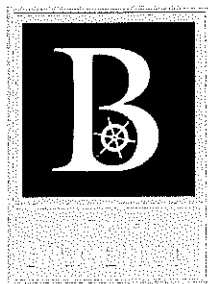


Chevron Tank Farm Port Wash Narrows
SIT 5.3

Former Chevron Property Cleanup Action Work Plan



April 2012
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Toxics Cleanup Program

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Chevron Tank Farm Port Wash Narrows
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4660 KITSAP WAY, SUITE A
BREMERTON, WA 98312-2357
T. 360.377.0014 F. 360.479.5961
www.parametrix.com

TRANSMITTAL

To: **Christopher Maurer**
Washington State Department of Ecology
PO Box 47600
300 Desmond Dr.
Olympia, WA 98504

Date: **4/20/2012**
Project Number: **233-1896-098 (01/05)**
Project Name: **Former Chevron Property
Remediation**

These are: ☐ PER YOUR REQUEST
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☐ FOR YOUR REVIEW AND APPROVAL
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☐ INTEROFFICE MAIL

We are transmitting the following materials:

One Draft Cleanup Action Work Plan Report and One CD copy of Action Work Plan Report PDF

Comments:

Please find enclosed one hard copy Cleanup Action Plan and one CD with PDF copy of Cleanup Action Plan. If you have any questions please let us know.

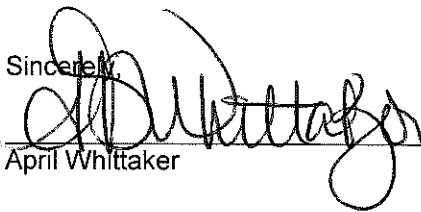
Thank you.

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DEPT OF ECOLOGY
Toxic Cleanup Program

Sincerely,


April Whittaker

cc:

Former Chevron Property Cleanup Action Work Plan

Prepared for

City of Bremerton
3037 Olympus Drive
Bremerton, WA 98310

Prepared by

Parametrix
4660 Kitsap Way, Suite A
Bremerton, WA 98312-2357
T: 360.377.0014 F: 360.479.5961
www.parametrix.com

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Parametrix. 2012. Former Chevron Property
Cleanup Action Work Plan. Prepared by Parametrix,
Bremerton, Washington. April 2012.

DRAFT

CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned.

Prepared by Lara Linde, LG

Checked by David Dinkuhn, P.E.

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- 4 Proposed Schedule

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KEY TERMS AND ABBREVIATIONS

ASTs	aboveground storage tanks
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	Cleanup Action Plan
City	City of Bremerton
COCs	Contaminants of concern
DCAP	Draft Cleanup Action Plan
Ecology	Washington State Department of Ecology
HASP	Health and Safety Plan
IA	Interim Action
ICP	Institutional Controls Plan
LTGMP	Long-Term Groundwater Monitoring Plan
mg/kg	milligrams per kilogram
MTCA	Model Toxics Control Act
ORC	oxygen release compound
PAHs	Polycyclic aromatic hydrocarbons
RI/FS	Remedial Investigation/ Feasibility Study
Site	Former Chevron Property site
SMP	Soil Monitoring Plan
ug/L	Micrograms per liter
WAC	Washington Administrative Code

1. INTRODUCTION

This Work Plan has been prepared as part of the Cleanup Action to be performed at the Former Chevron Property site (Site) located at 1310 Highland Avenue in Bremerton, Washington (Figure 1). Preparation of this Work Plan is a requirement of the site's Agreed Order (DE-07TCPHQ-5024) established between the Washington State Department of Ecology (Ecology) and the City of Bremerton (City). To date, the City has performed a Remedial Investigation/ Feasibility Study (RI/FS) and Interim Action at the site in order to address soil and groundwater contamination related to historical releases of petroleum products (Parametrix 2011).

1.1 PURPOSE

This Work Plan was completed per the Agreed Order and Washington Administrative Code (WAC) 173-340-380, Model Toxics Control Act (Ecology 2007). The purpose of the Work Plan is to present tasks to be performed at the site as part of a Cleanup Action. This plan also includes a general description of the documents required as part of cleanup actions developed under the RI/FS (Parametrix 2011). The Work Plan includes:

- A brief summary of RI/FS and Interim Action (IA) activities performed at the site.
- Requirements for development of planning documents including a Long-Term Groundwater Monitoring Plan, Soil Monitoring Plan and an Institutional Controls Plan.
- Requirements for securing a restrictive or environmental covenant for the site.
- A schedule for implementation of the Cleanup Action.

2. SUMMARY OF SITE CONDITIONS

2.1 SITE DESCRIPTION AND HISTORY

The Former Chevron Property is a 1.4-acre waterfront property located adjacent to Evergreen Rotary Park on the Port Washington Narrows. The historical bulk fuel tank farm operated at the site from prior to 1946 until circa 1988 (Figure 2). Based on aerial photographs, the facility was expanded northward to its present boundaries between 1946 and 1963 (Figure 3) by the placement of fill in the intertidal zone. This filling created a relatively level “lower yard” area where commercial fueling operations were conducted. The site uplands or “upper yard” are the former location of the aboveground bulk fuel tanks (Figure 4). The majority of the site’s shoreline is armored with concrete rubble or steel and wooden bulkheads.

Products handled at the tank farm consisted primarily of diesel and gasoline (Hart Crowser 1989). Fuel was offloaded from barges at a fueling pier in the Port Washington Narrows and pumped through piping to 12 aboveground storage tanks (ASTs) located in the upper yard. Fuel transfer likely occurred through underground piping as evidenced by observations made during the IA, when corroded steel piping was exposed in soil excavations conducted to remove hot spot soils in the lower yard. Leaks from this underground piping are the likely source of the majority of the subsurface contamination at the site. Fuel was loaded from the ASTs to tank trucks at four loading racks located in the lower yard. All aboveground structures were removed by the end of 1988 (GeoEngineers 1998).

Environmental work at the site began in 1988 following demolition of the bulk fuel facility (GeoEngineers 1988). Since this time, Parametrix has performed an Interim Action and an RI/FS report (Parametrix 2011).

2.2 SUMMARY OF ENVIRONMENTAL CONDITIONS

2.2.1 Existing Soil Conditions

Following the IA, residual contaminated soils with concentrations exceeding cleanup levels remain in some lower yard areas; however, residual concentrations are significantly reduced from pre-IA levels (Figures 5, 6, and 7). Contaminants that currently exceed cleanup levels in lower yard subsurface soils consist of:

- Gasoline (up to 1,000 milligrams per kilogram [mg/kg]).
- Benzene (up to 5.4 mg/kg).
- Ethylbenzene (up to 20 mg/kg).
- Total xylenes (up to 94 mg/kg).
- Polycyclic aromatic hydrocarbons (PAHs) (up to 2.7 mg/kg by toxicity equivalency method).

As described previously, all upper yard contaminated soils in excess of cleanup levels were removed during the IA.

2.2.2 Existing Groundwater Conditions

The approximate extent of groundwater contamination exceeding cleanup levels during remedial investigation sampling is shown on Figure 8. The most recent performance monitoring data is shown on Figure 9.

The performance monitoring shows a generally decreasing trend in concentrations with two exceptions: MW-09R and MW-21R exhibited increasing concentrations in the second through fourth performance monitoring sampling events. Concentrations then decreased following the supplemental oxygen release compound (ORC) injection. The increasing concentrations are apparently due to residual gasoline contamination present in the soils within the vicinity of the wells. As the oxygen released by the ORC declined with time, the associated aerobic biodegradation also declined. Once aerobic respiration was no longer occurring, concentrations in groundwater increased to equilibrium levels associated with anaerobic conditions.

Evidence that aerobic respiration has occurred in the wells is demonstrated by elevated alkalinity and decreasing dissolved oxygen concentrations following both injection events. Evidence that anaerobic biodegradation is occurring is provided by elevated dissolved methane concentrations with associated negative oxidation reduction potential values (Table 1).

Testing was conducted for both total and dissolved lead during the sampling events; the only results that exceeded cleanup levels were total lead results from wells MW-09R, MW-20, and MW-21R (Table 1). In general, corresponding dissolved results did not exceed cleanup levels, indicating that the total results were biased high by the presence of suspended sediment. An exception is a single dissolved lead result from well MW-09R in August 2010, which slightly exceeded the cleanup level.

3. CLEANUP REQUIREMENTS

3.1 INDICATOR HAZARDOUS SUBSTANCES

Contaminants of concern (COCs) at the site remaining in site soils consist of:

- Gasoline (up to 1,000 mg/kg).
- Benzene (up to 5.4 mg/kg).
- Ethylbenzene (up to 20 mg/kg).
- Total xylenes (up to 94 mg/kg).
- PAHs (up to 2.7 mg/kg by toxicity equivalency method).

COCs remaining in site groundwater consist of:

- Gasoline (up to 2,100 ug/L).
- Diesel (up to 1,300 ug/L).
- Benzene (up to 310 ug/L).

3.2 CLEANUP LEVELS

Applicable cleanup levels for the site were established in the RI/FS and IA work plan (Parametrix 2007) and consist of:

- Model Toxics Control Act (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Use (WAC 173-340, Table 740-1).
- MTCA Method A Cleanup Levels for Groundwater (WAC 173-340, Table 720-1).
- MTCA Method A cleanup levels are listed in Table 2.

4. SELECTED CLEANUP ACTION SCOPE OF WORK

IA activities performed at the site to date have resulted in a substantial reduction in contaminant mass. Natural attenuation is occurring at the site and should continue to reduce contaminant concentrations over time. Long-term groundwater monitoring will be performed to verify that natural attenuation is ongoing. It is anticipated that once groundwater concentrations reach cleanup levels at the point of compliance, groundwater monitoring will be discontinued. In addition to groundwater monitoring, institutional controls will be implemented to reduce exposure risk for contaminants remaining in site soil and groundwater.

The proposed future cleanup action scope of work for the site includes the following submittals:

- A Long-Term Groundwater Monitoring Plan (LTGMP) to monitor groundwater concentrations and to verify that natural attenuation is continuing to occur.
- Soil Monitoring Plan (SMP) should the City require removal of institutional controls to redevelop the site at a later date.
- An Institutional Controls Plan (ICP) to help ensure protection of human health and the environment.
- An environmental covenant to limit activities and land use of the site will be prepared as part of the ICP.

Each of these elements is described in further detail below.

4.1 LONG-TERM GROUNDWATER MONITORING PLAN

A detailed groundwater monitoring plan will be developed by the City and submitted to Ecology. A summary of the anticipated future groundwater monitoring plan is provided below. The monitoring plan shall include the following elements presented in WAC 173-340-820 (3):

- Purpose and objective(s).
- Organization and responsibilities.
- Identification and justification of location, frequency of sampling, and selected analytical parameters.
- Specific sampling and handling procedures including sample labeling and completion of chains-of-custody.
- Requirements for decontamination and investigation derived waste.
- Analytical requirements such as detection or quantitation limits and identification of selected analytical methods.
- Quality assurance plan.
- Data reporting and validation procedures.
- Site-specific health and safety plan.

A draft and final version of this plan will be submitted for Ecology review and approval before sampling begins.

4.1.1 Summary of Plan

A brief summary of the work activities under the Long-term Groundwater Monitoring Plan to be completed has been included for reference.

- **Additional Well Installation** – An additional well will be installed to replace former well MW-20 at the location shown on Figure 9. Well MW-20R will be included in long-term monitoring to provide more complete coverage of downgradient groundwater conditions.
- **Groundwater Monitoring** – Groundwater monitoring will be conducted on a semi-annual basis in all 11 lower yard wells (MW-4R, MW-9R, MW-10R, MW-11, MW-13R, MW-20R, MW-21R, MW-22R, MW-25, MW-26R, and MW-27) for an initial period of 4 years. The semi-annual events will occur in the spring and fall to assess both wet and dry weather conditions. The three upper yard wells (MW-16R, MW-18R, and MW-19R) will not be monitored since COCs were not detected above cleanup levels in these wells during four consecutive rounds of monitoring (Table 1). All samples will be analyzed for gasoline, benzene, toluene, ethylbenzene, and total xylenes (BTEX), diesel, lube oil, field parameters; and natural attenuation parameters (Table 3). In addition, MW-9R will be analyzed for total and dissolved lead. Four quarterly groundwater monitoring events will be conducted during the fifth year. At the completion of each sampling event, a technical memorandum will be prepared and submitted presenting the groundwater results. A 5-year summary monitoring report will be prepared at the end of the initial 5-year monitoring period, which will include recommendations for any follow on monitoring. Recommendations may include proposed changes to the monitoring program such as a reduction in the total number of wells sampled or a reduction in the number of analytes. A proposed monitoring schedule is provided in Table 4. An updated site specific Health and Safety Plan (HASP) will developed as part of the field preparation for the long-term groundwater monitoring.

4.2 SOIL MONITORING PLAN

Although it is not anticipated, development of the site beyond what is currently planned could occur at a future date. Future development may require removal of proposed land use restrictions described in Section 4.3. Should this time come, the City will develop a Soil Monitoring Plan that will address cleanup of existing soil contamination and submit a draft and final plan for Ecology review and approval. The soil monitoring plan should include the following:

- Similar elements described in the Long Term Monitoring Plan in Section 4.1.
- Proposed site development requiring environmental restrictions to be removed.
- Proposed confirmation soil sampling methodology.
- Proposed reporting which supports removal of land use restrictions.

4.3 INSTITUTIONAL CONTROLS PLAN

WAC 173-340-360(2)(e) requires cleanup actions to use institutional controls to limit or prohibit activities that may interfere with the integrity of a cleanup action or that may result in exposure of hazardous substances at a site. They are required to ensure the continued protection of human health and the environment and the integrity of the cleanup. Institutional controls may include physical measures (such as fences), restrictions on the use of the property, maintenance requirements for engineering controls (e.g., maintenance of caps), education programs, and financial assurances.

An Institutional Controls Plan will be developed by the City which will address the following:

- Existing institutional controls for the site, if any.
- Institutional controls or procedures to be implemented on the site including restrictive or environmental covenant.
- Timetable for establishment of new institutional controls or procedures.
- Identification of entity responsible for implementation, maintenance, and enforcement of selected institutional controls.
- Details on how protectiveness will be measured for each implemented institutional control.

A draft and final version of the Institutional Control Plan will be submitted for Ecology review and approval.

4.3.1 Restrictive Covenant

Land use restrictions are proposed for the site in which a restrictive covenant (or Ecology-approved equivalent such as an environmental covenant) will be executed by the City and recorded with the register of deeds for Kitsap County. At a minimum, the restrictive covenant will describe procedures to be followed during any future site excavation activities that could result in worker exposure or the transfer of contaminated soils to the ground surface. Such procedures shall include worker health and safety training requirements and contaminated soil management procedures. Use of site groundwater for any purpose will be prohibited. Future sites use shall be restricted to that of an outdoor recreational park. The restrictive covenant will also require that Ecology be notified of the City's intent to convey any interest in the site or to change land use from an outdoor recreational park to some other use. Final requirements for the restrictive covenant (or equivalent) will be negotiated by Ecology and the City.

4.4 SCHEDULE

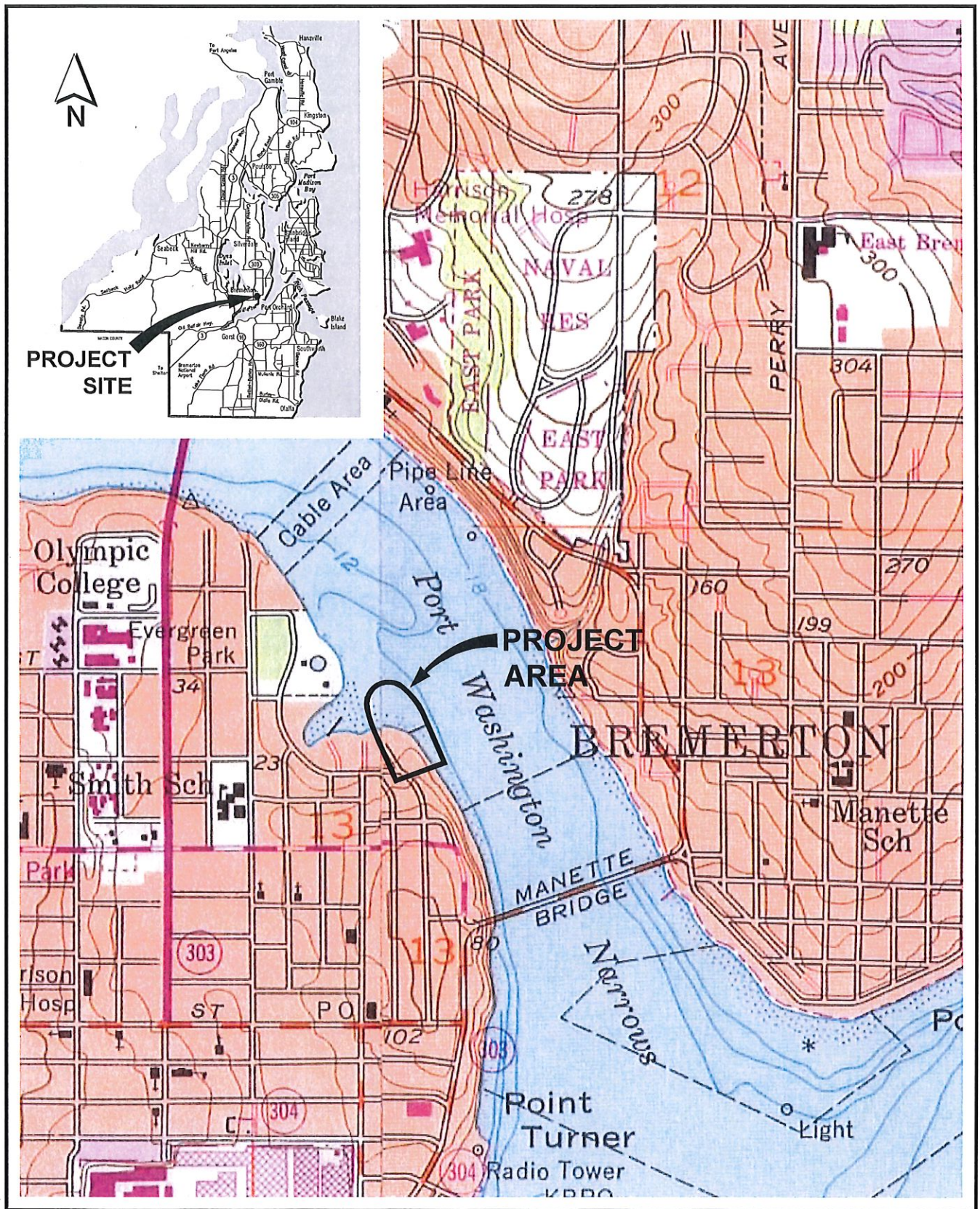
Implementation of the Work Plan will begin upon Ecology approval. It is anticipated that the first plan elements (development of a Long Term Groundwater Monitoring Plan and the first quarter groundwater monitoring event) will occur during the summer 2012. A proposed project schedule is provided in Table 4.

5. REFERENCES

- Ecology. 2007. Model toxics control act cleanup regulations. Washington Administrative Code (WAC) 173-340. November 2007.
- GeoEngineers. 1988. Report of geotechnical services, subsurface contamination study, Chevron Bulk Fuel Terminal, Bremerton, Washington. Prepared for Chevron U.S.A. November.
- Hart Crowser. 1989. Summary of work accomplished to date and pending, former Chevron Bremerton Bulk Plant, Bremerton, Washington. Prepared for Chevron U.S.A., Inc., Seattle, Washington. November.
- Parametrix. 2011. Former Chevron property remedial investigation/feasibility report. Prepared for The City of Bremerton. September.
- Parametrix. 2007. Work plan for remedial investigation/feasibility study, interim action, and shoreline restoration former Chevron property, Bremerton, Washington. Prepared for the City of Bremerton. September.

DRAFT

FIGURES



Parametrix DATE: Apr 13, 2012 FILE: BR1896063P04T1304 098 F01

Figure 1
Former Chevron Property
Cleanup Action Work Plan
Project Vicinity



Parametrix DATE: Apr 13, 2012 FILE: BR1896063P04T1304 098 F02

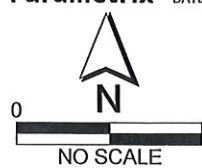


Figure 2
Former Chevron Property
Cleanup Action Work Plan
1963 Aerial Photograph



Parametrix DATE: Apr 13, 2012 FILE: BR1896063P04T1304 098 F02

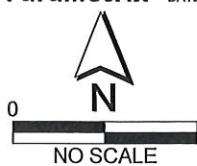
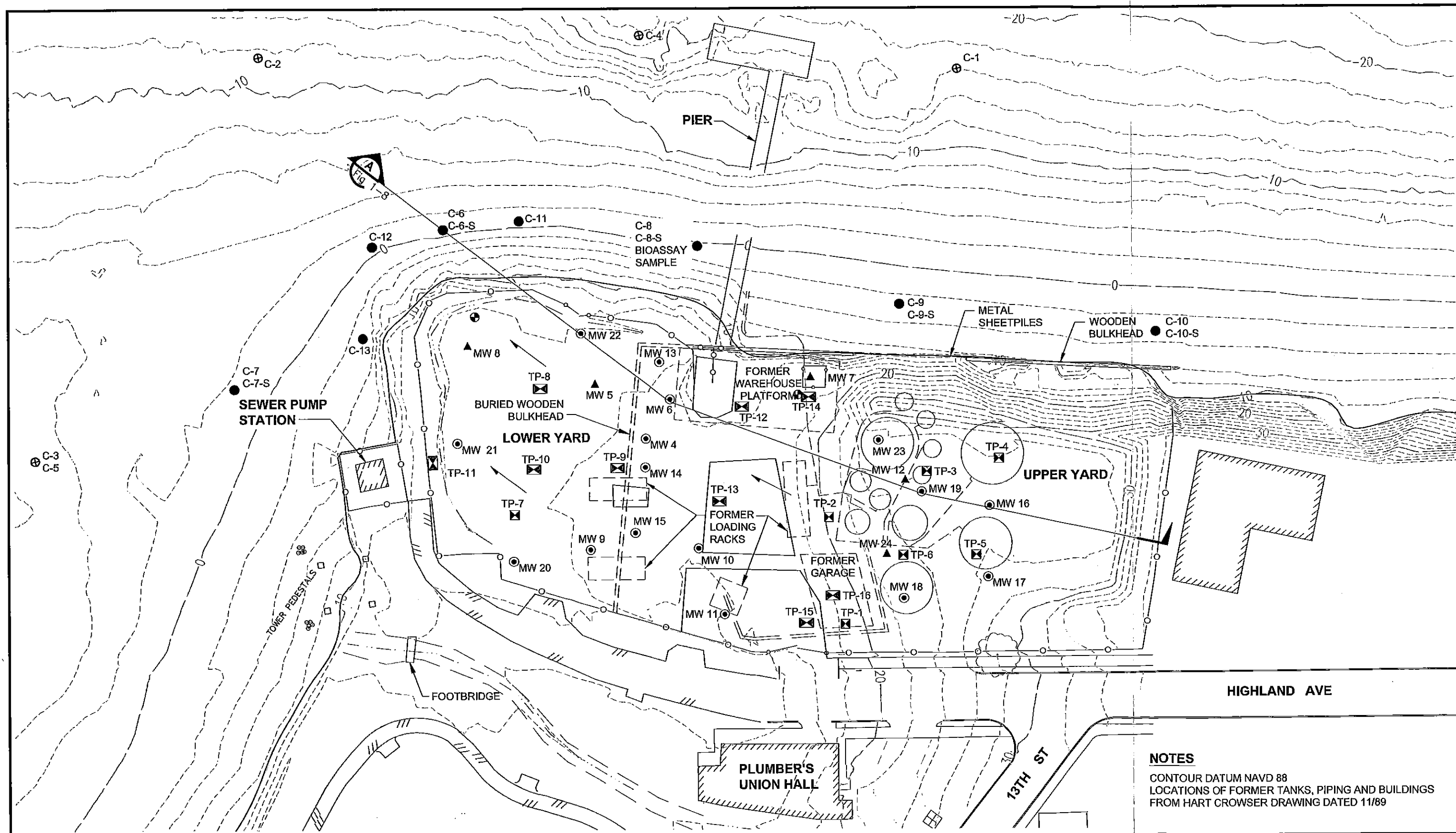
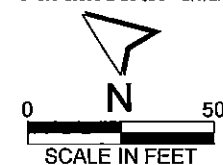


Figure 3
Former Chevron Property
Cleanup Action Work Plan
CIRCA 2005 Aerial Photograph



Parametrix DATE: Apr 13, 2012 FILE: BR1896063P04T1304 098 F04



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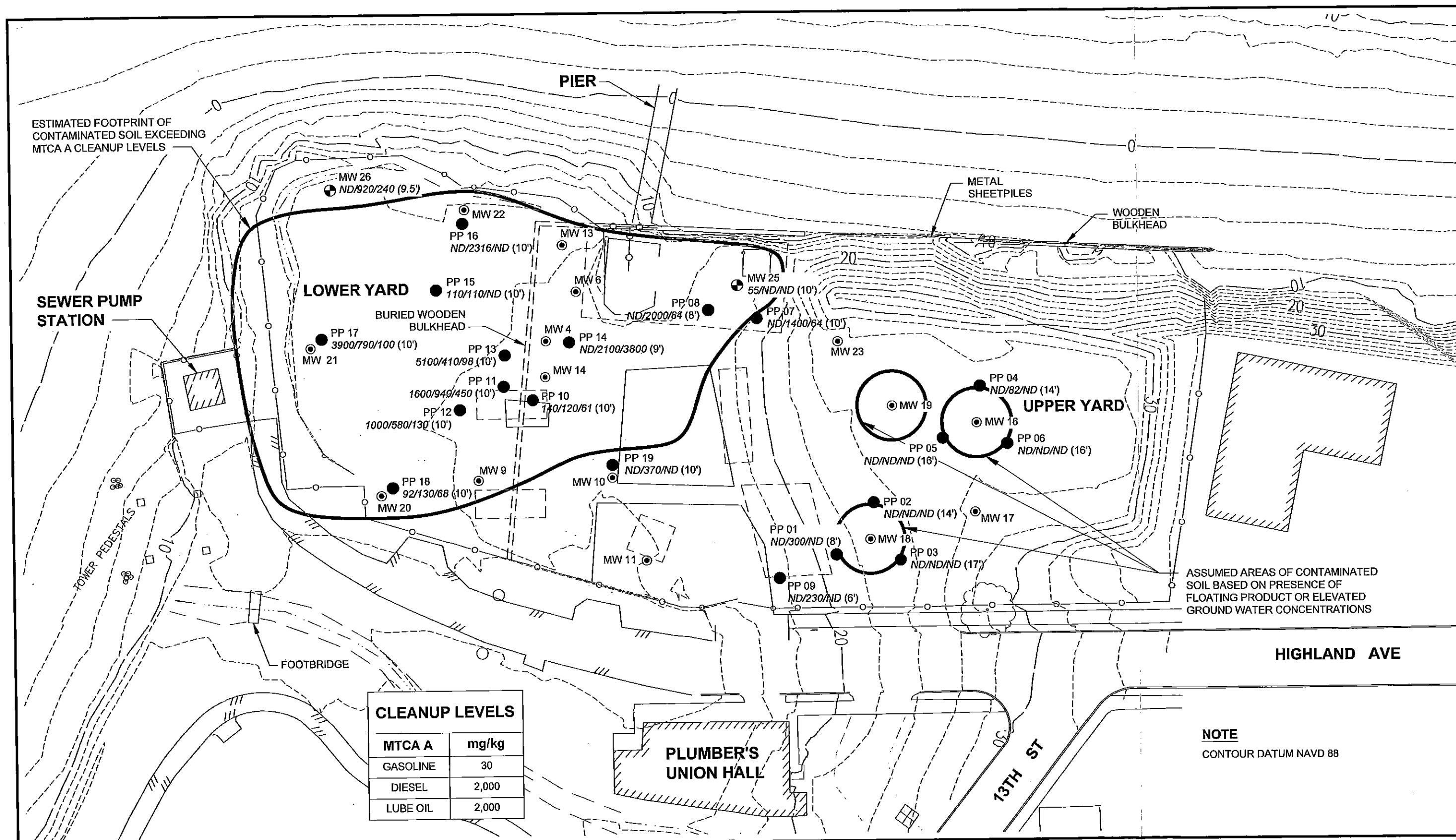
- INTERTIDAL SEDIMENT SAMPLE
- ⊕ SUBTIDAL SEDIMENT SAMPLE
- ⊙ EXISTING MONITORING WELL

- ⊠ TEST PIT, GEO ENGINEERS 1988
- ⊡ TEST PIT, HART CROWSER 1989
- ▲ DESTROYED MONITORING WELL
- EXISTING CONCRETE PAD

- ▨ EXISTING BUILDING
- CHAIN LINK FENCE
- - - DRAINAGE DITCH
- - - FORMER PIPING/BUILDING/LOADING RACK

- C-6 SURFACE SEDIMENT SAMPLE
- C-6-S SEDIMENT SAMPLE COLLECTED AT 2 FT DEPTH
- FORMER ABOVEGROUND STORAGE TANK
- GENERAL GROUNDWATER FLOW DIRECTION

Figure 4
Former Chevron Property
Cleanup Action Work Plan
Historical Site Features



Parametrix DATE: Apr 13, 2012 FILE: BR1895063P04T1304 098 F06

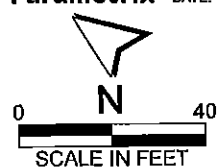
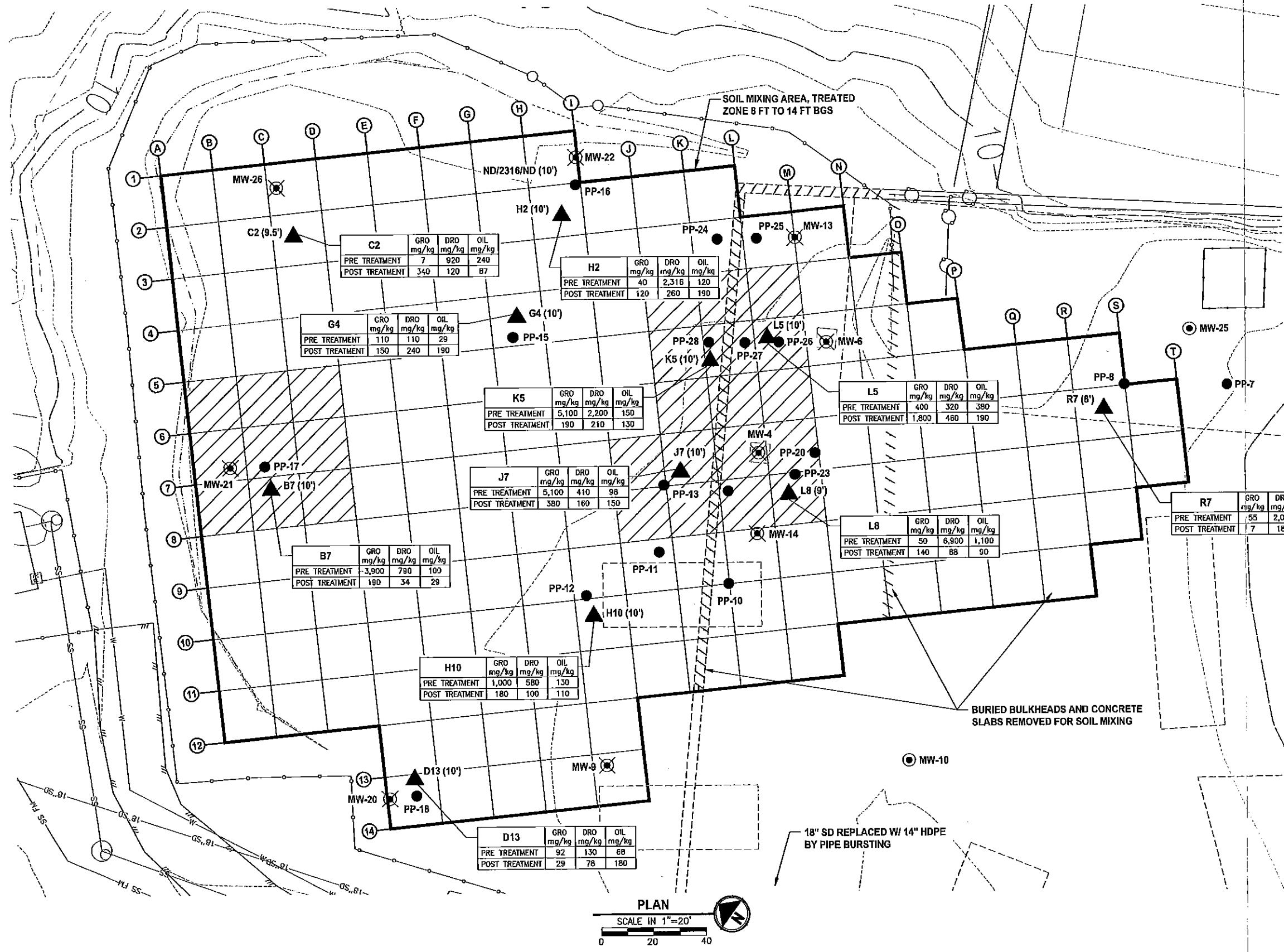


Figure 5
Former Chevron Property
Cleanup Action Work Plan
RI/FS Subsurface Soil Sampling Locations

FILE: BR18060304T1304 038 P09
DATE: Apr 13, 2012 - 5:11pm PLOTTED BY: rasmate
IMAGES: Chevron Property R01
XREFS: XB-BREM_WTRPRINT-BA-SY-061201 | XBR18060304T1304T-BA



LEGEND

- PP-11 ● RI/FS PUSH-PROBE LOCATION
- MW-10 ● EXISTING MONITORING WELL
- B7(10') ▲ CONFIRMATION SAMPLE LOCATION AND DEPTH
- [Solid Box] TREATMENT CELL-BASLINE DOSE (10LB/CY REGENOX)
- [Hatched Box] AGGRESSIVE DOSE TREATMENT AREA (20LB/CY REGENOX)
- [Box with X] MONITORING WELL REMOVED FOR SOIL MIXING
- GRO GASOLINE RANGE ORGANICS
- DRO DIESEL RANGE ORGANICS
- OIL LUBE OIL RANGE ORGANICS
- mg/kg MILLIGRAMS PER KILOGRAM
- 400 SAMPLE RESULT IN mg/kg

CLEANUP LEVELS

MTCA A	mg/kg
GASOLINE	30
DIESEL	2,000
LUBE OIL	2,000

REVISIONS			
NO.	DESCRIPTION	DATE	BY

0 1" 2"

TWO INCHES AT FULL SCALE
IF NOT SCALE ACCORDINGLY

SCALE

HORIZ. 1"=10' VERT. N/A

FIELD BOOK
DRAWING NO. 2

CITY OF BREMERTON
DEPARTMENT OF PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

DRAWN BY: JLP
DATE 4/10

DESIGN BY: DLD
WASH. P.E. # DATE 4/10

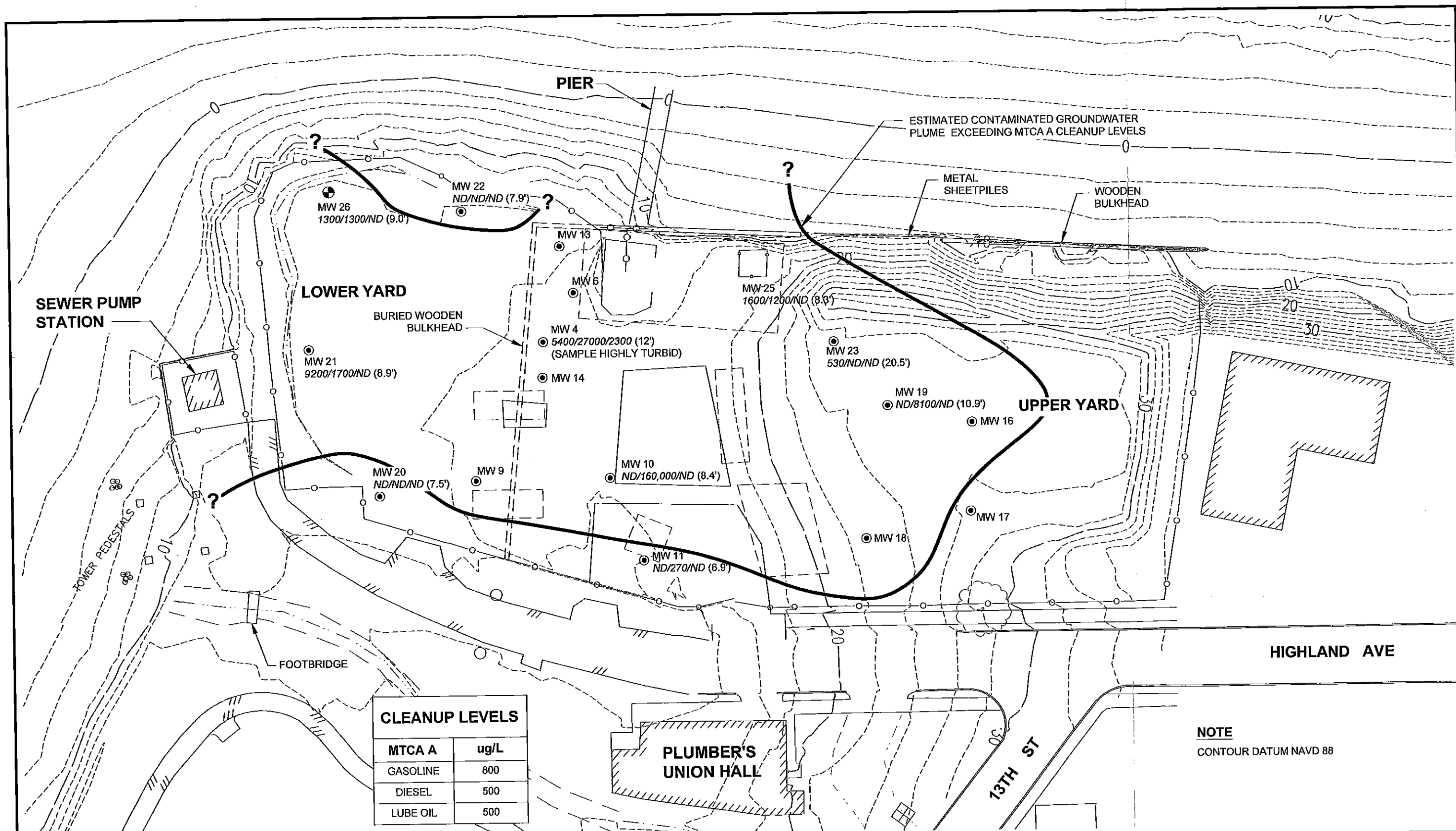
CHECKED BY: DATE
WASH. P.E. #

**FORMER CHEVRON PROPERTY
CLEANUP ACTION WORK PLAN
INTERIM ACTION SOIL MIXING AREA AND
CONFIRMATION SAMPLE RESULTS**

FIG. NO.	SHEET
6	1 of 1

PN: 255-1806-063

BREMERTON BOARDWALK PROJECT



Parametrix DATE: Apr 13, 2012 FILE: BR1896063P04T1304 098 F07

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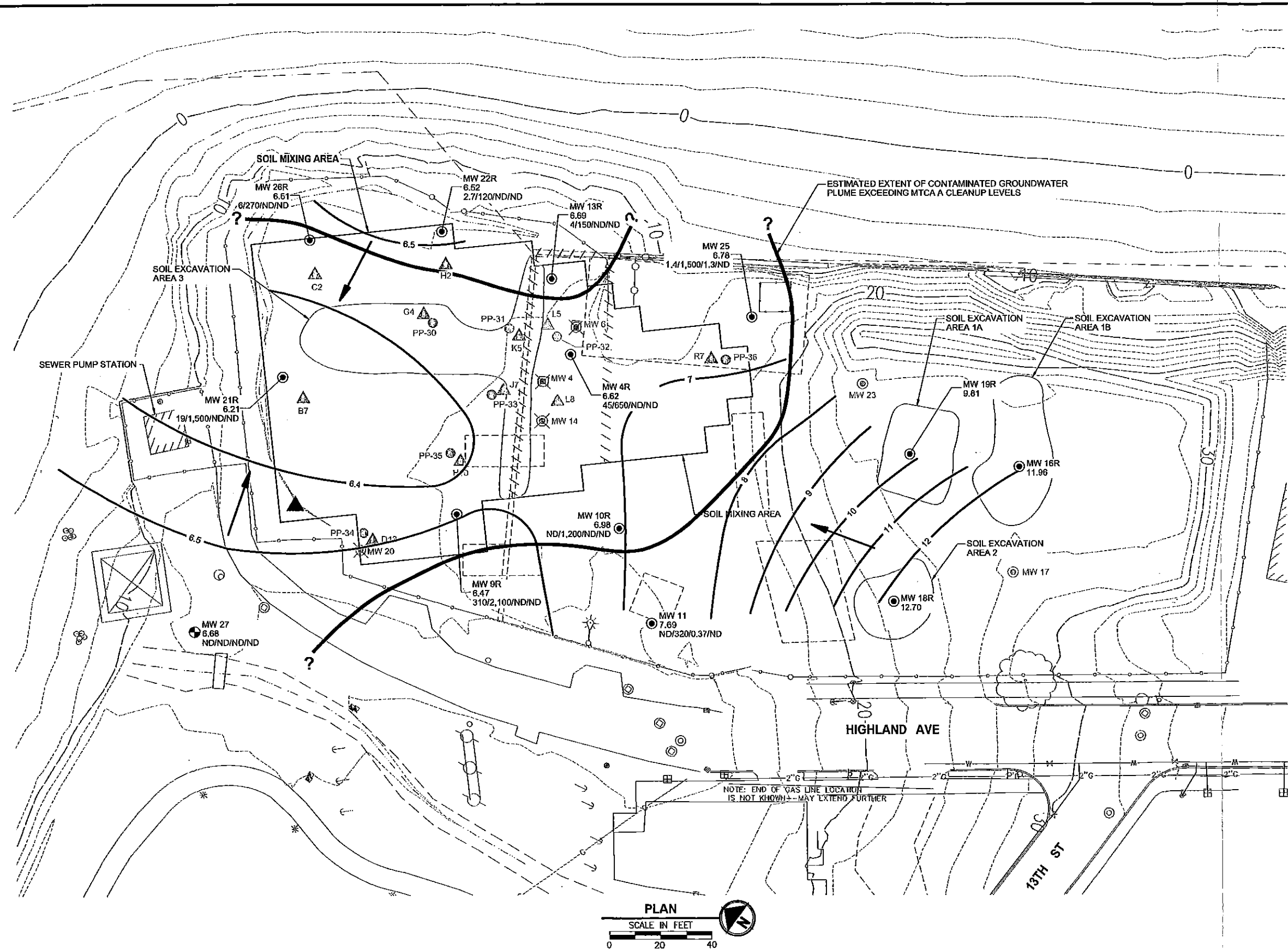
- EXISTING BUILDING
- CHAIN LINK FENCE
- DRAINAGE DITCH
- EXISTING MONITORING WELL
- RI/FS MONITORING WELL
- ND NOT DETECTED

ND/920/240 (10')

RI/FS GROUNDWATER RESULTS FOR: GASOLINE/DIESEL/LUBE OIL
(GROUNDWATER DEPTH BELOW TOP OF WELL CASING)
RESULTS IN ug/L

Figure 8
Former Chevron Property
Cleanup Action Work Plan
RI/FS Groundwater Sampling Locations

FILE: BR18606304_098.FTG
DATE: Apr 13, 2012 - 9:17am PLOTTED BY: ramulds
IMAGES: Chevron Property FIG
XREFS: XL-BREM-WTRFRNT-9A-SV-061201 | XBR18606304-0101F-9A



REVISIONS			
NO.	DESCRIPTION	DATE	BY

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TWO INCHES AT FULL SCALE IF NOT SCALE ACCORDINGLY
SCALE
HORIZ. 1"=20' VERT. N/A

FIELD BOOK
DRAWING NO.
3

CITY OF BREMERTON DEPARTMENT OF PUBLIC WORKS & UTILITIES ENGINEERING DIVISION			
DRAWN BY: SBR	DESIGN BY: DLD	CHECKED BY:	DATE
DATE 9/10	WASH. P.E. #	DATE 4/10	WASH. P.E. #

FORMER CHEVRON PROPERTY CLEANUP ACTION WORK PLAN SAMPLING RESULTS SEPTEMBER 2011	
---	--

FIG. NO.	SHEET
9	OF
PN: 255-1885-063	

BREMERTON BOARDWALK PROJECT

DRAFT

TABLES

Table 1 Groundwater Results Summary, RI 1st through 4th Monitoring Events and Performance Monitoring (February, May, and August 2010, and April and September 2011)

Monitoring Well No.		MW-04R										MW-09R						MW-10R						MW-11									
PARAMETERS	Units	Sample Date	3/19/08 ¹	1/21/10	6/1/10	6/1/10*	8/11/10	8/11/10*	4/6/11	4/6/11*	9/29/11	1/20/10	5/25/10	5/25/10*	8/11/10	4/7/11	4/7/11 Z	9/29/11	3/17/08 ¹	1/20/10	5/25/10	8/10/10	4/6/11	9/30/11	3/13/08	1/20/10	5/25/10	8/10/10	8/10/10*	4/6/11	4/6/11*	9/30/11	
VOLATILE ORGANICS (BTEX)																																	
MTCA A																																	
Benzene	ug/L	5	160	60 J	58	--	52	--	39	--	45	120 J	160	170	360	280	170	310	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	ug/L	1,000	10 U	2.0 J	1.0 U	--	1.0 U	--	4.0 U	--	1.0 U	4 U	3.2	3.6	11	11	7.8	13	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	700	45	31 J	45	--	40	--	17	--	20	89 J	89	97	230	220	120	150	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
m,p-Xylene	ug/L	1,000	86	15 J	7.6	--	4.7	--	9.4	--	2.1	170 J	120	140	400	300	180	190	6.8	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene	ug/L	1,000	12	1.8 J	1.0 U	--	1.0 U	--	4.0	--	1.0 U	4 U	3.5	3.9	8.1	11	6.7	10	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL PETROLEUM HYDROCARBONS																																	
Gasoline	ug/L	800	5,400	1,200 J	1,100	--	1,000	--	960	--	650	1,800 J	1,500	1,700	3,100	4,800	3,100	2,100	400 U	400 U	1,100	780	830	1200	100 U	100 U	100 U	140	130	100 U	100 U	320	
Diesel	mg/L	0.5	27	0.64 M	0.34 U	--	0.62 M	--	0.46	--	0.34 U	0.31 U	0.29 U	0.69	0.45 M	0.82	--	0.33 U	160	0.27 U	0.61 U	0.42 U	0.45 U	0.81 U	0.27	0.17 U	0.26 U	0.25 U	0.25 U	0.26 U	0.26 U	0.37	
Lube Oil	mg/L	0.5	2.3	0.45 U	0.42 U	--	0.41 U	--	0.42 U	--	0.42 U	0.49 U	0.47 U	0.66	0.42 U	0.43 U	--	0.42 U	8.8 U	0.44 U	0.42 U	0.45 U	0.43 U	0.43 U	0.40 U	0.27 U	0.42 U	0.41 U	0.41 U	0.42 U	0.42 U	0.42 U	
METALS																																	
Total Lead	ug/L	15	--	8.2	--	--	--	--	--	--	--	80	36 J	74 J	21 J	170	--	--	--	3.8	--	--	--	--	--	--	4.7	--	--	--	--	--	--
Dissolved Lead	ug/L	15	--	1.0 U	--	--	--	--	--	--	--	13	12	14	17	3.0	--	--	--	2.2	--	--	--	--	--	--	1.4	--	--	--	--	--	--
Dissolved Iron	ug/L		--	4,200	--	--	--	--	--	--	--	34,000	--	--	--	--	--	--	--	6,400	--	--	--	--	--	--	270	--	--	--	--	--	--
Total Ferrous Iron	mg/L		--	--	7.36	--	9.75	--	5.4	--	--	--	46.2	42.1	29.2	49.4	--	--	--	--	25.2	34.4	12.4	--	--	--	19.0	30.4	30.0	2.66	2.74	--	--
Dissolved Manganese	ug/L		--	3,000	4,600	--	4,400	--	3,400	--	--	5,000	3,800	3,900	4,200	4,500	--	--	--	1,100	1,400	2,000	1,500	--	--	300	1,400	2,600	2,600	400	400	--	--
PAHs																																	
Naphthalene	ug/L		--	1.4	--	--	--	--	1.0 U	1.0 U	--	6.4	--	--	--	--	--	--	--	0.14	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--
2-Methylnaphthalene	ug/L		--	0.20	--	--	--	--	1.0 U	1.0 U	--	2.8	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--
1-Methylnaphthalene	ug/L		--	3.2	--	--	--	--	4.7	4.9	--	2.2	--	--	--	--	--	--	--	21	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Acenaphthylene	ug/L		--	0.23	--	--	--	--	1.0 U	1.0 U	--	0.11 U	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Acenaphthene	ug/L		--	1.9	--	--	--	--	3.3	3.4	--	0.18	--	--	--	--	--	--	--	0.23	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Flourene	ug/L		--	1.8	--	--	--	--	2.3	2.3	--	0.14	--	--	--	--	--	--	--	0.32	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Phenanthrene	ug/L		--	0.15	--	--	--	--	1.0 U	1.0 U	--	0.17	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Anthracene	ug/L		--	0.44	--	--	--	--	1.0 U	1.0 U	--	0.11 U	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Fluoranthene	ug/L		--	0.39	--	--	--	--	1.0 U	1.0 U	--	0.11 U	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Pyrene	ug/L		--	0.26	--	--	--	--	1.0 U	1.0 U	--	0.11 U	--	--	--	--	--	--	--	0.12 U	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--
Benzo(a)anthracene	ug/L		--	0.047	0.032	0.03	0.050 U	0.042	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.014	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Chrysene	ug/L		--	0.033	0.010 U	0.010 U	0.050 U	0.029	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L		--	0.013	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L		--	0.028	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	0.1	--	0.020	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L		--	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L		--	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--
Benzo[g,h,i]perylene	ug/L		--	0.010 U	--	--	--	--	0.10 U	0.10 U	--	0.011 U	--	--	--	--	--	--	--	0.012 U	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--
GENERAL CHEMISTRY																																	
Alkalinity	mg/L		--	190	1,900	--	2,100	--	2,300	--	--	700	720	730	800	730	--	--	220	190	200	210	230	--	170	52	210	120	110	70	66	--	
Nitrate (as Nitrogen)	mg/L		--	0.050 U	0.050 U	--	0.050 U	--	0.050 U	--	--	0.050 U	0.050 U	0.050 U	0.14	0.050 U	--	--	0.050 U	0.77	0.094	0.050 U	0.050 U	--	0.050 U	0.050 U	0.070	0.086	0.1	0.050 U	0.050 U	--	
Sulfate	mg/L		--	250	150	--	120	--	110	--	--	30	7.5	7.4	5.0 U	5.0 U	--	--	5.0 U	10	10 U	5.0 U	5.0 U	--	5.0 U	8.8	10 U	25 U	25 U	5.0 U	5.0 U	--	
Chloride	mg/L		--	290	250	--	250	--	230	--	--	77	120	120	78	91	--	--	2.5	10	10	14	6.8	--	5.2	3.1	7.9	8.8	9.4	6.0	5.5	--	
Dissolved Methane	ug/L		--	710	580	--	670	--	740	--	--	2,100	8,600	7,800	8,600	9,900	--	--	--	170	510	260	590	--	--	15	1,200	870	730	310	340	--	
BOD5	mg/L		--	8.97	8.1	--	8.6	--	--	--	--	5.46	3.0	4.3	12.3	--	--	--	--	3.08	2.0	12 U	--	--	--	3.38	3.1	12 U	12 U	--	--	--	--
FIELD PARAMETERS																																	
Turbidity	NTU		--	333	5.3	5.3	106	106	9.0	9.0	116.0	146	57.9	57.9	>1000	>1000	>1000	106.0	208	54.7	3.0	235	2.7	6.5	12.6	165	1.5	32.9	32.9	3.4	3.4	21.1	
pH	--		--	8.83	6.80	6.80	7.01	7.01	7.09	7.09	7.11	6.36	6.77	6.77	6.94	6.78	6.78	7.05	6.38	6.00	6.32	6.05	6.50	6.52	6.20	5.27	6.20	6.27	6.27	6.17	6.17	6.41	
Specific Conductance	mS/cm		--	3.50	3.42	3.42	32.6	32.6	35.1	35.1	5.48	1.52	1.42	1.42	2.65	1.81	1.81	1.91	53.4	35.9	51.2	90	90	81.2	63.6	10.3	32.0	90	90	64.3	64.3	89.0	
Dissolved Oxygen	mg/L		--	4.81	4.55	4.55	0.0	0.0	4.02	4.02	0.06	9.65	0.96	0.96	0.0	0.40	0.40	6.68	0.0	5.38	6.31	2.38	2.20	6.16	0.0	5.87	0.90	0.0	0.0	2.87	2.67	0.06	
ORP	mV		--	-136	-115	-115	-161	-161	-149	-149	-163	-124	-136.8	-136.8	-169	-134	-134	-152	-35	-64	-19.0	-79	-110	-96	62	169	-49.3	-110	-110	-31	-31	-100	

Table 1 Groundwater Results Summary, RI 1st through 4th Monitoring Events and Performance Monitoring (February, May, and August 2010, and April and September 2011)

		Monitoring Well No.	MW-13R						MW-16R					MW-18R				MW-19R						MW-20	MW-21R								
PARAMETERS	Units	Sample Date	2/15/10	5/26/10	8/11/10	4/8/11	4/6/11 Z	9/29/11	2/18/10	5/27/10	8/10/10	4/6/11	4/6/11 Z	2/16/10	5/25/10	8/10/10	4/6/11	3/12/08 ¹	2/16/10	5/26/10	8/12/10	4/7/11	4/7/11 Z	3/13/08	3/18/08 ¹	2/16/10	6/1/10	8/11/10	8/11/10*	4/6/11	4/6/11*	9/28/11	
VOLATILE ORGANICS (BTEX)			MTCA A																														
Benzene	ug/L	5	35 J	33	22	11	17	4	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	15	48 J	34	27	--	45	--	19	
Toluene	ug/L	1,000	4.0 U	1.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	3.7	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	91	5.0 J	2.9	1.7	--	6.7	--	1.0 U	
Ethylbenzene	ug/L	700	13 J	15	10	2.6	3.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	620	230 J	240	120	--	340	--	34	
m,p-Xylene	ug/L	1,000	4.0 U	1.4	1.7	1.0 U	1.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.5	1.0 U	910	190 J	210	100	--	290	--	21	
o-Xylene	ug/L	1,000	4.0 U	1.0 U	1.0 U	1.0 U	1.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	110	8.9 J	2.3	1.9	--	4.0 U	--	1.0 U	
TOTAL PETROLEUM HYDROCARBONS																																	
Gasoline	ug/L	800	680 J	560	510	420	470	150	100 U	100 U	100 U	100 U	400 U	100 U	100 U	180 O	100 U	400 U	840 J	380	620 O	130	280	100 U	9,200	4,400 J	4,400	2,800	--	5,100	--	1500	
Diesel	mg/L	0.5	0.49 U	0.43	0.39 U	0.41	--	0.26 U	0.28 U	0.27 U	0.37	0.28 U	--	0.27 U	0.26 U	0.27 U	0.27 U	8.1	0.29 U	0.26 U	0.42 M	0.26 U	--	0.27 U	1.7	0.89 U	0.79 U	0.87 M	--	0.68 U	--	0.42 U	
Lube Oil	mg/L	0.5	0.70 J	0.45 U	0.43 U	0.42 U	--	0.42 U	0.44 U	0.43 U	0.39 U	0.44 U	--	0.43 U	0.42 U	0.43 U	0.43 U	0.42 U	0.46 U	0.42 U	0.42 U	0.42 U	--	0.44 U	0.40 U	0.46 U	0.42 U	0.41 U	--	0.42 U	--	0.42 U	
METALS																																	
Total Lead	ug/L	15	5.2	--	--	--	--	--	1.4	--	--	--	--	1.6	--	--	--	4.5	5.7	--	--	--	--	15	10	15	2.8 J	10 J	6.5 J	1.1	1.1 U	--	
Dissolved Lead	ug/L	15	1.1	--	--	--	--	--	1.0 U	--	--	--	--	1.0 U	--	--	--	1.0 U	1.0 U	--	--	--	--	1.0 U	8.9	2.3	1.4	1.4	1.0	1.0 U	1.0 U	--	
Dissolved Iron	ug/L		3,600	--	--	--	--	--	56 U	--	--	--	--	830	--	--	--	--	5,100	--	--	--	--	--	--	--	18,000	--	--	--	--	--	--
Total Ferrous Iron	mg/L		--	15.2	9.31	7.94	--	--	--	1.68	0.336	0.094	--	--	12.1	17.8	1.48	--	--	15.4	17.4	0.839	--	--	--	--	16.2	17.9	--	10.1	--	--	
Dissolved Manganese	ug/L		1,500	1,300	2,000	1,800	--	--	10 U	3,800	11,000	10 U	--	1,200	2,800	9,500	1,900	--	2,200	2,400	3,500	1,600	--	--	--	4,100	4,500	3,500	--	4,200	--	--	
PAHs																																	
Naphthalene	ug/L		15	--	--	0.35	--	--	0.11 U	--	--	--	--	1.0	--	--	--	0.88	0.43	--	--	--	--	0.12 U	18	18	--	--	--	--	--	--	
2-Methylnaphthalene	ug/L		1.1	--	--	0.10 U	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	0.11 U	0.17	--	--	--	--	0.12 U	32	7.3	--	--	--	--	--	--	
1-Methylnaphthalene	ug/L		4.7	--	--	0.38	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	15	4.3	--	--	--	--	0.12 U	20	18	--	--	--	--	--	--	
Acenaphthylene	ug/L		1.1	--	--	0.40	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	0.42	0.12	--	--	--	--	0.12 U	0.099	1.1 U	--	--	--	--	--	--	
Acenaphthene	ug/L		48	--	--	22	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	0.98	0.58	--	--	--	--	0.38	1.1	1.3	--	--	--	--	--	--	
Fluorene	ug/L		21	--	--	7.6	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	5.2	1.5	--	--	--	--	0.12 U	0.98	0.61	--	--	--	--	--	--	
Phenanthrene	ug/L		3.2	--	--	0.70	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	2.9	0.31	--	--	--	--	0.12 U	0.65	0.44	--	--	--	--	--	--	
Anthracene	ug/L		1.9	--	--	1.2	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	0.15	0.10 U	--	--	--	--	0.12 U	0.095 U	0.26	--	--	--	--	--	--	
Fluoranthene	ug/L		1.5	--	--	1.2	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	0.11 U	0.10 U	--	--	--	--	0.12 U	0.11	0.12	--	--	--	--	--	--	
Pyrene	ug/L		0.91	--	--	0.58	--	--	0.11 U	--	--	--	--	0.10 U	--	--	--	0.11 U	0.10 U	--	--	--	--	0.12 U	0.095 U	0.11 U	--	--	--	--	--	--	
Benzo(a)anthracene	ug/L		0.15	0.057	0.061	0.058	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.015	0.012	0.011 U	--	--	--	--	--	--	
Chrysene	ug/L		0.15	0.040	0.050 U	0.044	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.021	0.010 U	--	--	--	--	0.013	0.011	0.011 U	--	--	--	--	--	--	
Benzo(b)fluoranthene	ug/L		0.093	0.010 U	0.010 U	0.018	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.010	0.011 U	--	--	--	--	--	--	
Benzo(k)fluoranthene	ug/L		0.083	0.010 U	0.010 U	0.014	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.011	0.011 U	--	--	--	--	--	--	
Benzo(a)pyrene	ug/L	0.1	0.092	0.010 U	0.010 U	0.017	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.012	0.011 U	--	--	--	--	--	--	
Indeno(1,2,3-cd)pyrene	ug/L		0.041	0.010 U	0.010 U	0.010 U	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.0099	0.011 U	--	--	--	--	--	--	
Dibenz(a,h)anthracene	ug/L		0.013	0.010 U	0.010 U	0.010 U	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.011 U	0.010 U	--	--	--	--	0.012 U	0.0095 U	0.011 U	--	--	--	--	--	--	
Benzo(g,h,i)perylene	ug/L		0.053	--	--	0.010 U	--	--	0.011 U	--	--	--	--	0.010 U	--	--	--	0.11 U	0.010 U	--	--	--	--	0.12 U	0.013	0.011 U	--	--	--	--	--	--	
GENERAL CHEMISTRY																																	
Alkalinity	mg/L		1,300	1,400	1,600	1,500	--	--	20 U	450	710	20 U	--	200	420	870	250	160	170	200	190	120	--	180	150	140	1,400	1,500	--	2,000	--	--	
Nitrate (as Nitrogen)	mg/L		0.050 U	0.050 U	0.050 U	0.050 U	--	--	0.087	0.25 U	0.050 U	0.050 U	--	0.16	0.050 U	0.050 U	0.35	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	--	0.050 U	0.050 U	0.050 U	0.050 U	0.057	--	0.27	--	--	
Sulfate	mg/L		460	460	560	280	--	--	5.9	5.0 U	5.0 U	5.0 U	--	26	7.8	5.0 U	7.4	5.0 U	10 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	230	170	120	--	110	--	--	
Chloride	mg/L		710	670	750	420	--	--	4.2	8.3	8.4	8.7	--	3.7	4.3	14	2.4	3.4	4.7	2.5	3.1	2.0 U	--	11	28	140	120	110	--	100	--	--	
Dissolved Methane	ug/L		280	580	680	290	--	--	0.83	3,100	590	4.1	--	420	2,100	5,400	4300	--	32	44	350	61	--	--	--	5,700	4,200	4,800	--	3,200	--	--	
BOD5	mg/L		4.47	2.2	5.1	--	--	--	2.00 U	1.0 U	12 U	--	--	2.52	8.1	12 U	--	--	4.20	1.1	2.9	--	--	--	--	17	8.4	16.2	--	--	--	--	
FIELD PARAMETERS																																	
Turbidity	NTU		368	275.3	108	>1000	>1000	170.0	86.3	2565	>1000	704	704	58.1	16.7	221	28.6	NC	340	319	32.7	>1000	--	NC	168	303	8.9	384	384	52.2	52.2	646.0	
pH	--		6.96	6.81	6.89	6.99	7.42		6.16	6.53	6.87	6.37	6.37	6.03	6.49	6.61	6.51	6.00	6.40	6.68	6.34	6.41	--	6.56	6.39	6.58	6.83	7.00	7.00	7.06	7.06	7.06	
Specific Conductance	mS/cm		57.3	4.53	55.2	438	438	5.99	4.9	64.9	1.38	18.6	18.6	51.6	58.0	2.20	90	34.5	48.2	38.0	CAL	82.1	--	78.1	44.4	33.3	2.50	4.47	4.47	430	430	3.33	
Dissolved Oxygen	mg/L		7.56	3.07	0.0	4.82	4.82	7.70	10.09	2.32	6.27	14.10	14.10	2.79	1.28	0.0	3.39	0.0	3.00	5.05	0.01	4.10	--	0.0	0.0	0.00	4.92	0.0	0.0	1.80	1.80	0.00	
ORP	mV		-13	-98.3	-146	-103	-103	-133	280	-20.3	-38	147	147	143	-2.1	-156	-27	-35	1	-49.8	-84	4	--	-44	15	-107	-140.0	-162	-162	-160	-160	-195	

Table 1 Groundwater Results Summary, RI 1st through 4th Monitoring Events and Performance Monitoring (February, May, and August 2010, and April and September 2011)

		Monitoring Well No.	MW-22R						MW-23	MW-25						MW-26R						MW-27		
PARAMETERS	Units	Sample Date	3/17/08 ¹	1/20/10	6/26/10	8/12/10	4/6/11	9/29/11	3/12/08	3/18/08	3/18/08	1/21/10	5/27/10	8/12/10	4/6/11	9/29/11	3/18/08 ¹	1/20/10	5/26/10	8/11/10	4/6/11	9/28/11	4/7/11	9/30/11
MTCA A																								
VOLATILE ORGANICS (BTEX)																								
Benzene	ug/L	5	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	2.7	1.1	4.0 U	4.0	10 J	4.0 U	1.3	4.0 U	1.4	17	4.0 U	17	3.9	1.0 U	6.0	1.0 U	1.0 U
Toluene	ug/L	1,000	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	4.0	7.2 J	4.0 U	2.1	4.0 U	2.5	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	700	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	56	56	74 J	4.0 U	6.1	5.3	11	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
m,p-Xylene	ug/L	1,000	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.2	4.1	140 J	4.0 U	5.0 U	8.4	1.2	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene	ug/L	1,000	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	4.0	200 U1	4.0 U	1.0 U	4.0 U	1.0 U	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL PETROLEUM HYDROCARBONS																								
Gasoline	ug/L	800	400 U	400 U	100 U	100 U	100 U	120	530	1,600	1,700	2,000 U	1,400	1,300 O	1,500	1500	1,300	400 U	530	240	100 U	270	100 U	100 U
Diesel	mg/L	0.5	0.26 U	0.26 U	0.27 U	0.25 U	0.27 U	0.26 U	0.26 U	1.2	1	0.49	0.92	2 M	7.0	1.3	1.3	0.27 U	0.26 U	0.31 U	0.27 U	0.26 U	0.26 U	0.26 U
Lube Oil	mg/L	0.5	0.41 U	0.41 U	0.43 U	0.41 U	0.43 U	0.41 U	0.42 U	0.46 U	0.46 U	0.42 U	0.42 U	0.41 U	0.42 U	0.41 U	0.40 U	0.43 U	0.41 U	0.40 U	0.43 U	0.41 U	0.41 U	0.42 U
METALS																								
Total Lead	ug/L	15	1.1 U	1.3	--	--	--	--	--	1.2	1.3	1.1 U	--	--	--	--	3.3	1.1 U	--	--	--	--	--	--
Dissolved Lead	ug/L	15	1.0 U	1.0 U	--	--	--	--	--	1.0 U	1.0 U	1.0 U	--	--	--	--	1.0 U	1.0 U	--	--	--	--	--	--
Dissolved Iron	ug/L	--	--	220	--	--	--	--	--	--	--	2,000	--	--	--	--	--	56 U	--	--	--	--	--	--
Total Ferrous Iron	mg/L	--	--	--	0.295	1.29	0.043	--	--	--	--	--	0.352	3.78	1.39	--	--	--	0.758	0.8	0.059	--	27.6	--
Dissolved Manganese	ug/L	--	--	1,400	890	3,200	840	--	--	--	--	120	220	130	170	--	--	11 U	66	560	10 U	--	3,900	--
PAHs																								
Naphthalene	ug/L	--	0.098 U	0.10 U	--	--	--	--	--	1.2	1.4	0.27	--	--	--	--	0.80	0.10 U	--	--	--	--	--	--
2-Methylnaphthalene	ug/L	--	0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	0.10 U	0.10 U	--	--	--	--	--	--
1-Methylnaphthalene	ug/L	--	0.098 U	0.10 U	--	--	--	--	--	22	25	0.67	--	--	--	--	69	0.10 U	--	--	--	--	--	--
Acenaphthylene	ug/L	--	0.098 U	0.10 U	--	--	--	--	--	0.17	0.17	0.10 U	--	--	--	--	0.45	0.15 U	--	--	--	--	--	--
Acenaphthene	ug/L	--	0.52	0.10 U	--	--	--	--	--	0.98	0.98	0.15	--	--	--	--	23	0.17 U	--	--	--	--	--	--
Fluorene	ug/L	--	0.098 U	0.10 U	--	--	--	--	--	1.6	1.7	0.18	--	--	--	--	4.8	0.10 U	--	--	--	--	--	--
Phenanthrene	ug/L	--	0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	10	0.10 U	--	--	--	--	--	--
Anthracene	ug/L	--	0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	2.4	0.17 U	--	--	--	--	--	--
Fluoranthene	ug/L	--	0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	0.88	0.10 U	--	--	--	--	--	--
Pyrene	ug/L	--	0.098 U	0.10 U	--	--	--	--	--	0.11 U	0.11 U	0.10 U	--	--	--	--	1.2	0.10 U	--	--	--	--	--	--
Benzo(a)anthracene	ug/L	--	0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.10	0.016 U	--	--	--	--	--	--
Chrysene	ug/L	--	0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.098	0.010 U	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L	--	0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.022	0.010 U	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L	--	0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.027	0.010 U	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	0.1	0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.051	0.010 U	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L	--	0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.017	0.010 U	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L	--	0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.011 U	0.010 U	--	--	--	--	0.010 U	0.010 U	--	--	--	--	--	--
Benzo(g,h,i)perylene	ug/L	--	0.0098 U	0.010 U	--	--	--	--	--	0.011 U	0.11 U	0.010 U	--	--	--	--	0.020	0.010 U	--	--	--	--	--	--
GENERAL CHEMISTRY																								
Alkalinity	mg/L	--	340	160	320	240	310	--	230	420	410	140	190	260	200	--	190	180	270	210	300	--	310	--
Nitrate (as Nitrogen)	mg/L	--	0.050 U	0.50	0.050 U	0.17	0.41	--	0.051	0.052	0.050 U	3.4	0.73	0.050 U	1.4	--	0.050 U	1.0	0.16	0.050 U	0.050 U	--	0.050 U	--
Sulfate	mg/L	--	22	1,200	75	200	39	--	5.0 U	36	36	13	8.0	26	5.0 U	--	1,400	1,200	1,400	2,200	1,300	--	25 U	--
Chloride	mg/L	--	370	9,100	390	1,600	97	--	3.0	980	910	38	31	610	24	--	9,400	9,100	10,000	20,000	8,400	--	9.8	--
Dissolved Methane	ug/L	--	--	6.3	21	10	0.8	--	--	--	--	220	190	330	190	--	--	3.0	68	5.0	29	--	8,600	--
BOD5	mg/L	--	--	2.00 U	1.0 U	1.2 U	--	--	--	--	--	2.00 U	1.9	4.3	--	--	--	2.00 U	1.7	1.5	--	--	--	--
FIELD PARAMETERS																								
Turbidity	NTU	--	212	56.3	4.1	132	0.8	112.0	29	120	120	164	4.8	32.6	65.5	60.0	85.7	70.2	3.8	38.0	0.1	82.3	49.2	>1000
pH	--	--	6.82	6.32	6.82	6.69	7.03	7.65	6.49	6.31	6.31	5.81	6.28	6.98	6.20	6.21	6.24	6.19	6.31	6.53	6.88	6.52	6.58	6.53
Specific Conductance	mS/cm	--	19.6	17.9	1.37	CAL	128	6.04	52.4	19.8	19.8	31.8	28.9	5.13	90	51.6	3.25	16.6	22.42	CAL	CAL	CAL	92	1.18
Dissolved Oxygen	mg/L	--	0.0	7.55	4.90	0.01	1.75	8.48	0.0	0.0	0.0	4.96	1.10	0.0	0.57	0.00	0.0	6.75	5.52	0.01	0.36	0.00	0.27	0.00
ORP	mV	--	148	54	62.0	-36	32	-139	19	-56	-56	-14	85.6	-120	-30	-99	46	58	-64.5	-98	-84	-275	-88	-111

Notes:

¹ Sample collected from original well decommissioned during 2009 Interim Action.

* Duplicate collected.

CAL = Value out of calibration range.

J = Analyte was detected. Reported concentration should be considered an estimate.

M = Hydrocarbons in the gasoline range are impacting the diesel range result.

mg/L = Milligrams per liter.

mS/cm = Millisiemens per centimeter.

mV = Millivolts.

NC =

Parameter not collected due to malfunctioning equipment.

NTU = Nephelometric turbidity units.

O = Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

ORP = Oxidation reduction potential.

R = Replacement well.

ug/L = Micrograms per liter.

U = Analyte not detected above practical quantitation limit given.

U1 = The practical quantitation limit is elevated due to interferences present in the sample.

Z = Sample collected was unpreserved and allowed to settle prior to analysis. Results provided to assess effects of suspended sediment in the samples.

Exceeds MTCA A cleanup level.

Table 2. Cleanup Levels

Hazardous Substance	Medium	
	Soil MTCA A (mg/kg)	Groundwater MTCA A (ug/L)
Benzene	0.030	5
Diesel	2,000	500
Motor Oil	2,000	500
Gasoline	30/100 ^a	800/1,000 ^b
Lead	250	15
Benzo(a) pyrene	0.1	.01

^a 100 if no benzene and gas <1% TEX; 30 for other mixtures.

^b 1 if no benzene; 0.8 if benzene.

ug/L = Micrograms per liter.

Table 3. Proposed Initial Groundwater Sampling Program

	Gasoline/BTEX	Diesel/Lube Oil	Field Parameters ^a	Conventional ^b	Dissolved Methane	Total Lead	Dissolved Lead ^c	Total Ferrous Iron	Dissolved Manganese ^c
MW-4R	X	X	X	X	X	-	-	X	X
MW-9R	X	X	X	X	X	X	X	X	X
MW-10R	X	X	X	X	X	-	-	X	X
MW-11	X	X	X	X	X	-	-	X	X
MW-13R	X	X	X	X	X	-	-	X	X
MW-16R	-	-	-	-	-	-	-	-	-
MW-18R	-	-	-	-	-	-	-	-	-
MW-19R	-	-	-	-	-	-	-	-	-
MW-20R	X	X	X	X	X	-	-	X	X
MW-21R	X	X	X	X	X	-	-	X	X
MW-22R	X	X	X	X	X	-	-	X	X
MW-25	X	X	X	X	X	-	-	X	X
MW-26R	X	X	X	X	X	-	-	X	X
MW-27	X	X	X	X	X	-	-	X	X

^a Turbidity, dissolved oxygen, ORP, pH, and specific conductance.

^b nitrate, sulfate, alkalinity, chloride.

^c field filtered.

Table 4. Proposed Schedule

Work Element	Submitted or Completed By
Long Term Groundwater Monitoring Plan & Health and Safety Plan	June 2012
Draft Cleanup Action Plan (DCAP) public comment period	June 2012
Environmental Covenant	July 2012
Institutional Controls Plan	July 2012
1st semi-annual groundwater sampling event	July 2012
DCAP finalized as Cleanup Action Plan (CAP)	September 2012
2nd Agreed Order finalized	November 2012
2nd semi-annual groundwater sampling event	January 2013
3rd semi-annual groundwater sampling event	July 2013
4th semi-annual groundwater sampling event	January 2014
5th semi-annual groundwater sampling event	July 2014
6th semi-annual groundwater sampling event	January 2015
7th semi-annual groundwater sampling event	July 2015
8th semi-annual groundwater sampling event	January 2016
1st quarterly groundwater sampling event	April 2016
2nd quarterly groundwater sampling event	July 2016
3rd quarterly groundwater sampling event	October 2016
4th quarterly groundwater sampling event	January 2017
5-Year Summary Monitoring Report	February 2017
First 5-Year Review	March 2017

Note: Groundwater monitoring memoranda will be submitted within 8 weeks following completion of each groundwater monitoring event.

