Joseph T. Ryerson & Son, Inc.
1465 - 65th Street, Emeryville, California 94608
Mail Address: Box 23070
Oakland, California 94623

510 653 2933 FAX: 510 428 2985

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Ryerson

STID 799

September 24, 1993

Susan L. Hugo
Senior Hazardous Materials Specialist
Department of Environmental Health
State Water Resource Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Room 200
Oakland, CA 94621

Dear Susan,

Attached is the work plan prepared by Hydro Environmental Technologies, Inc. per your request on May 4, 1993. Please contact my office if you should have any questions or comments. (510)653-2933, x330.

Sincerely,

D. Mammini
Service Manager

DM:cg

attachment

HYDRO
ENVIRONMENTAL
TECHNOLOGIES, INC.

93 SEP 27 AM 11:36

PHASE 1 SUBSURFACE INVESTIGATION

Ryerson Steel and Aluminum, Inc.
1465 65th Street
Emeryville, California 94608

Prepared for:

JOSEPH T. RYERSON & SONS, INC.
P.O. Box 23070
Emeryville, CA 94623

Prepared by:

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.
2363 Mariner Square Drive, Suite 243
Alameda, California 94501
HETI Job No. 7-231

September 14, 1993

HYDRO ENVIRONMENTAL TECHNOLOGIES, INC.

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1.0 INTRODUCTION

1.1 Purpose and Scope

Joseph T. Ryerson and Sons, Inc. retained Hydro-Environmental Technologies, Inc. (HETI) to conduct a limited subsurface investigation at the Ryerson Steel and Aluminum plant located in Emeryville, California This phase of the site investigation was performed to assess the extent of petroleum hydrocarbons in the subsurface soil and ground water in the vicinity of the former underground storage tank at the site.

The tasks performed for this investigation included the following:

- Necessary well installation permits were obtained.
- Three soil bore holes were drilled and logged. Soil samples were collected for laboratory analysis.
- Three monitoring wells were installed in the soil borings.
- The wells were developed and surveyed.
- Ground water samples were collected from the wells for laboratory analysis.

1.2 Site Location, Description and Background

The subject facility is located on the corner of Hollis and 65th Street in Emeryville, California (Figure 1). It consists of a large warehouse/office building with an asphalted yard used for truck and car parking and for storage. Work was conducted in the yard behind the main facility building. A 5,000 gallon underground diesel storage tank was removed from the site on March 11, 1993 by Semco, Inc. The associated piping and fuel dispenser were also removed. Excavation sidewall soil samples and a groundwater grab sample were collected for laboratory analysis. The

samples were analyzed for Total Petroleum hydrocarbons as diesel (TPHd) using EPA Method 8015 (DHS modified) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 8020. 850 parts per billion (ppb) of TPHd was detected in the ground water sample.

2.0 FIELD ACTIVITIES

2.1 Borehole Drilling and Soil Sampling

All drilling and soil sampling was performed according to standard HETI protocol consistent with Alameda County Department of Environmental Health (ACDEH) and San Francisco Bay Regional Water Quality Control Board (RWQCB) recommended guidelines and procedures. A copy of the HETI protocol is included as Appendix A.

HETI conducted a safety briefing with Bayland Drilling personnel prior to the commencement of drilling. All personnel present on-site reviewed and signed a copy of the Field Crew Health and Safety Plan prepared for this site. The Field Crew Health and Safety Plan is included as Appendix B.

On August 6, 1993, Bayland Drilling of Menlo Park, California, supervised by HETI, used a CME 75 hollow-stem auger drill rig to drill three soil borings designated B1, B2 and B3. The borings were drilled to a depth of 15.5 feet below grade. First water was encountered at a depth of approximately 6 feet below grade. A California-modified split-spoon sampler, lined with three brass tubes, was used to collect soil samples at five-foot intervals. The shallowest soil sample from each borehole was sealed with teflon tape and plastic end caps, labeled, documented on a chain-of-custody form and placed on ice for transport to the analytical laboratory.

Soil samples collected at 9.5 and 14 feet were also retained for visual lithologic description using the United Soil Classification System and for volatile headspace analysis using an Organic Vapor Meter (OVM). Readings from samples collected for OVM headspace analysis ranged from 0.0 to 79 parts per million (ppm). Organic vapor meter readings are not a quantitative determination of hydrocarbon concentrations in the soil samples, but they are useful in determining the relative

magnitude of hydrocarbon concentrations. Soil cuttings generated during drilling were stored on plastic sheets at the site pending future removal by a licensed waste hauler. OVM readings for specific soil samples and complete sample descriptions, are presented on the bore logs in Appendix C.

All soil samples submitted for laboratory analyses were analyzed for TPHd using EPA Method 8015 (DHS-modified). Soil sample analyses were performed by PACE, Inc., a state DHS-certified laboratory, located in Novato, California.

2.2 Monitoring Well Installation, Gauging, and Development

On August 6, 1993, Bayland drilling under HETI supervision installed monitoring wells in the borings B1, B2 and B3. The wells were designated MW-1, MW-2 and MW-3 respectively. Well MW-2 was installed in the tank excavation backfill. Well locations are shown on Figure 2.

Monitoring wells were all constructed of two-inch inner diameter PVC casing to a depth of 4.5 feet. coupled to machine slotted 0.020-inch schedule 40 PVC well screen from 4.5 feet depth to the bottom of each boring. The annulus around the well casing and screen was filled with clean #2 sand to a depth of four feet. A one foot thick layer of bentonite pellets was placed above the sand pack and hydrated to form a seal. The remainder of each borehole was grouted to the surface, and traffic-rated road boxes were concreted in place, flush with the ground surface. Well construction diagrams and copies of the well installation permits are included in Appendix C.

On August 11, 1993 HETI gauged each well for depth to water and depth to bottom. Approximately 0.01 feet of separate-phase petroleum was noted at the ground water interface in MW-3. The wells were then developed by a combination of surging and bailing of at least ten well volumes, until pH, temperature and conductivity stabilized, or until the well went dry. Purged water was stored on-site in 55-gallon drums. Well development information is presented on the Purge/Sample Data Sheets in Appendix D.

2.3 Ground Water Sampling and Analysis

Following recovery of water levels to at least 80% of their original levels, ground water samples were collected from MW-1 and MW-2, using dedicated teflon bailers. Samples were then labeled, documented on chain-of-custody forms, and stored in a chilled cooler for transport to the analytical laboratory. MW-3 was not sampled since separate-phase petroleum had been detected in the well before development. Ground water samples were analyzed for TPHd and for BTEX. Water sample analyses were performed by PACE, Inc. a state DHS-certified laboratory.

Following development, the location and elevation of top-of-casing of MW-1, MW-2 and MW-3 were surveyed.

2.4 Monthly Well Gauging

ACDEH approved a monthly well gauging program as part of the monitoring activities at the subject site. The first well gauging was conducted on September 14, 1993. MW-1, MW-2 and MW-3 were gauged for depth to water. 0.02 feet of free product was detected in MW-3. The results of this event are summarized on Table 2.

3.0 RESULTS OF INVESTIGATION

3.1 Site Stratigraphy

Sediments encountered during drilling of borings B1 and B3 consisted primarily of lean clay. B3 also contained thin layers of silty and gravelly sand. Fat clay was encountered in the bottom one foot of B3 below the excavation backfill.

3.2 Results of Soil Sample Analysis

None of the soil samples analyzed contained TPHd in concentrations exceeding the method detection limits. These analytical results are summarized on Table 1. A copy of the soil sample analytical laboratory report and chain of custody is attached in Appendix E.

3.3 Ground Water Gradient

On August 11, 1993, depth to ground water in each of the wells ranged from 4.18 to 4.87 feet below grade. On September 14 the range was from 4.23 to 4.94 feet below grade. The depth to water measurements collected and top-of-casing elevation data were used to calculate ground water elevation contours. These contours are shown on Figures 3 and 4, the Ground Water Contour Maps. Figure 3 and 4 show ground water flow to be northerly at a gradient of approximately 3.5%.

3.4 Results of Ground Water Sample Analysis

BTEX concentrations exceeded the method detection limit in the ground water sample collected from MW-2. BTEX concentrations included 1.3 ppb benzene. BTEX concentrations did not exceed the method detection limit in the ground water sample collected from MW-1 TPHd concentrations did not exceeded the method detection limit in either of the ground water samples collected. These analytical results are summarized on Table 2 and shown on Figure 5, the Hydrocarbon Distribution Map. A copy of the ground water sample analytical laboratory report and chain of custody is attached in Appendix E.

4.0 SUMMARY OF RESULTS

- Three soil borings were drilled and converted to monitoring wells (MW-1, MW-2 and MW-3) on August 6, 1993.
- Sediments encountered during drilling consisted primarily of lean clay with thin silty and gravelly sand layers in B-3.
- No analytes were present in concentrations exceeding method detection limits in the soil samples collected from the borings.
- Ground water flow was determined to be northerly at a gradient of approximately 3.5%.

- No TPHd was detected in concentrations exceeding method detection limits in the ground water samples collected from the monitoring wells. 1.3 ppb of benzene was detected in MW-2. MW-3 contained 0.01 to 0.02 feet of separate phase diesel.

5.0 CONCLUSIONS AND RECOMMENDATIONS

- Petroleum hydrocarbons have been identified in the ground water samples collected from two of the three wells installed at the site. However, the lateral and vertical extent and the direction of movement of the petroleum hydrocarbons has not been completely defined.

- Pursuant to the workplan approved by ACDEH, gauging of water levels in the three monitoring wells will be conducted on a monthly basis. Data from several well gauging events may be necessary to efficiently locate additional monitoring wells in order to define the extent of the petroleum hydrocarbon contamination. Consequently, further recommendations concerning additional well installation will be included in the next quarterly monitoring report, at which time sufficient data will be available.

6.0 CERTIFICATION

This report was prepared under the supervision of a registered professional engineer. All statements, conclusions and recommendations are based solely upon field observations and analytical analyses performed by a state-certified laboratory related to the work performed by Hydro-Environmental Technologies, Inc.

It is possible that variations in the soil or groundwater conditions exist beyond the points explored in this investigation. Also, site conditions are subject to change at some time in the future due to variations in rainfall, temperature, regional water usage, or other factors.

The service performed by Hydro-Environmental Technologies, Inc. has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

Hydro-Environmental Technologies, Inc. includes in this report chemical analytical data from a state-certified laboratory. These analyses are performed according to procedures suggested by the U.S. EPA and the State of California. Hydro-Environmental Technologies, Inc. is not responsible for laboratory errors in procedure or result reporting.

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

Prepared by:

Ruary Allan
Staff Geologist

Reviewed by:

REGISTERED GEOLOGIST
MARKUS B.
NIEBANCK
#5607
STATE OF CALIFORNIA

Markus Niebanck, R.G.
Western Regional Manager

Table 1

SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS

Ryerson Steel and Aluminum, Inc.
1465 65th Street
Emeryville, CA 94608

Sample I.D. #	Sampling Date	TPHd (ppm)
MW-1 - 5.5'	8/6/93	<1.0
MW-2 - 5.5'	8/6/93	<1.0
MW-3 - 5'	8/6/93	<1.0

Notes:

TPHd:	Total Petroleum Hydrocarbons as Diesel by EPA Method 8015 (DHS modified)
ppm:	Parts per Million

Table 2

SUMMARY OF GROUND WATER ELEVATIONS AND WATER SAMPLE ANALYTICAL RESULTS

Ryerson Steel and Aluminum, Inc.
1465 65th Street
Emeryville, CA 94608

Sample I.D. #	Sampling Date	TOC (feet)	DTW (feet)	GWE (feet)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	TPHd (ppb)
MW-1	8/11/93	5.24	4.87	0.37	<0.5	<0.5	<0.5	<0.5	<50
	9/14/93	5.24	4.94	0.30	NA	NA	NA	NA	NA
MW-2	8/11/93	5.06	4.64	0.42	1.3	<0.5	<0.5	0.59	<50
	9/14/93	5.06	4.64	0.42	NA	NA	NA	NA	NA
MW-3	8/11/93	5.48	4.18	1.30	NA: Floating Product 0.01 feet				
	9/14/93	5.48	4.23	1.25	NA: Floating Product 0.02 feet				

Notes:

TPHd: Total Petroleum Hydrocarbons as Diesel by EPA Method 8015 (DHS modified)
BTEX: Benzene, Toluene, Ethylbenzene and Total Xylenes by EPA Method 8020
ppb: Parts per Billion
TOC: Top of Casing Elevation
DTW: Depth to Water
GWE: Ground Water Elevation
NA: Not Analyzed

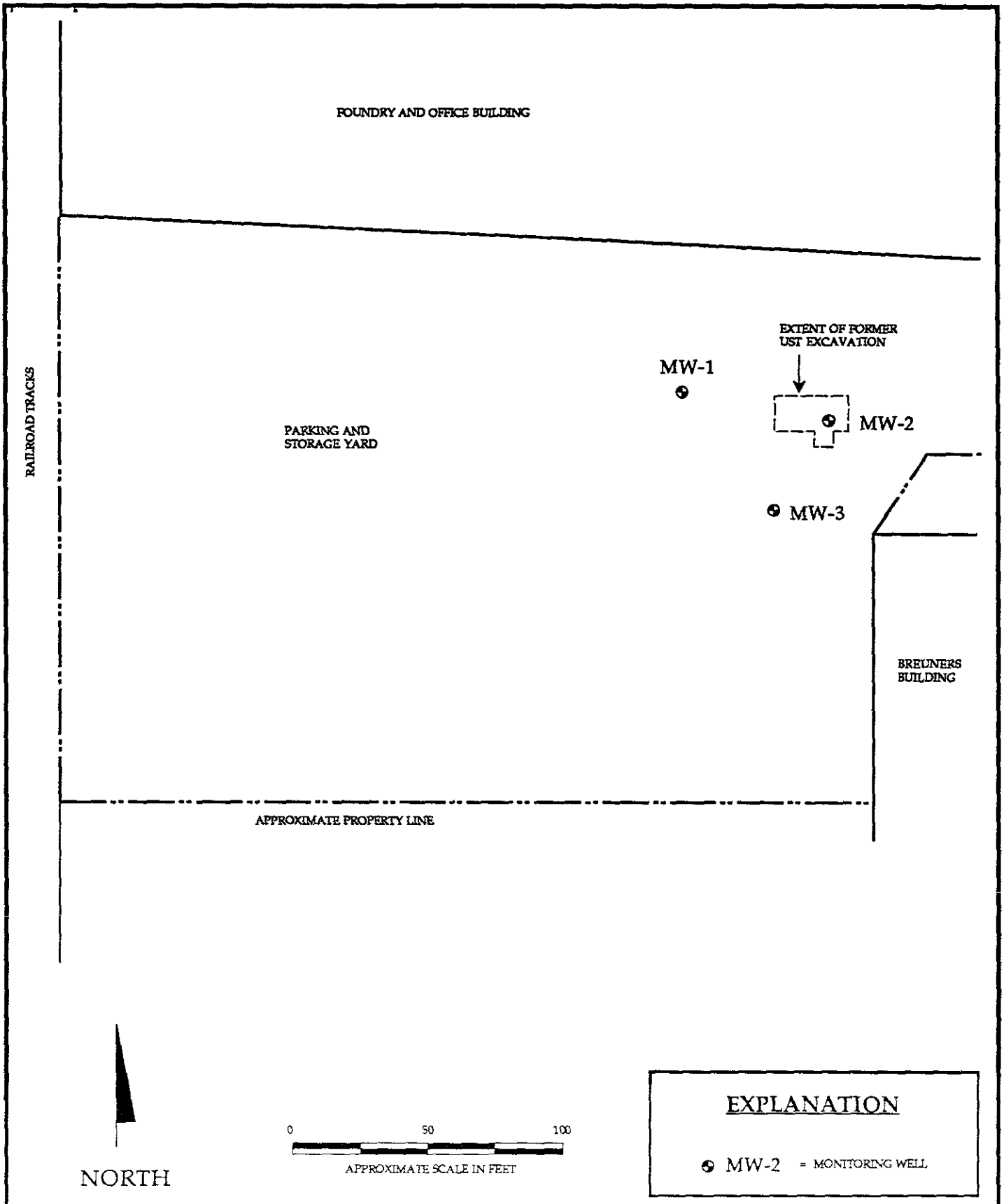
SOURCE:
USGS 7.5 MINUTE SERIES
OAKLAND WEST QUADRANGLE
PHOTOREVISED 1980

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

SITE LOCATION MAP
Ryerson Steel & Aluminum, Inc.
1465 65th Street
Emeryville, California 94608

Figure 1

7-231 9/93

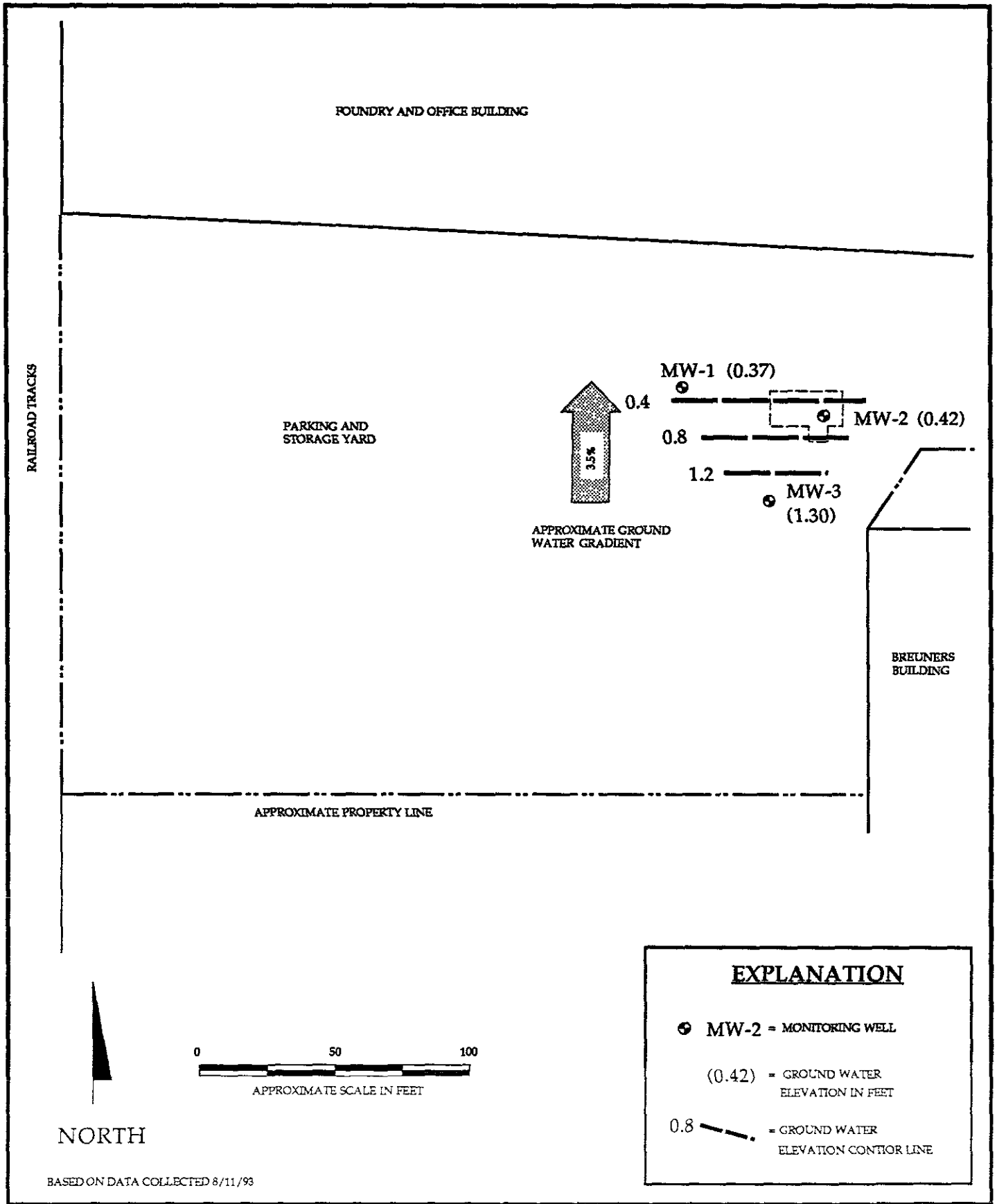


HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

SITE PLAN
Ryerson Steel & Aluminum, Inc.
1465 65th Street
Emeryville, California 94608

Figure 2

7-231 9/93



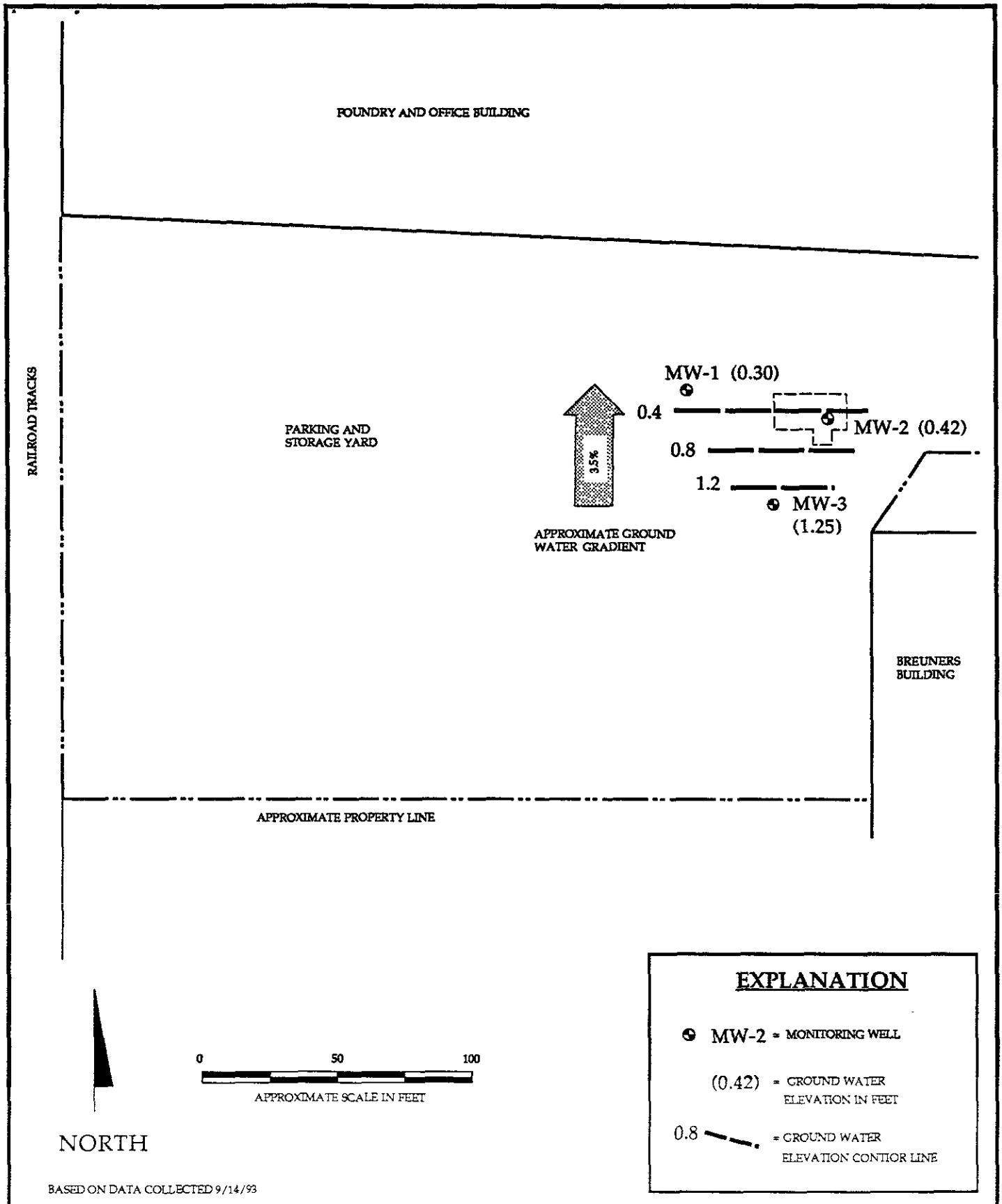
BASED ON DATA COLLECTED 8/11/93

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

GROUND WATER CONTOUR MAP 8/93
Ryerson Steel & Aluminum, Inc.
1465 65th Street
Emeryville, California 94608

Figure 3

7-231 9/93



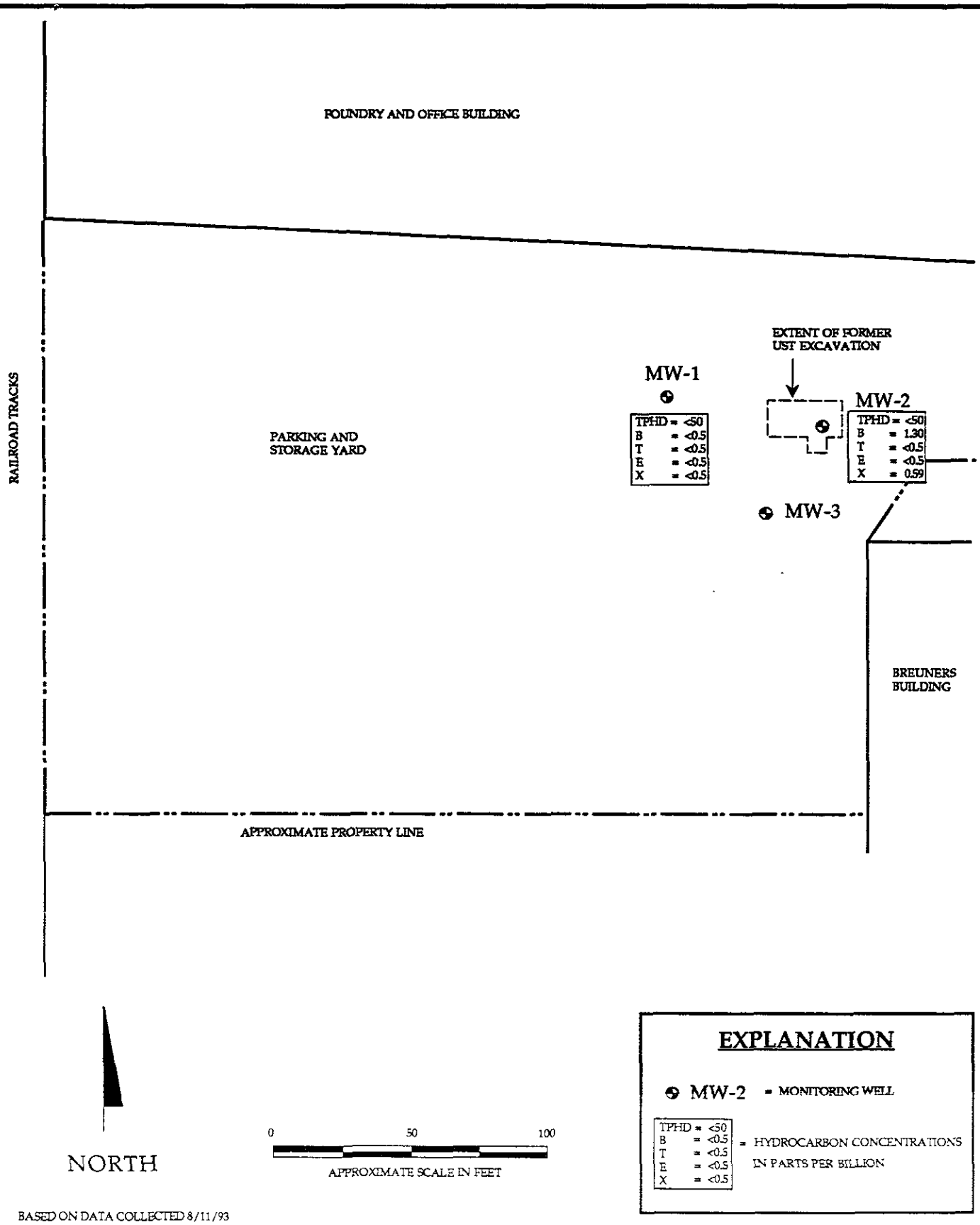
BASED ON DATA COLLECTED 9/14/93

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

GROUND WATER CONTOUR MAP 9/93
Ryerson Steel & Aluminum, Inc.
1465 65th Street
Emeryville, California 94608

Figure 4

7-231 9/93



BASED ON DATA COLLECTED 8/11/93

HYDR-ENVIRONMENTAL TECHNOLOGIES, INC.

HYDROCARBON DISTRIBUTION MAP
Ryerson Steel & Aluminum, Inc.
1465 65th Street
Emeryville, California 94608

Figure 5

7-231 9/93

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.
CALIFORNIA

DRILLING
WELL CONSTRUCTION
AND
SAMPLING PROTOCOLS

November 1992

DRILLING, WELL CONSTRUCTION, AND SAMPLING PROTOCOLS

Drilling Protocol

Prior to any drilling activities, Hydro-Environmental Technologies, Inc. (HETI) will verify that necessary drilling permits have been secured.

Prior to drilling, underground and above ground utilities will be located using Underground Service Alert (USA) and site reconnaissance. To the extent possible, drilling will be conducted so that disruptions of normal business activities at the project site are minimized. HETI shall obtain and review available public data on subsurface geology and, if warranted, the location of wells within a quarter mile of the project site will be identified. Drilling equipment will be inspected for suitability and integrity prior to performing work.

Subsurface investigations are typically performed to assess the lateral and vertical extent of petroleum hydrocarbons or other contaminants which may be present in soils and groundwater. Drilling methods will be selected to optimize field data requirements and to be compatible with known or suspected subsurface geologic conditions.

Shallow soil borings will be drilled dry using a truck-mounted hollow-stem auger drilling rig, unless site conditions favor a different drilling method. Drilling and sampling methods will be consistent with ASTM Method D-1452-80. The auger size will be a minimum of 3-inches nominal outside diameter (O.D.) for borings not to be completed as wells. The auger size will be a minimum of 8-inches nominal O.D. for borings to be completed as wells. No drilling fluids will be used during this drilling method. All augers and drill rods will initially be thoroughly steam cleaned before arriving on-site, to prevent the introduction of contaminants from off-site, and augers and drill rods which are used will be steam cleaned between borings away from boring locations. Working components of the drilling rig (subs, collars and all parts of the rig chassis near the borehole) will also be steam cleaned. Cleaned augers, rods and other tools, if required, will be stored and covered when not in use. Decontamination of drilling equipment will consist of steam cleaning, and/or trisodium phosphate wash. Cleaning operations will be observed and supervised by a representative of HETI. The drilling rig will also be inspected by a representative of HETI to ensure that no fluids (hydraulic or lubricant) are leaking from the equipment.

Soil Sampling Protocol

Soil samples are typically collected at 5-foot intervals, from the ground surface to the total depth of the boring, with a California Modified split-spoon sampler driven 18 to 24 inches ahead of the lead auger by a 140-pound hammer falling a minimum of 30 inches. The sampler will be lined with clean brass or stainless steel tubes. The number of blows necessary to drive the sampler will be recorded on the boring log and well construction diagram (Plate A-1) to help evaluate the consistency of the materials encountered. Additional soil samples may be collected based on significant lithologic changes and/or potential chemical content. All equipment that contacts soil samples will be thoroughly cleaned prior to arrival at the project site and between each individual sample collection point on-site. New and used split-spoon samplers will be steam cleaned or washed with a trisodium phosphate or Alconox solution, rinsed with tap water, air dried or wiped dry with a clean towel. Soil removed from the top two liners (typically each 4 to 6 inches in length) and the end cone will be used for visual logging purposes and disposed with cuttings produced during the drilling operations. The bottom liner, if suitable, will be preserved for laboratory analysis. Soil samples from each sampling interval will be lithologically described, consistent with the Unified Soil Classification System, by a HETI geologist. The exact depth of all borings to the nearest 1/2-

foot will be determined in the field. Exploratory boring logs shall be prepared under the direction of a Registered Geologist or Professional Engineer.

Head-space analysis will be performed in the field to check for the presence of volatile organic compounds. Head-space analysis will be performed using an organic vapor meter (either flame-ionization or photo-ionization). The method used will be consistent with the method described by Fitzgerald (1989). Organic vapor concentrations will be recorded on the HETI Soil Boring Log (Figure 1). The selection of soil samples for chemical analysis are typically based on the following criteria:

a. Soil discoloration
b. Soil odors
c. Visual confirmation of chemical in soil
d. Depth with respect to underground tanks
e. Depth with respect to groundwater
f. Organic vapor meter reading

The soil sampler and liners will be cleaned with a trisodium-phosphate or Alconox solution, rinsed with clean tap water and air dried or wiped dry with a clean towel prior to each sampling event. Soil samples (full liners) selected for chemical analyses will be covered with aluminum foil or teflon tape and the ends will be sealed with plastic end caps. The end caps will then be taped to ensure a more secure seal. The samples will then be labeled and entered onto a Chain-of-Custody document, and placed in a cooler on blue ice (hard shell) for transport to a state certified analytical laboratory.

Where copper and zinc contamination are the subject of the investigation, stainless steel liners will be used in lieu of brass liners. Stainless steel liners will also be used when the client, additional sampling protocol or regulatory agencies require.

Soil borings will be backfilled (sealed) to the ground surface using either a neat cement or cement-bentonite grout mixture in accordance with appropriate local regulations.

Pending the outcome of the results of the laboratory analyses, excess drill cuttings will remain on-site and, when deemed necessary, covered with a plastic tarp or drummed. Confirmed uncontaminated soils may be appropriately disposed of on-site by the client. Soils found to contain concentrations of contaminants above applicable local or state limits will be placed in appropriately labeled 55-gallon D.O.T. drums or in a hazardous materials drop bin and left on-site for proper disposal by the client. At the clients request, HETI will act as the client's agent by assisting in the disposal of the contained material. In no case will HETI personel sign a Hazardous Waste Manifest.

Well Construction

Monitoring wells shall be installed using a truck-mounted hollow-stem auger drilling rig or an air or mud-rotary drilling rig. Typically, the hollow stem rig will be used for the installation of wells up to 100 feet deep, if subsurface conditions prove favorable. Wells greater than 100 feet in depth will typically be drilled using air or mud-rotary equipment. Mud-rotary equipment will typically be used when alternate methods have failed or proven ineffective.

Monitoring well casing and screen shall be constructed of a minimum of Schedule 40, flush joint, threaded, polyvinylchloride (PVC) pipe. The well screen will be factory mill-slotted. The screen length shall be determined in the field and shall be placed with the intent of setting the screened interval adjacent to the aquifer material. The screen length shall also be set with the intent of placing the top of the screened interval a minimum of 2 feet above the static water

level. All screens and casings used will be in a contaminant-free condition when placed in the ground. No thread lubrication shall be used, other than teflon tape or distilled water, during the connection of individual lengths of screened and solid well casing. Screen shall not be placed in a borehole that creates hydraulic interconnection of two or more distinctly separate aquifer units. Screen slot size will be chosen to be compatible with the encountered aquifer materials. The screen slot size will be chosen to retain a high percentage of the filter pack or natural formation. The remainder of the well casing, above the screened interval, shall be of solid riser casing. A sand pack shall be placed in the remaining anular space surrounding the well casing to a minimum of 1 foot above the screened interval. Sand pack shall not be placed such that it interconnects two or more distinctly separate aquifer units. Sand pack shall be chosen to be compatible with both the aquifer materials and the screen slot size. Sand pack shall consist of clean, washed, kiln dried silica sand. A minimum 1-foot thick bentonite pellet or bentonite slurry seal shall be placed above the sand pack. All bentonite shall be hydrated by either formation water or steam-distilled water. The remaining annular space above the bentonite seal shall be grouted with a neat cement or bentonite-neat cement mixture and shall be placed from the top of the bentonite pellet seal to within 6 inches of the top of the well. If used, the bentonite content of the mixture shall not exceed 5 percent by weight. Sand pack, bentonite, and cement seal levels will be confirmed during construction by measuring the remaining anular space with a calibrated weighted tape. If shallow water table conditions prevail, the screen interval will be placed such that the screen height above the static water level is reduced and a maximum possible surface seal can be achieved. A field boring log and well construction diagram (Plate A-1) shall be prepared by a representative of HETI for each well completed. Monitoring and extraction wells shall be constructed with Class-A cement/bentonite grout or bentonite pellets tremied into position as a base for the well casing if necessary. The well casing will be set within the aquifer according to the proposed function of the well and the chemistry of the potential contaminants.

In the event a monitoring well is required to be installed in an aquifer unit underlying an existing, shallower aquifer, the well will be completed in the lower aquifer such that only water from the lower aquifer is drawn into the well. The upper aquifer will be sealed by installing a steel conductor casing which extends to the base of the shallow aquifer. The steel casing will be tremied into position with an annular neat cement or cement-bentonite grout seal placed between the outside wall of the casing and the wall of the borehole. The cement grout will be allowed a minimum of 72 hours to set prior to advancing the boring beyond the sealed conductor casing and into the next aquifer. After 72 hours, the boring will be advanced below the seal and completed as a well as described above but within the steel conductor casing.

The tops of all well casings will be sealed and placed in a vandal resistant, traffic rated box to prevent entry of surface contamination, unauthorized entry and tampering.

Monitoring wells will be surveyed to obtain north-end casing elevations to the nearest $\pm$ 0.01 foot. Water level measurements will be recorded with an interface probe to the nearest $\pm$ 0.01 foot and referenced to either a project datum or mean sea level (MSL). A project site datum is typically chosen such that it will remain in the event the project site undergoes a physical change as a result of construction or other cultural disturbance. Where required, the wells will be surveyed by a licensed land surveyor relative to the nearest bench mark and relative to mean sea level. Typically, the establishment of a known, on-site reference by a licensed survey, is enough to allow for the remaining well top elevations to be determined using a survey level and rod. Unless directed otherwise by local regulatory agencies, the well top elevations will be established in this manner.

Well Development

After installation, all monitoring wells shall be developed to remove fine grained sediments from the well and to stabilize sand, gravel and disturbed aquifer materials in the annular area around the screened interval. Well development will be accomplished by air-lift pump, suction-lift pump, submersible pump, bladder pump, surge block, bailer or any combination of the above. All well development equipment will be decontaminated prior to development using a steam cleaner and/or trisodium-phosphate solution wash, clean water rinse, and steam distilled water rinse. Well development will continue until each well is relatively free of turbidity. The adequacy of well development will be assessed by a HETI geologist. Where appropriate, indicator parameters (pH, specific conductance, temperature, and turbidity) will be monitored during well development. Field instrument calibrations will be performed prior to use according to manufacturers specifications.

Well Head Completion and Site Clean-up

Monitoring wells shall be completed below grade unless special conditions exist that require above grade design. Monitoring well casing (including the well locking seal and cap) will be completed approximately two inches below the vandal resistant traffic rated road box cover. Except in areas where snow plows might be used, the road box cover shall be completed approximately one inch above the existing grade surface to allow for precipitation runoff. All concrete work, both inside and outside the road box, shall be completed with a smooth finish.

Above ground completions will be set inside a 2 to 3 foot tall locking steel protective casing. If traffic conditions dictate, three 4-inch diameter steel pipes will be set in concrete in a triangular pattern to act as bumper posts. The posts will be set 2 feet deep and will be filled with concrete. A four foot square, 3-inch thick concrete pad which slopes away from the well will be set around each well. Both the protective steel well casing and the bumper posts will be painted yellow.

The project site shall be left as clean as possible. All soils and excess concrete produced from each monitoring well will be placed in appropriate areas to be disposed as previously described. All monitoring well locations will either be broomed or washed down such that staining of the existing surface cover is minimized.

GROUNDWATER SAMPLING AND ANALYSIS

Quality Assurance/Quality Control Objectives

The sampling and analysis procedures employed by HETI for groundwater sampling and monitoring follow specific Quality Assurance/Quality Control (QA/QC) guidelines. Quality Assurance (QA) objectives have been established by HETI to develop and implement procedures for obtaining field data and evaluating water quality in an accurate, precise and complete manner so that sampling procedures and field measurements provide information that is comparable and representative of the actual field conditions. Quality Control (QC) is maintained by HETI by using specific field protocols and requiring the analytical laboratory to perform internal and external QC checks. It is the goal of HETI to provide data that are accurate, precise, complete, comparable, and representative. The definitions for accuracy, precision, completeness, comparability, and representativeness are as follows:

1. Accuracy - the degree of agreement of a measurement with an accepted reference or true value.

2. Precision - a measure of agreement among individual measurements under similar conditions. Usually expressed in terms of standard deviation.

3. Completeness - the amount of valid data obtained from a measurement system compared to the amount that was expected to meet the project data goals.

4. Comparability - the confidence with which one data set can be compared with another.

5. Representativeness - the degree to which a sample or group of samples reflect the characteristics of a media at a given sampling point. Also includes the degree to which a sampling point represents the actual parameter variations which are under study.

As part of the HETI QA/QC program, applicable federal, state and local reference documents are to be followed. The procedures outlined in these regulations, manuals, handbooks, guidance documents and journals are incorporated into the HETI sampling procedures to assure that: (1) groundwater samples are properly collected, (2) groundwater samples are identified, preserved, and transported in a manner such that they are representative of field conditions, and (3) chemical analyses of samples are accurate and reproducible.

GUIDANCE AND REFERENCE DOCUMENTS USED TO COLLECT GROUNDWATER SAMPLES

U.S.E.P.A. - 339/9-51-002	NEIC Manual for Groundwater/ Subsurface Investigation at Hazardous Waste Sites
U.S.E.P.A. - 503/SW611	Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities (August, 1977)
U.S.E.P.A. - 600/4-79-020	Methods for Chemical Analysis of Water and Wastes (1983)
U.S.E.P.A. - 600/4-82-029	Handbook for Sampling and Sample Preservation of Water and Wastewater (1982)
U.S.E.P.A. - SW-846#, 3rd Edition	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (November, 1986) and latter additions
40 CFR 136.3e Table II	Required Containers, Preservation Techniques, and Holding Times
Resources Conservation and Recovery Act (OSWER 9950.1)	Groundwater Monitoring Technical Enforcement Guidance Document (September, 1986)
California Regional Water Quality Control Board (Central Valley Region)	A Compilation of Water Quality Goals (September, 1988); Updates (October, 1988)
California Regional Water Quality Control Board (North Coast, San Francisco Bay, and Central Valley)	Regional Board Staff Recommendations for Initial Evaluations and Investigation of Underground Tanks: Tri-Regional Recommendations (June, 1988)
California Regional Water Quality Control Board (Central Valley Region)	Memorandum: Disposal, Treatment, and Refuse of Soils Contaminated with Petroleum Fractions (August, 1986)
State of California Department of Health Services	Hazardous Waste Testing Laboratory Certification List (March, 1987)
State of California Water Resources Board	Leaking Underground Fuel Tank Control (LUFT) Field Manual (May, 1988), and LUFT Field Manual Revision (April, 1989)

State of California Water Resources 85), Control Board	Title 23 (Register #85.#33-8-17- Subchapter 16: Underground Tank Regulations; Article 3, Sections 2632 and 2634; Article 4, Section 2647 (October, 1986)
Santa Clara Valley Water District	Guidelines for Investigating Fuel Leaks (March, 1989)
Santa Clara Valley Water District	Guidelines for Preparing or Reviewing Sampling Plans for Soil and Groundwater Investigation of Fuel Contamination Sites (January, 1989)
Alameda County Water District	Groundwater Protection Program: Guidelines for Groundwater and Soil Investigations at Leaking Underground Fuel Tank Sites (most recent revision)
American Public Health Association	Standard Methods for the Examination of Water and Wastewaters, 16th Edition
Analytical Chemistry (journal)	Principles of Environmental Analysis Volume 55, pages 2212-18,December, 1983
American Petroleum Institute Environmental Affairs Dept., June, 1983	Groundwater Monitoring & Sample Bias
The Bay Area Air Quality Management District	Regulation 8 - Rule 40 & Rule 48

Because groundwater samples collected by HETI are analyzed in the parts per billion (ppb) range for many analytes, care is exercised to prevent contamination of samples. When volatile or semivolatile organic compounds are included for analysis, HETI sampling crew members will adhere to the following precautions in the field:

1. A new pair of clean, disposable, latex (or comparable material) gloves are to be worn for each well to be sampled.

2. When possible, samples will first be collected from wells known or suspected to contain the fewest contaminants, followed by wells in increasing order of degree of contamination.

3. All sample bottles and equipment are to be kept away from fuels and solvents. When possible, gasoline (used in generators and water pumps) is to be shipped to the project site in separate compartments of the same vehicle or in a separate vehicle as that in which sample bottles are shipped.

4. Sampling bailers are to be composed of polyethylene (when dedicated to the well), Teflon or stainless steel. Other materials, such as acrylic, may contain phthalate esters which can interfere with gas chromatography (GC) analyses. Well purging may be performed with PVC bailers.

5. Volatile organic groundwater samples are collected so that air passage through the sample does not occur or is minimal (to prevent volatiles from being stripped from the samples). Sample bottles are filled by slowly running the sample down the side of the bottle until there is a positive convex meniscus over the neck of the bottle. The Teflon side of the septum (in cap) is positioned against the meniscus and the cap is screwed on tightly. The sample is then inverted and lightly tapped while the sampler inspects the contents of the bottle for an air bubble. The absence of an air bubble indicates a successful seal. If a bubble is evident, the cap is removed and more water is added to the sample. The inspection procedure is repeated and if bubbles persist, the vial is discarded in a container designated for used and broken vials and bottles and the sample filling procedure is repeated with another vial.

6. Extra vials shall be available for use in the event of dropped bottles and/or caps. Any bottle which has come in contact with the ground shall be considered contaminated and shall not be used. When replacing septa, or if septa become inverted, care shall be taken to assure that the Teflon seal faces the interior of the bottle.

7. All preservatives shall be provided by the contract analytical laboratory.

Laboratory and field handling procedures of samples may be monitored by including QC samples for analysis with sample lots from a project site. QC samples may include any combination of the following:

1. Trip Blank - Used for purgable organic compounds only; QC samples shall be collected in 40 milliliter (ml) sample vials filled in the analytical laboratory with organic free water. Trip blanks should be sent to the project site, and travel with the samples from the project site. Trip blanks are <u>not</u> opened, and are returned from the project site with the samples from the project site for analysis.

2 Field Blank - Prepared in the field using steam-distilled water. Field blank QC samples shall accompany project site samples to the laboratory and shall be analyzed for the same chemical parameters as those samples taken from the project site.

3. Equipment Blank - Equipment Blank QC samples shall be prepared in the field using field equipment rinsate between two different wells after the equipment has been washed and rinsed. The equipment blank will consist of deionized water retained in the sampling equipment. These QC samples will only be taken when a dedicated bailer is not used for sampling.

4. Duplicates - Duplicate QC samples shall be collected "second samples" from a selected well and project site. Duplicates shall be collected as either split samples or second-run samples (i.e. later date) from the same well.

The number and types of QC samples shall be determined by HETI on a site-specific basis.

GROUNDWATER SAMPLE COLLECTION

This section describes the routine procedures followed by HETI while collecting groundwater samples for chemical analysis. These procedures include decontamination, water level measurements, well purging, physical parameter measurements, sample collection, sample preservation, and sample handling. Critical sampling objectives for HETI are to:

1. Collect groundwater samples which are representative of the sampled matrix.

2. Maintain sample integrity from the time of sample collection to delivery to the analytical laboratory.

Sample analyses, methods, containers, preservation, and holding times are presented in Table A-1.

Decontamination Procedures

All physical parameter measuring and sampling equipment shall be decontaminated prior to measurement and sample collection using a trisodium phosphate or Alconox solution wash, followed by two separate rinses in tap water, followed by one rinse in steam-distilled water. Any sampling equipment surfaces or parts that might absorb specific contaminants, such as plastic pump valves, impellers, etc., are to be cleaned in the same manner.

Sample bottles, bottle caps, and septa used for sampling volatile organics are thoroughly pre-cleaned in either the laboratory or the factory. All appropriate measures shall be taken to assure continued sterility of the containers issued by the contract laboratory prior to usage at the project site.

During field sampling, equipment which has been placed in a well shall be decontaminated by washing with a trisodium-phosphate or Alconox solution followed by two rinses in tap water and one rinse in steam-distilled water.

Water Level Measurements

Prior to purging and sampling any wells, the static-water level shall be measured by use of an electronic sounder and/or calibrated portable oil-water interface probe. Both static water level and separate phase product thickness shall be measured and noted to the nearest $\pm$0.01 foot. Interface probe results shall be confirmed by sampling the top of the water column with a clear bailer and measuring any floating product thickness to the nearest $\pm$0.01 foot with an engineers scale tape. In all cases a clear bailer sample will be taken from each well to check for color, sheen and undetected floating product. If floating product of any measureable thickness is observed, no sampling will be performed for that well. If visible product sheen is observed, sampling shall proceed under normal protocols.

The line used to lower the bailer shall be discarded after each use to preclude the possibility of cross contamination. Field observations (e.g., well integrity, product odor, turbidity, water color, odors, etc.) shall be recorded on the HETI Purge/Sample Sheet (Plate A-2). Before and after the use of the electric sounder, interface probe, non-dedicated bailer, or any other down well equipment, each will be decontaminated by washing in a trisodium phosphate or Alconox solution, followed by a double rinse with tap water, followed by a rinse with steam-distilled water.

Well Purging

Before sampling commences, well casing storage water and interstitial water in the artificial sand pack shall be purged from the well using: (1) a positive displacement bladder pump constructed of inert non-wetting Teflon and stainless steel; (2) a pneumatic-airlift pumping system; (3) a centrifugal pumping system; or (4) a PVC, Teflon or stainless steel bailer. Methods of purging will be assessed based on the well size, location, depth, accessibility, and known chemical conditions. Individual well purge volumes are calculated from the casing volumes. In general, a minimum of 3 to 5 casing volumes will be purged. Wells which dewater or demonstrate slow recharge capacities (i.e., low yield wells which only recover to 70 percent of initial water column height after 1 hour) during purging activities may be sampled after fewer than 3 to 5 purging cycles. If a low yield well is to be sampled, sampling shall not take place until at least 70 percent of the previously measured water column has been replaced by recharge. Monitoring wells shall be purged according to the protocol flowchart presented in Plate A-3. Water removed from the wells will either be disposed or stored in 55-gallon DOT drums for future disposal according to proceedures outlined for contaminated soil cuttings in the Soil Sampling Protocol section above. Where appropriate, physical parameters (pH, specific conductance, and temperature) will be monitored by HETI field crew during well purging operations. If necessary, purging may continue until all three physical parameters have stabilized. Stability shall be defined as a change of less than 0.2 pH units, less than 10 percent in micro mhos, and less than 1.0 degree Centigrade. The pH meters shall be read to the nearest $\pm$ 0.1 pH units. Specific conductance meters shall be read to the nearest $\pm$ 10 micro-mhos per centimeter. Both types of meters shall be calibrated daily to manufacturer's specifications. Temperature shall be read to the nearest $\pm$ 0.1 degree centigrade. Field data collected while developing, purging and sampling the wells will be entered onto the HETI Purge/Sample Sheet (Plate A-2). Copies of the Purge/Sample Sheets will be reviewed for accuracy and completeness for each well sampled.

DOCUMENTATION

Sample Container Labels

Each sample container shall be labeled immediately after the sample is collected and sealed. The label shall include:

- Company Name (HETI)
- Source (i.e., well number or code)
- Sampler's identification
- Project number
- Date and time of collection
- Type of preservation (if any) used

Field Sampling Data Sheets

In the field, the HETI sampling crew will record the following information on the Purge/Sample Sheet (Plate A-2) for each well sampled:

- Project number
- Client
- Location
- Source (i.e., well number or code)
- Time and date of development, purging and sampling
- Well accessibility and integrity
- Pertinent well data (e.g., total depth, product thickness, static water level)
- Physical parameters when appropriate (e.g., specific conductance, pH, temperature) - may be more than one reading
- Gallons and well casing volumes purged

Chain-of-Custody

A chain-of-custody record shall be completed and will accompany every shipment of samples to the analytical laboratory in order to establish documentation tracing sample possession from the time of collection until delivery to the laboratory. The record will contain the following information:

- Sample or station number or code (ID)
- Signature of the collector, sampler, or recorder
- Date and time of collection
- Place of collection (project address and name of business)
- Sample type (soil or water)
- Type of analysis requested
- Signatures of persons involved in chain of possession (in chronological order)
- Dates and times of individual possession (inclusive)
- Laboratory comments regarding the sample receptacle conditions

Samples will always be accompanied by a Chain-of-Custody record. When transferring the samples, the individuals relinquishing and receiving the samples will sign, date and note the time on the Chain-of-Custody record.

Sample Collection, Handling, Storage and Transport

All water samples will be collected in an order such that those parameters most sensitive to volatilization will be sampled first. A general order of collection for some common groundwater parameters is as follows:

- Volatile Organic Compounds (VOC's)
- Total Organic Halogens (TOH)
- Total Organic Carbon (TOC)
- Extractable Organics
- Total Metals
- Dissolved Metals
- Phenols
- Sulfate and Chloride
- Nitrate and Ammonia
- Turbidity

All samples from the same well shall be collected immediately after purging or when the well recovers to 70 percent of the original water column height. All samples from one sampling set from a single well should be collected on the same day.

All chemical sample handling and storage will be conducted under the direction of HETI's consulting analytical chemist. All laboratory chemical testing will be accomplished by a state approved analytical laboratory.

All water samples will be held at 4°C by packing them in a water-tight container inside an ice chest and covering with hard shelled "blue ice™". In no event shall the time between sample collection and delivery to the contract laboratory be greater than 72 hours. Preservatives will not be added to any sample by the sampling crew, unless instructed by the consulting analytical chemist. If added in the field, preservatives shall be supplied by the contract analytical laboratory. No one will open the samples other than laboratory personnel who will perform the specified chemical analyses.

If it is necessary for samples or sample ice chests to leave the immediate control of the sampling crew prior to delivery to the laboratory or laboratory courier, such as shipment by a common carrier (e.g., UPS™), a custody seal will be placed on each sample container and/or sample chest. Custody seals will be placed to ensure that the samples have not been tampered with during shipment and will contain the samplers signature, the date and time the seal was emplaced.

TABLE A-1

SAMPLE ANALYSIS METHODS, CONTAINERS, PRESERVATIVES, AND HOLDING TIMES

Parameter	Analytical Method	Reporting Units	Container*	Preservation†	Maximum Holding Time
Total Petroleum Hydrocarbons (low to med. b.p. i.e. gasoline)	EPA 8015 (DHS modified)	ppb ug/l	40ml glass vial, Teflon lined septum	4°C HCl to pH<2**	14 days
Benzene Toluene Ethylbenzene Xylenes (BTEX)	EPA 8020	ppb ug/l	40ml glass vial, Teflon lined septum	4°C HCl to pH<2**	7 days(w/o preservative) 14 days (w/preservative)
Oil & Grease	SM 503A&E	ppb ug/l	1L glass jar, Teflon lined cap	4°C H2SO4 to pH<2	28 days
Total Petroleum Hydrocarbons (high. b.p. i.e. diesel)	EPA 8015 (DHS modified)	ppb ug/l	1L glass jar, Teflon lined cap	4°C	14 days
Halogenated Volatile Organics (chlorinated solvents)	EPA 8010	ppb ug/l	40ml glass vial, Teflon lined septum	4°C	14 days
Non-Chlorinated Solvents	EPA 8020	ppb ug/l	as above	4°C	14 days
Volatile Organics (GC/MS)	EPA 8240	ppb ug/l	as above	4°C	14 days
Semi-Volatile Organics (GC/MS)	EPA 8270	ppb ug/l	as above	4°C	14 days
Metals	ICP-EPA 200.7 or A.A.EPA-	ppb ug/l	100 ml	4°C HNO3 to pH<2	6 months

* Containers listed are for water - soil containers are to be brass or stainless steel tubes with plastic end caps.

† Applies only to liquid samples.

** May vary depending on lab requirements.

SITE/LOCATION		BEGUN	BORING DIAMETER	ANGLE/BEARING	BORING NO
DRILLING CONTRACTOR		COMPLETED	FIRST ENCOUNTERED WATER DEPTH		
OPERATOR		LOGGED BY	STATIC WATER DEPTH/DATE		
DRILL MAKE & MODEL		SAMPLING METHOD			BOTTOM OF BORING
WELL MATERIAL	SLOT SIZE FILTER PACK	BORING SEAL			WELL NO.

BLOWS/ FOOT	HELD HEAD-SPACE*	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
		1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
		14					
		15					
		16					
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					
		26					
		27					
		28					
	*PID	29					
	(ppm)	30					

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE:

APPROVED BY:

SOIL BORING LOG MW-4
AND
WELL CONSTRUCTION MW-4

PLATE
A-1

JOB NO.

PURGED/SAMPLED BY: _____ DATE: _____

GAUGING DATA:

Depth to bottom: _____ ft.

Depth to water: _____ ft.

Saturated Thickness: _____ ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume _____ gallons

volumes to purge x_____ vols.

*Total volume to purge = _____ gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer/ Submersible pump/ Suction lift pump/ _____
(circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH

Color: _____ Turbidity: _____

Recharge: _____ SPP_____ft.

SAMPLING DATA:

Sampling method: Dedicated bailer /_____

Sample for: (circle)

TPHg/BTEX	METALS	TOC	8010	
TPHd	O-Pb	TEL	8020	
TPH mo	Total Pb	EDB	8240	
601	602	Nitrates	8260	8270

Other: _____

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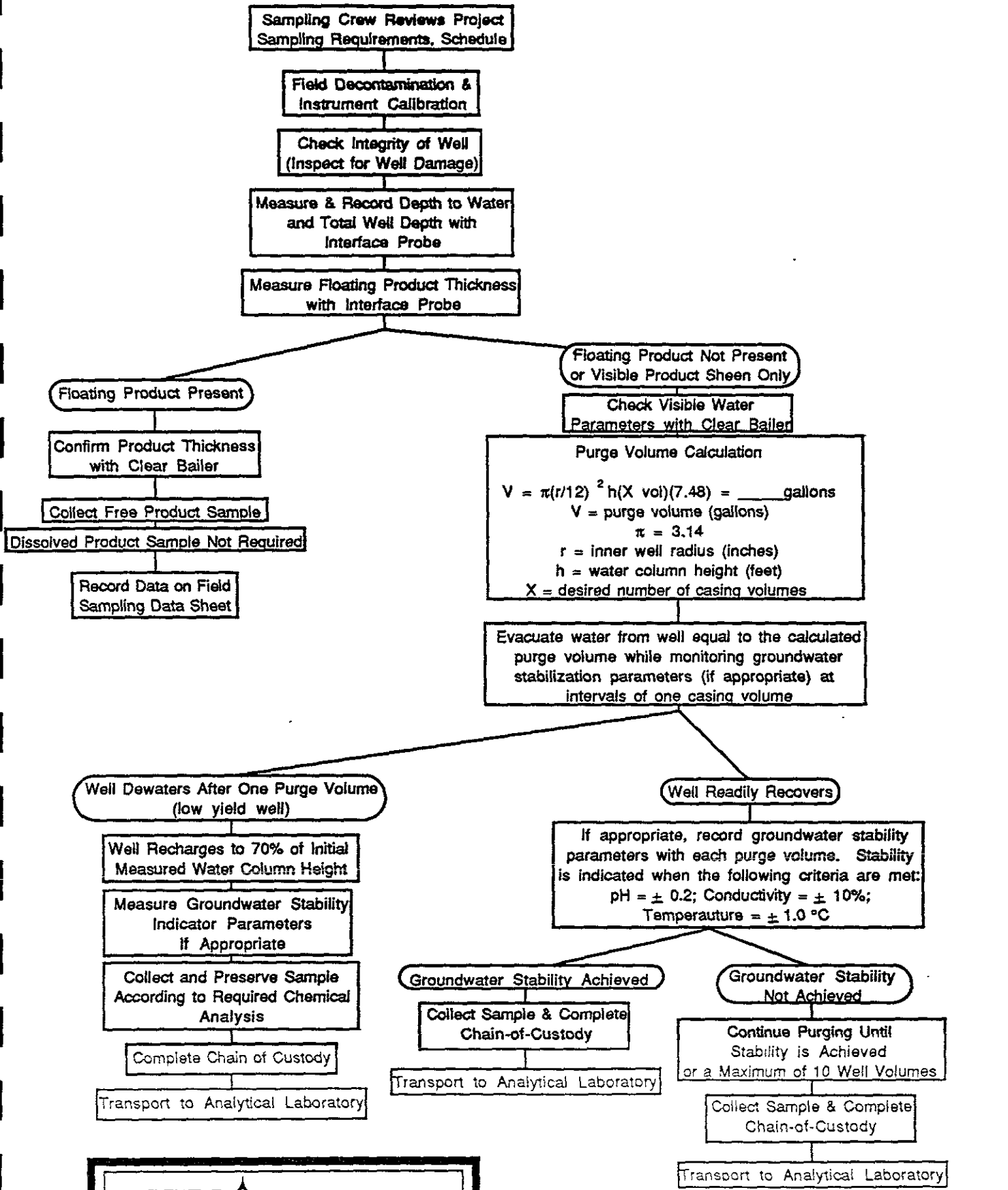
MONITORING WELL PURGE/SAMPLE SHEET

WELL # _____

LOCATION _____

PLATE A-2



HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

PLATE A-3
WATER SAMPLING FLOWCHART

FIELD CREW HEALTH & SAFETY PLAN

PRE-ACTIVITY BRIEFING

Project Location: 65TH + Hollis, Emeryville

Client: Ryerson Steel Job #: 7-231

POTENTIAL PHYSICAL HAZARDS AT WORKSITE: Underground/overhead utility lines; fires, explosion, electrical shock; flying/falling objects; pinch points/caught between objects; exertion or strain; lifting, slipping, tripping, falling; heavy equipment and vehicle traffic at worksite; noise; burns from steam or engine parts; heat stress or exhaustion; trash with nails, broken glass, etc.; excavation collapses.

CHEMICAL HAZARDS: Constituents of petroleum fuels, solvents, other organic compounds, in vapor, liquid or dissolved form, methane and hydrogen sulfide gas. Routes of entry include inhalation, absorbtion, contact and ingestion.

RESPIRATORY PROTECTIVE EQUIPMENT: None required unless organic vapor levels exceed 10 ppm in breathing zone as measured by OVM, then half-face respirator with appropriate vapor filter cartridge as required.

PROTECTIVE CLOTHING AND EQUIPMENT: Level D clothing: Hardhat mandatory for all personnel working at site; steel-toed boots recommended for geologist, required for driller and helper. Ear and eye protection as needed. Chemically hazardous conditions require nitrile gloves, Tyvek coveralls, and respirators.

SITE SPECIFIC INSTRUCTIONS: Driller will examine all wires/cables and ropes daily. Drilling equipment will be maintained in safe operating condition and meet state safety requirements. Know location of first aid kit, fire extinguisher, and telephone. Block/chock rig as required. No drilling or working at site without project geologist being present. Use hand tools safely.

Driller's Signature: [signature] Date: 8-6-93

Helper's Signature: [signature] Date: 08-06-93

Geologist's Signature: [signature] Date: 8-6-93

NEAREST HOSPITAL OR CLINIC: ALTA BATES Telegraph + Ashby Berkeley

HOSPITAL ADDRESS & DIRECTIONS FROM JOB SITE: Along Ashby east to hospital.

EMERGENCY PROCEDURE: Begin appropriate first-aid.
Send person for help. Call 911.

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588 VOICE (510) 484-2600
FAX (510) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 1465 65th St. Emeryville Ca 94608

CLIENT
Name RYERSON STEEL
Address 1465 65th ST. Phone (510) 271-4530
City EMERYVILLE Zip 94608

APPLICANT
Name RUSTY ALLAN HYDRO-ENVIRONMENTAL TECHNOLOGIES
Address 2363 MARINER SQ. DR#243 Phone (510) 521-2684
City ALAMEDA Zip 94501

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	___	General	___
Water Supply	___	Contamination	___
Monitoring	✓	Well Destruction	___

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger ✓
Cable ___ Other ___

DRILLER'S LICENSE NO. C57 374152

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 15 ft.
Surface Seal Depth 4 ft. Number 3

GEOTECHNICAL PROJECTS
Number of Borings ___ Maximum
Hole Diameter ___ in. Depth ___ ft.

ESTIMATED STARTING DATE 8/6/93
ESTIMATED COMPLETION DATE 8/6/93

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE

FOR OFFICE USE

PERMIT NUMBER 93430
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

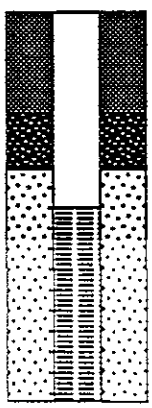
E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 3 Aug 93
Wyman Hong

UNIFIED SOIL CLASSIFICATION SYSTEM - VISUAL CLASSIFICATION OF SOILS
(ASTM D-2488)

MAJOR DIVISIONS		GROUP SYMBOL	GROUP NAME	DESCRIPTION
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravel Well-graded gravel with sand	Well-graded gravels or gravel-sand mixtures, little or no fines.
		GP	Poorly-graded gravel Poorly-graded gravel with sand	Poorly-graded gravels or gravel sand mixture, little or no fines.
		GM	Silty gravel Silty gravel with sand	Silty gravels, gravel-sand-silt mixtures.
		GC	Clayey gravel Clayey gravel with sand	Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS	SW	Well-graded sand Well-graded sand with gravel	Well-graded sands or gravelly sands, little or no fines.
		SP	Poorly-graded sand Poorly-graded sand with gravel	Poorly-graded sands or gravelly sands, little or no fines.
		SM	Silty sand Silty sand with gravel	Silty sands, sand-silt mixtures.
		SC	Clayey sand Clayey sand with gravel	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS	SILTS AND CLAYS	ML	Silt; Silt with sand; Silt with gravel; Sandy silt; Sandy silt with gravel; Gravelly silt; Gravelly silt with sand	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
		CL	Lean clay; Lean clay with sand; Lean clay with gravel Sandy lean clay; Sandy lean clay with gravel Gravelly lean clay; Gravelly lean clay with sand	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
	ELASTIC SILTS AND CLAYS	MH	Elastic silt; Elastic silt with sand; Elastic silt with gravel Sandy elastic silt; Sandy elastic silt with gravel Gravelly elastic silt; Gravelly elastic silt with sand	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH	Fat clay; Fat clay with sand; Fat clay with gravel Sandy fat clay; Sandy fat clay with gravel Gravelly fat clay; Gravelly fat clay with sand	Inorganic clays of high plasticity, fat clays.
HIGHLY ORGANIC SOILS		OL/OH	Organic soil; Organic soil with sand; Organic soil with gravel Sandy organic soil; Sandy organic soil with gravel Gravelly organic soil; Gravelly organic soil with sand	Organic silts and organic silt-clays of low plasticity. Organic clays of medium to high plasticity.
		Pt	Peat	Peat and other highly organic soils.

WELL CONSTRUCTION DETAILS



= Cement

= Bentonite

= Filter pack

= PVC Screen

= PVC Blank

Approximate first encountered water level

Approximate stabilized water level

Retained for Analysis } Sample Interval

NOTE: Blow count represents the number of blows of a 140-lb hammer falling 30 inches per blow required to drive a sampler through the last 12 inches of an 18-inch penetration.

No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil section observed at the boring location on the date of drilling only.

S = Sampler sank into medium under the weight of the hammer (no blow count)

P = Sampler was pushed into medium by drilling rig (no blow count)

NR = No Recovery

SANDS & GRAVELS	BLOWS/FT
VERY LOOSE	0 - 5
LOOSE	5 - 12
MED. DENSE	12 - 37
DENSE	37 - 62
VERY DENSE	OVER 62

SILTS & CLAYS	BLOWS/FT
SOFT	0 - 5
FIRM	5 - 10
STIFF	10 - 20
VERY STIFF	20 - 40
HARD	OVER 40

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

SOIL BORING AND WELL CONSTRUCTION LOG LEGEND

APPENDIX C

PLATE C-1

SITE/LOCATION 1465 65th St, Emeryville, CA	BEGUN 8/6/93	BORING DIAMETER 8 Inches	ANGLE/BEARING 90 Degrees	BORING NO B-1
DRILLING CONTRACTOR Bayland Drilling	COMPLETED 8/6/93	FIRST ENCOUNTERED WATER DEPTH 9.0 Feet		BOTTOM OF BORING 15.5 Feet
OPERATOR Adam Huajardo	LOGGED BY Ruary Allan	STATIC WATER DEPTH/DATE 4.87 Feet		WELL NO. MW-1
DRILL MAKE & MODEL CME-75	SAMPLING METHOD California Modified Split-Spoon			BOTTOM OF WELL 15 Feet
WELL MATERIAL 2" SCH 40 PVC	SLOT SIZE 0.020"	FILTER PACK #2	WELL SEAL Neat cement over hydrated bentonite pellets	PLANNED USE Monitoring

BLOWS/FOOT	PID FIELD HEADSPACE (ppm)	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
		1					ASPHALT
		2					BASEROCK
		3					
		4					
23	0	5		▼			Lean CLAY (CL); dark gray; moderate plasticity; silty; trace shell fragments; dry.
		6					
		7					
		8					
		9		▽			
20	0	10					Lean CLAY (CL); dark gray and red-brown, black speckling; moderate plasticity; wet.
		11					
		12					
		13					
		14					Lean CLAY (CL); dark gray to black, mottled red and green; moderate plasticity; 5% fine to coarse shale and shell gravel; 10% medium sand; wet.
17	0	15					
		16					
		17					
		18					
		19					
		20					

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE. September 2, 1993

APPROVED BY: John H. Turney, P.E

SOIL BORING LOG
AND
WELL CONSTRUCTION DIAGRAM
MW-1

Ryerson Steel & Aluminum, Inc.
1465 65th Street
Emeryville, CA 94608

PLATE
C-2

SHEET 1 OF 1

JOB NO.
7-231

SITE/LOCATION 1465 65th St, Emeryville, CA	BEGUN 8/6/93	BORING DIAMETER 8 Inches	ANGLE/BEARING 90 Degrees	BORING NO B-2
DRILLING CONTRACTOR Bayland Drilling	COMPLETED 8/6/93	FIRST ENCOUNTERED WATER DEPTH 6.0 Feet		BOTTOM OF BORING 15.5 Feet
OPERATOR Adam Huajardo	LOGGED BY Ruary Allan	STATIC WATER DEPTH/DATE 4.64 Feet		WELL NO. MW-2
DRILL MAKE & MODEL CME-75	SAMPLING METHOD California Modified Split-Spoon			BOTTOM OF WELL 15 Feet
WELL MATERIAL 2" SCH 40 PVC	SLOT SIZE 0.020"	FILTER PACK #2	WELL SEAL Neat cement over hydrated bentonite pellets	PLANNED USE Monitoring

BLOWS/ FOOT	PID FIELD HEADSPACE (ppm)	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
>50	0	1–5		▼			Poorly graded GRAVEL with sand (GP); dry at top to wet at base. Excavation Backfill.
		6		▽			
5	2.4	7–11					Well-graded SAND (SW); light brown, fine, wet.
18	48	12–15					Fat CLAY (CH); red brown, mottled gray; moderate plasticity; trace coarse sand; trace white to pale brown gravel; wet.
		16–20					

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE. September 2 1993

APPROVED BY: John H. Turney, P E

SOIL BORING LOG
AND
WELL CONSTRUCTION DIAGRAM
MW-2

Ryerson Steel & Aluminum, Inc.
1465 65th Street
Emeryville, CA 94608

PLATE
C-3

SHEET 1 OF 1

JOB NO.
7-231

SITE/LOCATION 1465 65th St, Emeryville, CA	BEGUN 8/6/93	BORING DIAMETER 8 Inches	ANGLE/BEARING 90 Degrees	BORING NO B-3
DRILLING CONTRACTOR Bayland Drilling	COMPLETED 8/6/93	FIRST ENCOUNTERED WATER DEPTH 6.0 Feet		BOTTOM OF BORING 15.5 Feet
OPERATOR Adam Huajardo	LOGGED BY Ruary Allan	STATIC WATER DEPTH/DATE 4.18 Feet		WELL NO. MW-3
DRILL MAKE & MODEL CME-75	SAMPLING METHOD California Modified Split-Spoon			BOTTOM OF WELL 15 Feet
WELL MATERIAL 2" SCH 40 PVC	SLOT SIZE 0.020"	FILTER PACK #2	WELL SEAL Neat cement over hydrated bentonite pellets	PLANNED USE Monitoring

BLOWS/FOOT	PID FIELD HEADSPACE (ppm)	DEPTH	SAMPLER	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
		1					ASPHALT
		2					BASEROCK
		3					
		4					
18	0	5					Lean CLAY with sand (CL); soft; light grey; moderate plasticity; silty; trace shell fragments; trace fine gravel; moist.
		6					
		7					
		8					
		9					Gravelly lean CLAY (CL); firm; dark brown; 35% fine sandstone/limestone gravel, saturated.
		10					
12	54	11					Poorly-graded SAND with silt (SM); dark gray, fine to coarse; 10% fines, saturated.
		12					Lean CLAY (CL); soft; dark green-gray; 5% fine sand; wet.
		13					
		14					Poorly graded SAND with silt and gravel (SP); medium gray; fine to coarse; 20% fine gravel; 10% fines; saturated.
25	79	15					Lean CLAY (CL); green-gray; trace coarse sand to fine gravel.
		16					Well-graded sand; brown; trace fines to fine sand, trace fine gravel; saturated.
		17					
		18					
		19					
		20					

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE: September 2 1993

APPROVED BY: John H. Turney, P.E.

SOIL BORING LOG
AND
WELL CONSTRUCTION DIAGRAM
MW-3

Ryerson Steel & Aluminum, Inc.
1465 65th Street
Emeryville, CA 94608

PLATE
C-4

SHEET 1 OF 1

JOB NO.
7-231

PURGED/SAMPLED BY: R. Allan DATE: 11-8-93

GAUGING DATA:

Depth to bottom: 14.95 ft.

Depth to water: 4.87 ft.

Saturated Thickness: 10.08 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 1.61 gallons

volumes to purge x 3 vols.

*Total volume to purge = 4.84 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer/ Submersible pump/ Suction lift pump/ _____
(circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH
	0	—	—	—
	3	20.6	1,684	[illegible] 7.49
	7	21.2	1.730	7,45
	11	21.3	1.608	7.40
	12	21.2	1570 [illegible]	7,35
	well dry			

Color: olive brown Turbidity: mod

Recharge: poor-fair SPP _____ ft.

SAMPLING DATA:

Sampling method: Dedicated bailer

Sample for: (circle)

BTEX	METALS	TOC	8010
TPHd	O-Pb	TEL	8020
TPH mo	Total Pb	EDB	8240
601	602	Nitrates	8260 8270

Other: _____

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-1

LOCATION: RYERSON STEEL

Job No. 7-231

SHEET 1 of 1

PURGED/SAMPLED BY: R. Allan DATE: 11-8-93

GAUGING DATA:

Depth to bottom: 14.27 ft.

Depth to water: 4.64 ft.

Saturated Thickness: 9.63 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 1.54 gallons

volumes to purge x 3 vols.

*Total volume to purge = 4.62 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer/ Submersible pump/ Suction lift pump/ _____
(circle one)

Time	Volume (gallons)	Temp. (°F) C	Conductivity (mS/cm)	pH
	0	—	—	—
	4	24.7	1.399	9.35
	8	23.5	1.161	10.17
	12	22.7	1.112	9.55
	16	22.2	1.088	9.12

Color: dk brown Turbidity: mod - high

Recharge: good SPP sheen ft.

SAMPLING DATA:

Sampling method: Dedicated bailer /

Sample for: (circle)

BTEX	METALS	TOG	8010	
TPHd	O-Pb	TEL	8020	
TPH mo	Total Pb	EDB	8240	
601	602	Nitrates	8260	8270

Other: _____

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-2

LOCATION: RUBERSON STEET

Job No. 7-23

SHEET 1 of 1

PURGED/SAMPLED BY: R. Allan DATE: 11-8-93

GAUGING DATA:

Depth to bottom: 13.90 ft.

Depth to water: 4.18 ft.

Saturated Thickness: 9.72 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 1.56 gallons

volumes to purge x 3 vols.

*Total volume to purge = 4.68 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer/ Submersible pump/ Suction lift pump/ _____ (circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH
	0	———	———	———
	FREE	PRODUCT.		

Color: ~ Turbidity: ~

Recharge: ~ SPP 0.01 ft.

SAMPLING DATA:

Sampling method: Dedicated bailer / _____

Sample for: (circle)

[redacted]/BTEX METALS TOG 8010

TPHd O-Pb TEL 8020

TPH mo Total Pb EDB 8240

601 602 Nitrates 8260 8270

Other: _____

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-3

LOCATION: RHERSON STREET

Job No. 7-231

SHEET 1 of 1

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

RECEIVED AUG 2 4 1993

Hydro Environmental	Client Project ID:	#7-231	Sampled:	Aug 6, 1993
2363 Mariner Square Dr., Bldg. 3, Ste 243	Sample Matrix:	Soil	Received:	Aug 9, 1993
Alameda, CA 94501	Analysis Method:	EPA 3550/8015	Reported:	Aug 20, 1993
Attention: Ruary Allan	*First Sample #:*	3H44001		

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit mg/kg	Sample I.D. 3H44001 MW-1	Sample I.D. 3H44002 MW-2	Sample I.D. 3H44003 MW-3	Sample I.D.	Sample I.D.	Sample I.D.
Extractable Hydrocarbons	1.0	N.D.	N.D.	N.D.			
Chromatogram Pattern:		--	--	--			

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0
Date Extracted:	8/12/93	8/12/93	8/12/93
Date Analyzed:	8/12/93	8/12/93	8/12/93
Instrument Identification:	GCHP-5	GCHP-5	GCHP-5

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hydro Environmental	Client Project ID:	#7-231
2363 Mariner Square Dr., Bldg. 3, Ste 243	Matrix:	Soil
Alameda, CA 94501		
Attention: Ruary Allan	QC Sample Group: 3H44001 - 03	Reported: Aug 20, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel
Method:	EPA 8015
Analyst:	C.Lee
Conc. Spiked:	15
Units:	mg/kg
LCS Batch#:	DBLK081293
Date Prepared:	8/12/93
Date Analyzed:	8/12/93
Instrument I.D.#:	GCHP-5
LCS % Recovery:	67
Control Limits:	50-150

MS/MSD Batch #:	D3H44003
Date Prepared:	8/12/93
Date Analyzed:	8/12/93
Instrument I.D.#:	GCHP-5
Matrix Spike % Recovery:	73
Matrix Spike Duplicate % Recovery:	80
Relative % Difference:	9.2

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

CHAIN OF CUSTODY RECORD

SAMPLER

Printed Name: RUARY ALLAN

Signature: Ruary Allan

DELIVER TO: Pace, Inc.

ATTENTION: Ron Chew

SEND RESULTS TO:
HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC
2363 MARINER SQUARE DR., SUITE 243
ALAMEDA, CA 94501
(510) 521-2684, (FAX) 521-5078
ATTENTION: Markus Niehaack

SEND INVOICE TO: Ryerson Steel ? MN
HETI.
c/o HETI

HETICAL JOB No.: 7-231

Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Ruary Allan		6-9-93	1045
Relinquished by:	Received by:		
Relinquished by:	Received by: LABORATORY		

PROJECT NAME: Ryerson steel

PAGE 1 OF 1

Sample Number	DATE & TIME	No. & Type Container	Analysis Requested: TPH+BTEX (DHS mod)	TPH (DHS mod)	Organic Lead	Lab Remarks
MW-1-5'	6/8/93	one 2x6" brass tube		X		
MW-2-5'	6/8/93	⇓		X		
MW-3-5'	6/8/93	⇓		X		

Special Instructions:

Turnaround:
- ☐ 5 DAY
- ☑ 10 DAY
- ☐ 72 HOURS
- ☐ 24 HOURS

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hydro Environmental	Client Project ID:	7-231	Sampled: Aug 11, 1993
2363 Mariner Square Dr., Bldg. 3, Ste 243	Sample Matrix:	Water	Received: Aug 11, 1993
Alameda, CA 94501	Analysis Method:	EPA 5030/8020	Reported: Aug 23, 1993
Attention: Markus Niebanck	First Sample #:	3H70801	

BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3H70801 MW-1	Sample I.D. 3H70802 MW-2	Sample I.D.	Sample I.D.	Sample I.D.	Sample I.D.
Benzene	0.50	N.D.	1.3				
Toluene	0.50	N.D.	N.D.				
Ethyl Benzene	0.50	N.D.	N.D.				
Total Xylenes	0.50	N.D.	0.59				

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Analyzed:	8/18/93	8/18/93
Instrument Identification:	GCHP-2	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	93	124

Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hydro Environmental	Client Project ID:	7-231	Sampled:	Aug 11, 1993
2363 Mariner Square Dr., Bldg. 3, Ste 243	Sample Matrix:	Water	Received:	Aug 11, 1993
Alameda, CA 94501	Analysis Method:	EPA 3510/3520/8015	Reported:	Aug 23, 1993
Attention: Markus Niebanck	First Sample #:	3H70801		

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 3H70801 MW-1	Sample I.D. 3H70802 MW-2	Sample I.D.	Sample I.D.	Sample I.D.	Sample I.D.
Extractable Hydrocarbons	50	N.D.	N.D.				
Chromatogram Pattern:		--	--				

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Extracted:	8/17/93	8/17/93
Date Analyzed:	8/19/93	8/19/93
Instrument Identification:	150	23 *

* - Coelution Confirmed

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hydro Environmental
2363 Mariner Square Dr., Bldg. 3, Ste 243
Alameda, CA 94501
Attention: Markus Niebanck

Client Project ID: 7-231
Matrix: Water
QC Sample Group: 3H70801

Reported: Aug 23, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M.Nipp	M.Nipp	M.Nipp	M.Nipp
Conc. Spiked:	10	10	10	30
Units:	µg/L	µg/L	µg/L	µg/L
LCS Batch#:	GBLK081893	GBLK081893	GBLK081893	GBLK081893
Date Prepared:	8/18/93	8/18/93	8/18/93	8/18/93
Date Analyzed:	8/18/93	8/18/93	8/18/93	8/18/93
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
LCS % Recovery:	110	110	110	110
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	G3H65905	G3H65905	G3H65905	G3H65905
Date Prepared:	8/18/93	8/18/93	8/18/93	8/18/93
Date Analyzed:	8/18/93	8/18/93	8/18/93	8/18/93
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Matrix Spike % Recovery:	97	96	97	97
Matrix Spike Duplicate % Recovery:	98	98	99	100
Relative % Difference:	1.0	2.1	2.0	3.0

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

Please Note.
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SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hydro Environmental
2363 Mariner Square Dr., Bldg. 3, Ste 243
Alameda, CA 94501
Attention: Markus Niebanck

Client Project ID: 7-231
Matrix: Water
QC Sample Group: 3H70802

Reported: Aug 23, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M.Nipp	M.Nipp	M.Nipp	M.Nipp
Conc. Spiked:	10	10	10	30
Units:	µg/L	µg/L	µg/L	µg/L
LCS Batch#:	GBLK081793	GBLK081793	GBLK081793	GBLK081793
Date Prepared:	8/17/93	8/17/93	8/17/93	8/17/93
Date Analyzed:	8/17/93	8/17/93	8/17/93	8/17/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
LCS % Recovery:	97	89	96	97
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	G3H25112	G3H25112	G3H25112	G3H25112
Date Prepared:	8/17/93	8/17/93	8/17/93	8/17/93
Date Analyzed:	8/17/93	8/17/93	8/17/93	8/17/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Matrix Spike % Recovery:	96	89	95	97
Matrix Spike Duplicate % Recovery:	95	88	95	93
Relative % Difference:	1.0	1.1	0 0	4.2

SEQUOIA ANALYTICAL

Maile A Springer
Project Manager

Please Note.
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hydro Environmental	Client Project ID: 7-231	
2363 Mariner Square Dr., Bldg. 3, Ste 243	Matrix: Water	
Alameda, CA 94501		
Attention: Markus Niebanck	QC Sample Group: 3H70801 - 02	Reported: Aug 23, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel
Method:	EPA 8015
Analyst:	C.Lee
Conc. Spiked:	300
Units:	µg/L
LCS Batch#:	DBLK081793
Date Prepared:	8/17/93
Date Analyzed:	8/17/93
Instrument I.D.#:	GCHP-5
LCS % Recovery:	92
Control Limits:	50-150

MS/MSD Batch #:	D3H68901
Date Prepared:	8/17/93
Date Analyzed:	8/19/93
Instrument I.D.#:	GCHP-5
Matrix Spike % Recovery:	77
Matrix Spike Duplicate % Recovery:	83
Relative % Difference:	7.5

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

CHAIN OF CUSTODY RECORD

SAMPLER
Printed Name: RUARK ALLAN
Signature: Ruark Allan
DELIVER TO: ~~[illegible]~~ SEQUOIA
ATTENTION: Markus

SEND RESULTS TO:
HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.
2363 MARINER SQUARE DR., SUITE 243
ALAMEDA, CA 94501
(510) 521-2684, (FAX) 521-5078
ATTENTION:

SEND INVOICE TO:
HETI

HETICAL JOB No.: 7-231

Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Ruark Allan	[signature]	8-11-93	1245
Relinquished by:	Received by:		
Relinquished by:	Received by: LABORATORY		

PROJECT NAME: 7-231 RUERSON STREET

PAGE 1 OF

Sample Number	DATE & TIME	No. & Type Container	Analysis Requested: BTEX	Analysis Requested: TPHd (DHS mod)	Analysis Requested: Organic Lead	Lab Remarks
MW-1	8-11-93	3x VOA	X			
MW-2	8-11-93	3x VOA	X			
MW-1	"	1l amber		X		
MW-2	"	1l amber		X		

Special Instructions: BTEX ONLY ON VOAS (NO TPHd)

Turnaround:
- ☐ 5 DAY
- ☐ 72 HOURS
- ☑ 10 DAY
- ☐ 24 HOURS