FINAL

SOURCE CONTROL EVALUATION ADDENDUM REPORT

JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON

Prepared for

Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, Washington 98008-5452

Prepared by

Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, Washington 98101

Farallon Consulting, LLC
975 5th Avenue NW
Issaquah, Washington 98027

On behalf of

Jorgensen Forge Corporation

March 2011

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

LIST OF ACRONYMS AND ABBREVIATIONS

AO	Agreed Order
AOC	Administrative Order on Consent
AOD	argon oxygen decarbonization
ASTDR	Agency for Toxic Substances & Disease Registry
bgs	below ground surface
Boeing	The Boeing Company
BMP	best management practice
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COI	chemical of interest
Ecology	Washington State Department of Ecology
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
Facility	Jorgensen Forge Facility located at 8531 East Marginal Way South in Seattle, Washington
Farallon	Farallon Consulting, LLC
Jorgensen Forge	Jorgensen Forge Corporation
HVOC	halogenated volatile organic compound
LDW	Lower Duwamish Waterway
LNAPL	light nonaqueous phase liquid
NPDES	National Pollutant Discharge Elimination System
NOAA	National Oceanic and Atmospheric Administration
µg/l	micrograms per liter
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
Plant 2	Boeing Plant 2 Facility
PQL	practical quantitation limit
PVC	polychlorinated vinyl
SCER	*Final Source Control Evaluation Report*
SCER Addendum	Source Control Evaluation Addendum Report
SIA	Sediment Investigation Area

SVOC	semivolatile organic compound
SWPPP	Stormwater Pollution Prevention Plan
TCE	trichloroethene
TOC	total organic carbon
TPH	total petroleum hydrocarbon
TSS	total suspended solids
VOC	volatile organic compound
Work Plan	*Data Gap Investigation Work Plan*

1 INTRODUCTION

This Final Source Control Evaluation Addendum Report (SCER Addendum) has been prepared by Anchor QEA, LLC, and Farallon Consulting, LLC (Farallon) on behalf of the Jorgensen Forge Corporation (Jorgensen Forge) as an addendum to the *Final Source Control Evaluation Report* (SCER), which was reviewed and approved by Washington State Department of Ecology (Ecology) in May 2008 (Anchor and Farallon 2008a). This SCER Addendum presents the results of the Data Gap Investigation conducted at the upland area of the Jorgensen Forge Facility located at 8531 East Marginal Way South in Seattle, Washington (the Facility). This upland area of the Facility is known as the Sediment Investigation Area (SIA; Figure 1) and was defined more specifically in the SCER. A map showing the various SIA features subject to the Data Gap Investigation are shown on Figure 2.

The Data Gap Investigation was conducted to complete the Source Control Investigation required by the Agreed Order (AO; No. DE 4127) entered into by Ecology and Jorgensen Forge (Ecology 2007). The Source Control Investigation will determine if ongoing sources of chemicals of interest (COIs) have complete migration pathways from the SIA to the Lower Duwamish Waterway (LDW) with the potential to result in concentrations in sediment and surface water above Ecology-approved screening levels. The AO requires that the Source Control Investigation of the SIA include:

- A summary of current and past operations
- Regulatory history
- Chemical release
- Nature and extent of COIs in soil, groundwater, and stormwater
- An evaluation of known or suspected migration pathways
- Data gap identification

The SCER identified direct discharge, stormwater discharge, discharge of groundwater, and erosion of solids as potential pathways for migration of COIs from the SIA to the LDW (Anchor and Farallon 2008a). The SCER also identified a number of data gaps that precluded completion of the Source Control Investigation required by the AO. As a result, Anchor QEA and Farallon prepared the *Data Gap Investigation Work Plan* (Work Plan) to provide the scope of work to collect sufficient information to address the data gaps identified in the SCER and complete the Source Control Investigation. The Work Plan was reviewed and approved by Ecology in May 2008.

As detailed in the Work Plan, this SCER Addendum provides the following:

- Summary of the scope of work, objectives, and results of the Data Gap Investigation
- Re-evaluation of the migration pathways presented in the SCER using the Data Gap Investigation findings
- Documentation of the status of source control measures at the SIA
- Completion of the reporting requirements identified in the AO

A Draft SCER Addendum was submitted to Ecology in December 2009. Ecology provided comments on the Draft SCER Addendum in an April 8, 2010, letter; this letter and Jorgensen Forge's responses are included in Appendix A. Any revisions to the Draft SCER Addendum based on Ecology's comments and Jorgensen Forge's responses are incorporated into this SCER Addendum.

Formal approval of this SCER Addendum will complete the requirements of the AO. Additional source control implementation deemed necessary to reduce concentrations of COIs at the SIA below the sediment and surface water screening levels (see Section 5) will be conducted under a new or amended order between Ecology and Jorgensen Forge.

1.1 Purpose of Source Control Evaluation Addendum Report

This SCER Addendum evaluates the results of the Data Gap Investigation to identify sources of the Ecology-approved COIs with complete migration pathways on the SIA that could result in adverse effects to sediment and surface water in the LDW. The data gaps identified in the SCER, further defined in the Work Plan by media and area, and depicted on Figure 3 of this SCER Addendum include:

- The nature and extent of semivolatile organic compounds (SVOCs) in groundwater
- The nature and extent of COIs in stormwater and groundwater that accumulates in subsurface vaults and pits, respectively, that discharge to the LDW through stormwater outfalls

- The nature and extent of total petroleum hydrocarbons (TPHs) and metals in soil and groundwater along the southern portion of the Facility
- The nature and extent of TPH, metals, and volatile organic compounds (VOCs) in soil and groundwater in the Forge Shop Area and Melt Shop Area of the SIA
- The nature and extent of TPH and VOCs in soil and groundwater in the vicinity of the oil-water separator, aboveground storage tank, and Steam Clean Area in the central portion of the SIA
- The nature and extent of COIs in soil in the vicinity of the Former Acid House and Former Acid Quench Pit
- The nature and extent of COIs in soil in the Former Swarf Stockpile Area
- The nature and extent of COIs in catch basin solids
- The nature and extent of COIs in stormwater discharged to the LDW
- The effectiveness of existing best management practices (BMPs) to control the impacts of the storage, distribution, and incidental releases of petroleum products on the SIA

1.2 Chemicals of Interest and Screening Levels

The Ecology-approved COIs are defined in the SCER as chemicals that are stored and used on the SIA, waste products that are generated on the SIA, and chemicals that are known or suspected to be present in media on the SIA. Screening levels are based on concentrations that are considered protective of sediment quality in the LDW or, where use of sediment screening levels is inappropriate, are protective of surface water quality in the LDW. The rational for selection of the screening levels is presented in the SCER's Table 5.1 (Anchor and Farallon 2008b). The Ecology-approved screening levels are presented in the SCER and referenced in Section 3 of this SCER Addendum.

In addition, stormwater samples collected at the SIA during the Data Gap Investigation are compared to the National Pollutant Discharge Elimination System (NPDES) Permit (No. WAR-003231) benchmark values for turbidity, pH, total copper, total zinc, total lead, and TPH (Ecology 2009). As part of the quarterly compliance monitoring required under this Permit, Jorgensen Forge identified a number of quarters since 2003 where zinc concentrations in stormwater discharge were above the permit benchmark values. These exceedances required Jorgensen Forge to complete a Level Three Corrective Action and to request and receive approval from Ecology to integrate the Level Three Response Action with the Source Control Investigation. The additional stormwater data screened against the NPDES Permit benchmark levels fulfills, in part, the Ecology approval for this integration. The NPDES Permit benchmark values are provided in Table 1.

The COIs identified in the SCER include:

- Polychlorinated biphenyls (PCBs)
- TPH
- Metals
- SVOCs, including polycyclic aromatic hydrocarbons (PAHs)
- VOCs

The SCER concludes that the potential sources of PCBs had been sufficiently characterized; therefore, no additional investigation was warranted (Anchor and Farallon 2008a). The COIs evaluated for the Data Gap Investigation included TPH, metals, SVOCs, and VOCs.

1.3 Recent Facility Source Control Improvements

After completion of the SCER, Jorgensen Forge implemented a number of BMPs to mitigate the potential migration of COIs from the Facility to the LDW, as described in the following subsections.

1.3.1 Scrap Storage Bin Removal

The aboveground scrap storage bins and contained scrap and debris formerly located along the southern Facility boundary were removed. The scrap storage bins were constructed on the SIA in the early 1940s and consisted of a number of adjacent concrete walls that extended approximately 10 feet above and below ground to act as storage cells for scrap metal pending the manufacturing process. All of the concrete walls and contained scrap and debris were removed to just below grade and covered back to grade with crushed rock. Following this removal, the former scrap storage bin area and adjacent unpaved areas along the southern Facility boundary were paved to reduce the potential for migration of dust and dirt to paved surfaces and the stormwater drainage system on other portions of the SIA. The paved area is designated on Figure 4.

1.3.2 Swarf Stockpile Area Relocation

The Former Swarf Stockpile Area was relocated to the newly paved area just east of the former scrap storage bins and west of the Billet Grinding Bag House (Figure 4). This relocation maintains the material farther from the LDW, within a better containment system, and directly adjacent to the railroad spur that is used for offsite disposal and recycling of this material. The relocated Swarf Stockpile Area is now on pavement surrounded on three sides by Ecology blocks and the nearest stormwater catch basin was plugged to prevent potential migration of this material into the stormwater drainage system. Jorgensen Forge is also better managing off-site removal of the material to maintain a smaller quantity on the SIA.

1.3.3 Non-magnetic Turnings Storage Area Relocation

The non-magnetic turnings storage area was relocated from the uncovered area just east of the former scrap storage bins to a newly constructed three-sided covered structure in the central portion of the SIA.

1.3.4 Removal of Steam Clean Area

The Steam Clean Area was pressure-washed and wash fluids were captured and appropriately disposed of. The Steam Clean Area was then demolished and filled in with concrete.

1.3.5 Replacement of Uncovered Storage Bins

Smaller uncovered storage bins that were used for production by-products awaiting on-site or off-site recycling were replaced with covered storage bins.

1.3.6 Pilot Test for Slag Placement

A pilot test is in process to determine the feasibility of placing superheated slag directly from slag pots into bins under cover rather than the currently uncovered, unpaved area on the southwest corner of the SIA.

1.3.7 Tank Removal

The 3,000-gallon diesel tank was removed from the miscellaneous chemical storage area on the northwest corner of the SIA.

The uncovered 300-gallon gasoline tank located just west of the laboratory was removed and replaced with a 550-gallon tank in the bermed, covered miscellaneous chemical storage area on the northwest corner of the SIA (in the former location of the diesel storage tank).

1.3.8 Manhole Installation

A manhole access point was installed just upgradient from the discharge location for Outfall 002 to facilitate greater access for maintenance, easier access for end-of-pipe sampling during a greater range of tidal heights, and the ability to effectively eliminate discharges to the LDW from this outfall (should the need arise).

1.3.9 Cleanup and Elimination of Off-site Stormwater Discharge

Elevated concentrations of total PCBs have been identified in the inactive The Boeing Company (Boeing) 15-inch storm pipe and directly-adjacent active 24-inch property line storm pipe that transit the northern Facility property boundary (Figure 4). Historical inputs to the Boeing 15-inch property line storm pipe were solely from the Boeing Plant 2 Facility (Plant 2). Stormwater inputs to the 24-inch property line storm pipe occurred historically from Plant 2, the Facility, and Boeing Field/King County International Airport and occur currently from a portion of the City of Tukwila stormwater drainage. A summary of the investigations and data findings and evaluations is summarized in the "Storm Drain Line Data Summary" technical memorandum (Farallon 2005) and *Historical 6-inch and 12-inch Lateral Pipes Investigation Report – Stormwater Source Control Implementation, Jorgensen Forge Facility, Seattle, Washington* (Anchor QEA 2010).

The U.S. Environmental Protection Agency (EPA) recently prepared the "Action Memorandum for the Jorgensen Forge Outfall Site, Seattle, King County, Washington" (2010a). This memorandum documented approval of the selected time-critical removal action under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for cleanup activities associated with the 24-inch and Boeing 15-inch property line storm pipe that collectively discharge to the LDW. Boeing and Jorgensen Forge are named as potentially responsible parties in the action memorandum. Boeing performed the cleanup actions and Jorgensen Forge provided access to the Facility. As required by the Action Memorandum, Boeing submitted the *Source Control Action – 15-inch and 24-inch Pipes Cleanout Work Plan* detailing the cleanup and closure activities on December 17, 2010 (Floyd Snider 2010). The removal action consists of the cleaning and closure of the concrete portions of the full extents of both property line storm pipes on the Facility to remove and prevent continued discharge of stormwater through known PCB contamination to the LDW. Boeing initiated the cleanup and closure activities November 2010 and received EPA approval that the cleanup and closure activities were completed on February 28, 2010.

1.4 Additional Source Control Evaluations

As part of the Level Three Corrective Action required by the NPDES Permit (see Section 1.2), Jorgensen Forge is completing additional investigations to evaluate the sources of elevated COIs above the Ecology-approved stormwater screening levels to determine the appropriate additional BMPs and stormwater treatment necessary to decrease chemical concentrations below target levels. These investigations will include:

- Several rounds of dry pavement sampling to determine the potential source loadings to the stormwater drainage system and the effectiveness of ongoing BMPs
- Wet weather runoff sampling in the vicinity of the pavement sampling areas to evaluate the mobilization of COIs into the stormwater drainage system
- Wet weather sampling from additional target roof areas to document source loading from roof surfaces
- Completion of a comprehensive roof inventory to document the types of roofing materials and potential source loadings from these materials

1.5 Document Organization

This SCER Addendum has been organized into the following sections:

- Section 2 – Background
- Section 3 – Data Gap Investigation Field Activities
- Section 4 – Data Gap Investigation Results
- Section 5 – Migration Pathway Analysis
- Section 6 – Conclusions
- Section 7 – Limitations
- Section 8 – References

2 DATA GAP INVESTIGATION

This section summarizes the scope and activities of the Data Gap Investigation, which was conducted in July 2008 and in February, May, August, and December 2009, in accordance with the Work Plan (Anchor and Farallon 2008b). Deviations from the Work Plan are provided in Section 2.6.

The investigation included:

- Collection and laboratory analysis of soil and reconnaissance groundwater samples from direct-push borings
- Monitoring well installation
- Collection and laboratory analysis of soil and groundwater samples collected from monitoring wells
- Collection and laboratory analysis of stormwater samples
- Collection and laboratory analysis of production byproducts

The sampling locations for the Data Gap Investigation are shown on Figure 4. The boring and well logs are included in Appendix B. The laboratory analytical reports are included in Appendix C.

The results of the Data Gap Investigation are included in Section 3.

2.1 Scope of Work

The scope of work completed for the Data Gap Investigation included the following:

- Preparing a Health and Safety Plan in accordance with Part 1910.120 of Title 29 of the Code of Federal Regulations prior to initiating field activities
- Performing a utility locate at the proposed boring and monitoring well locations using private utility location services, as well as contacting the One-Call Center for utility location
- Collecting 21 stormwater samples from various locations within the stormwater drainage system during two separate rainfall events for laboratory analysis
- Advancing seven direct-push borings to collect soil and reconnaissance groundwater samples for laboratory analysis

- Installing, developing, and surveying 16 monitoring wells
- Collecting a sample of non-magnetic grinding material from the relocated Swarf Stockpile Area on two separate dates for laboratory analysis
- Conducting a groundwater monitoring and sampling event at 16 monitoring wells, including measuring the depth to water and collecting groundwater samples for laboratory analysis

The field activities were conducted in accordance with the sampling procedures described in the Work Plan (Anchor and Farallon 2008b), except as noted in Section 2.6. The following subsections describe the Data Gap Investigation field activities.

2.2 Field Activities

The Data Gap Investigation was conducted in July 2008 and in February, May, August, and December 2009, and included the following activities:

- Collection of soil and reconnaissance groundwater samples from direct-push borings SB-13 through SB-19
- Collection of soil samples from the borings completed for the construction of monitoring wells MW-37 through MW-52
- Groundwater monitoring and sampling at select previously-installed monitoring wells and monitoring wells MW-37 through MW-52
- Collection of stormwater samples from various locations in the outfall drainage system and underground vaults
- Collection of samples of the non-magnetic grinding material from the relocated Swarf Stockpile Area (Figure 4)

Prior to the start of drilling activities, a private utility location survey was conducted by Applied Professional Services, Inc., of North Bend, Washington. Drilling services were provided by Cascade Drilling of Woodinville, Washington. The borings were advanced with a Geoprobe drill rig using direct-push drilling methods and the monitoring wells were installed by using a hollow-stem auger drill rig.

All soil cuttings, purge water, and decontamination water were placed into labeled 55-gallon steel drums and temporarily stored on the SIA, pending waste disposal suitability characterization. The investigation-derived waste was profiled using the laboratory analytical results of the sampling conducted for the Data Gap Investigation and transported off the SIA for disposal at an appropriate facility by Kleen Environmental Technologies, Inc., of Seattle, Washington.

The stormwater, subsurface vault, and non-magnetic grinding material collections were performed by Anchor QEA personnel.

2.3 Drilling and Soil Sampling

Soil samples were collected from direct-push borings and borings completed for the construction of monitoring wells at the SIA, as described in the following sections. The sample locations are depicted on Figure 3. The boring logs are included in Appendix B.

2.3.1 Direct-Push Borings

Four direct-push borings were completed to evaluate potential subsurface impacts associated with the historical operations in the vicinity of the Former Acid House and Former Acid Quench Pit (Figure 3). Borings SB-13 through SB-16 were advanced to total depths of 16 feet below ground surface (bgs) with the collection of soil and reconnaissance groundwater samples for laboratory analysis. Soil samples were collected in 4-foot intervals from the surface to the total depth of each boring, in accordance with the procedures described in the Work Plan. Reconnaissance groundwater samples were collected with a temporary screen set from 12 to 16 feet bgs, in accordance with the procedures described in the Work Plan (Anchor and Farallon 2008b).

Three borings were completed in the vicinity of the Former Swarf Stockpile Area to evaluate potential impacts of the storage of non-magnetic grinding material on shallow soil quality (Figure 3). Borings SB-17, SB-18, and SB-19 were advanced to total depths of 6 feet bgs with the collection of soil samples for laboratory analysis. Soil samples were collected in 2-foot intervals from the surface to the total depth of each boring, in accordance with the procedures described in the Work Plan (Anchor and Farallon 2008b).

The soil samples at monitoring wells MW-44 and MW-45 were collected using direct-push drilling methods because of limited recovery of soil due to heaving sands encountered at depths greater than 25 feet bgs at the boring for monitoring well MW-41. Soil samples were collected from the borings for monitoring wells MW-44 and MW-45 in 4-foot intervals from a depth of 5 feet bgs to the total depths of 40 and 60 feet bgs, respectively. The soil samples were collected in accordance with the procedures described in the Work Plan for direct-push borings (Anchor and Farallon 2008b).

2.3.2 Monitoring Well Borings

Soil samples were collected during drilling activities using a hollow-stem auger with a split-spoon sampler at the following monitoring wells and locations (Figure 3):

- MW-37 through MW-39, along the southern boundary of the SIA
- MW-41, in the Forge Shop Area and Melt Shop Area
- MW-46, adjacent to the oil-water separator, Steam Clean Area, and aboveground storage tank
- MW-48, downgradient of the groundwater plume of light nonaqueous phase liquid (LNAPL) as cutting oil
- MW-50 through MW-52, on the northwest portion of the SIA

Soil samples were collected in 5-foot intervals from a depth of 5 feet bgs to the total depth of each boring, which ranged from 20 to 60 feet bgs. The soil samples were collected in accordance with the procedures described in the Work Plan (Anchor and Farallon 2008b).

2.4 Monitoring Well Installation

Sixteen monitoring wells were installed during the field activities for the Data Gap Investigation (Figure 3). Monitoring wells MW-40 and MW-41 were installed adjacent to the 5,000-ton press pit and equipment vault in the Forge Shop Area and Melt Shop Area on July 19, 2008, in advance of the other monitoring wells to accommodate ongoing operations at the SIA. The other monitoring wells, including MW-37 through MW-39 and MW-42 through MW-52, were installed between February 5 and 13, 2009. The monitoring wells were installed, constructed, and developed in accordance with the procedures described in the Work Plan (Anchor and Farallon 2008b). The boring logs, which include the well construction details, are included in Appendix B.

Monitoring wells MW-49 through MW-52 (Figure 3) were installed in addition to the scope of work described in the Work Plan (Anchor and Farallon 2008b) to provide additional technical data to support ongoing communications with Boeing regarding releases from the north-adjacent Plant 2. They include:

- Monitoring well MW-49, located on the north side of the administrative office building just north of the Hollowbore Area, was installed to evaluate the northern extent of cutting oil as LNAPL on groundwater
- Monitoring wells MW-50, MW-51, and MW-52, located on the northwest corner of the SIA, was installed to evaluate the nature and extent of halogenated volatile organic compounds (HVOCs) in groundwater downgradient of the 2-66 Area of Plant 2

During the drilling activities for the installation of monitoring wells MW-48 and MW-49, borings were advanced to 27 feet bgs for the collection of reconnaissance groundwater samples in the deeper portion of the shallow water-bearing zone. These samples were used to evaluate the extent of HVOCs in groundwater downgradient of the south yard area on Plant 2 (Figure 3). Monitoring wells MW-50 through MW-52 were installed with screened intervals set deeper in the shallow portion of the water-bearing zone to correspond directly to the screened interval of Boeing monitoring well PL2-JF01AR, located on the northwest corner of the SIA. Remedial actions are ongoing at the 2-66 Area of Plant 2 to address historical releases of trichloroethene (TCE) to soil and groundwater. The monitoring well construction details are provided on the boring logs in Appendix B and summarized in Table 2.

2.5 Groundwater Monitoring and Sampling

A comprehensive groundwater monitoring and sampling event was conducted by Farallon at the SIA in February 2008. Additionally, four quarterly groundwater monitoring and sampling events have been completed at the SIA in February, May, August, and December 2009 as part of the Data Gap Investigation. The groundwater monitoring and sampling events were conducted in accordance with the procedures described in the Work Plan (Anchor and Farallon 2008b).

2.6 Subsurface Vault and Pit Water Sampling

The nature and extent of COIs in groundwater that accumulates in subsurface vaults, surface water that accumulates in pits, and subsequent discharges to the LDW through Outfalls 001 and 003 were identified as data gaps in the SCER (Anchor and Farallon 2008a). The planned scope of work included the laboratory analysis of water samples collected from the Railroad Scale Vault, the Argon Oxygen Decarbonization (AOD) Scale Pit, and the Vacuum De-gassing Pit, pending the availability of a sufficient volume of water to sample. Representative photographs of these sampling locations are included in Appendix D.

The subsurface features were accessed on May 6 and August 13, 2009, during variable intensity rain events. The Railroad Scale Vault and AOD Scale Pit did not contain sufficient volumes of water to collect samples during both rain events. Water samples were collected from the Vacuum De-gassing Pit pump discharge reservoir during both sampling events. The locations of the subsurface features and the Vacuum De-gassing Pit sampling location (AJF-01VDP) are shown on Figure 4.

Outfall discharge locations were monitored on August 4, 2009, during dry weather conditions (that is, no rain for at least seven days prior to this date), and no discharge was observed through Outfalls 001, 002, or 003 (Appendix E). The lack of discharge during extended dry weather conditions confirmed that there is no baseflow discharging to the LDW during the dry weather monitoring date.

2.7 Stormwater Sampling

Stormwater samples were collected from the Outfall 001, 002, and 003 stormwater drainage systems during variable intensity rainfall events on May 6, 2009, and August 13, 2009 (Appendix F). Additional stormwater samples were collected from the roof drain runoff water at downspouts and manholes. The stormwater sampling locations are shown on Figure 4.

The planned scope of work (Anchor and Farallon 2008b) included collection of solid samples from catch basins within the Outfall 002 and Outfall 003 drainage areas; however, insufficient solids were present in the catch basins within these drainage areas on May 6 and August 13, prohibiting sample collection. Representative photographs of stormwater sampling locations are included in Appendix D. The stormwater sampling activities are described in detail in the following subsections.

2.7.1 Outfall Discharge Sampling

Stormwater samples were collected from the Outfall 001, 002, and 003 (Figure 4) stormwater drainage systems during qualifying rain events (Appendix F; as identified in the SCER [Anchor and Farallon 2008a]) on May 6 and August 13 in accordance with the procedures described in the Work Plan (Anchor and Farallon 2008b).

The stormwater sample representative of discharge through Outfall 001 was collected from an upgradient vault because the discharge location is recessed within a concrete panel wall, eliminating the potential to sample discharge that is not in contact with the wall (Figure 4). The stormwater sample (AJF-01OD) was collected downgradient of all features conveying discharge through Outfall 001, including the Vacuum De-gassing Pit, roof drains, and the Railroad Scale Vault (Figure 4).

Outfall 002 was sampled directly from the end of pipe discharge location on May 6, although the discharge flow was minimal and inconsistent with the intensity of rainfall (Appendix F), indicating a potential blockage in the pipe. Subsequent completion of the stormwater system cleanout and video reconnaissance (see Section 2.9) confirmed a portion of the Outfall 002 is partially plugged in an upgradient location; therefore, the May 6 sampling results may not be fully representative of stormwater inputs to this outfall. Because a similar low level discharge was observed on August 13, the stormwater sample was collected from a vault just upgradient of the identified partially-plugged portion, identified as AJF-02OD, located within the Forge Shop Area (Figure 4). The upgradient vault is considered representative of discharge through Outfall 002 because all stormwater inputs to this outfall enter upgradient of this vault.

Outfall 003 was sampled from the end of pipe discharge location during both sampling events (Figure 4).

2.7.2 Roof Runoff Sampling

As discussed in Section 1.2, quarterly compliance sampling required under the NPDES Permit has shown elevated zinc concentrations above the benchmark levels. For this reason, stormwater samples were collected from roof runoff, as described in the Work Plan (Anchor and Farallon 2008b), to evaluate whether the roof surfaces are a source of metals to stormwater. Stormwater samples were collected from the Forge Shop Area and the Machine Shop Area roof surfaces that convey stormwater to Outfalls 002 and 003, respectively. The sampling locations were selected based on accessibility to roof surfaces that visually looked to be composed of different roof materials (Figure 5).

The stormwater roof samples were collected from the same location on the east and west sides of the Forge Shop Area (AJF-RFSE and AJF-RFSW) and Machine Shop Area (AJF-RMSE and AJF-RMSW) during the May 6 and August 13 sampling events (Figures 4 and 6). The Forge Shop Area stormwater roof samples were collected from downspout discharges and therefore include runoff in contact with both the roof surface and downspout. The east Machine Shop Area stormwater roof sample (AJF-RMSE) collected on May 6 consisted of runoff overflowing from an overhead gutter and in contact with the metal siding of the building. The sample collected from the same location on August 13 consisted of runoff overflowing from the overhead gutter and not in contact with the metal siding of the building. The west Machine Shop Area stormwater roof sample (AJF-RMSW) was collected from a downspout that contained relatively low discharges during both events. Based on the intensity of rainfall (Appendix F) during the sampling events and roof area, the flow from this downspout was lower than would be expected, likely indicating that the downspout may have been partially plugged.

2.7.3 Subsurface Manhole Stormwater Sampling

To obtain additional information on potential sources of metals to stormwater discharges from Outfall 003, a single stormwater sample (AJF-MHMS) was collected during both the May 6 and August 13 sampling events from a subsurface manhole pipe. The pipe conveys runoff from roof surfaces covering the Machine Shop Area, Hollowbore Area, Shipping Area, and Forge Shop Area and runoff from the road and parking areas around the north and east sides of the main building (Figure 4). In addition, a single stormwater sample (AJF-MHFS) was collected during both sampling events from the same subsurface manhole that conveys roof runoff from a portion of the Forge Shop Area. The approximate drainage area for the various roof types is shown on Figure 5 and a diagram showing the subsurface manhole configuration and sampling locations is shown on Figure 6. As shown on Figure 4, the discharges from both subsurface manhole pipes are conveyed to Outfall 003.

2.7.4 Catch Basin Solids Sampling

Catch basin solids sampling was attempted from each of the catch basins located within the Outfall 002 and 003 drainage areas (Figure 4) on May 6 and August 13 in accordance with the procedures described in the Work Plan (Anchor and Farallon 2008b). At each catch basin location, a decontaminated metal spoon attached to a telescoping sampling rod was lowered into the catch basin bottom. The bottom surface was scraped to collect a solids sample. The procedure was repeated at each catch basin located within the drainage areas for Outfall 002 and 003 during both sampling events. There was insufficient volume of solids present in each of the catch basins to collect a sample, confirming that the frequent cleanout of the catch basins conducted as part of Jorgensen Forge's stormwater BMPs is effective at preventing the build up and potential discharge of solids through Outfalls 002 and 003. No catch basins serve Outfall 001, prohibiting solids collection for this drainage area. Representative photographs of the catch basin sampling effort are included in Appendix D.

2.8 Relocated Swarf Stockpile Area Sampling

The non-magnetic grinding material was sampled directly from the relocated Swarf Stockpile Area (Figure 4). A single composite sample representative of the non-magnetic grinding material was collected on May 6 and August 13, 2009, in accordance with the procedures described in the Work Plan (Anchor and Farallon 2008b). A representative photograph of the non-magnetic cuttings is included in Appendix D.

2.9 Stormwater System Cleanout and Video Reconnaissance

Following completion of the stormwater sampling activities described in Section 2.7, the accessible portions of stormwater lines and features were jet cleaned within the drainage areas of Outfalls 001, 002, and 003 (Figure 4). These activities were conducted as additional scope of work items beyond those described in the Work Plan (Anchor and Farallon 2008b) to further assist in the delineation of the stormwater drainage system on the SIA and evaluation of potential sources of COIs through the stormwater pathway. Bravo Environmental cleaned approximately 240 lineal feet of storm pipe in Outfall 001 and 120 lineal feet of piping in Outfall 002 on September 1, 2009. On September 9, Bravo Environmental cleaned an additional approximate 840 lineal feet of piping in Outfall 003.

The outfall pipes were plugged at the most accessible downgradient location and jetted upgradient with high pressure water. All water and solids, totaling a volume of approximately 14,500 gallons, generated by the cleaning were vacuumed from the system and transported to an approved disposal facility. Access limitations prevented cleanout of the entire stormwater drainage system but the majority of the system was cleaned, as shown on Figure 4.

Following the pipe cleanout activities, a video reconnaissance of the drainage areas was performed to confirm the configuration and condition of the storm drainage system in the Outfall 001, Outfall 002, Outfall 003 drainage systems, and a historical drainage system located beneath the footprint of the historical Bethlehem Steel Facility on the SIA. The video reconnaissance was conducted by Applied Professional Services, Inc. on September 1, 9, and 11, 2009. The extents of the video reconnaissance are shown on Figure 4. Minor changes in the drainage plan were noted during the inspection and have been incorporated on Figure 4.

The following subsections describe the individual video surveys for Outfall 001, 002, and 003 and the historical drainage system. The inspection reports and DVDs for all video reconnaissance are included in Appendix G.

2.9.1 Video Survey for Outfall 001 Storm Piping

The video survey for Outfall 001 storm piping was conducted on September 1. The video inspection tractor was inserted at Access Vault AJF-01OD into two storm pipes in the Outfall 001 piping system (Figure 4). The eastern portion of the line was cleaned but the western portion was not, due to the inability to collect the wash water and solids from the discharge location. East of AJF-01OD, 157 lineal feet of a 6-inch diameter polychlorinated vinyl (PVC) pipe was inspected. The pipe was in good condition with no cracking or damage observed. The video inspection tractor could only extend to a bend in the storm drain pipe at 157 feet east of AJF-01OD. West of AJF-01OD, 324 feet of 12-inch concrete piping was inspected. The pipe was generally intact though some small fractures and cracking were noted in isolated locations. Two small lateral lines enter the pipe at 110 feet and 188 feet west of AJF-01OD. Small rock like debris and scale in the pipe prevented the video tractor from continuing the inspection beyond 324 feet.

2.9.2 Video Survey for Outfall 002 Storm Pipes

The video survey for Outfall 002 storm piping was conducted on September 1 and 11. The video inspection tractor was inserted into the storm pipe at the upgradient Access Vault AJF-02OD, as shown on Figure 4. Pipe inspection west of AJF-02OD was not possible due to sediment debris obstructing the pipe; this obstruction is likely the cause of the minimal Outfall 002 discharge that was noted during both stormwater sampling events, as discussed in Section 2.7.1. As discussed in Section 1.3, Jorgensen Forge installed a manhole just upgradient from the Outfall 002 discharge location, which will help facilitate removal of the obstruction from the pipe.

East of AJF-02OD, which was cleaned during the stormwater system cleanout activities, 81 lineal feet of 8-inch diameter concrete pipe was inspected. The pipe was generally intact, though some possible isolated cracks were noted during the inspection. The video inspection tractor was not able to pass through a previously unidentified vault at 81 feet east of AJF-02OD.

The video inspection tractor was inserted into a 6-inch concrete pipe in AJF-02OD and was able to inspect an additional 5.4 feet south. The pipe was completely full of soil at 5.4 feet with an 8-inch concrete pipe lateral intersecting the pipe from the east. The video tractor was unable to extend beyond the turn in the pipe, so no additional access points were identified further east in the Outfall 002 system and no additional video reconnaissance could be completed east of the previously unidentified vault.

2.9.3 Video Survey for Outfall 003 Storm Pipes

The video survey for Outfall 003 storm pipes was conducted on September 9. The video inspection tractor was inserted into the storm pipe at the manhole just east of the Heat Treat Area (sampling station AJF-MHFS on Figure 4). The entire survey extents were previously cleaned during the stormwater system cleanout activities. East of AJF-MHMS, 168 lineal feet of 10-inch diameter concrete pipe was inspected. The pipe was generally intact. Features noted in this section of pipe included:

- A size reduction at 77 feet
- Another size reduction and material change to ductile iron at 90 feet
- A final pipe size reduction precluding further inspection at 168 feet

South of AJF-MHFS, 79 lineal feet of 10 inch diameter concrete pipe was inspected. Minor fractures (no exposed soil) were noted in the inspection at 48 and 54 feet. Sediment debris in the pipe at 79 feet prevented further inspection.

Southwest of AJF-MHMS, 55 lineal feet of 10-inch diameter concrete pipe was inspected. The inspection noted multiple minor fractures (no exposed soil). The video inspection tractor could not negotiate the turn in the first encountered manhole (Figure 4). The tractor was reinstalled in this manhole and an additional 484 feet of 10-inch concrete pipe was inspected to the west; multiple minor fractures (no exposed soil) in that section of pipe were identified. The inspection terminated in a manhole where the concrete pipe re-directs to the south (Figure 4); the tractor was removed from this manhole, reinstalled in the adjacent final downgradient manhole, and inspected 71 feet north in the 10-inch concrete pipe. A piece of pipe scale debris was encountered at 71 feet preventing further inspection. From this inspection point, the upgradient manhole was visible, so no re-cleaning of the pipe was necessary.

West from the final downgradient manhole, 81 feet of 10-inch concrete pipe was inspected (Figure 4). Because wash water and solids could not be collected, this portion of the pipe was not cleaned during the stormwater system cleanout activities. Sediment and rock-like debris accumulation at 81 feet prevented further inspection.

2.9.4 Video Survey of Historical Drainage System

A video survey was also conducted on September 11 in the historical drainage system located beneath the footprint of the historical Bethlehem Steel Facility on the SIA.

The video inspection tractor was inserted into a manhole, providing access to two historical storm pipes, as shown on Figure 4. East of the manhole, 212 lineal feet of 14-inch diameter concrete pipe was inspected. The pipe was generally intact with no debris. Three historical lateral connections were identified entering this pipe from the north at 44, 100, and 163 feet, and a size reduction was identified at 170 feet. At 211 feet, the line was completely full of soil, preventing further inspection.

North of the manhole, 204 lineal feet of 12-inch diameter concrete pipe was inspected. Six historical lateral connections were identified entering the pipe from the north at 14, 111, 114, 150, 192, and 204 feet. At 204 feet, the pipe turned 90 degrees to the north, preventing further video inspection. Inspection of this historical drainage confirmed no active connection to the LDW.

2.10 Laboratory Analysis

The following samples were submitted for laboratory analysis of COIs during the Data Gap Investigation:

- Soil samples collected from the borings were submitted for TPH, metals, VOCs, SVOCs including PAHs, and pH
- Reconnaissance groundwater and groundwater samples were submitted for TPH, metals, VOCs, and SVOCs
- Subsurface vault water samples and stormwater outfall discharge samples were submitted for total organic carbon (TOC), total suspended solids (TSS), conductivity, turbidity, TPH, total and dissolved metals, VOCs, and SVOCs including PAHs

- Roof stormwater samples were submitted for total and dissolved metals and TSS
- Non-magnetic grinding material was submitted for TOC, TPH, metals, and SVOCs including PAHs

2.11 Deviations from the Work Plan

The following sections summarize the deviations from the sampling procedures identified in the Work Plan (Anchor and Farallon 2008b) for each of the sampled media.

2.11.1 Monitoring Wells Installation and Sampling

The scope of work in the Work Plan includes the installation and sampling of 12 monitoring wells at the SIA to address data gaps in the Source Control Investigation. Monitoring wells MW-37 through MW-48 were installed as described in the Work Plan (Anchor and Farallon 2008b). Four additional monitoring wells were installed at the SIA for the Data Gap Investigation to provide additional data unrelated to the Source Control Investigation, as discussed in Section 2.4.

2.11.2 Stormwater Sampling

Because the Outfall 001 discharge location is recessed within the concrete panel wall, an end-of-pipe sample could not be collected that was not in contact with the wall. For this reason, as discussed in Section 2.7.1, samples were collected from the nearest accessible upgradient vault (Figure 4). Due to limited discharge from the Outfall 002 end-of-pipe during both the May 6 and August 9, 2009, sampling events, the stormwater sample was collected from the end of pipe during the May 6 sampling and an upgradient vault location during the August 13 sampling.

Due to inconsistent rainfall intensity and duration during both the May 6 and August 13 sampling events (Appendix F), the duration of stormwater runoff discharge was highly variable; this prohibited collection of stormwater outfall discharge samples for laboratory analysis of conventionals (for example, temperature, pH, conductivity, dissolved oxygen, oxidation-reduction potential, turbidity, and salinity) using a portable Hydrolab™ unit. Conductivity, pH, and turbidity for each of the stormwater samples were analyzed by the analytical laboratory.

Stormwater samples collected from the roof runoff and manhole locations were collected during two rainfall events—although the Work Plan specified a single event (Anchor and Farallon 2008b)—to further understand the potential variations in the data at these locations. All roof drain samples were collected from the same locations using the same procedures except at station AJF-RMSE. The May 6 sampling included the collection of runoff overflowing from an overhead gutter and in contact with the metal siding of the building. The sampled collected from the same location on August 13 consisted of runoff overflowing from the overhead gutter and not in contact with the metal siding of the building.

No catch basin solids sampling could be completed due to lack of accumulated solids in each of the Outfall 002 and 003 catch basins (Appendix D).

2.11.3 Subsurface Vault and Pit Water Sampling

Sampling was not conducted within the Railroad Scale Vault or the AOD Scale Pit. The Railroad Scale Vault was damp but did not contain standing water. The AOD Scale Pit was completely dry with no signs of moisture entering the pit (Appendix D).

2.11.4 Stormwater System Cleanout and Video Reconnaissance

Following completion of the stormwater sampling activities (see Section 2.7), the accessible portions of stormwater lines and features were jet cleaned within the drainage areas of Outfalls 001, 002, and 003 (Figure 4). These activities were conducted as additional scope of work items beyond those described in the Work Plan (Anchor and Farallon 2008b) to further assist in the delineation of the stormwater drainage system on the SIA and in the evaluation of potential sources of COIs through the stormwater pathway.

3 DATA GAP INVESTIGATION RESULTS

This section summarize the results of the Data Gap Investigation activities conducted at the SIA in July 2008 and in February, May, August, and December 2009. Laboratory analytical reports for the soil, groundwater, and stormwater samples collected during the subsurface investigation are included in Appendix C.

3.1 Soil

This section presents the laboratory analytical results for each of the Ecology-approved COIs of soil samples collected at the SIA in July 2008 and February 2009 as part of the Data Gap Investigation activities. The laboratory analytical results for TPH, metals, SVOCs, and HVOCs are summarized in Tables 3 through 8, respectively. The laboratory analytical reports are attached in Appendix C.

3.1.1 Total Petroleum Hydrocarbons

Concentrations of diesel-range, gasoline-range, and heavy oil-range organics, ethylbenzene, and total xylenes were detected above the laboratory practical quantitation limits (PQLs) in soil samples collected from borings MW-37, MW-38, MW-39, MW-46, MW-48, MW-51, and MW-52 (Table 3). There are no Ecology-approved screening levels established for TPH in soil for the Source Control Investigation.

3.1.2 Total Metals

The laboratory analytical results detected concentrations of chromium and/or nickel exceeding the Ecology-approved screening levels at borings SB-13, SB-14, and SB-16 and borings MW-37, MW-38, MW-39, and MW-41 (Tables 4 and 5). Concentrations of chromium and nickel were detected exceeding the Ecology-approved screening levels in soil samples collected between depths of 6 and 12 feet bgs. Soil samples collected from the same borings at shallower and deeper intervals did not detect concentrations of chromium or nickel exceeding the Ecology-approved screening levels (Tables 4 and 5).

3.1.3 Semivolatile Organic Compounds

The laboratory analytical results did not detect concentrations of SVOCs in soil above the laboratory PQLs with the exception of bis(2-ethylhexyl)phthalate, which was detected below the screening level in soil samples collected from monitoring well MW-41 (Table 6).

3.1.4 Polycyclic Aromatic Hydrocarbons

Concentrations of PAHs were not detected in soil above the laboratory PQLs with the exception of naphthalene, which was detected in a soil sample collected from boring MW-46 at a concentration below the screening level (Table 7).

3.1.5 Halogenated Volatile Organic Compounds

The laboratory analytical results did not detect concentrations of HVOCs above the laboratory PQLs with the exception of TCE, which were detected in soil samples collected from borings MW-37, MW-50, MW-51, and MW-52 (Table 8) in the area impacted by documented Plant 2 releases. There are no Ecology-approved screening levels established for HVOCs in soil.

3.2 Groundwater

This section presents the results of groundwater monitoring and sampling conducted at the SIA between January 2008 and August 2009 as part of the Data Gap Investigation activities. Section 3.2.1 presents the results of groundwater level and LNAPL measurements and Section 3.2.2 presents a summary of the laboratory analytical results by COIs in groundwater.

3.2.1 Groundwater Elevations and LNAPL Measurements

The water level and LNAPL measurements and calculated groundwater elevations at each monitoring well are summarized in Table 9. Groundwater elevation contour maps for each of the groundwater monitoring and sampling events are included as Figures 7 through 10. The groundwater level measurement and LNAPL measurement data and results are summarized in the following subsections.

3.2.1.1 January and February 2008

The depth to groundwater measured on January 29, 2008, ranged from 5.80 feet (MW-34) to 13.32 feet (MW-7) below the tops of the well casings in monitoring wells with no measurable thickness of LNAPL (Table 9). The groundwater flow direction and approximate hydraulic gradient were calculated from the groundwater level data measured in monitoring wells with no LNAPL (Table 9). The groundwater monitoring data indicate that the apparent direction of shallow groundwater flow beneath the SIA is to the south under an average gradient of 0.0007 foot per foot. Groundwater surface elevation contours and flow direction calculated on January 29, 2008 are depicted on Figure 7.

The thickness of LNAPL as cutting oil on the northeastern portion of the SIA ranged from 1.66 feet (MW-18) to 10.93 feet (MW-27). On January 29, 2008, LNAPL was measured as hydraulic oil at a thickness of 1.41 feet in monitoring well MW-34 (Table 9 and Figure 7). LNAPL as hydraulic oil has been measured in monitoring wells MW-12 and MW-13; however, because of surface water intrusion, the thickness of LNAPL in monitoring wells MW-12 and MW-13 was not gauged on January 29, 2008.

3.2.1.2 February 2009

Groundwater level measurements were collected between 2 p.m. and 5 p.m. on February 23, 2009. According to the National Oceanic and Atmospheric Administration (NOAA), high tide at the Eighth Avenue South tidal gauge in the Duwamish River was predicted at 3:43 p.m. (NOAA 2009), indicating that the water level measurements were taken during slack high tide.

The depth to groundwater measured in monitoring wells with no measurable LNAPL on February 23, 2009, ranged from 10.27 (MW-43) to 15.18 feet (MW-7) below the top of the monitoring well casing (Table 9). Anomalous water level and total monitoring well depth measurements at monitoring wells MW-12, MW-13, and MW-33 indicate that the wells have been damaged and are no longer viable for groundwater monitoring and sampling. The calculated groundwater elevations were used to evaluate groundwater flow direction and gradient at the SIA. The groundwater flow direction on the eastern portion of the SIA is to the south at an average hydraulic gradient of 0.0005 foot per foot. The groundwater flow direction on the western portion of the SIA is to the east at an average hydraulic gradient of 0.0035 foot per foot, which is likely attributable to the inland flow of groundwater associated with high tide. Based on the February 23, water level measurements, the inland influence of tidal fluctuation on groundwater levels is approximately 300 feet on the southern portion of the SIA and 450 feet on the northern portion of the SIA. Groundwater surface elevation contours and flow direction calculated on February 23 are depicted on Figure 8.

LNAPL was present in monitoring wells MW-16 through MW-22, MW-26 through MW-29, MW-34, and MW-35. The thickness of LNAPL as cutting oil on the northeastern portion of the SIA ranged from 1.00 (MW-19) to 10.05 feet (MW-27; Table 9 and Figure 8). The plume of LNAPL as cutting oil is bound to the north by monitoring wells MW-23, MW-24, and MW-49; to the west by monitoring wells MW-25 and MW-48; to the south by monitoring wells MW-30 and MW-31; and to the east by monitoring wells MW-8, MW-9, and MW-10 (Figure 8). The thickness of LNAPL as hydraulic oil in monitoring wells on the southeastern portion of the SIA ranged from 1.44 (MW-34) to 6.70 feet (MW-35; Table 9). The plume of LNAPL as hydraulic oil is bound to the north by monitoring well MW-14; to the west by monitoring well MW-40; to the south by monitoring wells MW-32 and MW-36; and to the east by monitoring well MW-15 (Figure 8).

3.2.1.3 May 2009

Groundwater level measurements were taken between 1:40 p.m. and 3:40 p.m. on May 19, 2009. According to NOAA, high tide at the Eighth Avenue South tidal gauge in the Duwamish River was predicted at 2:21 p.m. (NOAA 2009), indicating that the water level measurements were taken during slack high tide.

The depth to groundwater measured on May 19 ranged from 10.05 (MW-10) to 15.42 feet (MW-47) below the top of the well casing in monitoring wells with no measurable thickness of LNAPL (Table 9). The groundwater flow direction and approximate hydraulic gradient were calculated from the groundwater level data in monitoring wells with no LNAPL (Table 9). The groundwater monitoring data indicate that the apparent direction of shallow groundwater flow beneath the SIA is to the southwest at an average gradient of 0.0008 foot per foot. The predominant groundwater flow direction on the western portion of the SIA is to the east at an average hydraulic gradient of 0.0029 foot per foot, which is likely attributable to the inland flow of groundwater associated with high tide. Based on the May 19 water level measurements, the inland influence of tidal fluctuation on groundwater levels is approximately 370 feet on the southern portion of the SIA and is not observed on the northern portion of the SIA. Groundwater surface elevation contours and flow direction calculated for May 19, 2009, are depicted on Figure 9.

The thickness of LNAPL as cutting oil on the northern portion of the SIA on May 18, 2009, ranged from 1.04 (MW-16) to 10.95 feet (MW-29; Table 9 and Figure 9). The plume of LNAPL as hydraulic oil on the southeastern portion of the SIA ranged from 0.12 (MW-34) to 7.1 feet (MW-35; Table 9). The identified range of thicknesses is consistent with previous monitoring findings.

3.2.1.4 August 2009

Groundwater level measurements were taken between 9:30 a.m. and 11:30 a.m. on August 25, 2009. According to NOAA, high tide at the Eighth Avenue South tidal gauge in the Duwamish River was predicted at 9:50 a.m. (NOAA 2009), indicating that the water level measurements were taken just past high tide.

The depth to groundwater measured on August 25 ranged from 10.99 (MW-5) to 15.65 feet (MW-7) below the top of the monitoring well casing in monitoring wells with no measureable thickness of LNAPL (Table 9). The groundwater flow direction and approximate hydraulic gradient were calculated from the groundwater level data in monitoring wells with no LNAPL (Table 9). The groundwater flow direction on the eastern portion of the SIA is to the south at an average hydraulic gradient of 0.0005 foot per foot. The groundwater flow direction on the western portion of the SIA is to the east at an average hydraulic gradient of 0.0034 foot per foot on the northwest and 0.0043 foot per foot on the southwest (Figure 10), which is estimated to be attributable to the inland flow of groundwater associated with high tide. Based on the August 25 water level measurements, the inland influence of tidal fluctuation on groundwater levels is approximately 380 feet on the southern portion of the SIA and is approximately 260 feet on the northern portion of the

SIA. Groundwater surface elevation contours and flow direction calculated on August 25, are depicted on Figure 10.

The presence of LNAPL was observed on August 25 in monitoring wells MW-16 through MW-22, MW-26 through MW-29 and MW-35 (Table 9). The thickness of LNAPL as cutting oil on the northern portion of the SIA on August 25, 2009 ranged from 0.09 (MW-19) to 9.35 feet (MW-29) (Figure 3.2.1.4). The plume of LNAPL as hydraulic oil on the southeastern portion of the SIA was observed in monitoring well MW-35 at a thickness of 6.41 feet (Table 9).

3.2.1.5 December 2009

Groundwater level measurements were taken between 11:30 a.m. and 1:37 p.m. on December 9, 2009. According to NOAA, high tide at the Eighth Avenue South tidal gauge in the Duwamish River was predicted at 10:57 a.m. (NOAA 2009), indicating that the water level measurements were taken just past high tide.

The depth to groundwater was measured on December 9 and ranged from 9.15 (MW-5) to 14.78 feet (MW-7) below the top of the monitoring well casing in monitoring wells with no measureable thickness of LNAPL (Table 9). The groundwater flow direction and approximate hydraulic gradient were calculated from the depth to groundwater data in monitoring wells with no LNAPL (Table 9). The groundwater flow direction on the eastern portion of the SIA is to the south at an average hydraulic gradient of 0.0006 foot per foot; the groundwater flow direction on the western portion of the SIA is to the east at an average hydraulic gradient of 0.0063 foot per foot (Figure 11), which appears to be tidally influenced. Based on the December 9 depth to groundwater measurements, the inland influence of tidal fluctuation on groundwater is approximately 440 feet on the southern portion of the SIA and is approximately 250 feet on the northern portion of the SIA. Groundwater surface elevation contours and flow direction calculated on December 9 are depicted on Figure 11.

The presence of LNAPL was measured on December 9 in monitoring wells MW-16 through MW-22, MW-27 through MW-29, and MW-35 (Table 9). The thickness of LNAPL, previously identified to be cutting oil, on the northern portion of the SIA on December 9 ranged from 0.89 (MW-18) to 10.32 feet (MW-29; Figure 11). The plume of LNAPL, previously identified to be hydraulic oil, on the southeastern portion of the SIA was measured in monitoring well MW-35 at a thickness of 7.11 feet (Table 9).

3.2.2 Groundwater Analytical Results

This section presents the laboratory analytical results for each of the Ecology-approved COIs of groundwater samples collected at the SIA during between January 2008 and December 2009 as part of the Data Gap Investigation activities.

3.2.2.1 Petroleum Hydrocarbons

Concentrations of TPH were not detected in groundwater at concentrations exceeding the Ecology-approved screening levels. The laboratory analytical results for TPH in groundwater are summarized in Table 10.

3.2.2.2 Dissolved Metals

The following dissolved metals were detected at concentrations exceeding the Ecology-approved screening levels:

- Zinc was detected in the groundwater sample collected during the February 2009 groundwater monitoring and sampling event at monitoring well MW-45
- Nickel was detected in the reconnaissance groundwater samples collected from borings SB-13 and SB-14
- Nickel was detected in the groundwater sample collected during the February 2009 and December 2009 groundwater monitoring and sampling event at monitoring well MW-44

Besides these detections, the laboratory analytical results did not detect concentrations of metals in groundwater exceeding the Ecology-approved screening levels. The laboratory analytical results for metals in groundwater are provided in Tables 11 and 12.

3.2.2.3 Semivolatile Organic Compounds

The laboratory analytical results did not detect concentrations of SVOCs in groundwater exceeding the Ecology-approved screening levels with the exception of bis(2-ethylhexyl)phthalate, which was detected in groundwater samples collected from monitoring wells MW-5, MW-10, and Boeing monitoring well PL2-JF04A located on the SIA (Table 13).

3.2.2.4 Polycyclic Aromatic Hydrocarbons

Concentrations of PAHs exceeding the Ecology-approved screening levels were detected during one or more of the groundwater monitoring and sampling events at monitoring wells MW-9, MW-31, MW-37, and MW-46. The PAHs detected at concentrations exceeding the Ecology-approved screening levels include naphthalene, acenaphthene, fluorene, phenanthrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene (Table 14).

3.2.2.5 Halogenated Volatile Organic Compounds

The laboratory analytical results of groundwater samples collected from monitoring wells and reconnaissance groundwater samples collected from borings at the SIA did not detect concentrations of HVOCs exceeding the Ecology-approved screening levels. Groundwater data provided by Boeing for monitoring wells located on the SIA indicates concentrations of vinyl chloride exceeding the Ecology-approved screening levels in Boeing monitoring wells PL2-JF01AR and PL2-JF01B (Table 15).

3.2.2.6 Polychlorinated Biphenyls

The groundwater sample collected from monitoring well MW-6 during the January and February 2008 groundwater monitoring and sampling event was analyzed for PCBs to confirm the suspected false positive detected in 2003. The laboratory analytical results did not detect PCBs in groundwater above the laboratory PQL (Table 16).

3.3 Stormwater

The laboratory analytical results for stormwater samples collected on May 6 and August 13, 2009 as part of the Data Gap Investigation activities are discussed in the following sections. The laboratory analytical results are compared to the Ecology-approved screening levels and the NPDES benchmark values (the rationale for this additional screening is provided in Section 1.2). The laboratory analytical results are summarized in Table 1. Laboratory analytical reports for the May 6 and August 13 sampling events are included in Appendix C.

3.3.1 Outfall 001

The laboratory analytical results of stormwater samples collected from Outfall 001 detected concentrations of dissolved arsenic, copper, and zinc exceeding the Ecology-approved screening levels during one or more of the stormwater sampling events (Table 1). All other detected concentrations of COIs above the laboratory PQLs are below Ecology-approved screening levels (Table 1).

Concentrations of total copper and zinc detected in the stormwater samples collected during both of the sampling events from Outfall 001 exceed the NPDES benchmark values (Table 1). All other measured values or detected concentrations above the laboratory PQLs are below the NPDES benchmark values (Table 1).

The laboratory analytical results of accumulated groundwater samples collected from the Vacuum De-gassing Pit pump discharge reservoir did not detect concentrations of TPH, metals, VOCs, or SVOCs above the Ecology-approved screening levels. The reported turbidity collected from the discharge reservoir on August 13 exceeds the NPDES benchmark value (Table 1).

3.3.2 Outfall 002

Stormwater samples were collected from the Outfall 002 drainage system at the discharge location, an upgradient vault location, and roof runoff locations. The results for each of these locations are discussed in the following subsections.

3.3.2.1 Outfall 002 Discharge and Upgradient Vault

The laboratory analytical results of stormwater samples collected from Outfall 002 detected concentrations of dissolved chromium and copper exceeding the Ecology-approved screening levels (Table 1) at both the discharge location and upgradient vault location. All other detected concentrations of COIs above the laboratory PQLs are below the Ecology-approved screening levels (Table 1).

The measured pH in the outfall discharge sample collected on May 6 exceeds the NPDES benchmark value. The measured turbidity and detected concentrations of total copper and zinc in the upgradient vault location collected on August 13 exceed the NPDES benchmark value. All other measured values or detected concentrations above the laboratory PQLs are below the NPDES benchmark values.

As discussed in Sections 2.7.1 and 2.9, a portion of the Outfall 002 is partially plugged in an upgradient location. For this reason, the sample results collected from the end pipe on May 6 may not be representative of stormwater inputs to this outfall. The collection of the samples from different locations (the discharge location and upgradient vault location) may have also affected the identified concentration differences at the two locations.

3.3.2.2 Outfall 002 Roof Runoff Results

Four stormwater samples were collected from roof runoff within the drainage area for Outfall 002 (Figure 4). The laboratory analytical results detected concentrations of dissolved cadmium, copper, and nickel exceeding the Ecology-approved screening levels. All other detected concentrations of dissolved metals above the laboratory PQLs are below the Ecology-approved screening levels (Table 1). The detected concentrations of total metals are below the NPDES benchmark values.

3.3.3 Outfall 003

Stormwater samples were collected from the Outfall 003 drainage system from the discharge location, an upgradient manhole location, and roof runoff locations. The results for each of these locations are discussed in the following subsections.

3.3.3.1 Outfall 003 Discharge

The laboratory analytical results of stormwater samples collected from the Outfall 003 discharge location detected the following COIs in stormwater during one or both of the sampling events at concentrations exceeding the Ecology-approved screening levels dissolved metals (chromium, nickel, zinc, and copper) and dissolved benzo(a)anthracene and chrysene. All of the other detected concentrations of COIs above the laboratory PQLs are below the Ecology-approved screening levels (Table 1).

The measured turbidity and detected concentrations of total copper and total zinc exceeded the NPDES benchmark value in the stormwater samples collected from Outfall 003 during both sampling events (Table 1). All other measured values or detected concentrations above the laboratory PQLs are below the NPDES benchmark values.

A duplicate sample was collected from the Outfall 003 discharge immediately following the initial sample during the May 6 sampling event. The results of the duplicate are consistent with the primary sample. The duplicate results are provided in Table 1.

3.3.3.2 Roof Runoff Results

Four stormwater samples of roof runoff were collected from within the Outfall 003 drainage area (Figure 4). The laboratory analytical results detected concentrations of dissolved cadmium, copper, lead, nickel, and zinc exceeding the Ecology-approved screening levels. All other detected concentrations of COIs above the laboratory PQLs are below the Ecology-approved screening levels (Table 1).

The detected concentrations of total copper in the roof runoff samples collected from within the Outfall 003 drainage area exceed the NPDES benchmark value. Detected concentrations of total zinc exceeded the NPDES benchmark value in three of the four samples. Detected concentrations of total lead are below the NPDES benchmark value (Table 1).

3.3.3.3 Subsurface Manhole Stormwater Results

The laboratory analytical results of stormwater samples collected from the manhole station AJF-MHMS (Figure 4), which is considered representative of roof runoff from the Machine

Shop Area and limited roadway runoff, detected concentrations of dissolved copper, nickel, benzo(a)anthracene, and chrysene exceeding the Ecology-approved screening levels during one or both of the sampling events (Table 1). The laboratory analytical results of stormwater samples collected from the manhole station AJF-MHFS that are considered representative of roof runoff from the Forge Shop Area detected concentrations of dissolved copper, nickel, and zinc exceeding the Ecology-approved screening levels during one or both of the sampling events. All of the other detected concentrations of COIs above the laboratory PQLs are below the Ecology-approved screening levels (Table 1).

The measured turbidity and concentrations of total copper and zinc in the stormwater sample from the manhole station AJF-MHFS (Figure 4) collected on August 13, which is considered representative of roof runoff from the Forge Shop Area, exceeds the NPDES benchmark value (Table 1.2). All other measured values or detected concentrations above the laboratory PQLs are below the NPDES benchmark values.

3.4 Production Byproducts

The laboratory analytical results of the non-magnetic grinding material collected from the relocated Swarf Stockpile Area as part of the Data Gap Investigation are summarized in Table 17 and compared to the Ecology-approved screening levels defined in the SCER (Anchor and Farallon 2008a). The laboratory analytical results for the May 6, 2009, sample identified concentrations of copper exceeding the screening level. The laboratory analytical results of the sample collected on August 13, 2009, detected concentrations of chromium, nickel, and silver exceeding the screening level. All other detections above the PQL were below the Ecology-approved screening levels.

Discussions with Jorgensen Forge personnel indicated that the non-magnetic grinding composition—and therefore chemistry—will vary significantly among products being processed depending on the particular metallurgical make-up required by the customer. The differences in metals concentrations identified during the two sampling events were not unexpected, due to the significant variability in the range of alloys being processed at any one time.

4 CONCEPTUAL SITE MODEL

A conceptual site model is considered dynamic and is refined as additional information becomes available. The conceptual site model presented in the SCER identified potential sources of COIs and migration pathways on the SIA and defined data gaps that precluded the determination of whether the SIA is an on-going source of chemicals to the LDW (Anchor and Farallon 2008a). The conceptual site model has been revised based on the additional data collected from the Data Gap Investigation to evaluate the potential sources of COIs to the LDW through completed pathways on the SIA. The updated conceptual site model is described in the following sections.

4.1 Sources of Chemicals of Interest

The SCER identified primary potential sources and secondary potential sources of COIs at the SIA (Anchor and Farallon 2008a). The primary potential sources are defined as existing sources that could directly result in chemicals impacting the LDW sediment and surface water or could directly contribute to a secondary potential source. The secondary potential sources are defined as media on the SIA that contain concentrations of COIs from historic and on-going activities that have the potential to impact sediments and surface water of the LDW through an indirect release.

The SCER identified the nature and extent of COIs in the secondary potential sources, including soil, groundwater, catch basin solids, and LNAPL, at specific areas of the SIA as a data gap (Anchor and Farallon 2008a). The specific areas identified as data gaps (Figure 1) include:

- Southern Facility boundary
- Forge Shop Area and Melt Shop Area
- Central portion of the SIA
- Vicinity of the Former Acid House and Former Acid Quench Pit
- Former Swarf Stockpile Area

4.2 Nature and Extent

This section briefly summarizes the nature and extent of COIs in secondary potential source media collected from each of the areas discussed in Section 4.1. A more detailed summary of the data for each COI in each media is described in Section 3 of this SCER Addendum. Section 4.4 presents the migration pathway analysis for COIs detected in secondary potential source media at concentrations exceeding the Ecology-approved screening levels.

4.2.1 Southern Facility Boundary

Concentrations of TPH, metals, VOCs, and SVOCs were not detected in soil or groundwater exceeding the Ecology-approved screening levels along the southern Facility boundary except for the following:

- Chromium and nickel in soil collected at depths of 6 to 15.5 feet bgs at borings MW-37, MW-38, and/or MW-39 (Table 4)
- Acenapthene detected in groundwater collected from monitoring well MW-37 in February, May, and August 2009 (Table 14)

4.2.2 Forge Shop Area and Melt Shop Area

Concentrations of TPH, metals, VOCs, and SVOCs were not detected in soil or groundwater exceeding the Ecology-approved screening levels in the Forge Shop Area and Melt Shop Area except for the following:

- Dissolved nickel and zinc in the groundwater samples collected from monitoring wells MW-44 and MW-45, respectively, in February 2009 (Table 11)
- Dissolved nickel in the groundwater sample collected from monitoring well MW-44 in December 2009 (Table 11)

4.2.3 Central Portion of the Sediment Investigation Area

Concentrations of metals, TPH, VOCs, and SVOCs were not detected in soil or groundwater exceeding the Ecology-approved screening levels in the central portion of the SIA except for the following COIs in the groundwater samples collected from monitoring well MW-46

- Naphthalene (May and December 2009)
- Acenaphthene and fluorene (February, May, August, and December 2009)

- Phenanthrene (December 2009; Table 14)

4.2.4 *Vicinity of the Former Acid House and Former Acid Quench Pit*

Concentrations of metals TPH, VOCs, and SVOCs were not detected in soil or groundwater exceeding the Ecology-approved screening levels in the vicinity of the Former Acid House and Former Acid Quench Pit area except for the following:

- Chromium and nickel in soil collected at depths of 8 and/or 12 feet bgs from borings SB-13 and SB-14 (Table 4)
- Nickel in the reconnaissance groundwater sample collected from borings SB-13 and SB-14 (Table 12)

The laboratory analytical results for soil pH indicate that the pH of soil collected in the vicinity of the Former Acid House/Former Acid Quench Pit range from 6.6 to 8.4 (Table 18). The measured pH values for groundwater ranged from 6.77 to 7.28 (Table 18).

4.2.5 *Former Swarf Stockpile Area*

Concentrations of metals were not detected in soil exceeding the Ecology-approved screening levels in the Former Swarf Stockpile Area (Tables 4 and 5).

4.3 Source Chemicals of Interest

Ecology agreed that COIs are present in primary or secondary sources on the SIA at concentrations that exceed the Ecology-approved screening levels and represent an ongoing source to the LDW, if there is a mechanism for the COIs to reach the LDW. Those COIs include:

- PCBs
- TPH
- Arsenic, cadmium, chromium, copper, nickel, lead, and zinc
- PAHs

This section evaluates the possible transport mechanism for these COIs to potentially migrate to the LDW.

4.4 Migration Pathway Analysis

The SCER identified the following migration pathways from the SIA to the LDW:

- Direct discharge of COIs to the LDW by airborne dust and particulates, wastewater discharge, and LNAPL migration
- Stormwater with concentrations of COIs discharging to the LDW
- Discharge of groundwater with concentrations of COIs to the LDW
- Erosion of solids with concentrations of COIs to the LDW (Anchor and Farallon 2008a)

A migration pathway is considered complete if there is a source of COIs at concentrations that could result in exceedances of the sediment and surface water screening levels, and if there is a pathway for the source of COIs to reach the LDW. The SCER identified data gaps necessary to determine whether there were sources of COIs associated with each of the above migration pathways and therefore if the pathway is complete. Each of the pathways has been re-evaluated using the additional information collected by the Data Gap Investigation, as summarized in the following subsections.

4.4.1 Direct Discharge Pathway

The SCER concluded that SIA airborne dust and particulates are controlled by BMPs (Anchor and Farallon 2008a); therefore, there is not a complete migration pathway for airborne dust and particulates to reach the LDW from the SIA.

Wastewater at the SIA discharges directly to the King County Metro sewer system, with the exception of fugitive stormwater that accumulates in the Railroad Scale Vault and groundwater that migrates into the Vacuum De-gassing Pit and is subsequently discharged to the LDW via Outfall 001. The SCER identified the nature and extent of COIs in the water that accumulates in the Railroad Scale Vault and the Vacuum De-gassing Pit as a data gap (Anchor and Farallon 2008a). During the data gaps investigation, concentrations of COIs in accumulated water in the Vacuum De-gassing Pit pump discharge reservoir were not detected above the Ecology-approved screening levels; therefore, direct discharge of groundwater that enters the pit is not a complete migration pathway to the LDW. The Railroad Scale Vault did not contain sufficient accumulated water to sample during two variable intensity rainfall events (Appendix F) indicating this migration pathway is incomplete to the LDW.

The SCER concluded that there was insufficient information to determine whether LNAPL at the SIA is a source of COIs to the LDW (Anchor and Farallon 2008a), so additional monitoring wells were installed in the central and western portion of the SIA during the Data Gap Investigation to further delineate the plumes on the SIA. Previous investigations, as well as additional monitoring conducted during the data gaps investigation, confirmed two distinct plumes of LNAPL exist on groundwater that are limited to the release source areas on the eastern portion of the SIA. LNAPL has not been identified in any of the 17 groundwater monitoring wells located on the western portion of the SIA, including the shoreline wells.

The additional information collected during the data gaps investigation more fully defined the lateral extent of the LNAPL on the SIA and confirmed that the LNAPL plumes are not migrating to the LDW and there is currently no potential for LNAPL to discharge to the LDW. The direct discharge of LNAPL is not a complete migration pathway to the LDW.

The direct discharge pathway is only complete for uncontrolled releases or spills from on-going operations. This migration pathway is controlled by the existing and on-going BMPs.

4.4.2 Stormwater Discharge

The SCER identified direct discharge of stormwater as a complete migration pathway for COIs to reach the LDW. The data gaps identified by the SCER included the nature and extent of COIs in stormwater that accumulates in subsurface pits and vaults that may eventually discharge to the LDW via Outfalls 001, 002, and 003. Gaps identified also included the effectiveness of existing BMPs to control the impacts of the storage, distribution, and incidental releases of petroleum products on the SIA (Anchor and Farallon 2008a).

As discussed in Section 4.5, the laboratory analytical results of accumulated water samples collected from subsurface pits and vaults that are subsequently conveyed through Outfall 001 did not detect concentrations of COIs exceeding the Ecology-approved screening levels. These results confirm that the water accumulated in the subsurface features on the SIA are not a source of COIs to the LDW.

The laboratory analytical results for Outfall 001, 002, and 003 stormwater discharges and roof runoff conveyed to Outfall 002 and 003 detected concentrations exceeding the Ecology-approved screening levels for dissolved cadmium, chromium, copper, lead, nickel, and zinc and for the NPDES benchmark values for total copper and zinc and turbidity (Table 1).

Concentrations of TPH were not detected in stormwater samples collected for the Data Gap Investigation. These results indicate that the existing BMPs are effective at controlling petroleum compounds within the stormwater system to prevent discharge to the LDW.

4.4.3 Groundwater Discharge

The SCER identified discharge of groundwater to the LDW as an incomplete pathway based on a detailed evaluation of historic groundwater data that confirm that COIs have not been detected at concentrations exceeding the Ecology-approved screening levels in groundwater (Anchor and Farallon 2008a). The lack of groundwater data for SVOCs and the impacts of potential source areas located along the southern Facility boundary and in the Forge Shop Area and the Melt Shop Area to groundwater were identified as data gaps for evaluation of this pathway.

Concentrations of the following COIs were detected in groundwater exceeding the Ecology-approved screening levels during the Data Gap Investigation:

- Dissolved zinc at monitoring well MW-45
- Dissolved nickel at borings SB-13 and SB-14 and monitoring well MW-44
- PAHs in monitoring well MW-10, MW-31, MW-37, and MW-46
- Bis(2-ethylhexyl)phthalate in monitoring wells MW-5, MW-10, and PL2-JF04A
- Vinyl chloride in monitoring wells PL2-JF01AR and PL2-JF01B

As documented in the SCER, the sporadic detections of dissolved nickel and zinc in groundwater at concentrations exceeding the Ecology-approved screening levels at the SIA are attributable to naturally occurring metals in groundwater and are not likely associated with releases on the SIA (Anchor and Farallon 2008a). Specifically, the laboratory analytical results detected concentrations of zinc in the groundwater sample collected from monitoring well MW-45 in February 2009. The single detection of zinc, at a concentration of 39 micrograms per liter (µg/l) only slightly exceeds the Ecology-approved screening level of 33 µg/l for zinc, and is the only result in which zinc was detected above the laboratory PQL. The results of subsequent groundwater monitoring and sampling events did not detect zinc above the laboratory reporting limit in groundwater samples collected from monitoring well MW-45. The laboratory analytical results did not detect concentrations of zinc above the laboratory reporting limit in any of the other 87 groundwater samples collected as part of the Data Gap Investigation.

Similarly, concentrations of nickel exceeding the Ecology-approved screening level of 8.2 µg/l were only detected in the reconnaissance groundwater samples collected from borings SB-13 and SB-14 and in groundwater samples collected from monitoring well MW-44 in February and December 2009. The detected concentrations of nickel in the reconnaissance groundwater samples collected from borings SB-13 and SB-14 (23 µg/l and 66 µg/l, respectively) are higher than those detected in the groundwater samples collected from monitoring well MW-44 (8.5 µg/l and 11 µg/l, respectively). The higher detected concentrations of nickel in reconnaissance groundwater samples are likely associated with greater volumes of total suspended solids that are typically present in groundwater samples collected from temporary wells. This is because of the absence of a sand pack around the screened interval of a permanent monitoring well that has been adequately developed to filter fine solid material from the surrounding formation. The laboratory analytical results did not detect concentrations of nickel above the laboratory reporting limit in any of the other 84 groundwater samples collected as part of the Data Gap Investigation.

The concentrations of PAHs detected in groundwater exceeding the Ecology-approved screening levels are limited to groundwater on the eastern portion of the SIA. The laboratory analytical results of groundwater samples collected from monitoring wells located between monitoring wells located on the eastern portion of the SIA and the LDW, including the line of shoreline monitoring wells, did not detect concentrations of PAHs above the

Ecology-approved screening levels. These results confirm that the discharge PAHs to the LDW via groundwater is not a complete migration pathway.

The source of concentrations of bis(2-ethylhexyl)phthalate, an SVOC, detected in groundwater samples collected from monitoring wells MW-5, MW-10, and PL2-JF04A above the Ecology-approved screening level are unknown but do not appear to be associated with operations on the SIA. Bis(2-ethylhexyl)phthalate was not detected in groundwater above the laboratory PQL in any of the other monitoring wells located on the SIA nor was bis(2-ethylhexyl)phthalate detected in any of the soil samples collected from the SIA above the laboratory PQL or the Ecology-approved screening level. The concentrations of bis(2-ethylhexyl)phthalate detected above the Ecology-approved screening level do not pose a risk to sediment or surface water quality in the LDW and bis(2-ethylhexyl)phthalate is not considered a COI for the SIA.

The concentrations of vinyl chloride detected in monitoring wells PL2-JF01AR and PL2-JF01B located on the northwestern portion of the SIA are consistent with the documented plume of HVOCs emanating from Plant 2 that extends across this portion of the SIA (Anchor and Farallon 2008b). The concentrations of HVOCs detected in groundwater on the northwestern portion of the SIA indicate that releases from the 2-66 Area on Plant 2 are a likely source of HVOCs to the LDW. This is evidenced by detected concentrations of HVOCs in sediment porewater offshore the northwest corner of the SIA and southwest corner of Plant 2 (Windward 2006). The conditions on the SIA do not contribute to or exacerbate the release of HVOCs present in groundwater to sediment or surface water of the LDW. For this reason, Jorgensen Forge anticipates that source control measures being conducted and planned for Plant 2 will address the groundwater plume of HVOCs that extends across the northwestern portion of the SIA and no additional source control actions are necessary by the Jorgensen Forge.

4.4.4 Erosion of Solids

The SCER identified erosion of shoreline bank soil, and contaminated fill, waste piles, and surface impoundments (collectively referred to as solids) on the SIA and subsequent transport through the stormwater system as a complete migration pathway for COIs to the

LDW. The SCER concluded that the physical condition of the shoreline bank significantly limits the potential erosion of bank fill material and the direct deposition of eroded soils containing concentrations of COIs to the LDW (Anchor and Farallon 2008a). The erosion of exposed soil on the SIA and transport via the stormwater system, however, is a completed pathway that is controlled by BMPs.

The Data Gap Investigation included an evaluation of the composition of production byproducts (non-magnetic grinding material) stored in the relocated Swarf Stockpile Area (moved from the former location just west of the melt bag house to a location much more removed from the LDW shoreline just west of the billet grinding bag house) and an investigation of the nature and extent of COIs in shallow surface soil that is exposed to erosion and subsurface soil.

The composition of the relocated Swarf Stockpile Area consists of non-magnetic grinding material created by the forging process. The laboratory analytical results showed concentrations of copper, chromium, nickel and silver above the Ecology-approved screening levels. Recent Facility improvements included relocation of the stockpile to the south-central portion of the SIA, construction of impoundment measures around the relocated Swarf Stockpile Area, and modification of the stormwater system to ensure that surface water runoff in the vicinity of the relocated Swarf Stockpile Area is no longer drained through the stormwater outfalls. These BMPs are effective at reducing potential non-magnetic grindings from entering the stormwater drainage system and preventing discharge to the LDW.

The laboratory analytical results of shallow soil samples collected from the exposed soil in the vicinity of the Former Swarf Stockpile Area did not detect concentrations of metals exceeding the Ecology-approved screening levels. Based on these data, there is no potential source of chemicals to the LDW through the erosion of solids in the vicinity of the Former Swarf Stockpile Area.

5 CONCLUSIONS

Earle M. Jorgensen, former owner and operator of the Facility, and EPA have executed an amended Administrative Order on Consent (AOC) for preparation of an Engineering Evaluation/Cost Analysis (EE/CA) for cleanup of sediments along a portion of the LDW, adjacent to the SIA (EPA 2010b). The Source Control Investigation at the Facility, consisting of the Source Control Investigation documented in the SCER (Anchor and Farallon 2008a) and the Data Gap Investigation documented in this SCER Addendum, has been conducted and sequenced so that the nature and extent of any potential ongoing sources of chemicals from the uplands to the adjacent sediment will be controlled prior to initiation of the EE/CA sediment cleanup activities to minimize the potential for sediment recontamination from the SIA. The conclusions of the Source Control Investigation are described in this section.

The SCER sufficiently addressed data gaps identified by Ecology for the SIA, including the extent of arsenic contamination on the southeast portion of the SIA associated with former operations on the Boeing-Isaacson Property, and the geochemical effects of TPH in soil on the redox potential of groundwater and subsequent precipitation of arsenic. The results of the Data Gap Investigation further support the results of the Source Control Investigation by demonstrating that arsenic is not present in soil or groundwater on the SIA at concentrations that pose a risk to the LDW. The additional data gaps presented by Ecology, as well as those identified in the SCER, were addressed by the Data Gap Investigation and are summarized in this section.

The potential migration pathways from the SIA to the LDW include direct discharge, stormwater discharge, discharge of groundwater, and erosion of solids. Sufficient information has been obtained through the Source Control Investigation to determine if each of these potential migration pathways has the potential to result in concentrations of COIs in sediment and surface water in the LDW above regulatory screening levels.

The results of the Source Control Investigation, including the information obtained through the Data Gap Investigation, indicate the following ongoing or potential future sources of COIs to the LDW from the SIA and recommended path forward for source control implementation:

- Direct discharge of COIs in byproducts associated with ongoing operations on the SIA to the stormwater system with subsequent discharge to the LDW through SIA Outfalls 001, 002, or 003
  - No additional source control implementation is necessary for this pathway beyond continued implementation of BMPs.
- Erosion of exposed soil containing COIs to the stormwater system with subsequent discharge to the LDW through SIA Outfalls 001, 002, or 003
  - No additional source control implementation is necessary for this pathway beyond the continued implementation of existing BMPs.
- Discharge of SIA stormwater to the LDW through Outfalls 001, 002, or 003 containing concentrations of metals
  - Additional source control implementation is necessary by Jorgensen Forge beyond the continued implementation of existing BMPs.

Further detail for each of these ongoing or potential future sources of COIs to the LDW are discussed in the following sections.

5.1 Direct Discharge

Airborne dust and particulates may be generated directly by current operations and are managed through BMPs and do not represent a source to LDW. The discharge of wastewater, consisting of stormwater runoff and groundwater that accumulates in subsurface features on the SIA, does not contain concentrations of any of the COIs exceeding the Ecology-approved screening levels and does not represent a source to the LDW. The nature and extent of LNAPL on groundwater at the SIA has been evaluated and delineated and does not represent a source to the LDW.

The migration pathway for direct discharge of COIs to the LDW is incomplete, with the exception of the potential for uncontrolled releases of products associated with ongoing operations on the SIA. The potential for releases of byproducts is minimized through the implementation of BMPs, as described in detail in the SCER. Additionally, the Spill Control Plan (Appendix C of the SCER) describes measures to reduce the potential for surface and subsurface releases of products containing COIs and provides mitigation measures to reduce impacts if a spill should occur (Anchor and Farallon 2008a).

5.2 Stormwater Discharge

The discharge of stormwater is a confirmed migration pathway for metals to reach the LDW from the existing stormwater drainage system. The results of the Data Gap Investigation indicate that the existing BMPs are sufficient to control fugitive releases of petroleum products associated with ongoing operations and reduce the volume of accumulated solids in the stormwater system, including solids attributable to the erosion and subsequent deposition of exposed surface soil.

The concentrations of metals in stormwater conveyed from runoff from driveways and parking areas and metal fabricated building and roofing materials located at the SIA were detected above the Ecology-approved screening levels identified in the SCER and the NPDES Permit benchmark values. Additional source control implementation is necessary to decrease stormwater discharges of metals from the SIA to concentrations below target levels that are protective of sediment and surface water quality. Due to the NPDES Permit benchmark value exceedances for metals (Section 1.2) and in accordance with Section S8 of the Permit, Jorgensen Forge is currently in the process of conducting a Level Three Corrective Action. The Level Three Corrective Action includes the following activities:

- Review of the Stormwater Pollution Prevention Plan (SWPPP) to make sure it fully complies with Section S3 of the NPDES Permit
- Completion of additional source tracing and loading evaluations at the SIA to identify the sources and loadings of COIs to the stormwater drainage to minimize these sources through the implementation of additional operational and structural BMPs
- Design and construction of a stormwater treatment system necessary to reduce stormwater discharge concentrations to levels are protective of both surface water quality and sediment quality in the LDW.

The design and construction of the stormwater treatment system will be completed prior to implementation of the EE/CA sediment remedy in late 2012.

5.3 Groundwater Discharge

The migration pathway for discharge of groundwater is incomplete because concentrations of COIs have not been detected in groundwater exceeding the Ecology-approved screening levels, with the exception of those COIs periodically detected in groundwater collected from single monitoring wells located in discrete areas of the SIA. As discussed in Section 4.7, the COIs detected in groundwater exceeding the Ecology-approved screening levels do not pose a risk to the sediment or surface water of the LDW.

The potential ongoing sources to groundwater include releases of products to groundwater, leaching from soil to groundwater and dissolution of LNAPL. The potential for releases of products to soil and groundwater is minimized through the implementation of BMPs and the Spill Control Plan (Appendix C of the SCER; Anchor and Farallon 2008a). Sufficient data has been collected to demonstrate that there is no dissolution of LNAPL to groundwater.

5.4 Erosion of Solids

The erosion of exposed soil to the stormwater system and subsequent discharge of stormwater to the LDW is an ongoing potential migration pathway for concentrations of COIs to the LDW. The erosion of exposed soil to the stormwater system is minimized through the implementation of BMPs on the SIA. The results of the Data Gap Investigation indicate that the existing BMPs are effective at reducing the volume of accumulated solids in the stormwater system, including solids attributable to the erosion and subsequent deposition of exposed surface soil. Any additional operational and source control BMPs and the installation of a stormwater treatment system (see Section 5.2) will further minimize or eliminate this migration pathway.

The erosion of exposed soil, containing elevated concentrations of PCBs and metals, along the shoreline bank is an incomplete pathway to the LDW because of the current condition of the shoreline, which significantly limits any potential erosion of bank fill material. In addition, the currently proposed removal action alternative identified in the Final EE/CA (Anchor QEA 2011) includes the reconfiguration of the entire shoreline bank area with erosion potential to a gentler slope followed by placement of a 3-foot layer of clean, containment material to eliminate the shoreline erosion pathway.

6 REFERENCES

Anchor Environmental, LLC (Anchor), and Farallon Consulting, LLC (Farallon), 2008a. Final Source Control Evaluation Report. Prepared on behalf of Jorgensen Forge Corporation for submittal to the Washington State Department of Ecology. May 2008.

Anchor and Farallon, 2008b. Data Gap Investigation Work Plan. Prepared on behalf of Jorgensen Forge Corporation for submittal to the Washington State Department of Ecology. May 2008.

Anchor QEA, LLC, 2010. Historical 6-inch and 12-inch Lateral Pipes Investigation Report – Stormwater Source Control Implementation, Jorgensen Forge Facility, Seattle, Washington. Prepared for the Jorgensen Forge Corporation. December 2010.

Anchor QEA, 2011. Final Engineering Evaluation/Cost Analysis. Prepared for the U.S. Environmental Protection Agency, Region 10. On Behalf of Earle M. Jorgensen Company and Jorgensen Forge Corporation. March 2011.

ATSDR (Agency for Toxic Substances and Disease Registry), 2002. Toxicological Profile for Di(2-ethylhexyl) phthlate. Update. Atlanta, Georgia: U.S. Department of Health and Human Services, Public Health Service.

Ecology (Washington State Department of Ecology), 2007. Agreed Order No. DE 4127. Source Control Agreed Order for Jorgensen Forge. Signed July 12, 2007.

Ecology, 2009. Industrial Stormwater General Permit. October 21, 2009.

EPA (U.S. Environmental Protection Agency), 2010a. Memorandum with subject: Action Memorandum for the Jorgensen Forge Outfall Site, Seattle, King County, Washington. Prepared for Daniel D. Opalski, Director of Environmental Cleanup. September 30.

EPA, 2010b. Administrative Order on Consent for Removal Action: Jorgensen Forge Outfall Site. U.S. EPA Region 10 CERCLA Docket No. 10-2011-0017. December.

Floyd Snider, 2010. Source Control Action Plan – 15-inch and 24-inch Pipes Cleanout Work Plan. Prepared for The Boeing Company. December 17, 2010.

NOAA (National Oceanic and Atmospheric Administration), 2009. Tides & Currents, 2009 Water Level Tidal Predictions, Washington State, Puget Sound, Edmonds, Seattle, Des Moines Area, Duwamish Waterway, Eighth Avenue So., Predictions. Last accessed at http://tidesandcurrents.noaa.gov/tides09/tab2wc1b.html#137. April 30, 2009.

Windward (Windward Environmental, LLC), 2006. Data and Analysis Report: Porewater Sampling of Lower Duwamish Waterway – Final. Prepared for the U.S. Environmental Protection Agency and the U.S. Washington State Department of Ecology. March 2006.

TABLES

Table 1
Data Gaps Investigation Subsurface Vault and Pit Water and Stormwater Sampling Results

	Source Control Evaluation Screening Levels	NPDES Benchmark Values[d]	Outfall 001 Drainage				Outfall 002 Drainage					
Location ID			Outfall 001	Outfall 001	Vacuum De-gassing Pit	Vacuum De-gassing Pit	Outfall 002	Outfall 002	East Forge Shop Roof	East Forge Shop Roof	West Forge Shop Roof	West Forge Shop Roof
Sample ID			AJF-010D-090506	AJF-010D-090813	AJF-01VDP-090506	AJF-01VDP-090813	AJF-020D-090506	AJF-020D-090813	AJF-RFSE-090506	AJF-RFSE-090813	AJF-RFSW-090506	AJF-RFSW-090813
Sample Date			5/6/2009	08/13/2009	5/6/2009	08/13/2009	5/6/2009	08/13/2009	5/6/2009	08/13/2009	5/6/2009	08/13/2009
Description			Outfall 001 Upgradient Vault	Outfall 001 Upgradient Vault	Vacuum De-gassing Pit Groundwater Discharge Into Cold Well	Vacuum De-gassing Pit Groundwater Discharge Into Cold Well	Outfall 002 Discharge	Outfall 002 Upgradient Vault	Roof Runoff East Portion of Forge Shop	Roof Runoff East Portion of Forge Shop	Roof Runoff West Portion of Forge Shop	Roof Runoff West Portion of Forge Shop
Conventional Parameters (µmhos/cm)												
Conductivity	--	--	**54**	**36**	--	--	**270**	**75**	--	--	--	--
Conventional Parameters (su)												
pH	--	5.0 - 9.0	**7.24**	**7.67 J**	--	**7.11 J**	**9.29**	**8.88 J**	--	--	--	--
Conventional Parameters (ntu)												
Turbidity	--	25	**2 J**	**4.3**	--	**28**	**0.42 J**	**35**	--	--	--	--
Conventional Parameters (mg/L)												
Hardness as CaCO3	--	--	--	--	--	--	--	--	--	--	--	--
Total organic carbon	--	--	**2.9**	**4**	--	--	**4.6**	**7.1**	--	--	--	--
Total Suspended Solids	--	--	2 U	**7.8**	--	**5**	2 U	**98**	2 U	2 U	2 U	2 U
Dissolved Metals (µg/L)												
Arsenic	36[b]	--	**99**	**18**	**1.9 J**	2 U	**5.3**	2 U	2 U	**2 U**	**13**	**6.9**
Cadmium	1.03[a]	--	**0.54 J**	**0.27 J**	2 U	2 U	2 U	2 U	**0.96 J**	**2.6**	2 U	2 U
Chromium	10[a]	--	**7.4**	**4.3**	**3.5**	**0.68 J**	**12**	**11**	**4.8**	**2.6**	**10**	**13**
Copper	3.1[b]	--	**10**	**14**	**1.8 J**	**0.5 J**	**3.2 J**	**48**	**2.6 J**	**12**	**4.7 J**	**12**
Lead	2.52[a]	--	**0.32 J**	**0.97 J**	2 U	2 U	**0.2 J**	**0.26 J**	2 U	2 U	2 U	2 U
Mercury	--	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	8.2[b]	--	**3.3**	**3.6**	**4.6**	**2.6**	**2.4**	**4.2**	**3.2**	**15**	**1.9 J**	**3.1**
Silver	25900	--	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Zinc	81[b]	--	**170**	**95**	**9.7**	7 U	**4.2 J**	9.9 U	**28**	**44**	**42**	**24**
Total Metals (µg/L)												
Arsenic	--	--	**100**	**20**	**6.1**	**4.7**	**3**	**0.66 J**	2 U	**0.24 J**	**13**	**6.7**
Cadmium	--	--	**0.64 J**	**0.29 J**	2 U	2 U	**0.3 J**	**0.34 J**	**1.2 J**	**2.7**	2 U	2 U
Chromium	--	--	**10**	**50**	**5.1**	6.9 U	**11**	**660**	**3.9**	**14**	**10**	**13**
Copper	--	14	**15**	**19**	**2.5 J**	**1.6 J**	**2.9 J**	**140**	**2.7 J**	**13**	**5.3**	**12**
Lead	--	81.6	**1.4 J**	**15**	**0.32 J**	**0.27 J**	**0.26 J**	**28**	**0.4 J**	**1 J**	**0.5 J**	**0.42 J**
Mercury	0.125[c]	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	--	--	**4.3**	**17**	**4.8**	**5**	**2.3**	**270**	**3.7**	**17**	**2.2**	**3.6**
Silver	--	--	2 U	2 U	2 U	2 U	2 U	**0.2 J**	2 U	2 U	2 U	2 U
Zinc	--	117	**190**	**130**	**5.5 J**	8 U	**3 J**	**320**	**29**	**47**	**43**	**27**
Volatile Organics (µg/L)												
Benzene	22.7	--	1 U	1 U	1 U	1 U	1 U	1 U	--	--	--	--
Ethylbenzene	69100	--	1 U	1 U	1 U	**0.064 J**	1 U	1 U	--	--	--	--
m,p-Xylene	--	--	2 U	2 U	2 U	2 U	2 U	2 U	--	--	--	--
o-Xylene	--	--	1 U	1 U	1 U	1 U	1 U	1 U	--	--	--	--
Toluene	48500	--	1 U	1 U	1 U	1 U	1 U	1 U	--	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/L)												
1-Methylnaphthalene	--	--	0.099 U	0.29 U	**0.046 J**	0.29 U	0.098 U	0.29 U	--	--	--	--
2-Methylnaphthalene	--	--	0.13 U	0.96 U	0.12 U	0.96 U	0.13 U	0.98 U	--	--	--	--
Acenaphthene	643	--	0.099 U	0.48 U	**0.82**	**0.74**	0.098 U	0.49 U	--	--	--	--
Acenaphthylene	--	--	0.099 U	0.38 U	**0.023 J**	0.39 U	0.098 U	0.39 U	--	--	--	--
Anthracene	25900	--	0.099 U	0.19 U	**0.057 J**	**0.053 J**	0.098 U	0.2 U	--	--	--	--
Benzo(a)anthracene	0.0296	--	0.099 U	0.29 U	0.095 U	0.29 U	0.098 U	0.29 U	--	--	--	--
Benzo(a)pyrene	0.0296	--	**0.027 J**	0.19 U	**0.027 J**	0.19 U	**0.027 J**	0.2 U	--	--	--	--
Benzo(b)fluoranthene	0.0296	--	0.099 U	0.38 U	0.095 U	0.39 U	0.098 U	0.39 U	--	--	--	--
Benzo(g,h,i)perylene	--	--	0.099 U	0.29 U	0.095 U	0.29 U	0.098 U	0.29 U	--	--	--	--
Benzo(k)fluoranthene	0.0296	--	0.099 U	0.29 U	0.095 U	0.29 U	0.098 U	0.29 U	--	--	--	--

Table 1

Data Gaps Investigation Subsurface Vault and Pit Water and Stormwater Sampling Results

			Outfall 001 Drainage				Outfall 002 Drainage					
Location ID			**Outfall 001**	**Outfall 001**	**Vacuum De-gassing Pit**	**Vacuum De-gassing Pit**	**Outfall 002**	**Outfall 002**	**East Forge Shop Roof**	**East Forge Shop Roof**	**West Forge Shop Roof**	**West Forge Shop Roof**
Sample ID			**AJF-010D-090506**	**AJF-010D-090813**	**AJF-01VDP-090506**	**AJF-01VDP-090813**	**AJF-020D-090506**	**AJF-020D-090813**	**AJF-RFSE-090506**	**AJF-RFSE-090813**	**AJF-RFSW-090506**	**AJF-RFSW-090813**
Sample Date			**5/6/2009**	**08/13/2009**	**5/6/2009**	**08/13/2009**	**5/6/2009**	**08/13/2009**	**5/6/2009**	**08/13/2009**	**5/6/2009**	**08/13/2009**
Description	**Source Control Evaluation Screening Levels**	**NPDES Benchmark Values^d**	**Outfall 001 Upgradient Vault**	**Outfall 001 Upgradient Vault**	**Vacuum De-gassing Pit Groundwater Discharge Into Cold Well**	**Vacuum De-gassing Pit Groundwater Discharge Into Cold Well**	**Outfall 002 Discharge**	**Outfall 002 Upgradient Vault**	**Roof Runoff East Portion of Forge Shop**	**Roof Runoff East Portion of Forge Shop**	**Roof Runoff West Portion of Forge Shop**	**Roof Runoff West Portion of Forge Shop**
Chrysene	0.0296	--	0.099 U	0.19 U	0.095 U	0.19 U	0.098 U	0.2 U	--	--	--	--
Dibenzo(a,h)anthracene	0.0296	--	0.099 U	0.29 U	0.095 U	0.29 U	0.098 U	0.29 U	--	--	--	--
Fluoranthene	90.2	--	0.099 U	0.24 U	**0.085 J**	**0.076 J**	0.098 U	**0.19 J**	--	--	--	--
Fluorene	3460	--	0.099 U	0.29 U	**0.28**	**0.24 J**	0.098 U	0.29 U	--	--	--	--
Indeno(1,2,3-c,d)pyrene	0.0296	--	0.099 U	0.29 U	0.095 U	0.29 U	0.098 U	0.29 U	--	--	--	--
Naphthalene	49400	--	0.099 U	1.9 U	**0.055 J**	1.9 U	0.098 U	2 U	--	--	--	--
Phenanthrene	--	--	0.099 U	**0.054 J**	**0.048 J**	**0.057 J**	0.098 U	**0.34 J**	--	--	--	--
Pyrene	2590	--	0.099 U	0.29 U	**0.085 J**	**0.07 J**	0.098 U	**0.12 J**	--	--	--	--
Semi-Volatile Organic Compounds (µg/L)									--	--	--	--
1,2,4-Trichlorobenzene	227	--	2 U	1.9 U	1.9 U	1.9 U	2 U	2 U	--	--	--	--
1,2-Dichlorobenzene	4200	--	2 U	1.9 U	1.9 U	1.9 U	2 U	2 U	--	--	--	--
1,3-Dichlorobenzene	--	--	2 U	1.9 U	1.9 U	1.9 U	2 U	2 U	--	--	--	--
1,4-Dichlorobenzene	4.86	--	2 U	1.9 U	1.9 U	1.9 U	2 U	2 U	--	--	--	--
2,4-Dimethylphenol	--	--	5 U	4.8 U	4.7 U	4.8 U	3 U	4.9 U	--	--	--	--
2-Methylphenol (o-Cresol)	--	--	2 U	1.9 U	1.9 U	1.9 U	4 U	2 U	--	--	--	--
3-Methylphenol & 4-Methylphenol (m&p-Cresol)	--	--	4 U	3.8 U	3.8 U	3.9 U	5 U	3.9 U	--	--	--	--
Benzoic acid	--	--	9.9 U	9.6 UJ	9.5 U	9.6 UJ	6 U	**8.5 J**	--	--	--	--
Benzyl alcohol	--	--	2 U	1.9 U	1.9 U	1.9 U	7 U	2 U	--	--	--	--
Bis(2-ethylhexyl) phthalate	3.56	--	15 U	14 U	14 U	14 U	8 U	15 U	--	--	--	--
Butylbenzyl phthalate	1250	--	3 U	**0.94 J**	2.8 U	2.9 U	9 U	**1.7 J**	--	--	--	--
Dibenzofuran	--	--	2 U	1.9 U	1.9 U	1.9 U	10 U	2 U	--	--	--	--
Diethyl phthalate	28400	--	2 U	1.9 U	1.9 U	1.9 U	11 U	2 U	--	--	--	--
Dimethyl phthalate	72000	--	2 U	1.9 U	1.9 U	1.9 U	12 U	2 U	--	--	--	--
Di-n-butyl phthalate	2910	--	2 U	**0.89 J**	1.9 U	1.9 U	13 U	**0.84 J**	--	--	--	--
Di-n-octyl phthalate	--	--	2 U	1.9 U	1.9 U	1.9 U	14 U	2 U	--	--	--	--
Hexachlorobenzene	0.000466	--	2 U	1.9 U	1.9 U	1.9 U	15 U	2 U	--	--	--	--
Hexachlorobutadiene	29.9	--	3 U	2.9 U	2.8 U	2.9 U	16 U	2.9 U	--	--	--	--
Hexachloroethane	--	--	3 U	2.9 U	2.8 U	2.9 U	17 U	2.9 U	--	--	--	--
N-Nitrosodiphenylamine	9.73	--	2 U	1.9 U	1.9 U	1.9 U	18 U	2 U	--	--	--	--
Pentachlorophenol	7.9^b	--	3.5 U	3.4 U	3.3 U	3.4 U	19 U	3.4 U	--	--	--	--
Phenol		--	3.0 U	2.9 UJ	2.8 U	2.9 UJ	20 U	**0.34 J**	--	--	--	--
Total Petroleum Hydrocarbons (mg/L)												
Diesel #2 Range	10^d	10	**0.27**	**0.2**	**0.17**	**0.22**	**0.51**	**0.39**	--	--	--	--
Gasoline Range Hydrocarbons	--	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	--	--	--	--
Motor Oil Range	--	--	0.27 U	**0.099 J**	0.29 U	**0.13 J**	**0.54**	**0.72**	--	--	--	--
Oil and grease	--	--	--	--	--	--	--	--	--	--	--	--

Table 1
Data Gaps Investigation Subsurface Vault and Pit Water and Stormwater Sampling Results

			Outfall 003 Drainage										
Location ID			Outfall 003	Outfall 003	Outfall 003	Forge Shop Manhole	Forge Shop Manhole	Machine Shop Manhole	Machine Shop Manhole	East Machine Shop Roof	East Machine Shop Roof	West Machine Shop Roof	West Machine Shop Roof
Sample ID			AJF-030D-090506	AJF-530D-090506	AJF-030D-090813	AJF-MHFS-090506	AJF-MHFS-090813	AJF-MHMS-090506	AJF-MHMS-090813	AJF-RMSE-090506	AJF-RMSE-090813	AJF-RMSW-090506	AJF-RMSW-090813
Sample Date			5/6/2009	5/6/2009	08/13/2009	5/6/2009	08/13/2009	5/6/2009	08/13/2009	5/6/2009	08/13/2009	5/6/2009	08/13/2009
Description	Source Control Evaluation Screening Levels	NPDES Benchmark Values[d]	Outfall 003 Discharge	Outfall 003 Discharge (Duplicate)	Outfall 003 Discharge	Roof Drain Runoff Entering Subgrade Manhole from Forge Shop	Roof Drain Runoff Entering Subgrade Manhole from Forge Shop	Roof Drain Runoff Entering Subgrade Manhole from Machine Shop	Roof Drain Runoff Entering Subgrade Manhole from Machine Shop	Roof Runoff East Portion of Machine Shop	Roof Runoff East Portion of Machine Shop	Roof Runoff West Portion of Machine Shop	Roof Runoff West Portion of Machine Shop
Conventional Parameters (µmhos/cm)													
Conductivity	--	--	**69**	--	**76**	--		--	--	--	--	--	--
Conventional Parameters (su)													
pH	--	5.0 - 9.0	**8.48**	--	**8.18 J**	--	**7.73 J**	--	**7.31 J**	--	--	--	--
Conventional Parameters (ntu)													
Turbidity	--	25	**36 J**	--	**44**	--	**39**	--	**9.9**	--	--	--	--
Conventional Parameters (mg/L)													
Hardness as CaCO3	--	--	--	--	**38**	--	--	--	--	--	--	--	--
Total organic carbon	--	--	**2.6**	--	**9.9**	**2.4**	**5.5**	**1.6**	**12**	--	--	--	--
Total Suspended Solids	--	--	**41**	--	**36**	**52**	**18**	**5.4**	**5**	**17**	**15**	2 U	**6**
Dissolved Metals (µg/L)													
Arsenic	36 [b]	--	**0.32 J**	2 U	2 U	**0.24 J**	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Cadmium	1.03 [a]	--	2 U	2 U	**0.24 J**	2 U	**0.26 J**	2 U	**0.26 J**	**0.52 J**	**0.39 J**	**0.2 J**	**4.6**
Chromium	10 [a]	--	**6**	**6.3**	**12**	**5.7**	**4.7**	**6.4**	**6.2**	**4.9**	**3.5**	**7.8**	**3.8**
Copper	3.1 [b]	--	**15**	**14**	**46**	**19**	**25**	**4.5 J**	**26**	**5.6**	**7.6**	**18**	**36**
Lead	2.52 [a]	--	**0.26 J**	**0.26 J**	**0.24 J**	**0.26 J**	**0.18 J**	2 U	**0.28 J**	**0.7 J**	**3.8**	2 U	**0.66 J**
Mercury	--	--	0.2 U	0.2 U	**0.049 J**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	8.2 [b]	--	**5**	**4.7**	**13**	**7.9**	**8.6**	**3**	**10**	**5.8**	**4.2**	**21**	**92**
Silver	25900	--	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Zinc	81 [b]	--	**26**	**33**	**120**	**28**	**49**	**300**	**350**	**910**	**720**	**100**	**5800**
Total Metals (µg/L)													
Arsenic	--	--	**3.1**	**2.1**	**0.97 J**	**3.8**	2 U	2 U	2 U	2 U	2 U	**2.5**	2 U
Cadmium	--	--	**0.4 J**	**0.43 J**	**0.5 J**	**0.66 J**	**0.42 J**	**0.24 J**	**0.32 J**	**0.73 J**	**0.48 J**	**0.34 J**	**4.7**
Chromium	--	--	**120**	**97**	**110**	**130**	**24**	**16**	**11**	**7.6**	**26**	**180**	**4.9**
Copper	--	14	**80**	**64**	**93**	**130**	**56**	**11**	**29**	**5.9**	**14**	**49**	**39**
Lead	--	81.6	**8.9**	**7.9**	**9.6**	**12**	**4.7**	**2.6**	**2.2**	**1.7 J**	**56**	**6**	**2.4**
Mercury	0.125 [c]	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	--	--	**110**	**81**	**120**	**180**	**58**	**12**	**16**	**18**	**18**	**140**	**96**
Silver	--	--	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Zinc	--	117	**250**	**280**	**280**	**310**	**120**	**380**	**350**	**1600**	**840**	**120**	**6100**
Volatile Organics (µg/L)													
Benzene	22.7	--	1 U	1 U	1 U	--	--	--	--	--	--	--	--
Ethylbenzene	69100	--	1 U	1 U	1 U	--	--	--	--	--	--	--	--
m,p-Xylene	--	--	2 U	2 U	2 U	--	--	--	--	--	--	--	--
o-Xylene	--	--	1 U	1 U	1 U	--	--	--	--	--	--	--	--
Toluene	48500	--	1 U	1 U	1 U	--	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/L)													
1-Methylnaphthalene	--	--	0.095 U	0.096 U	0.29 U	0.099 U	0.28 U	0.1 U	0.29 U	--	--	--	--
2-Methylnaphthalene	--	--	0.12 U	0.13 U	0.97 U	0.13 U	0.95 U	0.13 U	0.95 U	--	--	--	--
Acenaphthene	643	--	0.095 U	0.096 U	0.48 U	**0.011 J**	0.47 U	0.1 U	0.48 U	--	--	--	--
Acenaphthylene	--	--	0.095 U	0.096 U	0.39 U	0.099 U	0.38 U	0.1 U	0.38 U	--	--	--	--
Anthracene	25900	--	0.095 U	0.096 U	0.19 U	**0.016 J**	0.19 U	0.1 U	0.19 U	--	--	--	--
Benzo(a)anthracene	0.0296	--	**0.029 J**	**0.03 J**	0.29 U	**0.046 J**	0.28 U	0.1 U	0.29 U	--	--	--	--
Benzo(a)pyrene	0.0296	--	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.21 U	0.19 U	--	--	--	--
Benzo(b)fluoranthene	0.0296	--	0.095 U	0.096 U	0.39 U	0.099 U	0.38 U	0.1 U	0.38 U	--	--	--	--
Benzo(g,h,i)perylene	--	--	0.095 U	0.096 U	0.29 U	**0.038 J**	0.28 U	0.1 U	0.29 U	--	--	--	--
Benzo(k)fluoranthene	0.0296	--	0.095 U	0.096 U	0.29 U	0.099 U	0.28 U	0.1 U	0.29 U	--	--	--	--

Table 1

Data Gaps Investigation Subsurface Vault and Pit Water and Stormwater Sampling Results

			Outfall 003 Drainage										
Location ID			**Outfall 003**	**Outfall 003**	**Outfall 003**	**Forge Shop Manhole**	**Forge Shop Manhole**	**Machine Shop Manhole**	**Machine Shop Manhole**	**East Machine Shop Roof**	**East Machine Shop Roof**	**West Machine Shop Roof**	**West Machine Shop Roof**
Sample ID			**AJF-030D-090506**	**AJF-530D-090506**	**AJF-030D-090813**	**AJF-MHFS-090506**	**AJF-MHFS-090813**	**AJF-MHMS-090506**	**AJF-MHMS-090813**	**AJF-RMSE-090506**	**AJF-RMSE-090813**	**AJF-RMSW-090506**	**AJF-RMSW-090813**
Sample Date			**5/6/2009**	**5/6/2009**	**08/13/2009**	**5/6/2009**	**08/13/2009**	**5/6/2009**	**08/13/2009**	**5/6/2009**	**08/13/2009**	**5/6/2009**	**08/13/2009**
Description	**Source Control Evaluation Screening Levels**	**NPDES Benchmark Values^d**	**Outfall 003 Discharge**	**Outfall 003 Discharge (Duplicate)**	**Outfall 003 Discharge**	**Roof Drain Runoff Entering Subgrade Manhole from Forge Shop**	**Roof Drain Runoff Entering Subgrade Manhole from Forge Shop**	**Roof Drain Runoff Entering Subgrade Manhole from Machine Shop**	**Roof Drain Runoff Entering Subgrade Manhole from Machine Shop**	**Roof Runoff East Portion of Machine Shop**	**Roof Runoff East Portion of Machine Shop**	**Roof Runoff West Portion of Machine Shop**	**Roof Runoff West Portion of Machine Shop**
Chrysene	0.0296	--	**0.079 J**	**0.096 J**	0.19 U	**0.098 J**	0.19 U	**0.024 J**	0.19 U	--	--	--	--
Dibenzo(a,h)anthracene	0.0296	--	0.095 U	0.096 U	0.29 U	0.099 U	0.28 U	0.1 U	0.29 U	--	--	--	--
Fluoranthene	90.2	--	**0.14**	**0.16**	0.24 U	**0.23**	0.24 U	**0.035 J**	0.24 U	--	--	--	--
Fluorene	3460	--	**0.019 J**	**0.025 J**	0.29 U	**0.015 J**	0.28 U	0.1 U	0.29 U	--	--	--	--
Indeno(1,2,3-c,d)pyrene	0.0296	--	0.095 U	0.096 U	0.29 U	0.099 U	0.28 U	0.1 U	0.29 U	--	--	--	--
Naphthalene	49400	--	0.095 U	0.096 U	1.9 U	0.099 U	1.9 U	0.1 U	1.9 U	--	--	--	--
Phenanthrene	--	--	0.095 U	0.096 U	**0.12 J**	**0.089 J**	**0.1 J**	**0.03 J**	0.38 U	--	--	--	--
Pyrene	2590	--	**0.17**	**0.18**	0.29 U	**0.23**	0.28 U	**0.037 J**	**0.052 J**	--	--	--	--
Semi-Volatile Organic Compounds (µg/L)										--	--	--	--
1,2,4-Trichlorobenzene	227	--	1.9 U	1.9 U	1.9 U	2 U	1.9 U	2.1 U	1.9 U	--	--	--	--
1,2-Dichlorobenzene	4200	--	1.9 U	1.9 U	1.9 U	2 U	1.9 U	2.1 U	1.9 U	--	--	--	--
1,3-Dichlorobenzene	--	--	1.9 U	1.9 U	1.9 U	2 U	1.9 U	2.1 U	1.9 U	--	--	--	--
1,4-Dichlorobenzene	4.86	--	1.9 U	1.9 U	1.9 U	2 U	1.9 U	2.1 U	1.9 U	--	--	--	--
2,4-Dimethylphenol	--	--	4.7 U	4.8 U	4.8 U	4.9 U	4.7 U	5.2 U	4.8 U	--	--	--	--
2-Methylphenol (o-Cresol)	--	--	1.9 U	1.9 U	1.9 U	2 U	1.9 U	2.1 U	1.9 U	--	--	--	--
3-Methylphenol & 4-Methylphenol (m&p-Cresol)	--	--	**0.096 J**	3.9 U	**0.14 J**	4 U	3.8 U	4.1 U	3.8 U	--	--	--	--
Benzoic acid	--	--	**11**	9.6 U	**8.4 J**	**12**	**7.2 J**	10 U	**6.2 J**	--	--	--	--
Benzyl alcohol	--	--	**0.17 J**	**0.17 J**	**0.27 J**	**0.16 J**	1.9 U	2.1 U	1.9 U	--	--	--	--
Bis(2-ethylhexyl) phthalate	3.56	--	14 U	14 U	15 U	15 U	14 U	15 U	14 U	--	--	--	--
Butylbenzyl phthalate	1250	--	2.8 U	2.9 U	**1.4 J**	3 U	**1.3 J**	3.1 U	**1.6 J**	--	--	--	--
Dibenzofuran	--	--	1.9 U	1.9 U	1.9 U	2 U	1.9 U	2.1 U	1.9 U	--	--	--	--
Diethyl phthalate	28400	--	1.9 U	**0.073 J**	1.9 U	2 U	1.9 U	2.1 U	1.9 U	--	--	--	--
Dimethyl phthalate	72000	--	1.9 U	1.9 U	1.9 U	2 U	1.9 U	2.1 U	1.9 U	--	--	--	--
Di-n-butyl phthalate	2910	--	1.9 U	1.9 U	1.9 U	2 U	**0.62 J**	2.1 U	1.9 U	--	--	--	--
Di-n-octyl phthalate	--	--	1.9 U	1.9 U	1.9 U	2 U	1.9 U	2.1 U	1.9 U	--	--	--	--
Hexachlorobenzene	0.000466	--	1.9 U	1.9 U	1.9 U	2 U	1.9 U	2.1 U	1.9 U	--	--	--	--
Hexachlorobutadiene	29.9	--	2.8 U	2.9 U	2.9 U	3 U	2.8 U	3.1 U	2.9 U	--	--	--	--
Hexachloroethane	--	--	2.8 U	2.9 U	2.9 U	3 U	2.8 U	3.1 U	2.9 U	--	--	--	--
N-Nitrosodiphenylamine	9.73	--	**0.13 J**	1.9 U	1.9 U	2 U	1.9 U	2.1 U	1.9 U	--	--	--	--
Pentachlorophenol	7.9 ^{b}	--	**0.3 J**	**0.24 J**	3.4 U	**0.39 J**	3.3 U	3.6 U	3.3 U	--	--	--	--
Phenol		--	2.8 U	2.9 U	**0.35 J**	3.1 U	2.8 UJ	3.0 U	2.9 U	--	--	--	--
Total Petroleum Hydrocarbons (mg/L)													
Diesel #2 Range	10^d	10	**8.1**	**8.1**	**1.2**	**0.35**	**0.55**	**0.41**	**1.4**	--	--	--	--
Gasoline Range Hydrocarbons	--	--	0.05 U	0.05 U	†	0.05 U	0.05 U	0.05 U	**0.014 J**	--	--	--	--
Motor Oil Range	--	--	**36**	**37**	**2.4**	**1.9**	**0.91**	**1.3**	**3.2**	--	--	--	--
Oil and grease	--	--	**--**	**11**	5 UJ	**--**	**--**	**--**	**--**	--	--	--	--

Table 1

Data Gaps Investigation Subsurface Vault and Pit Water and Stormwater Sampling Results

Location ID			Field QA/QC	
Sample ID			AJF-TBW-090506	AJF-TBW-090813
Sample Date			5/6/2009	08/13/2009
Description	Source Control Evaluation Screening Levels	NPDES Benchmark Values[d]	Trip Blank	Trip Blank
Conventional Parameters (µmhos/cm)				
Conductivity	--	--	--	--
Conventional Parameters (su)				
pH	--	5.0 - 9.0	--	--
Conventional Parameters (ntu)				
Turbidity	--	25	--	--
Conventional Parameters (mg/L)				
Hardness as CaCO3	--	--	--	--
Total organic carbon	--	--	--	--
Total Suspended Solids	--	--	--	--
Dissolved Metals (µg/L)				
Arsenic	36 [b]	--	--	--
Cadmium	1.03 [a]	--	--	--
Chromium	10 [a]	--	--	--
Copper	3.1 [b]	--	--	--
Lead	2.52 [a]	--	--	--
Mercury	--	--	--	--
Nickel	8.2 [b]	--	--	--
Silver	25900	--	--	--
Zinc	81 [b]	--	--	--
Total Metals (µg/L)				
Arsenic	--	--	--	--
Cadmium	--	--	--	--
Chromium	--	--	--	--
Copper	--	14	--	--
Lead	--	81.6	--	--
Mercury	0.125 [c]	--	--	--
Nickel	--	--	--	--
Silver	--	--	--	--
Zinc	--	117	--	--
Volatile Organics (µg/L)				
Benzene	22.7	--	1 U	1 U
Ethylbenzene	69100	--	**0.18 J**	1 U
m,p-Xylene	--	--	**0.92 J**	2 U
o-Xylene	--	--	**0.19 J**	1 U
Toluene	48500	--	**0.77 J**	1 U
Polycyclic Aromatic Hydrocarbons (µg/L)				
1-Methylnaphthalene	--	--	--	--
2-Methylnaphthalene	--	--	--	--
Acenaphthene	643	--	--	--
Acenaphthylene	--	--	--	--
Anthracene	25900	--	--	--
Benzo(a)anthracene	0.0296	--	--	--
Benzo(a)pyrene	0.0296	--	--	--
Benzo(b)fluoranthene	0.0296	--	--	--
Benzo(g,h,i)perylene	--	--	--	--
Benzo(k)fluoranthene	0.0296	--	--	--

Table 1
Data Gaps Investigation Subsurface Vault and Pit Water and Stormwater Sampling Results

Location ID			Field QA/QC	
Sample ID			AJF-TBW-090506	AJF-TBW-090813
Sample Date			5/6/2009	08/13/2009
Description	**Source Control Evaluation Screening Levels**	**NPDES Benchmark Values**[d]	**Trip Blank**	**Trip Blank**
Chrysene	0.0296	--	--	--
Dibenzo(a,h)anthracene	0.0296	--	--	--
Fluoranthene	90.2	--	--	--
Fluorene	3460	--	--	--
Indeno(1,2,3-c,d)pyrene	0.0296	--	--	--
Naphthalene	49400	--	--	--
Phenanthrene	--	--	--	--
Pyrene	2590	--	--	--
Semi-Volatile Organic Compounds (µg/L)				--
1,2,4-Trichlorobenzene	227	--	--	
1,2-Dichlorobenzene	4200	--	--	--
1,3-Dichlorobenzene	--	--	--	--
1,4-Dichlorobenzene	4.86	--	--	--
2,4-Dimethylphenol	--	--	--	--
2-Methylphenol (o-Cresol)	--	--	--	--
3-Methylphenol & 4-Methylphenol (m&p-Cresol)	--	--	--	--
Benzoic acid	--	--	--	--
Benzyl alcohol	--	--	--	--
Bis(2-ethylhexyl) phthalate	3.56	--	--	--
Butylbenzyl phthalate	1250	--	--	--
Dibenzofuran	--	--	--	--
Diethyl phthalate	28400	--	--	--
Dimethyl phthalate	72000	--	--	--
Di-n-butyl phthalate	2910	--	--	--
Di-n-octyl phthalate	--	--	--	--
Hexachlorobenzene	0.000466	--	--	--
Hexachlorobutadiene	29.9	--	--	--
Hexachloroethane	--	--	--	--
N-Nitrosodiphenylamine	9.73	--	--	--
Pentachlorophenol	7.9 [b]	--	--	--
Phenol		--	--	--
Total Petroleum Hydrocarbons (mg/L)				
Diesel #2 Range	10[d]	10	--	--
Gasoline Range Hydrocarbons	--	--	0.05 U	0.05 U
Motor Oil Range	--	--	--	--
Oil and grease	--	--	--	--

Table 1
Data Gaps Investigation Subsurface Vault and Pit Water and Stormwater Sampling Results

Notes:

NPDES	National Pollutant Discharge Elimination System
µmhos/cm	micromhos per centimeter
su	standard units
ntu	nephelometric turbidity nits
mg/L	milligrams per liter
µg/L	micrograms per liter

🟨	Detected concentration is greater than Washington State Department of Ecology (Ecology) Model Toxics Cotnrol Act (MTCA) Method B Standard Formula Values for Surface Water screening levels (unless otherwise
🟩	Detected concentration is greater than Ecology Chronic Water Quality Criteria
🟦	Detected concentration is greater than Ecology NPDES Industrial Stormwater General Permit Benchmark Level (Levels effective January 1, 2010)
🟧	Non-detected concentration is above one or more identified screening levels

a	Screening level from Ecology Freshwater Chronic Water Quality Criteria
b	Screening level from Ecology Marine Chronic Water Quality Criteria
c	Screening level equals Laboratory Practical Detection Limit
d	Screening level from the New NPDES Industrial Stormwater General Permit Benchmark Value dated October 21, 2009
J	Estimated value
U	Compound analyzed, but not detected
†	Analysis not performed
Bold	Detected result
	Level II validation has been applied

Table 2
Well Construction Details

Monitoring Well Identification	Date Installed	Installed By	Screened Interval (feet bgs)^1	Top of Casing Elevation (feet NAVD88)^2	Status^3
MW-1	2/7/1991	SEACOR	5-15	Unknown	Decommissioned
MW-2	2/7/1991	SEACOR	5-15	Unknown	Decommissioned
MW-3	5/21/1991	SEACOR	4.5-19.75	14.05	Active
MW-4	5/21/1991	SEACOR	4.75-20	17.48	Active
MW-5	Unknown	Unknown	10-20	17.03	Active
MW-6	Unknown	Unknown	10-20	20.61	Active
MW-7	Unknown	Unknown	10-20	20.84	Active
MW-8	10/10/1991	SEACOR	5-20	17.7	Active
MW-9	3/19/1992	SEACOR	5-20	17.79	Active
MW-10	3/19/1992	SEACOR	5-20	17.57	Active
MW-11	3/19/1992	SEACOR	5-20	17.7	Active
MW-12	8/27/1992	SEACOR	5-20	17.19	Damaged
MW-13	8/27/1992	SEACOR	5-20	17.44	Damaged
MW-14	8/27/1992	SEACOR	5-20	17.64	Active
MW-15	8/27/1992	SEACOR	5-20	17.65	Active
MW-16	8/29/1992	SEACOR	6-16	17.72	Active - LNAPL
MW-17	4/3/1993	SEACOR	8-23	17.61	Active - LNAPL
MW-18	8/29/1992	SEACOR	6-15.75	17.51	Active - LNAPL
MW-19	8/28/1992	SEACOR	6-16	17.47	Active - LNAPL
MW-20	8/28/1992	SEACOR	6-16	18.22	Active - LNAPL
MW-21	8/28/1992	SEACOR	6-16	13.9	Active - LNAPL
MW-22	8/28/1992	SEACOR	6-15.75	16.98	Active - LNAPL
MW-23	8/31/1992	SEACOR	6-15.75	17.84	Active
MW-24	9/14/1992	SEACOR	6-19.75	17.88	Active
MW-25	9/14/1992	SEACOR	6-19.75	17.64	Active
MW-26	3/11/1993	SEACOR	7-22	18.36	Damaged
MW-27	3/11/1993	SEACOR	7-22	18.15	Active - LNAPL
MW-28	3/12/1993	SEACOR	5-20	18.35	Active - LNAPL
MW-29	3/12/1993	SEACOR	7-22	18.24	Active - LNAPL
MW-30	1/30/1994	SEACOR	5-19.5	17.48	Active
MW-31	1/30/1994	SEACOR	5-20	17.5	Active
MW-32	1/30/1994	SEACOR	5-20	13.62	Active
MW-33	4/8/1993	SEACOR	5-15	17.23	Damaged
MW-34	4/8/1993	SEACOR	5-15	17.13	Active
MW-35	4/8/1993	SEACOR	5-20	13.96	Active - LNAPL
MW-36	Unknown	Unknown	Unknown	17.41	Active
MW-37	2/9/2009	Farallon	10-25	17.55	Active
MW-38	2/9/2009	Farallon	5-20	17.45	Active
MW-39	2/11/2009	Farallon	5-20	20.83	Active
MW-40	7/19/2008	Farallon	10-25	17.19	Active
MW-41	7/19/2008	Farallon	30-40	17.37	Active

Table 2
Well Construction Details

Monitoring Well Identification	Date Installed	Installed By	Screened Interval (feet bgs)[1]	Top of Casing Elevation (feet NAVD88)[2]	Status[3]
MW-42	2/10/2009	Farallon	5-20	17.54	Active
MW-43	2/10/2009	Farallon	30-40	17.49	Active
MW-44	2/5/2009	Farallon	50-60	17.14	Active
MW-45	2/5/2009	Farallon	30-40	17.16	Active
MW-46	2/11/2009	Farallon	5-20	17.74	Active
MW-47	2/11/2009	Farallon	5-20	20.8	Active
MW-48	2/12/2009	Farallon	5-17	17.33	Active
MW-49	2/13/2009	Farallon	5-17	17.33	Active
MW-50	2/12/2009	Farallon	23-27	17.69	Active
MW-51	2/12/2009	Farallon	23-27	17.46	Active
MW-52	2/12/2009	Farallon	23-27	17.67	Active
PL2-JF01A	Unknown	Unknown	Unknown	Unknown	Decommissioned
PL2-JF01AR	5/9/2001	Weston	23-27	16.88	Active
PL2-JF01B	3/21/1995	Weston	40-50	16.97	Active
PL2-JF01C	5/9/2001	Weston	74-78	17.08	Active
PL2-JF02A	9/21/1995	Weston	8-23	17.81	Active
PL2-JF03A	9/21/1995	Weston	8-23	17.95	Decommissioned
PL2-JF04A	Unknown	Unknown	8-18	Unknown	Active

Notes:

bgs	below ground surface
NAVD	North American Vertical Datum
LNAPL	light nonaqueous phase liquid
1	Screened interval of monitroing well in feet bgs
2	Elevation of top of casing, in feet relative to NAVD88, as by PLS, Inc., Issaquah, Washington, August 2003 and March 2009, City of Seattle Benchmark No. SNV-5293
3	2009 status of monitoring well viability for monitoring and sampling
Decommissioned	Monitoring well has been decommissioned or abandoned and is no longer viable for monitoring and sampling
Active	Monitoring well is currently viable for monitoring and sampling
Damaged	Monitoring well has been damaged and is no longer viable for monitoring and sampling.
Active – LNAPL	Monitoring well is currently in good condition and contains measureable petroleum as LNAPL. Well is viable for monitoring but is not used in the groundwater sampling program.

Table 3
Summary of Soil Analytical Results for Petroleum Hydrocarbons

Sample Location	Sample Depth (feet) [1]	Sample Date	Analytical Results (mg/kg)						
			Benzene[2]	Ethylbenzene[2]	Toluene[2]	Xylenes Total[2]	Gasoline-range Organics[3]	Diesel-range Organics[4]	Heavy Oil-range Organics[4]
MW-37	6	2/9/2009	0.02 U	0.054 U	0.054 U	0.26	18	85	740
	11	2/9/2009	0.00074 U	0.00074 U	0.0037 U	0.0015 U	4.8 U	28 U	86
	15.5	2/9/2009	0.00082 U	0.00082 U	0.0041 U	0.0025	4.8 U	28 U	220
MW-38	5	2/9/2009	0.02 U	0.056 U	0.056 U	0.056 U	5.6 U	29 U	59 U
	9.5	2/9/2009	0.02 U	0.051 U	0.051 U	0.051 U	5.1 U	69 U	450
	15.5	2/9/2009	0.02 U	0.07 U	0.07 U	0.07 U	7 U	33 U	67 U
MW-39	6.3	2/11/2009	0.02 U	0.052 U	0.052 U	0.052 U	5.2 U	140	840
	10	2/11/2009	0.02 U	0.079 U	0.079 U	0.079 U	7.9 U	29 U	100
MW-41	5	7/19/2008	0.02 U	0.032 U	0.032 U	0.032 U	3.2 U	26 U	51 U
	10	7/19/2008	0.02 U	0.035 U	0.035 U	0.035 U	3.5 U	26 U	53 U
	20	7/19/2008	0.02 U	0.036 U	0.036 U	0.036 U	3.6 U	30 U	60 U
	30	7/19/2008	0.02 U	0.053 U	0.053 U	0.053 U	5.3 U	33 U	65 U
MW-44	5	2/5/2009	0.02 U	0.058 U	0.058 U	0.058 U	5.8 U	28 U	55 U
	9	2/5/2009	0.02 U	0.06 U	0.06 U	0.06 U	6 U	31 U	63 U
	15	2/5/2009	0.02 U	0.05 U	0.05 U	0.05 U	5 U	32 U	64 U
	28	2/5/2009	0.02 U	0.047 U	0.047 U	0.047 U	4.7 U	28 U	56 U
	45	2/5/2009	0.02 U	0.059 U	0.059 U	0.059 U	5.9 U	31 U	63 U
	60	2/5/2009	0.02 U	0.066 U	0.066 U	0.066 U	6.6 U	32 U	64 U
MW-45	11	2/5/2009	0.02 U	0.067 U	0.067 U	0.067 U	6.7 U	32 U	63 U
	17	2/5/2009	0.02 U	0.061 U	0.061 U	0.061 U	6.1 U	31 U	62 U
	29	2/5/2009	0.02 U	0.053 U	0.053 U	0.053 U	5.3 U	30 U	60 U
	40	2/5/2009	0.02 U	0.051 U	0.051 U	0.051 U	5.1 U	32 U	63 U
MW-46	6.5	2/11/2009	0.001 U	0.001 U	0.0052 U	0.0021 U	11 U	28 U	56 U
	10.5	2/11/2009	0.0011 U	0.0013	0.0056 U	0.0012	14 U	34 U	68 U
	16.5	2/11/2009	0.001 U	0.001 U	0.0052 U	0.0021 U	6.7 U	31 U	63 U

Table 3
Summary of Soil Analytical Results for Petroleum Hydrocarbons

Sample Location	Sample Depth (feet) [1]	Sample Date	Analytical Results (mg/kg)						
			Benzene[2]	Ethylbenzene[2]	Toluene[2]	Xylenes Total[2]	Gasoline-range Organics[3]	Diesel-range Organics[4]	Heavy Oil-range Organics[4]
MW-48	6	2/12/2009	0.00084 U	0.00084 U	0.0042 U	0.0017 U	5.6 U	29 U	150
	10.5	2/12/2009	0.0011 U	0.0011 U	0.0054 U	0.0021 U	6.8 U	32 U	64 U
	15.5	2/12/2009	0.001 U	0.001 U	0.0051 U	0.002 U	6.5 U	32 U	64 U
MW-50	6.5	2/12/2009	0.02 U	0.058 U	0.058 U	0.058 U	5.8 U	28 U	56 U
	11	2/12/2009	0.02 U	0.054 U	0.054 U	0.054 U	5.4 U	29 U	59 U
MW-51	5.5	2/12/2009	0.02 U	0.046 U	0.046 U	0.046 U	15	130	680
	10.5	2/12/2009	0.021 U	0.11 U	0.11 U	0.11 U	11 U	29 U	58 U
MW-52	5.5	2/12/2009	0.02 U	0.045 U	0.045 U	0.045 U	4.5 U	29 U	120
	11.5	2/12/2009	0.02 U	0.054 U	0.054 U	0.054 U	5.4 U	27 U	54 U
Source Control Evaluation Screening Levels[5]			**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

Notes:

NE not established

mg/kg milligrams per kilogram

1 Depth of sample collected in feet below ground surface (bgs)

2 Analyzed by U.S. Environmental Protection Agency (EPA) Method 8021B

3 Analyzed by Northwest Method NWTPH-Gx

4 Analyzed by Northwest Method NWTPH-Dx

5 Screening levels established in *Final Source Control Evaluation Report* , Jorgensen Forge Facility, prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC, May 2008

U No detectable concentrations above the listed laboratory practical quantitation limit

Table 4
Summary of Soil Analytical Results for Sediment Management Standards Metals

Sample Location	Sample Depth (feet)[1]	Sample Date	Analytical Results (mg/kg)[2]							
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc
SB-13	4	2/6/2009	11 U	0.57 U	7.9	9.4	5.7 U	0.28 U	0.57 U	17
	8	2/6/2009	12 U	0.6 U	290	21	64	0.3 U	0.6 U	27
	12	2/6/2009	12 U	0.6 U	9.3	12	6 U	0.3 U	0.6 U	25
	16	2/6/2009	13 U	0.64 U	8.5	6.6	6.4 U	0.32 U	0.64 U	16
SB-14	4	2/6/2009	12 U	0.6 U	9.9	9.5	6 U	0.3 U	0.6 U	21
	8	2/6/2009	11 U	0.55 U	8.3	7.3	5.5 U	0.27 U	0.55 U	18
	12	2/6/2009	11 U	0.56 U	1800	44	52	0.28 U	0.56 U	38
	16	2/6/2009	14 U	0.7 U	14	15	7 U	0.35 U	0.7 U	33
SB-15	4	2/6/2009	12 U	0.58 U	8.9	11	5.8 U	0.29 U	0.58 U	19
	8	2/6/2009	11 U	0.54 U	6.8	8.1	5.4 U	0.27 U	0.54 U	15
	12	2/6/2009	12 U	0.6 U	24	23	81	0.3 U	0.6 U	43
	16	2/6/2009	14 U	0.72 U	17	22	7.2 U	0.36 U	0.72 U	39
SB-16	4	2/6/2009	12 U	0.61 U	8	13	6.1 U	0.3 U	0.61 U	56
	8	2/6/2009	12 U	0.6 U	7.6	8.6	6 U	0.3 U	0.6 U	18
	12	2/6/2009	12 U	0.6 U	1800	89	150	0.3 U	0.6 U	140
	16	2/6/2009	14 U	0.68 U	9	9.9	6.8 U	0.34 U	0.68 U	21
SB-17	2	2/6/2009	12 U	0.59 U	19	9.6	5.9 U	0.29 U	0.59 U	18
	4	2/6/2009	12 U	0.59 U	12	14	5.9 U	0.29 U	0.59 U	27
	6	2/6/2009	12 U	0.6 U	11	13	6 U	0.3 U	0.6 U	21
SB-18	2	2/5/2009	12 U	0.6 U	14	13	6 U	0.3 U	0.6 U	26
	4	2/5/2009	13 U	0.66 U	9.5	13	6.6 U	0.33 U	0.66 U	20
	6	2/5/2009	14 U	0.72 U	18	26	7.3	0.36 U	0.72 U	41
SB-19	2	2/5/2009	11 U	0.57 U	87	44	46	0.28 U	0.57 U	160
	4	2/5/2009	12 U	0.59 U	16	23	33	0.29 U	0.59 U	110
	6	2/5/2009	13 U	0.63 U	14	19	6.3 U	0.32 U	0.63 U	30
MW-37	6	2/9/2009	11 U	0.56 U	35	38	81	0.28 U	0.56 U	75
	11	2/9/2009	11 U	0.56 U	36	62	350	0.28 U	0.56 U	170
	15.5	2/9/2009	11 U	0.56 U	29	34	41	0.28 U	0.56 U	60
MW-38	5	2/9/2009	12 U	0.59 U	15	15	5.9 U	0.29 U	0.59 U	26
	9.5	2/9/2009	12 U	0.58 U	940	100	220	0.29 U	0.58 U	120
	15.5	2/9/2009	13 U	0.67 U	11	12	6.7 U	0.33 U	0.67 U	17
MW-39	6.3	2/11/2009	12 U	1.8	1000	140	290	0.29 U	0.9	260
	10	2/11/2009	14 U	0.68 U	1100	66	200	0.34 U	0.82	230
Source Control Evaluation Screening Levels			**57**	**5.1**	**260**	**390**	**450**	**0.4**	**6.1**	**410**

Table 4

Summary of Soil Analytical Results for Sediment Management Standards Metals

Sample Location	Sample Depth (feet)[1]	Sample Date	Analytical Results (mg/kg) [2]							
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc
MW-41	5	7/19/2008	10 U	0.51 U	7.7	9.6	5.1 U	0.26 U	0.51 U	19
	10	7/19/2008	11 U	0.53 U	18	25	5.3 U	0.26 U	0.53 U	22
	20	7/19/2008	12 U	0.6 U	4.5	7.2	6 U	0.3 U	0.6 U	13
	30	7/19/2008	13 U	0.65 U	6.1	8.2	6.5 U	0.32 U	0.65 U	17
MW-44	5	2/5/2009	11 U	0.55 U	9.3	6.4	5.5 U	0.27 U	0.55 U	18
	9	2/5/2009	11 U	0.56 U	37	14	9.2	0.28 U	0.56 U	25
	15	2/5/2009	13 U	0.63 U	32	13	18	0.31 U	0.63 U	25
	28	2/5/2009	13 U	0.64 U	9.8	14	6.4 U	0.32 U	0.64 U	26
	45	2/5/2009	13 U	0.63 U	7.2	8.9	6.3 U	0.31 U	0.63 U	13
	60	2/5/2009	13 U	0.64 U	7.7	11	6.4 U	0.32 U	0.64 U	14
MW-45	11	2/5/2009	13 U	0.63 U	9.8	10	6.3 U	0.32 U	0.63 U	25
	17	2/5/2009	12 U	0.62 U	7.4	7.8	6.2 U	0.31 U	0.62 U	15
	29	2/5/2009	12 U	0.6 U	8	8.8	6 U	0.3 U	0.6 U	17
	40	2/5/2009	13 U	0.63 U	6.8	7.2	6.3 U	0.32 U	0.63 U	15
Source Control Evaluation Screening Levels			**57**	**5.1**	**260**	**390**	**450**	**0.4**	**6.1**	**410**

Notes:

mg/kg	milligrams per kilogram
🟪	Sample result exceeds the Source Control Evaluation Screening Levels established in *Final Source Control Evaluation Report, Jorgensen Forge Facility* , prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC May 2008
1	Depth of sample collected in feet below ground surface (bgs)
2	Analyzed by U.S. Environmental Protection Agency (EPA) 6000/7000 Series Methods
NE	not established
U	no detectable concentrations above the listed laboratory practical quantitation limit

Table 5
Summary of Soil Analytical Data for Non-sediment Management Standards Metals

Sample Location	Sample Depth (feet)[1]	Sample Date	Analytical Results (mg/kg)[2]						
			Aluminum	Antimony	Barium	Beryllium	Cobalt	Nickel	Selenium
SB-13	4	2/6/2009	—	—	20	—	—	6.7	11 U
	8	2/6/2009	—	—	26	—	—	64	12 U
	12	2/6/2009	—	—	20	—	—	12	12 U
	16	2/6/2009	—	—	17	—	—	7.1	13 U
SB-14	4	2/6/2009	—	—	22	—	—	7.3	12 U
	8	2/6/2009	—	—	20	—	—	7.2	11 U
	12	2/6/2009	—	—	26	—	—	270	11 U
	16	2/6/2009	—	—	34	—	—	40	14 U
SB-15	4	2/6/2009	—	—	24	—	—	7.1	12 U
	8	2/6/2009	—	—	16	—	—	6.3	11 U
	12	2/6/2009	—	—	32	—	—	15	12 U
	16	2/6/2009	—	—	47	—	—	14	14 U
SB-16	4	2/6/2009	—	—	23	—	—	33	12 U
	8	2/6/2009	—	—	19	—	—	7	12 U
	12	2/6/2009	—	—	35	—	—	310	12 U
	16	2/6/2009	—	—	25	—	—	8.9	14 U
SB-17	2	2/6/2009	—	—	21	—	—	8	12 U
	4	2/6/2009	—	—	29	—	—	9.7	12 U
	6	2/6/2009	—	—	28	—	—	8.3	12 U
SB-18	2	2/5/2009	—	—	31	—	—	8.8	12 U
	4	2/5/2009	—	—	26	—	—	8.4	13 U
	6	2/5/2009	—	—	43	—	—	14	14 U
SB-19	2	2/5/2009	—	—	51	—	—	31	11 U
	4	2/5/2009	—	—	39	—	—	15	12 U
	6	2/5/2009	—	—	32	—	—	11	13 U
MW-37	6	2/9/2009	—	—	47	—	—	100	11 U
	11	2/9/2009	—	—	52	—	—	45	11 U
	15.5	2/9/2009	—	—	44	—	—	110	11 U
MW-38	5	2/9/2009	—	—	39	—	—	10	12 U
	9.5	2/9/2009	—	—	58	—	—	390	12 U
	15.5	2/9/2009	—	—	32	—	—	8.5	13 U
MW-39	6.3	2/11/2009	—	—	50	—	—	360	12 U
	10	2/11/2009	—	—	87	—	—	60	14 U
MW-41	5	7/19/2008	—	—	21	—	—	8.2	10 U
	10	7/19/2008	—	—	22	—	—	95	11 U
	20	7/19/2008	—	—	19	—	—	5.3	12 U
	30	7/19/2008	—	—	23	—	—	5.9	13 U
MW-44	5	2/5/2009	—	—	16	—	—	6.7	11 U
	9	2/5/2009	—	—	31	—	—	8.5	11 U
	15	2/5/2009	—	—	39	—	—	7.8	13 U
	28	2/5/2009	—	—	32	—	—	9.4	13 U
	45	2/5/2009	—	—	11	—	—	5.7	13 U
	60	2/5/2009	—	—	13	—	—	6.8	13 U
MW-45	11	2/5/2009	—	—	28	—	—	9.5	13 U
	17	2/5/2009	—	—	21	—	—	6.2	12 U
	29	2/5/2009	—	—	21	—	—	7.4	12 U
	40	2/5/2009	—	—	22	—	—	5.9	13 U
Source Control Evaluation Screening Level			**32,600**	**NE**	**NE**	**0.6**	**NE**	**48**	**NE**

Table 5
Summary of Soil Analytical Data for Non-sediment Management Standards Metals

Notes:

mg/kg	milligrams per kilogram
🟪	Sample result exceeds the Source Control Evaluation Screening Levels established in *Final Source Control Evaluation Report, Jorgensen Forge Facility* , prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC, May 2008
1	Depth of sample collected in feet below ground surface (bgs)
2	Analyzed by U.S. Environmental Protection Agency (EPA) 6000/7000 Series Methods
NE	not established
U	no detectable concentrations above the listed laboratory practical quantitation limit
—	not analyzed/reported

Table 6
Summary of Soil Analytical Results for Semivolatile Organic Compounds

			Analytical Results (mg/kg)[2]																			
			Chlorinated Benzenes				Phthalate Esters						Phenols					Misc. Extractables				
Sample Location	Sample Date	Sample Depth (feet)[1]	1,4-Dichlorobenzene	1,2-Dichlorobenzene	1,2,4-Trichlorobenzene	Hexachlorobenzene	Dimethylphthalate	Diethylphthalate	Di-n-butylphthalate	Butylbenzylphthalate	bis(2-Ethylhexyl)phthalate	Di-n-octylphthalate	Phenol	2-Methylphenol	4-Methylphenol	2,4-Dimethylphenol	Pentachlorophenol	Benzyl alcohol	Benzoic acid	Dibenzofuran	Hexachlorobutadiene	n-Nitrosodiphenylamine
MW-37	2/9/2009	11	0.00074 U	0.00074 U	0.00074 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0037 U	—
	2/9/2009	15.5	0.00082 U	0.00082 U	0.00082 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0041 U	—
MW-41	7/19/2008	5	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	—	0.034 U	0.17 U	0.034 U	—	0.034 U	0.034 U	0.034 U
	7/19/2008	10	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	0.24	0.035 U	0.035 U	0.035 U	—	0.035 U	0.18 U	0.035 U	—	0.035 U	0.035 U	0.035 U
	7/19/2008	20	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.042	0.04 U	0.04 U	0.04 U	—	0.04 U	0.2 U	0.04 U	—	0.04 U	0.04 U	0.04 U
	7/19/2008	30	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	—	0.043 U	0.22 U	0.043 U	—	0.043 U	0.043 U	0.043 U
MW-46	2/11/2009	6.5	0.001 U	0.001 U	0.001 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0052 U	—
	2/11/2009	10.5	0.0011 U	0.0011 U	0.0011 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0056 U	—
	2/11/2009	16.5	0.001 U	0.001 U	0.001 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0052 U	—
MW-48	2/12/2009	6	0.00084 U	0.00084 U	0.00084 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0042 U	—
	2/12/2009	10.5	0.0011 U	0.0011 U	0.0011 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0054 U	—
	2/12/2009	15.5	0.001 U	0.001 U	0.001 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0051 U	—
MW-50	2/12/2009	6.5	0.001 U	0.001 U	0.001 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0052 U	—
	2/12/2009	11	0.00095 U	0.00095 U	0.00095 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0047 U	—
MW-51	2/12/2009	5.5	0.00071 U	0.00071 U	0.00071 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0036 U	—
	2/12/2009	10.5	0.00095 U	0.00095 U	0.00095 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0047 U	—
MW-52	2/12/2009	5.5	0.00083 U	0.00083 U	0.00083 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0041 U	—
	2/12/2009	11.5	0.001 U	0.001 U	0.001 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0051 U	—
Source Control Evaluation Screening Levels[3]			**0.11**	**0.035**	**0.031**	**0.022**	**0.071**	**0.048**	**1.4**	**0.063**	**1.3**	**0.42**	**0.42**	**0.063**	**0.67**	**0.029**	**0.36**	**0.057**	**0.65**	**0.54**	**0.011**	**0.028**

Notes:

mg/kg	milligrams per kilogram
1	Depth of sample collected in feet below ground surface (bgs)
2	Analyzed by U.S. Environmental Protection Agency (EPA) Methods 8270C
3	Screening levels established in *Final Source Control Evaluation Report, Jorgensen Forge Facility,* prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC, May 2008
—	not analyzed/reported
U	no detectable concentrations above the listed laboratory practical quantitation limit

Table 7
Summary of Soil Analytical Results for Polycyclic Aromatic Hydrocarbons

Sample Location	Sample Date	Sample Depth (feet)[1]	Analytical Results (mg/kg)[2]																	
			LPAH							HPAH										
			Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	2-Methylnaphthalene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Total Benzofluoranthenes	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene
MW-37	2/9/2009	11	0.00074 U		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2/9/2009	15.5	0.00082 U		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-41	7/19/2008	5	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U
	7/19/2008	10	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U
	7/19/2008	20	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0079 U
	7/19/2008	30	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U
MW-46	2/11/2009	6.5	0.001 U		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2/11/2009	10.5	1.5		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2/11/2009	16.5	0.0024		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-48	2/12/2009	6	0.00084 U		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2/12/2009	10.5	0.0011 U		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2/12/2009	15.5	0.001 U		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Source Control Evaluation Screening Level [3]			**2.1**	**1.3**	**0.5**	**0.54**	**1.5**	**0.96**	**0.67**	**1.7**	**2.6**	**1.3**	**1.4**	**NE**	**NE**	**3.2**	**1.6**	**0.6**	**0.23**	**0.67**

Notes:

mg/kg	milligrams per kilogram
LPAH	low molecular weight polycyclic hydrocarbons
HPAH	high molecular weight polycyclic hydrocarbons
1	Depth of sample collected in feet below ground surface (bgs)
2	Analyzed by U.S. Environmental Protection Agency (EPA) Methods 8270C
3	Screening levels established in *Final Source Control Evaluation Report, Jorgensen Forge Facility,* prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC, May 2008
—	not analyzed
NE	not established
U	no detectable concentrations above the listed laboratory practical quantitation limit

Table 8
Summary of Soil Analytical Results for Halogenated Volatile Organic Compounds

Sample Location	Sample Date	Sample Depth (feet)[1]	Analytical Results (mg/kg) [2]							
			PCE	**TCE**	**1,1-DCE**	**cis-1,2-DCE**	**trans-1,2-DCE**	**Vinyl Chloride**	**1,1-DCA**	**1,2-DCA**
MW-37	2/9/2009	11	0.00074 U	0.00074 U	0.00074 U	0.00074 U	0.00074 U	0.0037 U	0.00074 U	0.00074 U
	2/9/2009	15.5	0.00082 U	0.001	0.00082 U	0.00082 U	0.00082 U	0.0041 U	0.00082 U	0.00082 U
MW-46	2/11/2009	6.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0052 U	0.001 U	0.001 U
	2/11/2009	10.5	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0056 U	0.0011 U	0.0011 U
	2/11/2009	16.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0052 U	0.001 U	0.001 U
MW-48	2/12/2009	6	0.00084 U	0.00084 U	0.00084 U	0.00084 U	0.00084 U	0.0042 U	0.00084 U	0.00084 U
	2/12/2009	10.5	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0054 U	0.0011 U	0.0011 U
	2/12/2009	15.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0051 U	0.001 U	0.001 U
MW-50	2/12/2009	6.5	0.001 U	0.0026	0.001 U	0.001 U	0.001 U	0.0052 U	0.001 U	0.001 U
	2/12/2009	11	0.00095 U	0.021	0.00095 U	0.00095 U	0.00095 U	0.0047 U	0.00095 U	0.00095 U
MW-51	2/12/2009	5.5	0.00071 U	0.012	0.00071 U	0.00071 U	0.00071 U	0.0036 U	0.00071 U	0.00071 U
	2/12/2009	10.5	0.00095 U	0.00095 U	0.00095 U	0.00095 U	0.00095 U	0.0047 U	0.00095 U	0.00095 U
MW-52	2/12/2009	5.5	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.0041 U	0.00083 U	0.00083 U
	2/12/2009	11.5	0.001 U	0.0077	0.001 U	0.001 U	0.001 U	0.0051 U	0.001 U	0.001 U
Source Control Evaluation Screening Levels [3]			**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

Notes:

mg/kg milligrams per kilogram

1 Depth of sample collected in feet below ground surface (bgs)

2 Analyzed by U.S. Environmental Protection Agency Methods 8260C

3 Screening levels established in Final Source Control Evaluation Report, Jorgensen Forge Facility prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC dated May 2008

DCA	dichloroethane	PCE	tetrachloroethene
DCE	dichloroethene	TCE	trichloroethene
NE	not established	U	no detectable concentrations above the listed laboratory practical quantitation limit

Table 9
Summary of Water Level Measurements, LNAPL Thickness, and Groundwater Elevation Data

Monitoring Well Identification	Date Collected	Casing Elevation (feet)[1]	Depth to Water (feet)[2]	Depth to LNAPL (feet)[2]	LNAPL Thickness (feet)	Potentiometric Surface Elevation (feet)[3]
MW-3[4]	1/29/2008	14.05	9.59	—	0	4.46
	2/23/2009	14.05	11.56	—	0	2.49
	5/19/2009	14.05	11.34	—	0	2.71
	8/25/2009	14.05	12.02	—	0	2.03
	12/9/2009	14.05	11.15	—	0	2.90
MW-4	1/29/2008	17.48	9.67	—	0	7.81
	2/23/2009	17.48	11.65	—	0	5.83
	5/19/2009	17.48	11.42	—	0	6.06
	8/25/2009	17.48	12.12	—	0	5.36
	12/9/2009	17.48	11.23	—	0	6.25
MW-5	1/29/2008	17.03	8.30	—	0	8.73
	2/23/2009	17.03	NM	—	0	NM
	5/19/2009	17.03	14.01	—	0	3.02
	8/25/2009	17.03	10.99	—	0	6.04
	12/9/2009	17.03	9.15	—	0	7.88
MW-6	1/29/2008	20.61	12.36	—	0	8.25
	2/23/2009	20.61	14.19	—	0	6.42
	5/19/2009	20.61	14.15	—	0	6.46
	5/21/2009	20.61	14.14	—	0	6.47
	8/25/2009	20.61	15.18	—	0	5.43
	12/9/2009	20.61	13.56	—	0	7.05
MW-7	1/29/2008	20.84	13.32	—	0	7.52
	2/23/2009	20.84	15.18	—	0	5.66
	5/19/2009	20.84	14.98	—	0	5.86
	8/25/2009	20.84	15.65	—	0	5.19
	12/9/2009	20.84	14.78	—	0	6.06
MW-8	1/29/2008	17.7	9.92	—	0	7.78
	2/23/2009	17.7	11.29	—	0	6.41
	5/19/2009	17.7	NM	—	0	NM
	8/25/2009	17.7	12.35	—	0	5.35
	12/9/2009	17.7	11.49	—	0	6.21
MW-9	1/29/2008	17.79	9.94	—	0	7.85
	2/23/2009	17.79	NM	—	0	NM
	5/19/2009	17.79	11.71	—	0	6.08
	8/25/2009	17.79	12.78	—	0	5.01
	12/9/2009	17.79	11.50	—	0	6.29
MW-10	1/29/2008	17.57	NM	—	0	NM
	2/23/2009	17.57	NM	—	0	NM
	5/19/2009	17.57	10.05	—	0	7.52
	8/25/2009	17.57	12.22	—	0	5.35
	12/9/2009	17.57	10.35	—	0	7.22
MW-11	1/29/2008	17.70	10.00	—	0	7.70
	2/23/2009	17.70	NM	—	0	NM
	5/19/2009	17.7	11.66	—	0	6.04
	8/25/2009	17.7	12.39	—	0	5.31
	12/9/2009	17.7	11.57	—	0	6.13
MW-12	1/29/2008	17.19	0.00	—	0	17.19
	2/23/2009	17.19	5.12	—	0	12.07
	5/19/2009	17.19	NM	NM	NM	NM
	8/25/2009	17.19	NM	NM	NM	NM
	12/9/2009	17.19	NM	NM	NM	NM
MW-13	1/29/2008	17.44	0.00	—	0.00	17.44
	2/23/2009	17.44	1.64	—	—	15.80
	5/19/2009	17.44	NM	NM	NM	NM
	8/25/2009	17.44	NM	NM	NM	NM
	12/9/2009	17.44	NM	NM	NM	NM
MW-14	1/29/2008	17.64	NM	NM	NM	NM
	2/23/2009	17.64	NM	NM	NM	NM
	5/19/2009	17.64	11.74	—	0	5.90
	8/25/2009	17.64	12.39	—	0	5.25
	12/9/2009	17.64	11.50	—	0	6.14
MW-15	1/29/2008	17.65	9.98	—	0	7.67
	2/23/2009	17.65	11.90	—	0	5.75
	5/19/2009	17.65	11.70	—	0	5.95
	8/25/2009	17.65	12.39	—	0	5.26
	12/9/2009	17.65	11.50	—	0	6.15
MW-16	1/29/2008	17.72	NE	9.02	6.37	NM
	2/23/2009	17.72	NE	10.98	5.00	NM
	5/19/2009	17.72	11.90	10.86	1.04	6.77
	8/25/2009	17.72	NE	11.51	3.88	NM
	12/9/2009	17.72	NE	10.49	4.90	NM

Table 9
Summary of Water Level Measurements, LNAPL Thickness, and Groundwater Elevation Data

Monitoring Well Identification	Date Collected	Casing Elevation (feet)[1]	Depth to Water (feet)[2]	Depth to LNAPL (feet)[2]	LNAPL Thickness (feet)	Potentiometric Surface Elevation (feet)[3]
MW-17	1/29/2008	17.61	13.80	8.76	5.04	8.40
	2/23/2009	17.61	13.90	10.6	3.30	6.71
	5/19/2009	17.61	13.80	10.52	3.28	6.79
	8/25/2009	17.61	18.11	11.35	6.76	5.65
	12/9/2009	17.61	16.84	10.59	6.25	6.46
MW-18	1/29/2008	17.51	10.36	8.70	1.66	8.66
	2/23/2009	17.51	11.66	10.51	1.15	6.90
	5/19/2009	17.51	13.80	10.62	3.18	6.60
	8/25/2009	17.51	12.09	11.65	0.44	5.82
	12/9/2009	17.51	11.01	10.12	0.89	7.31
MW-19	1/29/2008	17.47	10.81	—	0.00	6.66
	2/23/2009	17.47	12.34	11.34	1.00	6.04
	5/19/2009	17.47	NM	NM	NM	NM
	8/25/2009	17.47	11.25	11.16	0.09	6.30
	12/9/2009	17.47	12.34	9.88	2.46	7.37
MW-20	1/29/2008	18.22	13.72	8.10	5.62	9.61
	2/23/2009	18.22	14.52	9.51	5.01	8.26
	5/19/2009	18.22	14.60	9.34	5.26	8.41
	8/25/2009	18.22	14.82	10.24	4.58	7.57
	12/9/2009	18.22	14.68	9.40	5.28	8.34
MW-21	1/29/2008	13.90	10.84	5.93	4.91	7.53
	2/23/2009	13.9	12.56	7.08	5.48	6.33
	5/19/2009	13.9	13.75	6.7	7.05	6.57
	8/25/2009	13.9	12.56	7.97	4.59	5.52
	12/9/2009	13.9	10.23	6.77	3.46	6.82
MW-22	1/29/2008	16.98	12.17	6.29	5.88	10.16
	2/23/2009	16.98	10.21	7.23	2.98	9.48
	5/19/2009	16.98	11.05	6.95	4.10	9.66
	8/25/2009	16.98	14.13	8.03	6.10	8.40
	12/9/2009	16.98	8.48	7.10	1.38	9.76
MW-23	1/29/2008	17.84	9.90	—	0	7.94
	2/23/2009	17.84	11.88	—	0	5.96
	5/19/2009	17.84	11.70	—	0	6.14
	8/25/2009	17.84	12.36	—	0	5.48
	12/9/2009	17.84	11.50	—	0	6.34
MW-24	1/29/2008	17.88	10.03	—	0	7.85
	2/23/2009	17.88	11.90	—	0	5.98
	5/19/2009	17.88	11.87	—	0	6.01
	8/25/2009	17.88	12.46	—	0	5.42
	12/9/2009	17.88	11.58	—	0	6.3
MW-25	1/29/2008	17.64	9.85	—	0	7.79
	2/23/2009	17.64	11.70	—	0	5.94
	5/19/2009	17.64	11.80	—	0	5.84
	5/21/2009	17.64	12.00	—	0	5.64
	8/25/2009	17.64	12.32	—	0	5.32
	12/9/2009	17.64	11.36	—	0	6.28
MW-26	1/29/2008	18.36	17.41	8.75	8.66	8.83
	2/23/2009	18.36	NE	10.26	3.30	NM
	5/19/2009	18.36	NE	10.23	3.33	NM
	8/25/2009	18.36	NM	NM	NM	NM
	12/9/2009	18.36	NM	NM	NM	NM
MW-27	1/29/2008	18.15	20.08	9.15	10.93	8.02
	2/23/2009	18.15	21.21	11.16	10.05	6.09
	5/19/2009	18.15	18.50	11.27	7.23	6.23
	8/25/2009	18.15	19.65	11.96	7.69	5.50
	12/9/2009	18.15	18.36	10.96	7.40	6.52
MW-28	1/29/2008	18.35	15.30	9.25	6.05	8.56
	2/23/2009	18.35	13.06	6.02	7.04	11.70
	5/19/2009	18.35	16.50	11.15	5.35	6.72
	8/25/2009	18.35	16.68	12.15	4.53	5.79
	12/9/2009	18.35	15.44	10.95	4.49	7.00
MW-29	1/29/2008	18.24	17.32	9.39	7.93	8.14
	2/23/2009	18.24	18.28	11.42	6.86	6.20
	5/19/2009	18.24	21.95	11.00	10.95	6.25
	8/25/2009	18.24	21.10	11.75	9.35	5.65
	12/9/2009	18.24	21.02	10.7	10.32	6.61
MW-30	1/29/2008	17.48	9.77	—	0	7.71
	2/23/2009	17.48	11.62	—	0	5.86
	5/19/2009	17.48	11.65	—	0	5.83
	8/25/2009	17.48	12.23	—	0	5.25
	12/9/2009	17.48	11.37	—	0	6.11

Table 9
Summary of Water Level Measurements, LNAPL Thickness, and Groundwater Elevation Data

Monitoring Well Identification	Date Collected	Casing Elevation (feet)[1]	Depth to Water (feet)[2]	Depth to LNAPL (feet)[2]	LNAPL Thickness (feet)	Potentiometric Surface Elevation (feet)[3]
MW-31	1/29/2008	17.5	9.78	—	0	7.72
	2/23/2009	17.5	11.63	—	0	5.87
	5/19/2009	17.5	11.70	—	0	5.80
	5/20/2009	17.5	11.85	—	0	5.65
	8/25/2009	17.5	12.24	—	0	5.26
	12/9/2009	17.5	11.42	—	0	6.08
MW-32	1/29/2008	13.62	9.57	—	0	4.05
	2/23/2009	13.62	11.44	—	0	2.18
	5/19/2009	13.62	12.45	—	0	1.17
	8/25/2009	13.62	11.96	—	0	1.66
	12/9/2009	13.62	11.08	—	0	2.54
MW-33	1/29/2008	17.23	10.81	9.40	1.41	7.70
	2/23/2009	17.23	1.53	—	—	15.7
	5/19/2009	17.23	NM	NM	NM	NM
	8/25/2009	17.23	NM	NM	NM	NM
	12/9/2009	17.23	NM	NM	NM	NM
MW-34	1/29/2008	17.13	5.80	—	0	11.33
	2/23/2009	17.13	12.74	11.30	1.44	5.70
	5/19/2009	17.13	11.41	11.29	0.12	5.83
	8/25/2009	17.13	11.81	—	0	5.32
	12/9/2009	17.13	10.97	—	0	6.16
MW-35[4]	2/23/2009	13.96	17.49	10.79	6.70	2.57
	5/19/2009	13.96	17.80	10.70	7.10	2.62
	8/25/2009	13.96	17.85	11.44	6.41	1.94
	12/9/2009	13.96	17.56	10.45	7.11	2.87
MW-36	1/29/2008	17.41	9.83	—	0	7.58
	2/23/2009	17.41	11.67	—	0	5.74
	5/19/2009	17.41	11.60	—	0	5.81
	8/25/2009	17.41	12.19	—	0	5.22
	12/9/2009	17.41	11.33	—	0	6.08
MW-37	2/23/2009	17.55	11.81	—	0	5.74
	5/19/2009	17.55	11.76	—	0	5.79
	8/25/2009	17.55	12.36	—	0	5.19
	12/9/2009	17.55	11.49	—	0	6.06
MW-38	2/23/2009	17.45	11.73	—	0	5.72
	5/19/2009	17.45	11.90	—	0	5.55
	5/21/2009	17.45	12.24	—	0	5.21
	8/25/2009	17.45	12.29	—	0	5.16
	12/9/2009	17.45	11.39	—	0	6.06
MW-39	2/23/2009	20.83	14.47	—	0	6.36
	5/19/2009	20.83	14.74	—	0	6.09
	5/21/2009	20.83	17.69	—	0	3.14
	8/25/2009	20.83	14.96	—	0	5.87
	12/9/2009	20.83	12.42	—	0	8.41
MW-40	2/23/2009	17.19	11.38	—	0	5.81
	5/19/2009	17.19	11.59	—	0	5.60
	8/26/2009	17.19	11.9	—	0	5.29
	12/18/2009	17.19	10.98	—	0	6.21
MW-41	2/23/2009	17.37	11.56	—	0	5.81
	5/19/2009	17.37	11.6	—	0	5.77
	8/26/2009	17.37	12.10	—	0	5.27
	12/18/2009	17.37	11.19	—	0	6.18
MW-42	2/23/2009	17.54	11.46	—	0	6.08
	5/19/2009	17.54	11.95	—	0	5.59
	5/21/2009	17.54	11.98	—	0	5.56
	8/25/2009	17.54	12.23	—	0	5.31
	12/9/2009	17.54	11.49	—	0	6.05
MW-43	2/23/2009	17.49	10.27	—	0	7.22
	5/19/2009	17.49	11.98	—	0	5.51
	8/25/2009	17.49	11.33	—	0	6.16
	12/9/2009	17.49	9.60	—	0	7.89
MW-44	2/25/2009	17.14	12.73	—	0	4.41
	5/19/2009	17.14	11.80	—	0	5.34
	8/25/2009	17.14	11.24	—	0	5.90
	12/18/2009	17.14	10.10	—	0	7.04
MW-45	2/23/2009	17.16	11.31	—	0	5.85
	5/19/2009	17.16	11.35	—	0	5.81
	5/21/2009	17.16	11.45	—	0	5.71
	8/25/2009	17.16	11.90	—	0	5.26
	12/9/2009	17.16	11.05	—	0	6.11

Table 9
Summary of Water Level Measurements, LNAPL Thickness, and Groundwater Elevation Data

Monitoring Well Identification	Date Collected	Casing Elevation (feet)[1]	Depth to Water (feet)[2]	Depth to LNAPL (feet)[2]	LNAPL Thickness (feet)	Potentiometric Surface Elevation (feet)[3]
MW-46	2/23/2009	17.74	11.99	—	0	5.75
	5/19/2009	17.74	12.18	—	0	5.56
	5/21/2009	17.74	12.42	—	0	5.32
	8/25/2009	17.74	12.61	—	0	5.13
	12/9/2009	17.74	11.85	—	0	5.89
MW-47	2/23/2009	20.8	11.47	—	0	9.33
	5/19/2009	20.8	15.42	—	0	5.38
	5/21/2009	20.8	15.90	—	0	4.90
	8/25/2009	20.8	15.60	—	0	5.20
	12/9/2009	20.8	14.60	—	0	6.20
MW-48	2/23/2009	17.33	11.44	—	0	5.89
	5/19/2009	17.33	11.50	—	0	5.83
	5/21/2009	17.33	11.66	—	0	5.67
	8/25/2009	17.33	12.01	—	0	5.32
	12/9/2009	17.33	11.11	—	0	6.22
MW-49	2/23/2009	17.33	11.33	—	0	6.00
	5/19/2009	17.33	11.23	—	0	6.10
	8/25/2009	17.33	11.85	—	0	5.48
	12/9/2009	17.33	10.95	—	0	6.38
MW-50	2/23/2009	17.69	11.28	—	0	6.41
	5/19/2009	17.69	12.16	—	0	5.53
	5/21/2009	17.69	15.05	—	0	2.64
	8/25/2009	17.69	11.82	—	0	5.87
	12/9/2009	17.69	10.41	—	0	7.28
MW-51	2/23/2009	17.46	11.03	—	0	6.43
	5/19/2009	17.46	12.17	—	0	5.29
	5/21/2009	17.46	14.90	—	0	2.56
	8/25/2009	17.46	11.58	—	0	5.88
	12/9/2009	17.46	10.22	—	0	7.24
MW-52	2/23/2009	17.67	10.92	—	0	6.75
	5/19/2009	17.67	12.15	—	0	5.52
	5/21/2009	17.67	16.45	—	0	1.22
	8/25/2009	17.67	11.37	—	0	6.30
	12/9/2009	17.67	9.74	—	0	7.93

Notes:

LNAPL	light nonaqueous phase liquid
1	Elevation of top of casing (TOC), in feet relative to North American Vertical Datum (NAVD)88, as surveyed by PLS, Inc., Issaquah, Washington, August 2003 and March 2009, City of Seattle Benchmark No. SNV-5293.
2	Depth to water/LNAPL in feet below top of well casing.
3	Potentiometric Surface = (Casing Elevation - Depth to Water) +0.91(LNAPL Thickness). The specific gravity for LNAPL is estimated at 0.91 (for typical diesel and/or oil).
4	Top of casing elevation relative to arbitrary benchmark datum of 15.00 feet established by SECOR. Well not located during subsequent survey event.
—	measureable LNAPL not present
NM	not measured/available

Table 10
Summary of Groundwater Analytical Results for Petroleum Hydrocarbons

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs) [1]	Analytical Results (µg/L)						
			Benzene[2]	Ethylbenzene[2]	Toluene[2]	Total Xylenes[2]	Gasoline-range Organics[3]	Diesel-range Organics[4]	Heavy Oil-range Organics[4]
GR-MW48	2/12/2009	23-27	0.39	0.2 U	2	0.4 U	—	—	—
GR-MW49	2/13/2009	23-27	0.28	0.2 U	1 U	0.4 U	—	—	—
MW-3	1/31/2008	4.5-19.75	1 U	1 U	1 U	1 U	100 U	260 U	420 U
MW-4	1/31/2008	4.75-20	4 U	4 U	4 U	4 U	400 U	260 U	420 U
MW-5	1/30/2008	10-20	1 U	1 U	1 U	1 U	100 U	250 U	410 U
	2/24/2009		0.91	0.2 U	1 U	1.47	1100	260 U	420 U
	5/21/2009		1.2	0.2 U	1 U	1.1	220	250 U	400 U
	8/27/2009		1.8	0.2 U	1 U	0.4 U	130	260 U	410 U
	12/11/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	420 U
MW-6	1/30/2008	10-20	1 U	1 U	1 U	1 U	100 U	250 U	400 U
MW-7	2/1/2008	10-20	1 U	1 U	1 U	1 U	100 U	260 U	420 U
	2/25/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	280 U	440 U
	5/20/2009		1 U	1 U	1 U	1 U	100 U	250 U	400 U
	8/25/2009		1 U	1 U	1 U	1 U	100 U	260 U	410 U
	12/10/2009		1 U	1 U	1 U	1 U	100 U	250 U	410 U
MW-8	1/31/2008	5-20	1 U	1 U	1 U	1 U	100 U	250 U	400 U
	2/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	420 U
MW-9	1/31/2008	5-20	1 U	1 U	1 U	1 U	100 U	260 U	410 U
MW-10	2/1/2008	5-20	4 U	4 U	4 U	4 U	400 U	270 U	13,000
MW-11	1/31/2008	5-20	1 U	1 U	1 U	1 U	100 U	260 U	420 U
	2/25/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
MW-14	2/1/2008	5-20	1 U	1 U	1 U	1 U	100 U	270 U	420 U
	2/27/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
MW-15	1/31/2008	5-20	1 U	1 U	1 U	1 U	100 U	250 U	400 U
MW-23	1/31/2008	6-15.75	1 U	1 U	1 U	1 U	100 U	260 U	420 U
	2/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	410 U
	5/21/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/27/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
	12/11/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
MW-24	1/31/2008	6-19.75	1 U	1 U	1 U	1 U	100 U	250 U	400 U
	2/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	430 U
	5/20/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
	12/10/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	420 U
Source Control Evaluation Screening Levels [5]			**22.7**	**69,100**	**48,500**	**NE**	**NE**	**NE**	**NE**

Table 10
Summary of Groundwater Analytical Results for Petroleum Hydrocarbons

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs) [1]	Analytical Results (µg/L)						
			Benzene[2]	Ethylbenzene[2]	Toluene[2]	Total Xylenes[2]	Gasoline-range Organics[3]	Diesel-range Organics[4]	Heavy Oil-range Organics[4]
MW-25	1/31/2008	6-19.75	1 U	1 U	1 U	1 U	100 U	270 U	430 U
	2/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	430 U
	5/20/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
	12/11/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	430 U
MW-30	1/31/2008	5-19.5	1 U	1 U	1 U	1 U	100 U	260 U	420 U
MW-31	1/30/2008	5-20	1 U	1 U	1 U	1 U	100 U	260 U	410 U
	2/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	430 U
	5/21/2009		1 U	1 U	1 U	1 U	100 U	250 U	400 U
	8/27/2009		1 U	1 U	1 U	1 U	100 U	270 U	420 U
	12/11/2009		1 U	1 U	1 U	1 U	100 U	260 U	420 U
MW-32	2/1/2008	5-20	1 U	1 U	1 U	1 U	100 U	260 U	420 U
	2/27/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	430 U
	5/20/2009		1 U	4	1 U	5.6	1600	2300	400 U
	8/26/2009		1 U	1 U	1 U	1 U	100 U	260 U	410 U
	12/10/2009		1 U	1 U	1 U	1 U	100 U	260 U	420 U
MW-34	2/1/2008	5-15	1 U	1 U	1 U	1 U	100 U	2200	410 U
MW-36	2/1/2008	Unknown	1 U	1 U	1 U	1 U	100 U	260 U	420 U
	2/27/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	430 U
	5/20/2009		1 U	1 U	1 U	1 U	100 U	250 U	400 U
	8/26/2009		1 U	1 U	1 U	1 U	100 U	250 U	400 U
	12/10/2009		1 U	1 U	1 U	1 U	100 U	260 U	420 U
MW-37	2/25/2009	10-25	0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	420 U
	5/20/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/27/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	12/11/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	430 U
MW-38	2/24/2009	5-20	0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	420 U
	5/20/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/25/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	12/10/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
MW-39	2/24/2009	5-20	0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	5/20/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	12/10/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
Source Control Evaluation Screening Levels [5]			**22.7**	**69,100**	**48,500**	**NE**	**NE**	**NE**	**NE**

Table 10

Summary of Groundwater Analytical Results for Petroleum Hydrocarbons

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs) [1]	Analytical Results (µg/L)						
			Benzene[2]	Ethylbenzene[2]	Toluene[2]	Total Xylenes[2]	Gasoline-range Organics[3]	Diesel-range Organics[4]	Heavy Oil-range Organics[4]
MW-40	2/27/2009	10-25	0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
	5/20/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	420 U
	12/18/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	420 U
MW-41	2/27/2009	30-40	0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	440 U
	5/20/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	430 U
	12/18/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	410 U
MW-42	2/25/2009	5-20	0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	420 U
	5/20/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	410 U
	12/10/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	420 U
MW-43	2/25/2009	30-40	0.25	0.2 U	1 U	0.4 U	100 U	260 U	420 U
	5/20/2009		0.21	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/26/2009		0.3	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	12/11/2009		0.27	0.2 U	1 U	0.4 U	100 U	260 U	410 U
MW-44	2/25/2009	50-60	0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	430 U
	5/20/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	12/18/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
MW-45	2/26/2009	30-40	1.2	0.2 U	1 U	0.4 U	100 U	270 U	430 U
	5/21/2009		0.78	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/27/2009		0.8	0.2 U	1 U	0.4 U	100 U	260 U	410 U
	12/11/2009		1.3	1 U	1 U	0.2 U	100 U	260 U	420 U
MW-46	2/26/2009	5-20	0.32	0.2 U	1 U	0.33	140	260 U	420 U
	5/21/2009		0.4 U	0.4 U	1 U	0.8 U	150	250 U	400 U
	8/27/2009		0.25	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	12/11/2009		0.3	0.32	1 U	0.34	310 T	280 U	420 U
MW-47	2/25/2009	5-20	0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	420 U
	5/21/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/27/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
	12/11/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
Source Control Evaluation Screening Levels [5]			**22.7**	**69,100**	**48,500**	**NE**	**NE**	**NE**	**NE**

Table 10
Summary of Groundwater Analytical Results for Petroleum Hydrocarbons

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs) ^{1}	Analytical Results (µg/L)						
			Benzene^2	Ethylbenzene^2	Toluene^2	Total Xylenes^2	Gasoline-range Organics^3	Diesel-range Organics^4	Heavy Oil-range Organics^4
MW-48	2/26/2009	5-17	0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	420 U
	5/20/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/26/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
	12/10/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
MW-49	2/26/2009	5-17	0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	5/21/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/27/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
	12/11/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	420 U
MW-50	2/24/2009	23-27	1.5	1 U	3.1	1 U	100 U	—	—
	5/21/2009		1.6	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/27/2009		1.3	0.2 U	1 U	0.4 U	100 U	260 U	410 U
	12/11/2009		1.6	0.2 U	1 U	0.4 U	100 U	250 U	400 U
MW-51	2/24/2009	23-27	1 U	1 U	1 U	1 U	100 U	—	—
	5/21/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/27/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	420 U
	12/11/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	260 U	410 U
MW-52	2/24/2009	23-27	1 U	1 U	1 U	1 U	100 U	—	—
	5/21/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
	8/27/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	270 U	420 U
	12/11/2009		0.2 U	0.2 U	1 U	0.4 U	100 U	250 U	400 U
PL2-JF01AR	1/30/2008	23-27	5.8	1 U	1 U	2.8	150	260 U	410 U
	2/4/2008		5.2	5 U	5 U	5 U	—	—	—
	8/4/2008		1 U	1 U	1 U	1.1	—	—	—
	8/10/2009		8.1	1 U	1 U	4	—	—	—
	8/4/2008		1 U	1 U	1 U	1 U	—	—	—
PL2-JF01B	1/30/2008	40-50	1 U	1 U	1 U	1 U	100 U	250 U	400 U
	2/4/2008		1 U	1 U	1 U	1 U	—	—	—
	8/4/2008		1 U	1 U	1 U	1 U	—	—	—
	8/10/2009		1 U	1 U	1 U	2 U	—	—	—
PL2-JF01C	1/30/2008	74-78	1 U	1 U	1 U	1 U	100 U	260 U	410 U
	2/4/2008		1 U	1 U	1 U	1 U	—	—	—
	8/4/2008		1 U	1 U	1 U	1 U	—	—	—
	8/10/2009		1 U	1 U	1 U	2 U	—	—	—
Source Control Evaluation Screening Levels ^{5}			**22.7**	**69,100**	**48,500**	**NE**	**NE**	**NE**	**NE**

Table 10

Summary of Groundwater Analytical Results for Petroleum Hydrocarbons

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs) [1]	Analytical Results (µg/L)						
			Benzene[2]	Ethylbenzene[2]	Toluene[2]	Total Xylenes[2]	Gasoline-range Organics[3]	Diesel-range Organics[4]	Heavy Oil-range Organics[4]
PL2-JF02A	1/30/2008	8-23	1 U	1 U	1 U	1 U	100 U	250 U	400 U
	2/4/2008		1 U	1 U	1 U	1 U	—	—	—
	8/4/2008		1 U	1 U	1 U	1 U	—	—	—
	8/10/2009		1 U	1 U	1 U	2 U	—	—	—
	1/30/2008		1.3	1 U	1 U	4	1,200	260 U	420 U
Source Control Evaluation Screening Levels [5]			**22.7**	**69,100**	**48,500**	**NE**	**NE**	**NE**	**NE**

Notes:

µg/L	micrograms per liter
bgs	below ground surface
1	Screened interval or depth of sample collected in feet bgs
2	Analyzed by U.S. Environmental Protection Agency (EPA) Method 8021B.
3	Analyzed by Northwest Method NWTPH-Gx.
4	Analyzed by Northwest Method NWTPH-Dx.
5	Screening levels established in *Final Source Control Evaluation Report, Jorgensen Forge Facility,* prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC, May 2008.
—	not analyzed
NE	not established
T	The laboratory analytical report indicates that the sample chromatogram is not similar to a typical gasoline
U	no detectable concentrations above the listed laboratory practical quantitation limit

Table 11
Summary of Groundwater Analytical Results for Sediment Management Standards Metals

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs) [1]	Analytical Results (μg/L) [2]															
			Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Silver		Zinc	
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
GR-SB-13	2/6/2009	12-16	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
GR-SB-14	2/6/2009	12-16	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
GR-SB-15	2/6/2009	12-16	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
GR-SB-16	2/6/2009	12-16	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
MW-3	1/31/2008	4.5-19.75	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
MW-4	1/31/2008	4.75-20	–	5.3	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
MW-5	1/30/2008	10-20	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/24/2009		–	14	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/21/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	8/27/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/11/2009		–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-6	1/30/2008	10-20	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
MW-7	2/1/2008	10-20	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/25/2009		–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/20/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	8/25/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/10/2009		–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-8	1/31/2008	5-20	–	14	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/26/2009		–	32	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
MW-9	1/31/2008	5-20	–	13	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
MW-10	2/1/2008	5-20	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
MW-11	1/31/2008	5-20	–	3.3	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/25/2009		–	4.1	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
MW-14	2/1/2008	5-20	–	3.8	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/27/2009		–	3 U	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
MW-15	1/31/2008	5-20	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
MW-23	1/31/2008	6-15.75	–	8.6	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/26/2009		–	5.2	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
MW-24	1/31/2008	6-19.75	–	32	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/26/2009		–	39	–	2.6 U	–	14	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
MW-25	1/31/2008	6-19.75	–	9.9	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/26/2009		–	21	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
MW-30	1/31/2008	5-19.5	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
MW-31	1/30/2008	5-20	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/26/2009		–	5.3	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
MW-32	2/1/2008	5-20	–	19	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/27/2009		–	39	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
MW-34	2/1/2008	5-15	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
MW-36	2/1/2008	Unknown	–	50	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/27/2009		–	92	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
MW-37	2/25/2009	10-25	–	4.8	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/20/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	8/27/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/11/2009		–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
Source Control Evaluation Screening Level Values			**NE**	**227**	**NE**	**2.6**	**NE**	**306**	**NE**	**123**	**NE**	**11**	**NE**	**0.0052**	**NE**	**1.5**	**NE**	**33**

Table 11
Summary of Groundwater Analytical Results for Sediment Management Standards Metals

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs) [1]	Analytical Results (µg/L) [2]															
			Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Silver		Zinc	
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
MW-38	2/24/2009	10-25	–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/20/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/10/2009		–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-39	2/24/2009	5-20	–	4.5 U	–	2.5 U	–	120	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/20/2009		–	3 U	–	4 U	–	56	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	8/26/2009		–	4 U	–	4 U	–	64	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/10/2009		–	3.5 U	–	2.5 U	–	18	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-40	2/27/2009	10-25	–	9.1	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/20/2009		–	3.7	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	8/26/2009		–	6.2	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/18/2009		–	4.9	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-41	2/27/2009	30-40	–	5.6	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/20/2009		–	4.5	–	4 U	–	10 U	–	10 U	–	2.7	–	0.5 U	–	10 U	–	50 U
	8/26/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/18/2009		–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-42	2/25/2009	5-20	–	34	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/20/2009		–	8.1	–	4 U	–	10 U	–	10 U	–	1	–	0.5 U	–	10 U	–	50 U
	8/26/2009		–	3.8	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/10/2009		–	4.3	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-43	2/25/2009	30-40	–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/20/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	8/26/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/11/2009		–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-44	2/25/2009	50-60	–	4.5 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/20/2009		–	4.6 U	–	4 U	–	38	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	8/26/2009		–	9.5 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/18/2009		–	8.7 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-45	2/26/2009	30-40	–	3 U	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	39
	5/21/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	8/27/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/11/2009		–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-46	2/26/2009	5-20	–	8.1	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/21/2009		–	16	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	8/27/2009		–	5.2	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/11/2009		–	11	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-47	2/25/2009	5-20	–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/21/2009		–	3 U	–	4 U	–	10 U	–	10	–	1 U	–	0.5 U	–	10 U	–	50 U
	8/27/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/11/2009		–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-48	2/26/2009	5-17	–	3 U	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
	5/20/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	8/26/2009		–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	12/10/2009		–	3 U	–	2.5 U	–	10 U	–	10 U	–	1 U	–	0.13 U	–	1.5 U	–	25 U
MW-49	2/26/2009	5-17	–	5.5	–	2.6 U	–	10 U	–	10 U	–	1 U	–	0.125 U	–	1.5 U	–	25 U
Source Control Evaluation Screening Level Values			**NE**	**227**	**NE**	**2.6**	**NE**	**306**	**NE**	**123**	**NE**	**11**	**NE**	**0.0052**	**NE**	**1.5**	**NE**	**33**

Table 11
Summary of Groundwater Analytical Results for Sediment Management Standards Metals

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs) [1]	Analytical Results (µg/L) [2]															
			Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Silver		Zinc	
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
PL2-JF01AR	1/30/2008	23-27	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/4/2008		0.2 U	0.5 U	2 U	2 U	5 U	5 U	0.8 U	0.5 U	1 U	1 U	0.02 U	0.02 U	0.2 U	0.2 U	10 U	10 U
	8/4/2008		0.5 U	0.5 U	2 U	2 U	5 U	5 U	0.5 U	0.5 U	1 U	1 U	0.02 U	0.02 U	0.2 U	0.2 U	10 U	10 U
	8/4/2008 DUP		0.5 U	0.5 U	2 U	2 U	5 U	5 U	1.1 U	0.5 U	1 U	1 U	0.02 U	0.02 U	0.2 U	0.2 U	10 U	10 U
	8/10/2009		0.5 U	0.9	2 U	2 U	5 U	5	0.7	0.5 U	1 U	1 U	0.02 U	0.02 U	0.2 U	0.2 U	10 U	10 U
	2/8/2010		0.6	0.7	2 U	2 U	5 U	5 U	0.7	0.5	1 U	1 U	0.02 U	0.02 U	0.2 U	0.2 U	10	10 U
PL2-JF01B	1/30/2008	40-50	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/4/2008		0.7	1.2	2 U	2 U	5 U	5 U	1.4 U	1 U	1 U	2 U	0.02 U	0.02 U	0.2 U	0.5 U	10 U	10 U
	8/4/2008		0.8	0.5	2 U	2 U	5 U	5 U	1.5 U	1.3 U	1 U	1 U	0.02 U	0.02 U	0.2 U	0.2 U	10 U	10 U
	8/10/2009		1 U	1 U	2 U	2 U	5 U	5 U	2	1	2 U	2 U	0.02 U	0.02 U	0.5 U	0.5 U	10 U	10 U
	2/8/2010		2	2	2 U	2 U	5 U	5 U	1	1 U	2 U	2 U	0.02 U	0.02 U	0.5 U	0.5 U	10 U	10 U
PL2-JF01C	1/30/2008	74-78	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	8/4/2008		0.729	3	4 U	10 U	10 U	20 U	9	2	2 U	2 U	0.02 U	0.02 U	0.5 U	0.5 U	20 U	50 U
	8/10/2009		4	9	4 U	4 U	10 U	10 U	7	2 U	5 U	5 U	0.02 U	0.02 U	1 U	1 U	20 U	20 U
PL2-JF02A	1/30/2008	8-23	–	3 U	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
	2/4/2008		0.2	0.2	2 U	2 U	5 U	5 U	0.5 U	0.5	1 U	1 U	0.02 U	0.02 U	0.2 U	0.2 U	10 U	10 U
	8/4/2008		0.5 U	0.5 U	2 U	2 U	5 U	5 U	1.4 U	0.5 U	1 U	1 U	0.02 U	0.02 U	0.2 U	0.2 U	10 U	10 U
	8/10/2009		0.3	0.3	2 U	2 U	5 U	5 U	1	0.5 U	1 U	1 U	0.02 U	0.02 U	0.2 U	0.2 U	10 U	10 U
	2/8/2010		0.7	0.4	2 U	2 U	5 U	5 U	0.8	0.5 U	1 U	1 U	0.02 U	0.02 U	0.2 U	0.2 U	10 U	10 U
PL2-JF04A	1/30/2008	8-18	–	21	–	4 U	–	10 U	–	10 U	–	1 U	–	0.5 U	–	10 U	–	50 U
Source Control Evaluation Screening Level Values			**NE**	**227**	**NE**	**2.6**	**NE**	**306**	**NE**	**123**	**NE**	**11**	**NE**	**0.0052**	**NE**	**1.5**	**NE**	**33**

Notes:

µg/L	micrograms per liter
bgs	below ground surface
▨	Sample result exceeds the Source Control Evaluation Screening Levels established in *Final Source Control Evaluation Report, Jorgensen Forge Facility* , prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC, May 2008
1	Screened interval or depth of sample collected in feet bgs.
2	Analyzed by U.S. Environmental Protection Agency (EPA) 6000/7000 Series Methods.
—	not analyzed
NE	not established
U	no detectable concentrations above the listed laboratory practical quantitation limit

Table 12
Summary of Groundwater Analytical Results for Non-Sediment Management Standards Metals

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	Analytical Results (micrograms per liter)[2]								
			Aluminum		Antimony		Barium		Beryllium		Bromide
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	
GR-SB-13	2/6/2009	12-16	–	–	–	–	–	25 U	–	–	–
GR-SB-14	2/6/2009	12-16	–	–	–	–	–	25 U	–	–	–
GR-SB-15	2/6/2009	12-16	–	–	–	–	–	25 U	–	–	–
GR-SB-16	2/6/2009	12-16	–	–	–	–	–	25 U	–	–	–
MW-3	1/31/2008	4.5-19.375	–	–	–	–	–	25 U	–	–	–
MW-4	1/31/2008	4.75-20	–	–	–	–	–	25 U	–	–	–
MW-5	1/30/2008	10-20	–	–	–	–	–	25 U	–	–	–
	2/24/2009		–	–	–	–	–	25 U	–	–	–
	5/21/2009		–	–	–	–	–	25 U	–	–	–
	8/27/2009		–	–	–	–	–	25 U	–	–	–
	12/11/2009		–	–	–	–	–	25 U	–	–	–
MW-6	1/30/2008	10-20	–	–	–	–	–	25 U	–	–	–
MW-7	2/1/2008	10-20	–	–	–	–	–	25 U	–	–	–
	2/25/2009		–	–	–	–	–	25 U	–	–	–
	5/20/2009		–	–	–	–	–	25 U	–	–	–
	8/25/2009		–	–	–	–	–	25 U	–	–	–
	12/10/2009		–	–	–	–	–	25 U	–	–	–
MW-8	1/31/2008	5-20	–	–	–	–	–	25 U	–	–	–
	2/26/2009		–	–	–	–	–	18	–	–	–
MW-9	1/31/2008	5-20	–	–	–	–	–	25 U	–	–	–
MW-10	2/1/2008	5-20	–	–	–	–	–	29	–	–	–
MW-11	1/31/2008	5-20	–	–	–	–	–	25 U	–	–	–
	2/25/2009		–	–	–	–	–	25 U	–	–	–
MW-14	2/1/2008	5-20	–	–	–	–	–	25 U	–	–	–
	2/27/2009		–	–	–	–	–	25 U	–	–	–
MW-15	1/31/2008	5-20	–	–	–	–	–	25 U	–	–	–
MW-23	1/31/2008	6-15.75	–	–	–	–	–	25 U	–	–	–
	2/26/2009		–	–	–	–	–	25 U	–	–	–
MW-24	1/31/2008	6-19.75	–	–	–	–	–	25 U	–	–	–
	2/26/2009		–	–	–	–	–	25 U	–	–	–
MW-25	1/31/2008	6-19.75	–	–	–	–	–	25 U	–	–	–
	2/26/2009		–	–	–	–	–	25 U	–	–	–
MW-30	1/31/2008	5-19.5	–	–	–	–	–	25 U	–	–	–
MW-31	1/30/2008	5-20	–	–	–	–	–	25 U	–	–	–
	2/26/2009		–	–	–	–	–	25 U	–	–	–
MW-32	2/1/2008	5-20	–	–	–	–	–	25 U	–	–	–
	2/27/2009		–	–	–	–	–	25 U	–	–	–
MW-34	2/1/2008	5-15	–	–	–	–	–	25 U	–	–	–
MW-36	2/1/2008	Unknown	–	–	–	–	–	25 U	–	–	–
	2/27/2009		–	–	–	–	–	25 U	–	–	–
MW-37	2/25/2009	10-25	–	–	–	–	–	25 U	–	–	–
	5/20/2009		–	–	–	–	–	25 U	–	–	–
	8/27/2009		–	–	–	–	–	25 U	–	–	–
	12/11/2009		–	–	–	–	–	25 U	–	–	–
MW-38	2/24/2009	10-25	–	–	–	–	–	25 U	–	–	–
	5/20/2009		–	–	–	–	–	25 U	–	–	–
	12/10/2009		–	–	–	–	–	25 U	–	–	–
MW-39	2/24/2009	5-20	–	–	–	–	–	30	–	–	–
	5/20/2009		–	–	–	–	–	25 U	–	–	–
	8/26/2009		–	–	–	–	–	210	–	–	–
	12/10/2009		–	–	–	–	–	25 U	–	–	–
MW-40	2/27/2009	10-25	–	–	–	–	–	25 U	–	–	–
	5/20/2009		–	–	–	–	–	25 U	–	–	–
	8/26/2009		–	–	–	–	–	25 U	–	–	–
	12/18/2009		–	–	–	–	–	25 U	–	–	–
MW-41	2/27/2009	30-40	–	–	–	–	–	25 U	–	–	–
	5/20/2009		–	–	–	–	–	25 U	–	–	–
	8/26/2009		–	–	–	–	–	25 U	–	–	–
	12/18/2009		–	–	–	–	–	25 U	–	–	–
Source Control Evaluation Screening Level Values			**NE**	**NE**	**NE**	**1,040**	**NE**	**NE**	**NE**	**273**	**NE**

Table 12
Summary of Groundwater Analytical Results for Non-Sediment Management Standards Metals

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	Analytical Results (micrograms per liter)[2]								
			Aluminum		Antimony		Barium		Beryllium		
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Bromide
MW-42	2/25/2009	5-20	–	–	–	–	–	25 U	–	–	–
	5/20/2009		–	–	–	–	–	25 U	–	–	–
	8/26/2009		–	–	–	–	–	25 U	–	–	–
	12/10/2009		–	–	–	–	–	25 U	–	–	–
MW-43	2/25/2009	30-40	–	–	–	–	–	25 U	–	–	–
	5/20/2009		–	–	–	–	–	25 U	–	–	–
	8/26/2009		–	–	–	–	–	25 U	–	–	–
	12/11/2009		–	–	–	–	–	25 U	–	–	–
MW-44	2/25/2009	50-60	–	–	–	–	–	130	–	–	–
	5/20/2009		–	–	–	–	–	92	–	–	–
	8/26/2009		–	–	–	–	–	140	–	–	–
	12/18/2009		–	–	–	–	–	120	–	–	–
MW-45	2/26/2009	30-40	–	–	–	–	–	25 U	–	–	–
	5/21/2009		–	–	–	–	–	25 U	–	–	–
	8/27/2009		–	–	–	–	–	25 U	–	–	–
	12/11/2009		–	–	–	–	–	25 U	–	–	–
MW-46	2/26/2009	5-20	–	–	–	–	–	25 U	–	–	–
	5/21/2009		–	–	–	–	–	25 U	–	–	–
	8/27/2009		–	–	–	–	–	25 U	–	–	–
	12/11/2009		–	–	–	–	–	25 U	–	–	–
MW-47	2/25/2009	5-20	–	–	–	–	–	25 U	–	–	–
	5/21/2009		–	–	–	–	–	25 U	–	–	–
	8/27/2009		–	–	–	–	–	25 U	–	–	–
	12/11/2009		–	–	–	–	–	25 U	–	–	–
MW-48	2/26/2009	5-17	–	–	–	–	–	25 U	–	–	–
	5/20/2009		–	–	–	–	–	25 U	–	–	–
	8/26/2009		–	–	–	–	–	25 U	–	–	–
	12/10/2009		–	–	–	–	–	25 U	–	–	–
MW-49	2/26/2009	5-17	–	–	–	–	–	25 U	–	–	–
PL2-JF01AR	1/30/2008	23-27	–	–	–	–	–	67	–	–	–
	2/4/2008		–	–	2 U	2 U	–	–	0.2 U	0.2 U	–
	8/4/2008		–	–	2 U	2 U	–	–	0.2 U	0.2 U	–
	8/4/2008 DUP		–	–	2 U	2 U	–	–	0.2 U	0.2 U	–
	8/10/2009		–	–	0.2 U	0.2 U	–	–	0.2 U	0.2 U	–
	2/8/2010		–	–	0.2 U	0.2 U	–	–	0.2 U	0.2 U	
PL2-JF01B	1/30/2008	40-50	–	–	–	–	–	72	–	–	–
	2/4/2008		–	–	4 U	4 U	–	–	0.2 U	0.5 U	–
	8/4/2008		–	–	4 U	4 U	–	–	0.2 U	0.5 U	–
	8/10/2009		–	–	0.5 U	0.5 U	–	–	0.5 U	0.5 U	–
	2/8/2010		–	–	0.5 U	0.5 U		–	0.5 U	0.5 U	
PL2-JF01C	1/30/2008	74-78	–	–	–	–	–	190	–	–	–
	8/4/2008		–	–	10 U	10 U	–	–	0.5 U	0.2 U	–
	8/10/2009		–	–	1 U	1 U	–	–	1 U	1 U	–
PL2-JF02A	1/30/2008	8-23	–	–	–	–	–	25 U	–	–	–
	2/4/2008		–	–	2 U	2 U	–	–	0.2 U	0.2 U	–
	8/4/2008		–	–	2 U	2 U	–	–	0.2 U	0.2 U	–
	8/10/2009		–	–	0.2 U	0.2 U	–	–	0.2 U	0.2 U	–
	2/8/2010		–	–	0.2 U	0.2 U	–	–	0.2 U	0.2 U	–
PL2-JF04A	1/30/2008	8-18	–	–	–	–	–	25 U	–	–	–
Source Control Evaluation Screening Level Values			**NE**	**NE**	**NE**	**1,040**	**NE**	**NE**	**NE**	**273**	**NE**

Table 12
Summary of Groundwater Analytical Results for Non-Sediment Management Standards Metals

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	Analytical Results (micrograms per liter)[2]									
			Cobalt		Nickel		Selenium		Thallium		Vanadium	
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
GR-SB-13	2/6/2009	12-16	–	–	–	23	–	5 U	–	–	–	–
GR-SB-14	2/6/2009	12-16	–	–	–	66	–	5 U	–	–	–	–
GR-SB-15	2/6/2009	12-16	–	–	–	20 U	–	5 U	–	–	–	–
GR-SB-16	2/6/2009	12-16	–	–	–	20 U	–	5 U	–	–	–	–
MW-3	1/31/2008	4.5-19.375	–	–	–	20 U	–	5 U	–	–	–	–
MW-4	1/31/2008	4.75-20	–	–	–	20 U	–	5 U	–	–	–	–
MW-5	1/30/2008	10-20	–	–	–	20 U	–	5 U	–	–	–	–
	2/24/2009		–	–	–	8 U	–	5 U	–	–	–	–
	5/21/2009		–	–	–	20 U	–	5 U	–	–	–	–
	8/27/2009		–	–	–	20 U	–	5 U	–	–	–	–
	12/11/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-6	1/30/2008	10-20	–	–	–	20 U		5 U	–	–	–	–
MW-7	2/1/2008	10-20	–	–	–	20 U	–	5 U	–	–	–	–
	2/25/2009		–	–	–	8 U	–	5 U	–	–	–	–
	5/20/2009		–	–	–	20 U	–	5 U	–	–	–	–
	8/25/2009		–	–	–	20 U	–	5 U	–	–	–	–
	12/10/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-8	1/31/2008	5-20	–	–	–	20 U	–	5 U	–	–	–	–
	2/26/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-9	1/31/2008	5-20	–	–	–	20 U	–	5 U	–	–	–	–
MW-10	2/1/2008	5-20	–	–	–	20 U	–	5 U	–	–	–	–
MW-11	1/31/2008	5-20	–	–	–	20 U	–	5 U	–	–	–	–
	2/25/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-14	2/1/2008	5-20	–	–	–	20 U	–	5 U	–	–	–	–
	2/27/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-15	1/31/2008	5-20	–	–	–	20 U	–	5 U	–	–	–	–
MW-23	1/31/2008	6-15.75	–	–	–	20 U	–	5 U	–	–	–	–
	2/26/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-24	1/31/2008	6-19.75	–	–	–	20 U	–	5 U	–	–	–	–
	2/26/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-25	1/31/2008	6-19.75	–	–	–	20 U	–	5 U	–	–	–	–
	2/26/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-30	1/31/2008	5-19.5	–	–	–	20 U	–	5 U	–	–	–	–
MW-31	1/30/2008	5-20	–	–	–	20 U	–	5 U	–	–	–	–
	2/26/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-32	2/1/2008	5-20	–	–	–	20 U	–	5 U	–	–	–	–
	2/27/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-34	2/1/2008	5-15	–	–	–	20 U	–	5 U	–	–	–	–
MW-36	2/1/2008	Unknown	–	–	–	20 U	–	5 U	–	–	–	–
	2/27/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-37	2/25/2009	10-25	–	–	–	8 U	–	5 U	–	–	–	–
	5/20/2009		–	–	–	20 U	–	5 U	–	–	–	–
	8/27/2009		–	–	–	20 U	–	5 U	–	–	–	–
	12/11/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-38	2/24/2009	10-25	–	–	–	8 U	–	5 U	–	–	–	–
	5/20/2009		–	–	–	20 U	–	5 U	–	–	–	–
	12/10/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-39	2/24/2009	5-20	–	–	–	8 U	–	5 U	–	–	–	–
	5/20/2009		–	–	–	20 U	–	5 U	–	–	–	–
	8/26/2009		–	–	–	20 U	–	15 U	–	–	–	–
	12/10/2009		–	–	–	8 U	–	11 U	–	–	–	–
MW-40	2/27/2009	10-25	–	–	–	8 U	–	5 U	–	–	–	–
	5/20/2009		–	–	–	20 U	–	5 U	–	–	–	–
	8/26/2009		–	–	–	20 U	–	5 U	–	–	–	–
	12/18/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-41	2/27/2009	30-40	–	–	–	8 U	–	5 U	–	–	–	–
	5/20/2009		–	–	–	20 U	–	5 U	–	–	–	–
	8/26/2009		–	–	–	20 U	–	5 U	–	–	–	–
	12/18/2009		–	–	–	8 U	–	5 U	–	–	–	–
Source Control Evaluation Screening Level Values			**NE**	**NE**	**NE**	**8.2**	**NE**	**71**	**NE**	**NE**	**NE**	**NE**

Table 12
Summary of Groundwater Analytical Results for Non-Sediment Management Standards Metals

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	Analytical Results (micrograms per liter)[2]									
			Cobalt		Nickel		Selenium		Thallium		Vanadium	
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
	2/25/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-42	5/20/2009	5-20	–	–	–	20 U	–	5 U	–	–	–	–
	8/26/2009		–	–	–	20 U	–	5 U	–	–	–	–
	12/10/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-43	2/25/2009	30-40	–	–	–	8 U	–	5 U	–	–	–	–
	5/20/2009		–	–	–	20 U	–	5 U	–	–	–	–
	8/26/2009		–	–	–	20 U	–	5 U	–	–	–	–
	12/11/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-44	2/25/2009	50-60	–	–	–	11	–	23 U	–	–	–	–
	5/20/2009		–	–	–	20 U	–	12 U	–	–	–	–
	8/26/2009		–	–	–	20 U	–	20 U	–	–	–	–
	12/18/2009		–	–	–	8.5	–	13 U	–	–	–	–
MW-45	2/26/2009	30-40	–	–	–	8 U	–	5 U	–	–	–	–
	5/21/2009		–	–	–	20 U	–	5 U	–	–	–	–
	8/27/2009		–	–	–	20 U	–	5 U	–	–	–	–
	12/11/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-46	2/26/2009	5-20	–	–	–	8 U	–	5 U	–	–	–	–
	5/21/2009		–	–	–	20 U	–	5 U	–	–	–	–
	8/27/2009		–	–	–	20 U	–	5 U	–	–	–	–
	12/11/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-47	2/25/2009	5-20	–	–	–	8 U	–	5 U	–	–	–	–
	5/21/2009		–	–	–	20 U	–	5 U	–	–	–	–
	8/27/2009		–	–	–	20 U	–	5 U	–	–	–	–
	12/11/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-48	2/26/2009	5-17	–	–	–	8 U	–	5 U	–	–	–	–
	5/20/2009		–	–	–	20 U	–	5 U	–	–	–	–
	8/26/2009		–	–	–	20 U	–	5 U	–	–	–	–
	12/10/2009		–	–	–	8 U	–	5 U	–	–	–	–
MW-49	2/26/2009	5-17	–	–	–	8 U	–	5 U	–	–	–	–
PL2-JF01AR	1/30/2008	23-27	–	–	–	20 U	–	5 U	–	–	–	–
	2/4/2008		–	–	1	0.9	50 U	50 U	0.2 U	0.2 U	8	9
	8/4/2008		–	–	0.9	0.9	50 U	50 U	0.2 U	0.2 U	12	12
	8/4/2008 DUP		–	–	1.1	1	50 U	50 U	0.2 U	0.2 U	11	12
	8/10/2009		–	–	1.2	1.2	50 U	50 U	0.2 U	0.2 U	11	12
	2/8/2010				1	2	50 U	50 U	0.2 U	0.2 U	11	11
PL2-JF01B	1/30/2008	40-50	–	–		20 U	–	18 U	–	–	–	–
	2/4/2008		–	–	1.8	2	50 U	50 U	0.2 U	0.5 U	5	4
	8/4/2008		–	–	3	3.1	50 U	50 U	0.2 U	0.2 U	3 U	3 U
	8/10/2009		–	–	3	3	50 U	50 U	0.5 U	0.5 U	5	3
	2/8/2010				2	2	50 U	50 U	0.5 U	0.5 U	6	5
PL2-JF01C	1/30/2008	74-78	–	–	–	20 U	–	90 U	–	–	–	–
	8/4/2008		–	–	10	8	0.219	0.208	0.5 U	0.5 U	10	20 U
	8/10/2009		–	–	9	7	0.203	0.211	1 U	1 U	10	6
PL2-JF02A	1/30/2008	8-23	–	–	–	20 U	–	5 U	–	–	–	–
	2/4/2008		–	–	0.5 U	1.3	50 U	50 U	0.2 U	0.2 U	5	6
	8/4/2008		–	–	1.6	1.6	50 U	50 U	0.2 U	0.2 U	6	5
	8/10/2009		–	–	1	1.1	50 U	50 U	0.2 U	0.2 U	5	6
	2/8/2010		–	–	1.6	1.1	50 U	50 U	0.2 U	0.2 U	7	6
PL2-JF04A	1/30/2008	8-18	–	–	–	20 U	–	5 U	–	–	–	–
Source Control Evaluation Screening Level Values			**NE**	**NE**	**NE**	**8.2**	**NE**	**71**	**NE**	**NE**	**NE**	**NE**

Notes:

µg/L	micrograms per liter
bgs	below ground surface
▨	Sample result exceeds the Source Control Evaluation Screening Levels established in *Final Source Control Evaluation Report, Jorgensen Forge Facility* , prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC, May 2008
1	Screened interval or depth of sample collected in feet bgs
2	Analyzed by U.S. Environmental Protection (EPA) Agency 6000/7000 Series Methods
—	not analyzed
NE	not established
U	no detectable concentrations above the listed laboratory practical quantitation limit

Table 13
Summary of Groundwater Analytical Results for Semivolatile Organic Compounds

			Analytical Results (µg/L)^2																		
			Chlorinated Benzenes				Phthalate Esters						Phenols					Misc Extractables			
Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)^1	1,4-Dichlorobenzene	1,2-Dichlorobenzene	1,2,4-Trichlorobenzene	Hexachlorobenzene	Dimethylphthalate	Diethylphthalate	Di-n-butylphthalate	Butylbenzylphthalate	bis(2-Ethylhexyl)phthalate	Di-n-octylphthalate	Phenol	2-Methylphenol	3&4-Methylphenol	2,4-Dimethylphenol	Pentachlorophenol	Benzyl alcohol	Dibenzofuran	Hexachlorobutadiene	n-Nitrosodiphenylamine
GR-MW48	2/12/2009	23-27	0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
GR-MW49	2/13/2009	23-27	0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
MW-3	1/31/2008	4.5-149.75	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	5 U	0.99 U	0.99 U	0.99 U	0.99 U
MW-4	1/31/2008	4.75-20	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	5 U	0.99 U	0.99 U	0.99 U	0.99 U
MW-5	1/30/2008	10-20	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	4.8 U	0.96 U	0.96 U	0.96 U	0.96 U
	2/24/2009		0.2 U	0.2 U	0.2 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	35	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	4.9 U	0.99 U	0.99 U	0.2 U	0.99 U
	5/21/2009		1.4	0.22	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
	8/27/2009		1.5	0.2 U	0.2 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	4.9 U	0.98 U	0.98 U	0.2 U	9.8 U
	12/11/2009		1.1	0.2 U	0.2 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	4.9 U	0.99 U	0.99 U	0.2 U	9.9 U
MW-6	1/30/2008	10-20	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U
MW-7	2/1/2008	10-20	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	5 U	0.99 U	0.99 U	0.99 U	0.99 U
	2/25/2009		0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.1 U	1 U	1 U	0.2 U	1 U
MW-8	1/31/2008	5-20	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	5 U	0.99 U	0.99 U	0.99 U	0.99 U
	2/26/2009		0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	0.2 U	1 U
MW-9	1/31/2008	5-20	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	4.9 U	0.98 U	0.98 U	0.98 U	0.98 U
MW-10	2/1/2008	5-20	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	20	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	4.9 U	0.98 U	0.98 U	0.98 U	0.98 U
MW-11	1/31/2008	5-20	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	4.9 U	0.98 U	0.98 U	0.98 U	0.98 U
	2/25/2009		0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	0.2 U	1 U
MW-14	2/1/2008	5-20	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.8 U	0.97 U	0.97 U	0.97 U	0.97 U
	2/27/2009		0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.1 U	1 U	1 U	0.2 U	1 U
MW-15	1/31/2008	5-20	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	4.9 U	0.99 U	0.99 U	0.99 U	0.99 U
MW-23	1/31/2008	6-15.75	0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.8 U	0.95 U	0.95 U	0.2 U	0.95 U
	2/26/2009		0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	0.2 U	1 U
	5/21/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	8/27/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	12/11/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
MW-24	1/31/2008	6-19.75	0.2 U	0.2 U	0.2 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	4.8 U	0.96 U	0.96 U	0.2 U	0.96 U
	2/26/2009		0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.2 U	1 U	1 U	0.2 U	1 U
	5/20/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	8/26/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	12/10/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—
MW-25	1/31/2008	6-19.75	0.2 U	0.2 U	0.2 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.9 U	0.97 U	0.97 U	0.2 U	0.97 U
	2/26/2009		0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.1 U	1 U	1 U	0.2 U	1 U
	5/20/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	8/26/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	12/11/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
MW-30	1/31/2008	5-19.5	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	1	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.8 U	0.97 U	0.97 U	0.97 U	0.97 U
MW-31	1/30/2008	5-20	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	4.9 U	0.98 U	0.98 U	0.98 U	0.98 U
	2/26/2009		0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.1 U	1 U	1 U	0.2 U	1 U
MW-32	2/1/2008	5-20	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	4.9 U	0.98 U	0.98 U	0.98 U	0.98 U
	2/27/2009		0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.1 U	1 U	1 U	0.2 U	1 U
MW-34	2/1/2008	5-15	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.95 U	0.95 U
Source Control Evaluation Screening Levels			**5.2**	**7.1**	**1.1**	**0.11**	**484**	**151**	**143**	**0.52**	**0.28**	**0.3**	**92**	**8.4**	**91**	**2.4**	**6.3**	**214**	**1.3**	**3.9**	**2**

Table 13

Summary of Groundwater Analytical Results for Semivolatile Organic Compounds

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	Analytical Results (µg/L)[2]																		
			Chlorinated Benzenes				Phthalate Esters						Phenols					Misc Extractables			
			1,4-Dichlorobenzene	1,2-Dichlorobenzene	1,2,4-Trichlorobenzene	Hexachlorobenzene	Dimethylphthalate	Diethylphthalate	Di-n-butylphthalate	Butylbenzylphthalate	bis(2-Ethylhexyl)phthalate	Di-n-octylphthalate	Phenol	2-Methylphenol	3&4-Methylphenol	2,4-Dimethylphenol	Pentachlorophenol	Benzyl alcohol	Dibenzofuran	Hexachlorobutadiene	n-Nitrosodiphenylamine
MW-36	2/1/2008	Unknown	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	4.9 U	0.98 U	0.98 U	0.98 U	0.98 U
	2/27/2009		0.2 U	0.2 U	0.2 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.9 U	0.97 U	0.97 U	0.2 U	0.97 U
MW-37	2/25/2009	10-25	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	0.2 U	1 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
	8/27/2009		0.2 U	0.2 U	0.2 U	0.97 U	0.97 U	1.1	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.8 U	0.97 U	0.97 U	0.2 U	9.7 U
	12/11/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
MW-38	2/24/2009	10-25	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.1 U	1 U	1 U	0.2 U	1 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
	8/25/2009		0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	0.2 U	10 U
	12/10/2009		0.2 U	0.2 U	0.2 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	4.8 U	0.96 U	0.96 U	0.2 U	9.6 U
MW-39	2/24/2009	5-20	0.2 U	0.2 U	0.2 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	4.9 U	0.98 U	0.98 U	0.2 U	0.98 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
	12/10/2009		0.2 U	0.2 U	0.2 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	4.9 U	0.98 U	0.98 U	0.2 U	9.8 U
MW-40	2/27/2009	10-25	0.2 U	0.2 U	0.2 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	4.7 U	0.94 U	0.94 U	0.2 U	0.94 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.8 U	0.95 U	0.95 U	0.2 U	9.5 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	4.9 U	0.98 U	0.98 U	0.2 U	9.8 U
	12/18/2009		0.2 U	0.2 U	0.2 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.9 U	0.97 U	0.97 U	0.2 U	9.7 U
MW-41	2/27/2009	30-40	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	0.2 U	1 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.8 U	0.95 U	0.95 U	0.2 U	9.5 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	5 U	0.99 U	0.99 U	0.2 U	9.9 U
	12/18/2009		0.2 U	0.2 U	0.2 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	4.9 U	0.99 U	0.99 U	0.2 U	9.9 U
MW-42	2/25/2009	5-20	0.2 U	0.2 U	0.2 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	4.9 U	0.99 U	0.99 U	0.2 U	0.99 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	4.8 U	0.96 U	0.96 U	0.2 U	9.6 U
	12/10/2009		0.2 U	0.2 U	0.2 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.9 U	0.97 U	0.97 U	0.2 U	9.7 U
MW-43	2/25/2009	30-40	0.2 U	0.2 U	0.2 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	5 U	0.99 U	0.99 U	0.2 U	0.99 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.9 U	0.97 U	0.97 U	0.2 U	9.7 U
	12/11/2009		0.2 U	0.2 U	0.2 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.9 U	0.97 U	0.97 U	0.2 U	9.7 U
MW-44	2/25/2009	50-60	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	0.2 U	1 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	4.7 U	0.94 U	0.94 U	0.2 U	9.4 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.8 U	0.97 U	0.97 U	0.2 U	9.7 U
	12/18/2009		0.2 U	0.2 U	0.2 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	4.9 U	0.98 U	0.98 U	0.2 U	9.8 U
MW-45	2/26/2009	30-40	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	18	1 U	5.1 U	1 U	1 U	0.2 U	1 U
	5/21/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
	8/27/2009		0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	0.2 U	10 U
	12/11/2009		0.2 U	0.2 U	0.2 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.9 U	0.97 U	0.97 U	0.2 U	9.7 U
MW-46	2/26/2009	5-20	0.2 U	0.2 U	0.2 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	5 U	0.99 U	0.99 U	0.2 U	0.99 U
	5/21/2009		0.4 U	0.4 U	0.4 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.4 U	9.5 U
	8/27/2009		0.2 U	0.2 U	0.2 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.9 U	0.97 U	0.97 U	0.2 U	9.7 U
	12/11/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
Source Control Evaluation Screening Levels			**5.2**	**7.1**	**1.1**	**0.11**	**484**	**151**	**143**	**0.52**	**0.28**	**0.3**	**92**	**8.4**	**91**	**2.4**	**6.3**	**214**	**1.3**	**3.9**	**2**

Table 13
Summary of Groundwater Analytical Results for Semivolatile Organic Compounds

			Analytical Results (µg/L)[2]																		
			Chlorinated Benzenes				Phthalate Esters						Phenols					Misc Extractables			
Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	1,4-Dichlorobenzene	1,2-Dichlorobenzene	1,2,4-Trichlorobenzene	Hexachlorobenzene	Dimethylphthalate	Diethylphthalate	Di-n-butylphthalate	Butylbenzylphthalate	bis(2-Ethylhexyl)phthalate	Di-n-octylphthalate	Phenol	2-Methylphenol	3&4-Methylphenol	2,4-Dimethylphenol	Pentachlorophenol	Benzyl alcohol	Dibenzofuran	Hexachlorobutadiene	n-Nitrosodiphenylamine
MW-47	2/25/2009	5-20	0.2 U	0.2 U	0.2 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	5 U	0.99 U	0.99 U	0.2 U	0.99 U
	5/21/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
	8/27/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
	12/11/2009		0.2 U	0.2 U	0.2 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.8 U	0.97 U	0.97 U	0.2 U	9.7 U
MW-48	2/26/2009	5-17	0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.8 U	0.95 U	0.95 U	0.2 U	0.95 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	4.7 U	0.95 U	0.95 U	0.2 U	9.5 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	4.9 U	0.97 U	0.97 U	0.2 U	9.7 U
	12/10/2009		0.2 U	0.2 U	0.2 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	4.8 U	0.96 U	0.96 U	0.2 U	9.6 U
MW-49	2/26/2009	5-17	0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	5/21/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	8/27/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	12/11/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
MW-50	2/24/2009	23-27	0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	5/21/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	8/27/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	12/11/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
MW-51	2/24/2009	23-27	0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	5/21/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	8/27/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	12/11/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
MW-52	2/24/2009	23-27	0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	5/21/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	8/27/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
	12/11/2009		0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
PL2-JF01AR	1/30/2008	23-27	2.9	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	—	0.96 U	4.8 U	0.96 U	0.96 U	0.96 U	0.96 U
	2/4/2008		3.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	—	1 U	5 U	5 U	0.1 U	1 U	1 U
PL2-JF01B	1/30/2008	40-50	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	—	0.96 U	4.8 U	0.96 U	0.96 U	0.96 U	0.96 U
PL2-JF01C	1/30/2008	74-78	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	0.94 U	—	0.94 U	4.7 U	0.94 U	0.94 U	0.94 U	0.94 U
PL2-JF02A	1/30/2008	8-22.75	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	—	0.97 U	4.9 U	0.97 U	0.97 U	0.97 U	0.97 U
	2/4/2008		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.8 U	1 U	1 U	1 U	—	1 U	5 U	5 U	0.1 U	1 U	1 U
PL2-JF04A	1/30/2008	8-18	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	29	0.95 U	0.95 U	0.95 U	—	0.95 U	4.7 U	0.95 U	0.95 U	0.95 U	0.95 U
FD-02	2/12/2009	NA	0.2 U	0.2 U	0.2 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2 U	—
Source Control Evaluation Screening Levels			**5.2**	**7.1**	**1.1**	**0.11**	**484**	**151**	**143**	**0.52**	**0.28**	**0.3**	**92**	**8.4**	**91**	**2.4**	**6.3**	**214**	**1.3**	**3.9**	**2**

Notes:

µg/L	micrograms per liter
bgs	below ground surface
▨	Sample result exceeds the Source Control Evaluation Screening Levels established in *Final Source Control Evaluation Report, Jorgensen Forge Facility* , prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC, May 2008
1	Screened interval or depth of sample collected in feet bgs
2	Analyzed by U.S. Environmental Protection Agency (EPA) Method 8260 or 8270
—	not analyzed
U	no detectable concentrations above the listed laboratory practical quantitation limit

Table 14
Summary of Groundwater Analytical Results for Polycyclic Aromatic Hydrocarbons

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	Analytical Results (micrograms per liter)[2]																
			LPAH							HPAH									
			Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	2-Methylnaphthalene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene
GR-MW48	2/12/2009	23-27	1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GR-MW49	2/13/2009	23-27	1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-3	1/31/2008	4.5-19.75	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
MW-4	1/31/2008	4.75-20	0.3	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.26	0.099 U	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
MW-5	1/30/2008	10-20	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U
	2/24/2009		0.15	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
	5/21/2009		0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	8/27/2009		0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U
	12/11/2009		0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
MW-6	1/30/2008	10-20	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
MW-7	2/1/2008	10-20	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
	2/25/2009		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
MW-8	1/31/2008	5-20	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
	2/26/2009		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
MW-9	1/31/2008	5-20	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U
MW-10	2/1/2008	5-20	0.098 U	0.098 U	0.098 U	0.098 U	0.19	0.098 U	0.098 U	0.24	0.43	0.052	0.22	0.17	0.0098 U	0.12	0.041	0.013	0.078
MW-11	1/31/2008	5-20	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U
	2/25/2009		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
MW-14	2/1/2008	5-20	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
	2/27/2009		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
MW-15	1/31/2008	5-20	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
MW-23	1/31/2008	6-15.75	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	2/26/2009		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	5/21/2009		1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	12/11/2009		1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-24	1/31/2008	6-19.75	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U
	2/26/2009		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	5/20/2009		1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	12/10/2009		1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-25	1/31/2008	6-19.75	0.097 U	0.097 U	0.21	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
	2/26/2009		0.1 U	0.1 U	0.22	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	5/20/2009		1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	12/11/2009		1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-30	1/31/2008	5-19.5	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
MW-31	1/30/2008	5-20	0.098 U	0.098 U	5.7	0.098 U	2.4	0.098 U	0.098 U	0.098 U	0.098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U
	2/26/2009		0.1 U	0.1 U	2.9	0.1 U	1.2	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
MW-32	2/1/2008	5-20	0.32	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.39	0.098 U	0.098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U
	2/27/2009		0.12	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.31	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
MW-34	2/1/2008	5-15	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
Source Control Evaluation Screening Levels			**54**	**11**	**2.6**	**2**	**4.8**	**11**	**18**	**2.3**	**14**	**0.26**	**0.47**	**0.29**	**0.29**	**0.13**	**0.013**	**0.0046**	**0.012**

Table 14
Summary of Groundwater Analytical Results for Polycyclic Aromatic Hydrocarbons

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	Analytical Results (micrograms per liter)[2]																
			LPAH							HPAH									
			Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	2-Methylnaphthalene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene
MW-36	2/1/2008	Unknown	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U
	2/27/2009		0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
MW-37	2/25/2009	10-25	0.1 U	0.1 U	4.5	0.1 U	0.12	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	5/20/2009		0.095 U	0.095 U	5.7	0.095 U	0.2	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	8/27/2009		0.097 U	0.097 U	6.3	0.097 U	0.2	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
	12/11/2009		0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
MW-38	2/24/2009	10-25	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	5/20/2009		0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	8/25/2009		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	12/10/2009		0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U
MW-39	2/24/2009	5-20	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U
	5/20/2009		0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	8/26/2009		0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0096
	12/10/2009		0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U
MW-40	2/27/2009	10-25	0.094 U	0.094 U	0.11	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U
	5/20/2009		0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	8/26/2009		0.098 U	0.098 U	0.17	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U
	12/18/2009		0.097 U	0.097 U	0.11	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
MW-41	2/27/2009	30-40	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	5/20/2009		0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	8/26/2009		0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
	12/18/2009		0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
MW-42	2/25/2009	5-20	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
	5/20/2009		0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	8/26/2009		0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U
	12/10/2009		0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
MW-43	2/25/2009	30-40	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
	5/20/2009		0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	8/26/2009		0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
	12/11/2009		0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
MW-44	2/25/2009	50-60	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	5/20/2009		0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U
	8/26/2009		0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
	12/18/2009		0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U	0.0098 U
MW-45	2/26/2009	30-40	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	5/21/2009		0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	8/27/2009		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	12/11/2009		0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
Source Control Evaluation Screening Levels			**54**	**11**	**2.6**	**2**	**4.8**	**11**	**18**	**2.3**	**14**	**0.26**	**0.47**	**0.29**	**0.29**	**0.13**	**0.013**	**0.0046**	**0.012**

Table 14

Summary of Groundwater Analytical Results for Polycyclic Aromatic Hydrocarbons

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	Analytical Results (micrograms per liter)[2]																
			LPAH							HPAH									
			Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	2-Methylnaphthalene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene
MW-46	2/26/2009	5-20	28	0.14	12	4.3	3.5	0.31	7.6	0.24	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
	5/21/2009		75	0.095 U	8.2	3.3	4	0.3	4.9	0.37	0.18	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	8/27/2009		15	0.097 U	7	2.4	2.7	0.18	4	0.21	0.11	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
	12/11/2009		97	0.19	15	6	6.7	0.37	11	0.42	0.25	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
MW-47	2/25/2009	5-20	0.099 U	0.099 U	0.23	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U
	5/21/2009		0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	8/27/2009		0.095 U	0.095 U	0.28	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	12/11/2009		0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
MW-48	2/26/2009	5-17	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	5/20/2009		0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
	8/26/2009		0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
	12/10/2009		0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U
MW-49	2/26/2009	5-17	1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	5/21/2009		1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	12/11/2009		1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-50	5/21/2009	23-27	1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	12/11/2009		1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-51	5/21/2009	23-27	1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	12/11/2009		1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-52	5/21/2009	23-27	1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	12/11/2009		1 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PL2-JF01AR	1/30/2008	23-27	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U
	2/4/2008		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
PL2-JF01B	1/30/2008	40-50	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U	0.0096 U
PL2-JF01C	1/30/2008	74-78	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.094 U	0.012	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U
PL2-JF02A	1/30/2008	8-22.75	0.097 U	0.097 U	0.33	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U	0.0097 U
	2/4/2008		0.1 U	0.1 U	0.79	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
PL2-JF04A	1/30/2008	8-18	0.49	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.2	0.095 U	0.095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
Source Control Evaluation Screening Levels			**54**	**11**	**2.6**	**2**	**4.8**	**11**	**18**	**2.3**	**14**	**0.26**	**0.47**	**0.29**	**0.29**	**0.13**	**0.013**	**0.0046**	**0.012**

Notes:

µg/L	micrograms per liter
bgs	below ground surface
▨	Sample result exceeds the Source Control Evaluation Screening Levels established in *Final Source Control Evaluation Report, Jorgensen Forge Facility* , prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC, May 2008
1	Screened interval or depth of sample collected in feet bgs
2	Analyzed by U.S. Environmental Protection Agency Method 8270
LPAH	low molecular weight polycyclic aromatic hydrocarbons
HPAH	high molecular weight polycyclic aromatic hydrocarbons
—	not analyzed
U	no detectable concentrations above the listed laboratory practical quantitation limit

Table 15
Summary of Groundwater Analytical Results for Halogenated Volatile Organic Compounds

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	Analytical Results (µg/L)[2]							
			PCE	TCE	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1-DCA	1,2-DCA
GR-MW48	2/12/2009	23-27	0.2 U	0.42	0.2 U	0.37	0.2 U	0.2	0.71	0.2 U
GR-MW49	2/13/2009	23-27	0.2 U	0.55	0.2 U	4.9	2.8	1.3	0.22	0.2 U
MW-5	2/24/2009	10-20	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/21/2009		0.2 U	0.24	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/27/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/11/2009		0.2 U	0.62	0.2 U	0.31	0.2 U	0.2 U	0.2 U	0.2 U
MW-7	2/25/2009	10-20	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-8	2/26/2009	5-20	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-11	2/25/2009	5-20	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-14	2/27/2009	5-20	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-23	1/31/2008	6-15.75	2.8	2.4	0.2 U	8.3	0.35	0.2 U	0.2 U	0.2 U
	2/26/2009		1.6	2	0.2 U	6.6	0.33	0.2 U	0.2 U	0.2 U
	5/21/2009		1.8	2.2	0.2 U	7.5	0.45	0.2 U	0.2 U	0.2 U
	8/27/2009		1.5	1.7	0.2 U	5.7	0.39	0.2 U	0.2 U	0.2 U
	12/11/2009		1.8	2.2	0.2 U	6.9	0.5	0.2 U	0.2 U	0.2 U
MW-24	1/31/2008	6-19.75	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/26/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/10/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-25	1/31/2008	6-19.75	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/26/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/11/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-31	2/26/2009	5-20	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-32	2/27/2009	5-15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-36	2/27/2009	Unknown	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-37	2/25/2009	10-25	0.2 U	0.2 U	0.2 U	0.3	0.2 U	0.2 U	0.2 U	0.2 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.29	0.2 U	0.2 U	0.2 U	0.2 U
	8/27/2009		0.2 U	0.2 U	0.2 U	0.34	0.2 U	0.42	0.2 U	0.2 U
	12/11/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Source Control Evaluation Screening Levels			**4.15**	**55.6**	**1.93**	**NE**	**32,800**	**3.69**	**NE**	**59.4**

Table 15
Summary of Groundwater Analytical Results for Halogenated Volatile Organic Compounds

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	Analytical Results (µg/L)[2]							
			PCE	TCE	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1-DCA	1,2-DCA
MW-38	2/24/2009	5-20	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/25/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/10/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-39	2/24/2009	5-20	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/10/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-40	2/27/2009	10-25	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.74	0.2 U	0.2 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.97	0.2 U	0.2 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1.3	0.2 U	0.2 U
	12/18/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1.4	0.2 U	0.2 U
MW-41	2/27/2009	30-40	0.2 U	0.2 U	0.2 U	1.2	0.2 U	0.47	0.2 U	0.2 U
	5/20/2009		0.2 U	0.2 U	0.2 U	1.1	0.2 U	0.35	0.2 U	0.2 U
	8/26/2009		0.2 U	0.2 U	0.2 U	1.4	0.21	0.36	0.2 U	0.2 U
	12/18/2009		0.2 U	0.2 U	0.2 U	0.85	0.2 U	0.43	0.2 U	0.2 U
MW-42	2/25/2009	5-20	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.25	0.2 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.34	0.2 U
	12/10/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-43	2/25/2009	30-40	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.42	0.2 U	0.3
	5/20/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.53	0.2 U	0.35
	8/26/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.67	0.2 U	0.51
	12/11/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.52	0.2 U	0.33
MW-44	2/25/2009	50-60	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/18/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-45	2/26/2009	30-40	0.2 U	0.2 U	0.2 U	1.1	0.2 U	0.89	0.2 U	0.2 U
	5/21/2009		0.2 U	0.2 U	0.2 U	0.26	0.2 U	0.76	0.2 U	0.2 U
	8/27/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.45	0.2 U	0.2 U
	12/11/2009		0.2 U	0.2 U	0.2 U	0.21	0.2 U	0.33	0.2 U	0.2 U
Source Control Evaluation Screening Levels			**4.15**	**55.6**	**1.93**	**NE**	**32,800**	**3.69**	**NE**	**59.4**

Table 15
Summary of Groundwater Analytical Results for Halogenated Volatile Organic Compounds

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	Analytical Results (µg/L)[2]							
			PCE	**TCE**	**1,1-DCE**	**cis-1,2-DCE**	**trans-1,2-DCE**	**Vinyl Chloride**	**1,1-DCA**	**1,2-DCA**
MW-46	2/26/2009	5-20	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.3	0.2 U	0.2 U
	5/21/2009		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
	8/27/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.22	0.2 U	0.2 U
	12/11/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21	0.2 U	0.2 U
MW-47	2/25/2009	5-20	0.2 U	0.2 U	0.27	0.22	0.2 U	0.2 U	2.4	0.2 U
	5/21/2009		0.2 U	0.2 U	0.29	0.2 U	0.2 U	0.2 U	2.5	0.2 U
	8/27/2009		0.2 U	0.2 U	0.2 U	0.22	0.2 U	0.2 U	0.71	0.2 U
	12/11/2009		0.2 U	0.2 U	0.35	0.2 U	0.2 U	0.2 U	2.7	0.2 U
MW-48	2/26/2009	5-17	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/20/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/26/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/10/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-49	2/26/2009	5-17	0.2 U	0.71	0.2 U	19	1.1	1.8	0.2 U	0.2 U
	5/21/2009		0.2 U	1.2	0.2 U	15	0.63	0.64	0.2 U	0.2 U
	8/27/2009		0.2 U	0.69	0.2 U	19	0.61	0.53	0.2 U	0.2 U
	12/11/2009		0.2 U	3.1	0.2 U	8	0.41	1.4	0.2 U	0.2 U
MW-50	2/24/2009	23-27	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.51	0.2 U	0.2 U
	5/21/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.39	0.2 U	0.2 U
	8/27/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.38	0.2 U	0.2 U
	12/11/2009		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.36	0.2 U	0.2 U
MW-51	2/24/2009	23-27	0.2 U	0.2 U	0.2 U	0.49	0.2 U	1	0.35	0.2 U
	5/21/2009		0.2 U	0.2 U	0.2 U	0.39	0.2 U	1.3	0.44	0.2 U
	8/27/2009		0.2 U	0.2 U	0.2 U	0.48	0.2 U	1.4	0.33	0.2 U
	12/11/2009		0.2 U	0.24	0.2 U	0.77	0.2 U	1.1	0.31	0.2 U
MW-52	2/24/2009	23-27	0.2 U	0.2 U	0.2 U	1.5	0.23	0.92	0.26	0.2 U
	5/21/2009		0.2 U	0.2 U	0.2 U	2.4	0.2 U	0.77	0.51	0.2 U
	8/27/2009		0.2 U	0.2 U	0.2 U	2.1	0.2 U	0.56	0.42	0.2 U
	12/11/2009		0.2 U	0.2 U	0.2 U	2.3	0.2 U	0.69	0.54	0.2 U
PL2-JF01AR	2/4/2008	23-27	5 U	5 U	5 U	14	5 U	1,100	5 U	5 U
	8/4/2008		1 U	1 U	1 U	1 U	1 U	89	1 U	1 U
	8/10/2009		1 U	1 U	1 U	1 U	1 U	1,300	1 U	1 U
	2/8/2010		1 U	1 U	1 U	1 U	1 U	100	1 U	1 U
Source Control Evaluation Screening Levels			**4.15**	**55.6**	**1.93**	**NE**	**32,800**	**3.69**	**NE**	**59.4**

Table 15
Summary of Groundwater Analytical Results for Halogenated Volatile Organic Compounds

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)^{1}	Analytical Results (µg/L)^{2}							
			PCE	TCE	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1-DCA	1,2-DCA
PL2-JF01B	2/4/2008	40-50	1 U	1 U	1 U	1 U	1 U	20	1 U	1 U
	8/4/2008		1 U	1 U	1 U	1 U	1 U	1.8	1 U	1 U
	8/10/2009		1 U	1 U	1 U	1 U	1 U	9	1 U	1 U
	2/8/2010		1 U	1 U	1 U	1 U	1 U	20	1 U	1 U
PL2-JF01C	2/4/2008	74-78	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	8/4/2008		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	8/10/2009		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	2/8/2010		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
PL2-JF02A	2/4/2008	8-22.75	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	8/4/2008		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	8/10/2009		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	2/8/2010		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
FD-02	2/12/2009	NA	0.2 U	0.42	0.2 U	0.37	0.2 U	0.21	0.64	0.2 U
Source Control Evaluation Screening Levels			**4.15**	**55.6**	**1.93**	**NE**	**32,800**	**3.69**	**NE**	**59.4**

Notes:

µg/L	micrograms per liter
bgs	below ground surface
▨	Sample result exceeds the Source Control Evaluation Screening Levels established in *Final Source Control Evaluation Report, Jorgensen Forge Facility* , prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC, May 2008
1	Screened interval or depth of sample collected in feet bgs
2	Analyzed using U.S. Environmental Protection Agency (EPA) Method 8260B
DCA	dichloroethane
DCE	dichloroethene
PCE	tetrachloroethene
TCE	trichloroethene
NE	not established
U	no detectable concentrations above the listed laboratory practical quantitation limit

Table 16
Summary of Groundwater Analytical Results for Polychlorinated Biphenyls

Sample Location	Sample Date	Sample Depth/ Screened Interval (feet bgs)[1]	Analytical Results (µg/L) [2]										
			Aroclor										Total PCBs
			1016	1016/ 1242	1221	1232	1242	1248	1254	1260	1262	1268	
MW-6	1/30/2008	10-20	0.049 U	—	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U
Source Control Evaluation Screening Level [3]													**0.27**

Notes:

µg/L	micrograms per liter
bgs	below ground surface
1	Screened interval or depth of sample collected in feet bgs
2	Analyzed by U.S. Environmental Protection Agency (EPA) Method 8082
3	Screening levels established in *Final Source Control Evaluation Report, Jorgensen Forge Facility,* prepared by Anchor Environmental, LLC, and Farallon Consulting, LLC, May 2008
—	not analyzed
U	no detectable concentrations above the listed laboratory practical quantitation limit

Table 17
Non-magnetic Grindings Solids Analytical Results

Location ID		Non-magnetic Steel Grinding Solids	Non-magnetic Steel Grinding Solids	Field QC	Field QC
Sample ID		**AJF-01SW-090506**	**AJF-01SW-090813**	**AJF-TBS-090506**	**AJF-TBS-090813**
Sample Date		**5/6/2009**	**08/13/2009**	**5/6/2009**	**08/13/2009**
Description	**Ecology SMS SQS Screening Level**	**Non-magnetic Grindings from Storage Area Adjacent to Billet Grinding Baghouse**	**Non-magnetic Grindings from Storage Area Adjacent to Billet Grinding Baghouse**	**Trip Blank**	**Trip Blank**
Conventional Parameters (mg/kg)					
Total organic carbon	--	**700 J**	**5800**	--	--
Conventional Parameters (pct)					
Total solids	--	**97**	**97**	--	--
Metals (mg/kg)					
Arsenic	57	**50**	300 U	--	--
Cadmium	5.1	**0.48**	50 U	--	--
Chromium	260	**140**	**210000**	--	--
Copper	390	**980**	**3700**	--	--
Lead	450	**0.93**	150 U	--	--
Mercury	0.41	**0.012 J**	0.018 U	--	--
Nickel	48[a]	**17**	**26000**	--	--
Silver	6.1	**0.057 J**	**16 J**	--	--
Zinc	410	**6.5**	250 U	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)					
2-Methylnaphthalene	670	**14**	**17**	--	--
Acenaphthene	500	**13**	**13**	--	--
Acenaphthylene	1300	2 U	2 U	--	--
Anthracene	960	**6.3**	**6**	--	--
Benzo(a)anthracene	1300	**3.4**	**4**	--	--
Benzo(a)pyrene	1600	3 U	**1.5 J**	--	--
Benzo(b)fluoranthene	--	**1.9 J**	**3.4**	--	--
Benzo(g,h,i)perylene	670	2.5 U	**0.72 J**	--	--
Benzo(k)fluoranthene	--	**0.64 J**	**1.1 J**	--	--
Chrysene	1400	**5**	**5.2**	--	--
Dibenzo(a,h)anthracene	230	4 U	4.1 UJ	--	--
Fluoranthene	1700	**30**	**29 J**	--	--
Fluorene	540	**14**	**13**	--	--
Indeno(1,2,3-c,d)pyrene	600	4 U	**0.9 J**	--	--
Naphthalene	2100	**60**	**67 J**	--	--
Phenanthrene	1500	**71**	**87 J**	--	--
Pyrene	2600	**12**	**12 J**	--	--
Total Benzofluoranthenes (U = 0)	3200	**2.54 J**	**4.5**	--	--
Total HPAH (U = 0)	12000	**52.94**	**57.82**	--	--
Total LPAH (U = 0)	5200	**164.3**	**186**	--	--
Total PAH (U = 0)	--	**217.24**	**243.82**	--	--
Semi-Volatile Organic Compounds (µg/kg)					
1,2,4-Trichlorobenzene	31	5.1 U	5.1 U	--	--
1,2-Dichlorobenzene	35	5.1 U	5.1 U	--	--
1,4-Dichlorobenzene	110	5.1 U	5.1 UJ	--	--
2,4-Dimethylphenol	29	**1.7 J**	**2.9 J**	--	--
2-Methylphenol (o-Cresol)	63	**3.9 J**	**3.5 J**	--	--
3-Methylphenol &	--	**6.1 J**	**6.8 J**	--	--
Benzoic acid	650	250 U	250 UJ	--	--
Benzyl alcohol	57	**6.4 J**	10 U	--	--
Bis(2-ethylhexyl) phthalate	1300	**20 J**	**41 J**	--	--
Butylbenzyl phthalate	63	**4.5 J**	10 U	--	--
Dibenzofuran	540	**23**	**25 J**	--	--
Diethyl phthalate	48	10 U	10 U	--	--
Dimethyl phthalate	71	10 U	10 U	--	--
Di-n-butyl phthalate	1400	**4.8 J**	20 U	--	--
Di-n-octyl phthalate	420	20 U	**3.7 J**	--	--
Hexachlorobenzene	22	5.1 U	5.1 U	--	--
Hexachlorobutadiene	11	5.1 U	5.1 U	--	--
Hexachloroethane	--	10 U	10 U	--	--
N-Nitrosodiphenylamine	28	5.1 U	5.1 U	--	--
Pentachlorophenol	360	10 U	10 U	--	--
Phenol	420	**21**	**38**	--	--
Total Petroleum Hydrocarbons (mg/kg)					
Diesel #2 Range	--	**10 J**	**180**	--	--
Gasoline Range Hydrocarbons	--	15 U	5.6 U	4 U	4 U
Motor Oil Range	--	**47 J**	320	--	--

Notes:

Ecology	Washington State Department of Ecology	a	Screening criteria is from Natural Background Soil Concentrations
SMS	Sediment Management Standards	J	Estimated value
SQS	Sediment Quality Standards	U	Composed analyzed, but not detected above detection limit
Bold	Detected result	--	not analyzed

🟨 Detected concentration is greater than Ecology SMS SQS screening level

🟧 Non-detected concentration is above one or more identified screening levels

Level II validation has been applied.

Total LPAH (Low PAH) are the total of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene and Anthracene. 2-Methylnapthalene is not included in the sum of LPAHs.

Total HPAH (High PAH) are the total of Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzofluoranthenes, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, Dibenzo(a,h)anthracene and Benzo(g,h,i)perylene.

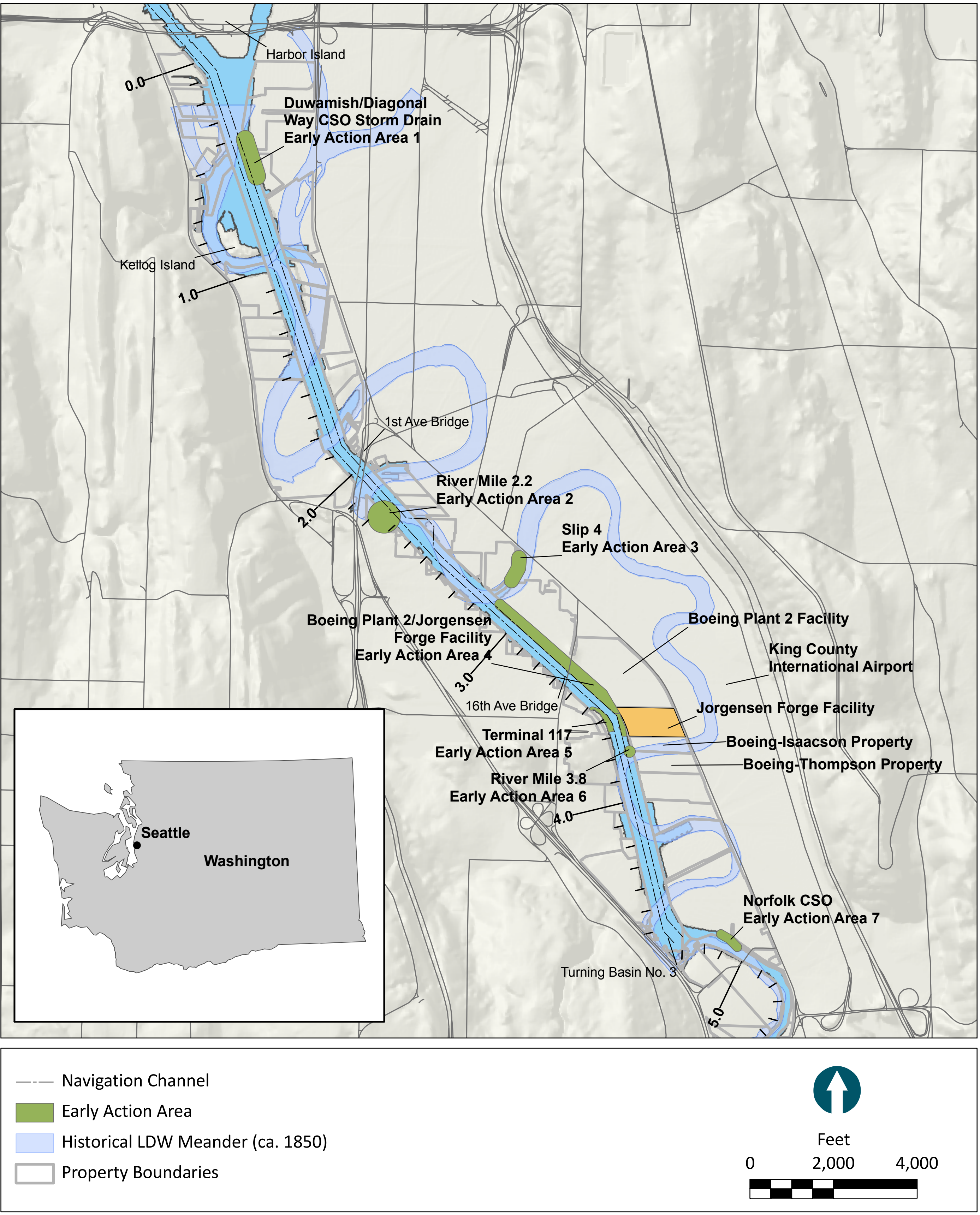
Table 18
Summary of Soil and Groundawater Analytical Results for pH

Sample Location	Sample Identification	Sample Date	Depth (feet)	Soil	Groundwater
				pH (pH units)	
SB-13	SB-13-020609-1	2/6/2009	4	7.2	7.28
	SB-13-020609-2	2/6/2009	8	8.4	
	SB-13-020609-3	2/6/2009	12	7.7	
	SB-13-020609-4	2/6/2009	16	7	
SB-14	SB-14-020609-1	2/6/2009	4	7.9	7.17
	SB-14-020609-2	2/6/2009	8	6.6	
	SB-14-020609-3	2/6/2009	12	8.1	
	SB-14-020609-4	2/6/2009	16	5.9	
SB-15	SB-15-020609-1	2/6/2009	4	7.5	6.77
	SB-15-020609-2	2/6/2009	8	7.3	
	SB-15-020609-3	2/6/2009	12	7.8	
	SB-15-020609-4	2/6/2009	16	7	
SB-16	SB-16-020609-1	2/6/2009	4	7.3	NA
	SB-16-020609-2	2/6/2009	8	7.1	
	SB-16-020609-3	2/6/2009	12	8.1	
	SB-16-020609-4	2/6/2009	16	7.8	

Notes:

NA	Not available

FIGURES



\\Orcas\GIS\Jobs\050224-Jorgensen_Forge\Maps\2010_12\Vicinity_Map.mxd nkochie 12/27/2010 2:19 PM

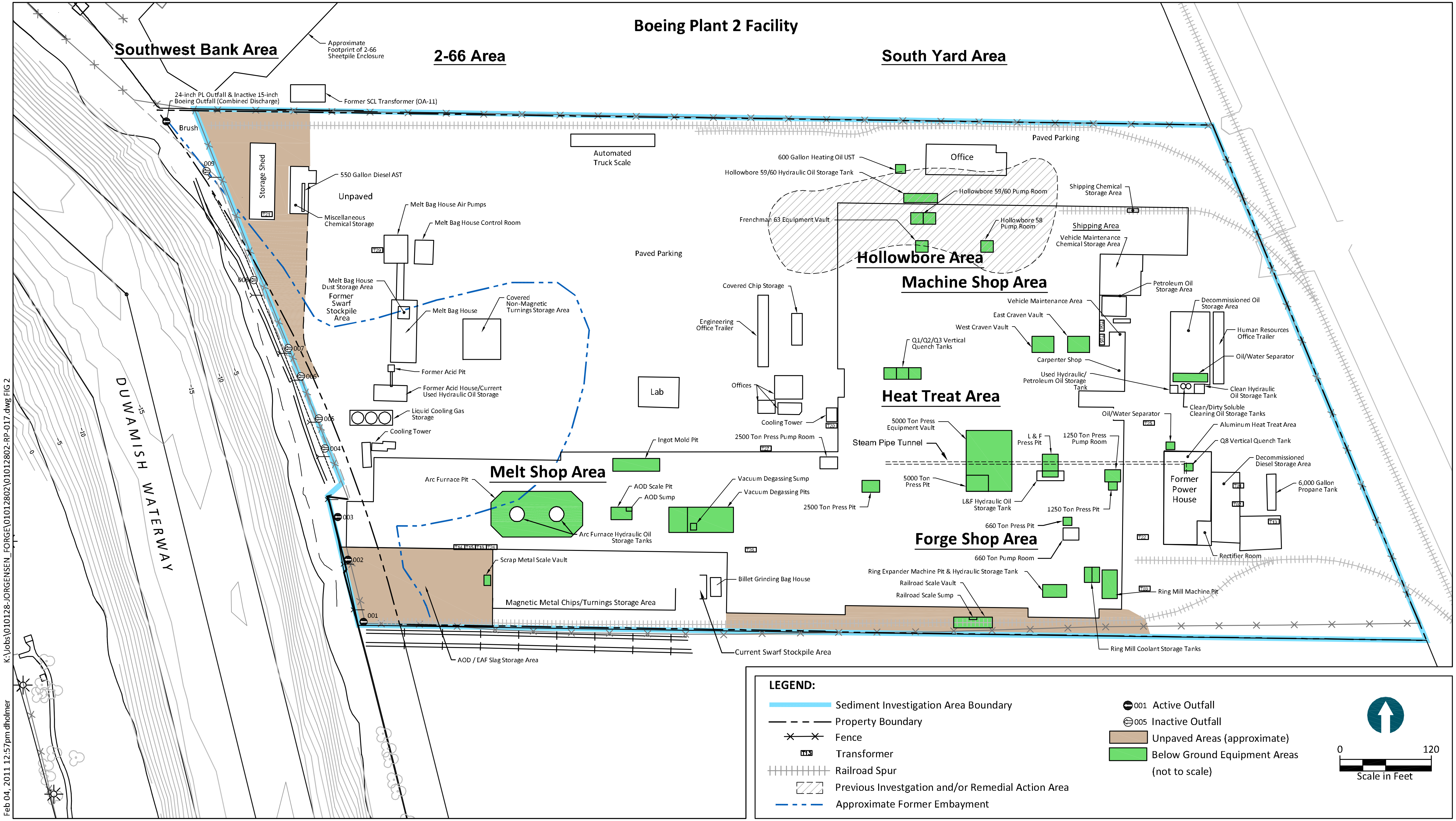
Figure 1

Facility Vicinity Map

Final Source Control Evaluation Addendum Report

Jorgensen Forge Facility

ANCHOR QEA



K:\Jobs\010128-JORGENSEN_FORGE\01012802\01012802-RP-017.dwg FIG 2

Feb 04, 2011 12:57pm dholmer

ANCHOR QEA

Farallon Consulting

Figure 2
Map Depicting Facility Features
Final Source Control Evaluation Addendum Report
Jorgensen Forge Facility

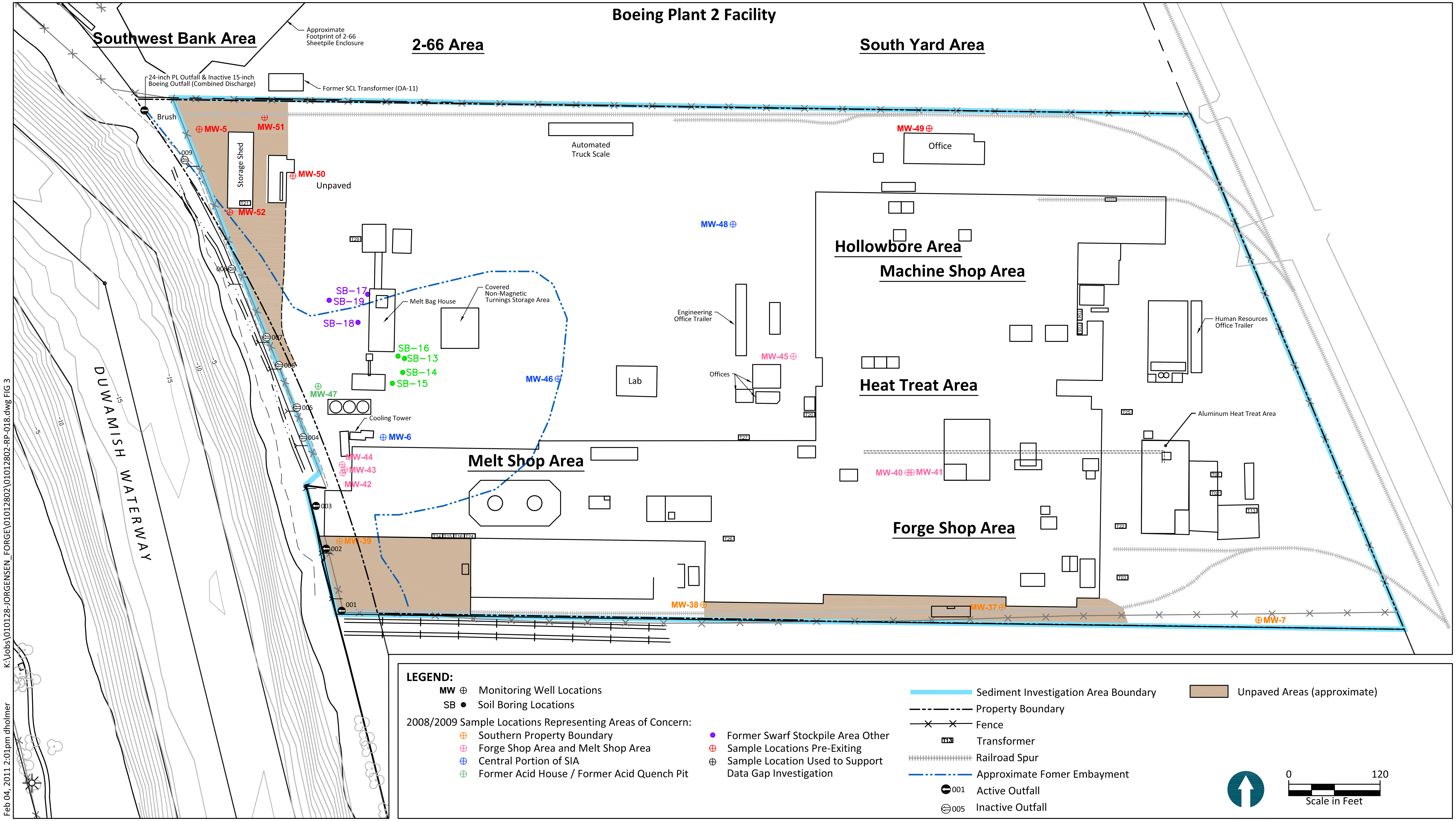
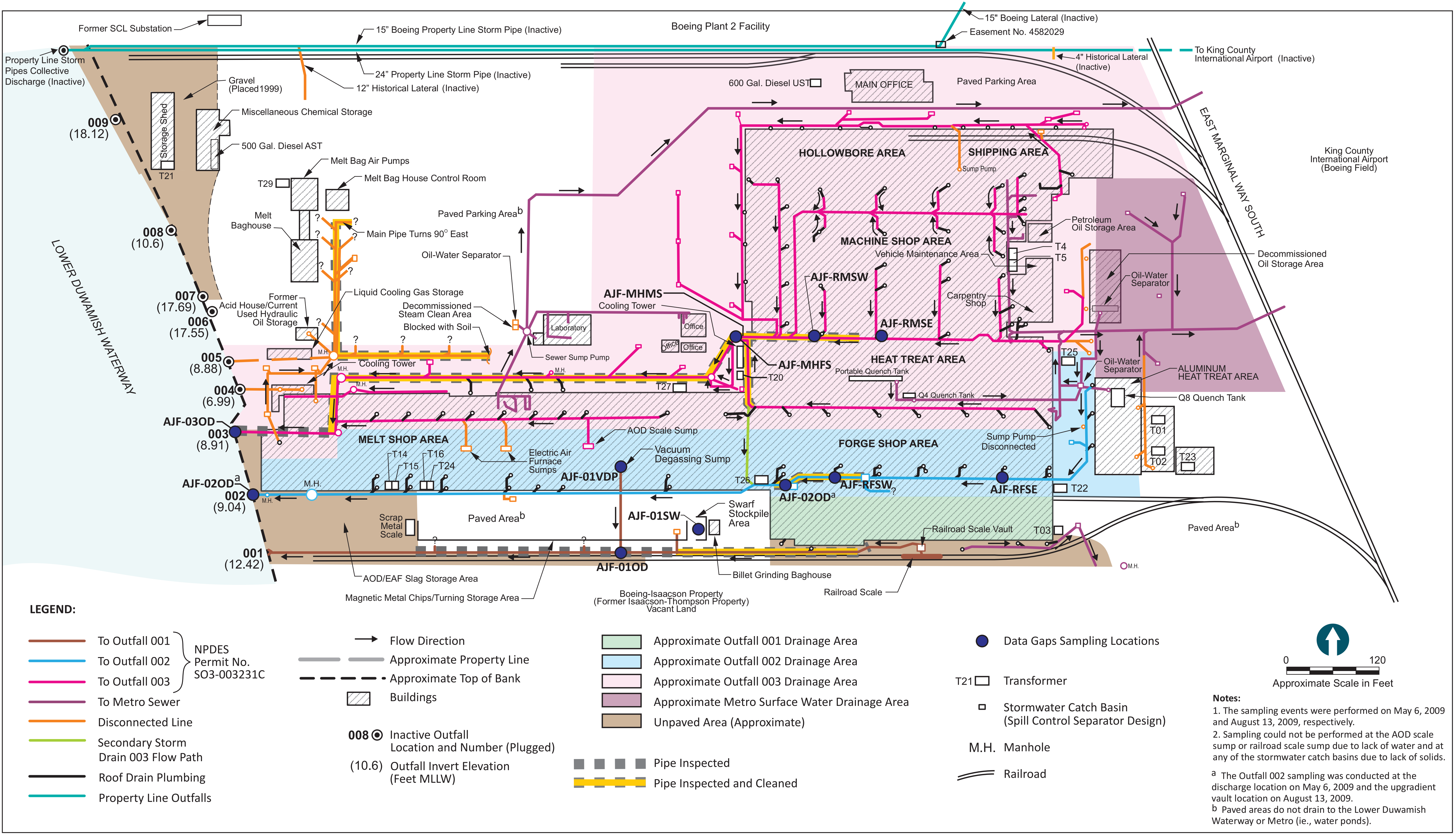


Figure 3
Map Show Data Gap Investigation Soil and Groundwater Sampling Locations
Final Source Control Evaluation Addendum Report
Jorgensen Forge Facility



Notes:

1. The sampling events were performed on May 6, 2009 and August 13, 2009, respectively.
2. Sampling could not be performed at the AOD scale sump or railroad scale sump due to lack of water and at any of the stormwater catch basins due to lack of solids.

[a] The Outfall 002 sampling was conducted at the discharge location on May 6, 2009 and the upgradient vault location on August 13, 2009.
[b] Paved areas do not drain to the Lower Duwamish Waterway or Metro (ie., water ponds).

3/31/2011 prichmond I:\Projects\Duwamish River\Jorgensen Forge Corporation\Ecology AO Process\Source Control Evaluation Report\Addendum SCER\Final SCER Addendum\Figures\FIG 4_new.pdf

Figure 4
Data Gaps Sampling Locations, Storm Drain Clean Out, and Inspection Locations
Final Source Control Evaluation Addendum Report
Jorgensen Forge Facility

LEGEND:

▬ ▬ ▬ Sediment Investigation Area

AJF-RFSW Stormwater Roof Sample Location and Number

NOTES:
1. Stormwater roof runoff samples collected on May 6, 2009 and August 13, 2009.
2. Shown runoff areas are approximate based on visual observation.

* The AJF-MHFS sample collected from the sub-grade manhole includes inputs from this approximate roof area.

SOURCE: Google Earth 2008

0 150
Approximate Scale in Feet

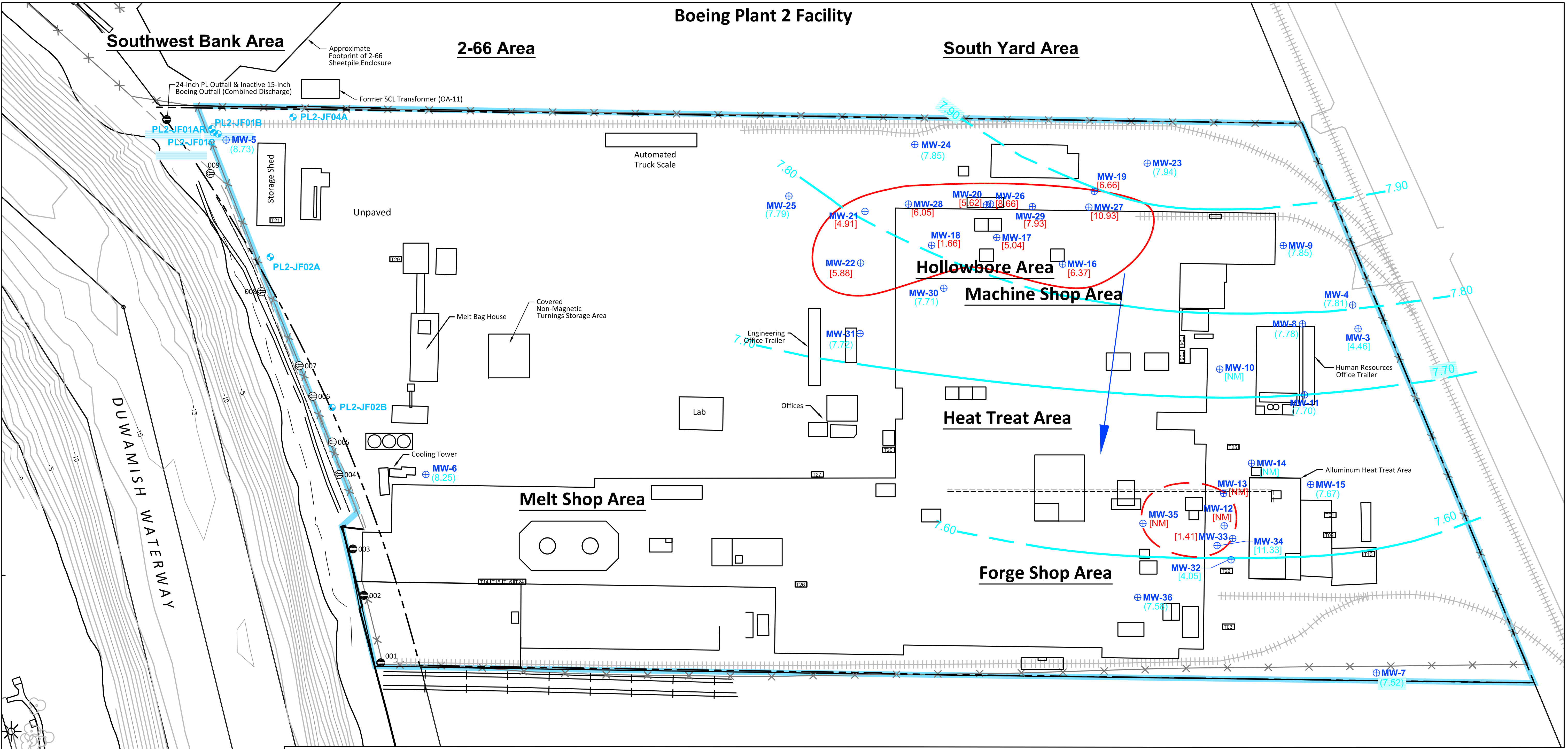
ANCHOR QEA

FARALLON CONSULTING

Figure 5
Approximate Roof Runoff Drainage Areas
Final Source Control Evaluation Addendum Report
Jorgensen Forge Facility

Figure 6
Manhole Sampling Location
Final Source Control Evaluation Addendum Report
Jorgensen Forge Facility

12/28/2010 cdavidson K:\Jobs\010128-JORGENSEN_FORGE\01012801\01012802-RP-007.cdr



LEGEND:

(4.36) Groundwater Elevation in feet Relative to to NAVD 88

[2.03] Groundwater Elevation Measurement not Considered in Contouring

[9.68] Measured Thickness of Petroleum as Light Non-Aqueous Phase Liquid (LNAPL) in feet

[NM] / (NM) Indicates LNAPL/Water Level not Measured

5.40 Groundwater Elevation Contour

Approximate Direction of Groundwater Flow

Estimated Extent of LNAPL on Groundwater Measured on January 29, 2008, Dashed where inferred

MW-1 ⊕ MW - Monitoring Well

PL2-JF01A Boeing Monitoring Well

Sediment Investigation Area Boundary

Property Boundary

Fence

Transformer

Railroad Spur

001 Active Outfall

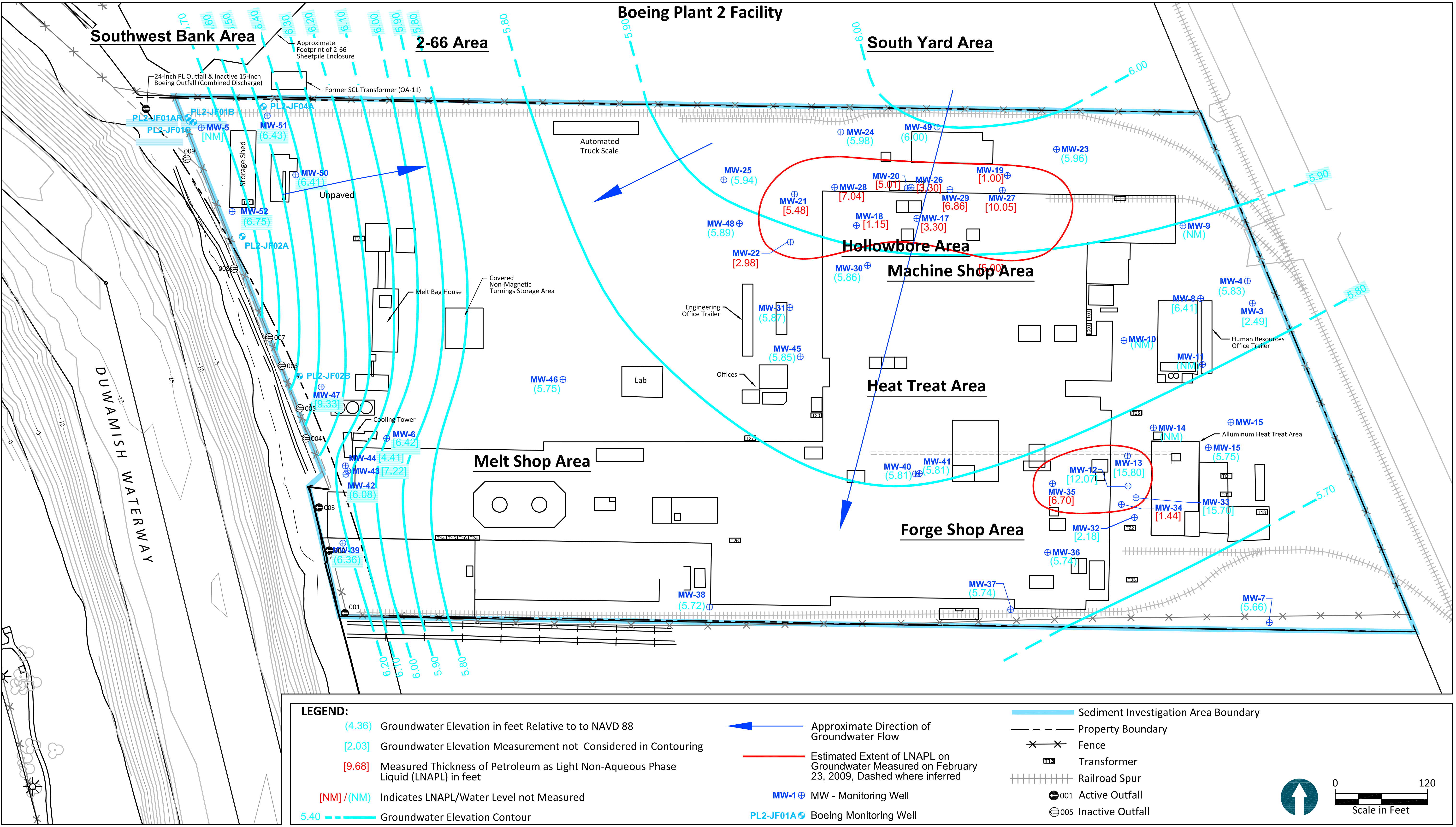
005 Inactive Outfall

0 120
Scale in Feet

ANCHOR QEA

FARALLON CONSULTING

Figure 7
Groundwater Elevation Contour Map for January 29, 2008
Final Source Control Evaluation Addendum Report
Jorgensen Forge Facility



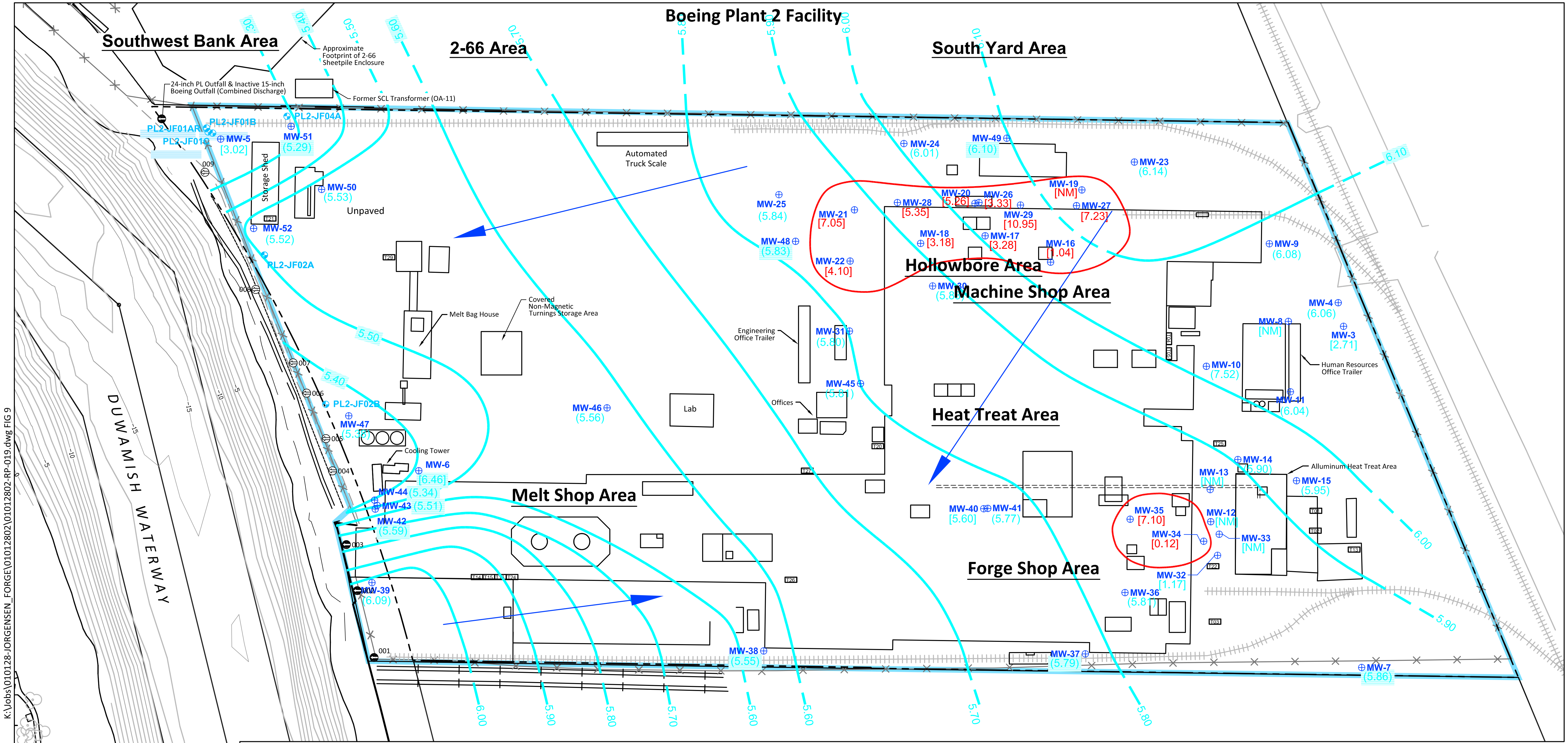
K:\Jobs\010128-JORGENSEN_FORGE\01012802\01012802-RP-019.dwg FIG 8

Feb 04, 2011 1:59pm dholmer

ANCHOR QEA

FARALLON CONSULTING

Figure 8
Groundwater Elevation Contour Map for February 23, 2009
Final Source Control Evaluation Addendum Report
Jorgensen Forge Facility



LEGEND:

(4.36) Groundwater Elevation in feet Relative to to NAVD 88

[2.03] Groundwater Elevation Measurement not Considered in Contouring

[9.68] Measured Thickness of Petroleum as Light Non-Aqueous Phase Liquid (LNAPL) in feet

[NM] / (NM) Indicates LNAPL/Water Level not Measured

5.40 – – —— Groundwater Elevation Contour

← Approximate Direction of Groundwater Flow

—— Estimated Extent of LNAPL on Groundwater Measured on May 19, 2009, Dashed where inferred

MW-1⊕ MW - Monitoring Well

PL2-JF01A Boeing Monitoring Well

—— Sediment Investigation Area Boundary

– – — Property Boundary

×—× Fence

T13 Transformer

┼┼┼┼┼ Railroad Spur

● 001 Active Outfall

⊖ 005 Inactive Outfall

0 120
Scale in Feet

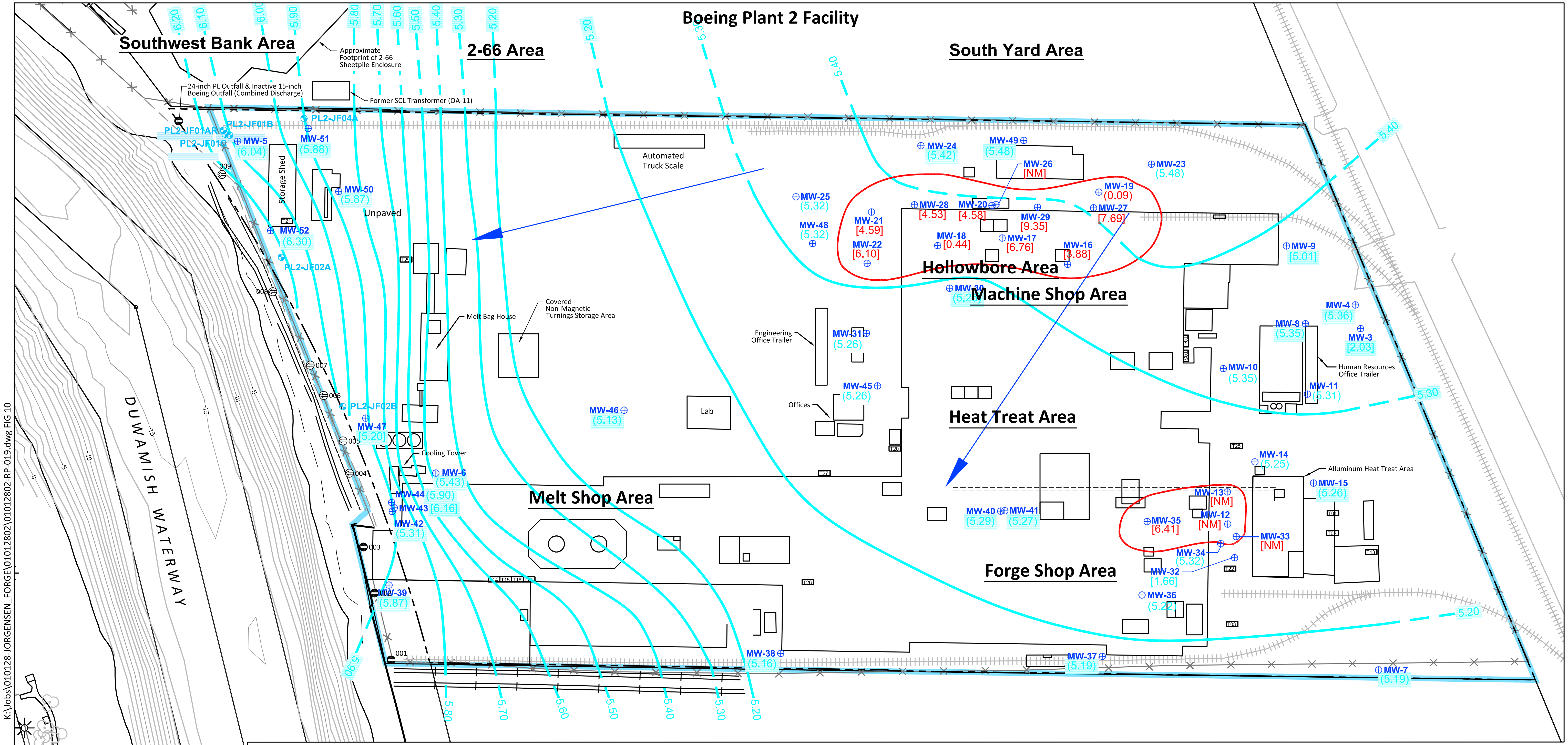
K:\Jobs\010128-JORGENSEN_FORGE\01012802\01012802-RP-019.dwg FIG 9

Feb 04, 2011 2:00pm dholmer

ANCHOR QEA

Farallon Consulting

Figure 9
Groundwater Elevation Contour Map for May 19, 2009
Final Source Control Evaluation Addendum Report
Jorgensen Forge Facility



LEGEND:

(4.36) Groundwater Elevation in feet Relative to to NAVD 88

[2.03] Groundwater Elevation Measurement not Considered in Contouring

[9.68] Measured Thickness of Petroleum as Light Non-Aqueous Phase Liquid (LNAPL) in feet

[NM] (NM) Indicates LNAPL/Water Level not Measured

5.40 Groundwater Elevation Contour

Approximate Direction of Groundwater Flow

Estimated Extent of LNAPL on Groundwater Measured on August 25, 2009, Dashed where inferred

MW-1 ⊕ MW - Monitoring Well

PL2-JF01A Boeing Monitoring Well

Sediment Investigation Area Boundary

Property Boundary

Fence

Transformer

Railroad Spur

001 Active Outfall

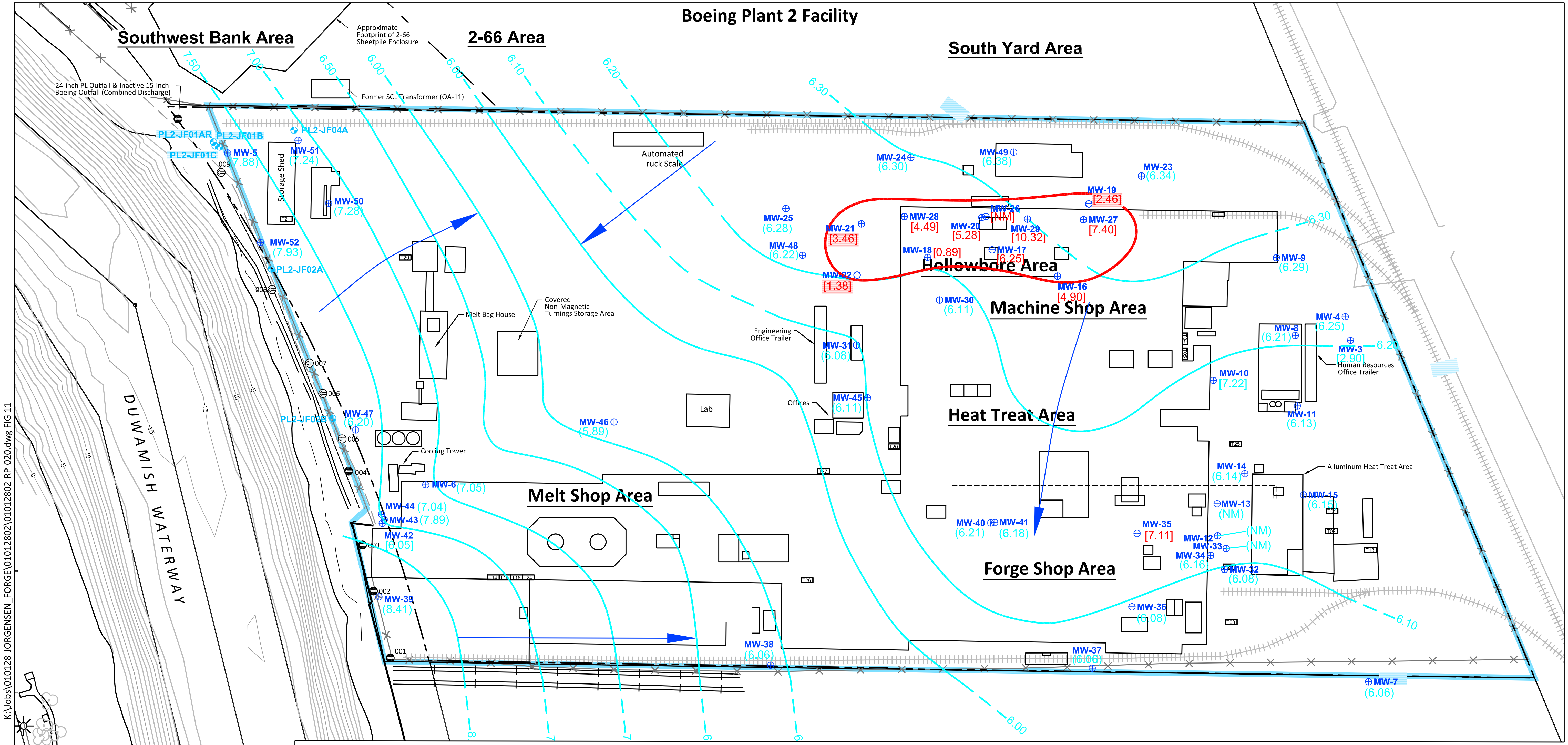
005 Inactive Outfall

0 120
Scale in Feet

ANCHOR QEA

Farallon Consulting

Figure 10
Groundwater Elevation Contour Map for August 25, 2009
Final Source Control Evaluation Addendum Report
Jorgensen Forge Facility



LEGEND:

(4.36)	Groundwater Elevation in feet Relative to to NAVD 88
[2.03]	Groundwater Elevation Measurement not Considered in Contouring
[9.68]	Measured Thickness of Petroleum as Light Non-Aqueous Phase Liquid (LNAPL) in feet
[NM] / (NM)	Indicates LNAPL/Water Level not Measured
5.40	Groundwater Elevation Contour
←	Approximate Direction of Groundwater Flow
—	Estimated Extent of LNAPL on Groundwater Measured on January 29, 2008, Dashed where inferred
MW-1 ⊕	MW - Monitoring Well
PL2-JF01A ⊕	Boeing Monitoring Well
—	Sediment Investigation Area Boundary
— —	Property Boundary
×—×	Fence
▭	Transformer
┼┼┼┼	Railroad Spur
● 001	Active Outfall
⊖ 005	Inactive Outfall

0 120
Scale in Feet

K:\Jobs\010128-JORGENSEN_FORGE\01012802\01012802-RP-020.dwg FIG 11

Feb 04, 2011 2:03pm dholmer

ANCHOR QEA

FARALLON CONSULTING

Figure 11

Groundwater Elevation Contour Map for December 9, 2009
Final Source Control Evaluation Addendum Report
Jorgensen Forge Facility

APPENDIX A
WASHINGTON STATE DEPARTMENT OF ECOLOGY'S COMMENTS ON THE DRAFT SCER ADDENDUM AND THE JORGENSEN FORGE CORPORATION'S RESPONSES

ANCHOR QEA

720 Olive Way, Suite 1900
Seattle, Washington 98101
Phone 206.287.9130
Fax 206.287.9131

March 31, 2011

John Keeling
Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, Washington 98008-5452

Re: Response to Ecology's April 8, 2010 Comments on the *Draft Source Control Addendum Report* dated December 2009

Project Number: 010128-02.01

Dear John:

Anchor QEA, LLC, and Farallon Consulting, LLC (Farallon) have prepared this letter on behalf of Jorgensen Forge Corporation (Jorgensen Forge) in response to the Washington State Department of Ecology's (Ecology's) April 8, 2010, comments on the *Draft Source Control Evaluation Addendum Report* (Draft SCER Addendum). The Draft SCER Addendum was prepared for the Sediment Investigation Area (SIA) of the Jorgensen Forge Facility located at 8531 East Marginal Way South in Seattle, Washington (the SIA), and was submitted to Ecology in December 2009. The Draft SCER Addendum was prepared to meet the requirements of Agreed Order No. DE 4127 issued by Ecology (the Agreed Order) pursuant to the authority of Chapter 70.105D.050 (1) of the Revised Code of Washington (RCW) and entered into by Jorgensen Forge.

In this letter, the original comments provided by Ecology are presented in bold, immediately followed by Jorgensen Forge's response in a different font. As applicable, text in the Draft SCER Addendum has been revised per the Ecology comments, and the revised *Final Source Control Evaluation Addendum Report* (Final SCER Addendum) is attached to this letter.

Citations for any documents mentioned in the responses to these comments can be found in Section 6 of the Final SCER Addendum.

Submittal of this letter and the Final SCER Addendum complete the requirements of the Source Control Investigation required under the Agreed Order.

The Final SCER Addendum identifies that additional stormwater source control implementation is necessary to maintain stormwater discharges protective of sediment and water quality in the Lower Duwamish Waterway. Based on recent communications, it is anticipated that Ecology will require Jorgensen Forge to implement the additional stormwater source control actions under an amended or new Agreed Order with Ecology. As repeated on page 8 of this letter, Jorgensen Forge requests a joint meeting with John Keeling and Bob Wright (Ecology's lead for the Jorgensen Forge National Pollutant Discharge Elimination System [NPDES] Permit compliance) to discuss the proposed path forward and schedule for completing an AKART (all known, available, and reasonable methods for prevention, control and treatment) analysis for stormwater treatment. This analysis will facilitate Ecology concurrence on the selection and design of the most cost-effective stormwater treatment system for the SIA.

Please contact Ryan Barth at (206) 287-9130 or rbarth@anchorqea.com to coordinate scheduling this joint meeting.

Regards,

Ryan Barth

Ryan Barth, P.E.
Anchor QEA, LLC

cc:

Wayne Desberg and Steve Abelman, Jorgensen Forge
Robert Wright, Ecology
Shawn Blocker, EPA
Rick Thomas, Ecology
David Templeton, Anchor QEA
Amy Essig Desai and Peter Jewett, Farallon

DEPARTMENT OF ECOLOGY'S COMMENTS

Groundwater

The report documents that zinc was found in groundwater samples from well MW-45. Nickel was found in MW-44 and SB-13 and SB-14. As the report points out the results are sporadic. They are also fairly low, however more analysis and/or modeling is needed before concluding there is no potential threat to sediments. As the report also points out, these metals are naturally occurring in some Washington soils. That would not usually translate into filtered groundwater results as high as found. Metals don't necessarily come out of soils into groundwater unless they are at high levels or there's a pH problem. Re-sampling the available wells and including laboratory filtering before analysis is necessary in order to understand what the zinc and nickel results mean. Typically a groundwater monitoring program is for four quarters, and Ecology is requesting that.

Jorgensen Forge's Response:
In accordance with the May 2008 *Data Gap Investigation Work Plan* (Work Plan) approved by Ecology, four quarters of groundwater monitoring and sampling have been conducted at the SIA under the Agreed Order process. The results of the groundwater monitoring and sampling events conducted in February, May, and August 2009 are summarized in the Draft SCER Addendum. The results of the fourth quarter of groundwater monitoring (December 2009) and sampling, conducted in December 2009, have been included in the attached Final SCER Addendum.

As outlined in the Work Plan, the scope of work for the four quarters of groundwater monitoring and sampling included submitting groundwater samples from select sampling locations for laboratory analysis of dissolved metals, including arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver and zinc. During the four quarters of sampling, 88 groundwater samples were collected for analysis of metals and all the samples were field filtered (February) or lab filtered (May, August, and December) prior to laboratory analysis.

The only metals detected in groundwater above the Source Control Evaluation Screening Level Value are zinc and nickel. Relatively low concentrations of nickel and zinc have been detected sporadically at two of 32 permanent groundwater sampling locations on the SIA.

Additional investigation and evaluation is not warranted, as shown by the zinc and nickel results discussed in the following paragraphs,

The laboratory analytical results detected concentrations of zinc in the groundwater sample collected from monitoring well MW-45 in February 2009. The single detection of zinc, at a concentration of 39 micrograms per liter (µg/l), only slightly exceeds the Source Control Evaluation Screening Level Value of 33 µg/l for zinc. The results of subsequent groundwater monitoring and sampling events did not detect zinc above the laboratory reporting limit in groundwater samples collected from monitoring well MW-45. Zinc was not detected above the laboratory reporting limit in any of the other 87 groundwater samples collected as part of the Data Gap Investigation. Zinc is not considered a COC in groundwater for the SIA.

Concentrations of nickel exceeding the Source Control Evaluation Screening Level Value of 8.2 µg/l were detected in the reconnaissance groundwater samples collected from borings SB-13 and SB-14 and in groundwater samples collected from monitoring well MW-44 in February and December 2009. The detected concentrations of nickel in the reconnaissance groundwater samples collected from borings SB-13 and SB-14 (23 µg/l and 66 µg/l , respectively) are higher than those detected in the groundwater samples collected from monitoring well MW-44 (8.5µg/l and 11 µg/l, respectively). The higher detected concentrations of nickel detected in reconnaissance groundwater samples are likely associated with the presence of higher total suspended solids that are typically present in reconnaissance groundwater samples collected from temporary well borings. Unlike a permanent monitoring well, temporary well borings do not contain a sand pack around the screened interval of a well nor do they undergo well development (i.e. purging a minimum of three pore volumes) to filter fine-grained sediments from the surrounding formation. Therefore, the analytical results of the groundwater samples collected from monitoring well MW-44 are considered more representative of subsurface conditions than the reconnaissance groundwater samples collected from borings SB-13 and SB-14. In addition, nickel was not detected above the laboratory reporting limit in any of the other 84 groundwater samples collected as part of the Data Gap Investigation. Nickel is not considered a COC in groundwater for the SIA.

The *Final Source Control Evaluation Report*, dated May 2008 and prepared by Anchor Environmental, LLC, and Farallon, included a comprehensive compilation and evaluation of groundwater analytical data collected on the SIA to the Source Control Evaluation Screening Level Values. The report concluded that nickel and zinc are naturally occurring at the SIA, as evidenced by their presence in monitoring well PL2-JF01C screened at a depth of 70 feet below ground surface and their absence in monitoring wells screened in upper portions of the water-bearing zone. Similarly, monitoring wells MW-44 and MW-45 are screened in deeper portions of the water-bearing zone, so the occasional detections of nickel and zinc from these wells are interpreted to be naturally occurring.

Following Ecology's review and approval of the Final SCER Addendum, a Long-term Groundwater Monitoring and Sampling Plan will be prepared and submitted to Ecology to be conducted under an amended or new Agreed Order. At a minimum, the Long-term Groundwater Monitoring and Sampling Plan will present the scope of work to:

- Monitor the plumes of light non-aqueous phase liquid (LNAPL) on groundwater on the eastern portion of the SIA
- Monitor groundwater quality between potential ongoing source areas of constituents of concern (based on ongoing operations) and the Lower Duwamish Waterway
- Report the long-term monitoring results

Stormwater

The report documents that cadmium, copper and nickel in concentrations above screening levels were found in roof drains. Please endeavor to discover why they are present. Do they represent air deposition? As mentioned in the report, further mitigation measures are necessary to prevent discharge of metals from outfalls 001, 002, and 003 to the Lower Duwamish Waterway. Please let Ecology know how you intend to stop these discharges.

Jorgensen Forge's Response:
As part of the quarterly compliance monitoring required under Jorgensen Forge's NPDES Permit (No. WAR-003231), copper and zinc stormwater discharge concentrations have been identified above the Permit benchmark values and/or action levels during a number of quarters since 2003. These exceedances required Jorgensen Forge to complete a Level Three Response Corrective Action (Level Three Response) set forth in Section S.4.C of the Permit dated January 14, 2005. These requirements included the following:

- Identify the potential sources of stormwater contamination that are causing or contributing to the presence of the benchmark parameter
- Investigate all available options of source control, operational control, and stormwater treatment BMPs to reduce stormwater contaminate levels below permit benchmark values
- Implement additional source and operational BMPs identified as part of this investigation
- Prepare and submit a Level Three Source Control Report outlining actions taken, planned, and scheduled for implementing source and operational BMPs to reduce stormwater contaminate levels

The 2005 Permit was updated in late 2009 and became effective on January 1, 2010. The 2010 Permit required that all permittees that triggered a Level Three Response under the 2005 Permit complete the previously-listed requirements and following additional requirements:

- Review the Stormwater Pollution Prevention Plan (SWPPP) and ensure that it fully complies with Permit Condition S3

- Make appropriate revisions to the SWPPP to include additional Treatment BMPs with the goal of achieving the applicable benchmark value(s) in future discharges
- Sign and certify the revised SWPPP is in accordance with S3.A.6
- Design and stamp (by a licensed professional engineer, geologist, hydrogeologist, or Certified Professional in Storm Water Quality [CPSWQ]) the portion of the SWPPP that addresses stormwater treatment structures or processes

In March 2008, Jorgensen Forge requested and obtained approval from Ecology (Attachment 1 to this letter) to fulfill the NPDES Level Three Response through completion of the Agreed Order Source Control Investigation process and subsequent implementation of necessary stormwater source controls. This approval allows Jorgensen Forge to use the additional stormwater sampling results gathered during the Source Control Investigation data gaps sampling and subsequent additional source control evaluations (see Section 1.4 of the Final SCER Addendum) to help identify the potential sources of metals contributing to exceedances of the benchmark parameters and inform the stormwater treatment design. As detailed in the Final SCER Addendum, the data gaps sampling results documented additional stormwater screening level exceedances on the SIA. These results further support the need for implementation of additional operational, source, and stormwater treatment BMPs to attempt to decrease the stormwater discharge concentrations to levels that are protective of both sediment and surface water quality in the Lower Duwamish Waterway.

As previously stated in this letter, Jorgensen Forge requests a joint meeting with John Keeling and Bob Wright to discuss the proposed path forward and schedule for completion of an AKART analysis to facilitate Ecology concurrence on the selection and design of the most cost-effective stormwater treatment system for the SIA. Completion of the Ecology-approved AKART process will also allow Jorgensen Forge to complete the requirements identified in the 2005 and 2010 NPDES Permits. The stormwater treatment system will be completed prior to initiation of the sediment cleanup activities in the Lower Duwamish Waterway adjacent to the Facility.

Stormwater Compliance Inspection Report

I am attaching a Stormwater Compliance Inspection Report in which Ecology's Water Quality Program raises concerns about slag storage in the south west corner of the facility. Please see photos 17 and 18 of the attached report that were taken by Ecology on January 13, 2010. Please provide a short explanation of why this area is not a problem (per the Source Control Evaluation Report), and why no metals or other contaminants are getting to the Duwamish.

Jorgensen Forge's Response:

Jorgensen Forge's response to the Stormwater Compliance Inspection Report are included as Attachment 2 to this letter. The "Jorgensen Response," starting on pages 7 and 8 of Attachment 2, provides an explanation of why the slag storage area is not a potential source of elevated chemical concentrations to the Lower Duwamish Waterway. This explanation reads:

> **Investigations Summary**
> Two separate investigations have provided data that the slag storage area is not a potential source of elevated chemical concentrations to the Lower Duwamish Waterway via groundwater infiltration and discharge, as discussed in the next paragraph. Regardless, as previously noted, the Jorgensen leadership team is currently evaluating additional alternative slag storage and containment options that will further minimize potential impacts to stormwater quality, in order to meet the BMP implementation requirements identified in the Permit.
>
> **Shoreline Seep Sampling Analysis**
> As part of the Lower Duwamish Waterway Remedial Investigation, the Lower Duwamish Waterway Group (LDWG) collected a single shoreline seep sample in July 2004 at the base of the concrete panel wall directly riverward of the slag storage area. The sample was submitted for analysis of total suspended solids, total organic carbon, metals, SVOCs, VOCs, polychlorinated biphenyls (PCBs), and pesticides. The results of the sample collection are presented in the Data Report: Survey and Sampling of Lower Duwamish Waterway Seeps – Final (Windward 2004). Comparison of the results to the acute and chronic marine water quality criteria for the surface waters of the state of Washington (WAC 173-201) showed that copper was the only identified

exceedance. Copper exceedances, however, were identified at every seep station sampled throughout the Lower Duwamish Waterway due to the very low criteria.

Slag Storage Area Monitoring Well Sampling Analysis

In addition, as part of the ongoing Site source control investigation being conducted under Ecology Agreed Order No. DE 4127, Jorgensen installed monitoring well MW-39 between the slag storage area and the shoreline in 2009. Monitoring well MW-39 is screened from 5 to 20 feet below ground surface (bgs), which extends across the top of the water table in this portion of the Site with groundwater levels measured at depths ranging from 12 to 18 feet bgs. Groundwater monitoring and sampling was conducted at monitoring well MW-39 in February, May, August, and December 2009. Groundwater samples collected from monitoring well MW-39 were submitted for laboratory analysis of total petroleum hydrocarbons (TPH), including gasoline-range organics, diesel-range organics, and oil-range organics; dissolved metals; SVOCs, including polycyclic aromatic hydrocarbons; and VOCs including benzene, toluene, ethylbenzene and xylene. The laboratory analytical results of the four quarters of groundwater monitoring and sampling at monitoring well MW-39 have not detected concentrations of TPH, dissolved metals, SVOCs, or VOCs above the source control investigation screening levels. Consistent with the seep sample data previously discussed, these four rounds of recent groundwater data provide evidence that upland seepage of groundwater migrating beneath the slag storage area and subsequent discharge to the Lower Duwamish Waterway is not contributing elevated chemical concentrations.

LIST OF ATTACHMENTS

Attachment 1	Request for Level Three Response Integration into Agreed Order Process and Ecology Approval
Attachment 2	Jorgensen Forge's Response to Ecology's Stormwater Inspection Report

Letter of Transmittal

To:
Ms. Elaine Worthen
Industrial Stormwater Permit Coordinator
Washington State Department of Ecology
PO Box 47696
Olympia, WA 98504-7696

From: Ryan Barth, Anchor Environmental

Date: March 3, 2008

Re: NPDES Level Three Response integration into Ecology Agreed Order process

Project: Jorgensen Forge Corporation - Industrial Stormwater General Permit Compliance

We are sending the following items:

Copies	Description
1	Letter formally requesting incorporation of the NPDES Level Three Response action into the Ecology Agreed Order source control investigation process

These are transmitted:

☐ For your information ☒ For action specified below ☐ For review and comment ☐ For your use ☐ As requested

Comments:

The Jorgensen Forge Corporation discharges stormwater from their facility under the revised Industrial Stormwater General Permit (No. SO3-003231C). They have documented greater than four exceedances of the Action Levels defined in the Permit and are therefore required to submit a Level Three Response Report. This letter formally requests incorporation of the Level Three Response action into the Ecology Agreed Order (No. DE 4127) source control investigation process. The objective of the Agreed Order process is to identify and subsequently control any sources from the site to the Lower Duwamish Waterway that can cause adverse effects to sediment and/or surface water quality. These objectives will fulfill the Level Three Response action requirements. Please don't hesitate to contact me at 206.903.3334 to discuss any questions you may have.

cc:
Ron Altier, Jorgensen Forge
David Templeton, Anchor
Josh Lipsky, Cascadia Law Group
Greg Stegmen, Ecology

ANCHOR
ENVIRONMENTAL, L.L.C.

Anchor Environmental, L.L.C.
1423 3rd Avenue, Suite 300
Seattle, Washington 98101
Phone 206.287.9130
Fax 206.287.9131

March 3, 2008

Ms. Elaine Worthen
Industrial Stormwater Permit Coordinator
Washington State Department of Ecology
PO Box 47696
Olympia, WA 98504-7696

Re: Jorgensen Forge Corporation E. Marginal Way Facility
Industrial Stormwater General Permit # SO3-003231C DMR
NPDES Permit Level Three Response Action Incorporation into Ecology Agreed Order Process

Dear Ms. Worthen:

As required by the Washington State Department of Ecology (Ecology) revised Industrial Stormwater General Permit (Permit), the Jorgensen Forge Corporation (Jorgensen) conducts quarterly sampling and analysis of permitted (No. SO3-003231C) stormwater discharges to the Lower Duwamish Waterway (LDW) from their facility located at 8531 East Marginal Way South in Seattle, Washington (Site). This sampling and analysis has shown four or more exceedances of the Action Levels defined in the revised Permit for samples collected since December 31, 2004. Due to these exceedances, Section S4.C of the revised Permit requires that Jorgensen initiate a Level Three Response Action to identify the source of the observed elevated concentrations and detail actions taken, planned, and scheduled to reduce stormwater contaminant levels below the Action Levels, as technically feasible. As discussed below, Jorgensen proposes conducting the Level Three Response Action as part of their ongoing Site source control investigation under their Agreed Order with Ecology.

Jorgensen and the former owner and operator, Earle M. Jorgensen (EMJ), are currently in negotiations with the U.S. Environmental Protection Agency (EPA) for an Amended Administrative Order of Consent (AOC) for preparation of an Engineering Evaluation/Cost

Analysis (EE/CA) for cleanup of affected sediments along a portion of the LDW adjacent to the Site. Prior to implementation of the sediment cleanup remedy, the nature and extent of any potential ongoing sources of chemicals from the uplands to the adjacent sediment need to be controlled to minimize the potential for sediment recontamination. To this end, Jorgensen entered into an Agreed Order (No. DE 4127, Attachment A) with Ecology on July 12, 2007, to conduct a Site source control investigation. The purpose of the source control investigation is to evaluate whether the Site is a potential ongoing source of chemicals to the adjacent LDW with the potential to cause adverse effects to sediment and surface water quality. This investigation will identify all potential sources of chemicals on the Site and determine what, if any, chemicals have complete pathways to the LDW via stormwater with the potential to cause exceedances of the Ecology marine chronic surface water quality criteria (November 2006). These criteria are protective of the Action Levels defined in the revised Permit.

The *Draft Source Control Evaluation Report* was submitted to Ecology on January 11, 2008 and summarized all of the available stormwater data on the Site (i.e., stormwater samples and catch basin solids). The evaluation showed that limited dissolved metals data were available for the Site stormwater, limiting comparison to the dissolved water quality criteria. Of the metals detected, only dissolved copper and nickel were detected at concentrations exceeding the water quality criteria in two samples. The report proposed additional stormwater sampling, including both total and dissolved metals, to obtain additional stormwater analytical data in several potential source areas. Following completion of these additional investigation activities, Jorgensen will submit a *Final Source Control Evaluation Addendum Report* to Ecology and determine what, if any, additional best management practices and/or treatment technologies may be required to control ongoing sources of chemicals to the stormwater drainage system and subsequently to the LDW.

The Agreed Order source control investigation and subsequent implementation of necessary source controls also fulfills the Level Three Response Action requirements defined in Section S4.C of the revised Permit. Anchor contacted Mr. Greg Stegmen at Ecology to discuss completion of the Level Three Response Actions through the Agreed Order reporting and source control implementation process. Mr. Stegmen was contacted because he previously conducted a stormwater inspection on the Site and was generally knowledgeable regarding the Site compliance monitoring results and the nature of the Agreed Order source control investigation. Mr. Stegmen indicated that other industrial stormwater permittees have incorporated their Level Three Response Actions into ongoing investigations with Ecology and therefore this combined approach may be considered acceptable by Ecology.

The timeline for completion of the remainder of the Agreed Order source control activities is defined in Exhibit C of Attachment A. Implementation of source control measures, if any, necessary to prevent recontamination of LDW sediments via ongoing sources will be implemented under a separate Order or Decree following completion of the Agreed Order activities. In accordance with Section S4.C of the revised Permit, any necessary source control implementation will include the preparation of a report detailing an investigation of all available options of source controls, operational controls, and stormwater treatment best management practices to reduce stormwater chemical levels below the applicable Action Levels.

Jorgensen requests that Ecology provide written approval documenting that incorporation of the Level Three Response Action into the Agreed Order and source control implementation process fulfills the Section S4.C revised Permit requirements. If approved, Jorgensen will provide you (or your designee) with a copy of existing and future Agreed Order submittals with a cover letter explaining the findings relevant to the Level Three Response Actions.

If you have any questions please do not hesitate to contact Ryan Barth at (206) 287-9130 or rbarth@anchorenv.com.

Sincerely,

Ryan Barth
Anchor Environmental, L.L.C.

Cc: Ron Altier, Jorgensen Forge Corporation
David Templeton, Anchor Environmental
Joshua Lipsky, Cascadia Law Group
Greg Stegmen, Ecology

Attachment A – Agreed Order No. DE 4127

RECEIVED
AUG 03 2007
By

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

July 30, 2007

Ron Altier
Vice President
Jorgensen Forge
8531 East Marginal Way
Seattle, WA 98108-4018

Dear Mr. Altier,

RE: Source Control Agreed Order for Jorgensen Forge

The Agreed Order was signed on July 12, 2007. A copy is enclosed. The Department of Ecology looks forward to working with you on this project.

If you have any questions, please feel free to contact me at 425-649-7052.

Sincerely,

John Keeling
Toxic Cleanup Program

jk/nr

Enclosure

cc: Ryan Barth, Anchor

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by: Jorgensen Forge Corporation	AGREED ORDER No. DE 4127

TO: Jorgensen Forge Corporation
Attn: Mr. Ron Altier
8531 E Marginal Way S
Tukwila, WA 98108-4018

TABLE OF CONTENTS

I. INTRODUCTION

The mutual objective of the State of Washington, Department of Ecology (Ecology), and Jorgensen Forge Corporation (Jorgensen) under this Agreed Order (Order) is to provide for remedial action at a facility where there has been a release or threatened release of hazardous substances that may have migrated to or have the potential to migrate to Lower Duwamish Waterway (LDW) sediments. This Order requires Jorgensen to perform certain activities to determine if the Jorgensen Property located at 8531 East Marginal Way South in Seattle, Washington (the Jorgensen Property) is an on-going source of contamination to sediments in the LDW. Ecology believes the actions required by this Order are in the public interest.

II. JURISDICTION

This Agreed Order is issued pursuant to the Model Toxics Control Act (MTCA), RCW 70.105D.050(1).

III. PARTIES BOUND

This Agreed Order shall apply to and be binding upon the Parties to this Order, their successors and assigns. The undersigned representative of each party hereby certifies that he or she is fully authorized to enter into this Order and to execute and legally bind such party to comply with this Order. Jorgensen agrees to undertake all actions required by the terms and conditions of this Order. No change in ownership or corporate status shall alter Jorgensen's responsibility under this Order. Jorgensen shall provide a copy of this Order to all agents, contractors, and subcontractors retained to perform work required by this Order, and shall ensure that all work undertaken by such agents, contractors, and subcontractors complies with this Order.

IV. DEFINITIONS

Unless otherwise specified herein, the definitions set forth in Chapter 70.105D RCW and Chapter 173-340 WAC shall control the meanings of the terms in this Order.

A. Sediment Investigation Area: For purposes of the investigation to be conducted pursuant to this Order, the "Sediment Investigation Area" is approximately located within the Jorgensen Property, as that property is identified below. The Sediment Investigation Area also includes and is further defined by the extent of hazardous substance contamination at or originating from the Jorgensen Property that is currently migrating to, or may have the potential to migrate to, LDW sediments and is resulting in, or could result in, violations of the Ecology Sediment Management Standards (WAC 173-204) criteria and pending LDW sediment cleanup goals. The Sediment Investigation Area will not include (a) the LDW sediments or shoreline bank area adjacent to the Jorgensen Property that will be addressed under the EPA Superfund process or (b) the areas addressed during activities undertaken pursuant to RCRA on the adjacent Boeing property. The Sediment Investigation Area is generally depicted in the Sediment Investigation Area Diagram (Exhibit A).

B. Parties: Refers to the State of Washington, Department of Ecology, and Jorgensen.

C. Potentially Liable Person (PLP): Refers to Jorgensen.

D. Agreed Order or Order: Refers to this Order and each of the exhibits to this Order. All exhibits are integral and enforceable parts of this Order. The terms "Agreed Order" or "Order" shall include all exhibits to this Order.

E. Jorgensen Property: The Jorgensen Property is defined as the property owned and/or occupied by Jorgenson located at 8531 E. Marginal Way S. Seattle, WA 98108-4018 and is delineated on the Agreed Order Sediment Investigation Area Diagram (Exhibit A). The Jorgensen Property is a "facility" or is part of a "facility" under RCW 70.105D.020(4).

V. FINDINGS OF FACT

Ecology makes the following findings of fact, without any express or implied admissions of such facts by Jorgensen:

A. The Jorgensen Property occupies 21.6 acres on the east bank of the LDW, between East Marginal Way and the LDW. The plant's street address is 8531 E Marginal Way South, Seattle, WA 98108. The latitude of the center of the main building, as estimated from a USGS map is 47 degrees; 30 minutes and 63.8 seconds north the longitude estimated from the same map is 122 degrees, 15 minutes and 52.5 seconds west. The King County tax parcel is 000160-0023.

B. The Jorgensen Property was developed in 1942, and operated from 1942 to 1965 as a fabricator of structural steel, and tractor and road equipment. On-property operations included forging and heat-treating by Isaacson Iron Works, which operated as a U.S. naval vessel manufacturer from 1942 to 1965. Bethlehem Steel operated a steel distribution center on the northwestern portion of the Jorgensen Property from approximately 1951 to 1963. Bethlehem Steel operations consisted of cutting prefabricated steel rods to customers' specifications. From 1965 to 1992, the Jorgensen Property was owned and operated by Earle M. Jorgensen Company (EMJ).

C. In July 1992, the facility was purchased by the plant management group and became the Jorgensen Forge Corporation. From 1992 to the present, the Jorgensen Property has been owned and operated by Jorgensen. EMJ is named as Grantor and Jorgensen is named as the Grantee in Warranty Deed No. 199206221436 for the Jorgensen Property, as filed with the King County Assessor.

D. The Boeing Company owns neighboring properties adjacent to the Jorgensen Property, including the Boeing Plant 2 facility to the north of the Jorgensen Property and the Boeing/Isaacson property to the south of the Jorgensen Property.

E. The U.S. Environmental Protection Agency (EPA) added the LDW to the federal Superfund list on September 13, 2001. EPA has entered into a Memorandum of Understanding with Ecology under which Ecology has been designated the Lead Agency to implement efforts to investigate and control sources of contamination to LDW sediments. Ecology has developed a Lower Duwamish Waterway Source Control Strategy (Ecology 2004) that provides the strategy and approach for upland site source control to date. According to the strategy, source control will be focused on chemicals with the potential to exceed Sediment Management Standards, WAC Ch. 173-204 (SMS), or other LDW sediment cleanup goals. Soil, groundwater, surface water, or other contamination issues within the property vicinity that do not have the potential to migrate to the LDW and exceed sediment cleanup goals will generally not be addressed by this source control program. Contaminants identified in LDW sediments that are the focus of these source control efforts include polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), mercury and other metals, and phthalates.

F. The following reports have been received by the Department with regard to the Jorgensen Property:

Underground Storage Tank Removal Investigation Earl M. Jorgensen Company 8531 East Marginal Way South Seattle, Washington, dated 4/30/91 by SEACOR

Draft Area 1 Hollow-bore Location Focused Remedial Investigation Feasibility Study Forge Facility 8531 East Marginal Way South Seattle, Washington, dated 2/19/1993 by SEACOR

Draft Area three former UST Area Focused Remedial Investigation/ Feasibility Study Forge Facility 8531 East Marginal Way South Seattle, Washington, dated 4/1/1993 by SEACOR

Report Subsurface Investigation Aluminum Heat Treating Building Area Jorgensen Forge Facility Seattle, Washington, dated 7/17/1999 by Dames & Moore

U.S. EPA DOCKET NO. CERCLA 10-2003-0111, dated 07/10/03 by Farallon Consulting, L.L.C. and Anchor Environmental, L.L.C.

Second Draft Environmental Sampling Work Plan, *Jorgensen Forge Facility 8531 East Marginal Way South, Seattle, Washington,* dated May 12, 2004 by Anchor Environmental, L.L.C. and Farallon Consulting, L.L.C.

Environmental Sampling Work Plan Addendum, Jorgensen Forge Facility 8531 East Marginal Way South, Seattle, Washington, dated April 2005 by Farallon Consulting, L.L.C. and Anchor Environmental, L.L.C.

Final Investigation Data Summary Report, Jorgensen Forge Facility 8531 East Marginal Way South, Seattle, Washington, dated February 13, 2006 by Farallon Consulting, L.L.C. and Anchor Environmental, L.L.C.

VI. ECOLOGY DETERMINATIONS

A. Ecology has determined that Jorgensen Forge Corporation is the current owner and operator, as defined in RCW 70.105D.020(12), of a "facility" as defined in RCW 70.105D.020(4).

B. Based upon all factors known to Ecology, a "release" or "threatened release" of "hazardous substance(s)" as defined in RCW 70.105D.020(20) and RCW 70.105D.020(7), respectively, has occurred at the facility.

C. Based upon credible evidence, Ecology issued a PLP status letter to Jorgensen dated November 16, 2005, pursuant to RCW 70.105D.040, -.020(16) and WAC 173-340-500. After providing for notice and opportunity for comment, reviewing any comments submitted, and concluding that credible evidence supported a finding of potential liability, Ecology issued a determination that Jorgensen is a PLP under RCW 70.105D.040 and notified Jorgensen of this determination by letter dated November 16, 2005.

D. Pursuant to RCW 70.105D.030(1) and -.050(1), Ecology may require PLPs to investigate or conduct other remedial actions with respect to any release or threatened release of hazardous substances, whenever it believes such action to be in the public interest. Based on the foregoing facts, Ecology believes the remedial actions required by this Order are in the public interest.

VII. WORK TO BE PERFORMED

Based on the Findings of Fact and Ecology Determinations, it is hereby ordered that Jorgensen take the following remedial actions at the Sediment Investigation Area and that these actions be conducted in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein:

A. The scope of work for this Order includes: (a) conducting a source control evaluation of existing data related to any existing or potential sources of LDW sediment contamination within the Sediment Investigation Area and (b) if necessary, conducting additional investigation within the Sediment Investigation Area to fill identified data gaps necessary to adequately document the status of source control from the Jorgensen Property to the LDW sediments. Soil, groundwater, surface water, or other contamination issues that do not have the potential to exceed SMS or otherwise violate LDW sediment cleanup goals will not be addressed by this Order. The scope of work is more particularly described in Exhibit B, "Scope of Work." Exhibit B is incorporated by reference and is an integral and enforceable part of this Order.

B. The schedule of performance and list of deliverables is described in Exhibit C, "Schedule for Performance and Deliverables." Exhibit C is incorporated by reference and is an integral and enforceable part of this Order.

C. Given the nature of the activities under the proposed Scope of Work and discussions with Ecology, Jorgensen will submit monthly progress reports via electronic mail until completion of the activities required by this Order.

D. If, at any time after the first exchange of comments on drafts, Ecology determines that insufficient progress is being made in the preparation of any of the deliverables required by this Section, Ecology may complete and issue the final deliverable.

VIII. TERMS AND CONDITIONS OF ORDER

A. Public Notice

RCW 70.105D.030(2)(a) requires that, at a minimum, this Order be subject to concurrent public notice. Ecology shall be responsible for providing such public notice and reserves the right to modify or withdraw any provisions of this Order should public comment disclose facts or considerations which indicate to Ecology that this Order is inadequate or improper in any respect.

B. Remedial Action Costs

Jorgensen shall pay to Ecology costs incurred by Ecology pursuant to this Order and consistent with WAC 173-340-550(2). These costs shall include work performed by Ecology or its contractors for or within the Sediment Investigation Area under Chapter 70.105D RCW, including remedial actions and Order preparation, negotiation, oversight, and administration. These costs shall include work performed both prior to and subsequent to the issuance of this Order. Ecology's costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). Jorgensen shall pay the required amount within ninety (90) days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general statement of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Pursuant to WAC 173-340-550(4), failure to pay Ecology's costs within ninety (90) days of receipt of the itemized statement of costs will result in interest charges at the rate of twelve percent (12%) per annum, compounded monthly.

Pursuant to RCW 70.105D.055, Ecology has authority to recover unreimbursed remedial action costs by filing a lien against real property subject to the remedial actions.

C. Implementation of Remedial Action

If Ecology determines that Jorgensen has failed without good cause to implement the remedial action, in whole or in part, Ecology may, after notice to Jorgensen, perform any or all portions of the remedial action that remain incomplete. If Ecology performs all or portions of the remedial action because of Jorgensen's failure to comply with its obligations under this Order, Jorgensen shall reimburse Ecology for the costs of doing such work in accordance with Section VIII.B (Remedial Action Costs), provided that Jorgensen is not obligated under this Section to reimburse Ecology for costs incurred for work inconsistent with or beyond the scope of this Order.

Except where necessary to abate an emergency situation, Jorgensen shall not perform any remedial actions within the Sediment Investigation Area outside those remedial actions required by this Order, unless Ecology concurs, in writing, with such additional remedial actions.

D. Designated Project Coordinators

The project coordinator for Ecology is:

John Keeling
Project Manager
Department of Ecology Northwest Regional Office
3190 160 Ave. SE
Bellevue, WA 98008-5452

The project coordinator for the Jorgensen Forge Corporation is:

Jorgensen Forge Corporation
Attn: Mr. Ron Altier
8531 E Marginal Way S
Seattle, WA 98108-4018

With a copy to:
Anchor Environmental, LLC
Attn: Mr. Ryan Barth
1423 Third Avenue, Suite 300
Seattle, WA 98101-2226

Each project coordinator shall be responsible for overseeing the implementation of this Order. Ecology's project coordinator will be Ecology's designated representative for the Sediment Investigation Area. To the maximum extent possible, communications between Ecology and Jorgensen, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order shall be directed through the project coordinators. The project coordinators may designate, in writing, working level staff contacts for all or portions of the implementation of the work to be performed required by this Order.

Any party may change its respective project coordinator. Written notification shall be given to the other party at least ten (10) calendar days prior to the change.

E. Performance

All geologic and hydrogeologic work performed pursuant to this Order shall be under the supervision and direction of a geologist licensed in the State of Washington or under the direct supervision of an engineer registered in the State of Washington, except as otherwise provided for by Chapters 18.220 and 18.43 RCW.

All engineering work performed pursuant to this Order shall be under the direct supervision of a professional engineer registered in the State of Washington, except as otherwise provided for by RCW 18.43.130.

All construction work performed pursuant to this Order shall be under the direct supervision of a professional engineer or a qualified technician under the direct supervision of a professional engineer. The professional engineer must be registered in the State of Washington, except as otherwise provided for by RCW 18.43.130.

Any documents submitted containing geologic, hydrologic or engineering work shall be under the seal of an appropriately licensed professional as required by Chapter 18.220 RCW or RCW 18.43.130.

Jorgensen shall notify Ecology in writing of the identity of any engineer(s) and geologist(s), contractor(s) and subcontractor(s), and others to be used in carrying out the terms of this Order, in advance of their involvement at the Sediment Investigation Area.

F. Access

Ecology or any Ecology authorized representative shall have the full authority to enter and freely move about all areas covered by this Order that Jorgensen either owns, controls, or has access rights to at all reasonable times for the purposes of, *inter alia*: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing Jorgensen's progress in carrying out the terms of this Order; conducting such tests or collecting such samples as Ecology may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by Jorgensen. Ecology or any Ecology authorized representative shall give reasonable notice before entering the Jorgensen Property unless an emergency prevents such notice. All persons who access the Jorgensen Property pursuant to this Section shall comply with any applicable Health and Safety Plan(s). Ecology employees and their representatives shall not be required to sign any liability release or waiver as a condition of Jorgensen Property access.

G. Sampling, Data Submittal, and Availability

With respect to the implementation of this Order, Jorgensen shall make the results of all sampling, laboratory reports, and/or test results generated by it or on its behalf available to Ecology. Pursuant to WAC 173-340-840(5), all sampling data shall be submitted to Ecology in both printed and electronic formats in accordance with Section VII (Work to be Performed), Ecology's Toxics Cleanup Program Policy 840 (Data Submittal Requirements), and/or any subsequent procedures specified by Ecology for data submittal.

If requested by Ecology, Jorgensen shall allow Ecology and/or its authorized representative to take split or duplicate samples of any samples collected by Jorgensen pursuant to implementation of this Order, if practicable to obtain sufficient sample volume for split samples and the collection does not interfere with Jorgensen's sampling. Jorgensen shall notify Ecology fourteen (14) days in advance of any sample collection or work activity undertaken pursuant to this Order. Ecology shall, upon request, allow Jorgensen and/or its authorized representative to take split or duplicate samples of any samples collected by Ecology pursuant to the implementation of this Order, if practicable to obtain sufficient sample volume for split samples and the collection does not interfere with Ecology's sampling. Without limitation on Ecology's rights under Section VIII.F (Access), Ecology shall notify Jorgensen prior to any sample collection activity unless an emergency prevents such notice.

In accordance with WAC 173-340-830(2)(a), all hazardous substance analyses shall be conducted by a laboratory accredited under Chapter 173-50 WAC for the specific analyses to be conducted, unless otherwise approved by Ecology.

H. Public Participation

A Public Participation Plan is required for this Order. Ecology shall review any existing Public Participation Plan to determine its continued appropriateness and whether it requires amendment, or if no plan exists, Ecology shall develop a Public Participation Plan alone or in conjunction with Jorgensen.

Ecology shall maintain the responsibility for public participation under this Order. However, Jorgensen shall cooperate with Ecology, and shall:

1. If agreed to by Ecology, develop appropriate mailing list, prepare drafts of public notices and fact sheets at important stages of the remedial action, such as the submission of work plans, remedial investigation/feasibility study reports, cleanup action plans, and engineering design reports. As appropriate, Ecology will edit, finalize, and distribute such fact sheets and prepare and distribute public notices of Ecology's presentations and meetings.
2. Notify Ecology's project coordinator prior to the preparation of all press releases and fact sheets, and before major meetings with the interested public and local governments. Likewise, Ecology shall notify Jorgensen prior to the issuance of all press releases and fact sheets, and before major meetings with the interested public and local governments. For all press releases, fact sheets, meetings, and other outreach efforts by Jorgensen that do not receive prior Ecology approval, Jorgensen shall clearly indicate to its audience that the press release, fact sheet, meeting, or other outreach effort was not sponsored or endorsed by Ecology.
3. When requested by Ecology, participate in public presentations on the progress of the remedial action at the Site. Participation may be through attendance at public meetings to assist in answering questions or as a presenter.
4. When requested by Ecology, arrange and/or continue information repositories to be located at the following locations:

a. Jorgensen Forge Corporation
8531 E Marginal Way S
Seattle, WA 98108-4018

b. Ecology's Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008-5456

At a minimum, copies of all public notices, fact sheets, and press releases; all quality assured monitoring data; remedial action plans and reports, supplemental remedial planning documents, and all other similar documents relating to performance of the remedial action required by this Order shall be promptly placed in these repositories.

I. Retention of Records

During the pendency of this Order, and for ten (10) years from the date of completion of work performed pursuant to this Order, Jorgensen shall preserve all records, reports, documents, and underlying data in its possession relevant to the implementation of this Order and shall insert a similar record retention requirement into all contracts with project contractors and subcontractors. Upon request of Ecology, Jorgensen shall make all records available to Ecology and allow access for review within a reasonable time.

J. Resolution of Disputes

1. In the event a dispute arises as to an approval, disapproval, proposed change, or other decision or action by Ecology's project coordinator, or an itemized billing statement under Section VIII.B (Remedial Action Costs), the Parties shall utilize the dispute resolution procedure set forth below.

a. Upon receipt of Ecology's project coordinator's written decision or the itemized billing statement, Jorgensen has fourteen (14) days within which to notify Ecology's project coordinator in writing of its objection to the decision or itemized statement.

b. The Parties' project coordinators shall then confer in an effort to resolve the dispute. If the project coordinators cannot resolve the dispute within fourteen (14) days, Ecology's project coordinator shall issue a written decision.

c. Jorgensen may then request regional management review of the decision. This request shall be submitted in writing to the Northwest Region Toxics Cleanup Section Manager within seven (7) days of receipt of Ecology's project coordinator's written decision.

d. The Section Manager shall conduct a review of the dispute and shall endeavor to issue a written decision regarding the dispute within thirty (30) days of Jorgensen's request for review. The Section Manager's decision shall be Ecology's final decision on the disputed matter.

2. The Parties agree to only utilize the dispute resolution process in good faith and agree to expedite, to the extent possible, the dispute resolution process whenever it is used.

3. Implementation of these dispute resolution procedures shall not provide a basis for delay of any activities required in this Order, unless Ecology agrees in writing to a schedule extension.

K. Extension of Schedule

1. An extension of schedule shall be granted only when a request for an extension is submitted in a timely fashion, generally at least thirty (30) days prior to expiration of the deadline for which the extension is requested, and good cause exists for granting the extension. All extensions shall be requested in writing. The request shall specify:

   a. The deadline that is sought to be extended;

   b. The length of the extension sought;

   c. The reason(s) for the extension; and

   d. Any related deadline or schedule that would be affected if the extension were granted.

2. The burden shall be on Jorgensen to demonstrate to the satisfaction of Ecology that the request for such extension has been submitted in a timely fashion and that good cause exists for granting the extension. Good cause may include, but may not be limited to:

   a. Circumstances beyond the reasonable control and despite the due diligence of Jorgensen including delays caused by unrelated third parties or Ecology, such as (but not limited to) delays by Ecology in reviewing, approving, or modifying documents submitted by Jorgensen;

   b. Acts of God, including fire, flood, blizzard, extreme temperatures, storm, or other unavoidable casualty; or

   c. Endangerment as described in Section VIII.M (Endangerment).

   However, neither increased costs of performance of the terms of this Order nor changed economic circumstances shall be considered circumstances beyond the reasonable control of Jorgensen.

3. Ecology shall act upon any written request for extension in a timely fashion. Ecology shall give Jorgensen written notification of any extensions granted pursuant to this Order. A requested extension shall not be effective until approved by Ecology. Unless the extension is a substantial change, it shall not be necessary to amend this Order pursuant to Section VIII.L (Amendment of Order) when a schedule extension is granted.

4. An extension shall only be granted for such period of time as Ecology determines is reasonable under the circumstances. Ecology may grant schedule extensions exceeding ninety (90) days only as a result of:

   a. Delays in the issuance of a necessary permit which was applied for in a timely manner;

   b. Other circumstances deemed exceptional or extraordinary by Ecology; or

   c. Endangerment as described in Section VIII.M (Endangerment).

L. **Amendment of Order**

The project coordinators may verbally agree to minor changes to the work to be performed without formally amending this Order. Minor changes will be documented in writing by Ecology within seven (7) days of verbal agreement.

Except as provided in Section VIII.N (Reservation of Rights), substantial changes to the work to be performed shall require formal amendment of this Order. This Order may only be formally amended by the written consent of both Ecology and Jorgensen. Jorgensen shall submit a written request for amendment to Ecology for approval. Ecology shall indicate its approval or disapproval in writing and in a timely manner after the written request for amendment is received. If the amendment to this Order represents a substantial change, Ecology will provide public notice and opportunity to comment. Reasons for the disapproval of a proposed amendment to this Order shall be stated in writing. If Ecology does not agree to a proposed amendment, the disagreement may be addressed through the dispute resolution procedures described in Section VIII.J (Resolution of Disputes).

M. **Endangerment**

In the event Ecology determines that any activity being performed under this Order is creating or has the potential to create a danger to human health or the environment on or surrounding the Sediment Investigation Area, Ecology may direct Jorgensen to cease such activities for such period of time as it deems necessary to abate the danger. Jorgensen shall immediately comply with such direction.

In the event Jorgensen determines that any activity being performed under this Order is creating or has the potential to create a danger to human health or the environment, Jorgensen may cease such activities. Jorgensen shall notify Ecology's project coordinator as soon as possible, but no later than twenty-four (24) hours after making such determination or ceasing such activities. Upon Ecology's direction Jorgensen shall provide Ecology with documentation of the basis for the determination or cessation of such activities. If Ecology disagrees with Jorgensen's cessation of activities, it may direct Jorgensen to resume such activities.

If Ecology concurs with or orders a work stoppage pursuant to Section VIII.M (Endangerment), Jorgensen's obligations with respect to the ceased activities shall be suspended until Ecology determines the danger is abated, and the time for performance of such activities, as well as the time for any other work dependent upon such activities, shall be extended in accordance with Section VIII.K (Extension of Schedule) for such period of time as Ecology determines is reasonable under the circumstances.

Nothing in this Order shall limit the authority of Ecology, its employees, agents, or contractors to take or require appropriate action in the event of an emergency.

N. Reservation of Rights

This Order is not a settlement under Chapter 70.105D RCW. Ecology's signature on this Order in no way constitutes a covenant not to sue or a compromise of any of Ecology's rights or authority. Ecology will not, however, bring an action against Jorgensen to recover remedial action costs paid to and received by Ecology under this Order. In addition, Ecology will not take additional enforcement actions against Jorgensen regarding remedial actions required by this Order, provided Jorgensen complies with this Order.

Ecology nevertheless reserves its rights under Chapter 70.105D RCW, including the right to require additional or different remedial actions within the Sediment Investigation Area should it deem such actions necessary to protect human health and the environment, and to issue orders requiring such remedial actions. Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the release or threatened release of hazardous substances at the Sediment Investigation Area.

O. Transfer of Interest in Property

No voluntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Sediment Investigation Area shall be consummated by Jorgensen without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to Jorgensen's transfer of any interest in all or any portion of the Sediment Investigation Area, and during the effective period of this Order, Jorgensen shall provide a copy of this Order to any prospective purchaser, lessee, transferee, assignee, or other successor in said interest; and, at least thirty (30) days prior to any transfer, Jorgensen shall notify Ecology of said transfer. Upon transfer of any interest, Jorgensen shall restrict uses and activities to those consistent with this Order and notify all transferees of the restrictions on the use of the property.

P. Compliance with Applicable Laws

1. All actions carried out by Jorgensen pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits, except as provided in RCW 70.105D.090.A drilling permit under WAC 173-360 may be required. In the event the sediment source control investigation activities Jorgenson will be required to implement under this Order trigger permit requirements, Jorgenson and Ecology will identify in writing the permits and/or specific federal, state, or local requirements that are applicable to the investigation.
2. Pursuant to RCW 70.105D.090(1), Jorgensen is exempt from the procedural requirements of Chapters 70.94, 70.95, 70.105, 77.55, 90.48, and 90.58 RCW and of any laws requiring or authorizing local government permits or approvals.

However, Jorgensen shall comply with the substantive requirements of such permits or approvals.

Jorgensen has a continuing obligation to determine whether additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order. In the event either Ecology or Jorgensen determines that additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order, it shall promptly notify the other party of its determination. Ecology shall determine whether Ecology or Jorgensen shall be responsible to contact the appropriate state and/or local agencies. If Ecology so requires, Jorgensen shall promptly consult with the appropriate state and/or local agencies and provide Ecology with written documentation from those agencies of the substantive requirements those agencies believe are applicable to the remedial action. Ecology shall make the final determination on the additional substantive requirements that must be met by Jorgensen and on how Jorgensen must meet those requirements. Ecology shall inform Jorgensen in writing of these requirements. Once established by Ecology, the additional requirements shall be enforceable requirements of this Order. Jorgensen shall not begin or continue the remedial action potentially subject to the additional requirements until Ecology makes its final determination.

3. Pursuant to RCW 70.105D.090(2), in the event Ecology determines that the exemption from complying with the procedural requirements of the laws referenced in RCW 70.105D.090(1) would result in the loss of approval from a federal agency that is necessary for the State to administer any federal law, the exemption shall not apply and Jorgensen shall comply with both the procedural

and substantive requirements of the laws referenced in RCW 70.105D.090(1), including any requirements to obtain permits.

Q. Indemnification

Jorgensen agrees to indemnify and save and hold the State of Washington, its employees, and agents harmless from any and all claims or causes of action for death or injuries to persons or for loss or damage to property to the extent arising from or on account of acts or omissions of Jorgensen, its officers, employees, agents, or contractors in entering into and implementing this Order. However, Jorgensen shall not indemnify the State of Washington nor save nor hold its employees and agents harmless from any claims or causes of action to the extent arising out of the negligent acts or omissions of the State of Washington, or the employees or agents of the State, in entering into or implementing this Order.

IX. SATISFACTION OF ORDER

The provisions of this Order shall be deemed satisfied upon Jorgensen's receipt of written notification from Ecology that Jorgensen has completed the remedial activity required by this Order, as amended by any modifications, and that Jorgensen has complied with all other provisions of this Agreed Order.

X. ENFORCEMENT

Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

A. The Attorney General may bring an action to enforce this Order in a state or federal court.

B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to this Order.

C. In the event Jorgensen refuses, without sufficient cause, to comply with any term of this Order, Jorgensen will be liable for:

a. Up to three (3) times the amount of any costs incurred by the State of Washington as a result of its refusal to comply; and

b. Civil penalties of up to twenty-five thousand dollars ($25,000) per day for each day it refuses to comply.

D. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under RCW 70.105D.060.

Effective date of this Order: 7.12.07

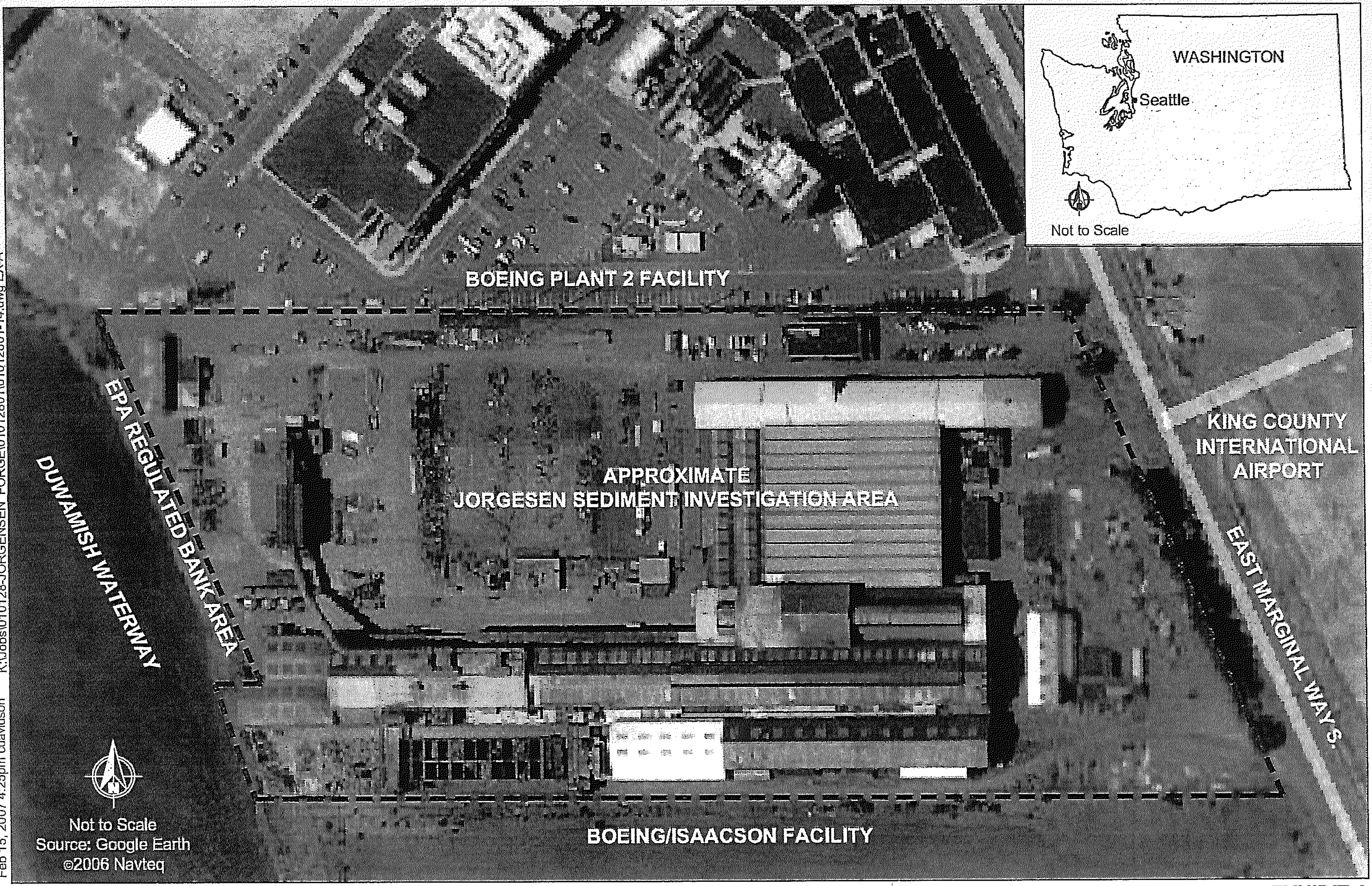
JORGENSEN FORGE CORPORATION

Ron Altier 3/30/07

Ron Altier
Vice President
Jorgensen Forge Corporation
8531 E Marginal Way S
Tukwila, WA 98108-4018
206/ 762-5414

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Steven M. Alexander
Section Manager
Toxics Cleanup Program
Northwest Regional Office
425/ 649-7054



Source: Google Earth
©2006 Navteq

Feb 15, 2007 4:25pm cdavidson K:\Jobs\010128-JORGENSEN FORGE\01012801\01012801-14.dwg EX-A

ANCHOR
ENVIRONMENTAL, L.L.C.

EXHIBIT A
Sediment Investigation Area (Approximate)
Jorgensen Forge Corporation

EXHIBIT B

STATEMENT OF WORK

This Statement of Work (SOW) defines the work to be completed in the Sediment Investigation Area as defined in Agreed Order Number 4127, the AO. The work consists of conducting a Source Control Investigation and producing a Source Control Evaluation Report.

The Source Control Investigation will determine whether the Sediment Investigation Area is an on-going source of contamination to sediments in the Lower Duwamish Waterway (LDW) that could cause a violation of Washington State Department of Ecology (Ecology) SMS (Chapter 173-204 Washington Administrative Code [WAC]) criteria and pending LDW sediment cleanup goals.

The results of the Source Control Investigation will be used to evaluate, and select effective measures to prevent or control sources of contamination migrating from the Sediment Investigation Area to the LDW. Any source control measures necessary to prevent recontamination of LDW sediments will be implemented under a separate Order or Decree. Source control measures will be "practicable" as defined in Chapter 173-340 WAC.

The Source Control Investigation will be conducted under Agreed Order Number 4127, and follow the guidance in the Lower Duwamish Source Control Strategy (Ecology Publication No. 04-09-043).

The Ecology and U.S. Environmental Protection Agency (EPA) Source Control team will aid in and review the production of the Source Control Investigation.

The Source Control Investigation will determine if soil, groundwater, surface water, or other potentially contaminated media are migrating, or can potentially migrate, and result a violation of Chapter 173-204 WAC. Any contamination identified in the Sediment Investigation Area that can't result in a violation, will not be the focus of the Source Control Evaluation Report.

Source Control Investigation activities will be limited to an area defined in the AO as the Sediment Investigation Area. The Sediment Investigation Area is illustrated on Exhibit A to the Agreed Order.

WORK TO BE PERFORMED

The Source Control Investigation includes conducting a source control evaluation of existing data, identifying data gaps, and, if necessary, an additional investigation to fill the data gaps. The work necessary to complete the Source Control Investigation is outlined in the tasks below.

TASK 1 — SOURCE CONTROL INVESTIGATION

The Source Control Investigation will compile and evaluate currently available information to document sources of contamination in the Sediment Investigation Area. It will identify contaminants of concern. Contaminants of concern are those that have migrated from or have the potential to migrate from the Sediment Investigation Area to the LDW sediments and result in the exceedance of the Ecology SMS (WAC 173-204) criteria and pending LDW sediment cleanup goals.

The source control evaluation will:

- Combine historical information and current reports.
- Assess the quality of historical data through comparison of method reporting limits to applicable screening levels and evaluation of field/laboratory quality assurance/quality control data, where available.
- Compile information on currently and formerly used chemicals in the Sediment Investigation Area.
- Compile the analytical results for all media sampled in the Sediment Investigation Area, that have migrated to or have the potential to migrate to the LDW sediments.

If source control data gaps are identified, Task 1 will identify additional investigation activities (see Task 2) that are necessary to fill the identified data gaps.

Task 1 of the Source Control Investigation will include the following:

Property Description and History

- Definition of historic and current operations in the Sediment Investigation Area.
- Preparation of a figure covering the Sediment Investigation Area and illustrating the following features, to the extent information regarding these features is reasonably available: underground and above ground storage tanks, transformers, railroad tracks, Resource Conservation and Recovery Act (RCRA) designated areas, locations of oil-water separator(s), storm drains, outfalls, catch basins, paved and unpaved surfaces, subsurface areas containing light nonaqueous-phase liquid (LNAPL), and other features important to historic and current practices and chemical uses within the Sediment Investigation Area.

- Identification of chemicals used in current and former operations in the Sediment Investigation Area.
- Identification of current and historical upland structures in the Sediment Investigation Area.
- Identification of potentially contaminated upland media in the Sediment Investigation Area that have migrated to or have the potential to migrate to the LDW sediments.
- Identification of best management practices or other measures currently implemented in the Sediment Investigation Area that prevent or minimize contaminant migration from the Sediment Investigation Area to the LDW sediments.
- Identification of complete, or potentially complete, contaminant migration pathways from the Sediment Investigation Area to the LDW sediments.
- Develop a hydrogeological site model which characterizes the groundwater system including tidal influence.

Regulatory History

- Description of the Sediment Investigation Area regulatory history including:
    - Regulated tanks (above and below ground)
    - Hazardous waste and chemical management practices
        - Resource conservation and recovery act generator status
        - Chemical storage areas
        - Containment
        - Inspections
        - Reporting
    - Permits
- Violations
- Complaints/spills
- Spill response
- Cleanup status

Chemical Releases:

- Description of all known chemical releases from the Sediment Investigation Area and adjacent properties that have migrated to or have the potential to migrate to the LDW sediments
- Summarization of previous investigations and cleanups conducted in the Sediment Investigation Area

Source Evaluation

- Description of the nature and extent of chemicals in soil, groundwater, and surface water in the Sediment Investigation Area that have migrated to or have the potential to migrate to the LDW sediments
- Summarization of analytical results for media that have the potential to migrate from the Sediment Investigation Area to the LDW sediments and comparison of these results to applicable cleanup standards/goals
- Summarization of sources of contamination migrating onto the Sediment Investigation Area from adjacent properties that have migrated to or have the potential to further migrate to the LDW sediments

Pathway Evaluation

Task 1 of the Source Control Investigation will utilize existing environmental data to evaluate potential migration pathways for chemicals released or used in the Sediment Investigation Area, or that have migrated onto the Sediment Investigation Area from adjacent properties, to reach sediment in the LDW adjacent to the Sediment Investigation Area. The pathway analysis will include evaluation of the following potential migration pathways to the LDW sediments:

- Direct discharge via effluent
- Stormwater discharge
- Groundwater
- Erosion/leaching
- Spills, dumping, leaks, housekeeping, and management practices
- Airborne migration
- Sheet flow

Figures will be included as needed to support the source control evaluation process. These figures may include, but not be limited to, the following:

- Current and historical upland contaminant sources
- Sample locations for all environmental media
- Contaminant distribution
- Geologic cross sections
- Groundwater elevation and contour maps

Identification of Data Gaps

The Source Control Investigation will identify data gaps in the existing data necessary to support the evaluation of sources of contamination in the Sediment Investigation Area that could contaminate the sediments in the LDW. A scope of work will be developed to collect additional data, if necessary, to address the identified data gaps.

Source Control Evaluation Report

Source Control Evaluation Report will describe the results of the Source Control Investigation, including a discussion of any identified data gaps. If data gaps are identified, the Source Control Evaluation Report will contain a scope of work to collect sufficient data to fill the identified data gaps.

TASK 2 –ADDITIONAL INVESTIGATION, IF NECESSARY

If data gaps are identified during the Task 1 Source Control Investigation, additional investigation will be performed in the Sediment Investigation Area, as necessary to fill the identified data gaps. The detailed workplan for the additional investigation will be described in a Sampling and Analysis Plan (SAP), a Quality Assurance Project Plan (QAPP), and a Health and Safety Plan (HASP). Each of these supporting plans will be submitted as an appendix to the Source Control Evaluation Report for Ecology review and approval. The content of each of these plans is further described below.

Sampling and Analysis Plan

The SAP shall be prepared in accordance with Chapter 173-340-820 WAC and will describe the sampling objectives, the rationale for the sampling approach (based upon the identified data gaps) and plans for data use, and shall provide a detailed description of sampling tasks. The SAP shall describe specifications for sample identifiers; sampling equipment, the type, number, and location of samples to be collected; the analyses to be performed; descriptions of sampling equipment and methods to be used; sample documentation; sample containers, collection and handling; and, schedule. The plan shall provide 14 days advanced notice to Ecology prior to sampling initiation. Ecology may obtain split samples, if practicable. New data generated under this SAP will be entered in Ecology's Environmental Information Management System (EIM).

Quality Assurance Project Plan

A QAPP will be prepared in accordance with the *Guidance for Preparation of Quality Assurance Project Plans*, EPA Region 10, Quality Data Management Program, QA/R-5 and requirements of the EPA Contract Laboratory Program. The QAPP will also follow Ecology's Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (July 2004). Laboratories will meet the accreditation standards established in Chapter 173-50 WAC. Data quality objectives will reflect the criteria or threshold values used for the source control evaluation.

Health and Safety Plan

A HASP will be consistent with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Occupational Safety and Health Administration (OSHA), and the Washington Safety and Health Administration (WSHA). The HASP shall identify specific monitoring and management responsibilities and activities to ensure the protection of human health and to promote safety for the activities associated with investigation sampling. The HASP shall be modified as necessary to reflect changes or revisions to the SAP and QAPP based on agency comments.

TASK 3 – SOURCE CONTROL EVALUATION ADDENDUM REPORT

The results of any additional investigation conducted to fill identified data gaps during Task 2 will be summarized in a Source Control Evaluation Addendum Report. This report will include the following:

- Summary of field activities and methods including a discussion of any deviations from the Ecology-approved field sampling plans and the effect of such changes upon data usability
- Field log forms for the additional investigation
- Laboratory analytical and data validation reports
- Quality assurance analytical results for samples collected during the additional investigation
- Re-evaluation of migration pathway analysis using the additional investigation findings and documentation of the source control status

EXHIBIT C

SCHEDULE OF DELIVERABLES AND NOTIFICATIONS

The schedule for notifications to Ecology or submission of major deliverables to Ecology for this SOW is described below. If the date for submission of any item or notification required by this SOW occurs on a weekend, state or federal holiday, the date for submission of that item or notification is extended to the next business day following the weekend or holiday. Where a deliverable due date is triggered by Ecology notification, comments or approval, the starting date for the period shown is the date Jorgensen Forge received such notification, comments or approval by certified mail, return receipt requested, unless otherwise noted below. Where triggered by Ecology receipt of a deliverable, the starting date for the period shown is the date Ecology receives the deliverable by certified mail, return receipt requested, or the date of Ecology signature on a hand-delivery form.

Table 1

Schedule for Submission of Major Deliverables

	Deliverable	*Due Date*[a]
1.	Outline for the "Source Control Evaluation Report"	30 days[b] after the AO[c] effective date
2.	Ecology Comments on the Outline for the "Source Control Evaluation Report"	15 days after the receipt or the outline for the "Source Control Evaluation Report".
3.	Draft Source Control Evaluation Report	45 days after receipt of Ecology/EPA Source Control Team comments on the outline or 90 days[b] after the AO[c] effective date, whichever is later.
4.	Ecology Comments on Draft Source Control Evaluation Report	60 days[b] after receipt of the draft report
5.	Final Source Control Evaluation Report, Including Sampling and Analysis Plan (if necessary)	45 days[b] after receipt of Ecology/EPA Source Control Team comments
6.	Additional Field Investigation Activities to Fill Identified Data Gaps (if any)	Initiated no later than 30 days[b] following Ecology/EPA Source Control Team approval of Final Source Control Evaluation Report
7.	Draft Source Control Evaluation Addendum Report	60 days[b] following receipt of additional investigation validated data
8.	Ecology Comments on Draft Source Control Evaluation Addendum Report	60 days[b] after receipt of the Draft report
9.	Final Source Control Evaluation Addendum Report	45 days[b] after receipt of Ecology comments

[a] *Due dates shown are for initial draft and final deliverables. This schedule assumes only a single revised document will be submitted following receipt of comments from Ecology. Documents become final upon approval by Ecology.*

[b] *Days are calendar days. If due dates fall on a weekend or state or federal holiday, deliverables will be submitted to Ecology on the next business day.*

[c] *AO (Agreed Order) is effective upon signature by both Ecology and Jorgensen Forge.*

1889

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

RECEIVED
MAY 07 2008
By________________

May 5, 2008

Mr. Ryan Barth
Anchor Environmental, L.L.C.
1423 3rd Avenue, Suite 300
Seattle, Washington 98101

Dear Mr. Barth:

RE: Level three response proposal submitted by Jorgensen Forge Corporation, Industrial Stormwater General Permit No. SO3003231.

I have reviewed your level three response proposal dated March 3, 2008. I approve of Jorgensen's plan to incorporate the level three response action, required by Industrial Stormwater General Permit (permit), into Ecology's Agreed Order No. DE 4127. Therefore your level three response proposal dated March 3, 2008 may serve as the level three source control report requirement stated in permit condition S4.C.

Please contact me if you have any questions.

Sincerely,

Gregory P. Stegman

Gregory P. Stegman
Water Quality Program
Northwest Regional Office
425-649-7019
gste461@ecy.wa.gov

GPS:gps

cc: Ron Altier, Jorgensen Forge Corporation
Josh Klimek, Ecology
Central Files: Jorgensen Forge Corporation; Permit No. SO3003231; WQ 3.0

JORGENSEN FORGE

ALUMINUM – TITANIUM – SPECIALTY STEELS

8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON 98108

PHONE (206) 762-1100 FAX: (206) 763-0848

June 1, 2010

To: Robert Wright
Washington State Department of Ecology,
NW Regional Office
3190 160th Avenue SE
Bellevue, Washington 98008-5452

From: Ron Altier, VP Administration & Co-Environmental Officer
Wayne Desberg, Engineering Mgr & Co-Environmental Officer

CC: Ryan Barth, P.E. and David Templeton, Anchor QEA, LLC
Josh Lipsky and Tanya Barnett, Cascadia Law Group

Re: Response to November 5, 2009, Ecology Stormwater Compliance Inspection Report (Received March 12, 2010)

On November 5, 2009, Raman Iyer, John Keeling, and Bob Wright from the Department of Ecology (Ecology) conducted an unannounced National Pollutant Discharge Elimination System (NPDES) Industrial Stormwater General Permit (Permit) compliance inspection at the Jorgensen Forge Corporation (Jorgensen) Facility (Site) located at 8531 East Marginal Way South in Seattle, Washington (Permit Number WAR003231D). Bob Wright prepared a Compliance Inspection Report (CIR) detailing Ecology's inspection findings dated November 5, 2009, that was provided to Jorgensen on March 12, 2010 (Attachment A). This memorandum details Jorgensen's responses to the CIR and the recommended source control best management practice (BMP) actions to maintain compliance with Permit conditions at the Site. Jorgensen is currently completing a Site-wide storm water source control investigation to evaluate what BMP source control actions will need to be implemented to meet the July 1, 2010 Permit deadline and to decrease stormwater discharge concentrations below the surface water screening levels identified during completion of the Ecology Agreed Order (No. DE 4127). The results of that investigation should be available in early June 2010, and will be coordinated with actions recommended in this CIR response memorandum.

For clarity, Ecology's comment paragraphs are reproduced in this memorandum in *italics*, and Jorgensen's responses are provided following the heading **Jorgensen Response.**

INSPECTION OVERVIEW

The compliance inspection was conducted from 10:00 to 13:00 on November 5, 2009, and included a comprehensive tour of the outside of the manufacturing building. The inspection was conducted by the following representatives from Ecology:

- Bob Wright (Ecology Manager for the Site Permit)
- John Keeling (Site Manager under Ecology's Toxic Cleanup Program)
- Raman Iyer (Compliance and Technical Assistance Supervisor under Ecology's Water Quality Program)

They were accompanied by Jorgensen representatives:

- Ron Altier (VP Administration & Co-Environmental Officer)
- Wayne Desberg (Engineering Manager & Co-Environmental Officer)

Following the inspection, Bob Wright requested that Jorgensen provide Ecology with a summary of Ecology's questions during the inspection and submit any additional information regarding these questions that could potentially assist Ecology with their Site inspection report. Jorgensen submitted this summary to Bob Wright on November 20, 2009 (Attachment B).

Inspection/Observations

Paragraph 1: Raman Iyer, John Keeling and I arrived at the facility at approximately 9:45 am and met with Ron Altier, Vice President of Administration. Ron is the designated corporate official for NPDES permit compliance. Mr. Altier was sure that the Stormwater Pollution Prevention Plan (SWPPP) dated March 2006 had been recently updated but could not locate it. An electronic copy of the most current Site Map was located and printed for use during the site inspection. Electronic access to the current SWPPP dated July 2009, was provide to Ecology the following day.

Jorgensen Response:

The Stormwater Pollution Prevention Plan (SWPPP) is located at the Site in a number of locations and available for Jorgensen's use and Ecology's inspection. A master copy of the SWPPP will be controlled by the VP Administration & Co-Environmental Manager and backed up by storage on our Corporate Server where reference documents will be available to senior managers.

<u>Paragraphs 2, 3, and 4:</u> The facility stores a large amount of scrap material outside in metal bins, dumpsters and bunkers. The new NPDES Industrial Stormwater General Permit (Permit) requires: "No later than July 1, 2010, Keep all dumpsters under cover or fit with a lid that must remain closed when not in use" (see Photos # 3-6 and 11 , 12).

The facility stores a lot of scrap metal outside in various types of bins and dumpsters. A whitish cutting oil/coolant could be seen at the bottom of a scrap metal storage bin and cutting oil/coolant could be seen on the pavement nearby (see Photos # 3, 4).

Miscellaneous scrap materials and wastes stored outside should be inventoried and covered as necessary. Dumpsters with lids must be kept closed when not in use.

Jorgensen Response:

Jorgensen understands that the new Permit requires that all containers, either for in-process material or material to be disposed, be kept under cover or fit with a lid that remains closed when not in use. The plant both uses, produces, and temporarily stores graded, specified, metallic feedstocks for use internally and depending on business needs may procure additional grades of feedstock meeting extensive customer specifications. Additionally, depending on the business balance of products being produced, we may elect to sell some of this high value product to others for uses similar to ours. As discussed in Response No. 15 in Attachment B, Jorgensen has organized a leadership team to improve their outside storage process and best management practices (BMPs). A number of commercially provided storage bins on the Site already include a closing lid (see Photo 5 in Attachment A). Site personnel have been instructed to maintain these bins in the closed position when not in use. The vendor providing remaining commercial bins that do not have covers have been requested to make this change. Jorgensen contacted the vendor and has procured bins with the ability to be closed when not in use. All commercial containers will be covered by July 1, 2010. Smaller batches of graded metallic feedstock are frequently temporarily stored in small bins (see Photos 3, 4, 5, 11, and 12 in Attachment A) that are not commercially available or were modified for use as temporary storage containers. The leadership team is evaluating the feasibility of replacing these bins with manufactured stackable bins with the top bin in any stack having a cover for protection from the elements or other forms of cover.

<u>Paragraph 5:</u> *The pressure wash/steam cleaning station is located near the laboratory (see Photos # 7, 8, 10). This facility is plumbed to the sanitary sewer through an oil/water separator. All wash-water is defined as process wastewater and cannot be discharged to the storm drainage system. Some of the area around the pressure wash/steam cleaning station flows to the storm drainage system. The footprint of the cleaning station must be clearly depicted on the Site Map in the SWPPP and on the ground with markings or a painted line. It must be clear to everyone working in the vicinity of the cleaning station, which areas drain to the sanitary sewer and which to the storm drainage system.*

Jorgensen Response:

The Jorgensen leadership team has evaluated the steam clean station and determined that it is no longer needed for ongoing Site operations. Jorgensen has communicated that employees are to no longer use the steam clean station, a sign has been posted clearly communicating the steam clean station is to no longer used, and concrete barrier blocks have been placed around the perimeter of the station to deter access to the station. The Jorgensen leadership team is also planning for decommissioning and backfilling the cleaning station at a later date.

<u>Paragraph 6:</u> *The facility must provide adequate cover and containment for all liquid petroleum and chemical products and wastes stored outside.*

Jorgensen Response:

Jorgensen will continue to store all drums and totes with liquid petroleum and chemical products with adequate cover and containment. Signage stating these requirements have been posted on the outside of drum and tote storage locations.

Other materials are temporarily placed in dumpsters in the north-central portion of the Site pending deposition. As previously noted in Jorgensen's responses to Paragraph 2, 3, and 4, Jorgensen is procuring containers with lids from the vendor that manages disposal of these materials. As requested in Photo 6, Jorgensen will identify graded metallic feedstock and other materials that are currently stored in alternative temporary bins. This inventory and modification as necessary to include covers or replacement with alternative covered bins, will be implemented by July 1, 2010, in accordance with the Permit timeline.

Paragraph 7, 8 and 9: Metal turnings and cuttings must be covered, stored under cover or inside (see photos # 11, 12).

Stormwater run-off from the metal turnings/cuttings storage bunkers in photos # 13 and 14 is likely to be contaminated.

Stormwater run-off from this area either flows to storm drains or infiltrates. Jorgensen must determine whether or not stormwater from this area can possibly get into the storm drainage system. The scrap metal storage bunkers seen in photos # 13, 14 must be provided with improved source control measures and pollution prevention practices. It is not clear where stormwater from this area flows. Infiltrating contaminated stormwater near the river with a high groundwater table is problematic.

Jorgensen Response:

Chips stored just east of the bag house will be stored in similar stackable containers, described in paragraph 2, and/or stored under a covered area. If not completed by July 1, 2010, the design and construction schedule for the interim cover or permanent cover will be indentified and communicated to Ecology by that date.

The proposed action plan for the magnetic turnings/cuttings storage is provided in Jorgensen's response to Paragraph 6.

The proposed action plan for miscellaneous turnings/cuttings storage in temporary bins is described in Jorgensen's response to Paragraphs 2, 3, and 4.

Regarding the potential for storm water in contact with the storage area to infiltrate and adversely affect groundwater quality, the nearest unpaved area is west of the melt bag house (some distance away from the storage area). As part of the ongoing Site source control investigation (conducted under Ecology Agreed Order No. DE 4127), Jorgensen installed monitoring well MW-47 between the melt bag house and the shoreline in 2009. MW-47 is screened from 5 to 20 feet below ground surface (bgs), which extends across the top of the water table in this portion of the Site. The groundwater levels are measured at depths ranging from 12 to 18 feet bgs. Groundwater monitoring and sampling was conducted at well MW-47 in February, May, August, and December 2009. Groundwater samples collected from well MW-47 were submitted for laboratory analysis of:

- Total petroleum hydrocarbons (TPH), including gasoline-range organics, diesel-range organics, and oil-range organics;
- Dissolved metals;
- semi-volatile organic compounds (SVOCs), including polycyclic aromatic hydrocarbons;

- Volatile organic compounds (VOCs), including benzene, toluene, ethylbenzene and xylene.

The laboratory analytical results for the four quarters of groundwater monitoring and sampling at monitoring well MW-47 did not detect concentrations of TPH, dissolved metals, SVOCs, or VOCs above the source control investigation screening levels. This data provides evidence that even if stormwater in contact with the storage area migrated to the unpaved area and infiltrated to groundwater, the groundwater concentrations are not above surface water quality criteria.

<u>Paragraph 10 and 11:</u> The southern portion of the facility is partially paved and is mostly used to store scrap metal and waste materials. Outfall lines # 001 and 002 flow under this area. The southwest corner of the facility is unpaved (see Photo # 17). There are no storm drains in the vicinity and most stormwater infiltrates into the ground. Given the close proximity to the Duwamish River, the facility must ensure that stormwater cannot flow overland towards the river between the concrete wall and the building (see Photo # 18). Contaminated stormwater infiltrating in this area may find a pathway to the river along the outside of storm drain lines # 001 and 002.

A variety of scrap metals and solid wastes are stored out in the open along the southern boundary of the facility (see Photos # 16, 19, 20, 21). Source control measures must be re-evaluated in this area. During rainy periods, stormwater from this area will flow towards storm drains or infiltrate.

Jorgensen Response:

Photos 17 and 23 show the slag storage, furnace feedstock storage, and metal grindings areas, respectively. The Jorgensen leadership team has evaluated the construction of a single large roof over the southern portion of the Site to cover these areas. It has determined that the excessive clearance required for the overhead Gantry crane used to move material and the location of the high voltage lines prohibit the attachment of a lean-to style roof structure over the storage area. Evaluations conducted by the leadership team also determined that a stand-alone roof structure would have a very high design and construction cost and could not be completed by the July 1st deadline identified in the Permit. In addition, this structure would not eliminate rainwater contact with the southernmost portion of the covered area due to the structure's height (i.e., directional rain during wind events will enter the covered areas) and would not eliminate potential tracking of these materials to other parts of the Site via vehicle traffic. Due to these many constraints, and in order to maintain a higher level of water quality protection, the Jorgensen leadership team is currently evaluating installing containment for any precipitation accumulation in these areas and designing and installing a sufficient treatment system consistent with the Ecology Stormwater Management Manual for Western Washington (SWWMMWW) and AKART to either discharge accumulated runoff water to the Metro system (if that can be permitted) or to the Lower Duwamish Waterway at concentrations below the appropriate screening levels. In addition, the Jorgensen is looking for contractors to repair and improve containment through the roof gutters.

As discussed in Response No. 11 in Attachment B, the slag storage area is unpaved because the slag can easily exceed 500 degrees Fahrenheit when placed on the ground. Therefore, it cannot be placed on standard paved or concrete surfaces without the risk of explosion. Jorgensen has actively researched alternative methods for slag storage and disposal that eliminate the need for storage on the unpaved area. Based on this research, Jorgensen contacted three contractors that specialize in managing slag. Each of these contractors found that it would not be economically feasible to manage the slag in this manner because of the relatively low volumes of slag that are produced at the site. Given this input, the Jorgensen leadership team is currently trialing whether they can use existing or modified Site equipment to place the heated slag directly into closeable containers provided by a contractor and have the contractor manage the disposal process. Jorgensen will identify a revised slag storage, reuse, and disposal plan by July 1, 2010, to meet the Permit timeline.

Based on visual reconnaissance of the area between the concrete wall and the building (Photo 8 of Attachment B) during two recent rainfall events on March 25, 2010 (0.15 inch over 6 hours), and April 27, 2010 (0.1 inch over 2 hours), this area is graded such that runoff does not migrate between the concrete wall and the building. Rainfall that accumulates in these areas pond and subsequently either infiltrates or evaporates. Jorgensen will continue to evaluate the potential for overland flow in this area during higher intensity and duration rain events and, if necessary, re-grade this area and install a containment flow barrier to prevent runoff into the area. A discussion of the infiltration pathway is provided in the following paragraphs.

Investigations Summary:

Two separate investigations have provided data that the slag storage area is not a potential source of elevated chemical concentrations to the Lower Duwamish Waterway via groundwater infiltration and discharge, as discussed in the next paragraph. Regardless, as previously noted, the Jorgensen leadership team is currently evaluating additional alternative slag storage and containment options that will further minimize potential impacts to stormwater quality, in order to meet the BMP implementation requirements identified in the Permit. Jorgensen will identify a revised slag storage and disposal plan by July 1, 2010, to meet the Permit timeline.

Shoreline Seep Sampling Analysis

As part of the Lower Duwamish Waterway Remedial Investigation, the Lower Duwamish Waterway Group (LDWG) collected a single shoreline seep sample in July 2004 at the base of the concrete panel wall directly riverward of the slag storage area. The sample was submitted for analysis of total suspended solids, total organic carbon, metals, SVOCs, VOCs, polychlorinated biphenyls (PCBs), and pesticides. The results of the sample collection are presented in the *Data Report: Survey and Sampling of Lower Duwamish Waterway Seeps – Final* (Windward 2004). Comparison of the results to the acute and chronic marine water quality criteria for the surface waters of the state of Washington (WAC 173-201) showed that copper was the only identified exceedance.

Slag Storage Area Monitoring Well Sampling Analysis

In addition, as part of the ongoing Site source control investigation being conducted under Ecology Agreed Order No. DE 4127, Jorgensen installed monitoring well MW-39 between the slag storage area and the shoreline in 2009. Monitoring well MW-39 is screened from 5 to 20 feet below ground surface (bgs), which extends across the top of the water table in this portion of the Site with groundwater levels measured at depths ranging from 12 to 18 feet bgs. Groundwater monitoring and sampling was conducted at monitoring well MW-39 in February, May, August, and December 2009. Groundwater samples collected from monitoring well MW-39 were submitted for laboratory analysis of TPH, including gasoline-range organics, diesel-range organics, and oil-range organics; dissolved metals; SVOCs, including polycyclic aromatic hydrocarbons; and VOCs including benzene, toluene, ethylbenzene and xylene. The laboratory analytical results of the four quarters of groundwater monitoring and sampling at monitoring well MW-39 have not detected concentrations of TPH, dissolved metals, SVOCs, or VOCs above the source control investigation screening levels. Consistent with the seep sample data previously discussed, these four rounds of recent groundwater data provide evidence that upland seepage of groundwater migrating beneath the slag storage area and subsequent discharge to the Lower Duwamish Waterway is not contributing elevated chemical concentrations.

Paragraph 12: The Site Map shows there is at least one catch basin in the scrap material storage area. The facility must inventory wastes stored along the southern portion of the facility and implement necessary source control measures for the pollutants that will mobilize during storm events. The scrap metal stored in an ecology block bunker (see Photos # 21 , 22) has enough petroleum in it to warrant the use of absorbent pads (see Photo # 22). This material needs to be stored under cover. Stormwater in this area was reddish brown and had a visible sheen on it. This stormwater is either infiltrating or flowing towards a storm drain (see Photo # 24).

Jorgensen Response:

The version of the Site map reviewed during the inspection was outdated and has been revised to show that there are no active catch basins serving the scrap material storage area. The stormwater Site map has been updated and the revised Site map is attached. The catch basin shown on that map has been plugged with expansion plugs to eliminate discharge to Outfall 002. Rainfall accumulates in this area as shown in Photos 23 and 24 and has no direct pathway to the Lower Duwamish Waterway.

As discussed in Response No. 12 in Attachment B, Jorgensen has evaluated existing Site data as part of the ongoing Site source control investigation under Ecology Agreed Order No. DE 4127 to determine if TPH (i.e., oil) sources were being discharged to the Lower Duwamish Waterway through the stormwater pathway. Historical stormwater data collected since 2005 as part of the NPDES Permit quarterly compliance monitoring have shown only isolated detections of oil and grease, all of which were below the previous Permit benchmark level (15 milligrams per liter). In addition, recent data gaps sampling performed under the Ecology Agreed Order process included the collection of stormwater data from each of the active Site outfalls (Outfalls 001, 002, and 003) and from a number of up-gradient locations in these outfall drainage systems. These samples showed no detections of TPH. This long-term data set provides evidence that the identified sources of petroleum compounds identified during the inspection are not migrating to the Waterway and that implemented BMPs have been effective at controlling petroleum compounds from entering the stormwater system and reaching the Lower Duwamish Waterway above Permit benchmark levels. The Jorgensen leadership team is currently evaluating improved source controls and containment to effectively capture known sources of petroleum compounds with the potential to enter the stormwater system as part of the ongoing source control investigation.

<u>Paragraph 13:</u> *The unpaved area just south of the Aluminum Heat Treat Area was contributing to very turbid run-off flowing to the nearby storm drain catch basin (see Photos # 25, 26) which is tributary to Outfall 002. Visible petroleum sheen on stormwater flowing into a catch basin tributary to the Duwamish River must elicit a source tracing investigation to determine the source.*

Jorgensen Response:

The Jorgensen leadership team has identified a high elevation area at the southeast corner of the forge shop with dirt and gravel that is believed to be the source of turbidity to the noted catch basin. Jorgensen will clean-up and level this area and conduct frequent visual monitoring of this area during rainfall events. Also sweeping is being conducted in the paved drainage area for the noted catch basin to minimize the potential for elevated turbidity. As necessary, Jorgensen will use absorbent materials if sheens are identified. The slight sheen identified in Photos 25 and 26 is being investigated as part of the source control investigation.

<u>Paragraph 14:</u> *Empty drums may have residual petroleum and/or chemicals on them that will mobilize if left out in the rain (see Photo # 27). All containers of liquid products and wastes stored outside must be provided with adequate cover and containment (see Photo # 28).*

Jorgensen Response:

See Jorgensen's response to Paragraph 6.

Issues & Requirements

Paragraph 1: The Stormwater Pollution Prevention Plan must be on site and available for review by unannounced inspectors.

Jorgensen Response:

See Jorgensen's response to Paragraph 1.

Paragraph 2: The facility must provide adequate cover and containment for all liquid petroleum and chemical products and wastes stored outside.

Jorgensen Response:

See Jorgensen's response to Paragraph 6.

Paragraph 3: Metal turnings/cuttings must be covered, stored under cover or kept inside.

Jorgensen Response:

See Jorgensen's response to Paragraphs 7, 8, and 9.

Paragraph 4: The footprint of the cleaning station must be clearly depicted on the Site Map in the SWPPP and on the ground with markings or a painted line.

Jorgensen Response:

See Jorgensen's response to Paragraph 5.

<u>Paragraph 5:</u> Jorgensen must determine whether or not stormwater from the scrap metal storage bunkers near the melt bag house can possibly get into the storm drainage system.

Jorgensen Response:

Jorgensen has evaluated stormwater runoff from this area under a number of variable intensity rainfall events and identified that the stormwater collects on the underlying and perimeter paved surfaces and is not conveyed to the Outfall 003 outfall drainage system. In any case, as described in Jorgensen's response to Paragraphs 7, 8 and 9, the Jorgensen leadership team is currently evaluating the design and construction of a roof covering the existing storage location to minimize rainwater contact with the metal turnings/cuttings.

Proposed next steps

Following your review of this response to the CIR, Jorgensen representatives would like to meet with you to further discuss the recommended source control BMP actions described herein and the actions that will be required to maintain compliance with the July 1, 2010 Permit timeline. Ron Altier will be contacting you to schedule a meeting time.

Sincerely,

Ron Altier

Ron Altier,
VP Administration & Co-Environmental Officer

Wayne Desberg
Engineering Mgr & Co-Environmental Officer

Attachment A: Department of Ecology Compliance Inspection Report (CIR) (3/12/10)

Attachment B: Jorgensen Forge Summary Inspection Notes to Department of Ecology

Attachment C: Jorgensen Forge Stormwater Site Map (4/13/10)

Attachment D: Memo to employees: Implementation of New Environmental Best Practices at Jorgensen and plant-wide training announcement (5/25/10)

State of Washington Department of Ecology
Northwest Regional Office

STORMWATER COMPLIANCE INSPECTION REPORT

WADOE Stormwater Compliance Inspection Form (last file update 4-04.)

Facility Type:
☒ Industrial ☐ Boatyard
☐ Construction ☐ S & G

Section A: General Data

Inspection Date	NPDES Permit #	County	Receiving Waters
11/05/2009	**WAR003231D**	King	Duwamish River

Discharges to: Surface Water ☒ Ground Water ☒
Weather at time of inspection: Raining

Section B: Facility Data

Name and Location of Facility Inspected
Jorgensen Forge Corporation
8531 E. Marginal Way S.
Seattle, WA 98108-4018

Entry Time: 9:45 am
Permit Effective Date: 1-01-10
Exit Time: 2:30 pm
Permit Expiration Date: 1-01-15

Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s)
Ron Altier/VP- Administration/206-676-9249
Wayne Desberg/Engineering Manager/206-965-1326

Other Participants:
John Keeling - Ecology's Toxic Cleanup Program
Raman Iyer - Compliance and Technical Assistance Unit Supervisor, Water Quality Program, Department of Ecology

Name, Address of Responsible Official/Title/Phone and Fax Number.
Ron Altier/Vice President - Administration
8531 E. Marginal Way South
Seattle, WA 9810-4018
Phone Number 206-762-1100 Fax 206-357-1063 Contacted? ☒Yes ☐ No

	Yes	No
Samples Taken?	☐	☒
Photos Taken?	☒	☐

Section C: Areas Evaluated During Inspection.

☒	NPDES Permit Available	☐	Wet & Dry Season Inspection Reports	☒	Operations & Maintenance	☐	Effluent/Receiving Water
☐	Storm Water Pollution Prevention Plan Available	☐	Employee Training Records	☒	Oil/Water Separator	☐	Pretreatment
☒	SPCC Plan & Equipment	☐	Compliance Schedules	☐	Solid Waste Disposal	☐	Laboratory
☐	Erosion and Sediment Control Plans	☐	Monitoring Plan	☒	Catch Basins	☐	0.5 inch Inspection Logs
☒	DMR Submittals	☒	Fuel/Chemical Storage	☐	Track out / Wheel wash	☐	
☐		☐		☐		☐	
☐		☐		☐		☐	

Section D: Summary of Findings/Comments

Background:

This compliance inspection was conducted as part of a Department of Ecology inspection program to control the potential sources of pollutants discharged to the Duwamish waterway through storm drainage systems. John Keeling, Site Manager with Ecology's Toxic Cleanup Program and Raman Iyer, Compliance and Technical Assistance Unit Supervisor with Ecology's Water Quality Program also participated in this inspection.

The last NPDES permit compliance inspection conducted by Ecology at Jorgensen Forge was on January 13, 2006. Permit compliance issues noted during that inspection included zinc discharges in excess of the benchmarks.

Jorgensen manufactures precision machined forgings for the commercial aircraft, aerospace, energy (oil exploration), power generation, automotive, and shipbuilding industries. The 20 acre facility is located on the Duwamish River but does not have overwater structures or riverside operations.

The Department of Ecology and US Environmental Protection Agency have several administrative orders regarding site contamination investigation and cleanup.

Inspection/Observations:

Raman Iyer, John Keeling and I arrived at the facility at approximately 9:45 am and met with Ron Altier, Vice President of Administration. Ron is the designated corporate official for NPDES permit compliance. Mr. Altier was sure that the Stormwater Pollution Prevention Plan (SWPPP) dated March 2006, had been recently updated but could not locate it. An electronic copy of the most current Site Map was located and printed for use during the site inspection. Electronic access to the current SWPPP dated July 2009, was provide to Ecology the following day.

The facility stores a large amount of scrap material outside in metal bins, dumpsters and bunkers. The new NPDES Industrial Stormwater General Permit requires: "No later than July 1, 2010, Keep all dumpsters under cover or fit with a lid that must remain closed when not in use" (see Photos # 3-6 and 11, 12).

The facility stores a lot of scrap metal outside in various types of bins and dumpsters. A whitish cutting oil/coolant could be seen at the bottom of a scrap metal storage bin and cutting oil/coolant could be seen on the pavement nearby (see Photos #3, 4).

Miscellaneous scrap materials and wastes stored outside should be inventoried and covered as necessary. Dumpsters with lids must be kept closed when not in use.

The pressure wash/steam cleaning station is located near the laboratory (see Photos # 7, 8, 10). This facility is plumbed to the sanitary sewer through an oil/water separator. All wash-water is defined as process wastewater and cannot be discharged to the storm drainage system. Some of the area around the pressure wash/steam cleaning station flows to the storm drainage system. The footprint of the cleaning station must be clearly depicted on the Site Map in the SWPPP and on the ground with markings or a painted line. It must be clear to everyone working in the vicinity of the cleaning station, which areas drain to the sanitary sewer and which to the storm drainage system.

The facility must provide adequate cover and containment for all liquid petroleum and chemical products and wastes stored outside.

Metal turnings and cuttings must be covered, stored under cover or inside (see photos # 11, 12).

Stormwater run-off from the metal turnings/cuttings storage bunkers in photos # 13 and 14 is likely to be contaminated. Stormwater run-off from this area either flows to storm drains or infiltrates. Jorgensen must determine whether or not stormwater from this area can possibly get into the storm drainage system. The scrap metal storage bunkers seen in photos # 13, 14 must be provided with improved source control measures and pollution prevention practices. It is not clear where stormwater from this area flows. Infiltrating contaminated stormwater near the river with a high groundwater table is problematic.

The southern portion of the facility is partially paved and is mostly used to store scrap metal and waste materials. Outfall lines # 001 and 002 flow under this area. The southwest corner of the facility is unpaved (see Photo # 17). There are no storm drains in the vicinity and most stormwater infiltrates into the ground. Given the close proximity to the Duwamish River, the facility must ensure that stormwater cannot flow overland towards the river between the concrete wall and the building (see Photo # 18). Contaminated stormwater infiltrating in this area may find a pathway to the river along the outside of storm drain lines # 001 and 002.

A variety of scrap metals and solid wastes are stored out in the open along the southern boundary of the facility (see Photos # 16, 19, 20, 21). Source control measures must be re-evaluated in this area. During rainy periods, stormwater from this area will flow towards storm drains or infiltrate.

The Site Map shows there is at least one catch basin in the scrap material storage area. The facility must inventory wastes stored along the southern portion of the facility and implement necessary source control measures for the pollutants that will mobilize during storm events. The scrap metal stored in an ecology block bunker (see Photos # 21, 22) has enough petroleum in it to warrant the use of absorbent pads (see Photo # 22). This material needs to be stored under cover. Stormwater in this area was reddish brown and had a visible sheen on it. This stormwater is either infiltrating or flowing towards a storm drain (see Photo # 24).

The unpaved area just south of the Aluminum Heat Treat Area was contributing to very turbid run-off flowing to the nearby storm drain catch basin (see Photos # 25, 26) which is tributary to Outfall 002. A visible petroleum sheen on stormwater flowing into a catch basin tributary to the Duwamish River must elicit a source tracing investigation to determine the source.

Empty drums may have residual petroleum and/or chemicals on them that will mobilize if left out in the rain (see Photo # 27). All containers of liquid products and wastes stored outside must be provided with adequate cover and containment (see Photo # 28).

Issues & Requirements:

The Stormwater Pollution Prevention Plan must be on site and available for review by unannounced inspectors.

The facility must provide adequate cover and containment for all liquid petroleum and chemical products and wastes stored outside.

Metal turnings/cuttings must be covered, stored under cover or kept inside.

The footprint of the cleaning station must be clearly depicted on the Site Map in the SWPPP and on the ground with markings or a painted line.

Jorgensen must determine whether or not stormwater from the scrap metal storage bunkers near the melt baghouse can possibly get into the storm drainage system.

Contact Robert Wright at 206-909-6640 with any questions or concerns regarding this report.

Name(s) and Signatures of Inspector(s)	Agency/Office/Telephone	Date
Robert Wright	WA Dept. of Ecology/ NW Regional Office/ 425-649-7060 3190 160th Ave SE, Bellevue, WA 98008-5452	12-29-09
Signature of Management Q A Reviewer	Agency/Office/Phone and Fax Numbers WA Dept. of Ecology/NWRO/ (425) 649-7000 Fax (425) 649-7098	03/12/10

UNANNOUNCED Inspection

PHOTO ADDENDUM

Jorgensen Forge, Seattle **Date: November 5, 2009**

#1. DESCRIPTION: Jorgensen Forge occupies approximately 20 acres on the Duwamish River. The buildings are in the shape of an "L". Most of the outside areas are concrete or asphalt.

#2. DESCRIPTION: The Duwamish River is beyond the large tan overhead ducting. The facility has no overwater structures or any water-side operations.

#3. DESCRIPTION: The facility stores a lot of scrap metal outside in various types of bins and dumpsters. A whitish cutting oil/coolant can be seen at the bottom of this scrap metal storage bin.

#4. DESCRIPTION: Cutting oil/coolant could be seen on the pavement near this scrap metal bin. Scrap metal stored in bins or dumpsters outside must be provided with proper cover.

PHOTO ADDENDUM

Jorgensen Forge, Seattle

Date: November 5, 2009

#5. DESCRIPTION: Of these two dumpsters, one has a lid and one does not. Procedures must be developed to ensure the lid is closed when access is not necessary.

#6. DESCRIPTION: Miscellaneous scrap materials and wastes should be inventoried and stored inside or covered as necessary.

#7. DESCRIPTION: The grated area is for pressure washing and steam cleaning. The grated area is plumbed to the sanitary sewer. Chemicals and petroleum products must be provided with proper containment.

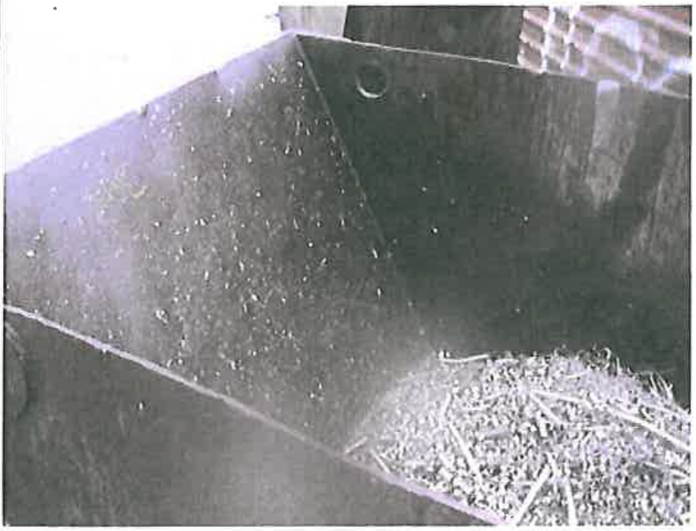
#8. DESCRIPTION: All wash-water is defined as process wastewater and cannot be discharged to the storm drainage system. Some of the area around the grating flows to the storm drainage system. The facility must clearly mark the "footprint" of the area that flows to the sanitary sewer. The Site Map in the SWPPP should be updated to clarify which areas are tributary to the sanitary sewer and which go to the storm drainage system in this area.

PHOTO ADDENDUM

Jorgensen Forge, Seattle **Date: November 5, 2009**

#9. DESCRIPTION: The facility must provide adequate cover and containment for all liquid petroleum and chemical products and wastes stored outside.

#10. DESCRIPTION: The footprint of the area tributary to the sanitary sewer needs to be clearly delineated so staff knows if wastewater may be flowing to storm drains.



#11. DESCRIPTION: Metal turnings and cuttings must be stored in bins or dumpsters with a cover.

#12. DESCRIPTION: These scrap metal bins must be covered, stored under cover or inside.

PHOTO ADDENDUM

Jorgensen Forge, Seattle **Date: November 5, 2009**

#13. DESCRIPTION: Stormwater run-off from this area is likely to be contaminated. This area is within the Outfall 003 drainage basin. The facility must determine where stormwater from this area goes. This pile of metal turnings/cuttings must be provided with adequate source control.

#14. DESCRIPTION: This scrap metal storage area must be provided with more adequate source control. It is not clear where stormwater from this area flows. Infiltrating contaminated stormwater near the river with a high groundwater table is problematic.

#15. DESCRIPTION: All liquid products and wastes must be provided with adequate cover and containment. The concrete floor of this storage area is recessed and has a lip around it.

#16. DESCRIPTION: The southern portion of the facility is partially paved and is used to store scrap metals and waste materials. Stormwater from this area either flows to Outfall 001 or Outfall 002 or infiltrates into the ground.

PHOTO ADDENDUM

Jorgensen Forge, Seattle **Date: November 5, 2009**

#17. DESCRIPTION: The southwest corner of the facility is unpaved. There are no storm drains in the vicinity and most stormwater infiltrates into the ground. The Duwamish River is on the other side of the concrete wall.

#18. DESCRIPTION: Storm drain lines 001 and 002 flow under this area. The facility must ensure that stormwater cannot flow overland towards the river between the concrete wall and the building (just to right of orange cone). Contaminated stormwater may infiltrate and then flow along the outside of storm drain lines 001 or 002.

#19. DESCRIPTION: The southern portion of the facility is called the scrap storage area. A variety of scrap metals and solid wastes are stored here out in the open. Source control measures must be re-evaluated in this area. During rainy periods, stormwater from this area will flow towards storm drains or infiltrate in the ground.

#20. DESCRIPTION: The Site Map shows there is at least one catch basin in the scrap storage area. The facility must inventory wastes stored along the southern portion of the facility and implement necessary source control measures for pollutants that will mobilize during storm events.

PHOTO ADDENDUM

Jorgensen Forge, Seattle **Date: November 5, 2009**

#21. Description: Scrap metal is stored in ecology block bunkers. This material is metal chips (or turnings or cuttings) and should be provided with cover.

#22. Description: The scrap metal seen in photo # 21 is on the other side of this ecology block wall. Apparently the metal chips have enough petroleum on them to warrant the use of absorbent pads to control petroleum in the stormwater.

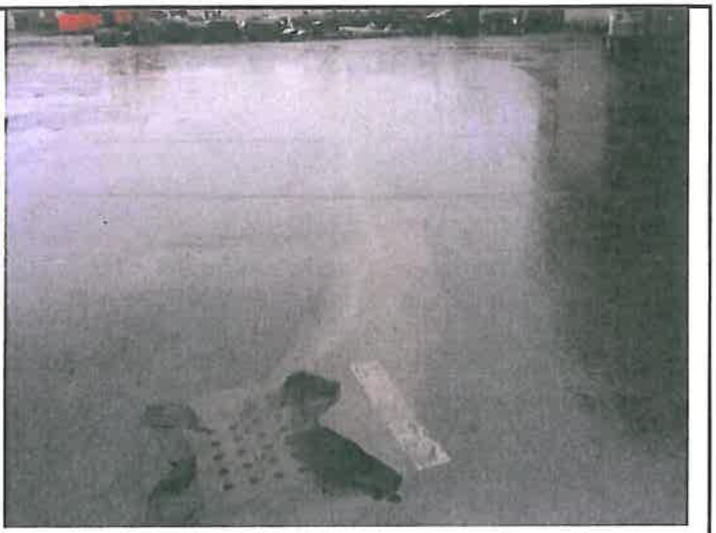
#23. Description: Materials stored outside in the scrap storage area must be covered.

#24. Description: Stormwater will pool in areas without adequate drainage. Stormwater from this area may eventually find an avenue to flow towards the river. The stormwater pooling in this area was reddish brown and had a petroleum sheen visible on it.

PHOTO ADDENDUM

Jorgensen Forge, Seattle **Date: November 5, 2009**

#25. DESCRIPTION: This storm drain is tributary to the Outfall 002. The nearby unpaved area was contributing very turbid stormwater to this catch basin. This area is at the southeast corner near the Aluminum Heat Treat building.



#26. DESCRIPTION: The turbid stormwater flowing to the storm drain catch basin had a visible petroleum sheen on it. A visible petroleum sheen on stormwater flowing to a catch basin tributary to the Duwamish River must elicit an investigation to determine the source.

#27. DESCRIPTION: Most of these drums were empty but residual petroleum and/or chemicals may mobilize if left out in the rain.

#28. DESCRIPTION: All liquid products and wastes stored outside must be provided with adequate cover and containment.

JORGENSEN FORGE

ALUMINUM – TITANIUM – SPECIALTY STEELS

Department of Ecology Stormwater Compliance Site Inspection
Jorgensen Forge Corporation Representative Notes
November 5, 2009 (10:00 to 13:00)

The Department of Ecology (Ecology) conducted an unannounced National Pollutant Discharge Elimination System (NPDES) Industrial Stormwater General Permit (Permit) compliance inspection at the Jorgensen Forge Corporation (Jorgensen) property (Site) located at 8531 East Marginal Way South in Seattle, Washington on November 5, 2009. The Site inspection lasted from 10:00 to 13:00 and included a comprehensive tour of the inside of the manufacturing building and the remainder of the Site outside the building including both Ecology and Jorgensen representatives. Following the inspection, the lead Ecology inspector requested that the Jorgensen representatives provide Ecology with a summary of Ecology's questions raised during the Site inspection and requested that they submit any additional information regarding these questions that could potentially assist Ecology with their Site inspection report.

Attendees

The following Ecology and Jorgensen representatives were present during the Site inspection:

- Jorgensen: Ron Altier (Vice President Administration and Site Environmental Manager) and Wayne Desberg (Site Engineering Manager)

- Ecology: Robert Wright (lead for Site Permit compliance), Raman Iyer (Site compliance supervision), and John Keeling (Site Manager for completion of the source control evaluation under Agreed Order No. DE 4126)

Summary of Discussion Items and Submittal of Additional information

The following questions or comments were raised by Ecology as potential issues or suggested best management practices (BMPs) for inclusion in Jorgensen's stormwater pollution prevention plan (SWPPP), during the course of the Site inspection.

1. **King County Metro permit:** If Jorgensen has no King County Metro permit, Jorgensen must request a permit or an exemption for a 1000 gallon per day exceedance.

Additional Information: Jorgensen does not have a permit to discharge to the King County Metro system and King County has never requested a permit be submitted. Anchor QEA will contact King County and determine the need for obtaining a permit for Metro discharges from the Site. If a permit is deemed necessary given the type, frequency, and magnitude of discharges from the Site, Anchor QEA will work with Jorgensen to submit the permit application.

2. **Storm Water Pollution Prevention Plan:** Send a copy of the updated Jorgensen SWPPP to Robert Wright, including the signed and dated certification page.

   Additional Information: A copy of the certifieid SWPPP updated in July 2009 was provided to Robert Wright via an ftp site the day after the Site inspection on November 6, 2009.

3. **Mobile equipment repair:** All mobile equipment repair involving motor oil, hydraulic oils, or other liquids must be performed inside a building or under a portable cover with drip pans.

   Additional Information: No open air repair is allowed unless there is full topside cover and under truck containment pans are used. Also use of "kitty-litter"-type absorbent outside of buildings for oil clean-up is not a recommended BMP.

4. **Oil-water separator:** West of the laboratory, the oil-water separator requires barriers to ensure steam washing and other cleaning and handling of parts does not contaminate the ground surface around the separator and become a source of pollution to storm drains and the river. Barriers may include a berm and wall. Cleaning overspray is not permitted. Written, documented oil-water separator maintenance is required. Non-protected drums in area must be on spill containment pad. These requirements also apply to the oil/water separator located on the central eastern portion of the Site.

   Additional Information: Jorgensen will develop alternative equipment cleaning procedures in order to eliminate steam cleaning at this location and document oil-water maintenance. Any additional procedures will be added to the SWPPP.

5. **Empty drum storage:** Empty drums stored on the outside south wall of the oil house adjacent to the auto shop building, should have bungs in place so rain water cannot collect in drums and/or remaining oil in drums cannot leak. These need to be under cover to avoid the potential for runoff.

   Additional Information: Jorgensen will eliminate drum storage in the noted location and move all drums into the bermed and covered used oil house.

6. **Totes and drums:** Storage of totes and drums must be inside a bermed, covered, area in case of leakage. After delivery of totes or drums, they must be properly stored within a reasonable time on the same day.

   Additional Information: Jorgensen concurs with the stated tote and drum handling BMPs and will add this to the SWPPP.

7. **Proper sizing of berms for liquid chemical storage:** Ensure that berms in the following locations have sufficient holding capacity to contain a potential leak/spill from the largest container in the area plus any additional volume within containers in the same storage area: used oil house, gasoline storage area, and the former acid etch house.

   Additional Information: Jorgensen will determine the volume of these containments and assess if they are satisfactory. Any additional berm upgrades would be included in the SWPPP.

8. **Pump-out procedure for outside bermed liquid storage areas:** Ensure that outside chemical bermed storage areas each have a written pump-out procedure that is included in the Jorgensen SWPPP.

   Additional Information: Jorgensen will ensure that the outside bermed storage areas each have a written pump-out procedure which will be included in the SWPPP.

9. **Skiffs, bins, and dumpsters:** All skiffs, bins, and dumpsters stored outside must have covers that are kept closed (except when accessed) to prevent the collection of rainwater and potential leakage of oils from the containers.

   Additional Information: Jorgensen understands that this is a new requirement under the revised Permit that will be implemented on January 1, 2010. Jorgensen is currently identifying how best to achieve this requirement given the Site operations and storage procedures.

10. **Property line 24-Inch pipe:** Jorgensen Forge must provide technical verification to Ecology that it does not have any active drainage lines connected to the property line 24-inch pipe (extending from the King County International Airport) on Jorgensen's north boundary.

    Additional Information: A video reconnaissance was conducted by Boeing within the property line 24-inch pipe in 2005 to document the inputs to this pipe. The reconnaissance results were summarized in the EPA-approved Phase II

Transformer Investigation Report prepared by Floyd Snyder and Weston Solutions dated August 3, 2005. The results showed only a single historical 12-inch lateral line entering the 24-inch pipe which was plugged with a piece of dimensional lumber approximately 40 feet south of the connection with the 24-inch pipe. Jorgensen Forge conducted extensive research of the Site historical records and talked with veteran personnel and found no information regarding the 12-inch pipe. In addition, no structures or operations currently occur in the vicinity of this area on the Site. Therefore, this pipe is assumed to have served the historical Bethlehem Steel Facility which historically operated on that portion of the Site from 1951 to 1963.

11. **Melt shop slag storage area:** Jorgensen needs to provide technical verification that this is not a source of pollution to the river through ground water seepage. Mr. Wright was also concerned about the north end of the concrete wall (along the top of the river bank) not being sealed where it meets the Melt storage building.

    Additional Information: The slag storage area is unpaved given the slag is superheated when placed on the ground and therefore cannot be placed on standard paved or concrete surfaces. Jorgensen has been actively researching alternative methods for slag storage and reuse/disposal that more efficiently contain the slag. Two separate investigations have been conducted to determine if the slag storage area is a potential source of contamination to the river, as discussed below, both of which have identified it is not a source.

    As part of the Lower Duwamish Waterway Remedial Investigation, the Lower Duwamish Waterway Group (LDWG) collected a single shoreline seep sample in July 2004 at the base of the concrete panel wall directly riverward of the slag storage area. The sample was submitted for analysis of total suspended solids, total organic carbon, metals, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and pesticides. The results of the sample collection are presented in the Data Report: Survey and Sampling of Lower Duwamish Waterway Seeps – Final (Windward 2004). Comparison of the results to the acute and chronic marine water quality criteria for the surface waters of the State of Washington (WAC 173-201) showed that the only identified exceedance was for copper. However, copper exceedances were identified at every seep station sampled throughout the Lower Duwamish Waterway due to the very low criteria. This data provides evidence that upland seepage of groundwater migrating beneath the slag storage area is not contributing elevated chemical concentrations to the Lower Duwamish Waterway.

    In addition, as part of the ongoing Site source control investigation under Ecology Agreed Order No. DE 4127, Jorgensen installed a monitoring well just down-gradient from the slag storage area adjacent (just east) of the concrete wall along the shoreline in early 2009, as shown in the attached figure (station MW-39). The well was screened from 5 to 20 feet below ground surface (bgs; groundwater table typically encountered from 14 to 17 feet bgs in this area) and sampled a single *time in February, May and August 2009 under a variety of hydrological conditions for analysis of benzene, toluene, ethylbenzene and xylene (BTEX), oil/diesel/gasoline range organics, dissolved metals, PAHs, SVOCs, and halogenated VOCs. The results showed no exceedances of the source control screening levels for any of the collected samples. This data provides additional evidence that upland seepage of groundwater migrating beneath the slag storage area is not contributing elevated chemical concentrations to the Lower Duwamish Waterway.*

12. **Outside storage of metal chips and turnings:** Jorgensen needs to insure that oil on chips, turnings, and grindings stored outside and exposed to rain, does not drain into storm drains.

    Additional Information: As part of the ongoing Site source control investigation under Ecology Agreed Order No. DE 4127Jorgensen Forge is currently completing a Site-wide source control evaluation under an Ecology Agreed Order. This evaluation reviewed existing Site media data to determine if total petroleum hydrocarbons (i.e., oil) sources were being discharged to the river through the stormwater pathway. Historical stormwater data collected as part of the NPDES Permit quarterly compliance monitoring since 2005 have shown only isolated detections of oil and grease, all of which were below the Permit benchmark level. In addition, recent data gaps sampling performed under the Ecology Agreed Order process included the collection of stormwater data from each of the active Site outfalls (Outfalls 001, 002 and 003) as well as a number of upgradient locations in these outfall drainages. These samples showed no detections of total petroleum hydrocarbons. Both sets of data document that the existing BMPs are effective at controlling petroleum compounds from entering the stormwater system and reaching the Lower Duwamish Waterway above screening levels.

13. **Written storm water drain inspection:** Jorgensen needs to maintain a written storm water drain inspection checklist process and associated map, validating each drain silt screen and other BMPs are in place.

    Additional Information: Jorgensen will complete this checklist for all future inspections and include the signed inspection in an appendix in the SWPPP.

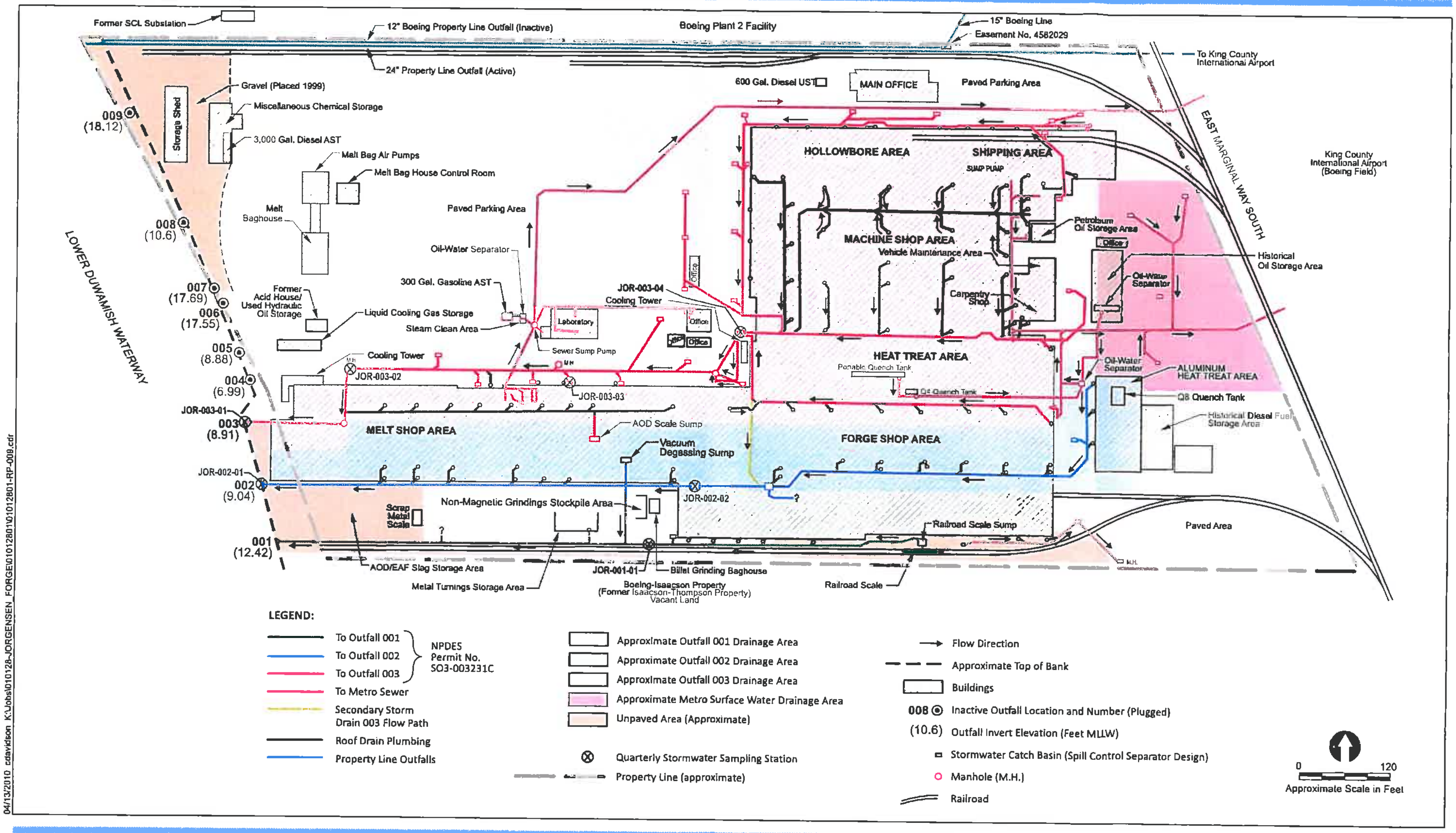
14. **Roof drains:** While not a Permit requirement, Ecology noted that repairing leaking roof drains would help minimize water collecting in problem areas.

    Additional Information: Jorgensen conducted a comprehensive roof gutter cleanout in early 2009 to minimize issues associated with buildup of deposited materials in the gutters as part of the source control evaluation under the Ecology Agreed Order. Jorgensen will evaluate the integrity of the roof drains and conduct any necessary repairs.

15. **General comments regarding outside storage in general as related to SWPPP BMPs**

Bob Wright commented on a number of potential sources of contamination to the stormwater system based on the non-covered storage of equipment (e.g., steel, scrap, old equipment, etc.).

Additional Information: Jorgensen has taken Bob's advice to heart and has organized a leadership team to improve our outside storage process and BMPs. Any actions taken or changes made will be included in the SWPPP.



ANCHOR QEA

Figure 3
Current Site Stormwater Drainage Plan and Sampling Locations
Jorgensen Forge Facility

JORGENSEN FORGE

QUALITY FORGINGS ON TIME

Memo

To: All Employees

From: Phil Ron Wayne

Date: 5-25-10

Re: Implementation of New Environmental Best Practices at Jorgensen

---

Environmental best practices include procedures designed to ensure cleanliness of storm water (rainwater). At Jorgensen storm water flows from our yards, parking lots, and building roofs to the Duwamish River through the Company's storm water drains, pipe system, and outfalls. The Company' has adopted new best practice procedures to protect public health, improve environmental conditions, help restore the Duwamish River, and comply with the stringent new Department of Ecology environmental regulations. The Washington State Department of Ecology has identified storm water as the most significant contributor to reduced water quality in Puget Sound. More procedures will follow as we implement our Pollution Prevention Plan.

The new procedures, part of our new storm water permit, are one piece of a larger puzzle to which the Company has and will commit considerable resources both organizationally and financially. Other pieces are:

- A property study to ensure we do not have waste streams that enter the river
- Future clean-up of polluted sediments in the river
- Renewal of the river bank to sustain fish and wildlife.

These efforts and further information on best practices will be presented in plant-wide meetings on Wednesday, June 9th. A schedule will be out shortly.

We appreciate and expect everyone's full cooperation in applying these procedures as you perform your jobs (it is everyone's job). If you have any concerns or see anything that "doesn't look right" and may be an environmental issue please notify your supervisor, Phil Goss, Ron Altier, or Wayne Desberg. Thank you! The new best practices procedures are the following

ENVIRONMENTAL COMPLIANCE

Drum and Tote Containers

(Filled or Empty)

Must be stored inside oil storage buildings

- not left outside -

Per Washington State Department of Ecology Industrial Stormwater Permit Regulations

All Liquid containers, including both empty or filled drums and totes, must be stored inside the oil storage buildings at all times. These locations are: the front oil storage house next to the mobile equipment shop, the tote storage building by the melt shop, and the oil house for used or recycle oil. No longer can we store empties outside or leave newly received containers outside for next-day stocking. **Purpose:** Inside, contained storage ensures that a leaking container or accidental rupture of a container cannot drain fluid to the river through storm drains or mix with storm water and drain to the river.

ENVIRONMENTAL COMPLIANCE

Container tops must be left closed

- after each use -

Per: Washington State Department of Ecology Industrial Stormwater Permit Regulations

Container tops (hard covers and tarps) for commercial containers and dumpsters, stored outside, must always be left in the closed position. In the rear yard and back of the main office, containers are provided by suppliers for collection of recycle metal materials, recycle paper, baghouse filter sacs, wood, and garbage, Jorgensen has requested suppliers to provide containers and dumpsters with removable or sliding tops. At this time most have tops. By the end of June all will have tops. **Purpose:** Closed containers ensure that chemicals or oil film associated with stored material are not "rinsed" off by falling rain. Most containers do not have waterproof bottoms and allow leakage to the ground where chemicals and oil can mix with storm water, flow into storm drains and into the river. <u>*When you discard something into any of these containers, please open the container, discard your item, and then close the container. All containers must be covered at all times except when discarding your refuse</u>

ENVIRONMENTAL COMPLIANCE

NOT ALLOWED:

- Steam Cleaning
- Equip. Washing
- Oily Storage

Per: Washington State Department of Ecology Industrial Stormwater Permit Regulations

Not allowed: steam cleaning, equipment washing, or oily storage. Immediately west of the lab was the steam clean, oil water separator pit where equipment and parts were steam cleaned or oily parts were left to drain. This area, now permanently out of service, is posted with the sign shown at the left and closed off with barrier blocks. The area will soon be decommissioned by filling in the pit or covering it over. Equipment washing and steam cleaning can no longer be done anywhere on Jorgensen property. **Purpose:** wash water and overspray from any type of outside equipment or parts washing may carry oil or chemical to the ground where it can mix with storm water, flow into storm drains, and into the river.

ENVIRONMENTAL COMPLIANCE

Company skiffs & bins

(Empty or filled)
must be at designated locations

inside and under roof

Except during transfer or
with approved container cover

Per: Washington State Department of Ecology Industrial Stormwater Permit Regulations

In process of implementation: Company skiffs and bins (filled or empty) must be inside and under roof at designated locations (except during transfer or with an approved cover). As with commercial containers there is no certainty that Company skiffs and bins are waterproof on the bottom. **Purpose:** keeping skiffs inside and under roof ensures that chemicals or oil film in the bottom of skiffs or on materials inside are not "rinsed" off by rain water and leaked to ground. Leaking oil and chemicals can mix with storm water, be carried to storm drains, and flow to the river. <u>*More details on appropriate designated locations will follow.</u>

APPENDIX B
BORING LOGS

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

USCS Classification and Graphic Legend

Major Divisions			USCS Graphic Symbol	USCS Letter Symbol	Lithologic Description
Coarse-Grained Soil (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)	▨	GW	Well graded GRAVEL, well graded GRAVEL with sand
			▨	GP	Poorly graded GRAVEL, GRAVEL with sand
		GRAVEL WITH FINES (Appreciable amount of fines)	▨	GP-GM	Poorly graded GRAVEL - GRAVEL with sand and silt
			▨	GM	Silty GRAVEL
			▨	GC	Clayey GRAVEL
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)	▨	SW	Well graded SAND
			▨	SP	Poorly graded SAND
		SAND WITH FINES (Appreciable amount of fines)	▨	SP-SM	Poorly graded SAND - silty SAND
			▨	SM	Silty SAND
			▨	SC	Clayey SAND
			▨	SM-ML	SILT - Silty SAND
Fine-Grained Soil (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)		▨	ML	SILT
			▨	CL	CLAY
			▨	OL	Organic SILT
	SILT AND CLAY (Liquid limit greater than 50)		▨	MH	Inorganic SILT
			▨	CH	Inorganic CLAY
			▨	OH	Organic CLAY
		Highly Organic Soil	▨	PT	Peat
OTHER MATERIALS	PAVEMENT		▨	AC	Asphalt concrete
			▨	CO	Concrete
	OTHER		▨	RK	Bedrock
			▨	WD	Wood Debris
			▨	DB	Debris (Miscellaneous)
			▨	PC	Portland cement

Legend

☐	Sample Interval
☐ G	Grab Sample Interval
▼	Water level at time of drilling
▽	Water level at time of sampling
▯	Blank Casing
▤	Screened Casing

▨	Cement Grout
▥	Bentonite
▩	Sand Pack
▦	Well Cap

————	Solid line indicates sharp contact between units well defined.
- - - - - - -	Dashed line indicates gradational contact between units.

feet bgs = feet below ground surface
NE = Not Encountered
NA = Not Applicable
PID = Photoionization Detector
PN = Project Number
*ppm = parts per million total organic vapors in isobutylene equivalents using a 10.6 electron volt lamp
USCS = Unified Soil Classification System

FARALLON
consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: SB-13

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 394-002

Logged By: D. Clement

Date/Time Started: 02/06/09 0743
Date/Time Completed: 02/06/09 0805
Equipment: Geoprobe
Drilling Company: Cascade Drilling
Drilling Foreman: Kasey Goebel
Drilling Method: Direct Push

Sampler Type: 5' Macrocore
Drive Hammer (lbs.): NA
Depth of Water ATD (ft bgs): 5
Total Boring Depth (ft bgs): 16
Total Well Depth (ft bgs): NA

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Asphalt, paving debris	AC							
		Well-graded SAND (100% sand), fine to coarse sand, brown, moist to 5 feet then wet, no odor.	SW							Bentonite
					100		45.1	SB-13-020609-1		
5										▼
					100		48.2	SB-13-020609-2		
10										
		Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, dark brown, wet, marine odor.	SP		100		50.3	SB-13-020609-3		
15										
							55.9	SB-13-020609-4 GR-SB-13-020609 @12-16 feet bgs		
20										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite
Surveyed Location: **X:** NA **Y:** NA

FARALLON
consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: SB-14

Page 1 of 1

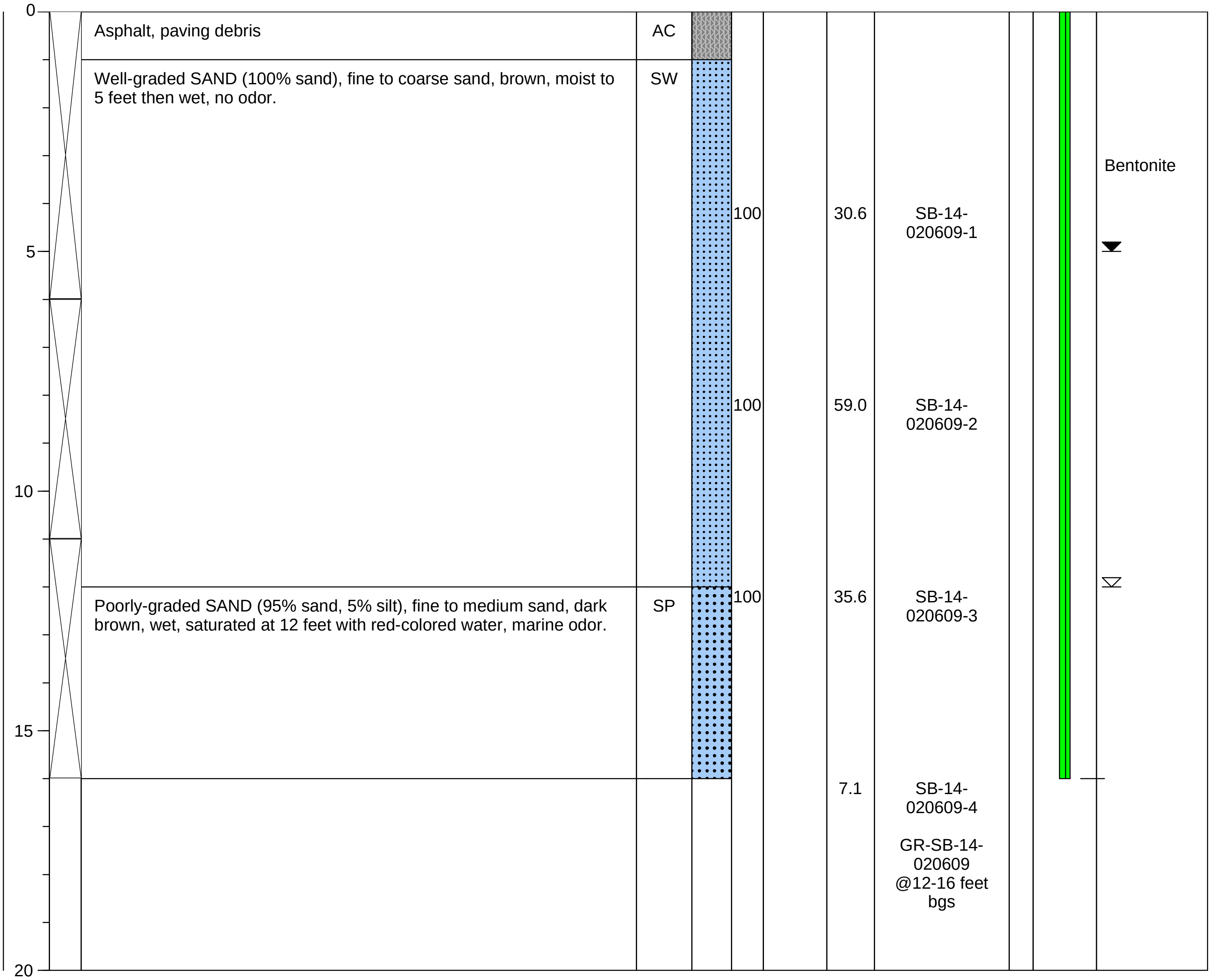
Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 394-002

Logged By: D. Clement

Date/Time Started: 02/06/09 0810
Date/Time Completed: 02/06/09 0830
Equipment: Geoprobe
Drilling Company: Cascade Drilling
Drilling Foreman: Kasey Goebel
Drilling Method: Direct Push

Sampler Type: 5' Macrocore
Drive Hammer (lbs.): NA
Depth of Water ATD (ft bgs): 5, 12
Total Boring Depth (ft bgs): 16
Total Well Depth (ft bgs): NA



Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Asphalt, paving debris	AC							
		Well-graded SAND (100% sand), fine to coarse sand, brown, moist to 5 feet then wet, no odor.	SW		100		30.6	SB-14-020609-1		Bentonite
					100		59.0	SB-14-020609-2		
		Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, dark brown, wet, saturated at 12 feet with red-colored water, marine odor.	SP		100		35.6	SB-14-020609-3		
							7.1	SB-14-020609-4 GR-SB-14-020609 @12-16 feet bgs		

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite
Surveyed Location: X: NA **Y:** NA

FARALLON
consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: SB-15

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 394-002

Logged By: D. Clement

Date/Time Started: 02/06/09 0836
Date/Time Completed: 02/06/09 0900
Equipment: Geoprobe
Drilling Company: Cascade Drilling
Drilling Foreman: Kasey Goebel
Drilling Method: Direct Push

Sampler Type: 5' Macrocore
Drive Hammer (lbs.): NA
Depth of Water ATD (ft bgs): 12
Total Boring Depth (ft bgs): 16
Total Well Depth (ft bgs): NA

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Asphalt, paving debris	AC							
		Well-graded SAND (100% sand), fine to coarse sand, brown, moist, no odor.	SW							Bentonite
					100		40.2	SB-15-020609-1		
5										
					100		60.2	SB-15-020609-2		
10										
		Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, grey, moist to 12 then wet, marine odor starting at 15.5 feet. SILT (100% silt), grey, wet, marine odor at 15.5 feet, 2 inches thick.	SP		100		16.6	SB-15-020609-3		▼
15										
							30.4	SB-15-020609-4 GR-SB-15-020609 @23-27 feet bgs		
20										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite
Surveyed Location: **X:** NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: SB-16

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 394-002

Logged By: D. Clement

Date/Time Started: 02/06/09 0913
Date/Time Completed: 02/06/09 0950
Equipment: Geoprobe
Drilling Company: Cascade Drilling
Drilling Foreman: Kasey Goebel
Drilling Method: Direct Push

Sampler Type: 5' Macrocore
Drive Hammer (lbs.): NA
Depth of Water ATD (ft bgs): 12
Total Boring Depth (ft bgs): 16
Total Well Depth (ft bgs): NA

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Asphalt, paving debris	AC							
		Well-graded SAND (100% sand), fine to coarse sand, brown, moist, no odor.	SW							Bentonite
					100		16.7	SB-16-020609-1		
5										
					100		22.7	SB-16-020609-2		
10										
		Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, black, moist to 12 then wet, no odor, several lenses of SILT (100% silt), black, wet, no odor.	SP		100		4.2	SB-16-020609-3		▼
15										
							11.1	SB-16-020609-4 GR-SB-16-020609 @12-16 feet bgs		
20										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite
Surveyed Location: **X:** NA **Y:** NA

FARALLON
consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: SB-17

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA
Farallon PN: 394-002
Logged By: D. Clement

Date/Time Started: 02/05/09 1320
Date/Time Completed: 02/06/09 1020
Equipment: Geoprobe
Drilling Company: Cascade Drilling
Drilling Foreman: Kasey Goebel
Drilling Method: Direct Push

Sampler Type: 5' Macrocore
Drive Hammer (lbs.): NA
Depth of Water ATD (ft bgs): NE
Total Boring Depth (ft bgs): 6
Total Well Depth (ft bgs): NA

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Attempted 2/5/09, no recovery. Concrete cored 2/6/09.	CO	▤						
		Well-graded SAND (100% sand), fine to coarse sand, brown, moist, no odor.	SW	⁙						
					100		14.2	SB-17-020609-1		
		Sandy SILT (60% silt, 40% sand), fine sand, grey, moist, no odor.	ML	▥						Bentonite
					100		20.7	SB-17-020609-2		
5		Well-graded SAND (100% sand), fine to coarse sand, brown, moist, no odor, several lenses of SILT (100% silt), brown-red, moist, no odor.	SW	⁙						
					100		9.0	SB-17-020609-3		
10										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite
Surveyed Location: **X:** NA **Y:** NA

FARALLON
consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: SB-18

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA
Farallon PN: 394-002
Logged By: D. Clement

Date/Time Started: 02/05/09 1340
Date/Time Completed: 02/05/09 1400
Equipment: Geoprobe
Drilling Company: Cascade Drilling
Drilling Foreman: Kasey Goebel
Drilling Method: Direct Push

Sampler Type: 5' Macrocore
Drive Hammer (lbs.): NA
Depth of Water ATD (ft bgs): 3
Total Boring Depth (ft bgs): 6
Total Well Depth (ft bgs): NA

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Concrete cored	CO							
		Well-graded SAND (100% sand), fine to coarse, brown, moist, no odor.	SW							
		Poorly-graded SAND (100% sand), fine to medium sand, dark brown, moist to 3 feet then wet, musty odor.	SP							
							8.6	SB-18-020509-1		
					100					▼ Bentonite
							15.1	SB-18-020509-2		
5										
							39.1	SB-18-020509-3		
10										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite
Surveyed Location: X: NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: SB-19

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 394-002

Logged By: D. Clement

Date/Time Started: 02/05/09 1400
Date/Time Completed: 02/05/09 1425
Equipment: Geoprobe
Drilling Company: Cascade Drilling
Drilling Foreman: Kasey Goebel
Drilling Method: Direct Push

Sampler Type: 5' Macrocore
Drive Hammer (lbs.): NA
Depth of Water ATD (ft bgs): 4.5
Total Boring Depth (ft bgs): 6
Total Well Depth (ft bgs): NA

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Concrete cored	CO							
		Poorly-graded SAND (95% sand, 5% gravel), fine to coarse sand, fine gravel, brown with red mottling, moist to 4.5 feet then wet, no odor.	SP				40.0	SB-19-020509-1		
					100					Bentonite
							62.1	SB-19-020509-2		▼
5		Poorly-graded SAND (100% sand), fine to medium, black, wet, strong acrid petroleum-like odor.	SP							
							86.8	SB-19-020509-3		
10										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite
Surveyed Location: **X:** NA **Y:** NA

FARALLON *consulting*
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-37

Page 1 of 1

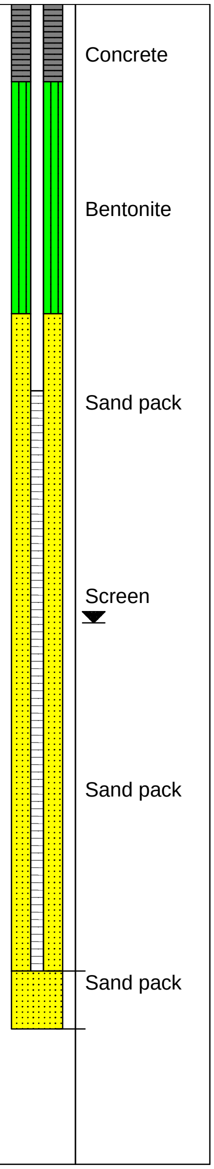
Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA
Farallon PN: 394-002
Logged By: D. Clement

Date/Time Started: 02/09/09 1143
Date/Time Completed: 02/09/09 1205
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Hollow stem auger

Sampler Type: 18" Split spoon
Drive Hammer (lbs.): 300
Depth of Water ATD (ft bgs): 16
Total Boring Depth (ft bgs): 26.5
Total Well Depth (ft bgs): 25

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed
0		0-5 feet Vac trucked out							
5		Well-graded SAND with gravel (85% sand, 15% gravel), fine to coarse sand, fine gravel, brown, very loose, moist, no odor.	SW		66	2/2/3	1.6	MWS-37-020909-1 FD-020909	
10		Well-graded SAND with gravel (85% sand, 15% gravel), fine to coarse sand, fine gravel, brown, loose, moist, no odor.	SW		66	1/3/5	2.5	MWS-37-020909-2	
15		Well-graded SAND with gravel (85% sand, 15% gravel), fine to coarse sand, fine gravel, brown, loose, moist, no odor.	SW		100	2/3/4	1.7	MWS-37-020909-3	
		SILT (100% silt), brown, medium stiff, wet at 16 feet, musty organic odor.	ML						
		Poorly-graded SAND (100% sand), fine to medium, grey, loose, wet, musty organic odor.	SP						
20		Poorly-graded SAND (100% sand), fine to medium, black, loose, wet, no odor.	SP		100	3/3/5	1.1	MWS-37-020909-4	
25		Poorly-graded SAND (100% sand), fine to medium, black, loose, wet, no odor.	SP		100	6/7/8	0.5	MWS-37-020909-5	
30									

Boring/Well Construction Details



Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 10-25

Filter Pack: 2/12 Sand pack
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: Sand
Surveyed Location: **X:** NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-38

Page 1 of 1

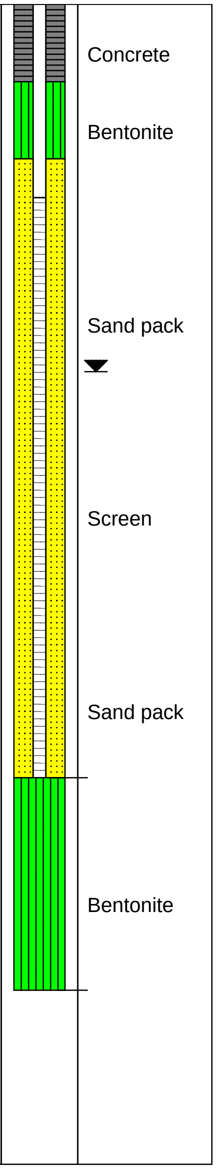
Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA
Farallon PN: 394-002
Logged By: D. Clement

Date/Time Started: 02/09/09 0943
Date/Time Completed: 02/09/09 1005
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Hollow stem auger

Sampler Type: 18" Split spoon
Drive Hammer (lbs.): 300
Depth of Water ATD (ft bgs): 9.5
Total Boring Depth (ft bgs): 25.5
Total Well Depth (ft bgs): 20

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed
0		0-4 feet Vac trucked out							
5	☒	Poorly-graded SAND (100% sand), fine to medium sand, brown, very loose, moist, no odor.	SP	░	100	2/2/3	1.0	MWS-38-020909-1	
		SILT (100% silt), brown, soft, moist, no odor.	ML	▥					
10	☒	Poorly-graded SAND (100% sand), fine to medium sand, brown, very loose, moist, no odor.	SP	░	100	1/2/3	2.2	MWS-38-020909-2	
		Sandy SILT (60% silt, 40% sand), fine sand, brown, soft, wet, no odor.	ML	▥					
15	☒	Poorly-graded SAND (100% sand), fine to medium sand, brown, loose, wet, no odor, aluminum-like metal shards.	SP	░	100	2/3/4	2.6	MWS-38-020909-3	
20	☒	Well-graded SAND (100% sand), fine to coarse sand, black, medium dense, wet, no odor, aluminum-like metal shards.	SW	░	100	7/8/10	3.1	MWS-38-020909-4	
25	☒	Well-graded SAND (100% sand), fine to coarse sand, black, loose, wet, no odor, aluminum-like metal shards.	SW	░	100	5/5/8	3.6	MWS-38-020909-5	
30									

Boring/Well Construction Details



Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 5-20

Filter Pack: 2/12 Sand pack
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite
Surveyed Location: **X:** NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-39

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

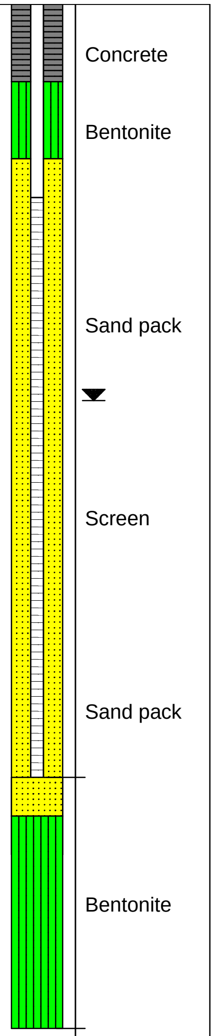
Farallon PN: 394-002

Logged By: D. Clement

Date/Time Started: 02/11/09 0815
Date/Time Completed: 02/11/09 1020
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Hollow stem auger

Sampler Type: 18" Split spoon
Drive Hammer (lbs.): 300
Depth of Water ATD (ft bgs): 10
Total Boring Depth (ft bgs): 26.5
Total Well Depth (ft bgs): 20

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		0-5 feet Vac trucked out								
5	☒	Poorly-graded SAND (60% sand, 35% gravel, 5% silt), fine to coarse sand, fine to coarse gravel, brown, dense, moist, no odor.	SP		80	12/22/33	1.3	MWS-39-021109-1		
10	☒	Silty GRAVEL with sand (55% gravel, 30% sand, 15% silt), fine to coarse sand, fine to coarse gravel, brown, dense, wet below approximately 10.25 feet, musty odor.	GM		100	17/22/32	2.2	MWS-39-021109-2		
15	☒	No recovery, metal or rocks in boring.								
20	☒	No recovery, metal or rocks in boring. Metal fragments observed in auger soil coming out of boring.								
25	☒	No recovery, metal or rocks in boring.								
30										



Well Construction Information

Monument Type: Stickup
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 5-20

Filter Pack: 2/12 Sand pack
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: Sand, bentonite
Surveyed Location: **X:** NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-40

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, Washington

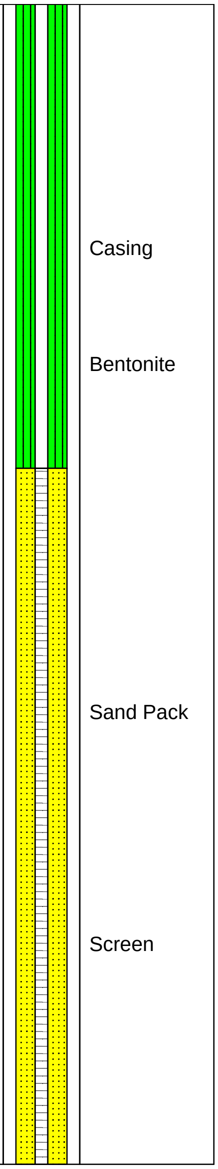
Farallon PN: 394-002

Logged By: Jeff Keller

Date/Time Started: 7/19/08 1200
Date/Time Completed: 7/19/08 1400
Equipment: LA HSA
Drilling Company: Cascade Drilling, Inc.
Drilling Foreman: Curtis A.
Drilling Method: Hollow Stem Auger

Sampler Type: NA
Drive Hammer (lbs.): NA
Depth of Water ATD (ft bgs): 15.5
Total Boring Depth (ft bgs): 25
Total Well Depth (ft bgs): 25

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0 5 10 15 20 25		Boring not logged or sampled. See boring log for MW-41 for lithology.								



Well Construction Information

Monument Type: Flush Mount HD
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 10-25

Filter Pack: Sand
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-41

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, Washington

Farallon PN: 394-002

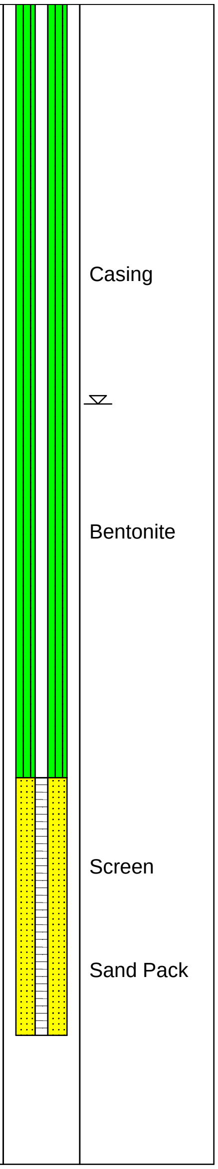
Logged By: Jeff Keller

Date/Time Started: 7/19/08 0930
Date/Time Completed: 7/19/08 1200
Equipment: LA HSA
Drilling Company: Cascade Drilling, Inc.
Drilling Foreman: Curtis A.
Drilling Method: Hollow Stem Auger

Sampler Type: D&M SS 16
Drive Hammer (lbs.): 300
Depth of Water ATD (ft bgs): 15.5
Total Boring Depth (ft bgs): 41.5
Total Well Depth (ft bgs): 40

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed
0		Air knife							
5		Poorly-graded SAND, medium to coarse, brown, medium dense, moist, no odor	SP		100	5/11/15	0.0	MWS 41-071908-01	
10		Poorly-graded SAND, medium to coarse, brown, very loose, moist, no odor	SP		30	6/4/2	0.1	MWS 41-071908-02	
15		Poorly-graded SAND, fine to coarse, black, medium dense, wet, no odor	SP		100	11/14/25	2.2	MWS 41-071908-03	
20		Poorly-graded SAND, fine to coarse, black, very dense, wet, no odor	SP		50	25/50	0.4	MWS 41-071908-04	
25		Poorly-graded SAND, fine to coarse, black, very dense, wet, no odor	SP		10	24/28/40	0.1	MWS 41-071908-05	
30		Poorly-graded SAND, fine to coarse, black, very dense, wet, no odor	SP		10	50	0.9	MWS 41-071908-06	
35		No recovery							
40		Heaving sands - no recovery.							
45									

Boring/Well Construction Details



Well Construction Information

Monument Type: Flush mount HD
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 30-40

Filter Pack: Sand
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-42

Page 1 of 1

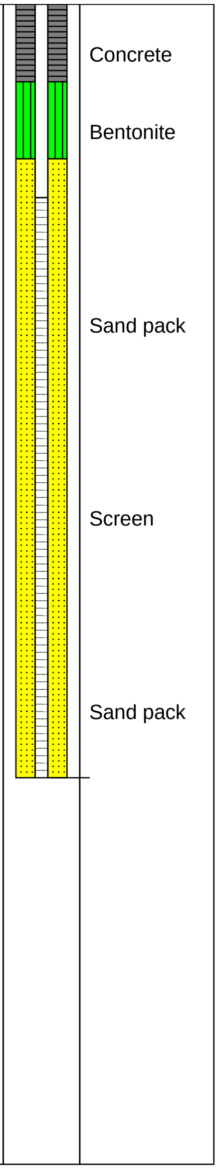
Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 394-002

Logged By: D. Clement

Date/Time Started: 02/10/09 1300
Date/Time Completed: 02/10/09 1515
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Hollow stem auger

Sampler Type: NS
Drive Hammer (lbs.): 300
Depth of Water ATD (ft bgs): NS
Total Boring Depth (ft bgs): 20
Total Well Depth (ft bgs): 20

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0 5 10 15 20 25 30		Boring not logged or sampled. See boring log for MW-44 for lithology.								

Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 5-20

Filter Pack: 2/12 Sand pack
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-43

Page 1 of 1

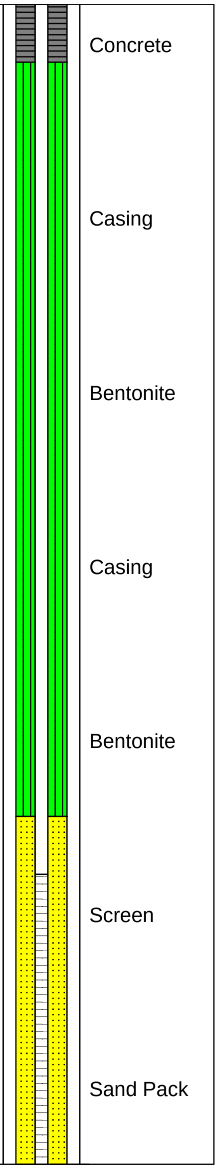
Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 394-002

Logged By: D. Clement

Date/Time Started: 02/10/09 1045
Date/Time Completed: 02/10/09 1300
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Hollow Stem Auger

Sampler Type: NA
Drive Hammer (lbs.): NA
Depth of Water ATD (ft bgs): NS
Total Boring Depth (ft bgs): 40
Total Well Depth (ft bgs): 40

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0 5 10 15 20 25 30 35 40		Boring not logged or sampled. See boring log for MW-44 for lithology.								

Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2"
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 30-40

Filter Pack: 2/12 Sand
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

FARALLON
consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-44

Page 1 of 2

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA
Farallon PN: 394-002
Logged By: D. Clement

Date/Time Started: 02/05/09 0840
Date/Time Completed: 02/05/09 1115
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Direct Push sampling / Hollow Stem Auger install

Sampler Type: 4' Macrocore
Drive Hammer (lbs.): NA
Depth of Water ATD (ft bgs): 15
Total Boring Depth (ft bgs): 60
Total Well Depth (ft bgs): 60

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0 5		Well-graded SAND (100% sand), fine to coarse sand, brown, moist, no odor. Concrete-like material at approximately 8 feet, 1 inch thick. SILT (60% silt, 40% sand), fine sand, red-brown, moist no odor at 10 feet, 0.5 inch thick.	SW		100 100		5.9 16.0	MWS-44-020509-1 MWS-44-020509-2		Concrete Casing
10		Well-graded SAND with gravel (85% sand, 15% gravel), fine to coarse sand, fine gravel, brown, moist, no odor.	SW							
15 20		Silty SAND (85% sand, 15% silt), fine to medium sand, brown, estimated dense, moist then wet starting at 15 feet, no odor to 15 feet then marine odor.	SM		100 100 100		12.3 9.4 11.8	MWS-44-020509-3 MWS-44-020509-4 MWS-44-020509-5		Bentonite ▼ Casing
		SILT (100% silt), black, wet, marine odor.	ML							
25		Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, black, wet, marine odor, wood fragments.	SP		100		11.1	MWS-44-020509-6		Bentonite
		SILT (100% silt), black to brown, wet, marine odor.	ML		100		13.1	MWS-44-020509-7		
30		Poorly-graded SAND (95% sand, 5% silt), black, wet, marine odor.	SP							

Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2"
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 50-60

Filter Pack: 2/12 Sand
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

FARALLON *consulting*
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-44

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Well Construction Details
		SILT (100% silt), black to brown, wet, marine odor, wood fragments.	ML							Casing
35		Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, brown, wet, marine odor. SILT (100% silt), black, wet, marine odor at 35 feet, 2 inches thick.	SP		100		18.9	MWS-44-020509-8		
40		Poorly-graded SAND (100% sand), fine to medium sand, brown, wet, marine odor.	SP		100		20.9	MWS-44-020509-9		Bentonite
		Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, black, wet, marine odor.	SP		100		20.3	MWS-44-020509-10		Casing
45					100		24.5	MWS-44-020509-11		
50					100		38.7	MWS-44-020509-12		Sand pack
55					100		35.2	MWS-44-020509-13		Screen
					100		39.7	MWS-44-020509-14		
60					100		6.0	MWS-44-020509-15		

Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2"
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 50-60

Filter Pack: 2/12 Sand
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-45

Page 1 of 2

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

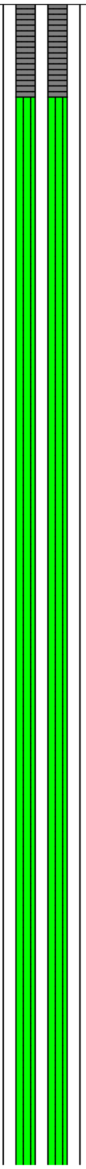
Farallon PN: 394-002

Logged By: D. Clement

Date/Time Started: 02/05/09 1130
Date/Time Completed: 02/05/09 1220
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Direct Push sampling / Hollow Stem Auger install

Sampler Type: 4' Macrocore
Drive Hammer (lbs.): NA
Depth of Water ATD (ft bgs): 9
Total Boring Depth (ft bgs): 40
Total Well Depth (ft bgs): 40

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Vac trucked out								Concrete
5	☒	Poorly-graded SAND with gravel (60% sand, 40% gravel), fine to coarse sand, fine gravel, brown, moist, no odor.	SP	▨						
	☒	Poorly-graded SAND (100% sand), fine to medium sand, brown, moist to 9 feet then wet, no odor.	SP	▨						Casing
	☒			▨	100		0.1	MWS-45-020509-1		▼
10	☒			▨						
	☒	SILT (100% silt), black, wet, organic odor.	ML	▥	100		0.1	MWS-45-020509-2 FD-020509		
	☒	Poorly-graded SAND (100% sand), brown-black, wet, no odor.	SP	▨						Bentonite
15	☒			▨						
	☒			▨	100		0.0	MWS-45-020509-3		
	☒			▨						Casing
20	☒			▨	100		0.2	MWS-45-020509-4		
25										



Well Construction Information

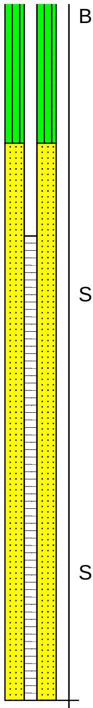
Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2"
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 30-40

Filter Pack: 2/12 Sand
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

Log of Boring: MW-45

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Well Construction Details
	☒			▒	100		0.0	MWS-45-020509-5		Bentonite
30	☒	Poorly-graded SAND (100% sand), brown-black, wet, musty odor. Approximately 60% of the sample is woody debris mixed in with the soil.	SP	▒	100		0.0	MWS-45-020509-6		Screen
35	☒			▒	100		0.1	MWS-45-020509-7		
	☒	Poorly-graded SAND (100% sand), black, wet, no odor.	SP	▒	100		0.1	MWS-45-020509-8		Sand Pack
40					100		0.0	MWS-45-020509-9		
45										



Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2"
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 30-40

Filter Pack: 2/12 Sand
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-46

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

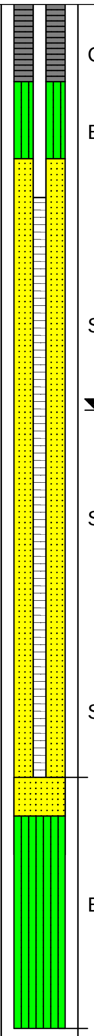
Farallon PN: 394-002

Logged By: D. Clement

Date/Time Started: 02/11/09 1245
Date/Time Completed: 02/11/09 1315
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Hollow stem auger

Sampler Type: 18" Split spoon
Drive Hammer (lbs.): 300
Depth of Water ATD (ft bgs): 10.5
Total Boring Depth (ft bgs): 26.5
Total Well Depth (ft bgs): 20

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		0-5 feet Vac trucked out								Concrete Bentonite
5	☒	Well-graded SAND (100% sand), fine to coarse sand, brown, loose, moist, no odor.	SW	▨	100	3/5/6	0.5	MWS-46-021109-1		Sand pack
10	☒	Well-graded SAND (100% sand), fine to coarse sand, brown, loose, moist, no odor. SILT (100% silt), grey with red mottling, medium stiff, wet, solvent-like odor from 10.5 to 11 feet.	SW ML	▨	100	1/3/5	0.6	MWS-46-021109-2		▼ Screen
15	☒	Poorly-graded SAND (100% sand), fine to medium sand, black, loose, wet, no odor.	SP	▨	100	5/3/9	0.7	MWS-46-021109-3		Sand pack
20	☒	Poorly-graded SAND (100% sand), fine to medium sand, black, medium dense, wet, no odor.	SP	▨	100	8/12/13	0.5	MWS-46-021109-4		Bentonite
25	☒	Poorly-graded SAND (100% sand), fine to medium sand, black, medium dense, wet, musty organic odor.	SP	▨	100	13/18/15	0.8	MWS-46-021109-5 FD-021109		
30										



Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 5-20

Filter Pack: 2/12 Sand pack
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: Sand, bentonite
Surveyed Location: **X:** NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-47

Page 1 of 1

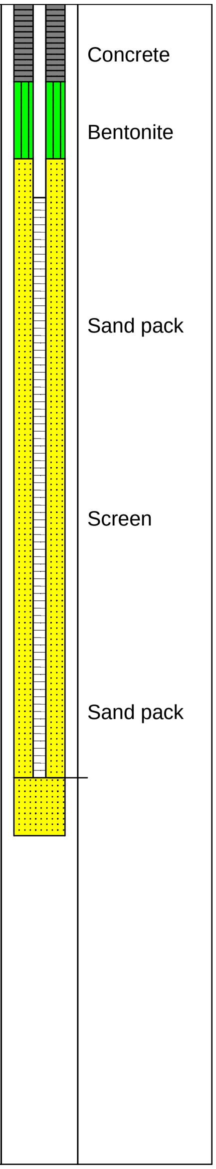
Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 394-002

Logged By: D. Clement

Date/Time Started: 02/11/09 1400
Date/Time Completed: 02/11/09 1530
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Hollow stem auger

Sampler Type: NS
Drive Hammer (lbs.): 300
Depth of Water ATD (ft bgs): NS
Total Boring Depth (ft bgs): 20
Total Well Depth (ft bgs): 20

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0 5 10 15 20 25 30		Boring not logged or sampled.								

Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 5-20

Filter Pack: 2/12 Sand pack
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-48

Page 1 of 1

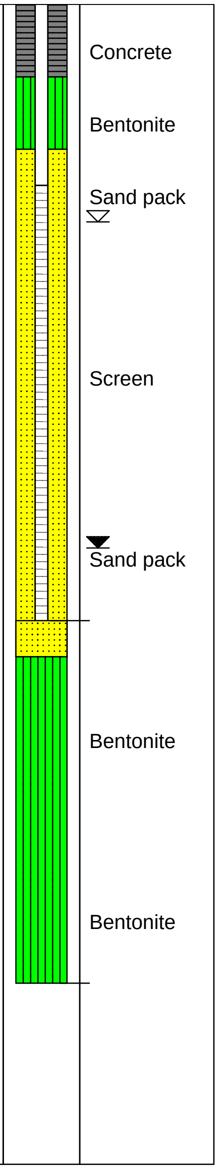
Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA
Farallon PN: 394-002
Logged By: D. Clement

Date/Time Started: 02/12/09 1255
Date/Time Completed: 02/12/09 1320
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Hollow stem auger

Sampler Type: 18" Split spoon
Drive Hammer (lbs.): 300
Depth of Water ATD (ft bgs): 6, 15
Total Boring Depth (ft bgs): 27
Total Well Depth (ft bgs): 17

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed
0		Vac trucked out							
5	☒	Poorly-graded SAND (100% sand), fine to medium sand, brown, loose, moist, no odor.	SP		100	2/3/5	0.6	MWS-48-021209-1	
		Well-graded SAND (100% sand), fine to coarse sand, black, loose, wet, no odor.	SW						
10	☒	Well-graded SAND (100% sand), fine to coarse sand, black, loose, wet, no odor.	SW		100	2/3/5	0.4	MWS-48-021209-2	
		SILT (100% silt), black, medium stiff, wet, organic odor.	ML						
15	☒	SILT (100% silt), black, medium stiff, saturated at 15, no odor.	ML		100	2/5/6	0.6	MWS-48-021209-3	
		Well-graded SAND (100% sand), fine to coarse sand, black, loose, wet, no odor.	SW						
20	☒	Well-graded SAND (100% sand), fine to coarse sand, black, medium dense, wet, no odor.	SW		100	7/8/8	0.4	MWS-48-021209-4	
25	☒	Well-graded SAND (100% sand), fine to coarse sand, black, loose, wet, organic odor, wood fragments.	SW		100	6/7/8	0.4	MWS-48-021209-5 GR-MW48-021209 @23-27 feet bgs FD-021209	
30									

Boring/Well Construction Details



Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 5-17

Filter Pack: 2/12 Sand pack
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

FARALLON
consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-49

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 394-002

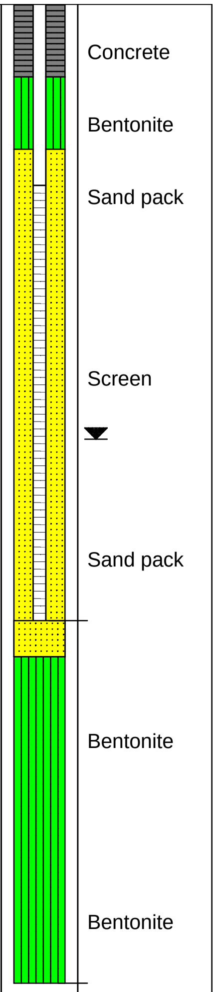
Logged By: D. Clement

Date/Time Started: 02/13/09 0818
Date/Time Completed: 02/13/09 0850
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Hollow stem auger

Sampler Type: 18" Split spoon
Drive Hammer (lbs.): 300
Depth of Water ATD (ft bgs): 12
Total Boring Depth (ft bgs): 27
Total Well Depth (ft bgs): 17

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed
0		Vac trucked out							
5	☒	Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, brown, dense, moist, no odor.	SP	▨	100	8/15/16	1.4	MWS-49-021309-1	
10	☒	Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, brown, medium dense, moist, no odor.	SP	▨	33	9/20/22	2.4	MWS-49-021309-2	
15	☒	Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, brown, dense, moist to 12 feet then wet, no odor.	SP	▨	100	12/18/22	1.2	MWS-49-021309-3	
20	☒	Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, brown, medium dense, wet, no odor.	SP	▨	100	10/12/18	1.1	MWS-49-021309-4	
25	☒	Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, brown, medium dense, wet, no odor.	SP	▨	100	8/10/10	1.2	MWS-49-021309-5 GR-MW49-021309 @23-27 feet bgs RB-021309	
30									

Boring/Well Construction Details



Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 5-17

Filter Pack: 2/12 Sand pack
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-50

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 394-002

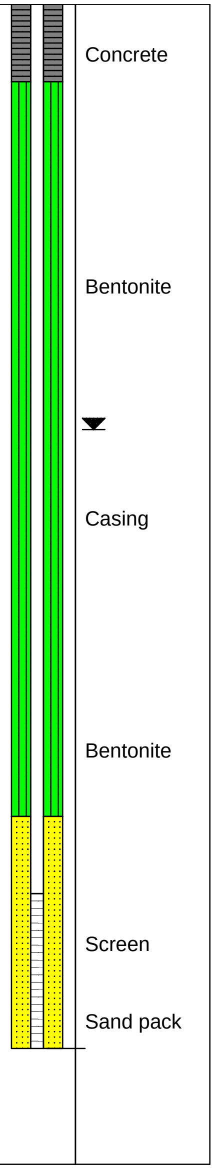
Logged By: D. Clement

Date/Time Started: 02/12/09 0935
Date/Time Completed: 02/12/09 1000
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Hollow stem auger

Sampler Type: 18" Split spoon
Drive Hammer (lbs.): 300
Depth of Water ATD (ft bgs): 11
Total Boring Depth (ft bgs): 27
Total Well Depth (ft bgs): 27

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed
0		Vac trucked out							
5	☒	Well-graded SAND (95% sand, 5% gravel), fine to coarse sand, fine gravel, brown, loose, moist, no odor.	SW	▒	100	5/6/8	0.1	MWS-50-021209-1	
10	☒	Well-graded SAND (95% sand, 5% gravel), fine to coarse sand, fine gravel, brown, very loose, moist, no odor.	SW	▒	100	2/2/2	0.7	MWS-50-021209-2	
		Sandy SILT (60% silt, 40% sand), brown, soft, wet, musty organic odor.	ML	▥					
15	☒	Poorly-graded SAND (95% sand, 5% silt), black, loose, wet, no odor.	SP	▒	100	2/4/6	0.3	MWS-50-021209-3	
20	☒	Poorly-graded SAND (95% sand, 5% silt), brown, loose, wet, no odor.	SP	▒	100	3/6/9	0.2	MWS-50-021209-4	
25	☒	Poorly-graded SAND (95% sand, 5% silt), brown, loose, wet, no odor.	SP	▒	100	3/3/4	0.2	MWS-50-021209-5	
30									

Boring/Well Construction Details



Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 23-27

Filter Pack: 2/12 Sand pack
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-51

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 394-002

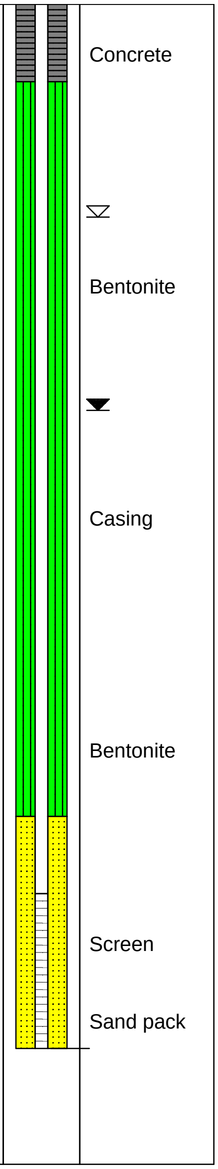
Logged By: D. Clement

Date/Time Started: 02/12/09 1118
Date/Time Completed: 02/12/09 1140
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Hollow stem auger

Sampler Type: 18" Split spoon
Drive Hammer (lbs.): 300
Depth of Water ATD (ft bgs): 5.5, 10.5
Total Boring Depth (ft bgs): 27
Total Well Depth (ft bgs): 27

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed
0		Vac trucked out							
5	☒	Well-graded SAND (100% sand), fine to coarse sand, brown, loose, moist then wet at 5.5, no odor.	SW	▨	100	3/3/7	1.2	MWS-51-021209-1	
10	☒	Well-graded SAND (100% sand), fine to coarse sand, black, very loose, moist then wet at 5.5, no odor.	SW	▨	100	1/1/2	1.1	MWS-51-021209-2	
		SILT (100% silt), black, soft, saturated at 10.5, musty organic odor.	ML	▥					
15	☒	Poorly-graded SAND (100% sand), fine to medium sand, black, very loose, wet, musty organic odor.	SP	▨	100	1/2/3	0.9	MWS-51-021209-3	
20	☒	Poorly-graded SAND (100% sand), fine to medium sand, black, loose, wet, no odor.	SP	▨	100	2/5/6	0.2	MWS-51-021209-4	
25	☒	Poorly-graded SAND (100% sand), fine to medium sand, black, loose, wet, no odor.	SP	▨	100	3/3/4	0.5	MWS-51-021209-5	
30									

Boring/Well Construction Details



Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 23-27

Filter Pack: 2/12 Sand pack
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: X: NA **Y:** NA

Log of Boring: MW-52

Page 1 of 1

Client: Jorgensen Forge Corp.
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 394-002

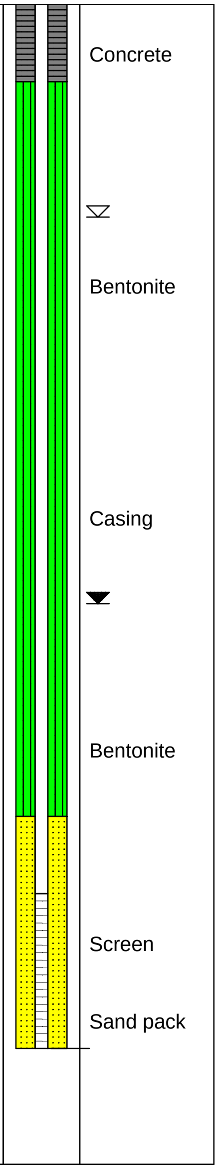
Logged By: D. Clement

Date/Time Started: 02/12/09 0750
Date/Time Completed: 02/12/09 0825
Equipment: CME 75
Drilling Company: Cascade Drilling
Drilling Foreman: David Gose
Drilling Method: Hollow stem auger

Sampler Type: 18" Split spoon
Drive Hammer (lbs.): 300
Depth of Water ATD (ft bgs): 5.5,15.5
Total Boring Depth (ft bgs): 27
Total Well Depth (ft bgs): 27

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed
0		Vac trucked out							
5		Well-graded SAND with gravel (60% sand, 40% gravel), fine to coarse sand, fine to coarse gravel, brown, medium dense, moist then wet at 5.5, no odor.	SW		66	6/10/18	1.1	MWS-52-021209-1	
10		Well-graded SAND (100% sand), fine to medium, brown, very loose, wet, no odor.	SW		100	1/2/3	1.0	MWS-52-021209-2	
15		Well-graded SAND (100% sand), fine to medium, brown, very loose, wet, no odor.	SW		100	2/2/2	1.4	MWS-52-021209-3	
		Sandy SILT (60% silt, 40% sand), fine sand, brown, soft, saturated at 15.5, no odor.	ML						
20		Well-graded SAND (100% sand), fine to coarse sand, brown, very loose, wet, no odor.	SW		100	2/2/2	1.5	MWS-52-021209-4	
		Poorly-graded SAND (100% sand), fine to medium sand, black, very loose, wet, no odor.	SP						
25		Poorly-graded SAND (100% sand), fine to medium sand, black, loose, wet, no odor.	SP		100	2/3/4	2.1	MWS-52-021209-5	
30									

Boring/Well Construction Details



Well Construction Information

Monument Type: Heavy-duty flush mount
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 23-27

Filter Pack: 2/12 Sand pack
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

APPENDIX C
LABORATORY ANALYTICAL REPORTS
(ON CD)

Soil and Groundwater Analytical Report
Stormwater Swarf Lab Data Packages (May 6 and August 13, 2009)

APPENDIX D

PHOTOGRAPHS OF SAMPLING ATTEMPTS, SAMPLING LOCATIONS, AND STORAGE AREAS

CATCH BASIN SAMPLING ATTEMPT PHOTOS

Photo 1

East of Carpentry Shop

Photo 2

East of Heat Treat Area

Photo 3

Northwest Corner of Hollowbore Area

Photo 4

North of Shipping Area

Photo 5

Southeast Corner of Main Office

Photo 6

Southwest Corner of Main Office

Photo 7

West of Machine Shop Area

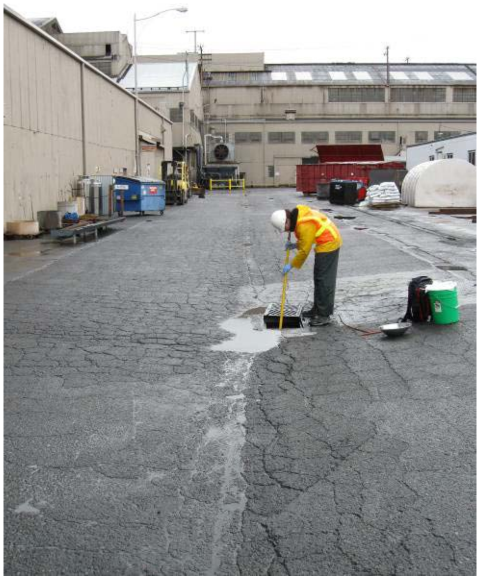


Photo 8

West of Hollowbore Area

Photo 9

West of Engineering Trailer

Photo 10

Northwest of Maintenance Office

Photo 11

Northeast of Shipping Area

Photo 12

South of Shipping Area

Photo 13

South of Melt Shop Area

STORMWATER SAMPLING PHOTOS

Photo 1

Forge Shop East Roof Surface

Photo 2

Forge Shop West Roof Surface

Photo 3

Machine Shop and Heat Treat Area Roof West

Photo 4

Outfall 001 Along Concrete Panel Wall

Photo 5

Outfall 001 Upgradient Vault Exterior

Photo 6

Outfall 001 Upgradient Vault Interior

Photo 7

Outfall 002 Upgradient Vault Interior

Photo 8

Outfall 002 Discharge Location

Photo 9

Outfall 003 Discharge Location

SUBSURFACE VAULT AND PIT WATER SAMPLING LOCATION PHOTOS

Photo 1

AOD Pit (Dry)

Photo 2

Railroad Scale Vault

Photo 3

Vacuum De-gassing Pit Pump Discharge Reservoir

RELOCATED SWARF STOCKPILE AREA PHOTOS

Photo 1

Mon-magnetic Grinding Stockpile,

May 6, 2009

APPENDIX E
DRY WEATHER INSPECTION REPORT

Jorgensen Forge Corporation

Industrial Baseline General Permit No. SO3-003231C - Section S4.D.1

Visual Monitoring Report

Annual Dry Season Inspection of All Outfalls

1. Personnel performing monitoring: RON ALTIER

   Note: This person must be identified in the SWPPP.

2. Date of inspection: 8/4/09

   Date of last precipitation: Last measurable rainfall on 7-13-09 with 0.04"

   Note: This inspection must be conducted during the dry season (July, August, or September) after 7 consecutive days without precipitation.

3. Is there active discharge from/into sampling locations: NO

   Note: Visual monitoring was conducted at the sampling locations to determine if there were any visual or audio queues (i.e., discoloration, floating materials, sheen, sound, etc.) potentially indicating a discharge was occurring.

   Observations: NO INDICATION (VISUAL OR OTHERWISE) OF A DISCHARGE OCCURRING

4. Is discharge visible from Outfall 001: NO

   Is discharge visible from Outfall 002: NO

   Is discharge visible from Outfall 003: NO

   Is discharge visible from Outfall 004 NO

   Note: Visual monitoring was conducted in the general vicinity of the outfalls to determine if there were any visual or audio queues (i.e., discoloration, floating materials, sheen, sound, etc.) potentially indicating a discharge was occurring.

   Observations: NO INDICATION (VISUAL OR OTHERWISE) OF A DISCHARGE OCCURRING

5. If the answer to question 3 or 4 is **Yes**, please describe any visible site activities potentially contributing to the non-stormwater discharge (i.e., sprinklers, hoses left unintentionally running, etc.):

6. Is Jorgensen Forge in compliance with the SWPPP? yes
   If **No**, please list actions taken to come into compliance with the SWPPP:

7. Signature of monitoring personnel: Ron Altier

CERTIFICATION

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision and in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Additionally, I certify that the facility is in compliance or non-compliance with the SWPPP (circle one*).*

If the facility is in non-compliance, the incidents of non-compliance are identified above and I shall initiate steps to notify Ecology according to the procedures in Section S5.E of the Permit.

If certification is not possible, indicate why.

If a non-stormwater discharge is discovered, I will notify Ecology and initiate the necessary steps to eliminate the illicit discharge within 30 days.

Ron Altier

Ron Altier
Vice President Administration
Jorgensen Forge Corporation

Date: 8/4/09

APPENDIX F
STORMWATER FIELD SAMPLING EVENT RAIN DATA

May 6 and August 13, 2009 Sampling Events

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
BOEING FLD/KING CO INTL AP (24234)
SEATTLE , WA
(05/2009)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 16 ft. above sea level
Latitude: 47.530
Longitude: -122.301
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
06	0053	12	BKN038 OVC050	10.00		48	8.9	47	8.0	45	7.2	89	0	000		29.91	8	018	29.94	AA	0.01	29.94
06	0143	12	BKN038 OVC050	2.50	-RA BR	48	9.0	47	8.3	46	8.0	93	3	100		29.90			M	SP		29.93
06	0151	12	BKN038 OVC050	3.00	-RA BR	46	8.0	46	7.7	46	8.0	100	0	000		29.90			M	SP		29.93
06	0153	12	BKN038 OVC050	3.00	-RA BR	47	8.3	47	8.0	46	7.8	96	0	000		29.90			29.93	AA	0.05	29.93
06	0239	12	OVC028	6.00	-RA BR	46	8.0	46	7.7	46	8.0	100	3	080		29.88			M	SP		29.91
06	0253	12	OVC028	9.00	-RA	48	8.9	47	8.3	46	7.8	93	0	000		29.88			29.91	AA	0.01	29.91
06	0353	12	OVC028	4.00	-RA BR	47	8.3	47	8.0	46	7.8	96	0	000		29.87	7	016	29.89	AA	0.04	29.90
06	0453	12	SCT036 BKN047 OVC060	6.00	-RA BR	47	8.3	47	8.0	46	7.8	96	5	150		29.84			29.86	AA	0.02	29.87
06	0553	12	OVC037	5.00	-RA BR	48	8.9	47	8.3	46	7.8	93	3	120		29.84			29.86	AA	0.02	29.87
06	0651	12	OVC029	4.00	-RA BR	48	9.0	47	8.3	46	8.0	93	0	000		29.83			M	SP		29.86
06	0653	12	OVC029	5.00	-RA BR	49	9.4	48	8.6	46	7.8	89	0	000		29.83	6	013	29.85	AA	0.02	29.86
06	0751	12	SCT029 BKN047	8.00	-RA	48	9.0	47	8.3	46	8.0	93	7	130		29.81			M	SP		29.84
06	0753	12	SCT029 BKN047	8.00	-RA	49	9.4	48	8.6	46	7.8	89	8	130		29.81			29.84	AA	0.03	29.84
06	0853	12	FEW032 OVC045	5.00	-RA BR	50	10.0	49	9.4	48	8.9	93	6	120		29.81			29.84	AA	0.05	29.84
06	0953	12	OVC046	8.00	-RA	50	10.0	48	9.1	47	8.3	90	6	110		29.80	6	010	29.83	AA	0.02	29.83
06	1053	12	OVC035	5.00	-RA BR	51	10.6	49	9.7	48	8.9	90	7	110		29.80			29.82	AA	0.03	29.83
06	1153	12	BKN041 OVC049	6.00	-RA BR	51	10.6	49	9.7	48	8.9	90	9	110		29.78			29.81	AA	0.03	29.81
06	1253	12	BKN024 BKN031 OVC047	7.00	-RA	52	11.1	50	10.2	49	9.4	90	9	140		29.79	5	004	29.81	AA	0.07	29.82
06	1353	12	FEW020 BKN026 OVC049	5.00	-RA BR	51	10.6	50	9.9	49	9.4	93	7	140		29.80			29.83	AA	0.12	29.83
06	1418	12	BKN030 BKN039 OVC050	5.00	-RA BR	52	11.0	50	9.9	48	9.0	86	7	150		29.81			M	SP		29.84
06	1453	12	FEW011 BKN035 OVC055	8.00	-RA	51	10.6	50	10.2	50	10.0	96	10	140		29.82			29.84	AA	0.07	29.85
06	1503	12	FEW009 BKN033 OVC060	5.00	-RA BR	52	11.0	51	10.5	50	10.0	93	9	140		29.82			M	SP		29.85
06	1553	12	SCT018 BKN044 OVC060	4.00	-RA BR	53	11.7	51	10.7	50	10.0	90	10	150		29.83	3	015	29.86	AA	0.01	29.86
06	1620	12	FEW015 BKN024 OVC034	4.00	-RA BR	54	12.0	53	11.6	52	11.0	93	10	160		29.84			M	SP		29.87
06	1651	12	SCT022 BKN030 OVC050	10.00	-RA	54	12.0	52	11.0	50	10.0	86	13	170	18	29.85			M	SP		29.88
06	1653	12	FEW022 BKN030 OVC050	10.00		54	12.2	52	11.0	50	10.0	86	10	180	18	29.85			29.88	AA	T	29.88
06	1706	12	FEW020 BKN028 OVC049	7.00	-RA	54	12.0	53	11.6	52	11.0	93	10	190	20	29.85			M	SP		29.88
06	1727	12	FEW022 SCT030 BKN065	10.00		54	12.0	51	10.5	48	9.0	80	15	200	23	29.86			M	SP		29.89
06	1753	12	SCT021 BKN035	10.00		54	12.2	51	10.5	48	8.9	80	14	200	22	29.87			29.89	AA	T	29.90
06	1831	12	FEW024 BKN035 BKN047	5.00	-RA BR	52	11.0	50	9.9	48	9.0	86	10	190	25	29.88			M	SP		29.91
06	1853	12	FEW024 BKN035 BKN047	10.00	-RA	51	10.6	49	9.7	48	8.9	90	10	200	20	29.89	3	020	29.92	AA	0.01	29.92
06	1953	12	SCT049 BKN070	10.00		50	10.0	48	8.8	46	7.8	86	10	200	16	29.92			29.94	AA	T	29.95
06	2053	12	FEW029 BKN039 OVC080	9.00	-RA	50	10.0	48	8.6	45	7.2	83	13	190	22	29.96			29.99	AA	0.01	29.99
06	2153	12	FEW029 BKN050 OVC100	10.00	-RA	49	9.4	47	8.0	44	6.7	83	15	190	23	29.98	1	030	30.01	AA	0.01	30.01
06	2253	12	FEW024	10.00		48	8.9	46	7.5	43	6.1	83	8	190	22	29.98			30.01	AA	T	30.01
06	2353	12	FEW023	10.00		48	8.9	46	7.5	43	6.1	83	10	190	24	30.00			30.03	AA		30.03

Dynamically generated Tue Sep 22 17:05:09 EDT 2009 via http://cdo.ncdc.noaa.gov/qclcd/QCLCD

www.weather.gov

National Weather Service Forecast Office

Seattle, WA

Home News Organization Frequently Asked Questions Search ● NWS ○ ALL NOAA Go

Get Local Forecast for:
Enter location... GO
Search Help
Text only version

Current Warnings
RSS XML
...local or USA
Mt St. Helens
NOAA Watch
Tsunami Info

Current Conditions
RSS XML
Observations
Obs Maps...
State | Pgt Sound
Satellite
Radar KML
AHPS: Rivers/Lks
Air Quality...
WA | OR | CA

Forecasts
Wrn Wa Zone Fcst
Fcst Discussion...
Text | Graphical
Public Text Fcsts
Aviation
Marine
Fire Weather
Activity Planner
Mountains
Hydrology
Model Forecasts
GIS Shapefiles
Canada / Int'l

Experimental...
Digital / Gridded
Wx Point Matrix:
Marine /Fire Wx
Precip Estimates

Climate/Historical
Local
National
NowData
More...

Weather Safety
Weather Radio
Safety Info
StormReady

Outreach
Educational
Spotters
NWS Info Center
COOP Observer
CoCoRaHS

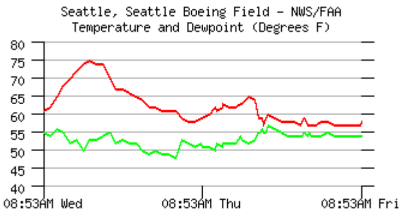
Reports
Recent Records
Local Storm Report
Public Information

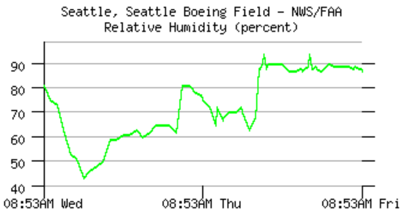
Miscellaneous
SEW webcam
Products and
Services Guide

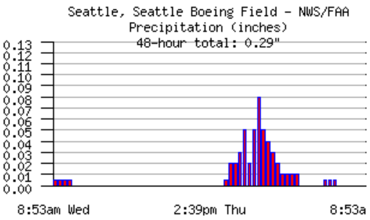
Contact Us
FAQ
Webmaster E-mail

USA.gov

Show 7 Days Printable Version Show Raw Observations For Information Regarding the Accuracy of This Data: MesoWest Disclaimer







Weather Conditions for:

Seattle, Seattle Boeing Field, WA (KBFI)

Elev: 16 ft; Latitude: 47.54583; Longitude: -122.31361

Current time: Fri, 14 Aug 9:51 am (PDT)
Most Recent Observation: Fri, 14 Aug 8:53 am (PDT)

Time (PDT)	Temp. (f)	Dew Point (f)	Relative Humidity (%)	Wind Direction	Wind Speed (mph)	Visibility (miles)	WX	Clouds	Sea Level Pressure (mb)	Altimeter Setting (inches)	Station Pressure (inches)	Precip 1 hour (inches)	Precip 3 hour (inches)	Precip 6 hour (inches)	Precip 24 hour (inches)	6 Hr Max Temp	6 Hr Min Temp	24 Hr Max Temp	24 Hr Min Temp	Quality Control
14 Aug 8:53 am	58	54	87	S	3	10.00		SCT013 **BKN029** OVC044	1020.7	30.14	30.131									OK
14 Aug 8:51 am	57	54	88	VRBL	5	10.00		FEW013 **BKN029** OVC044		30.14	30.131									OK
14 Aug 8:34 am	57	54	88	VRBL	5	10.00		FEW010 **BKN030** OVC044		30.14	30.131									OK
14 Aug 7:53 am	57	54	89	SSW	5	9.00		SCT008 **OVC018**	1020.4	30.13	30.121									OK
14 Aug 7:47 am	57	54	88	SSW	3	9.00		SCT008 **OVC018**		30.13	30.121									OK
14 Aug 6:53 am	57	54	89	CALM		8.00		**BKN008** BKN015	1019.9	30.12	30.111									OK
14 Aug 5:53 am	57	54	89	VRBL	3	10.00		**BKN008** BKN015 OVC028	1019.4	30.10	30.091									OK
14 Aug 4:53 am	57	54	89	VRBL	5	9.00		FEW008 **OVC015**	1019.1	30.10	30.091	**T**			**0.29**	59	57			OK
14 Aug 3:53 am	58	55	90	E	3	7.00	**-RA**	**BKN013** BKN018 OVC049	1019.3	30.10	30.091	**T**								OK
14 Aug 2:53 am	58	54	87	SE	6	10.00		FEW011 **BKN018** OVC025	1019.1	30.10	30.091	**T**								OK
14 Aug 2:05 am	57	54	88	SE	5	10.00		**BKN012** BKN018 OVC055		30.10	30.091									OK
14 Aug 1:53 am	57	54	89	SSE	5	10.00		FEW014 **BKN055** OVC070	1019.1	30.10	30.091		**0.02**							OK
14 Aug 1:30 am	57	54	88	ESE	5	10.00		**OVC016**		30.10	30.091									OK
14 Aug 1:23 am	57	54	88	SE	5	10.00		**OVC014**		30.09	30.081									OK
14 Aug 12:58 am	57	55	94	ESE	6	10.00		SCT008 **OVC016**		30.10	30.091									OK
14 Aug 12:53 am	57	54	89	SE	5	10.00		**BKN010** OVC016	1019.1	30.10	30.091	**0.01**								OK
14 Aug 12:15 am	59	55	88	CALM		10.00		**BKN012** OVC018		30.10	30.091	**0.01**								OK
13 Aug 11:53 pm	58	54	87	CALM		10.00		**BKN015** OVC100	1019.1	30.10	30.091	**0.01**								OK
13 Aug 11:46 pm	57	54	88	CALM		10.00		**BKN015** OVC100		30.10	30.091	**0.01**								OK
13 Aug 10:53 pm	58	54	87	CALM		10.00		**OVC080**	1019.2	30.10	30.091	**0.02**		**0.27**		64	58			OK
13 Aug 9:53 pm	58	54	87	CALM		10.00		SCT085	1019.2	30.10	30.091	**0.03**								OK
13 Aug 8:53 pm	58	55	90	CALM		9.00		**BKN075** BKN090	1019.0	30.10	30.091	**0.04**								OK
13 Aug 7:53 pm	59	56	90	W	3	8.00		SCT100	1018.8	30.09	30.081	**0.05**	**0.18**							OK
13 Aug 6:53 pm	60	57	90	NE	3	**4.00**	**-RA BR**	FEW030	1018.0	30.06	30.051	**0.08**								OK
13 Aug 6:25 pm	59	55	88	NE	5	**4.00**	**-RA BR**	**BKN033** OVC070		30.07	30.061	**0.05**								OK
13 Aug 6:05 pm	57	55	94	NE	5	**4.00**	**-RA BR**	**OVC021**		30.07	30.061	**0.02**								OK
13 Aug 5:53 pm	59	56	90	N	3	**4.00**	**-TSRA BR**	**OVC023**	1018.6	30.08	30.071	**0.05**								OK
13 Aug 5:39 pm	59	55	88	NNW	7	**4.00**	**-TSRA BR**	**BKN023** BKN046 OVC055		30.09	30.081	**0.03**								OK
13 Aug 5:34 pm	59	55	88	NNW	8	**4.00**	**+RA BR**	SCT025 **BKN046** OVC055		30.08	30.071	**0.02**								OK
13 Aug 5:27 pm	59	55	88	N	7	**1.75**	**RA BR**	FEW027 SCT034 **OVC060**		30.08	30.071	**0.02**								OK
13 Aug 4:53 pm	64	53	68	NNW	5	7.00	**-RA**	**BKN060** OVC080	1018.5	30.08	30.071	**T**				66	61			OK
13 Aug 3:53 pm	65	52	63	SE	5	10.00		SCT028 SCT046 **BKN060**	1018.6	30.08	30.071									OK
13 Aug 2:53 pm	63	53	70	SSE	6	10.00		FEW023 **OVC030**	1019.0	30.09	30.081									OK
13 Aug 2:39 pm	63	54	72	VRBL	5	10.00		FEW023 **OVC030**		30.10	30.091									OK
13 Aug 1:53 pm	62	52	70	VRBL	5	10.00		**OVC025**	1019.3	30.10	30.091									OK
13 Aug 12:53 pm	62	52	70	SSE	8	10.00		SCT019 **BKN027** OVC060	1019.3	30.10	30.091									OK
13 Aug 12:00 pm	63	52	68	VRBL	5	10.00		**BKN031** BKN040 OVC050		30.10	30.091									OK
13 Aug 11:53 am	62	51	67	CALM		10.00		**BKN027** OVC049	1019.4	30.11	30.101									OK
13 Aug 11:00 am	61	52	72	W	7	10.00		**BKN027** OVC049		30.10	30.091									OK
13 Aug 10:53 am	62	50	65	VRBL	7	10.00		SCT019 **OVC045**	1019.2	30.10	30.091					62	58			OK
13 Aug 9:53 am	60	51	72	S	3	10.00		SCT019 **OVC049**	1018.8	30.09	30.081									OK
13 Aug 8:53 am	59	51	75	VRBL	6	10.00		SCT019 **OVC049**	1018.9	30.09	30.081									OK
13 Aug 8:44 am	59	52	77	SE	7	10.00		SCT019 **OVC049**		30.09	30.081									OK
13 Aug 7:53 am	58	51	78	SSE	7	10.00		**BKN017** OVC046	1018.8	30.09	30.081									OK
13 Aug 6:53 am	58	52	81	S	6	10.00		**BKN015** OVC040	1018.6	30.08	30.071									OK
13 Aug 5:53 am	59	53	81	SSE	6	10.00		SCT018 **OVC048**	1018.1	30.07	30.061									OK
13 Aug 4:53 am	61	48	62	ENE	3	10.00		**OVC048**	1018.0	30.06	30.051				**0.02**	65	60			OK
13 Aug 3:53 am	61	49	65	E	6	10.00		**OVC044**	1018.0	30.07	30.061									OK
13 Aug 2:53 am	61	49	65	ENE	6	10.00		**OVC046**	1018.0	30.06	30.051									OK
13 Aug 1:53 am	62	50	65	ENE	3	10.00		**OVC044**	1018.1	30.07	30.061									OK
13 Aug 12:53 am	62	49	62	CALM		10.00		**OVC042**	1018.2	30.07	30.061							76	60	OK
12 Aug 11:53 pm	64	50	60	E	6	10.00		**BKN040**	1018.0	30.06	30.051									OK
12 Aug 10:53 pm	65	52	63	VRBL	3	10.00		**OVC036**	1017.9	30.06	30.051					75	65			OK
12 Aug 9:53 pm	66	52	61	CALM		10.00		**OVC034**	1017.7	30.05	30.041									OK
12 Aug 8:53 pm	67	53	61	VRBL	3	10.00		**BKN070**	1017.5	30.05	30.041									OK
12 Aug 7:53 pm	67	52	59	VRBL	6	10.00		**BKN040** BKN090	1017.1	30.04	30.032									OK
12 Aug 6:53 pm	70	55	59	NW	8	10.00		**BKN049** OVC075	1016.9	30.03	30.022									OK
12 Aug 5:53 pm	74	54	50	NW	7	10.00		CLR	1016.8	30.03	30.022									OK
12 Aug 4:53 pm	74	53	48	CALM		10.00		FEW048 SCT080	1017.0	30.03	30.022			**T**		76	65			OK
12 Aug 3:53 pm	75	53	46	VRBL	3	10.00		SCT075	1017.4	30.04	30.032									OK
12 Aug 2:53 pm	74	50	43	VRBL	6	10.00		SCT020 **BKN080**	1017.7	30.05	30.041									OK
12 Aug 1:53 pm	72	53	51	VRBL	3	10.00		**BKN020** BKN080	1017.7	30.06	30.051		**T**							OK
12 Aug 12:53 pm	70	52	53	CALM		10.00		**BKN080**	1017.9	30.06	30.051									OK
12 Aug 11:53 am	68	55	63	WSW	5	10.00		**BKN080**	1018.1	30.07	30.061	**T**								OK
12 Aug 10:53 am	65	56	73	CALM		10.00		FEW015 **BKN055** OVC070	1017.9	30.06	30.051	**T**				65	60			OK
12 Aug 9:53 am	62	54	75	CALM		10.00	**-RA**	**BKN065** OVC080	1017.8	30.06	30.051	**T**								OK

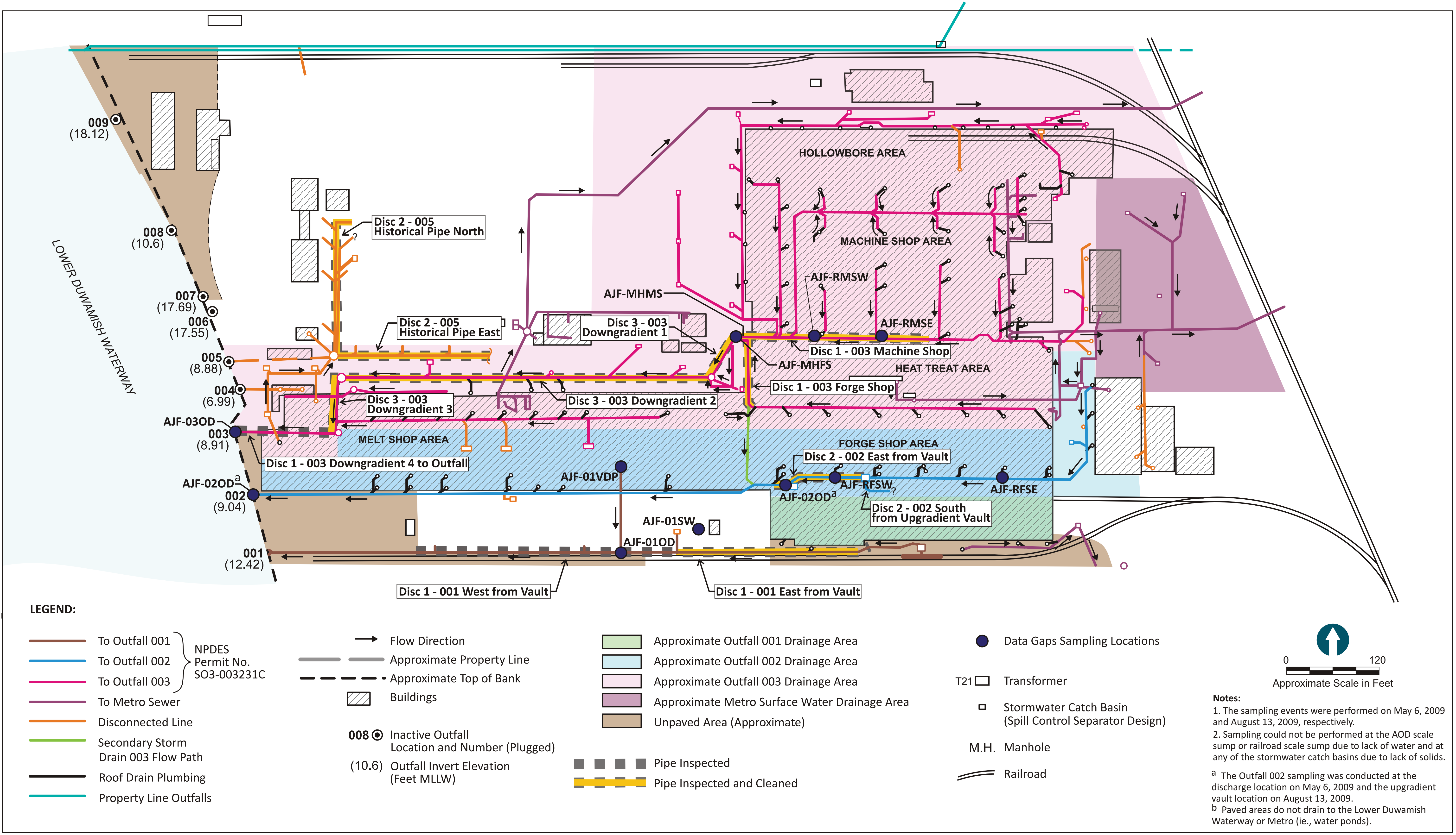
Webmaster
US Dept of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Seattle Weather Forecast Office
7600 Sandpoint Way NE
Seattle, Washington 98115-6349

Tel: (206) 526-6087

Disclaimer
Information Quality
Credits
Glossary

Privacy Policy
Freedom of Information Act
About Us
Career Opportunities

APPENDIX G
INSPECTION REPORTS AND VIDEOS (ON DVD)



Notes:
1. The sampling events were performed on May 6, 2009 and August 13, 2009, respectively.
2. Sampling could not be performed at the AOD scale sump or railroad scale sump due to lack of water and at any of the stormwater catch basins due to lack of solids.

[a] The Outfall 002 sampling was conducted at the discharge location on May 6, 2009 and the upgradient vault location on August 13, 2009.

[b] Paved areas do not drain to the Lower Duwamish Waterway or Metro (ie., water ponds).

12/15/2009 cdavidson K:\Jobs\010128-JORGENSEN_FORGE\01012801\01012802-RP-006.cdr

ANCHOR QEA

FARALLON CONSULTING

Appendix Figure 1
Stormwater System Video Key
Jorgensen Forge Facility

Tabular Report of PLR 005EM X for Anchor

Work Order
Contract
Video
Setup 10
Facility
Operator Jayme Keith
Van Ref 9
Surveyed On 09/11/2009

Street Name
City Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things
Weather Dry

Pipe Use Storm
Shape Circular
Material Concrete
Lining

Sched length 211.7 **Ft**
Size 14 **by** 14 **ins**
Joint Spacing **Ft**
Year laid

From 005HLE
Depth 8.60 **Ft**
To 005EM
Depth 5.00 **Ft**
Direction Up
Pre-clean Y
Last Cleaned 9/9/2009

Structural Service Constructional
Miscellaneous Hydraulic

General note
Location note

Video	Count	CD	Code		Sev	Fr	To	Value	Remarks
	0.0		ST	Start of Survey					
	0.0		MH	Manhole/Node					005HLE
	0.0		WL	Water level				1	
	43.9		LO	Lateral or connection exists OK		10			LATERAL CONNECTION OK
	99.4		LO	Lateral or connection exists OK		10			LATERAL CONNECTION OK
	163.4		LO	Lateral or connection exists OK		10			LATERAL CONNECTION OK
	169.6		GC	General Comment					PIPE SIZE CHANGES FROM 10" T...
	211.7		DE	Debris (Not grease or silt)	L	12			DEBRIS FULL IN PIPE 100%
	211.7		GC	General Comment					CAN NOT CONTINUE INSPECTION D...
	211.7		MH	Manhole/Node					005EM
	211.7		FH	Finish of Surveys					END OF INSPECTION

211.7 **Ft** **Total Length Surveyed**

Scores

Structural:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0
Service:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0

Pipe Graphic Report of PLR 005EM X for Anchor

Work Order **Contract** **Video** **Setup** 10
Facility **Operator** Jayme Keith **Van Ref** 9 **Surveyed On** 09/11/2009

Street Name **City** Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things **Weather** Dry

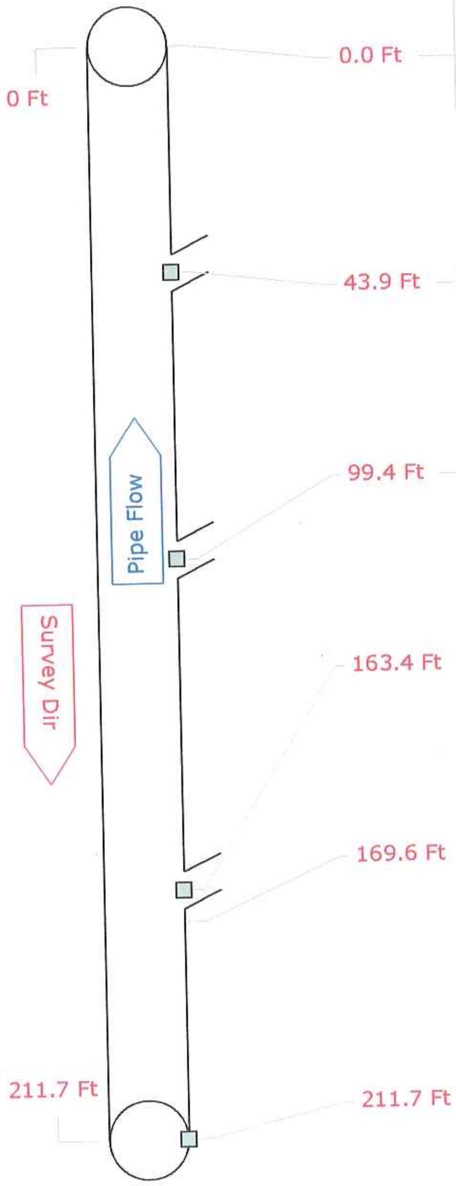
Pipe Use Storm
Shape Circular
Material Concrete
Lining

Schedule length 211.7 Ft
Size 14 **by** 14 ins
Joint spacing Ft
Year laid

From 005HLE **Depth** 8.60 Ft
To 005EM **Depth** 5.00 Ft
Direction Upstream
Pre-clean Y **Last cleaned** 9/9/2009

General note
Location note

Structural Service Constructional
Miscellaneous Hydraulic



0.0 Ft
Start of Survey
Manhole/Node [005HLE]
Water level 1

43.9 Ft
Lateral or connection exists OK 10 o'clock [LATERAL CONNECTION OK]

99.4 Ft
Lateral or connection exists OK 10 o'clock [LATERAL CONNECTION OK]

163.4 Ft
Lateral or connection exists OK 10 o'clock [LATERAL CONNECTION OK]

169.6 Ft
General Comment [PIPE SIZE CHANGES FROM 10" TO APPX 8"]

211.7 Ft
Debris (Not grease or silt) 12 o'clock [DEBRIS FULL IN PIPE 100%]
General Comment [CAN NOT CONTINUE INSPECTION DUE TO DEBRIS IN PIPE]
Manhole/Node [005EM]
Finish of Surveys [END OF INSPECTION]

Tabular Report of PLR 005HL X for Anchor

Work Order
Contract
Video
Setup 13
Facility
Operator Jayme Keith
Van Ref 9
Surveyed On 09/11/2009

Street Name
City Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things
Weather Dry

Pipe Use Storm
Shape Circular
Material Concrete
Lining

Sched length 204.0 **Ft**
Size 12 **by** 12 **ins**
Joint Spacing **Ft**
Year laid

From 005N **Depth** 8.60 **Ft**
To 005HL **Depth** 5.00 **Ft**
Direction Up
Pre-clean Y **Last Cleaned** 9/9/2009

Structural Service Constructional
Miscellaneous Hydraulic

General note
Location note

Video	Count	CD	Code	Sev	Fr	To	Value	Remarks
	0.0		ST Start of Survey					
	0.0		MH Manhole/Node					005N
	0.0		WL Water level				0	
	14.2		LO Lateral or connection exists OK		11			LATERAL CONNECTION OK
	111.2		LO Lateral or connection exists OK		10			LATERAL CONNECTION OK
	111.2		GC General Comment					CHANGE IN PIPE DIAMETER FROM ...
	113.7		LO Lateral or connection exists OK		03			LATERAL CONNECTION OK
	150.8		LO Lateral or connection exists OK		11			LATERAL CONNECTION OK
	191.9		LO Lateral or connection exists OK		09			LATERAL CONNECTION OK
	204.0		LO Lateral or connection exists OK		02			MAINLINE BENDS RIGHT TO EAST.
	204.0		GC General Comment					END OF INSPECTION DUE TO BEND...
	204.0		MH Manhole/Node					005HL
	204.0		FH Finish of Surveys					END OF INSPECTION

204.0 **Ft** **Total Length Surveyed**

Scores

Structural:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0
Service:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0

Pipe Graphic Report of PLR 005HL X for Anchor

Work Order **Contract** **Video** **Setup** 13
Facility **Operator** Jayme Keith **Van Ref** 9 **Surveyed On** 09/11/2009

Street Name **City** Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things **Weather** Dry

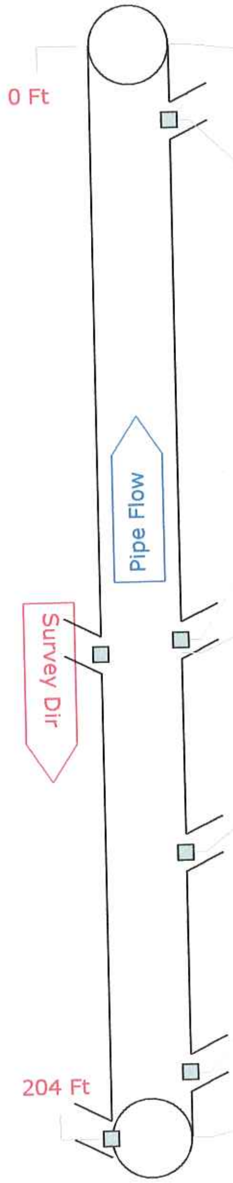
Pipe Use Storm
Shape Circular
Material Concrete
Lining

Schedule length 204.0 Ft
Size 12 **by** 12 ins
Joint spacing Ft
Year laid

From 005N **Depth** 8.60 Ft
To 005HL **Depth** 5.00 Ft
Direction Upstream
Pre-clean Y **Last cleaned** 9/9/2009

General note
Location note

Structural Service Constructional
Miscellaneous Hydraulic



0.0 Ft	Start of Survey Manhole/Node [005N] Water level 0
14.2 Ft	Lateral or connection exists OK 11 o'clock [LATERAL CONNECTION OK]
111.2 Ft	Lateral or connection exists OK 10 o'clock [LATERAL CONNECTION OK] General Comment [CHANGE IN PIPE DIAMETER FROM 10" TO APPX 8"]
113.7 Ft	Lateral or connection exists OK 03 o'clock [LATERAL CONNECTION OK]
150.8 Ft	Lateral or connection exists OK 11 o'clock [LATERAL CONNECTION OK]
191.9 Ft	Lateral or connection exists OK 09 o'clock [LATERAL CONNECTION OK]
204.0 Ft	Lateral or connection exists OK 02 o'clock [MAINLINE BENDS RIGHT TO EAST.] General Comment [END OF INSPECTION DUE TO BEND IN PIPE] Manhole/Node [005HL] Finish of Surveys [END OF INSPECTION]

Tabular Report of PLR CB001 D **for** **Anchor**

Work Order **Contract** **Video** **Setup** 10

Facility **Operator** Jayme Keith **Van Ref** 9 **Surveyed On** 09/01/2009

Street Name 8531 E Marginal Way **City** Jorgenson Steel

Location type Building, industrial and commercial or railways, watercourse, other di

Surface Concrete road

Survey purpose Random survey of pipes and things **Weather** Dry

Pipe Use Storm **Sched length** 156.5 **Ft** **From** 0001ESB **Depth** 3.00 **Ft**

Shape Circular **Size** 6 **by** 6 **ins** **To** CB001 **Depth** 3.50 **Ft**

Material Polyvinyl chloride **Joint Spacing** **Ft** **Direction** Up

Lining **Year laid** **Pre-clean** Y **Last Cleaned** 9/1/2009

General note center vault of outfall 001 east to east side of b

Location note

Structural Service Constructional

Miscellaneous Hydraulic

Video	**Count**	**CD**	**Code**		**Sev**	**Fr**	**To**	**Value**	**Remarks**
	0.0		ST	Start of Survey					
	0.0		MH	Manhole/Node					CB001
	0.0		WL	Water level				0	
	6.0		LO	Lateral or connection exists OK		11			lateral connection ok footing...
	36.1		LO	Lateral or connection exists OK		11			lateral connection ok footing...
	65.6		LO	Lateral or connection exists OK		11			lateral connection ok footing...
	95.8		LO	Lateral or connection exists OK		11			lateral connection ok footing...
	125.4		LO	Lateral or connection exists OK		11			lateral connection ok footing...
	155.2		LO	Lateral or connection exists OK		11			lateral connection ok footing...
	158.2		MH	Manhole/Node					0001ESB
	158.2		FH	Finish of Surveys					end of insp. bend in pipe
	158.3		GC	General Comment					end of inspection, bend in pi...

158.3 **Ft** **Total Length Surveyed**

Scores

Structural:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0
Service:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0

Pipe Graphic Report of PLR CB001 D **for** Anchor

Work Order **Contract** **Video** **Setup** 10
Facility **Operator** Jayme Keith **Van Ref** 9 **Surveyed On** 09/01/2009

Street Name 8531 E Marginal Way **City** Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things **Weather** Dry

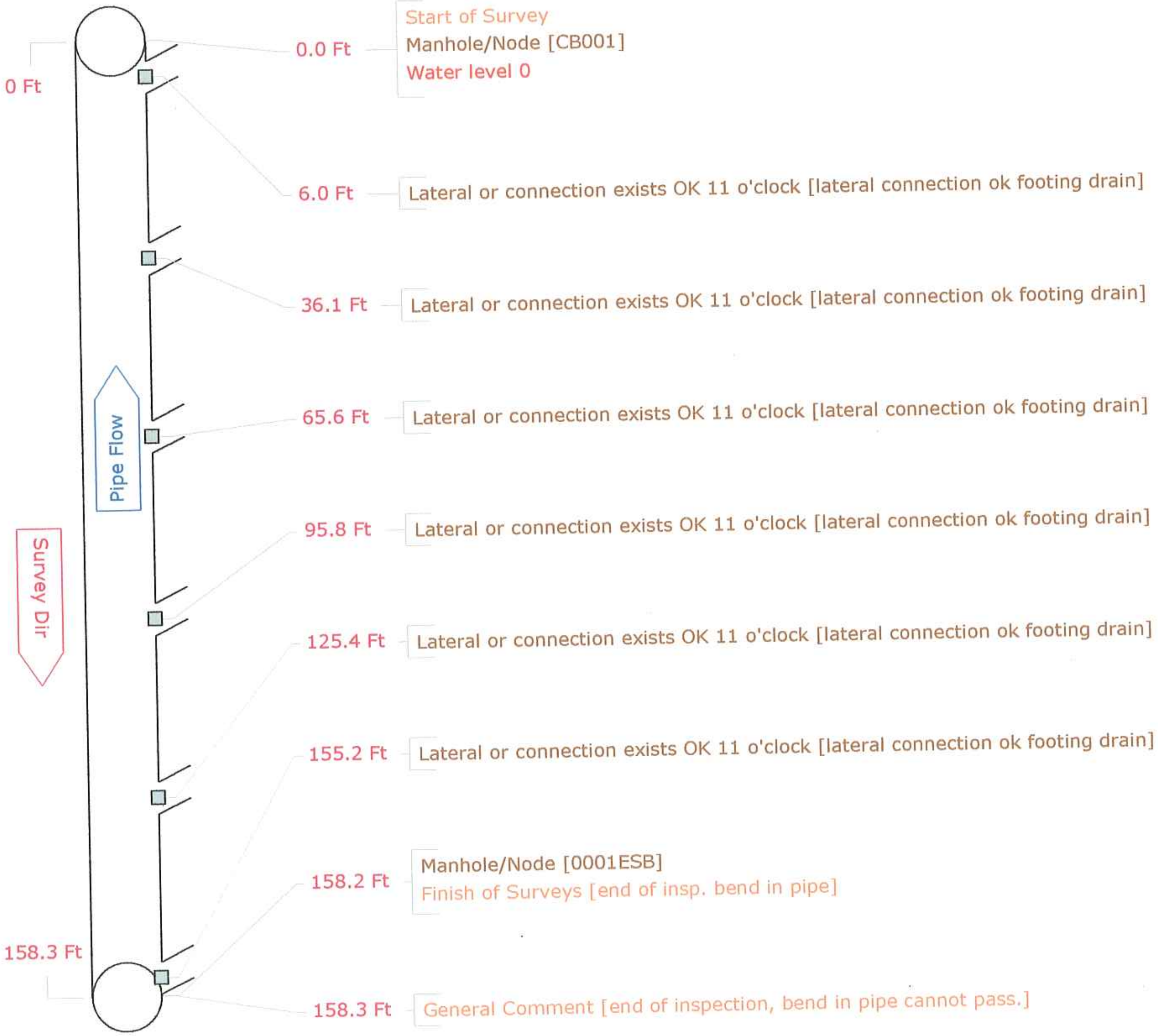
Pipe Use Storm
Shape Circular
Material Polyvinyl chloride
Lining

Schedule length 156.5 Ft
Size 6 **by** 6 ins
Joint spacing Ft
Year laid

From 0001ESB **Depth** 3.00 Ft
To CB001 **Depth** 3.50 Ft
Direction Upstream
Pre-clean Y **Last cleaned** 9/1/2009

General note center vault of outfall 001 east to east side of b
Location note

Structural Service Constructional
Miscellaneous Hydraulic



0.0 Ft Start of Survey
Manhole/Node [CB001]
Water level 0

6.0 Ft Lateral or connection exists OK 11 o'clock [lateral connection ok footing drain]

36.1 Ft Lateral or connection exists OK 11 o'clock [lateral connection ok footing drain]

65.6 Ft Lateral or connection exists OK 11 o'clock [lateral connection ok footing drain]

95.8 Ft Lateral or connection exists OK 11 o'clock [lateral connection ok footing drain]

125.4 Ft Lateral or connection exists OK 11 o'clock [lateral connection ok footing drain]

155.2 Ft Lateral or connection exists OK 11 o'clock [lateral connection ok footing drain]

158.2 Ft Manhole/Node [0001ESB]
Finish of Surveys [end of insp. bend in pipe]

158.3 Ft General Comment [end of inspection, bend in pipe cannot pass.]

PipeLogix Inc.
Phone: 866-299-3150
Fax: 760-406-6023

Tabular Report of PLR CV001 X for Anchor

Work Order **Contract** **Video** **Setup** 2

Facility **Operator** Jayme Keith **Van Ref** 9 **Surveyed On** 09/01/2009

Street Name 8531 E Marginal Way **City** Jorgenson Steel

Location type Building, industrial and commercial or railways, watercourse, other di

Surface Concrete road

Survey purpose Random survey of pipes and things **Weather** Dry

Pipe Use Storm **Sched length** 188.0 Ft **From** CV001 **Depth** 5.00 Ft

Shape Circular **Size** 12 **by** 12 **ins** **To** WOF001 **Depth** 8.00 Ft

Material Concrete **Joint Spacing** Ft **Direction** Down

Lining **Year laid** **Pre-clean** Y **Last Cleaned** 9/1/2009

General note center vault of outfall 001 west to outfall

Location note

Structural Service Constructional

Miscellaneous Hydraulic

Video	Count	CD	Code		Sev	Fr	To	Value	Remarks
	0.0		ST	Start of Survey					
	0.0		MH	Manhole/Node					CV001
	0.0		WL	Water level				1	
	6.2		FMJ	Fractures multiple at joint		09	05		multiple fractures
	12.4		CLJ	Crack longitudinal at joint		12	01		crack from join
	21.1		RJ	Roots at joint	S	01	02		root tap at j oint
	110.3		GC	General Comment					lateral connection at 12 in p...
	110.3		GC	General Comment					lateral conn at 16"depth gnd ...
	165.5		CLJ	Crack longitudinal at joint		07	03		multiple cracks at joint
	166.9		SE	Surface erosion	S	06	05		
	168.3		FMJ	Fractures multiple at joint		12	12		medium fractures steming from...
	188.0		LO	Lateral or connection exists OK		12			lateral connection ok
	188.0		DE	Debris (Not grease or silt)	M	05			debris in pipe can not contin...
	188.0		MH	Manhole/Node					WOF001
	188.0		FH	Finish of Surveys					

188.0 Ft **Total Length Surveyed**

Scores

Structural:	**Total** 30	**Mean Defect** 6	**Peak** 30	**Mean Pipe** 0.2
Service:	**Total** 30	**Mean Defect** 10	**Peak** 25	**Mean Pipe** 0.2

323.5

PipeLogix Inc.
Phone: 866-299-3150
Fax: 760-406-6023

Pipe Graphic Report of PLR CV001 X for Anchor

Work Order
Contract
Video
Setup 2
Facility
Operator Jayme Keith
Van Ref 9
Surveyed On 09/01/2009

Street Name 8531 E Marginal Way
City Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things
Weather Dry

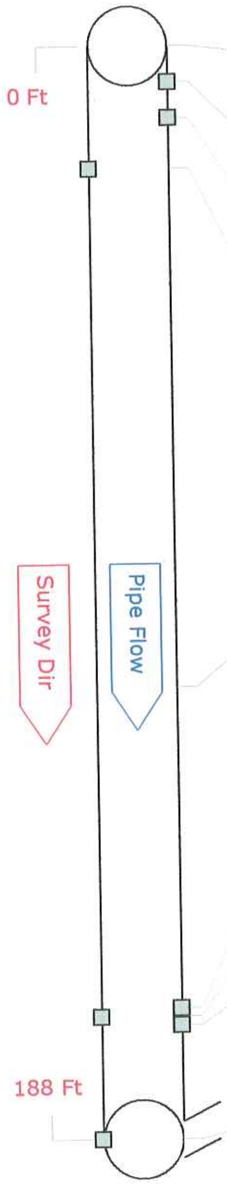
Pipe Use Storm
Shape Circular
Material Concrete
Lining

Schedule length 188.0 Ft
Size 12 **by** 12 ins
Joint spacing Ft
Year laid

From CV001 **Depth** 5.00 Ft
To WOF001 **Depth** 8.00 Ft
Direction Downstream
Pre-clean Y **Last cleaned** 9/1/2009

General note center vault of outfall 001 west to outfall
Location note

Structural Service Constructional
Miscellaneous Hydraulic



0.0 Ft
Start of Survey
Manhole/Node [CV001]
Water level 1

6.2 Ft
Fractures multiple at joint 09 to 05 o'clock [multiple fractures]

12.4 Ft
Crack longitudinal at joint 12 to 01 o'clock [crack from join]

21.1 Ft
Roots at joint 01 to 02 o'clock [root tap at j oint]

110.3 Ft
General Comment [lateral connection at 12 in pipe with root intrusion]
General Comment [lateral conn at 16"depth gnd to bottom of inside pipe]

165.5 Ft
Crack longitudinal at joint 07 to 03 o'clock [multiple cracks at joint]

166.9 Ft
Surface erosion 06 to 05 o'clock

168.3 Ft
Fractures multiple at joint 12 to 12 o'clock [medium fractures steming from joint.]

188.0 Ft
Lateral or connection exists OK 12 o'clock [lateral connection ok]
Debris (Not grease or silt) 05 o'clock [debris in pipe can not continue end inspection]
Manhole/Node [WOF001]
Finish of Surveys

PipeLogix Inc.
Phone: 866-299-3150
Fax: 760-406-6023

Tabular Report of PLR 002ESB D for Anchor

Work Order
Contract
Video
Setup 12
Facility
Operator Jayme Keith
Van Ref 9
Surveyed On 09/01/2009

Street Name 8531 E Marginal Way
City Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things
Weather Dry

Pipe Use Storm
Shape Circular
Material Concrete
Lining

Sched length 80.6 **Ft**
Size 8 **by** 8 **ins**
Joint Spacing **Ft**
Year laid

From 002CV
Depth 6.00 **Ft**
To 002ESB
Depth 3.00 **Ft**
Direction Up
Pre-clean Y
Last Cleaned 9/1/2009

General note center vault of outfall 001 east to east side of b
Location note

Structural Service Constructional
Miscellaneous Hydraulic

Video	Count	CD	Code		Sev	Fr	To	Value	Remarks
	0.0		ST	Start of Survey					
	0.0		MH	Manhole/Node					002CV
	0.0		WL	Water level				0	
	18.9		GC	General Comment					10 to 2 possible fracture/hol...
	20.6		WL	Water level				0015	water level to 15 percent of ...
	59.3		LO	Lateral or connection exists OK		12			lateral connection ok
	80.6		GC	General Comment					end of inspection, unknown ca...
	80.6		MH	Manhole/Node					cb unknown
	80.6		FH	Finish of Surveys					end of inspection due to unkn...

80.6 Ft **Total Length Surveyed**

Scores

Structural:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0
Service:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0

Pipe Graphic Report of PLR 002ESB D **for** Anchor

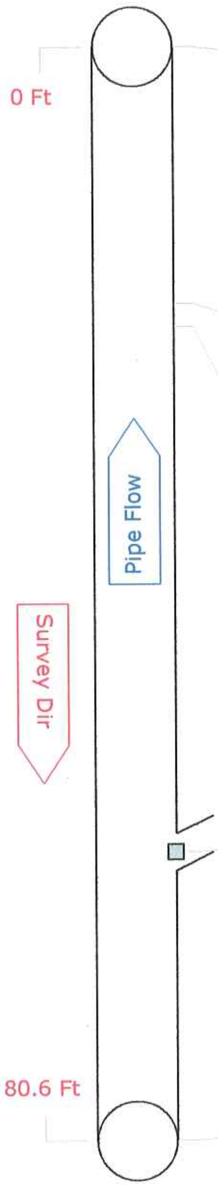
Work Order		**Contract**		**Video**		**Setup**	12
Facility		**Operator**	Jayme Keith	**Van Ref**	9	**Surveyed On**	09/01/2009

Street Name 8531 E Marginal Way **City** Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things **Weather** Dry

Pipe Use	Storm	**Schedule length**	80.6 Ft	**From**	002CV	**Depth**	6.00 Ft
Shape	Circular	**Size**	8 **by** 8 ins	**To**	002ESB	**Depth**	3.00 Ft
Material	Concrete	**Joint spacing**	Ft	**Direction**	Upstream		
Lining		**Year laid**		**Pre-clean**	Y	**Last cleaned**	9/1/2009

General note center vault of outfall 001 east to east side of b
Location note

Structural Service Constructional
Miscellaneous Hydraulic



0.0 Ft
Start of Survey
Manhole/Node [002CV]
Water level 0

18.9 Ft
General Comment [10 to 2 possible fracture/hole at joint, possible water intrusion]

20.6 Ft
Water level 0015 [water level to 15 percent of pipe]

59.3 Ft
Lateral or connection exists OK 12 o'clock [lateral connection ok]

80.6 Ft
General Comment [end of inspection, unknown catch basin]
Manhole/Node [cb unknown]
Finish of Surveys [end of inspection due to unknown catch basin]

PIPELOGIX INC

PipeLogix Inc.
Phone: 866-299-3150
Fax: 760-406-6023

Tabular Report of PLR 002MCBE X **for Anchor**

Work Order
Contract
Video
Setup 9
Facility
Operator Jayme Keith
Van Ref 9
Surveyed On 09/11/2009

Street Name
City Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things
Weather Dry

Pipe Use Storm
Shape Circular
Material Concrete
Lining
Sched length 5.4 **Ft**
Size 6 **by** 6 **ins**
Joint Spacing **Ft**
Year laid
From 002MCBE **Depth** 6.20 **Ft**
To 002CV **Depth** 5.60 **Ft**
Direction Down
Pre-clean Y **Last Cleaned** 9/9/2009

General note
Location note

Structural Service Constructional
Miscellaneous Hydraulic

Video	Count	CD	Code	Sev	Fr	To	Value	Remarks
	0.0		ST Start of Survey					
	0.0		MH Manhole/Node					002MCBE
	0.0		WL Water level				0	
	5.4		DE Debris (Not grease or silt)	L	12			pipe full of debris
	5.4		LO Lateral or connection exists OK		09			lateral connection ok
	5.4		MH Manhole/Node					002MCBE
	5.4		FH Finish of Surveys					end of inspection

5.4 **Ft** **Total Length Surveyed**

Scores

Structural:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0
Service:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0

Pipe Graphic Report of PLR 002MCBE X for Anchor

Work Order **Contract** **Video** **Setup** 9
Facility **Operator** Jayme Keith **Van Ref** 9 **Surveyed On** 09/11/2009

Street Name **City** Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things **Weather** Dry

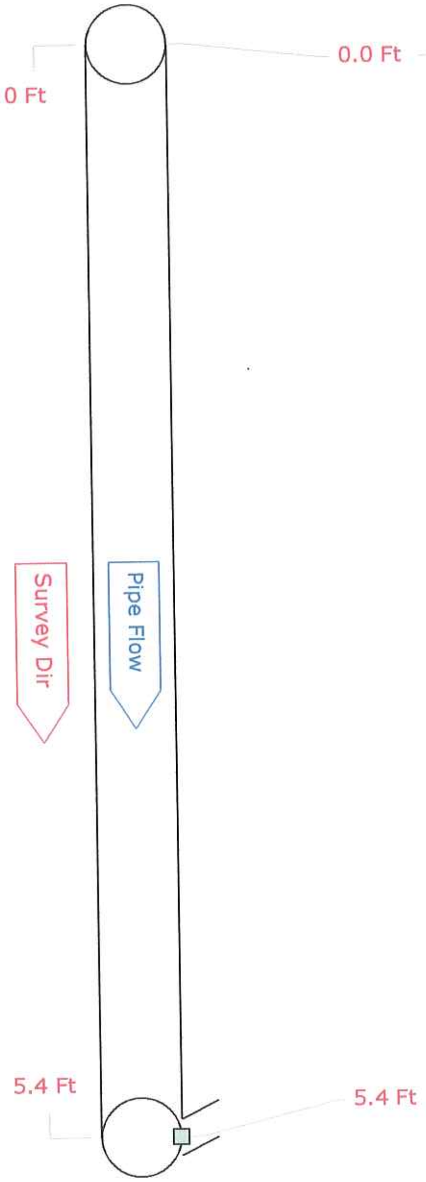
Pipe Use Storm
Shape Circular
Material Concrete
Lining

Schedule length 5.4 Ft
Size 6 **by** 6 ins
Joint spacing Ft
Year laid

From 002MCBE **Depth** 6.20 Ft
To 002CV **Depth** 5.60 Ft
Direction Downstream
Pre-clean Y **Last cleaned** 9/9/2009

General note
Location note

Structural Service Constructional
Miscellaneous Hydraulic



Start of Survey
Manhole/Node [002MCBE]
Water level 0

Debris (Not grease or silt) 12 o'clock [pipe full of debris]
Lateral or connection exists OK 09 o'clock [lateral connection ok]
Manhole/Node [002MCBE]
Finish of Surveys [end of inspection]

Tabular Report of PLR MSMHSTARTX for Anchor

Work Order
Contract
Video
Setup 2
Facility
Operator Jayme Keith
Van Ref 9
Surveyed On 09/09/2009

Street Name
City Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things
Weather Dry

Pipe Use Storm
Shape Circular
Material Concrete
Lining

Sched length 55.4 **Ft**
Size 10 **by** 10 **ins**
Joint Spacing **Ft**
Year laid

From MSMHSTART **Depth** 6.80 **Ft**
To OF003 **Depth** 6.00 **Ft**
Direction Down
Pre-clean Y **Last Cleaned** 9/9/2009

Structural Service Constructional
Miscellaneous Hydraulic

General note
Location note

Video	Count	CD	Code		Sev	Fr	To	Value	Remarks
	0.0		ST	Start of Survey					
	0.0		MH	Manhole/Node					MSMHSTART
	0.0		WL	Water level				0	
	8.3		FM	Fractures multiple		01	06		CONTINUOUS MULTIPLE FRACTURES
	11.2		FC	Fracture circumferential		06	05		CIRC FRACTURE
	16.1		FM	Fractures multiple		06	05		MUTLIPLE FRACTURE CIRCUMFEREB...
	17.3		CJ	Corrosion	S	05	06		CORROSION AT BOTTOM OF PIPE W...
	27.8		FC	Fracture circumferential		06	06		
	33.8		FM	Fractures multiple		06	06		MULTIPLE FRACTURES BETWEEN JO...
	55.4		MH	Manhole/Node					OF003
	55.4		FH	Finish of Surveys					FINISH INSPECTION AT MH TO OU...

55.4 Ft **Total Length Surveyed**

Scores

Structural:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0
Service:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0

Pipe Graphic Report of PLR MSMHSTARTX for Anchor

Work Order **Contract** **Video** **Setup** 2
Facility **Operator** Jayme Keith **Van Ref** 9 **Surveyed On** 09/09/2009

Street Name **City** Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things **Weather** Dry

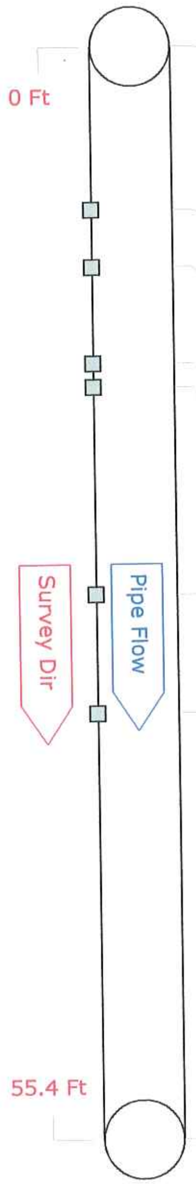
Pipe Use Storm
Shape Circular
Material Concrete
Lining

Schedule length 55.4 Ft
Size 10 **by** 10 ins
Joint spacing Ft
Year laid

From MSMHSTART **Depth** 6.80 Ft
To OF003 **Depth** 6.00 Ft
Direction Downstream
Pre-clean Y **Last cleaned** 9/9/2009

General note
Location note

Structural Service Constructional
Miscellaneous Hydraulic



0.0 Ft	Start of Survey Manhole/Node [MSMHSTART] Water level 0
8.3 Ft	Fractures multiple 01 to 06 o'clock [CONTINUOUS MULTIPLE FRACTURES]
11.2 Ft	Fracture circumferential 06 to 05 o'clock [CIRC FRACTURE]
16.1 Ft	Fractures multiple 06 to 05 o'clock [MUTLIPLE FRACTURE CIRCUMFEREBTUIaAL]
17.3 Ft	Corrosion 05 to 06 o'clock [CORROSION AT BOTTOM OF PIPE WITH CIRC FRACTURE]
27.8 Ft	Fracture circumferential 06 to 06 o'clock
33.8 Ft	Fractures multiple 06 to 06 o'clock [MULTIPLE FRACTURES BETWEEN JOINTS/ALL DIRECT
55.4 Ft	Manhole/Node [OF003] Finish of Surveys [FINISH INSPECTION AT MH TO OUTFALL003]

Tabular Report of PLR SDMH002 X **for Anchor**

Work Order **Contract** **Video** **Setup** 3

Facility **Operator** Jayme Keith **Van Ref** 9 **Surveyed On** 09/09/2009

Street Name **City** Jorgenson Steel

Location type Building, industrial and commercial or railways, watercourse, other di

Surface Concrete road

Survey purpose Random survey of pipes and things **Weather** Dry

Pipe Use Storm

Shape Circular

Material Concrete

Lining

Sched length 483.1 **Ft**

Size 10 **by** 10 **ins**

Joint Spacing **Ft**

Year laid

From SDMH002 **Depth** 6.80 **Ft**

To SDMH003 **Depth** 7.00 **Ft**

Direction Down

Pre-clean Y **Last Cleaned** 9/9/2009

Structural Service Constructional

Miscellaneous Hydraulic

General note

Location note

Video	Count	CD	Code		Sev	Fr	To	Value	Remarks
	0.0		ST	Start of Survey					
	0.0		MH	Manhole/Node					SDMH002
	0.0		WL	Water level				1	
	32.2		LO	Lateral or connection exists OK		12			LATERAL CONNECTION OK
	62.5		FLJ	Fracture longitudinal at joint		02	03		MULTIPLE FRACTURES LONGINTUDI...
	92.4		LO	Lateral or connection exists OK		12			LATERAL CONNECTION OK AT 12
	135.1		LO	Lateral or connection exists OK		12			LATERAL CONNECTION OK AT 12
	239.4		MH	Manhole/Node					SDMH003
	303.9		LO	Lateral or connection exists OK		11			LATERAL CONNECTION OK AT 11
	358.3		LO	Lateral or connection exists OK		12			LATERAL CONNECTION OK AT 12
	482.8		MH	Manhole/Node					SDMH003
	482.8		FH	Finish of Surveys					FINISH OF INSPECITON
	483.5		MH	Manhole/Node					SDMH AT COOLING TOWER
	483.5		GC	General Comment					END OF INSPECTION,

483.5 **Ft** **Total Length Surveyed**

Scores

Structural:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0
Service:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0

Pipe Graphic Report of PLR SDMH002 X for Anchor

Work Order		**Contract**		**Video**		**Setup**	3
Facility		**Operator**	Jayme Keith	**Van Ref**	9	**Surveyed On**	09/09/2009

Street Name **City** Jorgenson Steel

Location type Building, industrial and commercial or railways, watercourse, other di

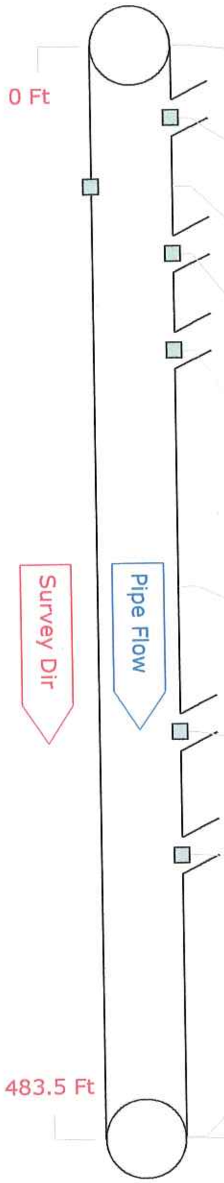
Surface Concrete road

Survey purpose Random survey of pipes and things **Weather** Dry

Pipe Use	Storm	**Schedule length**	483.1 Ft	**From**	SDMH002	**Depth**	6.80 Ft
Shape	Circular	**Size**	10 by 10 ins	**To**	SDMH003	**Depth**	7.00 Ft
Material	Concrete	**Joint spacing**	Ft	**Direction**	Downstream		
Lining		**Year laid**		**Pre-clean**	Y	**Last cleaned**	9/9/2009

General note Structural Service Constructional

Location note Miscellaneous Hydraulic



0.0 Ft	Start of Survey Manhole/Node [SDMH002] Water level 1
32.2 Ft	Lateral or connection exists OK 12 o'clock [LATERAL CONNECTION OK]
62.5 Ft	Fracture longitudinal at joint 02 to 03 o'clock [MULTIPLE FRACTURES LONGINTUDINAL CO
92.4 Ft	Lateral or connection exists OK 12 o'clock [LATERAL CONNECTION OK AT 12]
135.1 Ft	Lateral or connection exists OK 12 o'clock [LATERAL CONNECTION OK AT 12]
239.4 Ft	Manhole/Node [SDMH003]
303.9 Ft	Lateral or connection exists OK 11 o'clock [LATERAL CONNECTION OK AT 11]
358.3 Ft	Lateral or connection exists OK 12 o'clock [LATERAL CONNECTION OK AT 12]
482.8 Ft	Manhole/Node [SDMH003] Finish of Surveys [FINISH OF INSPECITON]
483.5 Ft	Manhole/Node [SDMH AT COOLING TOWER] General Comment [END OF INSPECTION,]

Tabular Report of PLR TOMSMH X for Anchor

Work Order
Contract
Video
Setup 7
Facility
Operator Jayme Keith
Van Ref 9
Surveyed On 09/09/2009

Street Name
City Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things
Weather Dry

Pipe Use Storm
Shape Circular
Material Concrete
Lining

Sched length 167.8 **Ft**
Size 10 **by** 10 **ins**
Joint Spacing **Ft**
Year laid

From MSMHEND01 **Depth** 6.80 **Ft**
To TOMSMH **Depth** 3.00 **Ft**
Direction Up
Pre-clean Y **Last Cleaned** 9/9/2009

General note
Location note

Structural Service Constructional
Miscellaneous Hydraulic

Video	Count	CD	Code		Sev	Fr	To	Value	Remarks
	0.0		ST	Start of Survey					
	0.0		MH	Manhole/Node					MSMHEND01
	0.0		WL	Water level				0	
	29.5		LO	Lateral or connection exists OK		01			lateral connection ok
	44.1		LO	Lateral or connection exists OK		09			lateral connection ok
	76.0		LO	Lateral or connection exists OK		12			lateral connection ok
	76.6		LO	Lateral or connection exists OK		09			lateral connection ok
	76.6		GC	General Comment					pipe size changes appx to 6-8...
	82.8		LO	Lateral or connection exists OK		02			lateral connection ok
	90.2		GC	General Comment					pipe material change to possi...
	97.6		LO	Lateral or connection exists OK		10			lateral connection ok
	167.3		LO	Lateral or connection exists OK		11			lateral connection ok
	167.8		MH	Manhole/Node					TOMSMH
	167.8		FH	Finish of Surveys					end of inspection
	168.3		GC	General Comment					Change in pipe size possible ...
	168.3		GC	General Comment					cannot continue inspection du...

168.3 Ft **Total Length Surveyed**

Scores

Structural:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0
Service:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0

PIPELOGIX INC

PipeLogix Inc.
Phone: 866-299-3150
Fax: 760-406-6023

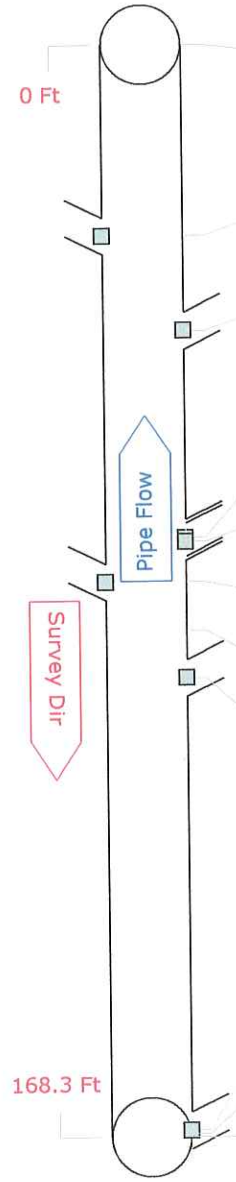
Pipe Graphic Report of PLR TOMSMH X **for** Anchor

Work Order **Contract** **Video** **Setup** 7
Facility **Operator** Jayme Keith **Van Ref** 9 **Surveyed On** 09/09/2009

Street Name **City** Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things **Weather** Dry

Pipe Use Storm	**Schedule length** 167.8 Ft	**From** MSMHEND01	**Depth** 6.80 Ft
Shape Circular	**Size** 10 **by** 10 ins	**To** TOMSMH	**Depth** 3.00 Ft
Material Concrete	**Joint spacing** Ft	**Direction** Upstream	
Lining	**Year laid**	**Pre-clean** Y	**Last cleaned** 9/9/2009

General note Structural Service Constructional
Location note Miscellaneous Hydraulic



0.0 Ft	Start of Survey Manhole/Node [MSMHEND01] Water level 0
29.5 Ft	Lateral or connection exists OK 01 o'clock [lateral connection ok]
44.1 Ft	Lateral or connection exists OK 09 o'clock [lateral connection ok]
76.0 Ft	Lateral or connection exists OK 12 o'clock [lateral connection ok]
76.6 Ft	Lateral or connection exists OK 09 o'clock [lateral connection ok] General Comment [pipe size changes appx to 6-8". same material concrete]
82.8 Ft	Lateral or connection exists OK 02 o'clock [lateral connection ok]
90.2 Ft	General Comment [pipe material change to possible DI]
97.6 Ft	Lateral or connection exists OK 10 o'clock [lateral connection ok]
167.3 Ft	Lateral or connection exists OK 11 o'clock [lateral connection ok]
167.8 Ft	Manhole/Node [TOMSMH] Finish of Surveys [end of inspection]
168.3 Ft	General Comment [Change in pipe size possible 4-6"] General Comment [cannot continue inspection due to pipe size]

Tabular Report of PLR MSMHEND01X for Anchor

Work Order
Contract
Video
Setup 6
Facility
Operator Jayme Keith
Van Ref 9
Surveyed On 09/09/2009

Street Name
City Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things
Weather Dry

Pipe Use Storm
Shape Circular
Material Concrete
Lining

Sched length 78.7 **Ft**
Size 10 **by** 10 **ins**
Joint Spacing **Ft**
Year laid

From MSMH **Depth** 6.80 **Ft**
To MSMHEND01 **Depth** 4.00 **Ft**
Direction Up
Pre-clean Y **Last Cleaned** 9/9/2009

General note
Location note

Structural Service Constructional
Miscellaneous Hydraulic

Video	Count	CD	Code		Sev	Fr	To	Value	Remarks
	0.0		ST	Start of Survey					
	0.0		MH	Manhole/Node					MSMH
	0.0		WL	Water level				0	
	47.7		FM	Fractures multiple		12	06		FRACTURES MULTIPLE ALL DIRECT...
	53.7		FM	Fractures multiple		11	06		FRACTURES, MULTIPLE DIRECTION...
	73.4		GC	General Comment					LATERAL CONNECTION/100% FULL ...
	78.6		LO	Lateral or connection exists OK		09			LATERAL CONNECTION AT ABOUT 7...
	78.7		DE	Debris (Not grease or silt)	S	06			DEBRIS CAN NOT CONTINUE INSPE...
	78.7		MH	Manhole/Node					MSMHEND01
	78.7		FH	Finish of Surveys					end of inspection

78.7 **Ft** **Total Length Surveyed**

Scores

Structural:	**Total** 0	**Mean Defect** 0	**Peak** 0	**Mean Pipe** 0
Service:	**Total** 5	**Mean Defect** 2.5	**Peak** 5	**Mean Pipe** 0.1

Pipe Graphic Report of PLR MSMHEND01X **for** Anchor

Work Order **Contract** **Video** **Setup** 6
Facility **Operator** Jayme Keith **Van Ref** 9 **Surveyed On** 09/09/2009

Street Name **City** Jorgenson Steel
Location type Building, industrial and commercial or railways, watercourse, other di
Surface Concrete road
Survey purpose Random survey of pipes and things **Weather** Dry

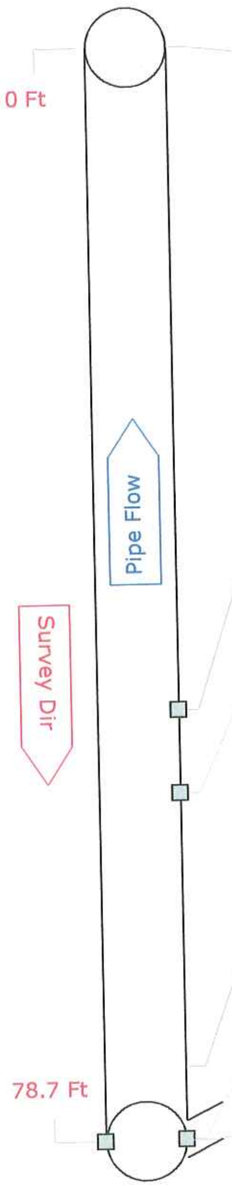
Pipe Use Storm
Shape Circular
Material Concrete
Lining

Schedule length 78.7 Ft
Size 10 **by** 10 ins
Joint spacing Ft
Year laid

From MSMH **Depth** 6.80 Ft
To MSMHEND01 **Depth** 4.00 Ft
Direction Upstream
Pre-clean Y **Last cleaned** 9/9/2009

General note
Location note

Structural Service Constructional
Miscellaneous Hydraulic



0.0 Ft — Start of Survey
Manhole/Node [MSMH]
Water level 0

47.7 Ft — Fractures multiple 12 to 06 o'clock [FRACTURES MULTIPLE ALL DIRECTIONS]

53.7 Ft — Fractures multiple 11 to 06 o'clock [FRACTURES, MULTIPLE DIRECTIONS]

73.4 Ft — General Comment [LATERAL CONNECTION/100% FULL OF OBSTRUCTION OR DEBRIS. PO

78.6 Ft — Lateral or connection exists OK 09 o'clock [LATERAL CONNECTION AT ABOUT 79.6]

78.7 Ft — Debris (Not grease or silt) 06 o'clock [DEBRIS CAN NOT CONTINUE INSPECTION]
Manhole/Node [MSMHEND01]
Finish of Surveys [end of inspection]