Groundwater Monitoring Report

Former Wasser & Winters Log Sort Yard

Port of Tacoma
Tacoma, Washington

Consent Decree No. 932086844
Consent Decree Date: August 1993
Monitoring Date: August 22, 2014

Prepared for
Port of Tacoma

December 15, 2014
19000-03

HARTCROWSER

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Prepared by
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Groundwater Monitoring Report

Former Wasser & Winters Log Sort Yard

Port of Tacoma

Tacoma, Washington

INTRODUCTION

This report summarizes the field activities and presents the results of the groundwater sampling event conducted on behalf of the Port of Tacoma (Port) for the Former Wasser & Winters Log Sort Yard Facility located at 1602 Marine View Drive in Tacoma, Washington (site) (Figure 1).

Groundwater sampling activities were conducted in accordance with the requirements identified in the Consent Decree (932086844) dated August 1993 between the Port and the Washington State Department of Ecology (Ecology). Ecology approved the removal of copper, lead, and zinc from the site groundwater monitoring analyte list in 2011 (Ecology 2011a). A memorandum of understanding (MOU) between Ecology and the Port reaffirming the 30-month monitoring frequency was issued on September 12, 2011. The MOU is included in Appendix A.

In May 2014, Ecology conducted a periodic review of post-cleanup site conditions and monitoring data to ensure that human health and the environment are being protected. The report meets the intent of Section XXIII (Five-Year Review) of the Consent Decree. The May 2014 Periodic Review Report for this site is Included in Appendix B. The next five-year review is expected to be in May 2019.

SITE BACKGROUND

From 1972 to 1984, the Wasser & Winters Company operated the site as a log sort yard. In the 1970s and early 1980s, slag generated by Asarco Incorporated of Tacoma, Washington, was placed on the site for use as roadbed or ballast. Ecology detected elevated concentrations of metals in surface water samples collected from the site between November 1983 and June 1984 and concluded that the metals leached from the slag.

In October 1991, Ecology and the Port entered into an Agreed Order to complete a remedial investigation/feasibility study (RI/FS), and Ecology issued a Consent Decree (932086844) for remedial action on the 11.4-acre parcel. Construction of a low-permeability asphalt cap and stormwater drainage system was completed in 1995. In July 2001, Hebert Construction began construction of an 85,080-square-foot building, which was completed in December 2001. The site is currently leased to Calbag Metals, a ferrous and non-ferrous metals recycling company. Compliance monitoring is being performed to fulfill the requirements of the Consent Decree.

GROUNDWATER MONITORING

On August 22, 2014, groundwater samples were collected from one monitoring well (GMW-3). A site plan with the monitoring well location is presented on Figure 2. The purpose of the groundwater monitoring program is to assess groundwater quality in monitoring wells along the perimeter of the facility to ensure that contaminants contained by the cap have not migrated outside of the capped area.

The groundwater sample was collected from the well using low-flow sampling techniques. The well-dedicated tubing stored in the casing of the well was removed and fresh tubing was used for purging and sampling. In addition to the groundwater sample, one field duplicate (sample GMW-300) was collected from well GMW-3. The samples were field filtered during collecting using a 0.45-micron filter. All groundwater samples collected were immediately placed in a cooler on ice and hand-delivered to Analytical Resources, Inc. (ARI), under chain of custody protocol. Samples were analyzed for dissolved arsenic. The groundwater sampling field log is provided in Appendix C.

The laboratory analytical result for the groundwater sample collected on August 22, 2014, from well GMW-3 indicates that the concentration of dissolved arsenic (346 µg/L) was above the performance standard established for the site (36 µg/L). The duplicate sample collected from GMW-3 showed a similar dissolved arsenic concentration of 353 µg/L. These results were lower than the concentration measured in the May 2012 sampling event (471 µg/L). Arsenic concentration will continue to be monitored to observe whether this trend changes over time. The laboratory analytical results are presented in Table 1, and the laboratory analytical report is provided in Appendix D. A plot of arsenic concentration versus time is presented in Appendix E.

During the monitoring event, the groundwater level in well GMW-3 was measured prior to sampling. The water level was measured as depth relative to the top of the well casing using a Waterline water level meter to the nearest hundredth of a foot. Water level data are presented in Table 2.

RECOMMENDATIONS

Based on the results of the groundwater monitoring event conducted on August 22, 2014, no additional actions are recommended. Arsenic concentrations will continue to be monitored to determine if the higher results from this event and the May 2012 event continue. The next groundwater monitoring event is scheduled for February 2017 based on the 30-month monitoring frequency set forth in the MOU.

REFERENCES

Ecology 1991. Agreed Order DE 91-S248. Washington State Department of Ecology. October 1991.

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Ecology 2011a. Email correspondence to M. Rettmann, Port of Tacoma. D. Reale, Washington State Department of Ecology. June 28, 2011.

Ecology 2011b. Memorandum of Understanding, Former Log Yard Groundwater Monitoring and Cap Inspection. Washington State Department of Ecology. September 2011.

Ecology 2014. Periodic Review Report, Final, Wasser Winters, Facility Site ID#: 1218. Washington State Department of Ecology. May 2014.

Kennedy Jenks 1993. Remedial Investigation/Feasibility Study, Wasser & Winters Log Yard Site, Port of Tacoma, Tacoma, Washington. Kennedy Jenks Consultants, Inc. 1993.

Kennedy Jenks 1993. Final Engineering and Design Report, Wasser & Winters Site Log Sort Yard Site. Kennedy Jenks Consultants, Inc. October 1993.

Norton, D., and A. Johnson 1985. Completion Report on WQIS Project 1 for the Commencement Bay Nearshore/Tideflats Remedial Investigation: Assessment of Log Sort Yards as Metal Sources to Commencement Bay Waterways, November 1983 to June 1984. Washington State Department of Ecology Memorandum. February 27, 1985.

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Table 1 - Groundwater Analytical Data
Former Wasser and Winters Log Sort Yard

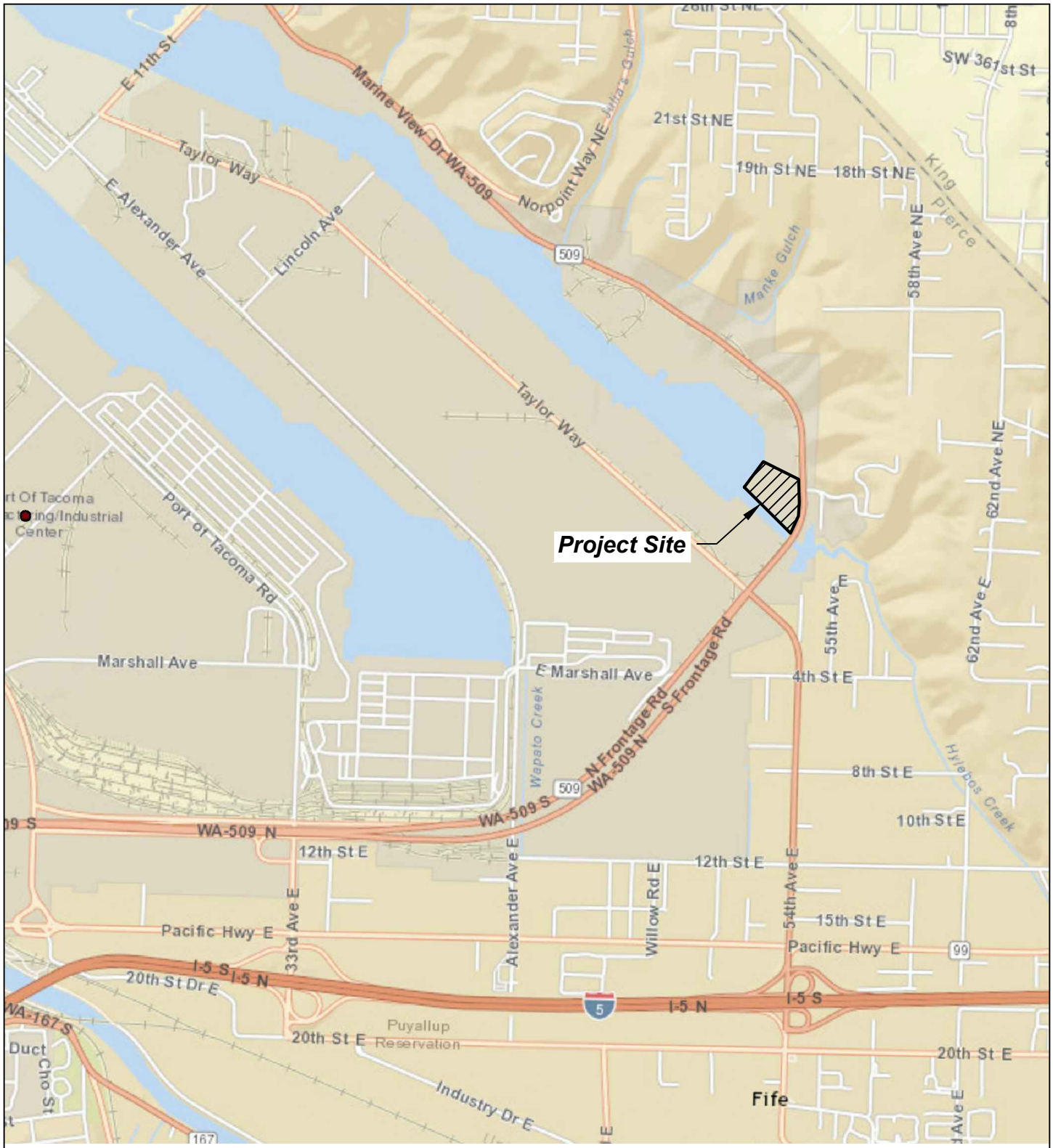
Well ID	Date	Concentration in µg/L			
		Dissolved Arsenic	Dissolved Copper	Dissolved Lead	Dissolved Zinc
Groundwater Cleanup Levels [(a)] :		***36***	***2.9***	***8.5***	***86***
GMW-3	2/7/1994	**49**	<2	<1	8
GMW-3	5/17/1994	**72**	<2	1	7
GMW-3	8/17/1994	**95**	<2	<1	5
GMW-3	11/11/1994	**82**	<2	2	8
GMW-3	5/17/1995	**74**	<2	<1	7
GMW-3	9/29/1995	**100**	<2	<1	5
GMW-3	3/9/1996	**82**	<2	<1	<4
GMW-3	10/8/1996	**83**	<2	<1	<4
GMW-3	8/14/1997	**144**	<2	<1	5
GMW-3	12/30/1997	**123**	<2	<1	**139**
GMW-3	6/11/1998	**89**	<2	<1	<4
GMW-3	12/22/1998	**190**	<2	<1	<2
GMW-3	1/28/2000	7.2	<1	<0.5	**99**
GMW-3	7/16/2002	**117**	1.02	<0.5	3.32
GMW-3 (Duplicate)	7/16/2002	**111**	0.979	<0.5	4.67
GMW-3	2/23/2004	**77.2**	1.07	<0.2	3.98
GMW-3 (Duplicate)	2/23/2004	**77.5**	1.06	0.675	4.79
GMW-3	7/26/2005	13.1	2.63	<2.5	<5
GMW-3 (Duplicate)	7/26/2005	12.9	<2.5	<2.0	<5
GMW-3	1/30/2007	**60**	**4.6**	<2.0	34
GMW-3	2/26/2008	12	1.2J	<2.0	47
GMW-3 (Duplicate)	2/26/2008	11	0.8J	<2.0	35
GMW-3	7/23/2009	**41.3**	1.5	<0.2	2.1
GMW-3 (Duplicate)	7/23/2009	**41.7**	1.4	<0.2	1.4
GMW-3	2/17/2012	**2,750[(b)]**	--	--	--
GMW-3 (Duplicate)	2/17/2012	**3,100[(b)]**	--	--	--
GMW-3	5/25/2012	**471**	--	--	--
GMW-3 (Duplicate)	5/25/2012	**455**	--	--	--
GMW-3	8/22/2014	**346**	--	--	--
GMW-3 (Duplicate)	8/22/2014	**353**	--	--	--

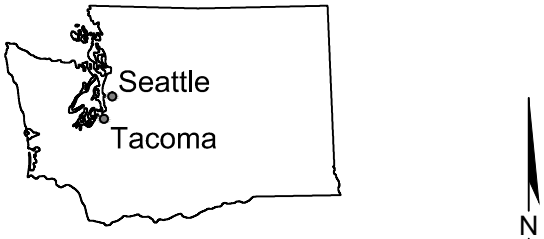
Notes:
Lead, zinc, and copper analyses were discontinued in 2011 with Ecology approval dated June 28, 2011 (Ecology 2011a).
Groundwater samples were analyzed for dissolved metals by EPA Method 200.8.
Value in bold indicates concentration greater than groundwater cleanup level.
(a) Groundwater cleanup levels established from EPA chronic marine water quality criteria (WAC 173-201A).
(b) Results from the February 2012 sampling event are considered invalid due to improper sampling procedures resulting in higher than normal turbidity.
-- Not analyzed
(µg/L) - Micrograms per liter
< 0.5 - Laboratory analytical result does not exceed laboratory quantitation limit.
J - Laboratory analytical result was detected above the method detection limit but below the quantitation limit.

Table 2 - Water Level Data
Former Wasser and Winters Log Sort Yard

Well ID	*Date*	*Top of Casing Elevation in Feet*	*Depth of Water Below Top of Casing in Feet*	*Water Level Elevation in Feet*
GMW-3	2/7/1994	22.11	9.72	12.39
GMW-3	5/17/1994	22.11	9.83	12.28
GMW-3	8/17/1994	22.11	10.24	11.87
GMW-3	11/11/1994	22.11	10.47	11.64
GMW-3	5/17/1995	22.11	9.48	12.63
GMW-3	9/29/1995	22.11	10.37	11.74
GMW-3	3/9/1996	22.11	8.51	13.60
GMW-3	10/8/1996	22.11	10.24	11.87
GMW-3	8/14/1997	22.11	9.76	12.35
GMW-3	12/30/1997	22.11	8.80	13.31
GMW-3	6/11/1998	22.11	9.68	12.43
GMW-3	12/22/1998	22.11	8.75	13.36
GMW-3	8/13/1999	22.11	10.05	12.06
GMW-3	1/28/2000	22.11	8.76	13.35
GMW-3	1/8/2001	22.11	9.92	12.19
GMW-3	7/16/2002	22.11	9.81	12.30
GMW-3	2/23/2004	22.11	9.45	12.66
GMW-3	7/26/2005	22.11	10.04	12.07
GMW-3	01/30/2007	22.11	9.88	12.23
GMW-3	02/26/2008	22.11	9.24	12.87
GMW-3	07/23/2009	22.11	10.18	11.93
GMW-3	2/17/2012	22.11	10.21	11.90
GMW-3	5/25/2012	22.11	9.85	12.26
GMW-3	8/22/2014	22.11	9.98	12.13

Notes:
Depth to water measured from reference point on top of well casing.





0 2000 4000

Scale in Feet

N

Source: Base map prepared from ArcGIS Online, 2014.

Former Wasser and Winters Log Sort Yard
Port of Tacoma

Vicinity Map

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Figure
1

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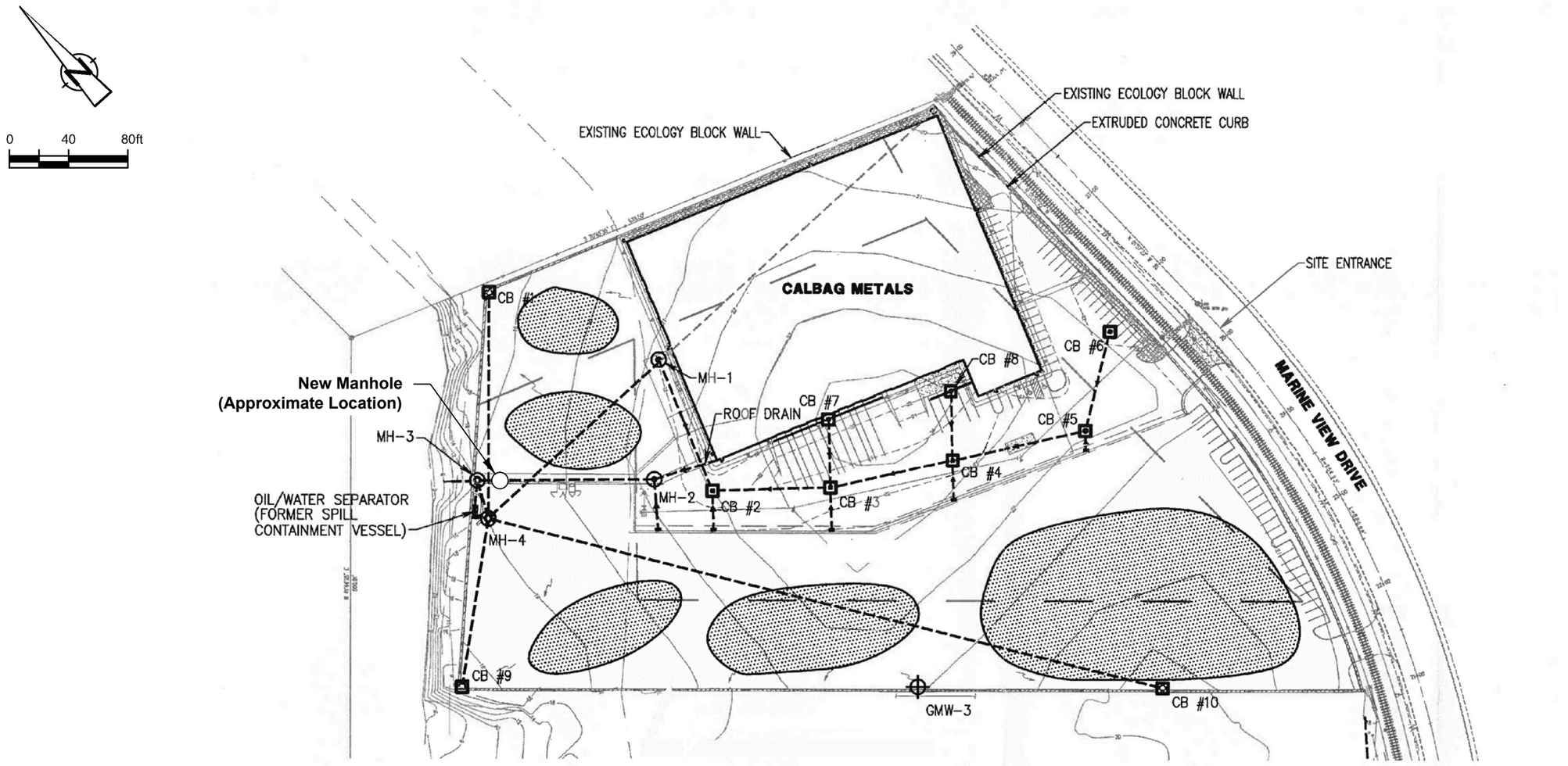

Former Wasser and Winters Log Sort Yard
Port of Tacoma

Site Plan

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Figure
2

Source: Kennedy/Jenks Consultants, Figure 2.

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APPENDIX A
Memorandum of Understanding

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6.4 Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING

Former Log Yard Groundwater Monitoring and
Cap Inspection

This Memorandum of Understanding (MOU) is entered into this 12 day of September 2011 between the Washington State Department of Ecology ("Ecology") and the Port of Tacoma ("Port") (collectively the "Parties") to memorialize the Parties' agreement to modify the requirements for future groundwater monitoring and cap inspection frequencies for five Port sites, as set forth below.

These sites affected by this agreement are Cascade Timber No. 3, Murray Pacific No. 2, Wasser Winters, Portac, and Louisiana-Pacific (aka Pony Lumber) ("Monitored Sites").

Each Monitored Site was cleaned up under an administrative agreement between Ecology and the Port, either as an original party or successor interest, as follows: Cascade Timber No. 3, Murray Pacific No. 2, and Wasser Winters were cleaned up under Consent Decrees, Louisiana-Pacific under an Enforcement Order, and Portac under a pre-Model Toxics Control Act (MTCA) Order On Consent (cumulatively referred to as: "Ecology Orders"). Portac, Inc. was also a respondent to the Portac Order on Consent along with the Port.

Each Monitored Site addressed similar contaminants of concern (COCs), which included arsenic, copper, lead, and zinc. However, each Ecology Order had site-specific requirements with respect to cleanup levels, and cap and groundwater monitoring frequencies.

In Spring 2010, the Port initiated a request to Ecology to standardize the monitoring requirements for the Monitored Sites in an effort to align the timing of the periodic monitoring/ inspections at the sites so that the Port may better align a contractor to do the work all at once, as required.

In August 2010, to supplement the information already provided to Ecology, the Port provided Ecology with a tour of the Monitored Sites. As part of the tour, Ecology inspected the type and condition of the caps; the current site uses, specifically on the capped areas, and the locations and conditions of existing monitoring wells and stormwater basins.

Ecology has reviewed the information provided by the Port, as well as observations made during the site tour, and has chosen to provide a response in the form of this MOU.

This MOU was created for the Parties to understand and agree upon the requirements associated with Ecology's response, and to memorialize the decisions made with respect to each of the Port's requests.

In preparing this MOU, Ecology took into account, for each site, the type and condition of the cap and stormwater collection system, the adequacy of the groundwater monitoring system, and the recent groundwater compliance history.

Based on the above, Ecology and the Port agree as follows:

A. CAP MONITORING FREQUENCY

1. The Port may standardize the cap monitoring (inspection and reporting) frequency for the Monitored Sites to 30 months as requested. However, the following shall also occur:

   - During the site tours, Ecology noted that some of the stormwater basins were in better condition than others. Stormwater basins at each of the Monitored Sites should be inspected quarterly and cleaned out as needed, such that they are continuously operational.

   - Any unanticipated breaches of the cap for any of the Monitored Sites shall be reported to Ecology and repaired as soon as practicable. As per the respective Ecology Orders, the Port shall provide Ecology with a plan for each of the sites that summarizes intended action and reporting by the Port for unanticipated cap breaches.

   - Advance notice shall be provided and prior approval shall be obtained from Ecology for any planned cap breaches and repairs that are not otherwise permitted under the respective Ecology Order for each Monitored Site.

   - Minor cracking and normal wear and tear shall be repaired and reported as anticipated by and according to each Monitored Site's Ecology Order.

   - The appropriate Ecology Site Manager shall be informed, in writing, of any changes in site use on capped areas.

2. The next cap monitoring for the Monitored Sites based on this new 30-month frequency shall be February 2012, which corresponds to the next 30-month groundwater monitoring event for Wasser Winters described below. Unless changed by Ecology, all future cap monitoring for the Monitored Sites shall occur every 30 months beginning February 2012 to coincide with the groundwater monitoring that is intended to target alternating wet and dry seasons.

B. GROUNDWATER MONITORING FREQUENCY

1. The Port may standardize the groundwater monitoring frequency for each of the Monitored Sites as requested, which included the following:

   - Cascade Timber No. 3 – 18 months (formerly 12 months).
   - Murray Pacific No. 2 – 18 months (formerly 6 months).
   - Wasser Winters – No change (currently 30 months).
   - Portac – No change (currently discontinued).
   - Louisiana-Pacific – 30 months (formerly 24 months wet/dry).

2. The next groundwater monitoring for the Monitored Sites shall be conducted in February 2012. Unless changed by Ecology, all future groundwater monitoring for the Monitored Sites shall occur according to the frequency identified above beginning February 2012.

C. EFFECT OF MODIFICATION

1. Except as modified herein, all provisions of the Original Ecology Orders for each Monitored Site as existing and as may have been amended, including addressing any potential data compliance issues, remain in full force and effect.

2. A copy of this MOU shall be filed with the Ecology Project Manager for each of the Monitored Sites.

John Wolfe
Chief Executive Officer
Port of Tacoma

9.1.11
Date

Rebecca S. Lawson, P.E., LHG
Section Manager, Toxics Cleanup Program
Southwest Regional Office
Washington State Department of Ecology

9/12/2011
Date

cc:
Jason Jordan – Port of Tacoma
Mark Rettmann – Port of Tacoma
William Evans – Port of Tacoma
Leslee Connor – Port of Tacoma
Scott Hooton – Port of Tacoma
Dom Reale – Ecology
Marv Coleman – Ecology
Guy Barrett – Ecology
James DeMay – Ecology
Scott Rose – Ecology
Rebecca Lawson – Ecology

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APPENDIX B
Periodic Review Report, May 2014

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

May 20, 2014

Mr. Scott Hooton
Environmental Project Manager
Port of Tacoma
P.O. Box 1837
Tacoma, WA 98401-1837

Re: Notice of Periodic Review Conducted at the following Hazardous Waste Site:

- Name: Wasser Winters
- Address: 1602 Marine View Drive, Tacoma, WA 98421
- Facility/Site Number: 1218

Dear Mr. Hooton:

Under the Model Toxics Control Act (MTCA), Chapter 70.105D RCW, which governs the cleanup of hazardous waste sites in Washington State, the Department of Ecology (Ecology) must conduct a periodic review of all sites with institutional controls and Environmental Covenants every five years. This letter serves to inform you that a periodic review has been conducted at the Wasser Winters Site.

The periodic review process includes the following steps:

- Confirmation that the Environmental Covenant is still active and recorded with the Title to the property.

- A review of any monitoring data collected since the cleanup was completed or since the last review was conducted.

- A Site visit to confirm the institutional controls and conditions of the Environmental Covenant are being followed.

- A 30-day public comment period on the draft periodic review report.

Based on the information collected during this periodic review, the Wasser Winters Site appears to meet the requirements of Chapter 173-340 WAC, and the selected remedy continues to be protective of human health and the environment. The 30-day public comment period on the draft periodic review report was ended on May 19, 2014. We received no public comments on the draft report. Enclosed is a copy of the final periodic review report for your information.

A periodic review will continue to be required every five years as long as institutional controls and/or an environmental covenant are required to protect human health and the environment. The next periodic review will be due in May 2019.

If you have any questions regarding this letter or if you would like additional information regarding the cleanup of hazardous waste sites, please call me at (360) 407-6335. Thank you for your cooperation.

Sincerely,

Panjini Balaraju, P.E.
Periodic Review Coordinator
Toxics Cleanup Program
Southwest Regional Office

Enclosure: 1

By certified mail: (7012 2210 0002 6581 3592)

cc: Nick Nickolas, Calbag Metals
Central Files

PERIODIC REVIEW REPORT
FINAL

WASSER WINTERS
Facility Site ID#: 1218

1602 Marine Drive
Tacoma, Washington 98421

Southwest Region Office

TOXICS CLEANUP PROGRAM

May 2014

TABLE OF CONTENTS

1.0 INTRODUCTION

This document is a review by the Washington State Department of Ecology (Ecology) of post-cleanup site conditions and monitoring data to ensure that human health and the environment are being protected at the Wasser Winters site (Site). Cleanup at this Site was implemented under the Model Toxics Control Act (MTCA) Regulations, Chapter 173-340 Washington Administrative Code (WAC).

Cleanup activities at this Site were completed under a Consent Decree (CD), 93-2-08684-4 filed in Pierce County Superior Court on August 27, 1993 for implementing the selected remedial alternative as a part of the Upland source control. The cleanup actions resulted in concentrations of metals in soil and groundwater exceeding MTCA Method A cleanup levels remaining at the Site. The MTCA Method A industrial cleanup levels for soil are established under WAC 173-340-745(2). The groundwater cleanup levels are established under Environmental Protection Agency (US EPA) Chronic Marine Water Quality Criteria (WAC 173-201A). WAC 173-340-420 (2) requires that Ecology conduct a periodic review of a site every five years under the following conditions:

(a) Whenever the department conducts a cleanup action.
(b) Whenever the department approves a cleanup action under an order, agreed order or consent decree.
(c) Or, as resources permit, whenever the department issues a No Further Action (NFA) opinion
(d) And one of the following conditions exists:

1. Institutional controls or financial assurance are required as part of the cleanup.
2. Where the cleanup level is based on a practical quantitation limit.
3. Where, in the department's judgment, modifications to the default equations or assumptions using site-specific information would significantly increase the concentration of hazardous substances remaining at the site after cleanup or the uncertainty in the ecological evaluation or the reliability of the cleanup action is such that additional review is necessary to assure long-term protection of human health and the environment.

When evaluating whether human health and the environment are being protected, the factors the department shall consider include [WAC 173-340-420(4)]:

(a) The effectiveness of ongoing or completed cleanup actions.
(b) New scientific information for individual hazardous substances of mixtures present at the Site.
(c) New applicable state and federal laws for hazardous substances present at the Site.
(d) Current and projected Site use.
(e) Availability and practicability of higher preference technologies.
(f) The availability of improved analytical techniques to evaluate compliance with cleanup levels.

The department shall publish a notice of all periodic reviews in the Site Register and provide an opportunity for public comment.

2.0 SUMMARY OF SITE CONDITIONS

2.1 Site History

The Wasser Winters Site is located at 1602 Marine Drive in Tacoma, Washington (Vicinity Map - Appendix 6.1). The Port of Tacoma (Port) owns approximately 13.54 acres, approximately 11.4 acres of which is "the Site." The Site is located along the Hylebos Waterway and is located in the Commencement Bay Nearshore/Tideflats (CBN/T) Superfund site. In 1982, the CBN/T was added to the National Priorities List (NPL) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. The CBN/T site includes the head of Hylebos Waterway and upland sites believed to contribute contamination to the waterway. The United States Environmental Protection Agency (EPA) is responsible for the cleanup of waterway sediment, while Ecology is responsible for the cleanup of the upland acres that are sources of contamination to the waterway.

Wassre & Winters Company leased the property for log storage and sorting from June 1972, through November 1984. During yard operations, logs were trucked into the sort yard, weighed, and unloaded into scaling bays. The natural soils and dredged fill material at the Site are fine-grained silt and sand, which are unstable under heavy loads, particularly during wet weather. Therefore, operation of the Site as a log sort yard required the use of ballast material to support the heavy machinery and log inventory on the Site. In addition to other rock and gravel material, the ASARCO slag was placed on the Site as ballast in 1970s and early 1980s.

During normal log sort yard operations, wood waste (primarily bark) is produced by loading, unloading, and movement of logs within the yard. This wood waste accumulates on top of natural soil, dredged fill material, and ballast. As a result of heavy vehicular traffic, wood wastes at the Site were mixed with surficial soils and slag ballast. Metals in the slag were believed to leach due to the acidic conditions caused by biological decomposition of the wood waste. This ability to leach was increased by pulverizing slag by heavy vehicular traffic, which caused slag particles to have more surface area with greater availability to leach metals. The log sorting operations were ended in late 1984 and currently the Site is occupied by Calbag Metals Company, a recycling facility.

2.2 Site Investigations

Between November 1983 and June 1984, Ecology conducted a surface water investigation at the Site. The study revealed elevated levels of several metals in surface water runoff from the Site, which discharged to the Hylebos Waterway. Metals included arsenic, copper, lead, and zinc, which were found at concentrations as high as 21,600 micrograms per liter (µg/L,) 10,160 µg/L, 5,900 µg/L and 11,930 µg/L respectively.

In March 1987, Ecology issued a Consent Order under Chapter 90.48 RCW to the Port to perform a preliminary Site Characterization and Focused Feasibility Study to further investigate

occurrences and potential control of metals in Site storm water runoff. The Port's contractor reported that surface water runoff contained elevated levels of arsenic, copper, lead, and zinc.

On October 7, 1991, Ecology issued an Agreed Order, DE 91-S248 under Chapter 70.105D RCW to conduct a Remedial Investigation/Feasibility Study (RI/FS). The RI revealed surface soil samples taken from 39 locations across the Site contained concentrations of arsenic, copper, lead, and zinc up to 3,250 milligrams per kilogram (mg/Kg), 3,270 mg/Kg, 1,870 mg/Kg and 3,340 mg/Kg, respectively. At the time of this investigation, the MTCA Method A industrial cleanup standards for arsenic and lead were 200 mg/Kg and 1,000 mg/Kg, respectively. Sampling of 30 soil borings indicated that samples taken from 2 to 4 feet below ground surface (bgs) generally contained 1 to 3 orders of magnitude lower metals concentrations than the corresponding ground surface soil samples; in no case did any of the samples deeper than 2.5 feet exceed 20 mg/Kg arsenic, the MTCA Method A residential cleanup level. Based on the RI/FS, it was estimated approximately 18,500 cubic yards of mixed soil, bark, wood waste, and slag containing above the MTCA Method A industrial cleanup standard (200 mg/Kg) is present at the Site. Soil sampling locations and a arsenic concentration contour map in surface soils are available as Appendix 6.3 and 6.4, respectively.

Three rounds of groundwater sampling were conducted during the RI from 11 monitoring wells. Metal concentrations in groundwater were generally low and did not indicate groundwater to be a significant pathway for contaminant migration.

Monitoring of surface water runoff conducted during the RI in 1992 indicated concentrations of arsenic, copper, lead, and zinc up to 340 µg/L, 282 µg/L, 52 µg/L and 695 µg/L respectively, were detected in storm water leaving the Site.

As previously mentioned, the Site is located within the boundaries of the CBN/T Superfund site, and has been identified as a source of contamination to the Head of Hylebos Problem Area. The Port negotiated a federal CD for the CBN/T Superfund site. The CD was also signed by the State of Washington in its capacity as a natural resource trustee. The CD settled the Natural Resource Damage (NRD) liability for all land owned, operated, or managed by the Port, including the Wasser Winters Site. The NRD settlement required the Port to place institutional controls upon the Wasser Winters Site.

In addition to the contamination described above, petroleum hydrocarbons were identified in a limited area of the Site's southern portion. This contamination was addressed under a separate independent cleanup action.

A Cleanup Action Plan (CAP) was completed in June 1993 and was included in the CD. The CAP included the installation of a storm water collection system, monitoring of surface water and groundwater, and filing a Restrictive Covenant (RC) limiting the use of most of the Site for industrial use purposes.

2.3 Remedial Activities

Remedial activities were conducted at the Site from July through October 1993. A total of six Remedial Alternatives were evaluated in the Feasibility Study. The selected remedial action included the installation of an asphalt cap over the upland portions of the Site and long term groundwater monitoring. As required by the City of Tacoma's Critical Area Ordnance, a 100-foot wide stream buffer was left between the asphalt cap Hylebos Creek. This buffer was constructed to provide wildlife habitat. Contaminated soil and organic material removed from the stream buffer area were placed in the central portion of the Site to be capped. Confirmation samples were collected from excavated areas to ensure achievement of Site cleanup levels. Confirmation soil samples were analyzed for total arsenic and lead.

At the conclusion of soil removal activities, up to 5 feet of soil had been excavated from portions of the stream buffer area, and 66 surface samples were collected to confirm the remaining soil met the cleanup levels. As a component of capping activities, ecology blocks (large concrete blocks) were placed around the perimeter of the cap, forming a berm.

2.4 Cleanup Levels

Cleanup levels for the Site were established in the Final Cleanup Action Plan, which was submitted to Ecology in June 1993. These cleanup levels (CULs) are available in the table below:

Table 2: Site Cleanup Levels

Contaminant	Groundwater	Soil
	(µg/l)	(mg/Kg)
Arsenic	36	200
Copper	2.9 (10[1])	N/A
Lead	8.5 (10[1])	1000
Zinc	86	N/A

1: Practical Quantitation Limit (PQL).

Cleanup standards were developed for this Site based on Chapter 173-340 WAC. The use of Method A industrial soil cleanup standards per WAC 173-340-745 was justified for the following reasons: the Site cleanup may be defined as a routine cleanup per WAC 173-340-130; the Site is located in a heavy industrial area adjacent to other industrial properties; the Site is zoned for industrial use; and. deed restrictions will limit the use of the Site to industrial activities in the future. Since the groundwater is not a current and potential source of drinking water,

groundwater cleanup levels were established based on EPA Water Quality Marine Chronic Criteria.

2.5 Groundwater Monitoring

As required by the Final CAP, the groundwater monitoring is being conducted at the Site from February 1994 on an 18-month frequency. The latest round of groundwater monitoring was conducted in February 2012. Though the results of arsenic concentrations in monitoring well GMW-3 exceeded its Site cleanup level of 36 µg/L from 1994 to 2009, during this period concentrations remained steady without any significant variation. However, the latest round of sampling conducted in 2012, showed a significant increase in arsenic concentration. As a result the arsenic concentrations will continue to be monitored to determine if the higher results from this event will continue or if the data is to be considered an anomaly.

The copper, lead and zinc concentrations were either below their cleanup levels (2.9 µg/L, 8.5 µg/L and 86 µg/L, respectively) or below the laboratory detection limits throughout the monitoring period except during January 2000 and 2007 there were slight exceedances. Since copper, lead and zinc concentrations were either below cleanup levels and/or below the laboratory detection limits for most of the rounds, the Port requested Ecology to drop these metals from the monitoring program. In June 2011, Ecology approved the Port's request to discontinue the monitoring for these metals. Currently only dissolved arsenic is being monitored as a part of the groundwater monitoring. Detailed groundwater monitoring results are available as Appendix 6.5.

The Port of Tacoma (Port) is conducting groundwater monitoring and cap maintenance as required by an Agreed Order or a Consent Decree with similar contaminants at five sites. To standardize the groundwater monitoring frequency and cap inspection amongst all these sites, the Department of Ecology (Ecology) and the Port of Tacoma entered into a Memorandum of Understanding (MOU) on September 1, 2011. Per the MOU, the Port is required to conduct both groundwater monitoring and cap inspection on a 30-months frequency at this Site. A copy of the MOU is included as Appendix 6.6.

2.6 Restrictive Covenant

Following the remediation, a Restrictive Covenant (RC) was recorded for the Site on June 27, 1994. The RC imposes the following limitations:

Section 1: The Site may be used only for Industrial uses as defined in and allowed under the City of Tacoma's zoning Regulations codified in the Tacoma City in accordance with the RC.

Section 2: Any activity on the Site that may interfere with or reduce the effectiveness of the Cleanup Action or operation, maintenance, or monitoring, or other activity required by the Order (or any Ecology-approved modification or amendment to the Order) is prohibited.

Section 3: The Port or future owner shall maintain the cap and stormwater collection system in accordance with the Cleanup Action Plan and Ecology-approved Remedial Design Documents.

Section 4: The owner of the Site must give written notice to Ecology, or successor agency, of the owner's intent to convey any interest in the Site. No conveyance of title, easement, lease or other interest in the Site shall be consummated by the owner without adequate and complete provision for the continued operation, maintenance and monitoring of the Cleanup Action.

Section 5: The owner must notify and obtain approval from Ecology, or from a successor agency, prior to any use of the Site that may be inconsistent with the terms of the RC.

Section 6: The owner shall allow authorized representatives of Ecology, or successor agency, the right to enter the Site at reasonable times for the purpose of evaluating compliance with the CAP and the Order, to take samples, to inspect Cleanup Actions conducted at the Site, and to inspect records that are related to the Cleanup Action

Section 7: The owner of the Site and owner's assigns and successors in interest reserve the right under WAC 173-340-730 and WAC 173-340-440 to record as instrument which provides that this RC shall no longer limit the use of the Site or be of any further force or effect. However, such an instrument may be recorded only with the consent of Ecology or a successor agency may consent to the recording of such an instrument only after public notice and comment.

The RC is available as Appendix 6.7.

3.0 PERIODIC REVIEW

3.1 Effectiveness of completed cleanup actions

Based upon the site visit conducted on March 14, 2014, the asphalt cover at the Site is intact and in excellent condition. The overall integrity of the cap seems to be in satisfactory condition. The Site is currently used as a metals recycling facility by the Calbag Metals Company. The excavation of contaminated soils from the stream buffer and capping of this material with an asphalt cap at the Site continues to eliminate direct exposure pathways (ingestion, contact) of human and wildlife exposure to contaminated soils/sediments. The asphalt cap and storm water collection system continues to be inspected and maintained. The asphalt cap also appears to be effective in eliminating storm water percolation into contaminated soils below the cap. A Photo Log is available as Appendix 6.8.

The results of groundwater monitoring indicates that cleanup levels for dissolved copper, lead, and zinc has been achieved; of the Site-related contaminants of concern, only arsenic has been present at the concentrations above the cleanup level. Overall, the remedial action has been successful at meeting the marine chronic ambient water quality criteria in groundwater for protection of the adjacent Hylebos Waterway. The Port estimated that the cleanup efforts at the

Site had reduced the overall metals loading to the Hylebos Waterway from groundwater and surface water migration by over 99.9 percent when compared to pre-cleanup loading estimates.

The RC for the Site was recorded and is in place. This RC prohibits activities that will result in the release of contaminants contained as part of the cleanup without Ecology's approval, and prohibits any use of the property that is inconsistent with the Covenant.

3.2 New scientific information for individual hazardous substances for mixtures present at the Site

Cleanup levels at the site were based on regulatory standards rather than calculated risk for chemicals and/or media. These standards continue to be protective of site-specific conditions.

3.3 New applicable state and federal laws for hazardous substances present at the Site

The cleanup at the Site was governed by Chapter 173-340 WAC (1996 ed.). WAC 173-340-702(12) (c) [2001 ed.] provides that,

"A release cleaned up under the cleanup levels determined in (a) or (b) of this subsection shall not be subject to further cleanup action due solely to subsequent amendments to the provision in this chapter on cleanup levels, unless the department determines, on a case-by-case basis, that the previous cleanup action is no longer sufficiently protective of human health and the environment."

The current MTCA Method A Industrial soil cleanup standard for arsenic has been reduced from 200 mg/Kg to 20 mg/Kg since the final CD was issued. Because contaminated soils at the Site have been capped, the modification to the MTCA cleanup standard does not represent an increase in risk to human health or the environment. Several of the state marine chronic surface water quality criteria have also changed since the CD was issued. Values for lead and zinc have been reduced to 8.1 µg/L and 86 µg/L, respectively. Overall, the changes to the original standards have not resulted in the need for additional remedial actions at the Site.

3.4 Current and projected site use

The Site is currently used for industrial purposes. The Property is leased to Calbag Metals Company, a metals recycling facility. The Calbag Metals Company is approximately eight years into a 50-years lease (with a 30 year option) on the property and is projected to continue to use the property for metals recycling.

The southern portion of the Site is leased intermittently to Auto Warehousing, a new car Warehousing business, on a month-to-month basis. This company occasionally stores new vehicles on this portion of the Site. The projected use of the southern portion of the property is continued automobile storage and parking overflow.

Future uses are likely to remain related to recycling and new car overflow parking. These uses are not likely to have a negative impact on the integrity of the Site cap.

3.5 Availability and practicability of higher preference technologies

The remedy implemented included containment of hazardous substances, and it continues to be protective of human health and the environment. While higher preference cleanup technologies may be available, they are still not practicable at this Site.

3.6 Availability of improved analytical techniques to evaluate compliance with cleanup levels

The analytical methods used at the time of the remedial action were capable of detection below MTCA Method A cleanup levels. The presence of improved analytical techniques would not affect decisions or recommendations made for the Site.

4.0 CONCLUSIONS

- The cleanup actions completed at the Site appear to be protective of human health and the environment.

- Metals concentrations in excavated sediments/soils cleanup levels have not been met at the Site; however, under WAC 173-340-740(6)(f), the cleanup action is determined to comply with cleanup standards since the long-term integrity of the containment system is ensured, and the requirements for containment technologies have been met.

- The RC for the property is in place and will be effective in protecting public health and the environment from exposure to hazardous substances and protecting the integrity of the cleanup action.

- Sufficient compliance groundwater monitoring has been conducted to demonstrate that, with the exception of arsenic, the remedy had effectively contained metals contamination in soils.

- Continued cap inspection and groundwater monitoring every 30-months and maintenance are required. Cap maintenance appears to be adequate at this time.

Based on this periodic review, Ecology has determined that the requirements of the RC are being met and no additional remedial actions are required at this time. The cap is currently in satisfactory condition, and the conditions set forth in the RC are being followed. It is the property owner's responsibility to continue to inspect the site to ensure that the integrity of the cap is maintained and to continue groundwater monitoring.

4.1 Next Review

The next review for the site will be scheduled five years from the date of this periodic review. In the event that additional cleanup actions or institutional controls are required, the next periodic review will be scheduled five years from the completion of those activities.

5.0 REFERENCES

Sweet, Edwards & Associates, April 13, 1987, Wasser Winters/Port of Tacoma, Preliminary Site Characterization and Interim Remediation Feasibility study.

Ecology and Environment. 1987. Volume 1. Site Inspection Report for Commencement Bay Nearshore/Tideflats, Tacoma, Washington. Prepared for U.S. EPA.

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Pacific Environmental Group, Inc., October 10, 1991, Environmental Investigation, Former Underground Storage Tank and Maintenance Area, Port of Tacoma-Wasser Winters Site, Marine View Drive, Tacoma, Washington.

Kennedy/Jenks Consultants, March 1993, Remedial Investigation/Feasibility Study, Wasser & Winters Site, Log Yard Site.

Ecology. Consent Decree No. 94TC-S167 and Cleanup Action Plan. December 27, 1993. Cascade Timber No. 3 Log Yard.

U.S. Environmental Protection Agency. 1998. Commencement Bay Nearshore/Tidefliats Record of Decision.

EMCON Northwest Inc., January 10, 1994, Soil Remediation, Former Ground Storage Tank and Maintenance Area-Final Report, Port of Tacoma, Wasser Winters Site, Marine View Drive, Tacoma, Washington.

Kennedy/Jenks Consultants, January 1994, Closure Report, Wasser & Winters Site.

Kennedy/Jenks Consultants, April 10, 1996, Confirmation Monitoring Report March/April 1996, Former Wasser & Winters Log Yard Site.

BOATENG, Engineers/Managers/Scientists, Summary of Compliance Monitoring, January 2000 and August 2000, Wasser Winters Site, Port of Tacoma, Washington.

Kennedy/Jenks Consultants, February 8, 2005, Groundwater Monitoring and Cap Inspection Report, Wasser Winters Site.

Kennedy/Jenks Consultants, October 1996 through July 2009, Confirmation Monitoring Reports, Wasser Winters Site.

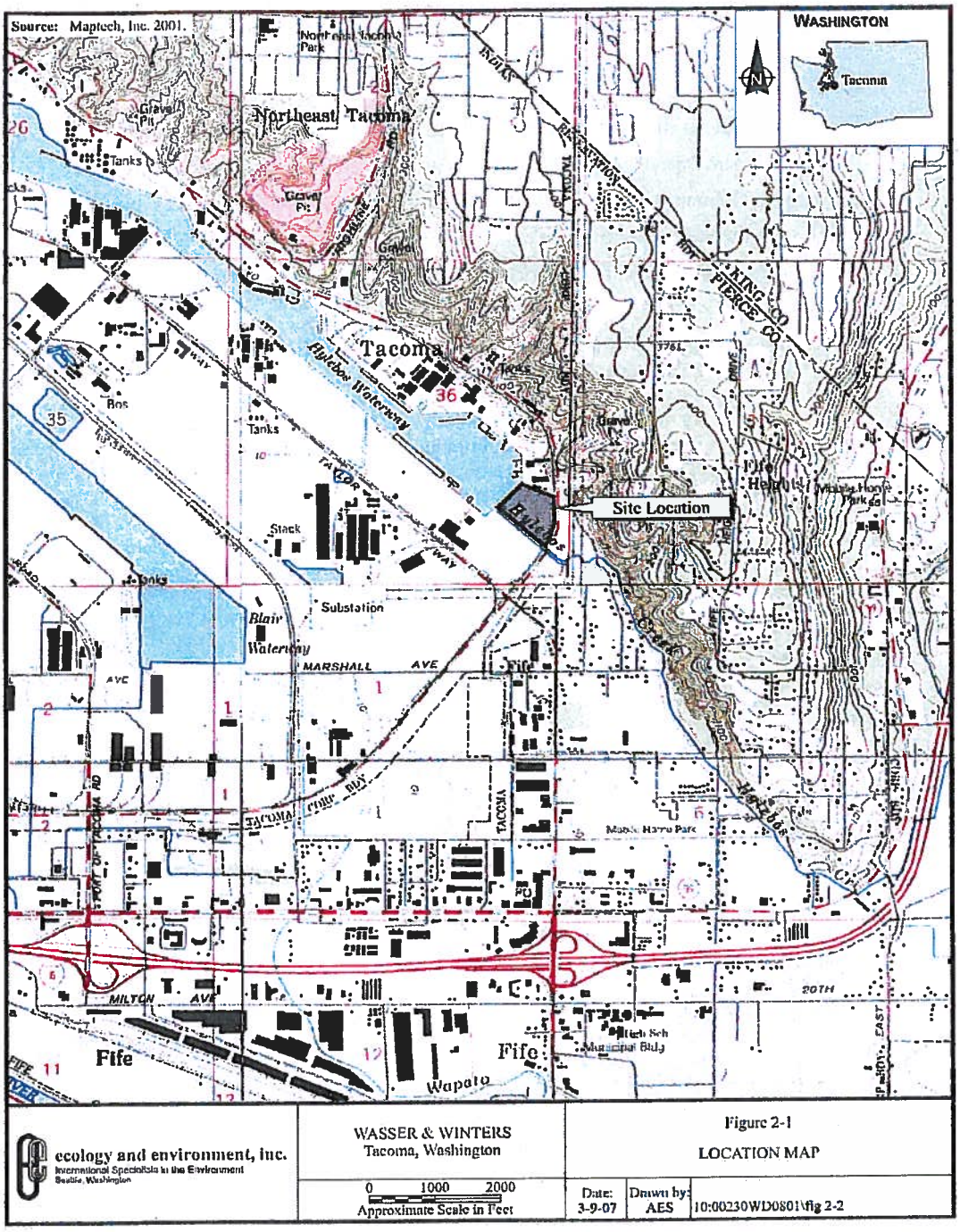
Kennedy/Jenks Consultants, February 2002 through February 2010, Cap Inspection Reports, Wasser Winters Site.

Conestoga-Rovers & Associates, September 2010 and February 2011, Cap Inspection Reports, Wasser Winters, Marine Drive, Tacoma, Washington.

Ecology, March 14, 2014 Site Visit.

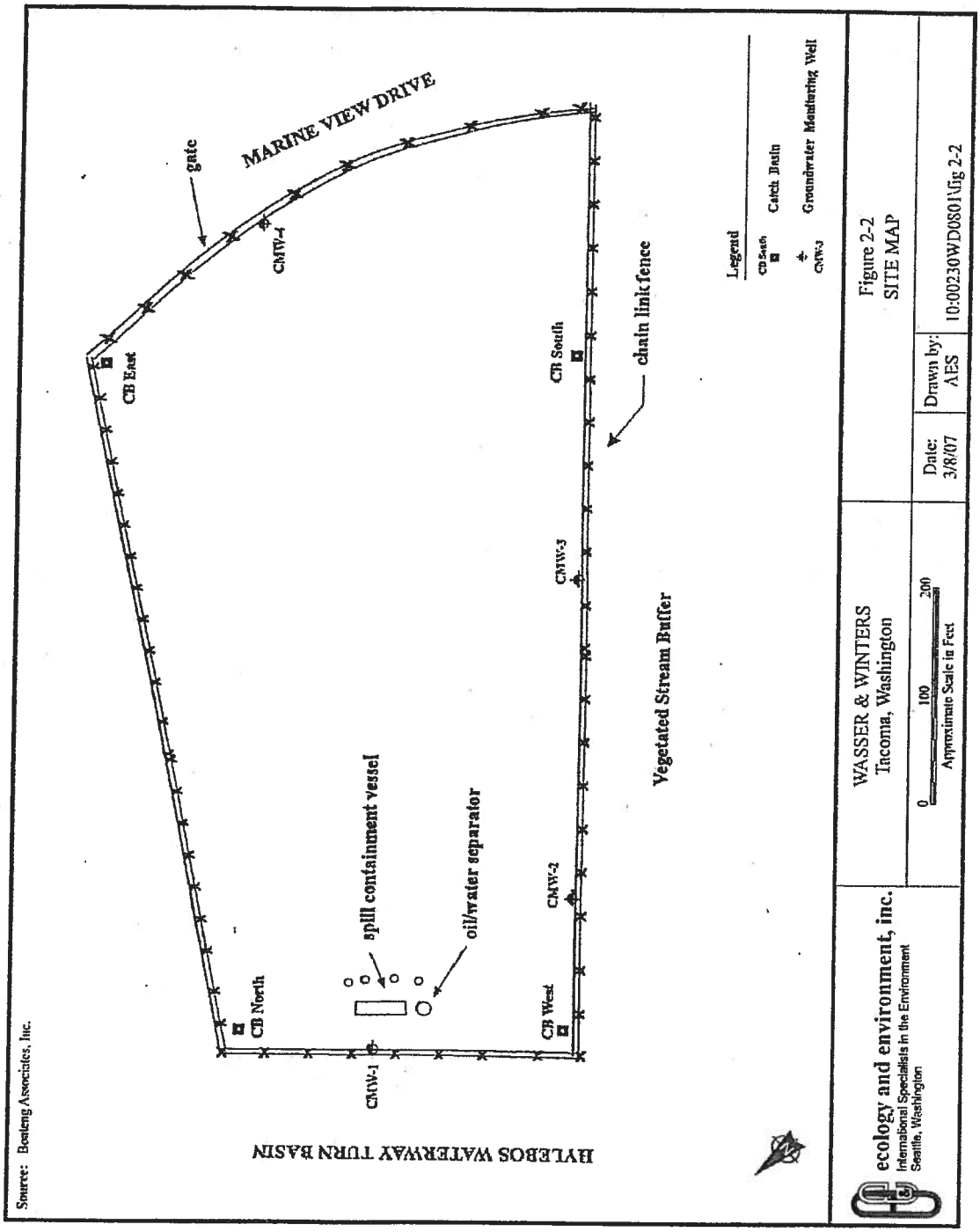
6.0 APPENDICES

6.1 Vicinity Map



2-6

6.2 Site Plan



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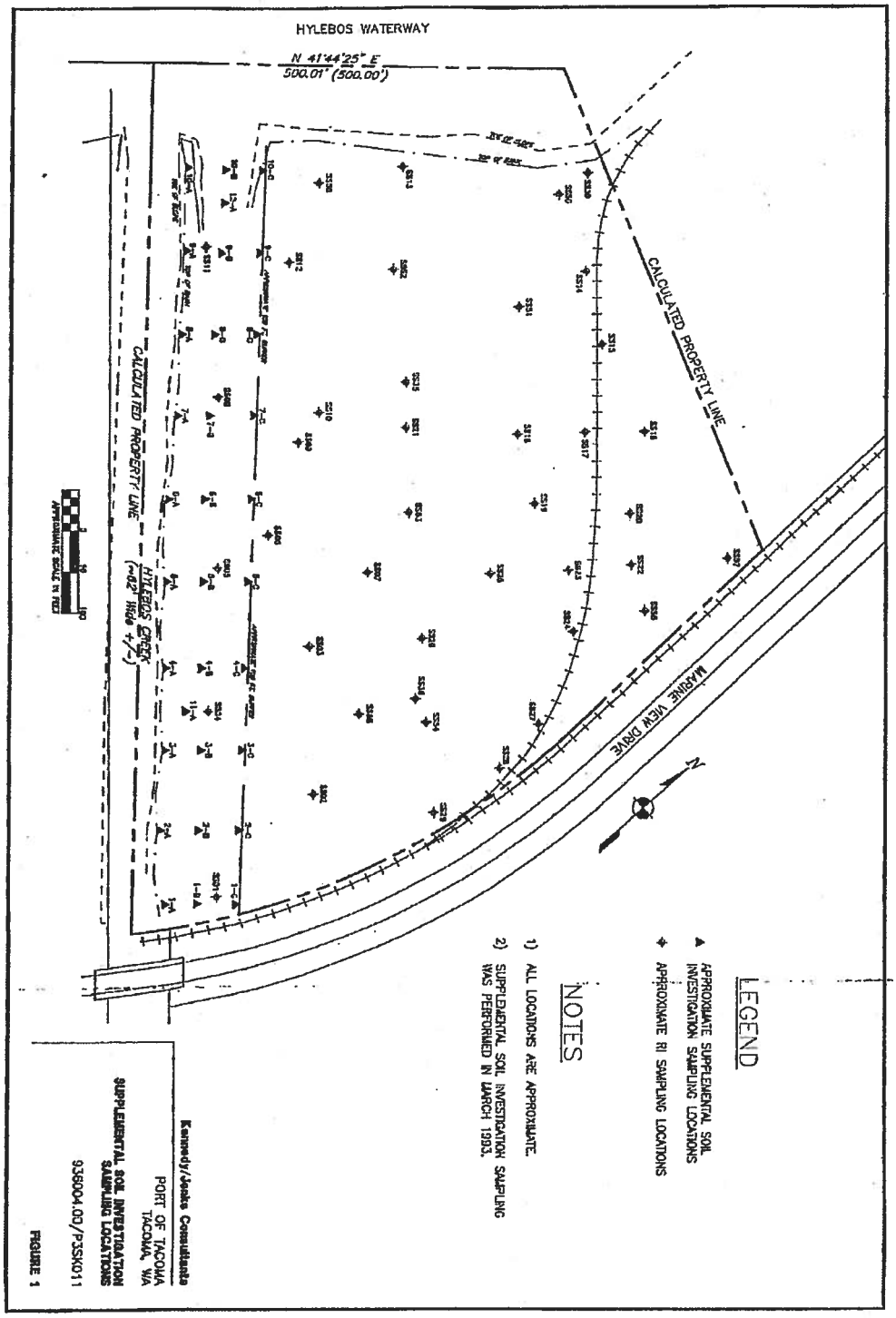
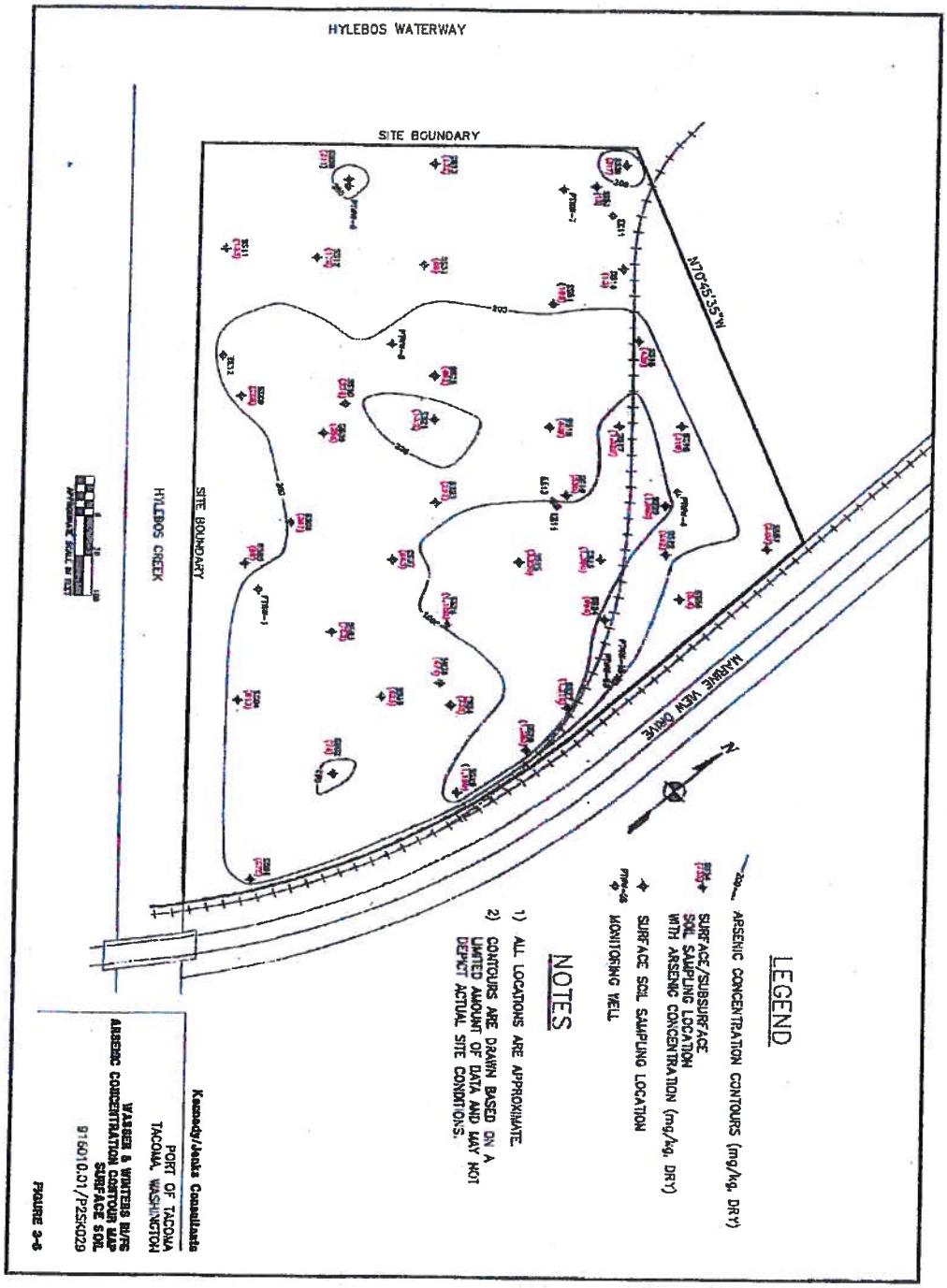

HYLEBOS WATERWAY
N 41°44'25" E
500.01' (500.00')
CALCULATED PROPERTY LINE
CALCULATED PROPERTY LINE
MARINE VIEW DRIVE
HYLEBOS CREEK
LEGEND
APPROXIMATE SUPPLEMENTAL SOIL INVESTIGATION SAMPLING LOCATIONS
APPROXIMATE RI SAMPLING LOCATIONS
NOTES
1) ALL LOCATIONS ARE APPROXIMATE.
2) SUPPLEMENTAL SOIL INVESTIGATION SAMPLING WAS PERFORMED IN MARCH 1993.
Kennedy/Jenks Consultants
PORT OF TACOMA
TACOMA, WA
SUPPLEMENTAL SOIL INVESTIGATION SAMPLING LOCATIONS
938004.00/P3SK011
FIGURE 1

6.4 Arsenic Concentration Contour Map, Surface Soil



6.5 Groundwater Monitoring Results

TABLE 1

Page 1 of 1

GROUNDWATER ANALYTICAL DATA
FORMER WASSER WINTERS LOG SORT YARD FACILITY
PORT OF TACOMA
TACOMA, WASHINGTON

		Metals			
Well	Date	Dissolved Arsenic ug/L	Dissolved Copper ug/L	Dissolved Lead ug/L	Dissolved Zinc ug/L
Groundwater Cleanup Levels (1):		36	2.9	8.5	86
GMW-3	2/7/1994	49	<2	<1	8
GMW-3	5/17/1994	72	<2	1	7
GMW-3	8/17/1994	95	<2	<1	5
GMW-3	11/11/1994	82	<2	2	8
GMW-3	5/17/1995	74	<2	<1	7
GMW-3	9/29/1995	100	<2	<1	5
GMW-3	3/9/1996	82	<2	<1	<4
GMW-3	10/8/1996	83	<2	<1	<4
GMW-3	8/14/1997	144	<2	<1	5
GMW-3	12/30/1997	123	<2	<1	139
GMW-3	6/11/1998	89	<2	<1	<4
GMW-3	12/22/1998	190	<2	<1	<2
GMW-3	1/26/2000	7.2	<1	<0.5	99
GMW-3	7/16/2002	117	1.02	<0.5	3.32
GMW-3 (Duplicate)	7/16/2002	111	0.979	<0.5	4.67
GMW-3	2/23/2004	77.2	1.07	<0.2	3.98
GMW-3 (Duplicate)	2/23/2004	77.5	1.06	0.675	4.79
GMW-3	7/26/2005	13.1	2.63	<2.5	<5
GMW-3 (Duplicate)	7/26/2005	12.9	<2.5	<2.0	<5
GMW-3	1/30/2007	60	4.6	<2.0	34
GMW-3	2/26/2008	12	1.2J	<2.0	47
GMW-3 (Duplicate)	2/26/2008	11	0.8J	<2.0	35
GMW-3	7/23/2009	41.3	1.5	<0.2	2.1
GMW-3 (Duplicate)	7/23/2009	41.7	1.4	<0.2	1.4
GMW-3	2/17/2012	2750 (2)	--	--	--
GMW-3 (Duplicate)	2/17/2012	3100 (2)	--	--	--
GMW-3	5/25/2012	471	--	--	--
GMW-3 (Duplicate)	5/25/2012	455	--	--	--

Notes:

-Lead, zinc, and copper analyses were discontinued in 2011 with Ecology approval dated June 28, 2011.
-Groundwater samples were analyzed for dissolved metals by EPA Method 200.8 ICPMS
-Values in bold indicate concentration greater than groundwater cleanup levels.

(1) Groundwater cleanup levels established from EPA chronic marine water quality criteria (WAC 173-201A)

(2) - Results from the February 2012 sampling event are considered invalid due to improper sampling procedures resulting in higher than normal turbidity

-- Not analyzed

(ug/L) Micrograms per liter

<0.5 Laboratory analytical result does not exceed laboratory quantitation limit

J Laboratory analytical result was detected above the method detection limit but below the quantitation limit. Value is estimated.

CRA 060188 (20)

6.6 Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING

Former Log Yard Groundwater Monitoring and
Cap Inspection

This Memorandum of Understanding (MOU) is entered into this 12 day of September 2011 between the Washington State Department of Ecology ("Ecology") and the Port of Tacoma ("Port") (collectively the "Parties") to memorialize the Parties' agreement to modify the requirements for future groundwater monitoring and cap inspection frequencies for five Port sites, as set forth below.

These sites affected by this agreement are Cascade Timber No. 3, Murray Pacific No. 2, Wasser Winters, Portac, and Louisiana-Pacific (aka Pony Lumber) ("Monitored Sites").

Each Monitored Site was cleaned up under an administrative agreement between Ecology and the Port, either as an original party or successor interest, as follows: Cascade Timber No. 3, Murray Pacific No. 2, and Wasser Winters were cleaned up under Consent Decrees, Louisiana-Pacific under an Enforcement Order, and Portac under a pre-Model Toxics Control Act (MTCA) Order On Consent (cumulatively referred to as: "Ecology Orders"). Portac, Inc. was also a respondent to the Portac Order on Consent along with the Port.

Each Monitored Site addressed similar contaminants of concern (COCs), which included arsenic, copper, lead, and zinc. However, each Ecology Order had site-specific requirements with respect to cleanup levels, and cap and groundwater monitoring frequencies.

In Spring 2010, the Port initiated a request to Ecology to standardize the monitoring requirements for the Monitored Sites in an effort to align the timing of the periodic monitoring/ inspections at the sites so that the Port may better align a contractor to do the work all at once, as required.

In August 2010, to supplement the information already provided to Ecology, the Port provided Ecology with a tour of the Monitored Sites. As part of the tour, Ecology inspected the type and condition of the caps; the current site uses, specifically on the capped areas, and the locations and conditions of existing monitoring wells and stormwater basins.

Ecology has reviewed the information provided by the Port, as well as observations made during the site tour, and has chosen to provide a response in the form of this MOU.

This MOU was created for the Parties to understand and agree upon the requirements associated with Ecology's response, and to memorialize the decisions made with respect to each of the Port's requests.

In preparing this MOU, Ecology took into account, for each site, the type and condition of the cap and stormwater collection system, the adequacy of the groundwater monitoring system, and the recent groundwater compliance history.

6.7 Environmental Covenant

9406270308

DECLARATION OF RESTRICTIVE COVENANT

The property that is the subject of this Restrictive Covenant is the subject of remedial action under Chapter 70.105D RCW, excepting that portion of the property addressed by proposed federal consent decree for the Commencement Bay Nearshore/Tideflats Superfund site; Sitcum Waterway Problem Area. Exhibit F. The work done to clean up the property (hereafter the "Cleanup Action") is described in Washington State Department of Ecology Consent Decree No. 93 2 06844, and in attachments to the Decree. This Restrictive Covenant is required by WAC 173-340-440 because the Cleanup Action at the Site will result in residual concentrations of arsenic and lead which exceed Ecology's Method A cleanup levels for Industrial soil established under WAC 173-340-745.

The Port of Tacoma is the fee owner of real property known as the Wasser-Winters log sort yard in the county of Pierce, state of Washington (legal description attached in Exhibit B), hereafter referred to as the "Site".

As a result of the Cleanup Action, the Site will include a woodwaste, soil, and slag mixture which will be covered with a cap system equipped with a surface water collection system. The Site will also include monitoring wells. The portion of the property remaining uncontained by the cap will meet Method A Industrial soil standards but may exceed Method A residential soil standards for arsenic and lead.

The Port of Tacoma makes the following declaration as to limitations, restrictions, and uses to which the Site may be put, and specifies that such declarations shall constitute covenants to run with the land, as provided by law, and shall be binding on all parties and all persons claiming under them, including all current and future owners of any portion of or interest in the Site.

1

AT017797

Section 1 The Site may be used only for Industrial uses as defined in and allowed under the City of Tacoma's Zoning Regulations codified in the Tacoma City Code as of the date of this Restrictive Covenant.

Section 2 Any activity on the Site that would interfere with or reduce the effectiveness of the Cleanup Action or any operation, maintenance, monitoring, or other activity required by the Order (or any Ecology-approved modification or amendment to the Order) is prohibited. Any activity on the Site that would result in the release of a hazardous substance that was contained as a part of the Cleanup Action is prohibited. It is understood that disturbance of the cap may be required in the future for installation of utilities or other activities associated with future industrial use of the site. The Port or future owner shall obtain approval from Ecology prior to initiating any disturbance of the cap stormwater drainage and/or monitoring system. Ecology shall not deny approval if the Port or future owner can show: (1) that no releases of hazardous materials will occur; (2) Integrity of the cap and stormwater drainage and monitoring systems will be restored to their original condition in a timely manner; and (3) that material will be handled and disposed of in accordance with State law.

Section 3 The Port or future owner shall maintain the cap and stormwater collection system in accordance with the Cleanup Action Plan and Ecology-approved Remedial Design Documents.

Section 4 The owner of the Site must give written notice to the Department of Ecology, or to a successor agency, of the owner's intent to convey any interest in the Site. No conveyance of title, easement, lease or other interest in the Site shall be consummated by the owner without adequate and complete provision for the continued operation , maintenance and monitoring of the Cleanup Action.

2

PTO 17798

Section 5 The owner must notify and obtain approval from the Department of Ecology, or from a successor agency, prior to any use of the Site that may be inconsistent with the terms of this Restrictive Covenant.

Section 6 The owner shall allow authorized representatives of the Department of Ecology, or of a successor agency, the right to enter the Site at reasonable times for the purpose of evaluating compliance with the Cleanup Action Plan and the Order, to take samples, to inspect Cleanup Actions conducted at the Site, and to inspect records that are related to the Cleanup Action.

Section 7 The owner of the Site and owner's assigns and successors in interest reserve the right under WAC 173-340-730 and WAC 173-340-440 to record an instrument which provides that this Restrictive Covenant shall no longer limit the use of the Site or be of any further force or effect. However, such an instrument may be recorded only with the consent of the Department of Ecology or of a successor agency. The Department of Ecology or a successor agency may consent to the recording of such an instrument only after public notice and comment.

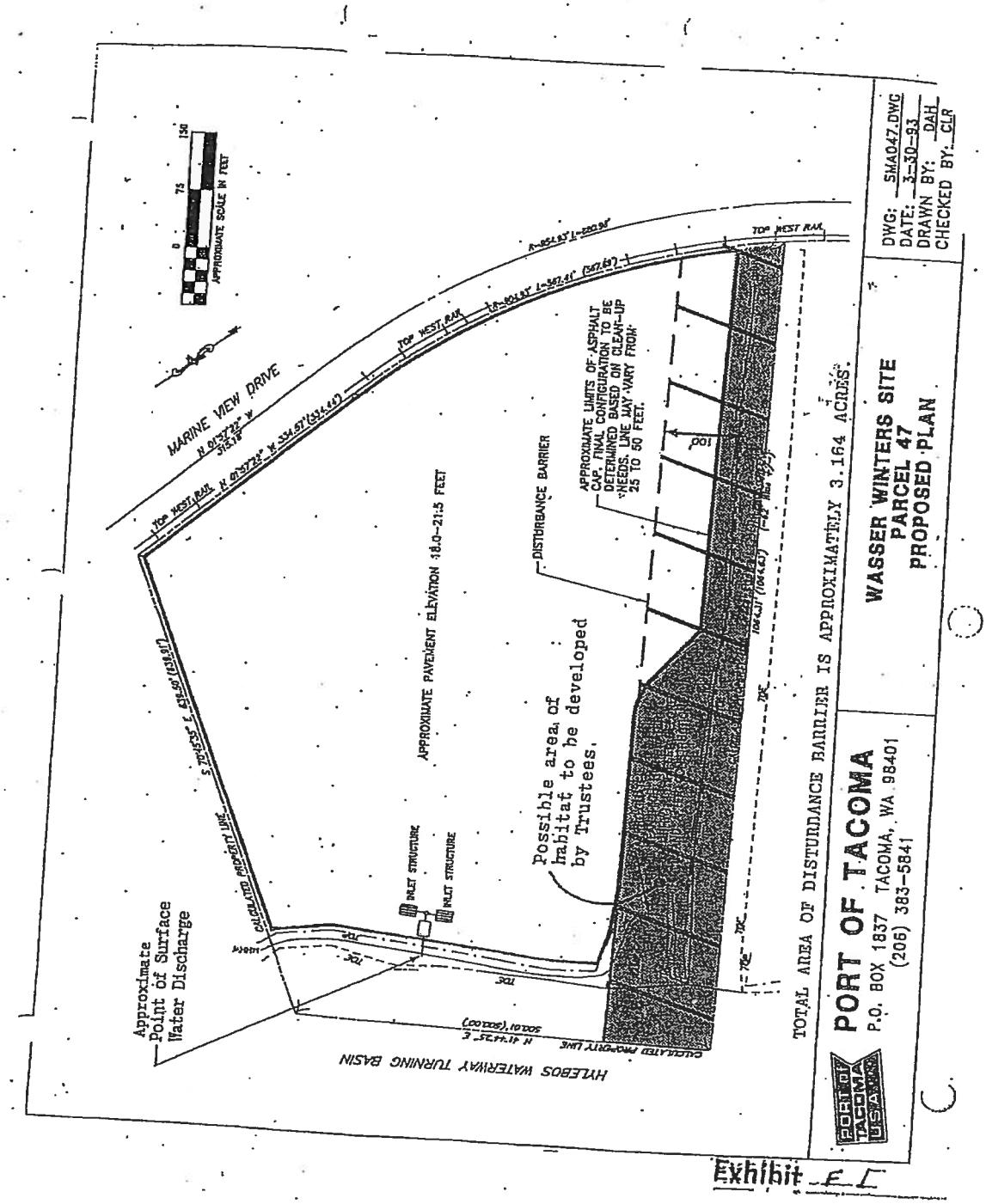
The Port of Tacoma agrees to file this Restrictive Covenant in the Site property deed with the Pierce County Auditor and provide the Department of Ecology with a filed copy.

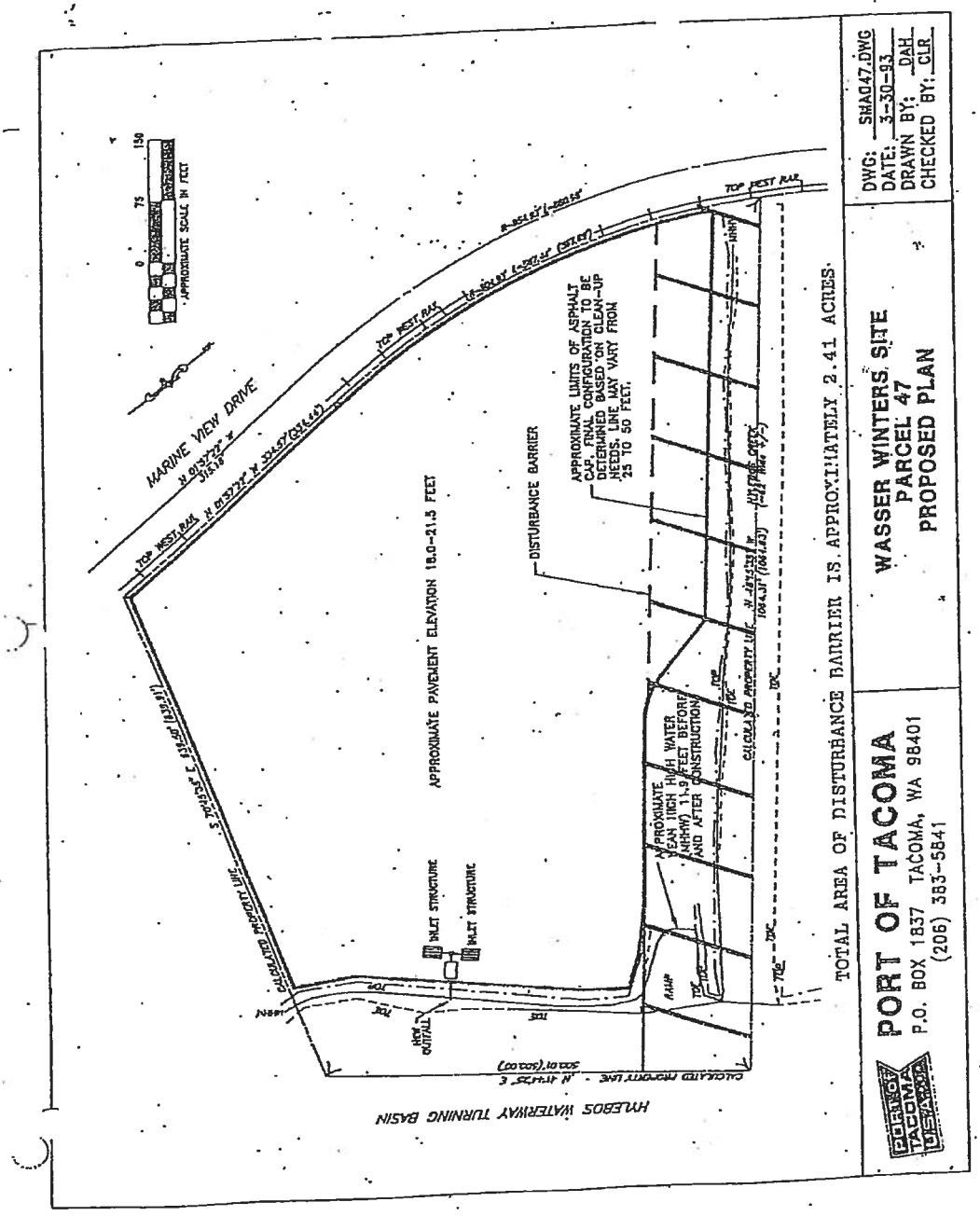
[signature] 6/27/94

Port of Tacoma Date

3

PT017799


MARINE VIEW DRIVE
TOP WEST BANK
APPROXIMATE SCALE IN FEET
APPROXIMATE LIMITS OF ASPHALT CAP. FINAL CONFIGURATION TO BE DETERMINED BASED ON CLEAN-UP NEEDS. LINE MAY VARY FROM 25 TO 50 FEET.
DISTURBANCE BARRIER
APPROXIMATE PAVEMENT ELEVATION 18.0-21.5 FEET
Possible area of habitat to be developed by Trustees.
INLET STRUCTURE
Approximate Point of Surface Water Discharge
HYLEBOS WATERWAY TURNING BASIN
TOTAL AREA OF DISTURBANCE BARRIER IS APPROXIMATELY 3.164 ACRES.
WASSER WINTERS SITE
PARCEL 47
PROPOSED PLAN
PORT OF TACOMA
P.O. BOX 1837 TACOMA, WA 98401
(206) 383-5841
DWG: SMA047.DWG
DATE: 3-30-93
DRAWN BY: DAH
CHECKED BY: CLR
Exhibit


MARINE VIEW DRIVE
APPROXIMATE SCALE IN FEET
0
75
150
APPROXIMATE PAVEMENT ELEVATION 18.0-21.5 FEET
DISTURBANCE BARRIER
APPROXIMATE LIMITS OF ASPHALT CAP. FINAL CONFIGURATION TO BE DETERMINED BASED ON CLEAN-UP NEEDS. LINE MAY VARY FROM 25 TO 50 FEET.
INLET STRUCTURE
INLET STRUCTURE
NEW OUTFALL
APPROXIMATE MEAN HIGH HIGH WATER (MHHW) 11.9 FEET BEFORE AND AFTER CONSTRUCTION
CALCULATED PROPERTY LINE
CALCULATED PROPERTY LINE
HYLEBOS WATERWAY TURNING BASIN
TOTAL AREA OF DISTURBANCE BARRIER IS APPROXIMATELY 2.41 ACRES.
PORT OF TACOMA
P.O. BOX 1837 TACOMA, WA 98401
(206) 383-5841
WASSER WINTERS SITE
PARCEL 47
PROPOSED PLAN
DWG: SMA047.DWG
DATE: 3-30-93
DRAWN BY: DAH
CHECKED BY: CLR

6.5 Photo log

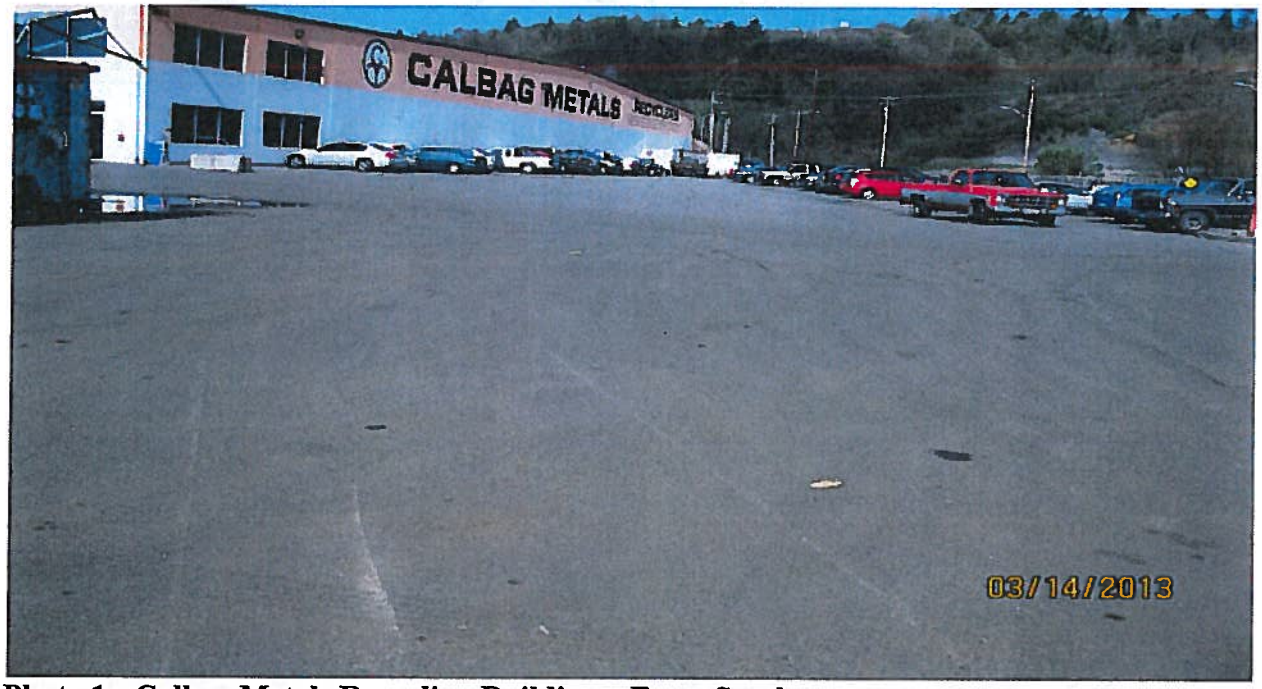


Photo 1: Calbag Metals Recycling Building – From Southwest

Photo 2: Yard Operations – From Southwest of Calbag Bulding

Photo 3: Yard Operations – Behind Calbag Building

Photo 4: Yard Operations – West of Calbag Building

Photo 5: Oil Water Separator – Storm Water Treatment System

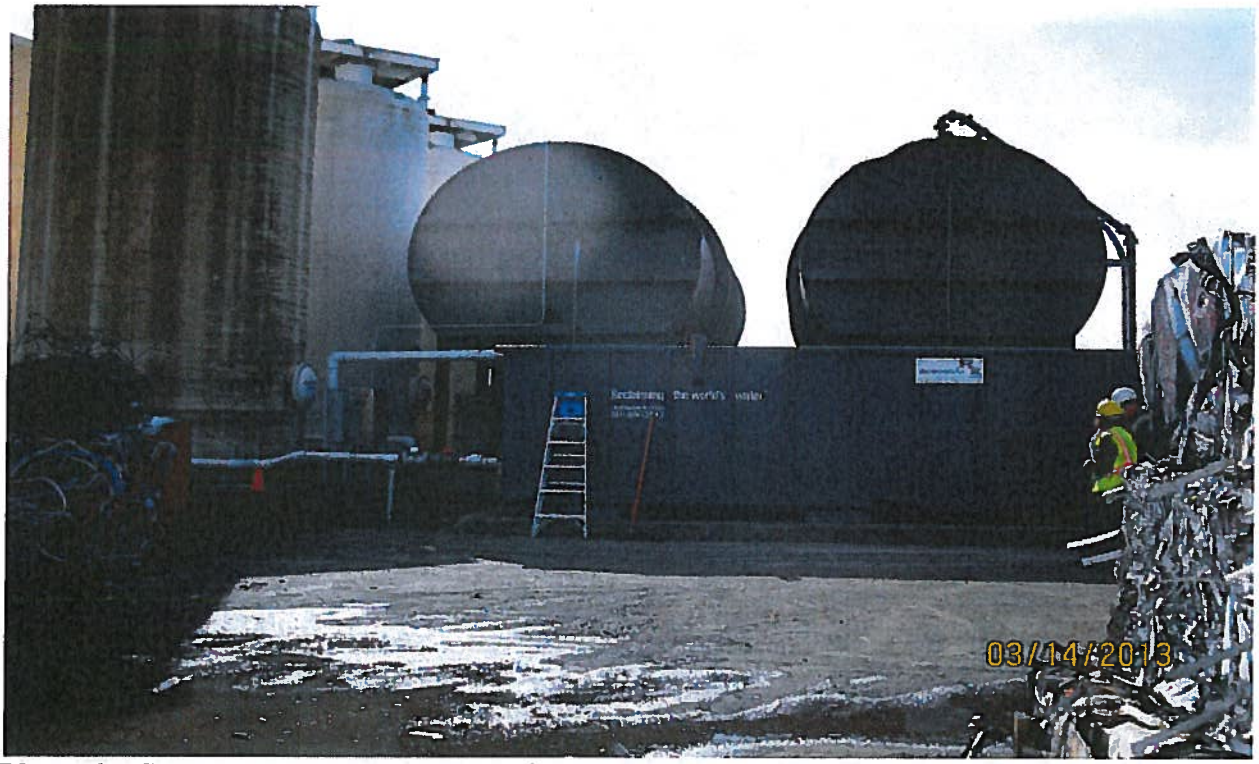


Photo 6: Storm Water Storage and Treatment Systems – Sequential Filtration

Photo 7: Asphalt Cap – From South

Photo 8: Patched/Repaired Asphalt Cap – From Southeast

APPENDIX C
Groundwater Monitoring Field Log

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for double-sided printing.

HARTCROWSER Groundwater Sampling Data - Well I.D. GMW-3

PROJECT	POT / WASSER WINDMILLS	DATE/TIME SAMPLED	8/22/14 / 0925
JOB NO.	19000-03	TIDALLY INFLUENCED	YES X NO
PROJECT MANAGER	P. SMITHS	WELL DEPTH IN FEET	NA
FIELD REPS	WDM	SCREENED INTERVAL IN FEET	NA

(1) Purging Data/Field Measurements: *All Measurements Relative to Top of Casing (TOC)*

WELL DEPTH	NA	CASING VOLUME IN GALLONS	0.37
DEPTH TO SEDIMENT (DTS) IN FEET	12.25	[2" diam = x .163 gal/ft	4" diam = x .653 gal/ft]
DEPTH TO WATER (DTW) IN FEET	9.98	PURGE VOLUME IN GALLONS	
(DTS – DTW)	2.27	ACTUAL PURGE IN GALLONS	1.75

Ø 6.82 17.4 544

Time	No. of Gallons Purged	pH	Temp in °C	Conduct in µS/cm	Diss. Oxygen in ____	Turbidity	ORP in ____	Comments: quality, recovery, color, odor, sheen, accumulated silt/sand
0909	0.15	6.28	17.3	522				CLEAR, NO SHEEN
0912	0.30	6.33	17.3	516				
0915	0.50	6.35	17.4	514				
0918	0.~~80~~	6.36	17.5	510				
sample: 0921	1.00	6.36	17.5	507				
0923	1.50	6.36	17.5	510				

Comments: 0903 - PUMP ON / NO SHEEN, LOW TURBIDITY, ORGANIC ~~ODOR~~ ODOR
4 FIELD FILTERED 4

	Method	Pumping Rate in GPM	Depth of Equip. in Feet
Purge	PERISTALTIC	0.05 GPM	11.00
Sample			

Boils dry? Yes ____ No X

At no. of casing volumes ____

Purge Water Disposal Method/Volume
ONSITE DRUM (FULL)
1/4 GAL IN ~~5~~ 5 GAL BUCKET
AS PER P.O.T. REQUEST

(2) Sampling Data

	Bottle Type	# of Containers	Analyses	Preserv.	Filter
	250 L POLY	1		HNO3	Y
Dup →	250 L POLY	1		HNO3	Y

Total number of Bottles 2

Duplicate Sample I.D. GMW-300 / 0955 HR

Field Blank I.D. ____

Rinseate Sample I.D. ____

(3) Field Equipment

Type/Brand/Serial No./Material Units

Pump Type/Tubing Type	ATP	Temp/pH/E.C. meter	PROF, SERIES YSI (REUSE)
Bailer Type	NA	Water Level Probe	WATERLINE
Filter Type	ENVIRO TECH 0.45µm	Other	

(4) Well Conditions

OK ☒ Not OK ☐ Explain ____

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APPENDIX D
Laboratory Report
Analytical Resources, Inc.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

September 2, 2014

Peter Smiltins
Hart Crowser, Inc.
1700 Westlake Avenue N. Suite 200
Seattle, WA 98109-3256

RE: Client Project: Port of Tacoma, 19000-03
ARI Job No.: YX52

Dear Peter:

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and the final data for samples from the project referenced above. Analytical Resources, Inc. (ARI) received two water samples in good condition August 22, 2014. The samples were received with a cooler temperature of 13.8°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

The samples were analyzed for dissolved arsenic, as requested.

There were no anomalies associated with the analysis of these samples.

An electronic copy of this package will be kept on file at ARI. Should you have any questions or concerns, please feel free to contact us at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

- FOR -
Kelly Bottem
Client Services Manager
kellyb@arilabs.com
206/695-6211
Enclosures

cc: eFile YX52

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

ARI Assigned Number: YX52	Turn-around Requested: STANDARD
ARI Client Company: HART CROWSER	Phone: (206) 324 9530
Client Contact: P. SMILTINS	
Client Project Name: P.O.T.	
Client Project #: 19000-03	Samplers: WDM
Page: 1 of 1	
Date: 8/22/14	Ice Present? Y
No. of Coolers: 1	Cooler Temps: 13.8

Analysis Requested / Notes/Comments

Sample ID	Date	Time	Matrix	No. Containers	DISS. ARSENIC METHOD 200.8								Notes/Comments
GMW-3	8/22/14	0925	H2O	1	X								
GMW-300	8/22/14	0955	↓	1	X								

Comments/Special Instructions: FILTERED IN FIELD

	Relinquished by	Received by	Relinquished by	Received by
(Signature)	[signature]	[signature]		
Printed Name	WARD MCDONALD	A. Valgardsen		
Company	HART CROWSER	ARI		
Date & Time	8/22/14 1343	8/22/14 1343		

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client. Hart Crowser | Project Name: P.O.T

COC No(s). _____ (NA) | Delivered by. Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: _____ | Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6 0 °C for chemistry) 13.8

Time: 1343

If cooler temperature is out of compliance fill out form 00070F | Temp Gun ID#: 90879852

Cooler Accepted by: AV | Date: 8/22/14 | Time: 1343

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____			
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		(YES)	NO
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	(YES)	NO
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI...	(NA)		

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: DA | Date: 8/22/14 | Time: 1420

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
○ ○ ○	○ ○ ○	● ● ●

Small → "sm" (< 2 mm)
Peabubbles → "pb" (2 to < 4 mm)
Large → "lg" (4 to < 6 mm)
Headspace → "hs" (> 6 mm)

YX52 : 00003

PRESERVATION VERIFICATION 08/22/14
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **YX52**

Inquiry Number: NONE
Analysis Requested: 08/22/14
Contact: Spadaro, Philip
Client: Hart Crowser, Incorporated
Logged by: CA
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 08/22/14

Project #: 19000-03
Project: P.O.T
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
14-17314 **YX52A**	GMW-3						DIS									Y						
14-17315 **YX52B**	GMW-300						DIS									Y						

Checked By CA Date 8/22/14

YX52 08/22/14

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: YX52
Client: Hart Crowser, Incorporated
Project Event: 19000-03
Project Name: P.O.T

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	GMW-3	YX52A	14-17314	Water	08/22/14 09:25	08/22/14 13:43
2.	GMW-300	YX52B	14-17315	Water	08/22/14 09:55	08/22/14 13:43

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: GMW-3
SAMPLE

Lab Sample ID: YX52A
LIMS ID: 14-17314
Matrix: Water
Data Release Authorized:
Reported: 09/01/14

QC Report No: YX52-Hart Crowser, Incorporated
Project: P.O.T
19000-03
Date Sampled: 08/22/14
Date Received: 08/22/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	08/22/14	200.8	09/01/14	**7440-38-2**	**Arsenic**	0.5	**346**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: GMW-300
SAMPLE

Lab Sample ID: YX52B
LIMS ID: 14-17315
Matrix: Water
Data Release Authorized:
Reported: 09/01/14

QC Report No: YX52-Hart Crowser, Incorporated
Project: P.O.T
19000-03
Date Sampled: 08/22/14
Date Received: 08/22/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	08/22/14	200.8	09/01/14	**7440-38-2**	**Arsenic**	0.5	**353**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: YX52LCS
LIMS ID: 14-17315
Matrix: Water
Data Release Authorized:
Reported: 09/01/14

QC Report No: YX52-Hart Crowser, Incorporated
Project: P.O.T
19000-03
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	200.8	27.6	25.0	110%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: YX52MB
LIMS ID: 14-17315
Matrix: Water
Data Release Authorized:
Reported: 09/01/14

QC Report No: YX52-Hart Crowser, Incorporated
Project: P.O.T
19000-03
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	08/22/14	200.8	09/01/14	7440-38-2	Arsenic	0.2	0.2	U

U-Analyte undetected at given RL
RL-Reporting Limit

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APPENDIX E
Plot of Arsenic Concentration Versus Time

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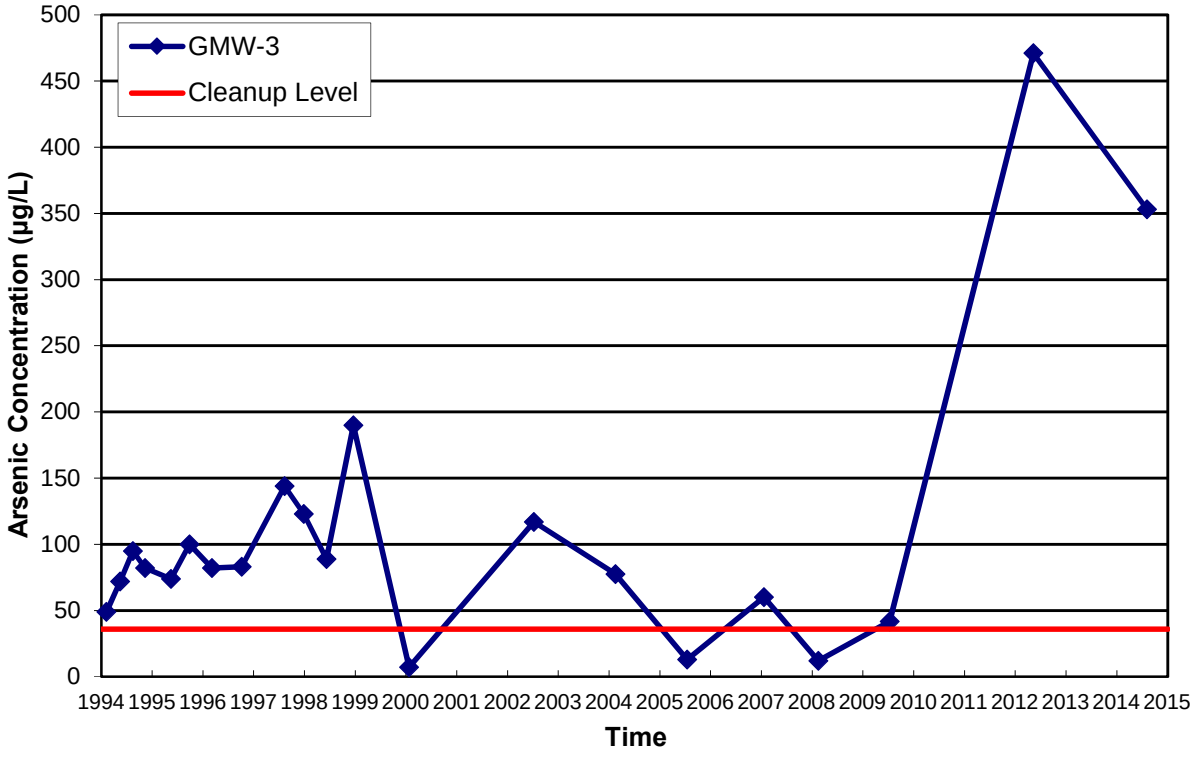

Notes:
For sampling events that included a duplicate sample for dissolved arsenic analysis, the greater analytical result for the two GMW-3 samples is plotted (see Table 1).

Results from the February 2012 sampling event are considered invalid due to improper sampling procedures resulting in higher than normal turbidity. These data are excluded from the data set plotted in the chart.

Former Wasser & Winters Log Sort Yard
Port of Tacoma

Arsenic Concentration Versus Time

19000-03 12/14

HARTCROWSER

Figure
E-1

PRS 12/09/14 1900003\E1.xls

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