120	13.5	58.8	5.0	
10:10	7.1	120	13.5	19.5	8.0	
10:15	7.1	120	13.5	24.5	9.0	
10:16	Sample collected					

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: 29.5 - 11.70 = 17.8 x 167.0

[Comments may continue on back]

Form Completed By: E. Allen

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:	LAIDLAW Project Number:
Measuring Point (MP) Location: Inner Casing (IC)	**Well No.** A01-34 R1-B1W1
Well Depth: (Below MP): Feet 16.68	
Casing Diameter: Inches 2"	Sampling Date: 10/12/97
Depth To Ground Water (Below MP): Feet 10.68' (IC) 10.79 (OC)	Sample ID No. R1-B1W1
Method Of Well Development:	Time: ☑AM, ☐PM
☐ Tap ☐ Submersible Pump ☐ Bladder Pump	Riser Elevation (MP):
☑ Bailer ☐ Centrifugal Pump ☐ Other	Top of Screen Elevation:
Sampling Collection Method:	Sample Appearance:
☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample	Odor:
☑ Bailer Type: ○ Teflon ○ Stainless Steel	Sampling Problems (if any):
○ ABS Plastic ○ PVC	
Pump Intake Or Bailer Set At Feet Below MP	Decontamination Performed:
Tubing Type (if Used):	
Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests	Samples Collected:

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level ~~(Nearest 0.01 Ft.)~~ Turbidit.	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
10:25	7.1	400	14.5	234	.5	
10:26	6.4	600	14.5	778	1.0	
10:27	6.4	700	14.5	750	2.0	
10:28	6.4	700	14.5	763	2.5	
10:29	6.4	700	14.5	769	3.0	
10:30	collected Sample					

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: 16.68 - 10.68 = 6 x = 1 gal/well volume,

[Comments may continue on back]

Form Completed By: E. Allmer Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:

LAIDLAW Project Number:

Measuring Point (MP) Location: inner casing

Well No. A01-34
R1-B2W2

Well Depth: (Below MP): Feet 18.0

Casing Diameter: Inches 2"

Sampling Date: 10/12/97

Depth To Ground Water (Below MP): Feet 12.48 (IC) 12.70 (OC)

Sample ID No. R1-B2W2

Method Of Well Development:

Time: ☒AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: milky

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: very slight PO odor

☒ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any): None

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: not

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOCs, PNA, TPH, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level~~ (Nearest 0.01 Ft.) Total Depth	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
11:48	6.8	400	14.0	75.0	.50	
11:51	6.6	508	14.0	185.0	1.0	
11:53	6.6	502	14.0	176.0	2.0	
11:55	6.6	502	14.0	198	3.0	
Collected	Sample at	12:00				

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: 18.00 - 12.48 = 5.52 x .92 gal/wv.

[Comments may continue on back]

Form Completed By: E. Allen

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: | LAIDLAW Project Number:

Measuring Point (MP) Location: | **Well No.** A0134 R1-0B12

Well Depth: (Below MP): Feet 19.90'

Casing Diameter: Inches 2" | Sampling Date: 10/12/97

Depth To Ground Water (Below MP): Feet 9.23 (1c) 9.58 (2c) | Sample ID No. R1-0B12

Method Of Well Development: | Time: ☐AM, ☒PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump | Riser Elevation (MP):

☐ Bailer ☐ Centrifugal Pump ☐ Other | Top of Screen Elevation:

Sampling Collection Method: | Sample Appearance:

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample | Odor:

☐ Bailer Type: ○ Teflon ○ Stainless Steel | Sampling Problems (if any):

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP | Decontamination Performed:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests | Samples Collected:

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level~~ (Nearest 0.01 Ft.) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
12:25	6.8	700	13.5	595	1.0	
12:32	6.7	600	13.5	400	2.0	
12:34	6.7	600	13.0	226	3.0	
12:35	6.6	600	13.0	111	3.5	
12:40	6.6	600	13.0	65	5.0	
12:42	6.6	600	13.0	53		
12:45	Sample Collected					

At Least Well Bore Volumes Were Evacuated Before Sampling | Discharge Rate = GPM x 0.00223 = cfs

Comments: 19.90 - 9.23 = 10.67 x .163 = 1.78 gal/w.v.

[Comments may continue on back]

Form Completed By: E. Allmen | Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:

LAIDLAW Project Number:

Measuring Point (MP) Location:

Well No. A01-34
R1-0B13

Well Depth: (Below MP): Feet 19.90

Casing Diameter: Inches 2.0

Sampling Date: 10/12/97

Depth To Ground Water (Below MP): Feet 8.83 (1c) 9.16 oc

Sample ID No. R1-0B13

Method Of Well Development:

Time: ☒AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☑ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance:

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor:

☑ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any):

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOC, PNA, TPH, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
10:40	7.3	300	12.5	685	1.0	
10:45	7.2	250	13.5	735	3.0	
10:50	7.1	360	13.0	545	5.0	
10:55	7.1	300	13.0	532	6.0	
11:00	7.1	300	13.0	585	7.0	
11:02	7.1	300	13.0	256	8.0	
11:05	Collected	Samples				

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: 19.90 - 8.13 = 11.77 X = ≈ 2.0 gal / well vol.

[Comments may continue on back]

Form Completed By: E. Allen

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:

LAIDLAW Project Number:

Measuring Point (MP) Location:

Well No. A01-34 R1-0B16

Well Depth: (Below MP): Feet 15.90

Casing Diameter: Inches

Sampling Date: 10/12/97

Depth To Ground Water (Below MP): Feet 10.55

Sample ID No. R1-0B16

Method Of Well Development:

Time: ☐AM, ☒PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance:

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor:

☒ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any):

☒ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected:

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (~~Nearest 0.01~~ Ft.)	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1:10	7.2	400	13.0	304	.5	
1:12	6.8	300	13.0	545	1.0	
1:15	6.7	400	13.0	740	2.0	
1:18	6.6	400	13.0	155	2.5	
1:19	6.6	400	13.0	162	3.0	
1:20						

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: 15.90 - 10.99 = 4.91 X = 182 gal/wv.

[Comments may continue on back]

Form Completed By: E. Allen

Witnessed By:

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: | USPCI Project Number

Measuring Point (MP) Location: Inner Casing | **Well No.** R1-OB17 A01-34

Well Depth (Below MP): 17.20

Casing diameter (Inches): 2.0 | Sampling Date: 10/12/97

Depth To Ground Water in feet (Below MP): 9.04 (ic) 9.24 (oc) | Sample ID No. R1-OB17

Method Of Well Development: | Time: ☐AM, ☑PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump | Riser Elevation (MP):

☑ Bailer ☐ Centrifugal Pump ☐ Other | Top of Screen Elevation:

Sampling Collection Method: | Sample Appearance: cloudy

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample | Odor: slight odor

☑ Bailer Type: ○ Teflon ○ Stainless Steel | Sampling Problems (if any):

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP | Decontamination Performed:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests | Samples Collected:

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ ~~22~~ Turb.	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1:40	7.3	400	14.5	226	.5	
1:42	7.0	400	14.0	687	1.0	
1:45	7.0	500	14.0	895	1.5	
8:40	Sampled	well	10/13/97			

At Least Well Bore Volumes Were Evacuated Before Sampling | Discharge Rate = GPM x 0.00223 = cfs

Comments: 17.20 - 9.04 = 8.16 x 1.36 gal/wv

well dry - slow to recharge - will sample tomorrow

[Comments may continue on back]

Form Completed By: E. Allman | Witnessed By:

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name:

USPCI Project Number

Measuring Point (MP) Location:

Well No. 36-MW1

Well Depth (Below MP): 13.00'

Casing diameter (Inches): 2"

Sampling Date: 10/13/97

Depth To Ground Water in feet (Below MP): 6.73 (IC) 8.18' (OC)

Sample ID No. 36-MW1

Method Of Well Development:

Time: ☑AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☑ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: cloudy

☑ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: none

☑ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any): none

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: none

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOC, TPH, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (~~Nearest 0.01 Ft.~~) Turbidity	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
11:20	6.7	700	17.0	626	1.0	
11:28	6.3	700	17.0	190	1.5	
11:35	6.3	700	16.0	205	2.5	
11:40	6.3	700	16.0	187	3.0	
11:45	Conducted	Sampling				

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: 13.00 - 6.73 = 6.27 x .16 = ≈ 1 gal/wv.

[Comments may continue on back]

Form Completed By: E. Allen

Witnessed By:

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name:

USPCI Project Number

Measuring Point (MP) Location: top of inner Riser (

Well No. 36-MW2

Well Depth (Below MP): 17.45

Casing diameter (Inches): 2"

Sampling Date: 10/13/97

Depth To Ground Water in feet (Below MP): 10.66 (IC) 10.86 (OC)

Sample ID No. 36-MW2

Method Of Well Development:

Time: ☐AM, ☑PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☐ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: cloudy

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: None

☐ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any): None

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: VOC, metals, TPH

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected:

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level ~~(Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
12:15	6.8	600	16.0	608	.5	
12:20	6.5	600	16.0	795	1.0	
12:23	6.4	800	16.0	371	2.0	
12:27	6.4	700	15.5	420	3.0	
12:35	6.4	700	15.5	343	3.5	
12:37	6.4	700	15.5	373	4.0	
12:40	Sampled	well				

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: 17.45 - 10.66 = 6.79 X .167 = 1.14 gal/WV

[Comments may continue on back]

Form Completed By: E. Allen

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:	LAIDLAW Project Number:
Measuring Point (MP) Location: top of inside riser	**Well No.** 37-MW-1 AOI 37
Well Depth: (Below MP): ~~[illegible]~~ Feet 15.84'	
Casing Diameter: Inches 2"	Sampling Date: Oct 7, 1997
Depth To Ground Water (Below MP): Feet 12.10	Sample ID No. 37-MW1
Method Of Well Development:	Time: ☒AM, ☐PM 9:50
☐ Tap ☐ Submersible Pump ☐ Bladder Pump	Riser Elevation (MP):
☒ Bailer ☐ Centrifugal Pump ☐ Other	Top of Screen Elevation:
Sampling Collection Method:	Sample Appearance: cloudy
☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample	Odor: slight hydrocarbon odor
☒ Bailer Type: ○ Teflon ○ Stainless Steel	Sampling Problems (if any): none
☒ ABS Plastic ○ PVC	
Pump Intake Or Bailer Set At Feet Below MP	Decontamination Performed: none
Tubing Type (if Used):	(37-MW1)
Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests	Samples Collected: TPH & PAHs

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
9:00	7.9	500	17.50	750	1.0	Raining Hard
9:15	7.8	500	17.10	515	2.0	Raining Hard
9:35	7.7	450	16.54	508	2.5	"
9:45	7.7	450	16.01	490	3.0	"
9:50	Collected	Sample				

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: 15.84 - 12.10 = 3.74' of H_2O in well 3.74 x .167 = .62 gallons per well volume.

Somewhat slow to recharge

[Comments may continue on back]

Form Completed By: E. Allen Witnessed By:

Alle

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: OGDEN Railyard - Phase 1 | LAIDLAW Project Number:

Measuring Point (MP) Location: | Well No. 37-MW-2 (37-MW2)

Well Depth: (Below MP): Feet 16.15'

Casing Diameter: Inches 2" | Sampling Date:

Depth To Ground Water (Below MP): Feet 11.66' | Sample ID No.

Method Of Well Development: | Time: ☐AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump | Riser Elevation (MP):

☐ Bailer ☐ Centrifugal Pump ☐ Other | Top of Screen Elevation:

Sampling Collection Method: | Sample Appearance:

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample | Odor: slight hydrocarbon odor

☐ Bailer Type: ○ Teflon ○ Stainless Steel | Sampling Problems (if any):

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP | Decontamination Performed:

Tubing Type (if Used): | 37-MW2

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests | Samples Collected: TPH & PAHS

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
10:05	7.3	450	18.0	256	1.0	slightly clear
10:10	7.3	> 1000	18.0	200	2.0	
10:15	7.3	> 1000	18.0	210	3.0	
10:20	collected sample					

At Least Well Bore Volumes Were Evacuated Before Sampling | Discharge Rate = GPM x 0.00223 = cfs

Comments: 16.15' - 11.66' = 4.49 X 0.067 = .75 gallons per well volume,
10 Continuous light to heavy rain

[Comments may continue on back]

Form Completed By: E. Allen | Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 79L904

Measuring Point (MP) Location: TOC

Well No. 13-MW1

Well Depth: (Below MP): Feet 15.86

Casing Diameter: Inches 2"

Sampling Date: 6/7/98

Depth To Ground Water (Below MP): Feet 10.83

Sample ID No. 13-MW1

Method Of Well Development:

Time: ☐AM, ☒PM 1521

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O LCUL

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
			15.0	Turb.		
1513	7.0	1.60	~~10.69~~	10.69	1	
1517	7.0	1.70	15.5	22.3	2	
1521	7.0	1.70	15.0	36.3	3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. MW2

13-

Well Depth: (Below MP): Feet 16.4

Casing Diameter: Inches 2"

Sampling Date: 6/7/98

Depth To Ground Water (Below MP): Feet 10.64

Sample ID No. 13-MW2

Method Of Well Development:

Time: ☐AM, ☒PM 1500

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: Cloudy

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.) Turb.	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1450	7.0	0.70	14.5	0.39	1	
1454	7.0	1.20	13.5	1.09	2	
1457	7.0	1.30	13.0	90.5	3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 79L904

Measuring Point (MP) Location: TOC

Well No. 13-MW18

Well Depth: (Below MP): Feet 15.50

Casing Diameter: Inches 2"

Sampling Date: 6/17/98

Depth To Ground Water (Below MP): Feet 10.53

Sample ID No. 13-MW18

Method Of Well Development:

Time: ☐AM, ☒PM 1430

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: CLOUDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water ~~Level~~ (~~Nearest 0.01 Ft.~~) Turb	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1421	7.0	1.10	13.0	382	1	
1425	7.0	1.10	13.0	274	2	
1428	7.0	1.00	13.0	273	3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 21-MW1

Well Depth: (Below MP): Feet 16.32

Casing Diameter: Inches 2"

Sampling Date: 6/7/98

Depth To Ground Water (Below MP): Feet 11.19

Sample ID No. 21-MW1

Method Of Well Development:

Time: ☐AM, ☐PM 1055

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water ~~Level~~ (~~Nearest~~ 0.01 Ft.) Turb.	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1044	7.0	1.00	11.5	0.18	1	
1048	7.0	0.90	11.5	0.13	2	
1052	7.0	0.90	11.0	3.22	3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 22a-MW1

Well Depth: (Below MP): Feet 18.84

Casing Diameter: Inches 2"

Sampling Date: 6/5/98

Depth To Ground Water (Below MP): Feet 11.86

Sample ID No. 22a-MW1

Method Of Well Development:

Time: ☐AM, ☒PM 1410

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: slight diesel

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: TPH, PAH, VOA PCB, METALS

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turb	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1400	7.0	1.20	14.5	0.39	1.3	
1405	7.0	1.10	14.5	0.31	2.6	
1409	7.0	1.20	14.0	0.31	3.9	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 22A-MW2

Well Depth: (Below MP): Feet 17.23

Casing Diameter: Inches 2"

Sampling Date: 6/5/98

Depth To Ground Water (Below MP): Feet 10.10

Sample ID No. 22A-MW2

Method Of Well Development:

Time: ☒AM, ☐PM 0915

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: slight diesel

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: HD Level

Tubing Type (if Used):

Tubing Used for: ☒ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH PCB, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water ~~Level~~ (Nearest 0.01 Ft.) Turb	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
0842	7.0	1.70	13	0.45	1.2	
0848	7.0	1.70	13	0.32	2.4	
0946	7.0	1.80	13	2.35	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 22A-MW3

Well Depth: (Below MP): Feet 16.90

Casing Diameter: Inches 2"

Sampling Date: 6/5/98

Depth To Ground Water (Below MP): Feet 10.67

Sample ID No. 22A-MW3

Method Of Well Development:

Time: ☒AM, ☐PM 0830

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: HD label

Tubing Type (if Used):

Tubing Used for: ☒ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH PCB, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turb.	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
0810	7.0	1.20	13	0.40	1	
0820	7.0	1.60	13	8.02	2	
0829	7.0	1.60	13	7.35	3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 22A - MW4

Well Depth: (Below MP): Feet 14.80

Casing Diameter: Inches 2"

Sampling Date: 6/5/98

Depth To Ground Water (Below MP): Feet 7.18

Sample ID No. 22A-MW4

Method Of Well Development:

Time: ☒AM, ☐PM 1020

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☒ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH PCB, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water ~~Level~~ (Nearest 0.01 Ft.) Turb.	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
0959	7.0	2.10	15	1.75	1.2	
1004	7.0	2.00	14.5	0.20	2.4	
1014	7.0	2.20	14.5	1.54	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 ≈ cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: VPRK OGDEN

LAIDLAW Project Number: 79-904

Measuring Point (MP) Location: TOC

Well No. 26-MW1

Well Depth: (Below MP): Feet 14.53

Casing Diameter: Inches 2"

Sampling Date: 6/8/98

Depth To Ground Water (Below MP): Feet 6.83

Sample ID No. 26-MW1

Method Of Well Development:

Time: ☒AM, ☐PM 1110

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turb.	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1100	7.0	1.58	10.0°	0.78	1.2	
1104	7.0	1.58	10.0	2.38	2.4	
1108	7.0	1.50	10.5	6.54	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 30-MW1

Well Depth: (Below MP): Feet 14.55

Casing Diameter: Inches 2"

Sampling Date: 6/7/98

Depth To Ground Water (Below MP): Feet 9.18

Sample ID No. 30-MW1

Method Of Well Development:

Time: ☒AM, ☐PM 0945

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: cloudy

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water ~~Level~~ (~~Nearest 0.01 Ft.~~) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
0937	7.0	3.10	13.5	859.0	1	
0940	7.0	3.50	13.0	1046.0	2	
0944	7.0	3.30	13.0	530.0	3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 30-MW2

Well Depth: (Below MP): Feet 11.85

Casing Diameter: Inches 2"

Sampling Date: 6/7/98

Depth To Ground Water (Below MP): Feet 9.05

Sample ID No. 30-MW2

Method Of Well Development:

Time: ☒AM, ☐PM 1010

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: cloudy

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: diesel

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): None

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: HD Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1004	7.0	2.70	13.0	81.5	.5	
1005	7.0	2.60	12.5	98.6	1	
1008	7.0	2.90	12.5	126.2	1.5	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 30-MW3

Well Depth: (Below MP): Feet 18.74

Casing Diameter: Inches 2"

Sampling Date: 6/6/98

Depth To Ground Water (Below MP): Feet 11.8

Sample ID No. 30-MW3

Method Of Well Development:

Time: ☐AM, ☒PM 1730

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: diesel

☒ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1720	7.0	1.80	13.5	0.10	1	
1724	7.0	1.60	13.5	42.3	2	
1728	7.0	1.30	13.5	112.8	3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 30-MW4

Well Depth: (Below MP): Feet 18.16

Casing Diameter: Inches 2"

Sampling Date: 6/6/98

Depth To Ground Water (Below MP): Feet 11.14

Sample ID No. 30-MW4

Method Of Well Development:

Time: ☐AM, ☒PM 1810

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: Diesel

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: NONE

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water ~~Level~~ (Nearest 0.01 Ft.) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1800	7.0	1.40	14.0	0.35	1.1	
1804	7.0	1.30	13.5	0.37	2.2	
1807	7.0	1.50	13.5	0.39	3.3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 79L904

Measuring Point (MP) Location: TOC

Well No. 30-MW5

Well Depth: (Below MP): Feet 13.3

Casing Diameter: Inches 2"

Sampling Date: 6/8/98

Depth To Ground Water (Below MP): Feet 7.95

Sample ID No. 30-MW5

Method Of Well Development:

Time: ☒AM, ☐PM 0950

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: DIESEL

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel ○ ABS Plastic ○ PVC

Sampling Problems (if any): NONE

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H_2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: TPH, PAH, VOA metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1029	7.0	1.80	13.5	0.11	1	
1033	7.0	1.70	13.5	0.32	2	
1037	7.0	1.80	13.0	0.76	3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 30-MW6

Well Depth: (Below MP): Feet 17.11

Casing Diameter: Inches 2"

Sampling Date: 6/7/98

Depth To Ground Water (Below MP): Feet 8.81

Sample ID No. 30-MW6

Method Of Well Development:

Time: ☒AM, ☐PM 0825

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: diesel

☒ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H_2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
0817	7.0	1.10	13.5	0.29	1.3	
0820	7.0	1.20	13.5	0.25	2.6	
0824	7.0	1.30	13.5	0.18	3.9	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: VPRK 060 EN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 30 - MW 6D

Well Depth: (Below MP): Feet 23.7

Casing Diameter: Inches 2"

Sampling Date: 6/7/98

Depth To Ground Water (Below MP): Feet 8.05

Sample ID No. 30-MW6D

Method Of Well Development:

Time: ☒AM, ☐PM 0900

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (~~Nearest 0.01 Ft.~~) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
0845	7.0	1.50	13.0	71.0	2.5	
0850	7.0	1.50	13.0	173.2	5	
0857	7.0	1.50	12.5	528.0	7.5	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPER OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 34 MW-1

Well Depth: (Below MP): Feet 19.28

Casing Diameter: Inches 2"

Sampling Date: 6/4/98

Depth To Ground Water (Below MP): Feet 11.72

Sample ID No. 34 MW-1

Method Of Well Development:

Time: ☐AM, ☒PM 1230

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: WATER LEVEL

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: TPH, PAH, VOA metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level~~ (~~Nearest 0.01 Ft.~~) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1212	8.7	2.00	12.5	12.44	1.2	
1219	8.8	2.10	12.5	0.44	2.4	
1225	8.7	2.00	12.5	0.59	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: VPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well Depth: (Below MP): Feet 18.96

Well No. 34 MW-2

Casing Diameter: Inches 2

Sampling Date: 6/4/98

Depth To Ground Water (Below MP): Feet 12.84

Sample ID No. 34 MW-2

Method Of Well Development:

Time: ☒AM, ☐PM 0915

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: ○ Teflon ○ Stainless Steel HDPE

Sampling Problems (if any): RAIN

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: water level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
0854	7.0	1.70	8.0	123.2	1	
0904	7.0		8.0	195.8	2	
0911	7.0		8.0	197.1	3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: BAILED 7 gal. to try to purge out muddy water

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR · COBEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 34-MW-3

Well Depth: (Below MP): Feet 18.7

Casing Diameter: Inches 2"

Sampling Date: 6/4/98

Depth To Ground Water (Below MP): Feet 11.41

Sample ID No. 34-MW3

Method Of Well Development:

Time: ☒AM, ☐PM 1100

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: WATER LEVEL

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: TPH, PAH, VOA metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1045	7.3	0.70	12	1.31	1.2	
1052	7.4	0.70	12	8.39	2.4	
1058	7.3	0.70	12	1.08	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 34-MW3D

Well Depth: (Below MP): Feet 30.14

Casing Diameter: Inches 2"

Sampling Date: 6/4/98

Depth To Ground Water (Below MP): Feet 25.82

Sample ID No. 34-MW3D

Method Of Well Development:

Time: ☒AM, ☐PM 1155

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): RAIN

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: water level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: TPH, PAH, VOA metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water ~~Level~~ (~~Nearest~~ 0.01 Ft.) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1131	7.5	2.00	12.5	19.63	1	
1140	7.5	2.00	12.5	26.60	2	
1149	7.4	2.00	12.5	29.30	3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: Dup 34-MW100

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792504

Measuring Point (MP) Location: TOC

Well No. 34-MW4

Well Depth: (Below MP): Feet 16.94

Casing Diameter: Inches 2"

Sampling Date: 6/4/98

Depth To Ground Water (Below MP): Feet 9.99

Sample ID No. 34-MW4

Method Of Well Development:

Time: ☐AM, ☒PM 1640

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest ~~0.01~~ Ft.) turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1627	8.5	1.00	13.5	6.86	1.2	
1633	8.5	1.00	13.5	0.10	2.4	
1638	8.5	1.00	13.5	39.9	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well Depth: (Below MP): Feet 19.70

Well No. 34-MW5

Casing Diameter: Inches 2"

Sampling Date: 6/4/98

Depth To Ground Water (Below MP): Feet 11.76

Sample ID No. 34-MW5

Method Of Well Development:

Time: ☐AM, ☒PM 1550

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H_2O Clean

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1538	7.0	1.10	14.5	50.4	1.2	
1543	7.0	1.20	14.5	18.10	2.4	
1548	7.1	1.20	14.5	101.2	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR - OGDEN

LAIDLAW Project Number: 792-904

Measuring Point (MP) Location: TOC

Well No. # 34-MW-6

Well Depth: (Below MP): Feet 16.80

Casing Diameter: Inches 2"

Sampling Date: 6/6/98

Depth To Ground Water (Below MP): Feet 9.08

Sample ID No. 34-MW6

Method Of Well Development:

Time: ☒AM, ☐PM 0855

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel ○ ABS Plastic ○ PVC

Sampling Problems (if any): NONE

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H_2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: 2VOA, TPH, PAH METALS

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
0837	7.0	1.10	14.0	0.29	1.2	
0845	7.0	1.30	14.5	67.80	2.4	
0855	7.0	1.20	14.0	460.0	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 791904

Measuring Point (MP) Location: TOC

Well No. 37-MW1

Well Depth: (Below MP): Feet 18.13

Casing Diameter: Inches 2"

Sampling Date: 6/7/98

Depth To Ground Water (Below MP): Feet 14.67

Sample ID No. 37-MW1

Method Of Well Development:

Time: ☐AM ☒PM 1240

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: KDAE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: TPH, PAH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (~~Nearest 0.01 Ft.~~) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1225	7.0	0.80	13.0	336.0	.5	
1231	7.0	1.10	13.5	7.85	1.0	
1236	7.0	0.90	12.5	85.2	1.5	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: DUP 37-MW100

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 37 MW2

Well Depth: (Below MP): Feet 17.92

Casing Diameter: Inches 2"

Sampling Date: 6/7/98

Depth To Ground Water (Below MP): Feet 13.6

Sample ID No. 37-MW2

Method Of Well Development:

Time: ☐AM, ☒PM 1305

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: cloudy

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: diesel

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: TPH, PAH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1259	7.0	0.60	13.5	176.0	.7	
1302	7.0	0.80	13.0	288.0	1.4	
1305	7.0	0.80	12.5	435.0	2.1	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments: 37-MW2 MS

37-MW2 MSD

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792-904

Measuring Point (MP) Location: TOC

Well No. 37-MW3

Well Depth: (Below MP): Feet 18.06

Casing Diameter: Inches 2"

Sampling Date: 6/7/98

Depth To Ground Water (Below MP): Feet 11.45

Sample ID No. 37-MW3

Method Of Well Development:

Time: ☐AM, ☒PM 1340

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: TPH, PAH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest ~~0.01~~ Ft.) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1329	7.0	0.80	13.5	7.86	1.2	
1333	7.0	1.00	13.0	3.58	2.4	
1337	7.0	1.00	12.5	191.5	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: VPKR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 37-MW4

Well Depth: (Below MP): Feet 18.78

Casing Diameter: Inches 2"

Sampling Date: 6/7/98

Depth To Ground Water (Below MP): Feet 12.33

Sample ID No. 37-MW4

Method Of Well Development:

Time: ☐AM, ☒PM 1405

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: NONE

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: TPH, PAH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	~~Water Level (Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1353	7.0	0.90	13.5	0.18	1	
1357	7.0	1.00	13.0	78.2	2	
1401	7.0	1.10	13.0	93.5	3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:

LAIDLAW Project Number: 792904

Measuring Point (MP) Location:

Well No. PRODUCT

Well Depth: (Below MP): Feet

38 - MW 1 13:17

Casing Diameter: Inches

Sampling Date: 6/5/98

Depth To Ground Water (Below MP): Feet

Sample ID No.

Method Of Well Development:

Time: ☐AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance:

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor:

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any):

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected:

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By:

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 38-MW2

Well Depth: (Below MP): Feet 17.50

Casing Diameter: Inches 2"

Sampling Date: 6/6/98

Depth To Ground Water (Below MP): Feet 9.49

Sample ID No. 38-MW2

Method Of Well Development:

Time: ☒AM, ☐PM 1145

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH PCB, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1134	7.0	1.20	14.0	0.46	1.3	
1138	7.0	1.10	13.5	2.50	2.6	
1141	7.0	1.20	13.5	5.94	3.9	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 38-MW3

Well Depth: (Below MP): Feet 17.70

Casing Diameter: Inches 2"

Sampling Date: 6/6/98

Depth To Ground Water (Below MP): Feet 8.93

Sample ID No. 38-MW3

Method Of Well Development:

Time: ☐AM, ☒PM 1215

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: HgO level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH PAH PCB, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level ~~(Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1205	7.0	0.80	13.5	0.20	1.4	
1209	7.0	0.90	13.0	0.11	2.8	
1212	7.0	1.00	13.0	0.14	4.2	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 38-MW4

Well Depth: (Below MP): Feet 16.44

Casing Diameter: Inches 2"

Sampling Date: 6/5/98

Depth To Ground Water (Below MP): Feet 7.97

Sample ID No. 38-MW4

Method Of Well Development:

Time: ☐AM, ☒PM 1350

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: slight diesel

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: HD Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: TPH, PAH, VOA PCB, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level ~~(Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1338	7.0	1.50	14	0.24	1.3	
1342	7.0	1.50	14.5	0.21	2.6	
1346	7.0	1.40	14.5	0.18	3.9	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 38. MW5

Well Depth: (Below MP): Feet 18.70

Casing Diameter: Inches 2"

Sampling Date: 6/5/98

Depth To Ground Water (Below MP): Feet 9.76

Sample ID No. 38-MW5

Method Of Well Development:

Time: ☐AM, ☒PM 1315

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: slight diesel

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH PCB, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water ~~Level~~ ~~(Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1254	7.1	0.70	16	17.86	1.5	
1303	7.0	1.10	14	17.97	3.0	
1307	7.0	1.00	15	6.52	4.5	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name:

LAIDLAW Project Number: 792904

Measuring Point (MP) Location:

Well No. 38-MW6 PRODUCT

Well Depth: (Below MP): Feet

Casing Diameter: Inches

Sampling Date: 6/5/98

Depth To Ground Water (Below MP): Feet

Sample ID No.

Method Of Well Development:

Time: ☐AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☐ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance:

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor:

☐ Bailer Type: ○ Teflon ○ Stainless Steel

Sampling Problems (if any):

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected:

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: E Allen

Witnessed By:

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LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: VARR OGDEN — LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC — Well No. 38-MW7

Well Depth: (Below MP): Feet 18.0

Casing Diameter: Inches 2 — Sampling Date: 6/6/98

Depth To Ground Water (Below MP): Feet 9.55 — Sample ID No. 38-MW7

Method Of Well Development: — Time: ☒AM, ☐PM 0935

☐ Tap ☐ Submersible Pump ☐ Bladder Pump — Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other — Top of Screen Elevation:

Sampling Collection Method: — Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample — Odor: slight diesel

☒ Bailer Type: ○ Teflon ○ Stainless Steel — Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP — Decontamination Performed: H_2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests — Samples Collected: VOA, TPH, PAH, PCB, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
[illegible]	[illegible]	1.40	14.0	[illegible]	1.4	
[illegible]	[illegible]	1.40	14.0	[illegible]	2.8	
[illegible]	[illegible]	1.40	13.5	[illegible]	4.2	

At Least Well Bore Volumes Were Evacuated Before Sampling — Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN — Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR - OGDEN LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC Well No.: 38 - MW8

Well Depth: (Below MP): Feet 18.60

Casing Diameter: Inches 2" Sampling Date: 6/6/98

Depth To Ground Water (Below MP): Feet 9.27 Sample ID No. 38 - MW8

Method Of Well Development: Time: ☒AM, ☐PM 1010

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other Top of Screen Elevation:

Sampling Collection Method: Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests Samples Collected: VOA, TPH, PAH PCB, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	14.5	[redacted]	4.5	[redacted]
[redacted]	[redacted]	[redacted]	14.0	[redacted]	5.0	[redacted]
[redacted]	[redacted]	[redacted]	14.0	[redacted]	4.5	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: VPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. 38-MW9

Well Depth: (Below MP): Feet 13.9

Casing Diameter: Inches 2"

Sampling Date: 6/6/98

Depth To Ground Water (Below MP): Feet 5.1

Sample ID No. 38-MW9

Method Of Well Development:

Time: ☐AM, ☒PM 1650

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: muddy

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: slight diesel

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): None

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH, PCB, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level ~~(Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1640	7.0	1.40	18.0	13.13	1.4	
1643	7.0	1.40	17.0	5.83	2.8	
1646	7.0	1.50	16.0	131.28	4.2	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN LAIDLAW Project Number: 79490

Measuring Point (MP) Location: TOC

Well No. 38-MW10

Well Depth: (Below MP): Feet 14.0

Casing Diameter: Inches 2"

Sampling Date: 6/6/88

Depth To Ground Water (Below MP): Feet 6.53

Sample ID No. 38-MW10

Method Of Well Development:

Time: ☒AM, ☐PM 1100

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: slight diesel

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH, PAH PCB, metals

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
[illegible]	7.0	1.10	[illegible]	[illegible]	1.2	
[illegible]	7.0	1.20	[illegible]	[illegible]	2.4	
[illegible]	7.0	1.10	[illegible]	[illegible]	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments:

DUP 38-MW100

[Comments may continue on back]

Form Completed By: JOE FRANZEN Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. SPRR5-MW1

Well Depth: (Below MP): Feet 14.77

Casing Diameter: Inches 2"

Sampling Date: 6/6/98

Depth To Ground Water (Below MP): Feet 8.03

Sample ID No. SPRR5-MW1

Method Of Well Development:

Time: ☐AM, ☒PM 1610

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: 4D Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, GRO

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level ~~(Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1558	7.0	1.60	14	0.30	1.1	
1602	7.0	1.50	13.5	5.82	2.2	
1605	7.0	1.50	13.0	0.25	3.3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: VPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. SPRR5-MW2

Well Depth: (Below MP): Feet 14.86

Casing Diameter: Inches 2"

Sampling Date: 6/6/98

Depth To Ground Water (Below MP): Feet 7.85

Sample ID No.

Method Of Well Development:

Time: ☐AM, ☒PM 1500

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: GASOLINE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, GRO

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level ~~(Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1445	7.0	0.90	14.0	0.2	1	
1448	7.0	1.10	13.5	0.43	2	
1453	7.0	1.20	13.5	0.41	3	

At Least Well Bore Volumes Were Evacuated Before Sampling. Discharge Rate = GPM x 0.00223 = cfs

Comments: MS-MSD

[Comments may continue on back]

Form Completed By: JOE FRANZEN Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: VPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. SPRR5-MW3

Well Depth: (Below MP): Feet 14.23

Casing Diameter: Inches 2"

Sampling Date: 6/6/98

Depth To Ground Water (Below MP): Feet 7.84

Sample ID No. SPRR5-MW3

Method Of Well Development:

Time: ☐AM, ☒PM 1540

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: NONE

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, GRO

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.) Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1529	7.0	1.50	15.0	0.12	1	
1533	7.0	1.50	15.0	0.11	2	
1536	7.0	1.50	15.0	0.14	3	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FLANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. SPRR3-MW1

Well Depth: (Below MP): Feet 17.42

Casing Diameter: Inches 2"

Sampling Date: 6/5/98

Depth To Ground Water (Below MP): Feet 9.64

Sample ID No. SPRR3-MW1

Method Of Well Development:

Time: ☐AM, ☒PM 1515

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: muddy

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: slight diesel

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, GRO

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level ~~(Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1458	7.0	.90	14.0	0.15	1.2	
1503	7.0	.80	14.0	7.01	2.4	
1506	7.0	1.10	14.5	0.34	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN

Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN — LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC — Well No. SPRR3-W2

Well Depth: (Below MP): Feet 17.6

Casing Diameter: Inches 2" — Sampling Date: 6/5/98

Depth To Ground Water (Below MP): Feet 10.7 — Sample ID No. SPRR3-MW2

Method Of Well Development: — Time: ☐AM, ☒PM 1535

☐ Tap ☐ Submersible Pump ☐ Bladder Pump — Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other — Top of Screen Elevation:

Sampling Collection Method: — Sample Appearance: MUDDY

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample — Odor: [illegible]

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel — Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP — Decontamination Performed: H_2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests — Samples Collected: VOA, GRO

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level ~~(Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1523	7.0	1.50	16	0.02	1	
1526	7.0	1.40	15	0.11	2.4	
1532	7.0	1.40	14	0.25	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling — Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEN — Witnessed By:

LAIDLAW SAMPLING AND WELL STABILIZATION FORM

LAIDLAW Project Name: UPRR OGDEN

LAIDLAW Project Number: 792904

Measuring Point (MP) Location: TOC

Well No. SPRR3MW3

Well Depth: (Below MP): Feet 14.76

Casing Diameter: Inches 2"

Sampling Date: 6/5/98

Depth To Ground Water (Below MP): Feet 7.46

Sample ID No. SPRR3MW3

Method Of Well Development:

Time: ☐AM, ☒PM 1725

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation:

Sampling Collection Method:

Sample Appearance: dark, slick

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: diesel

☒ Bailer Type: HDPE ○ Teflon ○ Stainless Steel

Sampling Problems (if any): NONE

○ ABS Plastic ○ PVC

Pump Intake Or Bailer Set At Feet Below MP

Decontamination Performed: H2O Level

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: VOA, TPH

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level ~~(Nearest 0.01 Ft.)~~ Turbidity	Cumulative Volume of Water Removed from Well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1711	6.0	1.60	14	0.14	1.2	
1717	6.2	1.60	14.5	0.20	2.4	
1721	6.2	1.60	14.5	0.09	3.6	

At Least Well Bore Volumes Were Evacuated Before Sampling

Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: JOE FRANZEM

Witnessed By: