PES Environmental, Inc.
Engineering & Environmental Services

A Report Prepared for:

Port of Seattle
Pier 69
P.O. Box 1209
Seattle, Washington 98111

CONSTRUCTION REPORT
TERMINAL 91 TANK FARM AFFECTED AREA CLEANUP ACTION
SEATTLE, WASHINGTON

OCTOBER 2017

By:

Brian O'Neal, P.E.
PES Environmental
Project Manager

Roger North, P.E.
Vista Consultants
Principal Engineer

948.007.08.004

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LIST OF ACRONYMS AND ABBREVIATIONS

ACM	Asbestos-Containing Materials
AO	Agreed Order No. DE 8938
AOC	Area of Concern (used to describe AOC 11 area)
AOC	Area of Contamination (used in Section 4)
BMPs	Best Management Practices
BNSF	Burlington Northern Santa Fe
CAO	Cleanup Action Objective
CAP	Cleanup Action Plan
CDF	Controlled Density Fill
CFR	Code of Federal Regulations
CID	Contained In Determination
cm/sec	Centimeters per Second
CMP	Compliance Monitoring Plan
CPM	Clearcreek's Project Manager
CPOC	Conditional Point of Compliance
CQA	Construction Quality Assurance
CQAC	Construction Quality Assurance Consultant
CQC	Construction Quality Control
CR	Construction Report
CS	Clearcreek's Superintendent
CSM	Conceptual Site Model
CSWGP	Construction Stormwater General Permit
CULs	Cleanup Levels
DGI	Data Gaps Investigation
DGIWP	Data Gaps Investigation Work Plan
DOSH	Washington Department of Safety and Health
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
ESC	Erosion and Sediment Control
FS	Feasibility Study
ft	Foot / Feet
ft bgs	Feet below ground surface
HASP	Health and Safety Plan
HCS	Highly Contaminated Soil
HID	High Intensity Discharge
IHS	Indicator Hazardous Substance
in.	Inch / Inches
KCIW	King County Industrial Waste
LNAPL	Light Non-Aqueous Phase Liquid
MDA	Major Discharge Authorization
MNA	Monitored Natural Attenuation
MTCA	Model Toxics Control Act
NCR	Non-Conformance Report

LIST OF ACRONYMS AND ABBREVIATIONS

NTP	Notice to Proceed
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Act
OWS	Oil-Water Separator
PM	Project Manager
Port	The Port of Seattle
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RE	Resident Engineer
RFA	Terminal 91 RCRA Facility Assessment
RFI	Request for Information
RI	Remedial Investigation
SB	Soil-Bentonite
SBB	Soil-Bentonite Backfill
SCB	Soil-Cement-Bentonite
SMR	Self-Monitoring Report
SWMU	Solid Waste Management Unit
SWPPP	Stormwater Pollution Prevention Plan
T-91	Terminal 91
TFA	Tank Farm Area
TFAA	Tank Farm Affected Area
TFLP	Tank Farm Lease Parcel
WAC	Washington Administrative Code

PES Environmental, Inc.
Engineering & Environmental Services

TRANSMITTAL

To: WA Dept of Ecology
1250 W. Alder Street
Union Gap, WA 98903-0009

Attn: Mr. Thomas Mackie
cc: Kathy Bahnick (Port)
Sharon Aboe (Ecology NWRO)

Date: 10/10/2017
PES Project: 948.007.08
Subject: **Port of Seattle**
Final Construction Report -
T-91 Tank Farm Affected Area
Cleanup Action

From: **Brian L. O'Neal**

We Are Sending You: ☒ *Attached* ☐ *Copies*
The Following: ☐ *Under Separate Cover* ☒ *via U.S. Mail*
☒ *Originals* ☐ *via Overnight Express*

Quantity	*Description*
1	Final Construction Report, T91 Tank Farm Affected Area
1	Responsiveness Summary – Construction Report T91 Tank Farm Affected Area

Remarks:

Please find attached a hard copy of the referenced final report and the responsiveness summary documenting how the Ecology comments on the draft report were addressed. The includes the final as-built drawings and the final recorded environmental covenant. A complete copy has also been sent to Sharon Aboe at Ecology's Northwest Regional Office. If you have any questions or concerns, please do not hesitate to contact me.

Thank you,

Brian O'Neal, P.E.
Associate Engineer

1215 Fourth Avenue • Suite 1350 • Seattle, Washington • TEL (206) 529-3980 • FAX (206) 529-3985

PES Environmental, Inc.
Engineering & Environmental Services

October 9, 2017

948.007.08(004)

Port of Seattle
Pier 69
P.O. Box 1209
Seattle, Washington 98111-1209
Attention: Mr. Fred Chou

RESPONSIVENESS SUMMARY
CONSTRUCTION REPORT
PORT OF SEATTLE TERMINAL 91 TANK FARM AFFECTED AREA
SEATTLE, WASHINGTON

Dear Mr. Chou:

PES Environmental, Inc. (PES) and Vista Consultants, LLC (Vista), are submitting this letter to respond to comments from the Washington State Department of Ecology (Ecology) following their review of the following document associated with the Terminal 91 Tank Farm and Tank Farm Affected Area (TFAA) cleanup:

- **Construction Report (Draft)**, Terminal 91 Tank Farm Affected Area, Prepared by PES Environmental and Vista Consultants LLC in November 2015.

The written comments were sent to Brian O'Neal and Kathy Bahnick in an e-mail dated December 30, 2015[1]. Per a conference call between the Port, Ecology, PES, Roth Consulting, and Aspect Consulting on January 12, 2016, the Construction Report was not to be finalized until the final environmental covenant was prepared, approved by Ecology, and recorded with King County. The final environmental covenant was recorded with King County on August 28, 2017 and received by the Port on September 12, 2017. The purpose of this letter is to provide the Port's responses to the comments in preparation of the final Construction Report. For ease of use, this responsiveness summary repeats each of the comments provided in italicized text, followed by the Port's response.

RESPONSE TO ECOLOGY COMMENTS (DECEMBER 30, 2015)

Ecology Comment #1: *Table of Contents: For sections 3.3 to 3.7, the section numbers do not match the section titles (page numbers are correct, though).*

> **Port Response to Ecology Comment #1:** Section headings in Table of Contents were repopulated to match document.

[1] Washington State Department of Ecology. 2015. *Ecology comments Draft Construction Report T-91 TFAA Port of Seattle Nov 2015.* December 30.

Ecology EDR Comment #2: *List of acronyms and abbreviations: Missing CFR (pg. 20), CPM (pg. 14), CS (pg. 13), NCR (pg. 30), RE (pg. 13).*

Port Response to Ecology Comment #2: Missing acronyms and definitions were added to the table on pages ix and x.

Ecology Comment #3: *Page 1, section 1.1, last sentence: Typo - A comma appears where a period should be.*

Port Response to Ecology Comment #3: Typo corrected.

Ecology Comment #4: *Page 2, paragraph preceding section 1.3, second to last sentence: Typo: "document" should be "documents".*

Port Response to Ecology Comment #4: Typo corrected.

Ecology Comment #5: *Page 10, section 2.2.3: The acronym "IHS" that appears in the second bullet should appear in the first bullet, where the term "indicator hazardous substances" is first used.*

Port Response to Ecology Comment #5: Acronym moved to first bullet.

Ecology Comment #6: *Page 15, section 3.5.6: Typo- Block Steel Industries should be "Bloch...."*

Port Response to Ecology Comment #6: Typo corrected.

Ecology Comment #7: *Page 20, section 4.5, first sentence: Typo - insert "in" between the words "... outlined section..."*

Port Response to Ecology Comment #7: Typo corrected.

Ecology Comment #8: *Page 23, section 4.8, first bullet: Reference to section 4.5 should be 4.6.*

Port Response to Ecology Comment #8: Reference corrected.

Ecology Comment #9: *Page 31, paragraph preceding section 4.10: "maximum" should actually be "minimum", I believe. We're talking about K values here, so it might seem backwards. May need to clarify that part.*

Port Response to Ecology Comment #9: The text was revised for clarification.

Ecology Comment #10: *References, page 41:*
a. PES Environmental, Inc. 2006: This reference appears on Page 10 as PES et al.
b. PES Environmental, Inc. 2013a, b, c, & 2014 all appear in the text (pages 2 &12) as PES et al. However, in the references they are listed as PES Environmental, Inc. (These may be style issues, and may not need editing?).

Port Response to Ecology Comment #10: References corrected to reflect collaborators.

Ecology Comment #11: *Appendix E, Daily Field Reports: The disk file had only one daily field report on it. Was that intended? Or were the remaining reports omitted by mistake?*

Port Response to Ecology Comment #11: This appears to be a file format incompatibility issue. The reports were provided to Ecology as a PDF Portfolio and require a more recent version of Acrobat to view and navigate. PES converted the files to regular PDF format to be universally readable in the final submittal.

Ecology Comment #12: *Appendix F, page 4, First column of spreadsheet: What do the P, S, B and V designations mean? Please include a notation for clarity.*

Port Response to Ecology Comment #12: A notation explanation of the designations was added.

Ecology Comment #13: *Appendix F: Status of pipelines 3-1 to 3-5 unclear. Pipelines 3-1 to 3-3 were listed as empty, but were they grouted outside the TFA? Were pipelines 3-4 and 3-5 grouted outside the TFA as well?*

Port Response to Ecology Comment #13: Pipelines 3-1 through 3-5 were inspected by the marine chemist on August 22, 2014 (report in Appendix F), and pipes 3-1 through 3-3 were noted as empty, while 3-4 and 3-5 were noted as containing product. This report notes that pipes 3-4 and 3-5 had 3-inch holes drilled into them to facilitate product removal. These five pipes ran north from the inside the TFA and all came aboveground at the north edge of the TFA and continued aboveground to the north under the Building M-19 loading dock. Near the northwest corner of Building M-19, several of the pipes went back underground. Following removal of the product, the aboveground portions of these pipes were removed, cleaned as necessary, and recycled. The remaining underground portions of the pipes were grouted as indicated on as-built Drawing 5, Detail 7.

If you have any additional questions or would like to discuss this letter, please call Brian O'Neal at (206) 529-3980 or Fred Chou at (206) 787-3217.

Sincerely,

PES ENVIRONMENTAL, INC.

Brian O'Neal, P.E.
Associate Engineer

VISTA CONSULTANTS, LLC.

Roger North, P.E.
Principal

cc: Fred Chou, Port of Seattle
Kathy Bahnick, Port of Seattle
Sue Roth, Roth Consulting
Tom Mackie, Ecology
Sharon Aboe, HWTR, Ecology
Glen Wallace, Pacific Groundwater Group

1.0 SUMMARY

1.1 Introduction and Purpose

PES Environmental, Inc. (PES) has prepared this Construction Report (CR) to describe the cleanup action construction at the Terminal 91 Tank Farm Affected Area (TFAA) of the Terminal 91 Site. The TFAA is situated within the Port of Seattle's (Port's) Terminal 91 Facility (T-91) in Seattle, Washington (Figure 1). This CR has been prepared pursuant to Agreed Order No. DE-8938 (AO) between the Port and the Washington Department of Ecology (Ecology) and in accordance with the Model Toxics Control Act (MTCA) under Chapter 70.105D of the Revised Code of Washington (RCW) and Chapter 173-340 of the Washington Administrative Code (WAC).

The CR describes the construction of the cleanup action implemented for the TFAA, including the former tank farm and fuel pipelines, with the exception of the cleanup activities at Solid Waste Management Unit (SWMU) 30. SWMU 30 was the location of a pipeline break that occurred in 1989, and the cleanup action for this area was conducted by the Port between October 2013 and April 2014. The SWMU 30 cleanup action is documented in a January 2015 Final CR (PES, 2015) that was approved by Ecology. The CR does not include descriptions of the compliance monitoring or operations and maintenance inspection and other activities that are part of the cleanup action. These activities have been initiated and will be described in future reports.

1.2 Relevant Reference Documents

The background and history of the TFAA are described extensively in other documents, including:

- *Remedial Investigation Summary Report for the Terminal 91 Tank Farm Site in Seattle, Washington* (RI Summary Report; Roth Consulting, 2007);
- *Final Draft Feasibility Study Report, Terminal 91 Site, Seattle, Washington* (FS Report; PES et al., 2009);
- *Agreed Order No. DE 8938* (Ecology, 2012)
- *Final Cleanup Action Plan* (CAP; Ecology, 2010);
- *Final Data Gaps Investigation Work Plan, Terminal 91 Tank Farm Affected Area Cleanup, Port of Seattle, Seattle, Washington* (DGIWP; PES et al., 2011);
- *Data Gaps Investigation Technical Memorandum, Terminal 91 Tank Farm Affected Area Cleanup, Port of Seattle, Seattle, Washington* (DGI Technical Memorandum; PES et al., 2012); and
- Documents referenced in the above reports.

Documents describing the cleanup action design and associated with the implementation of the cleanup action include:

- *Engineering Design Report, Terminal 91 Tank Farm Cleanup, Port of Seattle, Seattle, Washington.* (EDR; PES et al., 2013a). Other documents included as appendices to the main EDR report include:
    - Construction Drawings (Appendix B of the EDR);
    - Technical Specifications (Appendix C of the EDR); and
    - *Construction Quality Assurance (CQA) Manual, Terminal 91 Tank Farm Cleanup, Port of Seattle, Seattle, Washington.* (Appendix D of the EDR; revised in July 2014; PES et al., 2014).
- Terminal 91 Tank Farm Cleanup Construction Contract Documents (Contract MC-0317586). (Contract Documents; Port of Seattle, 2014). The Contract Documents included:
    - The Project Manual (including the final technical specifications and EDR); and
    - Project Drawings.

The EDR and other documents included as appendices (e.g. compliance monitoring plan [CMP], operations and maintenance [O&M] plan) were approved by Ecology on July 30, 2013 and were incorporated into the Contract Documents (Appendix A), which the Port used to solicit bids from contractors. Once the contract was awarded to Clearcreek Contractors, Inc. (Clearcreek), the Contract Documents (which included the EDR) were the primary contract management document for the project. Throughout the construction process, all submittals, formal contract communications, and related documentation were managed within the Port's Livelink documents management system.

1.3 Report Organization

Contents of the CR include the following:

Section 1 describes the purpose of the report and references relevant supporting documents such as the construction drawings, technical specifications, and construction quality assurance (CQA) manual.

Section 2 briefly describes the background of the project and the cleanup action development and design for the TFAA.

Section 3 describes organizations involved in the project and their responsibilities.

Section 4 briefly describes how each major component of the project was constructed and its general function and includes a brief description of the environmental covenant and a statement regarding the financial assurance.

Section 5 describes CQA and construction quality control (CQC) implemented during the cleanup action.

Section 6 describes the recordkeeping and documentation prepared during construction, such as daily reports, photographic records and as-built drawings.

Section 7 describes design modifications made during construction and the justification for each modification.

Section 8 provides a statement by PES that the Final Cleanup Action was constructed in substantial compliance with the design intent.

Section 9 lists the sources of information referenced in the document.

The following information is attached to the CR:

Appendix A – Construction Contract Documents (Contract MC-0317586): The Contract Documents were prepared by the Port for the purposes of soliciting contractor bids and managing the construction project. It includes the construction drawings and technical specifications, the EDR, and the CQA Manual.

Appendix B – Weekly Construction Updates: Includes copies of the weekly e-mails prepared by PES and sent to Ecology with summaries of the work performed that week and the work scheduled for the next three weeks.

Appendix C – Clearcreek's Work Plans: Includes the following Clearcreek Work Plans and Port review comments:

- Asphalt and Concrete Stockpile Plan
- Construction Water Management Plan
- Cutoff Wall Work Plan
- Decontamination Plan
- Exploratory Trench Work Plan
- Health and Safety Plan
- LNAPL Recovery Trench Work Plan
- Pipeline Decommissioning Plan
- Pollution Prevention Plan
- Quality Control Plan
- Regulated Materials Plan
- Sheeting and Shoring Plan
- Stockpile Plan
- Stormwater Pollution Prevention Plan
- Traffic Control Plan; and
- Transportation and Disposal Plan

Appendix D – KCIW Discharge Documentation: Includes a copy of the King County Industrial Waste (KCIW) Wastewater Major Discharge Authorization (MDA) No. 4315-01, the monthly Self-Monitoring Reports (SMRs), and the discharge sample laboratory analytical reports.

Appendix E – Daily Field Reports: Includes the PES and Port daily field reports.

Appendix F – Pipeline Decommissioning Documentation: Includes a summary of the pipeline contents, a summary of the grouting quantities, the marine chemist certificates, the Emerald Recycling Waste Acceptance Form, and the video documentation files.

Appendix G – Waste Disposal Documentation: Includes a Waste Disposal Summary table and associated disposal truck tickets for the waste concrete, waste asphalt, pipeline decommissioning liquids, construction debris, highly contaminated soil (HCS), dangerous waste soils, soils receiving a Contained In Determination (CID), and recycling tickets for the steel tank bases and pipelines. Appendix G also includes two Requests for CIDs and the two CID letters from Ecology.

Appendix H – PES As-Built Drawings: Includes drawings documenting the site conditions as encountered during cleanup, and the as-built documentation of the Light Non-Aqueous Phase Liquid (LNAPL) trenches, cutoff wall, revised stormwater management system, and final cover.

Appendix I – Regulated Materials Reports: Includes Rose Environmental's Asbestos Testing Reports for the interior electrical panels in Buildings M-25 and M-27, Argus Removal Reports, Certificate of Clearance Forms, and Asbestos Waste Shipment Report Forms.

Appendix J – Well Decommissioning Records: Includes the well decommissioning logs for the 20 wells decommissioned as part of the TFAA site preparation activities.

Appendix K – Waste Disposal Characterization Laboratory Analytical Reports: Includes laboratory analytical reports for samples collected for waste disposal profiling.

Appendix L – Construction Quality Control Documentation: Includes the Krazan & Associates, Inc. (Krazan) fill compaction density testing reports, lab testing reports, and a summary of the quantities of crushed materials re-used as backfill.

Appendix M – Construction Quality Assurance Documentation: Includes the HWA GeoSciences, Inc. (HWA) fill compaction density testing reports for the crushed concrete and the laboratory testing report for the LNAPL trench gravel.

Appendix N – Cutoff Wall Construction Documentation: Includes the Clearcreek Cutoff Wall QA/QC Final Report, the HWA lab testing report of the low permeability soil and Final Materials Laboratory Report, and the PES CQA data summary tables. The CQA tables include: the cutoff wall bottom elevations, the slurry sampling and testing, the soil bentonite backfill (SBB) slump and density testing, the soil cement bentonite (SCB) cap dimension measurements, the SCB mix properties, a log of samples collected, and the probe measurements of the SCB cap.

Appendix O – Environmental Covenant: Provides the Environmental Covenant for the project that addresses specific exposure pathways and ensures that the integrity of the cleanup action is maintained over time.

2.0 PROJECT BACKGROUND AND CLEANUP APPROACH

2.1 Background Information

The background and history of the TFAA are described extensively in the documents listed in Section 1.2. For ease of reference, a brief site description and history, summary of the subsurface conditions and conceptual site model (CSM) and goals of the cleanup action, and a summary of the selected cleanup action are presented below.

2.1.1 Property Description and History

T-91 is located at 2001 West Garfield Street, Seattle, Washington and encompasses approximately 216 acres (Figure 1). The TFAA is located in the central portion of T-91, and comprises approximately 17 acres, including the Tank Farm Lease Parcel (TFLP), which is a contiguous parcel approximately four acres in size located immediately north of the Magnolia Bridge.[1] Figure 2 is a 2002 aerial photograph of the Terminal 91 Site showing the approximate boundaries of T-91, the TFAA, the TFLP, the SWMU 30 area, and other portions of the T-91 Site, including the Upland Area, Short Fill Area, and Submerged Lands Area.

The TFAA is flat and paved or covered with buildings. The TFAA generally is bounded to the south by Piers 90 and 91 and the Short Fill Area and the adjacent Short Fill Impoundment located between the two piers, to the east by the Burlington Northern Santa Fe (BNSF) Rail Yard and the Washington Army National Guard facility, and to the north and west by the T-91 Upland Area.

The TFLP is located at the north end of the TFAA. The primary historical features of the TFLP are the bulk petroleum tank farm present from the 1920s through 2005, and the dangerous waste treatment and storage operations that were conducted in the TFLP from 1980 through 1995. The aboveground portion of the tank farm, including the tanks, containment walls, and other aboveground piping and equipment, was demolished and removed in 2005 as part of an interim remedial action (Roth Consulting, 2005). The TFLP consisted of three tank yards and associated buildings, divided into the following areas (Figure 3):

- **The Black Oil Yard** located at the south end of the TFLP. This yard contained three large tanks (Tanks 90 to 92) that were used to store heavy fuel oils (e.g., Bunker C);
- **The Marine Diesel Oil Yard** located in the center of the tank farm. This yard contained 12 tanks (Tanks 93 to 104) that were used to store a variety of products including diesel, kerosene, and other middle distillates as well as wastewater and waste oil;

[1] The AO (Ecology, 2012) defines the TFAA as "*the Tank Farm Lease Parcel and any areas where Hazardous Substances originating from the Tank Farm Lease Parcel have come to be located*," and the TFLP as, "*the site of a tank farm, demolished in 2005, which had for a time operated as a Dangerous Waste facility.*"

- **The Small Yard** located at the north end of the tank farm. This yard contained 10 primary tanks (Tanks 105 to 114) and a number of smaller tanks that were used to store a variety of petroleum products including gasoline and diesel, wastewater, and a variety of other waste materials (all the tank bases in this yard were reportedly removed during the remedial action in 2005);

- **The main warehouse** (i.e., Building 19) located just north of the three tank yards. This building still exists in the TFLP; and

- **Additional areas** including the pipe alley between the Small Yard and the Marine Diesel Oil Yard, the decommissioned former oil-water separator (OWS) and pump house west of the Small Yard, and the foam mixing area at the north end of the TFLP.

The Black Oil Yard and the Marine Diesel Oil Yard were surrounded by concrete product-containment walls approximately 15-feet (ft) high. The Small Yard was surrounded by a concrete product-containment wall approximately 3-ft high. All three tank yards were fully paved with concrete; the Small Yard was paved in 1982, and the Marine Diesel Oil and Black Oil Yards were paved in 1986. Aboveground and subsurface piping systems were used to transfer product within the tank yards. Underground fuel pipelines have been used throughout much of T-91's history, connecting the tank yards with the piers (Piers 90 and 91) to the south.

As described in the FS Report, dangerous waste treatment and storage operations were conducted in the TFLP from 1980 through 1995. No dangerous waste operations requiring a permit (other than corrective action) were conducted at the TFLP after September 1995, and all regulated waste units at the TFLP have undergone closure.

Another tank farm, identified as the Old Tank Farm (referenced as Area of Concern (AOC) 11 in the Terminal 91 Resource Conservation and Recovery Act [RCRA] Facility Assessment [RFA; EPA, 1994]), was located in the area west of the TFLP, as shown on Figure 4. This former tank farm was reportedly active between 1927 and 1942. The United States Department of the Navy took possession of T-91 in December 1942, and the tank farm was reportedly demolished subsequently, sometime between 1942 and 1946 (Pinnacle, 2006).

Other areas of interest include SWMU 30 (Figure 4), which is the location of a pipeline break that occurred in 1989 near the north end of Pier 91, and former fuel transfer pipelines that ran in and around the TFLP and to Piers 90 and 91. As noted above, the SWMU 30 area was the subject of a separate cleanup action implemented by the Port in late 2013 and early 2014 (PES, 2015).

2.1.2 Subsurface Conditions

Numerous investigations have been conducted at T-91 since 1988 to characterize the geology, hydrogeology, and nature and extent of contamination. The results of these investigations are detailed in the RI Summary Report and the FS Report and more generally in the CAP. The following is a brief summary of the geology and hydrostratigraphy at the Site.

2.1.2.1 Geology

As described in detail in the RI and FS Reports, four mappable lithologic units have been identified beneath the TFLP and adjacent areas. These four units in order of increasing depth include:

- The **Shallow Sand Unit** consists of fill material emplaced over shallow marine and tidal marsh deposits of Smith Cove during the early 1900s. It consists primarily of moderately to poorly sorted, fine- to medium-grained unconsolidated sand, with laminations of silty sand and gravel lenses occurring locally. The Shallow Sand Unit extends vertically from just below the paved ground surface to between 15 and 20 ft below ground surface (ft bgs).

- The **Silty Sand Unit** is comprised of gray or olive, moderately sorted, fine- to medium-grained silty sand with traces of coarse sand, shell debris, and wood debris. This unit is interpreted to be native marsh, intertidal, and shallow marine sediments that formed the pre-fill surface in the Smith Cover Waterway and the adjacent tidelands. Beneath the TFLP and adjacent upland areas, the Silty Sand Unit generally occurs at depths of 15 to 20 ft bgs, and varies from 20-ft thick beneath the BNSF rail yard, east of the TFLP, to 5-ft thick or less in the southwest corner of the TFLP. A **Gravel Layer** was found within the Silty Sand Unit in some locations and consists of moderately to poorly sorted, silty sandy gravel.

- The **Deep Sand Unit** directly underlies the Silty Sand Unit and is composed primarily of poorly to moderately sorted, medium- to coarse-grained sand and gravelly sand, with only isolated occurrences of silt. However, beneath the northern portion of the TFLP, the Deep Sand Unit is composed of only 6 to 8 ft of sand, gravelly sand, and sandy gravel, with the remaining deeper portions of the unit characterized by interbedded silty sand and sand. The depth to the top of the Deep Sand Unit varies from approximately 25 ft bgs at the center of the TFLP to as much as 45 ft beneath the north end of Pier 90.

- The **Silty Clayey Sand Unit** underlies the Deep Sand Unit and is composed of soft to stiff fine-grained sediments, primarily silty clay and clayey silt, with lesser amounts of silt and silty clayey sand. The top of the Silty Clayey Sand Unit is shallowest beneath the eastern portion of the TFLP, where it occurs as shallow as 42 ft bgs.

Generalized geologic cross-sections prepared for the *Remedial Investigation/Data Evaluation (RI/DE) Report* (Philip Environmental Services Corp., et al, 1999) are included in Appendix A1 of the EDR Report (included in Appendix B of the Contract Documents).

2.1.2.2 Hydrostratigraphy

Shallow Aquifer. The Shallow Aquifer is generally present in the Shallow Sand Unit and is separated from the Deep Confined Aquifer by the Silty Sand Unit that acts as an upper confining unit. Water level data collected during routine monitoring of monitoring wells show that the dominant unconfined groundwater flow direction is generally towards the south beneath the

TFLP, TFAA, and piers, with flow locally to the southwest beneath AOC 11. Water levels in the monitoring wells typically range between 3 and 7 ft bgs and generally correspond to seasonal variations in precipitation rates, with the highest water levels observed during the wetter winter months. The typical horizontal gradient beneath the TFLP is approximately 0.001 ft/ft.

Downward vertical gradients between the Shallow Aquifer and Deep Confined Aquifer have been noted throughout the TFAA. Vertical gradients typically range from approximately 0.018 to 0.040 ft/ft, with vertical gradients decreasing to the south. Despite the presence of downward vertical gradients, significant downward movement of Shallow Aquifer groundwater under most of the TFAA is considered unlikely due to the low measured vertical permeability in the upper confining unit (Silty Sand Unit).

Tidal influence on Shallow Aquifer groundwater levels under the piers (reflected in higher tidal efficiency and lower time lag) is generally highest near the southern ends of the piers, decreasing progressively inland towards the east-west trending, shore-parallel bulkheads. Tidal efficiencies were notably higher on Pier 91 than Pier 90 and in areas without bulkheads or significant silt accumulations. Little tidal influence was evident in Shallow Aquifer wells at the south end of the TFLP.

Deep Confined Aquifer. The deep confined aquifer is present in the Deep Sand Unit. The tidally-averaged groundwater flow direction in the Deep Confined Aquifer beneath and shoreward (i.e., south) of the TFLP is towards the south. As in the Shallow Aquifer, water levels in the Deep Confined Aquifer respond to seasonal variations in precipitation rates, with the highest water levels observed during the wetter winter months. The typical Deep Confined Aquifer horizontal gradient is relatively constant at approximately 0.003 ft/ft beneath the TFAA.

Tidal influence on Deep Aquifer groundwater levels under the piers is similar to the Shallow Aquifer, with a higher influence near the southern ends of the piers. Time lags were generally shorter in the Deep Aquifer under the piers than in the Shallow Aquifer. Tidal influence was evident in Deep Aquifer wells in the TFLP, except east of the Small Yard and Marine Diesel Oil Yard; the shortest time lags were along the southern boundary of the TFLP, and the longest time lags were north of the Small Yard.

2.2 Conceptual Site Model

The results of the previous investigations were used to create a CSM that summarizes the sources of contamination, potential routes of exposure, and potential receptors. The CSM (presented in both the FS Report and CAP) is based on the current and future industrial land use, the soil and groundwater sampling results, and the active and potentially active fate and transport mechanisms.

2.2.1 Contaminant Sources

Tank Farm Lease Parcel. The primary source of contamination in the TFAA is the former tank farm and its associated operations. A number of documented releases have occurred, including two large releases of petroleum hydrocarbons in 1978 (420,000 gallons of Bunker C fuel oil) and 1980 (up to 113,000 gallons of oil). In both of these cases, the oil was contained within the tank

farm by the concrete retaining walls, and the oil and impacted soil were removed to the extent practicable. A number of smaller releases of petroleum products and/or oily water have been documented, ranging in size from several hundred gallons to 20,000 gallons. In all cases, these documented releases were reported to have been cleaned up.

No releases were documented at the TFLP prior to 1971, although historical releases are suspected and periodic releases of oily liquids have reportedly occurred at the TFLP since the 1930s. The main activities conducted by Chemical Processors, Inc. (Chempro) after they began operations in 1971 and Chempro's successors were waste oil recovery and wastewater treatment. Chempro applied for and was granted interim status under RCRA and began dangerous waste management activities at the TFLP, which continued through 1995.

Secondary Source Areas. There are three other potential sources of contamination from sources outside the TFLP, including:

- **SWMU 30** – An estimated 340 to 1,370 gallons of product were released from a fuel pipeline. A product recovery system was installed and operated between 1991 and 1994 and recovered a total of 76 gallons. Passive product recovery (i.e., bailing) continued after 1994 with limited amounts of product recovered. The final cleanup action selected for the SWMU 30 area in the FS report was implemented in late 2013 and early 2014.
- **AOC 11** – There are no documented releases from the AOC 11 tank farm, although historical undocumented releases are suspected. According to the Brownfield Historical Research Overview (Pinnacle, 2006), the AOC 11 tank farm was constructed sometime between 1925 and 1936. It began as a vegetable oil storage facility and was later converted to petroleum oil storage. By 1936, the tank farm consisted of eight smaller tanks and one large tank, an oil shed, and a truck loading rack. The AOC 11 tank farm was demolished during the early years of Navy occupancy, probably in 1942 and certainly by 1946.
- **Former Fuel Transfer Pipelines** – Over the history of T-91, petroleum and other materials were transferred between ships at Piers 90 and 91, the tank farms, and waste management areas, typically via above- and below-ground pipelines.

2.2.2 Exposure Pathways and Receptors

The CSM established potentially complete exposure pathways and potential receptors for the TFAA for both soil and groundwater prior to implementation of the TFAA cleanup action construction.

Soil. Three potentially complete exposure pathways related to soil were identified: (1) direct contact with soil by utility or construction workers; (2) soil to indoor air; and (3) soil to groundwater (which ultimately may impact aquatic receptors).

Groundwater. Two potentially complete exposure pathways related to groundwater were identified: (1) groundwater to indoor air; and (2) groundwater to surface water/sediment.

2.2.3 Cleanup Action Objectives

As described in the FS Report, cleanup action objectives (CAOs) formed the basis for developing TFAA cleanup actions. CAOs were based on an evaluation of the data collected during previous investigations (summarized in the CSM) and on the cleanup levels (CULs) established for the TFAA. The focus of the CAOs is protection of human health and the environment. The CAOs for soil and groundwater, which focused on four primary exposure or migration pathways, were:

- Preventing exposure of future subsurface construction workers to indicator hazardous substances (IHSs) in soil (via direct contact), particulates (i.e., dust), and soil vapors;
- Preventing exposure of future workers and trespassers to IHSs in vapors originating from soil and/or groundwater via indoor air;
- Preventing discharge of groundwater containing IHSs at concentrations exceeding the applicable CULs to surface water and/or sediment and the subsequent potential for impacts on aquatic life or humans consuming fish; and
- Controlling, to the extent practicable, the migration of IHSs from soil to groundwater in quantities that would result in the accumulation of LNAPL on the groundwater.

2.2.4 Approach to Addressing CAOs

This section describes the approach that this cleanup action takes to address the four CAOs described in Section 2.2.3 above. The first two of the above CAOs (i.e., preventing direct contact with soil and exposures to vapors in subsurface soil or migrating from soil and/or groundwater to indoor air) are being addressed by implementing engineering and institutional controls (see Section 4.12 and Appendix O).

The third CAO is being addressed by implementing a monitored natural attenuation (MNA) program at the Site. Discharge of groundwater to surface water and sediment does not appear to present a current risk to human health and the environment. Also, a prior MNA evaluation (PES et al., 2006) demonstrated that naturally occurring attenuation mechanisms have resulted in stable plumes of petroleum-related compounds in the TFAA. The post-cleanup-construction MNA evaluation was designed to confirm the continuing occurrence of natural attenuation at the TFAA.

The fourth CAO (i.e., minimizing LNAPL accumulation on groundwater) was the primary focus of the construction cleanup actions for the TFLP and secondary source areas. That cleanup action is the subject of this report.

2.3 Cleanup Action Summary

The TFAA cleanup action consisted of: (1) a combination of four presumptive cleanup actions addressing secondary source areas and other potential future exposures; and (2) the cleanup action for the TFLP.

2.3.1 Presumptive Cleanup Actions

The CAP identified a series of presumptive cleanup actions, including:

- Institutional controls, such as health and safety requirements for site workers and addressing potential exposures when future land use changes are made; the latter is addressed by the environmental covenant (see Section 4.12 and Appendix O);
- Cleaning and decommissioning underground fuel pipelines remaining in the TFAA; this was completed during the TFAA cleanup and will be described in this implementation report;
- Excavating LNAPL source areas at SWMU 30; this work has been completed and was described in the *Final Construction Report – Final Cleanup Action,* (PES, 2015); and
- Implementing an MNA groundwater sampling program to confirm that natural attenuation processes continue to degrade chemicals in groundwater; this program was implemented starting in August 2015 and will be described in future reports.

2.3.2 Final Cleanup Action for the Tank Farm Lease Parcel

As described in the CAP, Ecology selected Alternative 4 from the FS Report as the final cleanup action for implementation at the TFLP and adjacent areas. Alternative 4's primary objectives are to prevent migration of LNAPL from the TFLP source area and to prevent future surface product seeps from occurring. This alternative, which is described in detail in the EDR, includes the following components:

- Removing existing above-ground structures and the existing asphalt paving; removing the remaining subsurface utilities, structures, and tank bases that appear to be the source of the current surface seeps; and removing highly contaminated soil encountered during the tank base removal process (see Section 7 of the EDR);
- Constructing a subsurface cutoff wall around the perimeter of the former tank farm (see Section 8 of the EDR);
- Installing an enhanced passive LNAPL recovery system (see Section 9 of the EDR); and
- Backfilling and grading the area, constructing a new asphalt cover over the area and constructing new stormwater drainage improvements (see Section 10 of the EDR).

Construction of the final cleanup action is complete, and descriptions of these activities are provided in this implementation report. Upon completion of the cleanup construction, compliance monitoring and O&M activities were initiated in August 2015. These include:

- Asphalt paving inspections and maintenance;
- LNAPL monitoring and passive recovery from LNAPL recovery trenches and existing LNAPL monitoring wells;
- Compliance monitoring, including MNA monitoring; and
- Reporting.

The scope of work for these activities is defined in the following documents:

- *Compliance Monitoring Plan, Terminal 91 Tank Farm Cleanup, Port of Seattle, Seattle, Washington.* (CMP; PES et al., 2013b); and
- *Operations and Maintenance Plan, Terminal 91 Tank Farm Cleanup, Port of Seattle, Seattle, Washington.* (O&M Plan; PES et al., 2013c).

Descriptions and findings of these activities will be provided in future reports.

3.0 PROJECT ORGANIZATIONS AND RESPONSIBILITIES

This section of the report describes the primary organizations involved in the project and their responsibilities.

3.1 The Port of Seattle (Port)

The Port is the owner and operator of Terminal 91, which includes the TFAA. The Port was responsible for the overall planning, implementation, and management of the project. The Port's Resident Engineer (Port's RE) was the primary point of contact for the contractor throughout the construction process and conducted weekly construction meetings, responded to all Requests for Information (RFIs), released funds, and authorized planned work by the contractors. Port inspectors were the lead for quality assurance (QA) activities and also documented all on-site activities, prepared daily reports, and provided weekly construction progress summaries. The Port also kept all stakeholders appraised of work planned and work performed.

3.2 PES Environmental

PES was retained by the Port to perform various site investigations and the design of the remedial actions associated with the TFAA. PES's specific involvement associated with the TFAA final cleanup action included preparation of the EDR, including the construction drawings, technical specifications, and CQA Manual for the Terminal 91 Tank Farm Cleanup Action. PES was also retained to provide oversight and reporting of specific construction activities during the construction phase. PES acted as the Port's Environmental Management Specialist and also as the Port's Construction Quality Assurance Consultant (CQAC). PES oversight included verifying proper management of HCS, verifying tank base decontamination, verifying proper handling and testing of construction water, verifying proper pipeline decommissioning, and CQA associated with the cutoff wall and LNAPL trench installations; PES's oversight personnel were on-site as needed to observe these activities.

3.2.1 Vista Consultants (Vista)

Vista was retained by PES to assist in the preparation of the EDR. Their role focused on geotechnical aspects of the cutoff wall and final cover.

3.2.2 Argus Pacific

Argus Pacific was retained by PES to assist in the preparation of the EDR, and specifically the technical specifications related to regulated materials abatement and management and performed the sampling for lead in paint and asbestos-containing materials (ACM). Argus Pacific also reviewed Contractor submittals related to regulated materials abatement and management and provided field inspection services once the Contractor's abatement activities were completed.

3.3 Clean Harbors

Clean Harbors was retained by the Port to provide transportation and disposal of dangerous waste sludge, soil, and water at their Clean Harbors Grassy Mountain, LLC facility in Grantsville, Utah.

3.4 HWA Geosciences (HWA)

HWA was retained by PES to provide geotechnical testing and inspection services during construction activities. This includes testing of various fill materials, CQA testing related to the cutoff wall, and compaction testing associated with the final cover.

3.5 Clearcreek Contractors

Clearcreek Contractors (Clearcreek or the Contractor) was contracted by the Port and was responsible for coordinating the activities of its own forces and subcontractors, scheduling and performing the work within the timeframe and budget agreed to in the construction contract documents, performing the work in accordance with the Contract Documents, and implementing CQC procedures to document that the construction complied with the intended design.

Clearcreek's roles were defined in the Project Manual issued by the Port. Clearcreek's Project Manager (CPM) reported directly to the Port's RE and was responsible for all Clearcreek and subcontractor activities. Clearcreek's Superintendent (CS) provided on-site management of and direction to the Clearcreek's and subcontractor's personnel. The CS was responsible for executing the work in full compliance with the Contract Documents, including CQC. In addition, the CS verified proper operation and maintenance of equipment, managed subcontractors, and provided daily reports to the Port's RE.

The following were major subcontractors providing services to Clearcreek.

3.5.1 Krazan & Associates

Krazan & Associates was retained by Clearcreek to perform special testing and inspection services defined in the CQA Manual and other construction documents. Their services included inspection and testing associated with field density testing of the structural fill, and aggregate and asphalt final cover.

3.5.2 Pacific GeoMatic Services

Pacific GeoMatic Services was retained by Clearcreek to perform various surveys to layout the work, measure installed quantities, and obtain as-constructed documentation.

3.5.3 Rhine Demolition

Rhine Demolition was retained by Clearcreek to provide concrete and asphalt crushing services which included separating and stockpiling the steel rebar from the concrete.

3.5.4 Wrecking Ball Demolition

Wrecking Ball Demolition was retained by Clearcreek to provide regulated materials abatement services, including removal of asbestos containing materials.

3.5.5 Jeff Johnson Excavating

Jeff Johnson Excavating was retained by Clearcreek to provide demolition services for the removal, size reduction, and stockpiling of the subsurface concrete structures and steel tank bases.

3.5.6 Bloch Steel Industries

Bloch Steel Industries was retained by Jeff Johnson Excavating, LLC to receive the decontaminated steel tank bases removed during the project and worked with other operators on stockpiles. Bloch Steel Industries was retained by Clearcreek to receive the scrap steel from the pipeline decommissioning and rebar.

3.5.7 Emerald Services

Emerald Services was retained by Clearcreek to provide pipeline decommissioning and liquid waste transport and disposal.

3.5.8 Applied Professional Services

Applied Professional Services was retained by Clearcreek to provide pipeline camera verification services.

3.5.9 Holt Services

Holt Services was retained by Clearcreek to conduct monitoring well decommissioning.

3.5.10 Friedman & Bruya

Friedman & Bruya was retained by Clearcreek to analyze soil and water samples from the excavation stockpile and wastewater for disposal characterization.

3.5.11 Kangley Rock & Recycling

Kangley Rock & Recycling was retained by Clearcreek to receive the waste concrete and asphalt requiring off-site disposal.

3.5.12 US Ecology

US Ecology was retained by Clearcreek to receive the profiled PCB-contaminated soil.

3.5.13 Regional Disposal/Republic Services

Regional Disposal/Republic Services was retained by Clearcreek to receive the profiled Class III/IV HCS and non-PCB containing CID soil from the excavations and construction debris.

3.5.14 Waste Management

Waste Management was retained by Clearcreek to receive the profiled diesel waste solids and lead-contaminated dangerous waste solids.

3.5.15 Steve Forler Trucking

Steve Forler Trucking was retained by Clearcreek to transport the profiled PCB-contaminated soil.

3.5.16 R Transport

R Transport was retained by Clearcreek to transport the profiled diesel waste solids and lead-contaminated dangerous waste solids.

3.5.17 Aero Construction

Aero Construction was retained by Clearcreek to transport the profiled contaminated Class III/IV HCS from the excavations.

3.5.18 Brien Excavating

Brien Excavating was retained by Clearcreek to transport the profiled contaminated Class III/IV HCS from the excavations.

3.5.19 Northshore Paving

Northshore Paving was retained by Clearcreek to provide the asphalt paving services for the final cover.

3.5.20 Ford Crane

Ford Crane was retained by Clearcreek to place the OWS and water quality vaults.

3.6 Washington State Department of Ecology (Ecology)

Ecology is the regulatory authority and responsible agency for overseeing and authorizing the Cleanup Action. In this capacity, Ecology reviewed and approved the design documents. Select Contractor submittals and documentation generated during construction were also reviewed by Ecology. Ecology's Site Manager periodically visited the site throughout the project,

participated in a portion of the weekly project meetings, and worked cooperatively with the Port throughout the construction process to resolve unforeseen problems. Ecology also reviewed and approved significant design changes and modifications throughout the construction process (see Section 7).

4.0 CLEANUP ACTION CONSTRUCTION

This section generally describes how the major components of the Tank Farm Cleanup Action were performed.

4.1 Definition of Terms

As part of the cleanup action design process, two distinct areas within the TFAA were defined for various purposes: (1) the Tank Farm Area (TFA) and (2) the Area of Contamination (AOC). These areas are shown on Figure 5 and are described below.

4.1.1 Tank Farm Area (TFA)

The TFA is generally defined as the footprint of the former tank farm and the associated support areas (e.g., former Building 26 [Pump House] and the OWS in the northwest corner of the tank farm). It also includes limited areas outside of but adjacent to the tank farm footprint where implementation of the cleanup action required removal of the existing asphalt cover and excavation of potentially contaminated soil (e.g., in the southeast corner of the tank farm where the new stormwater vaults were installed). The TFA includes the area where the former fuel transfer pipelines were removed (as opposed to decommissioned in place).

4.1.2 Area of Contamination

Due to the variety and volume of materials that were to be removed during the construction of the selected remedy for the former tank farm, the Port developed an overall framework for managing the various materials and wastes generated during construction, described below. A critical part of this framework was the use of AOC, which was established by Ecology consistent with its 1991 inter-program policy. Features of the AOC include:

- The AOC was designated as the area in which contamination from dangerous waste units or other sources was continuously present;
- The AOC permitted movement of materials within Ecology-supervised cleanups without materials being labeled as "generated" wastes; and
- Any materials to be considered not generated could not leave the AOC.

The AOC for this project included the TFLP and adjacent areas where materials would be generated (e.g., in Coontz Avenue during construction of LNAPL Trench 5) or managed (transported from one portion of the AOC to another).

4.2 Overall Waste and Material Management Approach

Exhibit E of the AO contains the Contamination Contingency Work Plan for the T-91 site. Appendix C of that work plan emphasized productive re-use of media and debris that would result from the cleanup at the TFLP to fill and stabilize the excavation areas.

To support this overall objective, the Port developed an overall materials and waste management framework that included the use of an AOC (see 4.1.1 above for definition of the AOC for this project). Pursuant to the framework developed for the AOC, the debris and media excavated from within the AOC as part of implementing the cleanup action were managed as follows:

1. Highly contaminated soil (HCS). This material, which was defined in the CAP as soil that was "visibly and highly contaminated with petroleum" (i.e., product-saturated soil), was excavated, stockpiled inside of the AOC, tested to characterize and profile the material, and disposed of off-site. HCS included (by definition) sand or pea gravel between the bases of former tanks with multiple bases.

2. Soil or debris characterized as a dangerous, hazardous, or "contained-in" waste. A limited quantity of soil encountered during the construction contained dangerous waste constituents (e.g., PCBs, lead, volatile organic compounds) at concentrations that did not allow for their management in the AOC. These materials were characterized and transported off-site for disposal.

3. Debris not suitable for reuse on-site. This material included pipes, tank bases and other non-concrete and non-asphalt debris. This material was stockpiled (inside or outside of the AOC) and was managed as follows:
   - Debris known to have come from units in which dangerous waste was managed or that had come into contact with listed dangerous waste was decontaminated consistent with the *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Ecology, 2001) to meet Land Disposal Restrictions and disposed of or recycled.
   - Debris that had not come from units in which listed dangerous waste was managed and that did not come into contact with listed dangerous waste was decontaminated and tested as necessary to meet the receiving facility requirements, and then recycled or disposed of.

4. Media and debris that was suitable for reuse on-site, including soil (excluding HCS), asphalt, and concrete. This material was separated into two general categories as follows:
   - Soil or debris from units not known to have managed or come into contact with listed dangerous waste. This category included the existing asphalt cover and the underlying gravel and fill brought in after the 2005 tank farm demolition, with the possible exception of gravel and fill associated with the two product seeps that had been contained in utility vaults. This material was stockpiled (inside or outside of the AOC), processed as necessary to be suitable for reuse (e.g., crushed asphalt), and then used on-site as fill.
   - Soil or debris known to have potentially come in contact with listed dangerous waste or listed dangerous waste constituents. This included concrete (slabs beneath tank bases, containment wall footings, sumps, paving between tanks) and soil beneath the former tank farm. This material was managed entirely within the AOC. Soil was stockpiled and reused as fill to bring the site up to its final grade. Gross contamination (adhered soil, product) was removed from concrete as

required to facilitate crushing and then the concrete was crushed, stockpiled, and reused as fill.

4.3 Overview of Construction

The TFA cleanup project was advertised for bidding in early January 2014, and the Port selected Clearcreek to perform the work in mid-February. Over the next two months, Clearcreek prepared pre-construction submittals and work plans (see Section 4.4 below), and after these were approved by the Port, Clearcreek was given formal Partial Notice to Proceed (NTP) by the Port on May 21, 2014. The Partial NTP let Clearcreek begin establishing survey controls, installing construction fences, utility locating and perform other preparatory activities. After additional contracting requirements were met, the Port issued a full NTP on June 6, 2014.

Over the next 14 months, Clearcreek implemented the cleanup action as defined in the Contract Documents. A description of each of the major components of the cleanup is provided below in Sections 4.4 through 4.12. The final asphalt cover was placed in June 2015. After additional minor "punch-list" items were addressed and the majority of the required post-construction submittals were transmitted, the Port issued notice of Substantial Completion on August 20, 2015.

Throughout this construction period, PES provided weekly e-mail summaries of work completed and upcoming activities; copies of these e-mails are included in Appendix B.

4.4 Pre-Construction Submittals and Work Plans

As noted above, after Clearcreek was awarded the contract, they began to prepare a wide variety of pre-construction submittals and contract documents, including the following work plans included in Appendix C.

4.5 Health and Safety

Clearcreek prepared a site-specific health and safety plan (HASP) consistent with the requirements outlined in Section 01860 of the Project Manual (Safety Management). The HASP complied with the provision of the Port of Seattle Construction Safety and Health Manual, the Washington Department of Safety and Health (DOSH) Worker Health and Safety guidelines (WAC 173-340-810) and the federal Occupational Safety and Health Act (OSHA, 29 CFR 1900). All workers associated with the cleanup action were required to familiarize themselves with the HASP prior to starting work at the Property. The HASP was prepared prior to initiating construction and a copy of the final HASP is included in Appendix C.

Subcontractors and/or other non-PES personnel were responsible for preparing, providing, and signing their own project specific HASP, which also incorporated the Port's safety and health policies. Health and safety meetings associated with the cleanup action were conducted with all contractor's and subcontractor's construction personnel, and all other applicable personnel prior to the commencement of cleanup action activities. All personnel involved with the construction

attended a mandatory Port health and safety orientation. The Port conducted weekly site safety inspections that were attended by Port's and contractors' personnel.

4.6 Construction Stormwater Management

Stormwater runoff generated during construction activities was managed consistent with the following requirements:

- Section 02270 (Construction Stormwater Management) of the Project Manual. This section required the contractor to obtain coverage under Ecology's Construction Stormwater General Permit (CSWGP) and also to prepare a Stormwater Pollution Prevention Plan (SWPPP) that described the best management practices (BMPs) and treatment procedures for managing stormwater during construction (see Appendix C). Details of the required erosion and sediment control (ESC) measures are presented in Section 02270 of the Project Manual.

- Section 02405 (Waste Collection, Storage, Profiling, and Disposal). This section required the contractor to prepare a Construction Water Management Plan (see Appendix C) that described how construction water (e.g., dewatering water, contaminated stormwater runoff, decontamination water) would be managed either by:

  - On-site storage, treatment, and discharge to the King County sanitary sewer pursuant to the requirements of MDA No. 4315-01, obtained by the Port for this project (see Appendix D); or

  - Collected, containerized, and/or transported off-site for treatment and disposal at an approved and permitted facility.

In general, precipitation falling in portions of the site where the asphalt or concrete paving had been removed (e.g., areas of the TFA during demolition and excavation activities) was allowed to either infiltrate or was collected and stored prior to treatment and discharge. The treatment included oil/water separation, sediment removal, filtration, and carbon adsorption. Copies of the SMRs prepared and submitted (including the associated discharge sample analytical reports) pursuant to the requirements of the MDA are included in Appendix D. At the completion of the project, the tank sludge was sampled for waste disposal characterization. Twenty five drums of dangerous waste sludge were transported to the Clean Harbors Grassy Mountain, LLC facility in Grantsville, Utah for disposal. The laboratory analytical report is included in Appendix K, and the waste disposal documentation is included in Appendix G.

In other portions of the site, primarily the paved areas surrounding the exposed areas described above, runoff was managed in the Port's existing stormwater management and conveyance systems after application of the appropriate ESC measures including catch basin protection, sweeping, asphalt curbs and berms, straw wattles, stockpile covering and plastic sheeting. Also, all vehicles exiting the main TFA construction area were required to pass through a wheel wash and then exit the TFA through a stabilized egress road consisting of quarry spalls.

The Port conducted routine ESC inspections (typically daily) throughout the construction process; these inspections are documented in the daily field reports included in Appendix E.

4.7 Former Fuel Pipeline Decommissioning

This work element included decommissioning underground former fuel transfer pipelines within the TFAA. The historical drawings used to establish pipeline locations were included in the reference drawings included in the Project Manual (Appendix A) and included:

- Historical construction and as-built drawings provided by the Port dating back to the 1940s, when the Site was occupied by the U.S. Navy;
- Various drawings associated with Port construction and demolition projects; and
- As-built drawings prepared by the Port following previous construction projects.

Pipelines included in this work included those that ran within the former tank farm area (i.e., in the TFA), those that originated within the TFA and terminated on Piers 90 and 91, and those that ran north out of the TFA. Because the pipelines located in the TFA were decommissioned during the tank farm preparation phase of the project (Section 4.8 below), the removal, decontamination, and disposal or recycling of the pipeline materials are described in detail in Section 4.8.6 below.

For the pipelines that remained outside of the TFA, the decommissioning activities were defined by Section 02224 of the Project Manual and in Clearcreek's Pipeline Decommissioning Work Plan and consisted of preparatory activities, locating and exposing the pipelines (i.e., potholing), removing residual materials (e.g., oil, water, scale) from the pipelines, cleaning, grouting, and capping.

The preparatory activities before subsurface exploration and potholing began included: utility locating; establishing security fencing, barricades, and traffic/pedestrian control; providing worker safety and decontamination equipment; and preparing stockpile locations.

The pipeline decommissioning commenced on June 18, 2014. However, Clearcreek conducted the decommissioning work intermittently for a variety reasons, including but not limited to allocating work crews and equipment for other work elements related to the TFA construction project and the restricted access to the piers during the cruise line season. The pipeline decommissioning activities were completed on April 30, 2015. During decommissioning, a total of 50,318 gallons of oily water and sludge were removed from the pipelines and transported off-site for disposal at the Port-approved disposal facility, and a total of 12,604 feet of piping was cleaned, grouted, and capped.

During the potholing activity, a section of each pipeline was identified, and Clearcreek recorded pipe composition, length, and diameter and surveyed the top of the pipe elevation. After each excavation was completed and shored, a small hole was drilled into each pipe within the excavation, and a marine chemist tested for explosive gases. Once a pipeline section was cleared by the marine chemist, an access hole was cut into each pipe to determine the contents (i.e., sludge, oil, water). Clearcreek then removed a short section of each pipeline and removed the

contents using vacuum trucks and collected samples to characterize the contents for disposal. As the materials were removed, the vacuum trucks transported the materials off-site for disposal. A table summarizing the pipeline contents, the Emerald Waste Acceptance Forms, and the marine chemist's certificates are included in Appendix F; disposal records for the pipeline decommissioning activities are included in Appendix G.

After each pipeline was cleaned, it was grouted using a non-shrink controlled density fill (CDF), the end capped, the pothole excavations backfilled, and the asphalt surface replaced. A summary of the pipeline grouting quantities is included in Appendix F. A remote camera was used to video approximately 10 percent of the total length of the cleaned pipelines before they were grouted to determine if the cleaning was successful. The videos from this verification survey work are included on a DVD contained in Appendix F. If a pipeline was not sufficiently cleaned per the specifications, the cleaning was repeated until the pipeline was satisfactorily cleaned.

As-built drawings of the decommissioned pipelines are presented in Appendix H.

4.8 Tank Farm Preparation

Tank farm preparation work began in mid-June 2014 and continued into November 2014. The phrase "tank farm preparation" was used in the Contract Documents and throughout the construction process to describe those work elements used to prepare the TFA for installation of the cutoff wall, LNAPL recovery trenches, and the final asphalt cover. As described below, however, several of the "preparation" steps involved the cleanup of pipelines, tank bases and removal of HCS. The tank farm preparation work included the following major activities:

- Established and operated construction stormwater management systems (See section 4.6);
- Removed and abated regulated building materials;
- Demolished aboveground structures including buildings M-25, and M-27, and electrical Substation 11;
- Decommissioned monitoring wells and vapor probes;
- Removed existing asphalt pavement and underlying base course and stockpiled these materials for reuse as engineered fill;
- Demolished and decontaminated tank bases;
- Exposed, removed, decontaminated, and disposed of fuel pipelines;
- Demolished subsurface structures including concrete slabs, footings, walls, and concrete structures associated with stormwater sumps, oil/water separators, and utilities;
- Excavated, loaded, hauled, profiled and disposed of HCS, including oil-saturated sand located beneath some tank bases;
- Excavated an exploratory trench to locate and remove obstructions from along the cutoff wall alignment;
- Managed and disposed of other waste materials encountered during the above tasks; and
- Placed engineered fill to the grade required to construct the cutoff wall.

These phases of the tank farm preparation work are described in detail below.

4.8.1 Hazardous Materials Abatement

Prior to the start of building demolition activities, a new electrical substation located near the northwest corner of the TFA was constructed by the Port, and existing Substation 11 was de-energized. Regulated materials identified during pre-construction surveys were abated in existing Substation 11 and other remaining buildings in accordance with Sections 01315 (regulated materials), 02085 (asbestos abatement), 02075 (lead controls in construction and demolition), 02082 (removal and disposal of fluorescent lamps), 02083 (fugitive and silica dust control procedures) and 02081 (PCB Component Removal and Disposal) of the Project Manual and Clearcreek's Regulated Materials Work Plan(s). Specific regulated materials removed included asbestos from the interior electrical panels in Buildings M-25 and M-27. Regulated materials reports and disposal records are included in Appendix I. Argus Pacific determined, based on a visual inspection, that the electrical equipment on the North side of Building M-25 that was previously suspected to be PCB-containing did not contain PCB material.

4.8.2 Demolition of Above-Ground Structures

Following abatement of the regulated materials, the following above-ground features were removed or demolished:

- Permanent fencing near the former OWS in the northwest corner of the TFA;
- Substation 11;
- The above-ground components of Buildings M-25 and M-27;
- The concrete loading ramp on the east side of Building M-27;
- The surface piping from the surface vault on the east side of Building M-27 and the above-ground components of the vault;
- The pumps from within the four stormwater vaults (after decommissioning the power), and the concrete blocks from around the vaults;
- The above-ground stormwater conveyance pipes (including, as necessary, the management of any pipe gaskets that contained asbestos), and connections to existing stormwater and/or sanitary sewer systems; and
- The foam hydrants (on the east and south sides of the TFA), and any remaining above-ground foam system components.

Construction debris for off-site disposal was transported to Regional Disposal/Republic Services, and the disposal documentation is included in Appendix G. The waste included five drums of lead-contaminated construction debris from Building M-27 that were transported for disposal to Waste Management's facility in Arlington, Oregon.

4.8.3 Monitoring Well Decommissioning

Prior to removal of the existing asphalt cap, 12 monitoring wells and 6 vapor monitoring points within the cutoff wall alignment (CP_PR-01 through CP_PR-12, and VP-1 throughVP-6) and one monitoring well located outside the cutoff wall alignment (UT_MW39-2) were decommissioned in accordance with Chapter 173-160 WAC by overdrilling with a hollow-stem auger while the casing was pulled. The overdrilled boreholes were filled with bentonite to within 1 ft of the ground surface, and the upper 1 ft of UT_MW39-2 was filled with concrete to match the existing pavement. One compliance monitoring well (UT_MW39-3) was inadvertently decommissioned (incorrectly believed to be UT_MW39-2). This is further documented in Section 7.0.

Well decommissioning logs are presented in Appendix J.

4.8.4 Existing Surface Asphalt and Overburden Removal and Stockpiling

The next phase of work was to remove the existing asphalt cover and the underlying fill that was placed over the former tank farm surface remaining following the 2005 demolition of the majority of the above-ground structures in the tank farm. Construction Drawings C015 and C016 (contained in the Project Manual in Appendix A) show the area and approximate thickness of these materials. As described in Section 4.2 above, this material was not expected to be contaminated and could be managed within or outside of the AOC. In general, the existing asphalt was stockpiled within the TFA for future crushing, while the underlying fill was transported to a stockpile area that was created north of the TFAA for managing non-contaminated materials and later reused as fill at the site (see Stockpile Plan in Appendix C for details). A total of 3,843.6 tons of asphalt was crushed and re-used (see summary in Appendix L).

4.8.5 Tank Base Demolition, Decontamination, and Oil Sand Removal

Construction Drawing C017 (contained in the Construction Documents in Appendix A) shows the steel tank bases remaining after the 2005 demolition activities were complete. Note that the bases for Tanks 113 and 114 in the Small Yard were thought to have been removed in 2005, but were encountered during the current work. With the exception of Tanks 113 and 114, the remainder of the tanks in the Small Yard (Tanks 105-112 and other smaller tanks) were removed in 2005.

After the steel tank bases were exposed by removing the clean overburden, the tank bottoms were cut or torn into manageably sized pieces and removed from the soil and/or concrete pads beneath the tank bases and stockpiled within the AOC. For tanks that were not formerly used to manage dangerous wastes (Tanks 91-93, 95, 101-104, and 113), the bases were stockpiled or direct-hauled off-site for recycling. For tanks that were identified as having been in contact with or managed dangerous wastes at some point in their history (Tanks 90, 94, 96-100, and 114), the bases were decontaminated consistent with the *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Ecology, 2001) and then recycled. Specific decontamination procedures are described in Clearcreek's Decontamination Plan included in Appendix C. The decontamination water was collected in the decontamination pit and pumped to a holding tank

and then transferred to the on-site construction water treatment system. A total of 284.55 tons of steel tank bases were removed and transported to Bloch Steel for recycling; the recycling tickets are included in Appendix G.

A layer of oil-saturated sand was present beneath some tank bases (i.e., oil sands). A total of 254.0 tons of oil sands, which were assumed to be HCS, were stockpiled, sampled for waste characterization, and hauled to Regional Disposal/Republic Services' disposal facility. The waste disposal documentation is included in Appendix G.

4.8.6 Pipeline Removal and Decontamination

This section describes the activities related to exposing, removing, and decontaminating fuel transfer pipelines located inside the TFA. See Section 4.7 above for a discussion of the decommissioning activities for fuel transfer pipelines located outside the TFA. Construction Drawing C016 (see Appendix A) shows the location of the majority of the pipelines that were removed during this phase of the work, although numerous other previously unidentified pipelines were encountered throughout the TFA.

When fuel transfer pipelines were encountered, they were removed using the excavator and broken into manageably sized pieces and stockpiled within the TFA. Once a sufficient quantity of pipelines were stockpiled, they were transferred to the decontamination area where they were pressure washed to remove excess oil and contaminated soil (if necessary based on recycling facility acceptance standards). The decontaminated pipelines were placed in steel bins and transported off-site for recycling. A total of 18,923.5 feet (162.70 tons) of piping were cleaned and removed from the TFA. The recycling tickets are included in Appendix G.

4.8.7 Demolishing of Subsurface Structures

Once the tank bases and pipelines were removed from an area of the TFA, Clearcreek removed the remainder of the below-grade structures and utilities. Construction Drawing C016 (Appendix A) shows the majority of the utilities (e.g., water, electrical, storm drains, foam system) and Construction Drawing C018 shows the subsurface concrete structures that were encountered. As with the fuel transfer pipelines inside the TFA, numerous additional previously unidentified utilities and subsurface structures were also encountered. Specific activities related to subsurface structures included:

- Decontaminating free product observed on concrete surfaces before demolishing;
- Saw-cutting the containment wall footing at the north and south ends of the east side of Building M-28 to preserve the 15-ft high concrete retaining wall and foundation that forms the approximately 165-ft long east wall of Building M-28;
- Demolishing the 12-ft wide containment wall footings around the Black Oil Yard and Marine Diesel Oil Yard;
- Demolishing the footing for Firewall A, which formed the north and east sides of the Small Yard;

- Demolishing the footing for Firewall B, which formed the south and west sides of the Small Yard adjacent to the former Pipe Alley;
- Demolishing miscellaneous other retaining walls and footings that were in or adjacent to the Small Yard;
- Demolishing the concrete slabs, ring beams, individual footings, and pits associated with former tank bases;
- Demolishing the concrete slab, and concrete pipe/equipment supports located between the former tank bases present throughout the three oil yards;
- Demolishing: (1) the six stormwater vaults inside and outside the three oil yards, (2) the approximately 9-ft deep sump and base located close to the north wall of Building M-28, which was filled with gravel during the 2005 mitigation, and (3) the pit approximately 3-ft below grade, west of the Small Oil Yard, which was backfilled during the 2005 tank farm demolition project;
- Demolishing foundations associated with former Buildings 16, 17, 24, 26, and 30, Buildings M-25 and M-27, and former Substation 11;
- Excavating and stockpiling for reuse as engineered fill soil placed inside the former OWS during the 2005 demolition work, and demolishing the walls and base of the former OWS. A total of 48.87 tons of chlorinated solvent and PCB-contaminated soil excavated from directly beneath and adjacent to the concrete walls of the former OWS were transported to US Ecology for disposal following a CID received from Ecology on August 26, 2014. The PES CID Request and Ecology CID letter are included in Appendix I.
- Removing HCS encountered throughout the TFA adjacent to and beneath the demolished concrete structures. See Section 4.8.8 below for discussion of HCS management;
- Breaking up the demolished concrete and asphalt to a size suitable for the on-site crushing equipment (see Section 4.8.9 below);
- Installing temporary sheeting and shoring as required to remove some of the deeper structures, to protect adjacent structures outside the TFA and utilities that were to remain in place, and to reduce inflow of groundwater during excavation below the water table. Clearcreek prepared a Sheeting and Shoring Plan that referenced each location where it was employed in applicable areas (Appendix C);
- A concrete vault and associated manhole were encountered in the vicinity of M-17. Soil and material removed from the vault and manhole were sampled for waste disposal characterization. Ten super-sacks of dangerous waste soil and two drums of dangerous waste liquids were transported to the Clean Harbors Grassy Mountain, LLC facility in Grantsville, Utah for disposal. Debris (concrete) associated with the removal of the vault was sampled for waste disposal characterization. A total of 13.46 tons of contaminated debris was transported as hazardous waste to Waste Management's Arlington, Oregon facility for disposal. The manhole was filled with CDF. The laboratory analytical reports are included in Appendix K and the waste disposal documentation is included in Appendix G; and

- Managing groundwater where encountered during removal of structures and the associated excavation work. In some cases, the excavations were performed "in the wet" (e.g. the former OWS), with groundwater maintained above the bottom of the excavation for stability purposes. If LNAPL was present on the water table in these excavations, it was collected or adsorbed using pads and removed and profiled for off-site disposal at an approved facility. In other cases, dewatering systems were designed to reduce groundwater inflow as necessary to provide a stable excavation bottom and provide a reasonably dry base of excavation. Removed groundwater was managed as described in Section 4.6 and treated and discharged to the sanitary sewer under a permit with KCIW (see Appendix D).

4.8.8 Highly Contaminated Soil Excavation

As described in Section 4.2, the Port's framework for managing soil, debris, and other materials included the concept of excavating HCS encountered during the cleanup action implementation. HCS was defined as soil that was, "visibly and highly contaminated with petroleum" (i.e., product-saturated soil). The determination of what soil was and was not HCS was primarily made by PES personnel present on-site throughout the cleanup work. When HCS was encountered, it was excavated and stockpiled inside of the AOC, tested to characterize and profile the material, and disposed of off-site. As noted previously, HCS included (by definition) sand or pea gravel between the bases of former tanks with multiple bases.

Excavation of HCS continued downward vertically until either non-HCS or the water table was encountered, whichever was first. Excavation of HCS extended horizontally until non- HCS or the edge of the TFA was encountered, whichever was first.

A total of 6,645.86 tons of HCS was removed from the TFA. Waste characterization laboratory analytical reports are included in Appendix K. Disposal tickets for this material are included in Appendix G.

Construction personnel noted a nuisance odor associated with an area of soil northeast of the Small Yard. A characterization sample indicated the soil was contaminated with a low-level of acetone. Although not HCS, 155.94 tons of this soil were excavated and transported to Republic Services' Roosevelt Regional Landfill for disposal after receiving a CID letter from Ecology on September 26, 2014. The CID request and Ecology letter are included in Appendix G.

4.8.9 Concrete and Asphalt Crushing

The concrete and asphalt generated during the various activities described above were stockpiled within the AOC. Once all of the concrete and asphalt was stockpiled, Clearcreek mobilized a crushing system to process the material into a gradation suitable for engineered fill. A total of 6,211.5 tons of concrete and 3,843.6 tons of asphalt were crushed and stored on-site for use during the final grading phase of work. The crushed material summaries are included in Appendix L. The rebar present in the concrete was removed, collected, and recycled.

4.8.10 Backfill and Grading

Once the work described above was completed and all of the subsurface structures, tank bases, pipelines, and utilities were removed, the overall TFA was backfilled with available fill (primarily the clean fill previously removed from beneath the existing asphalt cover) to a nominal elevation of approximately 18 ft. This provided a generally level and stable working surface to conduct the remaining work within the TFA. Krazan conducted compaction testing during the backfilling process; these test reports are included in Appendix L. HWA Geosciences, a PES subcontractor, also conducted period compaction testing in a CQA capacity; their testing reports are included in Appendix M.

4.8.11 Exploratory Trench Excavation

Following the completion of the TFA preparation activities (removal of all below-grade concrete, piping, and other structures, and backfilling/re-grading of the TFA), an approximately 2-ft wide exploratory trench was excavated along the alignment of the cutoff wall to identify and remove obstructions (e.g. structures, debris, pipelines and utilities) that had not been encountered by the prior work and that could affect the construction of the cutoff wall. Construction Drawing C019 (Appendix A) shows the alignment of the exploratory trench, and Clearcreek's method for excavating the exploratory trench is described in the Exploratory Trench Work Plan (Appendix C). The exploratory trench excavation included the following:

- Excavating the exploratory trench to an elevation of at least 11 ft or less (approximately 7 ft below surrounding grades);
- Removing soil that was classified as HCS and managing as described above for disposal;
- Stockpiling the remaining (i.e., non-HCS) soil removed from the exploratory trench. The purpose of this was to maintain a stock pile of material that was similar in consistency to the material removed from the trench itself. Where HCS was encountered and removed, additional backfill was used as needed.
- Removing any obstructions encountered. The exploratory trench encountered a number of obstructions, including several large logs or stumps, timbers, several large pieces of concrete, and several buried pipes or utilities not previously removed. These obstructions were managed consistent with the other materials removed from the TFA.

4.9 Cutoff Wall Construction

Following completion of the TFA preparation activities, the cutoff wall was constructed around the perimeter of the TFA, along the same alignment as the exploratory trench. The objectives of the cutoff wall were to:

1. Prevent migration of LNAPL from the TFA;
2. Prevent groundwater from flowing through the former tank farm source area; and
3. Be compatible with the final cover system.

To meet these requirements, the cutoff wall was designed, as follows:

- A top elevation of 15.2 to 15.6 ft and a bottom elevation of -0.7 ft (i.e. a total wall height that varies from 15.9 to 16.3 ft);
- An upper 2 ft section made from soil-cement-bentonite (SCB) with a minimum width of 6 ft and a hydraulic conductivity of 10^{-6} centimeters per second (cm/sec) or less; and
- A lower section made from soil-bentonite (SB) with a minimum width of 2 ft, and a hydraulic conductivity of 10^{-7} cm/sec or less.

Construction Drawings C021 through C025 (Appendix A) provide details on the cutoff wall alignment, and Clearcreek's approach for installing the cutoff wall is described in their Cutoff Wall Work Plan (Appendix C). Prior to initiating construction of the cutoff wall, approximately 1,541 tons of low permeability soil and 230 tons of bentonite were imported to the site. Slurry for use during construction of the wall was prepared at Clearcreek's main facility in Marysville and transported via tanker truck to the site, where it was stored in a 20,000-gallon above-ground storage tank.

Clearcreek began the trenching operation about 20 feet to the east of Station 0+00 with a lead-in trench sloped at 1:1 that reached the cutoff wall base elevation about 5 feet before Station 0+00 (at Station -0+05). The cutoff wall was excavated in a continuous fashion around the alignment until the wall was completed at Station 13+53, where it crossed and overlapped the original wall segment at Station 0+00.

Throughout the construction of the cutoff wall, both Clearcreek personnel and PES and Port CQA inspectors made detailed observations and measurements, and conducted the required CQC and CQA testing of the cutoff wall and construction materials. Clearcreek's CQC activities are presented in their Cutoff Wall QA/QC Final Report included in Appendix N. PES's CQA field observations and testing, as well as HWA Geosciences laboratory testing results, are also included in Appendix N. The as-built alignment of the cutoff wall is presented in Appendix H.

During the construction of the cutoff wall, several issues came up that required correction and/or modification of the cutoff wall design, including:

- Sloughing of the trench walls to a depth of about 12 ft below the top of the SCB cap between approximately Stations 3+30 and 3+45. The sloughing resulted in the width of the cutoff wall increasing to a maximum of about 5.5 feet compared to the planned width of 2 to 2.5 feet. This issue and the repairs necessary to address the sloughing are described in Non-Conformance Report (NCR) No. 2, which is contained in Appendix M.1 of the Cutoff Wall QA/QC Final Report included in Appendix N.

- The width of the top of the soil-bentonite portion of the cutoff wall was measured to be greater than the nominal design width of 24 inches, ranging from a minimum of 32 inches to 45 inches or more. This issue, the design modifications, and required corrective actions are described in NCR No. 3, which is contained in Appendix M.2 of the Cutoff Wall QA/QC Final Report in Appendix N.

- The QA/QC testing of the unconfined compressive strength of the SCB portion of the cutoff wall showed that the SCB in some sections of the wall did not achieve the specified minimum 28-day strength of 70 pounds per square inch (10,000 pounds per square foot). This issue, the approach used to assess which sections required repair, and the approach for conducting the repairs are described in NCR No. 5, which is contained in Appendix M.3 of the Cutoff Wall QA/QC Final Report in Appendix N.

After Clearcreek addressed these issues, the QA/QC testing results indicated that the cutoff wall was completed consistent with the overall design requirements or parameters, and in particular that the hydraulic conductivities of the soil-bentonite (SB) portion of the cutoff wall were less than 10^{-7} cm/sec.

4.10 Enhanced LNAPL Recovery System Installation

This part of the cleanup included installation of LNAPL recovery trenches in areas most likely to contain recoverable LNAPL. The objective of the LNAPL recovery system was to remove recoverable LNAPL to the extent practicable using passive recovery techniques. Two trenches were installed inside the cutoff wall alignment (LNAPL Trench 2 and LNAPL Trench 3), and one trench (LNAPL Trench 5) was installed in the former fuel line area directly west of the TFA. The design criteria for these trenches included:

- Extending the LNAPL recovery trenches above and below the seasonal water table to allow for potential year-round accumulation and recovery of LNAPL;

- Installing granular trench backfill with higher permeability than surrounding sandy soil to promote LNAPL accumulation in the trench (the HWA sieve analysis testing report is included in Appendix M); and

- Locating trenches near monitoring wells with accumulations of recoverable LNAPL since 2010.

The as-built locations of the LNAPL recovery trenches are shown in the as-built drawings included in Appendix H. As shown on Construction Drawing C026 (Appendix A), the original design included five trenches (four inside the cutoff wall and one outside). Due to conditions observed during the TFA preparation work described in Section 4.8, and after consultation with Ecology, Trenches 1 and 4 were determined not to be necessary. In the Trench 1 area, the excavation of extensive amounts of HCS in this area effectively removed LNAPL down to the water table, and the recovery trench was no longer required. In the Trench 4 area, it was determined that based on relatively limited quantities of LNAPL being observed on the water table in excavations in this area, that a single recovery trench would be sufficient.

4.11 Final Cover and Stormwater Management System

The new asphalt cover and associated stormwater management system was constructed after the cutoff wall and LNAPL trenches had been constructed. As-built drawing 7 in Appendix H shows the final site grades and locations of stormwater management structures. The final cover was constructed based on the following design objectives:

- Minimize infiltration of precipitation and prevent direct contact with residual contaminants;
- Grade at a minimum slope of 2 percent to promote storm water runoff, and a maximum slope of 5 percent, to ensure site usability;
- Match existing perimeter grades to the extent practicable;
- Provide a 5-ft wide walkway along the north side of Building M-28 to maintain access to a doorway near the northeast corner of the building. A gravity block retaining wall was constructed to provide grade separation between the final cover and the walkway;
- Provide a minimum separation of 2 feet between the top of the cutoff wall and final grade to enable the pavement to bridge the slurry wall. This bridging was enhanced by constructing the top of the cutoff wall from SCB and placing geogrid layers across the top of the cutoff wall. Select granular fill was placed above the geogrid layers to ensure interaction between the soil and geogrid;
- Provide that the final cover section above the TFA general fill would be consistent with the Port's standards for trafficked areas, consisting of:
  - A 4-in. thick layer of compacted Class B hot mix asphalt;
  - A 4-in. thick layer of ¾-in. minus crushed rock base course; and
  - A 4 -in. thick layer of 1½-in. minus crushed rock subbase.

The final cover grades were adjusted as needed to effectively utilize all of the cleanup material volumes that were suitable for reuse (e.g., non-HCS soil, crushed concrete, and crushed asphalt).

From a stormwater management standpoint, the cover system drains all storm water to outside the cutoff wall alignment per the design criteria. The cover is divided into five drainage areas. The portion that drains west was integrated with the existing storm water management system in Coontz Avenue. The remaining portions of the cover, on the north, east, and south sides, drain to shallow 10-ft wide collection swales built into the final cover outside the cutoff wall alignment. The swales have been designed with longitudinal slopes of approximately 1 percent, and discharge into a series of collection basins and manholes at the low points to enable the runoff to be captured and conveyed to the new OWS and water quality treatment vault installed in the southeast corner of the TFA.

4.12 Environmental Covenant

Institutional controls are a required component of the cleanup action, since contaminants exceeding the cleanup levels described in the CAP will remain within the TFAA. Institutional controls will consist of a restrictive covenant developed consistent with Ecology's Model Restrictive (Environmental) Covenant[2] in the real property records to notify potential purchasers

[2] Ecology's Model Restrictive (Environmental) Covenant can be found at: www.ecy.wa.gov/programs/TCP/vcp/vcp_boilerplates/Model%20Covenant%20(Quick%20Fix)%20(2).doc

of the Property of this cleanup action. A draft of the environmental covenant is included in Appendix O.

The environmental covenant will limit activities that may create a new exposure pathway (e.g., direct contact with soil and vapor migration to indoor air), result in release of hazardous substances, or interfere with the integrity of the cleanup action without Ecology's written approval. As described in the CAP, future development in the portion of the T91 facility covered by the environmental covenant will have to consider the indoor air pathway and incorporate engineering controls (e.g., vapor barriers) as appropriate, or conduct a development-specific evaluation of the soil/groundwater to indoor air pathway to control potential exposures.

4.13 Financial Assurance Cost Estimate Statement

WAC 173-340-400(6)(c) requires that a copy of the financial assurance document and any procedures for periodic adjustment to the value of the financial assurance mechanism be included in the implementation report, except where it has not already been submitted under an order or decree or as part of another previously submitted document. The Port already has submitted financial assurance documents, including annual adjustments for inflation, under the AO for the Site. The most recent cost estimates and financial assurance documents were submitted to Ecology on June 1, 2015. The AO requires adjustments to the financial assurance documents annually and/or whenever a substantial change to the work to be performed requires an amendment to the AO. Because the financial assurance documents already have been submitted to Ecology, they are not being provided in this implementation report. The next adjustment to the financial assurance documents is anticipated to be provided to Ecology by the end of May 2016, or sooner if a substantial change to the work to be performed requires an amendment to the AO.

5.0 CONSTRUCTION QUALITY CONTROL AND QUALITY ASSURANCE

This section of the report describes CQA and CQC implemented during the Cleanup Action.

5.1 Definition of Construction Quality Assurance and Construction Quality Control

5.1.1 CQA

CQA is a planned and systematic pattern of procedures and documentation designed to provide confidence that items of work or services meet the requirements of the contract documents. It includes observation and testing of work performed by the contractor or their subcontractors and was performed by the Port field inspectors and the CQAC, which in this case was PES and their selected sub-consultants.

5.1.2 CQC

CQC is comprised of actions that provide a means to measure and regulate the characteristics of an item or service to comply with the requirements of the contract documents. CQC was performed by Clearcreek or their subcontractors.

5.2 Construction Quality Assurance

CQA services were guided by a CQA Manual. The majority of CQA services consisted of observing the contractors' work and documenting that the Project Manual requirements were met. The Port and PES provided on-site personnel that were responsible for observing the contractor's work and managing the construction contract. With the exception of the laboratory testing associated with the cutoff wall, limited CQA testing of materials was conducted.

5.3 CQA and CQC Summary

The following sections briefly summarize the results of the CQA and CQC work-by-work element. Unless specifically noted otherwise, the CQA activities conducted by the Port and PES consisted of observing and documenting the contractor's work and confirming the project requirements were being addressed.

5.3.1 General Requirements

Site clearing and preparation activities were observed by the Port and PES as they occurred. These activities were completed as the project progressed and generally completed in compliance with the design intent.

5.3.2 Former Fuel Pipeline Decommissioning

The primary CQC activity performed by Clearcreek was the video surveys of approximately 10 percent of the pipelines to document the condition of the pipelines after cleaning. The videos

and other documentation related to the pipeline decommissioning activities are included in Appendix F.

5.3.3 TFA Site Preparation

Section 4.8 describes the TFA site preparation activities. The primary CQC activities associated with these activities included waste disposal characterization testing (Appendix G) and fill compaction testing (Appendix L).

In addition to the general observation of TFA site preparation activities specific CQA activities included PES personnel observing the soil excavations throughout the TFA to distinguish HCS (which had to be disposed of off-site) from non-HCS (which was managed in the TFA and reused as fill). HWA conducted periodic compaction testing of fill in the TFA; these testing reports are included in Appendix M.

5.3.4 Asphalt and Concrete Cleaning, Crushing, and Screening

CQC testing associated with the crushed concrete and crushed asphalt consisted of sieve and compaction testing. These test reports are included in Appendix L.

5.3.5 Cutoff Wall

The CQC and CQA testing conducted for the cutoff wall construction are included in the documentation included in Appendix N.

5.3.6 TFA Final Grading, Final Cover, and Stormwater Management Systems

The primary CQC activities related to the final grading and cover included in-place compaction testing of the fill as the lifts were placed (Appendix L) and surveys of the grading to ensure that it conformed to the design grading plan. The final site survey information is reflected in the as-built drawings in Appendix H.

In some cases, proof rolling was utilized as a method to determine that compaction of various fill lifts was adequate. When this method was used, Clearcreek and the Port/PES both observed and documented the results. The Port and PES field notes documenting these observations are included in Appendix E.

6.0 RECORDKEEPING

The Port, CQAC, and contractors documented that quality control and quality assurance requirements were satisfied by observation, testing, and record keeping. Records consisted of daily reports, test reports, installation reports, photographic records, documentation of design and CQA revisions, and this report. Appendix E contains copies of the Port and PES field reports.

6.1 Daily Recordkeeping

The daily recordkeeping responsibilities associated with the CQA activities were divided between the Port's Inspector and the PES on-site representative. Daily reports were prepared that included the following information as appropriate:

- a date, project name, project number and location;
- a unique number for cross-referencing and document control;
- weather information;
- a description of all ongoing construction for the day in the area of the monitor's responsibility;
- an inventory of equipment utilized by the contractor;
- items of discussion and names of parties involved in discussions;
- a summary of materials received and quality documentation;
- follow-up information on previously reported problems or deficiencies; and
- a record of any site visitors.

In addition, Clearcreek prepared daily reports throughout the project; these reports are maintained on the Port's Livelink document management system.

6.2 Test Reports

Test reports were prepared by the CQA laboratories, CQC laboratories, and CQC field personnel. As described in Section 5, these various CQC and CQA test reports are provided in appendices to this report.

6.3 As-Built Records

Section 01730 of the Project Manual (Appendix A) required Clearcreek to prepare and maintain documentation of the as-built conditions throughout the project, including red-lining the Construction Drawings and related survey information. The as-built records were submitted to the Port via the Livelink document management system.

PES utilized these Clearcreek-provided records to prepare the as-built Record Drawings provided in Appendix H.

6.4 Photographs

Construction activities were photographed. Photographs included any significant problems encountered and actions taken to correct these problems, and general progress of the project. The daily reports in Appendix E include select photographs taken on the day the report was prepared.

7.0 DESIGN AND CQA MODIFICATIONS MADE DURING CONSTRUCTION

This section summarizes the significant design modifications made during construction. The significant design changes are reflected on the as-built drawings (Appendix H) and in the other relevant documentation included in the appendices. For these more significant design modifications, Ecology was made aware of the situation leading to the modification and the proposed design change or corrective action. The Port obtained Ecology approval of these changes prior to the contractor implementing them. In some cases, Ecology's approval was in the form of e-mail correspondence, but was often provided during weekly project meetings and documented in the meeting minutes, which are maintained in the Port's Livelink document management system.

Less significant changes, product substitutions, and other modifications that did not have a material effect on the function and performance of the cleanup action elements are not described in this report but are documented in submittals, requests for information, and other contract communications and maintained in the Port's Livelink document management system.

7.1 Design Modifications

The significant design changes that occurred during the course of the project include:

- **Cutoff wall related changes**:
  - The method of installing the cutoff wall was changed from the one-pass trenching method described in Section 02469 of the Project Manual to a method using standard excavation equipment and aboveground mixing of the SB and SCB mixtures prior to placement in the trench.
  - As described in Section 4.9, sloughing of the trench walls between Stations 3+30 and 3+45 resulted in the cutoff wall trench width increasing to a maximum of about 5.5 feet. This required a repair that included a thicker and wider SCB cap being placed over the SB wall, and the cement content of the SCB cap was increased for added strength. This issue and details of the repairs necessary to address this are described in NCR No. 2, which is contained in Appendix M.1 of the Cutoff Wall QA/QC Final Report in Appendix N.
  - As described in Section 4.9, the width of the top of the soil-bentonite portion of the cutoff wall was wider than the nominal design width of 24 inches, ranging from a minimum of 32 inches and ranging up to 45 inches or more. This condition required repairs that included a thicker and wider SCB cap being placed over the SB wall, additional reinforcing geotextiles being installed in certain locations, and the cement content of the SCB cap being increased for added strength. This issue, the design modifications, and required corrective actions are described in NCR No. 3, which is contained in Appendix M.2 of the Cutoff Wall QA/QC Final Report in Appendix N.

- The QA/QC testing of the unconfined compressive strength of the cutoff wall showed some areas of the wall did not achieve the minimum 28-day strength of 70 pounds per square inch (10,000 pounds per square foot). The corrective action for this issue was to excavate the under-strength SCB material and replace it with new SCB containing twice the specified cement content. This issue, the approach used to assess which sections required repair, and the approach for conducting the repairs are described in NCR No. 5, which is contained in Appendix M.3 of the Cutoff Wall QA/QC Final Report in Appendix N.

- **LNAPL Recovery Trench related change**. As shown in the Construction Drawing C026 (Appendix A), the original design included five trenches (four inside the cutoff wall and one outside). Due to conditions observed during the TFA preparation work described in Section 4.8, and after consultation with Ecology, Trenches 1 and 4 were determined not to be necessary. In the Trench 1 area, the excavation of extensive amounts of HCS in this area effectively removed LNAPL down to the water table, and the recovery trench was no longer required. In the Trench 4 area, it was determined that based on relatively limited quantities of LNAPL being observed on the water table in excavations in this area, that a single recovery trench would be sufficient.

- **Pier 90 Pipeline Change.** After initial attempts to locate several of the pipelines on Pier 90, the Port found additional drawings that showed these pipes were previously removed or decommissioned and eliminated the need to search for some of the pipes. This change resulted in fewer pipes requiring decommissioning than anticipated in the design

- **Stormwater system reconfiguration.** The new stormwater system drains the storm water from the new asphalt cover to outside the cutoff wall alignment, the majority of which is conveyed to the new OWS and water quality treatment vault installed in the southeast corner of the TFA. Due to the presence of significant underground utilities in this area, and utilities in locations different from what was expected, the configuration of these water quality vaults and the associated pipes and manholes were changed from that shown in Construction Drawings C028 and C032 (Appendix A) to avoid working in close proximity to the City of Seattle subsurface power lines. In addition, a new discharge line was added after the manhole downstream of the water quality vault that connected the new system to an existing storm drain manhole located on the south side the bridge. The final configuration of this system is shown in the as-built drawings included in Appendix H.

8.0 STATEMENT OF COMPLIANCE

Representatives of PES, Vista Consultants, specialty testing and inspection consultants, and off-site laboratories observed and tested the construction activities described in this Construction Report, reviewed documentation produced during the CQA work, and reviewed CQC data provided by the manufacturers and contractors, all under supervision of the Engineer of Record. On the basis of direct observations by PES, Vista, and special inspections and testing completed by their sub-consultants, PES concludes that construction of the Terminal 91 Tank Farm Affected Area Cleanup Action was constructed consistent with the Contract Documents issued for construction, and met the design intent.

9.0 REFERENCES

PES Environmental, Inc., and Roth Consulting. 2006. MNA Evaluation Final Technical Memorandum, Terminal 91 Tank Farm Site, Seattle, Washington. October 27.

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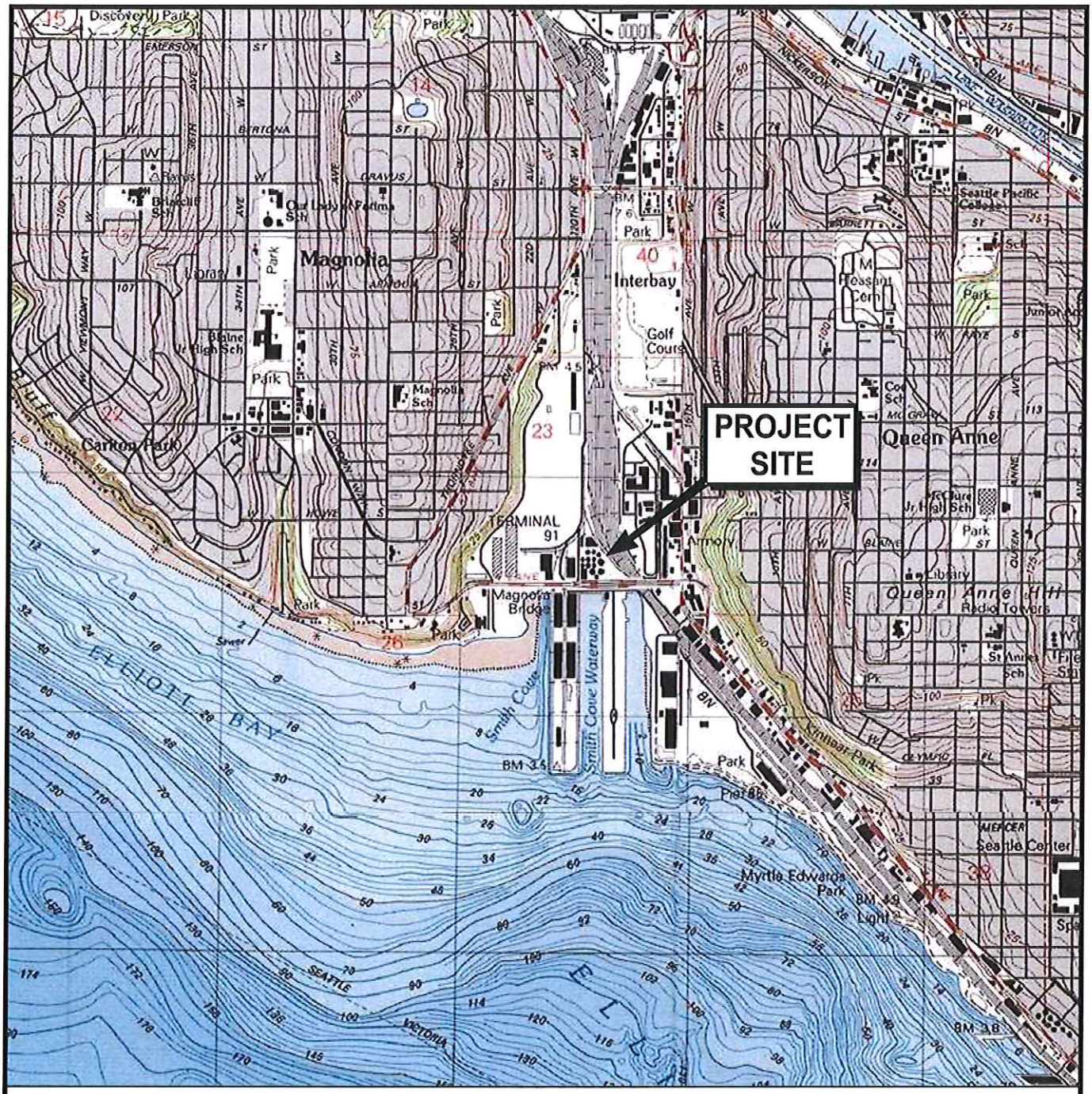


U.S.G.S. Topo Map - Seattle North W, WA, 7.5-minute quadrangle.1983

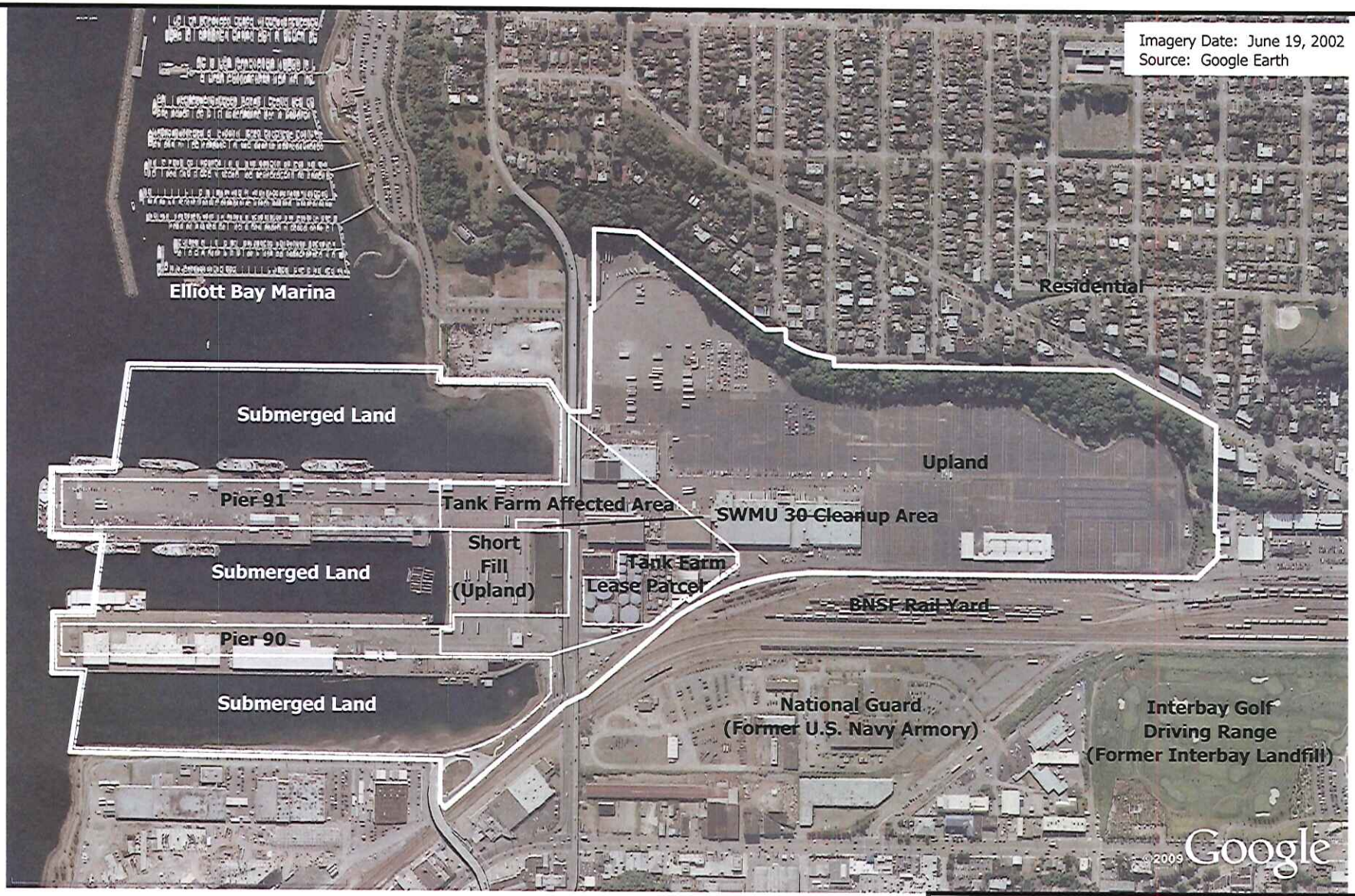
PES Environmental, Inc.
Engineering & Environmental Services

Site Location Map
Port of Seattle Terminal 91
Seattle, Washington

FIGURE
1

948.007.08.004	94800708004_CR_1	BLO	9/17
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE

94800708004_CR_2



Note:

N

0 700 feet

The locations of all features are approximate.

Explanation

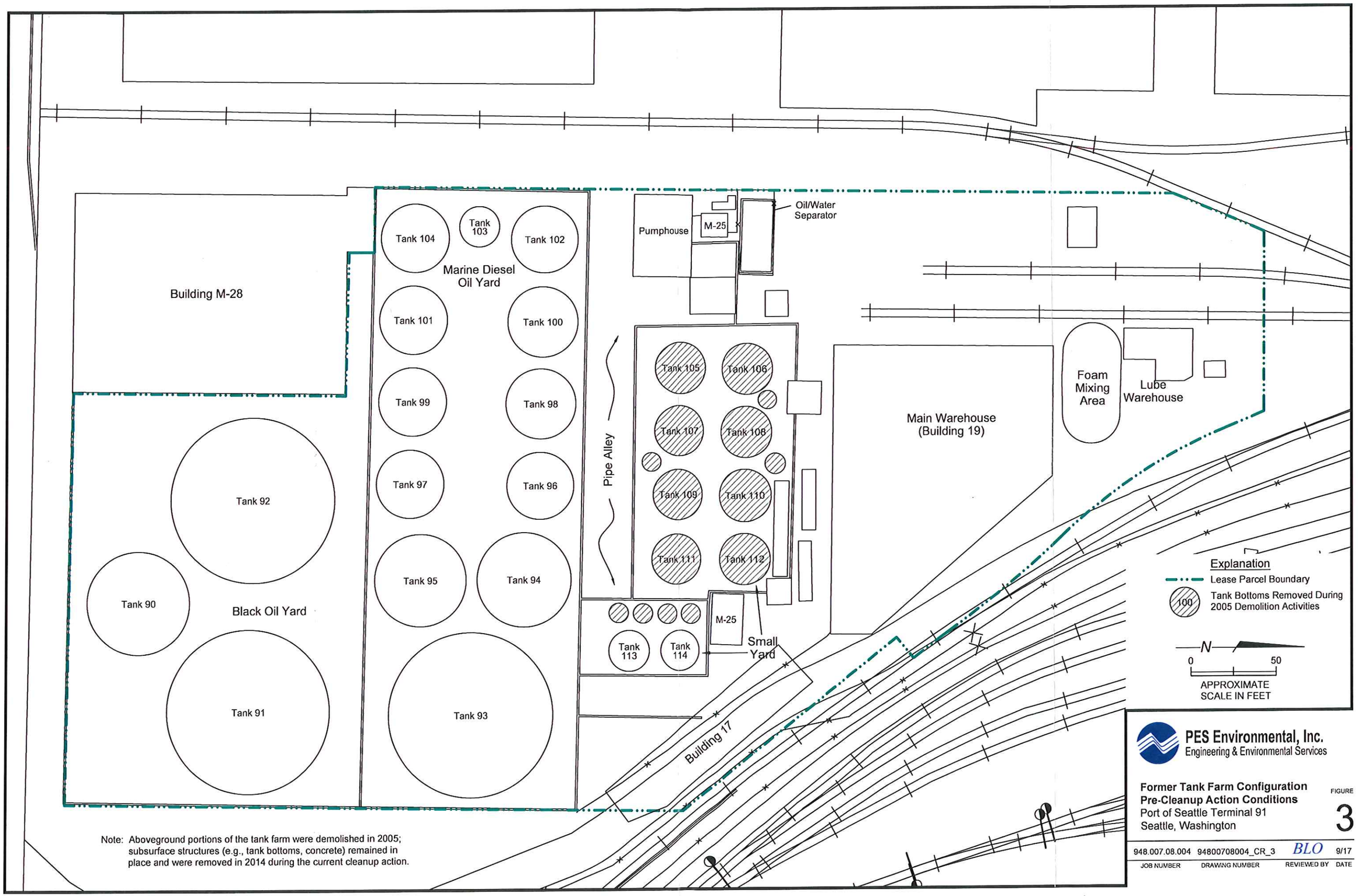
- Port of Seattle Property Limits
- Tank Farm Lease Parcel
- Tank Farm Affected Area
- Submerged Land

PES Environmental, Inc.
Engineering & Environmental Services

FIGURE 2

Port of Seattle Terminal 91 Facility
Port of Seattle Terminal 91
Seattle, Washington

948.007.08.004	94800708004_CR_2	BLO	9/17
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE



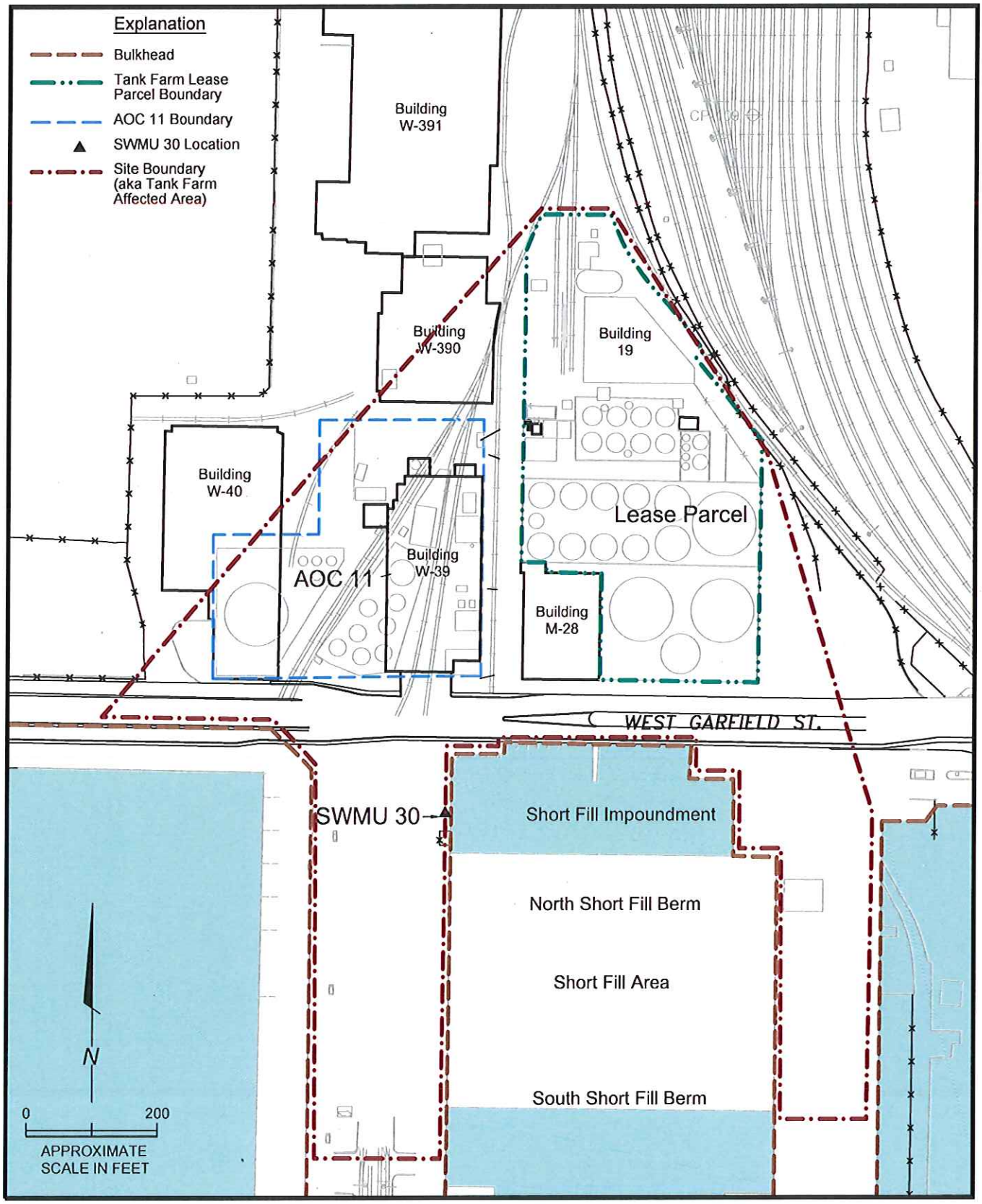
Note: Aboveground portions of the tank farm were demolished in 2005; subsurface structures (e.g., tank bottoms, concrete) remained in place and were removed in 2014 during the current cleanup action.

PES Environmental, Inc.
Engineering & Environmental Services

Former Tank Farm Configuration
Pre-Cleanup Action Conditions
Port of Seattle Terminal 91
Seattle, Washington

FIGURE
3

948.007.08.004	94800708004_CR_3	BLO	9/17
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE

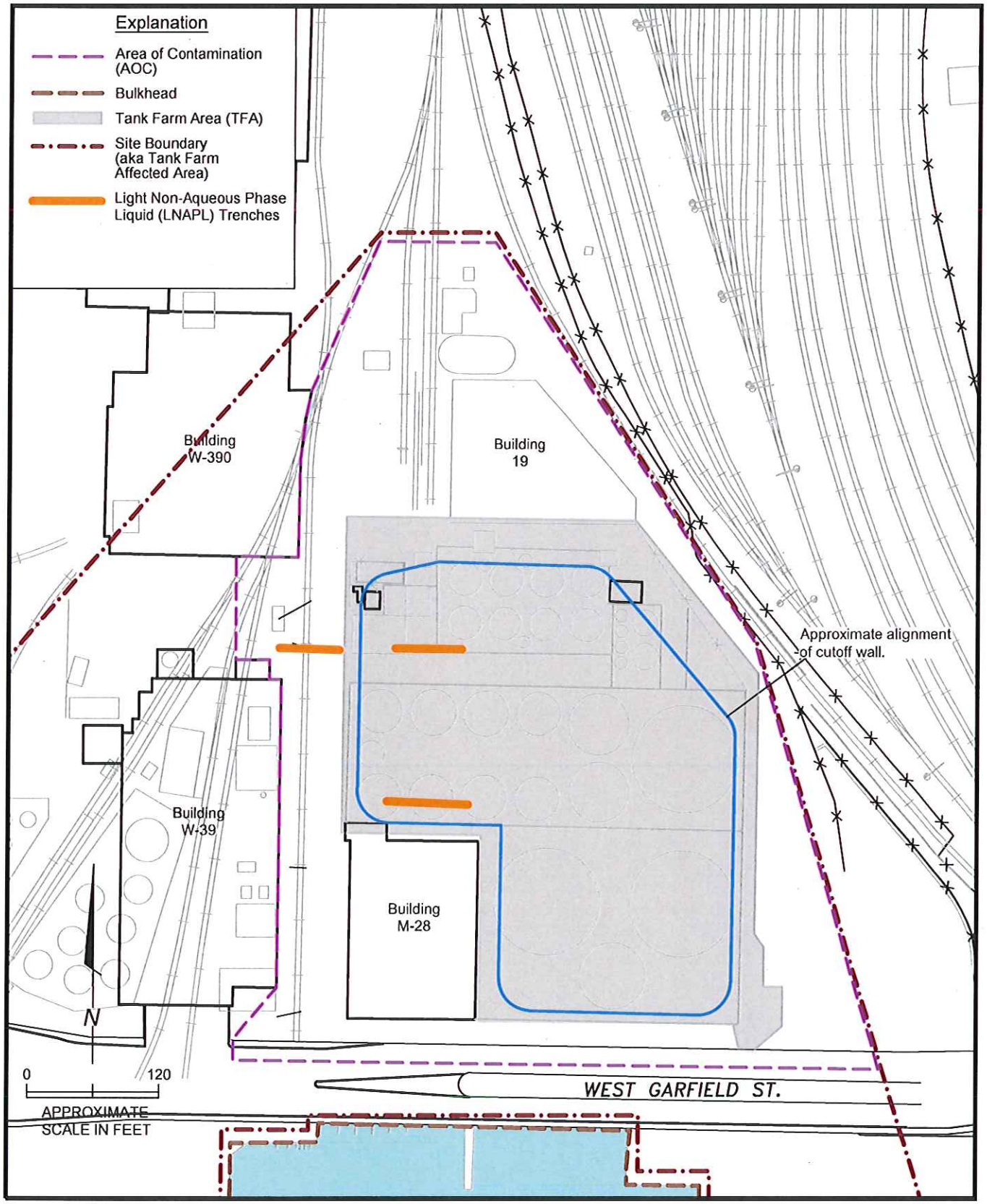


PES Environmental, Inc.
Engineering & Environmental Services

Site Plan
Port of Seattle Terminal 91
Seattle, Washington

FIGURE
4

948.007.08.004	94800708004_CR_4	BLO	9/17
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE



PES Environmental, Inc.
Engineering & Environmental Services

Area of Contamination and Tank Farm Area
Port of Seattle Terminal 91
Seattle, Washington

FIGURE
5

948.007.08.004	94800708004_CR_5	*BLO*	9/17
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE

APPENDICES

The following appendices are included on the attached Disk 1:

Appendix A – Construction Contract Documents (Contract MC-0317586)
- Project Manual
- Project Drawings
- Addenda

Appendix C – Clearcreek Contractors' Work Plans
- Asphalt and Concrete Stockpile Plan
- Construction Water Management Plan
- Cutoff Wall Work Plan
- Decontamination Plan
- Exploratory Trench Work Plan
- Health and Safety Plan
- LNAPL Recovery Trench Work Plan
- Pipeline Decommissioning Plan
- Pollution Prevention Plan
- Quality Control Plan
- Regulated Materials Plan
- Sheeting and Shoring Plan
- Stockpile Plan
- Stormwater Pollution Prevention Plan
- Traffic Control Plan; and
- Transportation and Disposal Plan

Appendix D – KCIW Discharge Documentation
- KCIW Wastewater Major Discharge Authorization (MDA) No. 4315-01
- Self Monitoring Reports
- Discharge Sample Laboratory Analytical Reports

Appendix E – Daily Field Reports
- Port of Seattle Daily Field Reports
- PES Daily Field Reports

Appendix F – Pipeline Decommissioning Documentation
- Summary Table of Pipeline Contents
- Marine Chemist Certificates
- Summary Table of Grout Quantities
- Emerald Waste Acceptance Form
- APS Video Documentation files are included on Disk 2

Appendix G – Waste Disposal Documentation
- Waste Disposal Summary Table
- Waste Disposal Tickets and Manifests
- Block Steel Recycling Tickets
- Contained In Determination Documentation

APPENDICES (CONTINUED)

The following appendices are included on the attached Disk 1:

Appendix I – Regulated Materials Reports
Appendix J – Well Decommissioning Records
Appendix K – Waste Disposal Characterization Laboratory Analytical Reports
Appendix L – Construction Quality Control Documentation
- Krazan Fill Compaction Density Testing Reports
- Laboratory Testing Reports
- Crushed Materials Summaries for Asphalt and Concrete

Appendix M – Construction Quality Assurance Documentation
- HWA Field Test Reports
- HWA Laboratory Testing Reports

Appendix N – Cutoff Wall Construction Documentation
- Clearcreek's Cutoff Wall Final Report
- HWA Laboratory Testing Reports
- PES Cutoff Wall CQA Tables

The following appendices are included on the attached Disk 2:

Appendix F – Pipeline Decommissioning Documentation (partial)
- APS Video Documentation

APPENDIX B

Weekly Construction Updates

Kelly Rankich

From: Brian O'Neal
Sent: Friday, June 13, 2014 4:42 PM
To: Caron, Greg (ECY)
Cc: Heilgeist, Stacy; Chou, Fred; 'Bahnick, Kathy'; susanjroth@comcast.net; Roger North; Kelly Rankich; Russell Stolsen
Subject: T-91 Tank Farm Cleanup - Construction Update #1 (June 13th)
Attachments: 2014-06-13 11.53.34.jpg; 2014-06-13 13.17.33.jpg; 2014-06-13 11.57.59.jpg

Greg –

Please find below this week's update regarding the construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of June 9th)

- This was the first full week of work since the Notice to Proceed was issued by the Port last Friday.
- The majority of the work this was related to initial site preparation and mobilization.
- Limited invasive/subsurface were conducted including
    - Clearing the overburden (asphalt, clean fill) in the proposed contaminated soil stockpile area south of Building M-27 (see photo 11.53.34 [last series of numbers in the file name])
    - Test pitting to locate pipelines so the locator can clip on and trace (see Photo 13.17.33)
    - Installation of the wheel wash unit
- Soils were stockpiled on site consistent with the stockpile plan (see photo 11.57.59) – note that piles were still in use and will be covered when work completed today
- Regulated materials (asbestos, lead paint) abatement for Buildings M-25, M-27, and Substation 11 began prior to building demolition next
- Port Construction Services began subsurface work (concrete demolition, excavation) associated with replacing Substation 11; this work is being conducted immediately north of the NW corner of the tank farm area.

Work Scheduled for Next Three Weeks

- As part of the weekly progress meeting minutes you received yesterday, there was Clearcreek Contactors (CCC) 3 week look ahead schedule. I contacted you yesterday to discuss this.
- As we discussed, the main activities for next week (6/16)are clearing the overburden for the small yard, additional test pitting and locating for pipelines on Piers 90 and 91, and monitoring well/probe decommissioning.
- The following week (6/23) will begin excavation/demolition activities in the small yard.
- Pipeline decommissioning activities are currently scheduled to begin the week of 6/30.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

From:	'Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; Chou, Fred; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Russell Stolsen
Subject:	T-91 Tank Farm Cleanup - Construction Update #2 (June 20th)
Date:	Friday, June 20, 2014 3:24:09 PM

Greg –

Please find below this week's update regarding the construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of June 16th)

- Decommissioned 12 LNAPL monitoring wells (CP_PR-01 through CP_PR-12), six vapor monitoring probes (VP-1 through VP-6), and one monitoring well (UT_MW39-2).
  - Monitoring well UT_MW39-3 was inadvertently decommissioned; based on discussions with you on June 19, the Port will not re-install this well at this time as it is not a part of the compliance monitoring program. If it is determined in the future that this well is required, the Port will replace it then.
  - The wells were decommissioned by over-drilling and no highly contaminated soils (HCS) were encountered.
- Clearcreek Contractors (CCC) continued preparations of the dangerous waste (DW) decontamination area on the bottom of Tank 94 and the non-DW decontamination area on the bottom of Tank 93.
  - Asphalt and overburden from these areas were stockpiled
- CCC sampled the non-HCS soil between Tanks 93 and 94 to evaluate worker safety; analytical results are pending.
- CCC removed the asphalt and overburden above Tanks 113 and 114 and removed the remaining portion of the tank bottoms as follows:
  - CCC broke out concrete at Tanks 113 and 114 and cleaned the concrete in non-DW decon area;
  - Tank 114 was formerly a tank that contained DW. The bottom of Tank 114 that was in use while it contained DW had been removed back in 2005, and what was left was a concrete pad and below that another older tank bottom. This older tank bottom had been temporarily placed in the DW decon area.
  - During your visit on June 19 we discussed this situation and agreed that this lower (older) tank bottom had not come into contact with DW and therefore could be managed in the same manner as the other non-DW tank bottoms – decontaminated to the extent necessary to be recycled. We further discussed that this same general approach was suitable for the other DW tanks with multiple tank bottoms on a case-by-case basis as determined by the Port's oversight personnel. If there was evidence that the DW previously contained in a tank had come in contact with the lower/older tank bottom, then this lower/older tank bottom would be managed as DW debris and decontaminated to a "clean debris surface" consistent with Ecology's guidance.

- The wheel wash area was modified with the addition of rock.
- CCC continued preparing the HCS stockpile area (located near building M-27).
- Soils were stockpiled on site consistent with the stockpile plan.
- Regulated materials (asbestos, lead paint) abatement for Buildings M-25, M-27, and Substation 11 was completed by CCC and their subcontractor and a certification was issued by Argus.
- Port Construction Services (PCS) continued activities associated with replacing Substation 11; this work is being conducted immediately north of the NW corner of the tank farm area.
    - Removed asphalt, concrete, and overburden
    - Excavated to below the depth of the water table in preparation to set the new electrical vaults;
    - Saturated soils with hydrocarbon odors were encountered and minor amounts of LNAPL was observed floating on the water that entered the excavation; HCS were not encountered;
    - Water with product was pumped and stored in drums
    - Saturated soils (1 cubic yard) were stockpiled on plastic
- CCC began pot-holing on Pier 91 to find end of pipes.
    - Accidentally punctured a sewer line, fixed same day
- CCC began asphalt, concrete, and overburden removal in the northwest corner of the small yard area.
- Demolition of substation 11 and buildings M-25 and M-27 began.

Work Scheduled for Next Three Weeks (schedule attached)

- Continued demolition of substation 11 and buildings M-25 and M-27.
- Continued test pitting and locating for pipelines on Piers 90 and 91 and pipeline cleaning/decommissioning (currently scheduled to begin the week of 6/30).
- Continued clearing of the overburden for the small oil yard (SMO).
- Excavation/demolition activities in the SMO.
    - Site walk scheduled for 6/25 to observe demo and excavation activities

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; Chou, Fred; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Russell Stolsen
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #3 (June 27th)
Date:	Friday, June 27, 2014 4:05:04 PM
Attachments:	20140627_123824_resized.jpg TFA Demo (062614).jpg

Greg –

Please find below this week's update regarding the construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of June 23rd)

- Concrete decontamination was consistent with the decontamination plan.
- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA (see attached photo)
- Port Construction Services (PCS) continued activities associated with replacing Substation 11; this work is being conducted immediately north of the NW corner of the tank farm area.
    - Excavated to below the depth of the water table and set the new electrical vaults;
    - Saturated soils with hydrocarbon odors were encountered and minor amounts of LNAPL was observed floating on the water that entered the first vault excavation; HCS were not encountered;
    - 25 gallons of water with product from the first vault was pumped and stored in a drum (last week)
    - Approx. 9,500 gallons of water from the second vault was pumped into a Baker tank;
    - Soils from the excavation of the 1st and 2nd vaults (51 cubic yards) was sampled for profiling and the soils were transported to the main stockpile area (stockpiled separately).
- CCC continued pot-holing on Pier 91 to find end of pipes.
- CCC continued asphalt, concrete, and overburden removal in the northwest corner of the Small Oil Yard area (see attached photo).
    - prepped the location of the waste water storage Baker tank and constructed secondary containment
- Demolition of Substation 11 and buildings M-25 and M-27 was completed.
- Removing most of the overburden and concrete from the former oil/water separator in the NW corner.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Continued test pitting and locating for pipelines on Piers 90 and 91 and pipeline cleaning/decommissioning (currently scheduled to begin the week of 6/30).
- Continued clearing of the overburden for the Small Oil Yard (SMO).
- Excavation/demolition activities in the SMO (decontamination of concrete debris – ongoing

as needed).

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; Chou, Fred; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Russell Stolsen
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #4 (July 7th)
Date:	Monday, July 07, 2014 4:05:33 PM

Greg –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup. Note that this is being sent today (Monday) due to the holiday on Friday.

Work Performed (Week of June 30th)

- Concrete decontamination continued consistent with the decontamination plan.
- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA (see attached photo)
- Port Construction Services (PCS) continued activities associated with replacing Substation 11 including shallow trenching and placement of conduits. No additional potentially contaminated soil was encountered during this work.
- CCC continued work on Pier 91 related to locating and exposing pipelines.
- CCC continued asphalt, concrete, and overburden removal in the Small Oil Yard area.
- The demolition and removal of utilities and pipelines in a portion of the northwest portion of the Small Oil Yard just south of the existing oil-water separate was completed and partially backfilled with soil from within the AOC. The Port and PES confirmed that demolition/removal work in this area was complete and not highly contaminated soil (HCS) was encountered or remained. This "cleared" area was then used for stockpiling of decontaminated concreted.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Initiating pipeline cleaning/decommissioning (currently scheduled to begin this week).
- Continued clearing of the overburden for the Small Oil Yard (SMO).
- Excavation/demolition activities in the SMO will continue to progress generally from west to east, with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
- The Port, PES Team, and CCC will work to reconfigure the two new stormwater vaults to be installed in the SE corner of the TFA to address conflicts with utilities in this area.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
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cell: (425) 241-2627

From:	Brian O"Neal
To:	Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; Chou, Fred; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Russell Stolsen; Brian O"Neal
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #5 (July 11th)
Date:	Friday, July 11, 2014 3:35:58 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of July 7th)

- Concrete and piping decontamination continued consistent with the decontamination plan.
- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- Port Construction Services (PCS) is finishing activities associated with replacing Substation 11.
- CCC continued work between the TFA and Pier 91 related to locating and exposing pipelines.
- CCC continued asphalt, concrete, and overburden removal in the Small Oil Yard area.
- CCC began asphalt, concrete, and overburden removal in the Marine Diesel Oil Yard (MDOY).
    - Potential HCS was observed in the vicinity of Seep 4 and on the northwest side of Tank 98 and was left in place
- CCC removed the tank bottoms for Tanks 96, 97, 98, 99, 100, 101, 102, 103, 104
    - Oil sands were stockpiled in the HCS stockpile area (on top of Tank 114);
    - Decontamination of the dangerous waste tank bottoms (upper tank bottom for tanks 96 through 100) began and the level of decontamination required to achieve the "clean debris surface" standard was evaluated;
    - Tank bottoms from non-dangerous waste tanks (101 through 104 and the lower tank bottoms for tanks 96-100) were removed in pieces and direct loaded into 20 CY roll off containers; these tank bottoms were relatively clean and suitable for transport directly to the recycling facility and did not require additional decontamination;
    - Late in the week, potential HCS was observed under Tank 98 and in places in the western side of the MDOY and was temporarily left in place – this material will begin to be addressed early next week.
- The demolition and removal of utilities and pipelines in portions of the Small Oil Yard was completed and partially backfilled with soil from within the AOC. The Port and PES confirmed that demolition/removal work in these areas was complete and no highly contaminated soil (HCS) was encountered during the work to date or remained. The "cleared" areas were then used for stockpiling concrete.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Continued pipeline cleaning/decommissioning (Pier 91 pipeline cleaning to begin 7/14).
- Continued clearing of the overburden and tank base removals in the MDOY.
- Excavation/demolition activities in the SMO will continue to progress generally from west to east and north to south, with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
- Excavation of the HCS found on the western side of the MDOY.
- The Port, PES Team, and CCC will work to reconfigure the two new stormwater vaults to be installed in the SE corner of the TFA to address conflicts with utilities in this area.
- The Port, PES Team, and CCC are determining the shoring requirements to safely decommission the oil/water separator in the northwest corner of the Small Oil Yard in order to protect nearby utilities (currently planned for 7/22 and 7/25).
- Pump out the vault discovered to have Bunker fuel within it during pipeline decommissioning work.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
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From:	Kelly Rankich
To:	Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; Chou, Fred; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Brian O"Neal
Subject:	T-91 Tank Farm Cleanup - Construction Update #6 (July 18th)
Date:	Friday, July 18, 2014 12:36:00 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of July 14th)

- Concrete and piping decontamination continued consistent with the decontamination plan.
- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- Port Construction Services (PCS) is finishing activities associated with replacing Substation 11.
- CCC continued work between the TFA and Pier 91 related to locating and exposing pipelines.
- Emerald Services began prepping for the pipe cleanout activities.
- CCC continued asphalt, concrete, and overburden removal in the Marine Diesel Oil Yard (MDOY).
    - It would appear that the product from Seeps 2 and 4 originated from product-saturated oil sands between the tank layers; a limited amount of HCS was removed related to the seeps.
- CCC continued DW tank bottom decontamination.
- CCC began removing former fuel lines within the MDOY.
    - PES directed CCC on the determination of HCS vs non-HCS soils during the pipeline removals;
    - Previously unknown bottomless catch basin structures and associated clay piping were encountered. Some of the piping was full of highly contaminated sludge and was handled as HCS;
    - The trenches from the pipe removal excavations were approved by the Port and PES for backfilling.
- The demolition and removal of pipelines, concrete, and tank bottoms in the western portion of the MDOY was completed and backfilled with clean overburden from within the AOC. The Port and PES confirmed that demolition/removal work in this area was complete and either no highly contaminated soil (HCS) was encountered during the work to date or no observable HCS remained.
- CCC began asphalt, concrete, and overburden removal in the Black Oil Yard.
- CCC began removal of the tank bottom for Tank 92 in the Black Oil Yard.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning is to begin on 7/21.
- Excavation/demolition activities in the MDOY will continue to progress generally from west to east and north to south, with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
- The Port, PES Team, and CCC will work to reconfigure the two new stormwater vaults to be installed in the SE corner of the TFA to address conflicts with utilities in this area.
- The oil/water separator in the northwest corner of the Small Oil Yard is currently planned for demolition on 7/29.
- Pump out the vault discovered to have Bunker fuel within it during pipeline decommissioning work.

Let me know if you have any questions or need additional information.

Kelly Rankich
Project Engineer
PES Environmental, Inc.
1215 Fourth Avenue, Suite 1350
Seattle, WA 98161
phone: (206) 529-3980 ext. 117
fax: (206) 529-3985

From: Kelly Rankich
To: Caron, Greg (ECY)
Cc: Heilgeist, Stacy; Chou, Fred; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Brian O"Neal
Subject: T-91 Tank Farm Cleanup - Construction Update #7 (July 25th)
Date: Friday, July 25, 2014 1:18:00 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of July 21st)

- Concrete and piping decontamination continued consistent with the decontamination plan.
- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- Port Construction Services (PCS) is finishing activities associated with replacing Substation 11.
- CCC continued work between the TFA and Pier 91 related to locating and exposing pipelines.
- Emerald Services continued prepping for the pipe cleanout activities by assessing the contents of exposed pipes with a marine chemist.
- Emerald Services began removal of the contents of pipelines in preparation for cleaning activities.
- Emerald Services began pipe cleaning activities on Friday, July 25th.
- CCC continued DW tank bottom decontamination.
- CCC continued removing former fuel lines within the MDOY and began removal in the Black Oil Yard (B.O.Y.).
    - PES directed CCC on the determination of HCS vs non-HCS soils during the pipeline removals;
    - bottomless catch basin structures and associated clay piping were encountered in the MDOY. Some of the piping was full of highly contaminated sludge and was handled as HCS;
    - 9 pipes were encountered in the western portion of the B.O.Y. that contained highly contaminated sludge that was stockpiled as HCS;
    - A concrete sump and HCS was uncovered in the southwest corner of the B.O.Y.
    - The trenches from the pipe removal excavations in the MDOY were approved by the Port and PES for backfilling.
- The demolition and removal of pipelines, concrete, and tank bottoms in the western portion of the B.O.Y. was completed and backfilled with clean overburden from within the AOC. The Port and PES confirmed that demolition/removal work in this area was complete and either no highly contaminated soil (HCS) was encountered during the work to date or no observable HCS remained.
- CCC continued asphalt, concrete, and overburden removal in the B.O.Y.

- CCC began removing asphalt and concrete along the western portion of the Tank Farm Area to expose utilities
    - Minor amounts of HCS was encountered and excavated during this work
- CCC continued removal of the tank bottom for Tank 92 and began removal of Tank 90 in the B.OY.
- An HCS stockpile sample was collected for disposal profiling.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning will continue.
- Excavation/demolition activities in the B.O.Y. and MDOY will continue to progress generally from west to east and north to south, with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
- The Port, PES Team, and CCC will work to reconfigure the two new stormwater vaults to be installed in the SE corner of the TFA to address conflicts with utilities in this area.
- The oil/water separator in the northwest corner of the Small Oil Yard is currently planned for demolition on 7/28.
- Pump out the vault discovered to have Bunker fuel within it during pipeline decommissioning work.

Let me know if you have any questions or need additional information.

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phone: (206) 529-3980 ext. 117
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From:	Brian O"Neal
To:	Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	T-91 Tank Farm Cleanup - Construction Update #8 (August 1st)
Date:	Friday, August 01, 2014 4:24:49 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of July 28th)

- Concrete and piping decontamination continued consistent with the decontamination plan.
- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- Port Construction Services (PCS) is finishing activities associated with replacing Substation 11.
- Emerald Services continued pipe cleaning activities on Pier 91.
    - As of 8/1, approximately 2,800 ft of pipeline had been jetted and vacuumed out; these pipes still need to have a pig run through them to complete the cleaning.
- CCC continued DW tank bottom decontamination.
- CCC continued removing former fuel lines within the MDOY (primarily along the western edge of the MDOY and just north of Building M-28) and continued removal in the Black Oil Yard (B.O.Y.).
    - PES directed CCC on the determination of HCS vs non-HCS soils during the pipeline removals;
- The demolition and removal of pipelines, concrete, and tank bottoms in additional areas within the MDOY and B.O.Y were completed and backfilled with clean overburden from within the AOC. The Port and PES confirmed that demolition/removal work in this area was complete and either no highly contaminated soil (HCS) was encountered during the work to date or no observable HCS remained.
- CCC continued asphalt, concrete, and overburden removal in eastern portion of the B.O.Y.
- CCC continued removing asphalt and concrete along the western portion of the Tank Farm Area to expose utilities
    - Minor amounts of HCS was encountered and excavated during this work
    - CCC uncovered pipelines around the OWS in the northwest corner of the site
- CCC began removal of Tank 91 in the B.O.Y.
- CCC demolished the oil/water separator in the northwest corner of the Small Oil Yard
    - Oily water was pumped from the excavation
    - Less than 5 cubic yards of HCS excavated during the OWS demo. was stockpiled

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning will continue.

- Installation of LNAPL Recovery Trench 5 will commence the week of August 4th, with the Port removing the railroad tracks in the trench area, followed by trenching, installation of pipe systems, and backfilling. This is scheduled to take approximately 2 weeks.
- Excavation/demolition activities in the B.O.Y. and MDOY will continue to progress generally from west to east and north to south, with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
- The Port, PES Team, and CCC will work to reconfigure the two new stormwater vaults to be installed in the SE corner of the TFA to address conflicts with utilities in this area.
- Pump out the vault discovered to have Bunker fuel within it during pipeline decommissioning work.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #9 (August 8th)
Date:	Friday, August 08, 2014 2:37:18 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of August 4th)

- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- Emerald Services continued pipe cleaning activities on Pier 91.
- Emerald Services began pipe cleaning activities of piping on the western side of the TFA.
- CCC continued DW tank bottom decontamination.
- CCC continued asphalt, concrete, overburden, and HCS removal in southwest portion of the B.O.Y.
- CCC nearly completed demolishing the oil/water separator in the northwest corner of the Small Oil Yard; the lower portion of the west wall of the OWS wall remains in place and will be removed later.
    - A total of approximately 18 cubic yards of HCS excavated during the OWS demo. This material was stockpiled and sampled for profiling
    - A letter requesting a contained in determination for the OWS HCS is being prepared.
- CCC removed concrete foundations near Building M-28.
- CCC began installing LNAPL trench #5.
    - The Port removed the railroad tracks
    - CCC excavated and shored approximately 20 feet of the trench from the western limit
    - Water with LNAPL was encountered at 6 feet bgs
- Transportation of HCS for off-site disposal began.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning will continue.
- Installation of LNAPL Recovery Trench 5 will continue with the trenching, installation of pipe systems, and backfilling. This is scheduled to be completed by August 15th.
- Excavation/demolition activities in the eastern portions of the B.O.Y. and MDOY will continue with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
    1. The eastern portion of Tank 91 will be removed.
- HCS in the B.O.Y. will continue to be excavated.
- Transportation of HCS for off-site disposal will continue.

- Decontamination of tank base bottoms will continue.
- The Port, PES Team, and CCC will work to reconfigure the two new stormwater vaults to be installed in the SE corner of the TFA to address conflicts with utilities in this area.
- Pump out the vault discovered to have Bunker fuel within it during pipeline decommissioning work.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Caron, Greg (ECY)
Cc:	Brian O"Neal; Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred
Subject:	FW: T-91 Tank Farm Cleanup - Construction Update #10 (August 15th)
Date:	Friday, August 15, 2014 3:51:15 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of August 11th)

- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- Emerald Services continued pipe cleaning activities on Pier 91.
- Emerald Services continued pipe cleaning activities of piping on the western side of the TFA.
- CCC continued and completed DW tank bottom decontamination for all tank bases removed to date.
- CCC removed asphalt from the south portion of the B.O.Y.
- A letter requesting a contained in determination for the oil/water separator HCS stockpile was submitted on August 14th.
- CCC continued installing LNAPL trench #5.
    - CCC removed saturated soil with a vacuum truck and stockpiled the soil in a lined pit in the M.D.O.Y., water will be pumped out and treated
    - Harder, dense soil was encountered at approximately 9 feet bgs and soil removal continued with an excavator
    - CCC backfilled a portion of the trench with gravel below the water table
- Transportation of HCS for off-site disposal continued (approx. 900 tons has been transported off-site to-date).

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning will continue with grouting scheduled to begin on August 25th.
- Installation of LNAPL Recovery Trench 5 will continue with the trenching, installation of pipe systems, and backfilling. This is scheduled to be completed by August 22nd.
- Excavation/demolition activities in the eastern portions of the B.O.Y. and MDOY will continue with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
    1. The eastern portion of Tank 91 will be removed.
- HCS in the B.O.Y. will continue to be excavated.
- Transportation of HCS for off-site disposal will continue.
- Demolition of the final wall (west wall) of the oil/water separator will be completed.

- Decontamination of piping removed from the TFA will begin next week.
- The Port, PES Team, and CCC will work to reconfigure the two new stormwater vaults to be installed in the SE corner of the TFA to address conflicts with utilities in this area.
- Pump out the vault discovered to have Bunker fuel within it during pipeline decommissioning work.
- Potholing in preparation for Pier 90 pipeline cleaning is scheduled to begin on August 25th.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #11 (August 22nd)
Date:	Friday, August 22, 2014 2:41:39 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of August 18th)

- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- Emerald Services continued pipe cleaning activities on Pier 91.
- Emerald Services continued pipe cleaning activities of piping near the southwest corner of Building M-28.
- CCC began decontamination of previously removed piping in the TFA.
- CCC demolished the final wall (west wall) of the oil/water separator (OWS) and stockpiled additional HCS with the previously excavated soil from the OWS.
    - Disposal of this material is pending a contained-in determination and profiling
- CCC removed asphalt from the southern portion of the B.O.Y.
- CCC removed and stockpiled highly contaminated soil (HCS) from an area near the northeast corner of Building M-28 and north of Tank 92 in the B.O.Y.
- CCC removed piping along the western edge of the TFA. The Port and PES confirmed that demolition/removal work in this area was complete and either no HCS was encountered or no observable HCS remained and the areas were approved for backfill.
- CCC completed installing LNAPL trench #5.
    - During the trench installation activities on Saturday, August 16th, unidentified piping was encountered, cut and repaired with PVC.
    - Saturated soils were allowed to drain in lined detention basins and were then spread out in the M.D.O.Y. and B.O.Y. as they were determined to not be HCS
- Emerald pumped the product out of two vaults discovered during pipeline decommissioning work on Pier 91.
- Transportation of HCS for off-site disposal continued.
- CCC installed the water treatment system and KCIW inspected and approved the system on August 22nd .

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning will continue with video scheduled for August 27th and grouting scheduled to begin on September 3rd.
- Excavation/demolition activities in the eastern portions of the B.O.Y. and MDOY and

northern portion of the S.O.Y. will continue with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
    - The eastern portion of Tank 91 will be removed.
- HCS in the B.O.Y. will continue to be excavated.
- Transportation of HCS for off-site disposal will continue.
- Decontamination of piping removed from the TFA will continue
- The Port, PES Team, and CCC will work to reconfigure the two new stormwater vaults to be installed in the SE corner of the TFA to address conflicts with utilities in this area.
- Potholing in preparation for Pier 90 pipeline cleaning is scheduled to begin on August 25th.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #12 (August 29th)
Date:	Friday, August 29, 2014 4:35:57 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of August 25th)

- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- Emerald Services continued pipe cleaning activities on Pier 91.
- Emerald Services cleaned pipes located north of the TFA (west of building 19).
- CCC continued decontamination of previously removed piping in the TFA.
- CCC removed and stockpiled highly contaminated soil (HCS) from within the B.O.Y.
- CCC removed the additional portions of the Tank 91 tank bottom
- The Port and PES confirmed that demolition/removal work in areas within the B.O.Y. was complete and either no HCS was encountered or no observable HCS remained and the areas were approved for backfill.
- Transportation of HCS for off-site disposal continued.
- Contained-in determination letter dated August 26th from Ecology was received on August 28th and profiling of soil from OWS removal was completed.
- Jeff Johnson began breaking of the foundation footing at the south end of the B.O.Y. and the concrete foundation wall between the B.O.Y. and the M.D.O.Y.
- CCC began discharging water to the sanitary sewer from the wastewater discharge system after repairs were made to the sanitary sewer line on August 27th .
- Camera inspections of the cleaned pipelines on Pier 91 began on August 28th. Video files were distributed on August 28th to you, PES, and the Port for review.
- CCC pot-holed every 25 feet along the southern boundary of the TFA (below the former tank farm foundation wall) and no HCS was observed.
- PES collect depth to LNAPL/water measurements in LNAPL Trench #5.
- CCC is in the process of "flipping the site" to move the wheel wash and job shack to the western half of the TFA.
- CCC began asphalt removal in the area of the new stormwater vaults in the SE corner of the TFA.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning will continue with additional camera inspections and

th

grouting scheduled to begin on September 8 .

- The stockpiled soil from the oil/water separator demolition will be transported to US Ecology in Idaho for disposal.
- Excavation/demolition activities in the eastern portions of the B.O.Y. and MDOY and northern portion of the S.O.Y. will continue with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
- HCS in the B.O.Y. will continue to be excavated.
- Transportation of HCS for off-site disposal will continue.
- Decontamination of piping removed from the TFA will continue.
- PES will collect water level measurements in the two manholes on Pier 91 that formerly contained oil/water.
- Potholing in preparation for Pier 90 pipeline cleaning is scheduled to begin on week of September 2nd.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Caron, Greg (ECY)
Cc:	Brian O"Neal; Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred
Subject:	T-91 Tank Farm Cleanup - Construction Update #13 (September 5th)
Date:	Friday, September 05, 2014 3:05:41 PM
Attachments:	20140905_090812_resized.jpg 20140905_090854_resized.jpg

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of September 2nd)

- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- Emerald Services continued pipe cleaning activities on Pier 91.
- CCC continued decontamination of previously removed piping in the TFA.
- Transportation of HCS for off-site disposal continued.
- Continued breaking of the foundation footing at the south end of the Black Oil Yard (B.O.Y.) and the concrete foundation wall between the B.O.Y. and the Marine Diesel Oil Yard (M.D.O.Y.)
- PES collect depth to water measurements in LNAPL Trench #5 and observed a sheen on the water surface.
- CCC finished "flipping the site" to move the wheel wash and job shack to the western half of the TFA.
- CCC removed asphalt and overburden along the eastern edge of the B.O.Y. and the M.D.O.Y (see attached photo). Overburden was stockpiled in the southern portion of the B.O.Y. (see attached photo).
- CCC backfilled an excavation in the B.O.Y. that extended beneath the water table after skimming LNAPL off of the water surface, placing geotextile fabric and washed gravel beneath the water table.
- CCC and the Port continued to evaluate utilities in the northwest corner of the TFA and also evaluated the existing stormwater system in the SE corner of the TFA.
- CCC prepped for demolition activities in the northern portion of the TFA by moving waste water tanks and removing concrete foundations.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning will continue with additional camera inspections and grouting scheduled to begin on September 17th.
- The stockpiled soil from the oil/water separator demolition will be transported to US Ecology in Idaho for disposal.
- Excavation/demolition activities in the eastern portions of the B.O.Y. and MDOY and

northern portion of the S.O.Y. will continue with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).

- HCS in the B.O.Y. will continue to be excavated.
- Transportation of HCS for off-site disposal will continue.
- Decontamination of piping removed from the TFA will continue.
- PES will collect water level measurements in the two manholes on Pier 91 that formerly contained oil/water.
- Potholing in preparation for Pier 90 pipeline cleaning is scheduled the week of September 8th.
- Pre-trenching for the cutoff wall is scheduled to begin on September 9th.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	T-91 Tank Farm Cleanup - Construction Update #14 (September 12th)
Date:	Friday, September 12, 2014 2:13:04 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of September 8th)

- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- Emerald Services continued pipe cleaning activities on Pier 91.
- Preparations for Pier 90 pipe cleaning are on-going.
- CCC removed remaining tank bottoms including the remainder of Tank 91 from the B.O.Y., Tanks 93, 95, and 96 from the M.D.O.Y. and Tank 114 from the S.O.Y.
    - HCS was not observed beneath Tank 91
    - The tank bottoms are being stockpiled awaiting decontamination consistent with the decontamination plan (former dangerous waste tanks) or direct loaded for recycling
    - Oil sands from beneath Tank 96 were stockpile separately
- CCC began excavating the Cut Off Wall exploratory trench along the east and north sides of Building M-28 and TFA western boundary.
    - POS/PES observed the trench for HCS and obstructions
- CCC removed piping and HCS between the S.O.Y. and the M.D.O.Y. and at the north side of the S.O.Y.
- CCC and the Port continued to evaluate utilities in the northwest corner of the TFA and also evaluated the existing stormwater system in the SE corner of the TFA.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning will continue with grouting scheduled to begin on September 22nd.
- The stockpiled soil from the oil/water separator demolition will be transported to US Ecology in Idaho for disposal.
- Excavation/demolition activities in the eastern portions of the B.O.Y. and MDOY and northern portion of the S.O.Y. will continue with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
- Transportation of HCS for off-site disposal will continue.
- Decontamination of tank bases and piping removed from the TFA will continue.
- PES will collect water level measurements in the two manholes on Pier 91 that formerly contained oil/water.
-

Preparations for Pier 90 pipeline cleaning is on-going.

- The cutoff wall installation is scheduled to begin on September 29th.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #15 (September 18th)
Date:	Friday, September 19, 2014 3:53:36 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of September 15th)

- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- CCC decontaminated the tank bottoms and piping consistent with the decontamination plan.
- Emerald Services continued pipe cleaning activities on Pier 91.
- HCS was transported off-site for disposal.
- Evaluations of the Pier 90 pipe cleaning are on-going.
- CCC removed concrete, overburden, piping, and HCS in the vicinity of Tank 96 and the eastern areas of the S.O.Y. and the M.D.O.Y.
- CCC and the Port continued to evaluate utilities in the northwest corner of the TFA and also evaluated the existing stormwater system in the SE corner of the TFA.
- Jeff Johnson began pre-processing the concrete (size reduction) in preparation for concrete crushing.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning will continue with grouting scheduled to begin the week of September 22nd after the grout submittals are approved.
- Excavation/demolition activities in the eastern portions of the B.O.Y. and MDOY and northern portion of the S.O.Y. will continue with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
- Transportation of HCS for off-site disposal will continue.
- The oil/water separator HCS will be transported to US Ecology for disposal.
- Decontamination of tank bases and piping removed from the TFA will continue.
- PES will collect water level measurements in the two manholes on Pier 91 that formerly contained oil/water.
- Evaluations for Pier 90 pipeline cleaning are on-going.
- Concrete size reduction and crushing will begin.
- Pre-trenching for the cut off wall will continue on September 22nd.
- The cutoff wall installation is scheduled to begin on September 29th.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #16 (September 16th)
Date:	Friday, September 26, 2014 3:27:45 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of September 22nd)

- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- Emerald Services prepared for pipe grouting activities on Pier 91.
- HCS was transported off-site for disposal (approximately 5,000 tons hauled to date).
- Evaluations of the Pier 90 pipe cleaning are on-going.
- CCC removed asphalt, concrete, overburden, piping, and HCS in the eastern portions of the S.O.Y. and the M.D.O.Y.
- CCC and the Port continued to evaluate utilities in the northwest corner of the TFA; select utilities are schedule for removal in the coming days;
- Evaluation of the existing stormwater system in the SE corner of the TFA was completed, and work begin an modifying the design of the new stormwater system, with a design bulletin expected next week.
- Jeff Johnson continued pre-processing the concrete (size reduction) in preparation for concrete crushing.
- A contained-in determination request was submitted to Ecology on September 24th for the soil with a nuisance odor from the NE portion of the TFA. The request was verbally approved on Thursday at the weekly meeting, with the letter forthcoming.
- Wrecking Ball conducted abatement of ACM-wrapped steam lines.
- CCC cleaned and removed a fuel line located along the eastern edge of the TFA; found additional lines (3) below the pipelines shown on the drawing in this area. Soil around and beneath these pipelines was not HCS.
- CCC demolished the utilidor in the SE corner of the TFA.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning will continue with grouting scheduled to begin October 1st.
- Excavation/demolition activities in the eastern portions of the B.O.Y. and MDOY and northern portion of the S.O.Y. will continue with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
- Transportation of HCS for off-site disposal will continue.

- The 30 cubic yard stockpile of soil with a nuisance odor from the northeast portion of the TFA will be transported to Republic after receiving approval from the disposal facility.
    1. Additional soil from this area will be excavated as needed for disposal as contained-out material.
- Decontamination of tank bases and piping removed from the TFA will continue.
- PES will collect water level measurements in the two manholes on Pier 91 that formerly contained oil/water.
- Evaluations for Pier 90 pipeline cleaning are on-going.
- Concrete size reduction will continue and crushing will begin.
- Pre-trenching for the cut off wall will continue on September 29th.
- The equipment and materials for the cutoff wall installation will be mobilized during the week of September 29th, with construction of the wall scheduled to begin on October 6th.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #17 (October 3rd)
Date:	Friday, October 03, 2014 4:06:54 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of September 29th)

- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- Pipe grouting activities on Pier 91 began on October 1st.
- HCS was transported off-site for disposal (total of approximately 5,000 tons hauled to date).
- Evaluations of the Pier 90 pipe cleaning are on-going, pending fuel manhole cleanout to locate lines.
- CCC removed asphalt, concrete, overburden, piping, and HCS in the eastern portions of the B.O.Y and the M.D.O.Y.
- CCC removed the double tank bottoms for Tank 94. Upper tank bottom (former dangerous waste tank) will be decontaminated per guidance. Lower tank bottom removed for recycling.
- CCC removed utilities (storm vault and lines) in the northwest portion of the TFA.
- Began installation of the stormwater system in the SE corner of the TFA.
- Jeff Johnson continued pre-processing the concrete (size reduction) in preparation for concrete crushing.
- Wrecking Ball conducted abatement of ACM-wrapped steam lines.
- CCC removed piping located along the eastern edge of the TFA, including pumping liquids from several pipes prior to demolition. Approximately 6 pipes turned east and exited the TFA; these will be evaluated and cleaned as necessary.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning/grouting will continue.
- Excavation/demolition activities in the eastern portions of the B.O.Y. and MDOY will continue with additional areas being "cleared" as completed (decontamination of concrete debris – ongoing as needed).
- Transportation of HCS for off-site disposal will continue.
- The 30 cubic yard stockpile of soil with a nuisance odor from the northeast portion of the TFA will be transported to Republic the week of October 6th. Additional soil from this area will be excavated as needed for disposal as contained-out material.
- Decontamination of tank bases and piping removed from the TFA will continue.

- PES will collect water level measurements in the two manholes on Pier 91 that formerly contained oil/water.
- Evaluations for Pier 90 pipeline cleaning are on-going with the fuel manhole cleanout scheduled for October 6th.
- Concrete size reduction will continue and crushing will begin early the week of October 6th.
- Pre-trenching for the cut off wall will continue on October 6th, pending removal of soil with a nuisance odor.
- The equipment and materials for the cutoff wall installation will continue to be mobilized during the week of October 6th, with construction of the wall scheduled to begin on October 13th, pending procurement of low permeability soil.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #18 (October 10th)
Date:	Friday, October 10, 2014 3:35:19 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of October 6th)

- Soils were stockpiled on site consistent with the stockpile plan, including in the stockpile area to the north of the TFA.
- HCS was transported off-site for disposal (approximately 6,500 tons to-date, including oil sands).
- Evaluations of the Pier 90 pipe cleaning are on-going (the fuel manhole was full of CDF).
- CCC removed asphalt, concrete, overburden, piping, utilities, and HCS in the northern and eastern portions of the TFA.
- CCC continued decontaminating the tank bottoms, consistent with the decontamination plan.
- CCC continued installation of the stormwater system in the SE corner of the TFA.
- Rhine Demolition began concrete crushing activities.
- CCC will begin hauling low permeability soil from spoils pond at Quality Aggregates Saturday. Testing data for this material will be available early next week.
- CCC continued the installation of the exploratory trench for the cut off wall.
- Additional soil with a nuisance odor ("acetone soil") was excavated from the northeast portion of the TFA. The soil was transported to Republic as contained-out material.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pipeline cleaning/decommissioning/grouting will continue.
- Transportation of HCS for off-site disposal will continue, if encountered.
- Decontamination of piping removed from the TFA will continue.
- PES will collect water level measurements in the two manholes on Pier 91 that formerly contained oil/water.
- Evaluations for Pier 90 pipeline cleaning are on-going.
- Concrete crushing will continue.
- Import of additional low permeability soil from Quality Aggregates as available.
- Pre-trenching for the cut off wall will continue.
- Mobilization of equipment for construction of the cutoff wall scheduled to begin on October 14th and trenching activities scheduled to start October 20th pending acquisition of low permeability soil.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #19 (October 17th)
Date:	Friday, October 17, 2014 4:31:20 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of October 13th)

- CCC continued decontaminating the tank bottoms and piping, consistent with the decontamination plan.
- CCC continued installation of the stormwater system in the SE corner of the TFA, including the temporary bypass.
- CCC continued grouting pipelines on Pier 91.
- CCC transported the remaining HCS/nuisance odor soil off-site for disposal.
- Rhine Demolition continued concrete crushing activities and began asphalt crushing activities.
- CCC began hauling low permeability soil from spoils pond at Quality Aggregates Saturday and began producing the slurry for the cutoff wall. The initial batch of slurry was delivered to the Site on Friday.
- CCC completed the installation of the exploratory trench for the cut off wall.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Excavation for the cutoff wall installation is scheduled to begin early the week of October 20th. Actual start date will depend on approval of alternative source of low permeability soil from the "pond" at Quality Aggregates.
- Pipeline cleaning/decommissioning/grouting will continue after the installation of the cutoff wall.
- PES will collect water level measurements in the two manholes on Pier 91 that formerly contained oil/water.
- Asphalt and concrete crushing will continue.
- A former oil/water separator is scheduled to be demolished on October 24th.

Let me know if you have any questions or need additional information.

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To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #20 (October 24th)
Date:	Friday, October 24, 2014 3:28:09 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of October 20th)

- CCC completed decontaminating the tank bottoms and piping, consistent with the decontamination plan.
- CCC continued installation of the stormwater system in the SE corner of the TFA, including removing the OWS and extending the temporary bypass.
- Rhine Demolition continued asphalt crushing activities.
- CCC mobilized select equipment to the site for use in constructing the cutoff wall and staged material (bentonite) around the wall alignment.
- CCC and the Port continued to try and resolve issues related to the supply of low permeability soil from Quality Aggregates.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Excavation for the cutoff wall installation is delayed pending resolution of the supply issues related to the supply of low permeability soil from Quality Aggregates. Once these supply issues are resolved, a schedule for the cutoff wall work will be established.
- Pipeline cleaning/decommissioning/grouting will proceed in the coming weeks as Emerald Services is available and pending activity on the cutoff wall.
- Asphalt and concrete crushing will continue, and should be completed by late October or early November.
- Shoring for the new oil/water separator and water quality vaults is schedule for the week of October 27th, and the new vaults could be delivered to the project that week.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred; Mike Stewart
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #21 (October 31st)
Date:	Friday, October 31, 2014 3:07:02 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of October 27th)

- CCC began preparing to install the sheet piling around the where new stormwater vaults in the SE corner of the TFA will go.
- Rhine Demolition continued asphalt crushing activities, and should complete this work on Monday November 3rd.
- CCC and Emerald Services cleaned out the storm line running north from the TFA along the west side of Building M-19.
- CCC and Emerald Services conducted additional cleaning of Pier 91 pipelines between the bridge and the tank far. An additional 2,000 gallons of water/fuel/oil was removed from the previously cleaned line along the southern and eastern sides of Building W-39.
- Began potholing to evaluate pipelines located east of the TFA. Unexpected lines were encountered and camera verification of these lines will be conducted next week.
- CCC and the Port continued to try and resolve issues related to the supply of low permeability soil from Quality Aggregates.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Excavation for the cutoff wall installation continues to be delayed pending resolution of the supply issues related to the supply of low permeability soil from Quality Aggregates. Progress has been made in establishing the suitability of the material from the "pond", with the biggest issue now being Quality Aggregates ability to produce the material. Alternative strategies are being pursued. Once these supply issues are resolved, a schedule for the cutoff wall work will be established.
- Pipeline cleaning/decommissioning/grouting will proceed in the coming weeks as Emerald Services is available and pending activity on the cutoff wall.
- Shoring for the new oil/water separator and water quality vaults is schedule for the week of November 3rd, and the new vaults could be delivered to the project that week. Installation of the vaults will to some degree depend on the status of the cutoff wall work.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred; Mike Stewart
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #22 (November 7th)
Date:	Friday, November 07, 2014 3:35:54 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of November 3rd)

- CCC completed installation the sheet piling around where the new stormwater vaults in the SE corner of the TFA will go.
- Rhine Demolition completed asphalt crushing activities.
- One set of pot-holes on Pier 91 was backfilled and paved.
- Ground penetrating radar was used to confirm that there were no pipelines on Pier 90 in the area west of Building A-500.
- CCC and Emerald Services conducted additional cleaning of pipelines located east of the TFA.
- CCC and the Port coordinated regarding acquisition of low permeability soil from Quality Aggregates. Clearcreek will haul low permeability soil from Quality Aggregates, with the Port providing oversight, on Saturday November 8th.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Pending successful delivery of lo low permeability soil from Quality Aggregates on November 8th, the installation of the cutoff wall is scheduled to begin on Monday November 17th. A pre-installation meeting is scheduled for the morning of the 17th.
- Delivery and placement of the water quality vault and oil/water separator is scheduled for Wednesday November 12th.
- Pipeline cleaning/decommissioning/grouting will proceed in the coming weeks as Emerald Services is available and pending activity on the cutoff wall.

Let me know if you have any questions or need additional information.

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To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred; Mike Stewart
Subject:	T-91 Tank Farm Cleanup - Construction Update #23 (November 14th)
Date:	Friday, November 14, 2014 3:33:34 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of November 10rd)

- CCC completed the delivery and placement of the water quality vault and oil/water separators on Thursday November 13th. Plumbing of these vaults is ongoing.
- Rhine Demolition demobilized the crushing/screening equipment from the site.
- CCC and the Port coordinated regarding acquisition of additional low permeability soil from Quality Aggregates. Clearcreek hauled low permeability soil from Quality Aggregates, with the Port providing oversight, on Saturday November 8th, Wednesday November 12th and Friday November 14th. Although final weigh tickets have not been received, total material on site is estimated at approximately 900 tons.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Installation of the cutoff wall is scheduled to begin on Monday November 17th. A pre-installation meeting is scheduled for 10:00 am the morning of the 17th. The current schedule calls for the soil/bentonite portion the wall to be completed in 10 consecutive days and finishing prior to the Thanksgiving weekend.
- Plumbing and backfilling of the WQV/OWS and related manholes, including removal of the sheet pile shoring, will proceed as crew availability allows during the week of the 17th.
- Pipeline cleaning/decommissioning/grouting will proceed in the coming weeks as Emerald Services is available and pending activity on the cutoff wall.

Let me know if you have any questions or need additional information.

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Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred; Mike Stewart
Subject:	T-91 Tank Farm Cleanup - Construction Update #24 (November 21st)
Date:	Friday, November 21, 2014 4:20:36 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of November 17th)

- Plumbing of these OWS and WQV vaults is ongoing.
- CCC began construction of the cutoff wall on Monday the 17th and continued excavation and backfill of the soil-bentonite portion of the wall all week. As of this afternoon (11/21), backfill has been completed to approximately Station 3+30. Work on the cutoff wall will continue both Saturday and Sunday and the Port and PES will be providing QA oversight.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- CCC will continue construction of the cutoff wall through Wednesday 11/26, the take the 4-day Thanksgiving weekend off, and resume cutoff construction on Monday December 1st.
- Plumbing and backfilling of the WQV/OWS and related manholes, including removal of the sheet pile shoring, will proceed as crew availability allows during the week of the 24th.
- Pipeline cleaning/decommissioning/grouting will proceed in the coming weeks as Emerald Services is available and pending activity on the cutoff wall.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred; Mike Stewart
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #25 (December 12th)
Date:	Friday, December 12, 2014 4:11:50 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup. I neglected to provide an update last week and also did not send out one the week of Thanksgiving. We have, however, been communicating via phone so that you were apprised of the progress.

Work Performed (Weeks of December 1st and 8th)

- CCC continued construction of the soil-bentonite (SB) portion of the cutoff wall and completed the SB portion on Monday December 8th. There were several "down" periods during this time include the Thanksgiving holiday weekend and three days after that due to freezing temperatures.
- Construction of the soil-cement-bentonite (SCB) portion of the cutoff wall began on December 10th. As of this afternoon, Clearcreek has completed approximately 200 ft pf the SCB portion of the wall.
- Plumbing of the OWS and WQV vaults proceeded as time allowed.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- CCC will continue construction of the SCB portion of cutoff wall through approximately Wednesday 12/17. After that, a 14 day curing period will be required for the SCB portion of the all before beginning to work on the geogrid placement over the SCB portion of the wall.
- Plumbing and backfilling of the WQV/OWS and related manholes, including removal of the sheet pile shoring the week of December 15th, will proceed as crew availability allows.
- Pipeline cleaning/decommissioning/grouting will proceed in the coming weeks as Emerald Services is available and pending activity on the cutoff wall.
- Work on the remaining two LNAPL trenches and beginning the final site grading may also begin in this period.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Russell Stolsen; Kelly Rankich; Chou, Fred; Mike Stewart
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #26 (December 19th)
Date:	Friday, December 19, 2014 1:31:18 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Weeks of December 15th)

- Construction of the soil-cement-bentonite (SCB) portion of the cutoff wall was completed on December 18th.
- Site cleanup and demobilization of equipment associated with the SB and SCB mixing and placement work began on December 19th.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Construction of the geogrid and aggregate cap over the SCB portion of the cutoff wall is scheduled to begin on December 29th after the 14 day curing period is over for the beginning sections of the wall.
- Rough grading of the site is scheduled to begin December 22nd and continue through the next three weeks.
- Plumbing and backfilling of the WQV/OWS and related manholes, including removal of the sheet pile shoring the week of December 22nd, will proceed as crew availability allows.
- Pipeline cleaning/decommissioning/grouting will proceed in the coming weeks as Emerald Services is available and pending activity on the cutoff wall.
- Work on the remaining two LNAPL trenches and beginning the final site grading may also begin in this period.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #27 (January 23rd)
Date:	Friday, January 23, 2015 2:13:53 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup. Note that this is the first update since the week before the holidays. Since the last update, we have kept you apprised of the progress though periodic phone calls, your visits to the site, and from the weekly meeting minutes.

Work Performed (Weeks of January 19th)

- Work on the stormwater line extension from the SE corner of the TFA underneath the Magnolia Bridge began; and
- Work on the stormwater piping in the SE corner of the TFA continued.
- Also during the week, Clearcreek and the Port continued to evaluate the QA/QC results of the SCB cap, specifically those for unconfined compressive strength, and Clearcreek prepared a plan for repairing sections of the SCB cap that did not meet standards.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- The repairs to the SCB Cap will be conducted the week of January 26th and should take most of the week.
- Once the SCB cap repairs are complete, the geogrid and aggregate cap will be placed over the approved portions of the SCB, tentatively beginning the week of February 2nd.
- As time allows, additional work on the SE stormwater system extension and additional pipeline cleaning/decommissioning will occur.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred
Subject:	T-91 Tank Farm Cleanup - Construction Update #28 (January 30th)
Date:	Friday, January 30, 2015 3:01:38 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Weeks of January 26th)

- Continued work on the stormwater line extension from the SE corner of the TFA (backfilled OWS around and WQV and manhole structure);
- Remobilized materials and equipment to conduct SCB cap repair work; and
- Conducted SCB repair activities Thursday and Friday; a minor amount of repair work is scheduled for Saturday.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- The primary task the week of February 2nd will be working on the stormwater line extension from the SE corner of the TFA underneath the Magnolia Bridge. This work will need to be conducted in the evenings to take advantage of the low tides.
- Once the SCB cap repair curing period has occurred and samples indicate that the unconfined compressive strength of the repaired SCB meets the specifications, the geogrid and aggregate cap will be placed over the SCB, tentatively beginning the week of February 9th.
- As time allows, additional work on the SE stormwater system extension and additional pipeline cleaning/decommissioning will occur.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #29 (February 6th)
Date:	Friday, February 06, 2015 3:59:14 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of February 2nd)

- Continued work on the stormwater line extension from the SE corner of the TFA, including installing the northern and southern manholes associated with the extension;

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- The primary task the first part of the week of February 9th will be completing the stormwater line extension from the SE corner of the TFA underneath the Magnolia Bridge.
- Assuming that unconfirmed compressive strength test results indicate that the SCB cap repair has met the interim requirements, the geogrid and aggregate cap will be placed over the SCB, tentatively beginning later in the week of February 9th.
- Following the geogrid and aggregate cap work, general site grading and installation of the remainder of the stormwater system around the perimeter of the TFA will begin.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	T-91 Tank Farm Cleanup - Construction Update #30 (February 13th)
Date:	Friday, February 13, 2015 3:17:42 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of February 9th)

- Continued work on the stormwater line extension from the SE corner of the TFA, including installing the line between the northern and southern manholes, backfilling or portions of the trench, and evaluating utilities crossing the trench to determine if any are possible fuel lines.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Initial unconfined compressive strength test results indicate that the SCB cap repair has met or exceed the interim requirements. Therefore, the geogrid and aggregate cap installation will begin starting on Monday February 16th and should continue for the majority of the week.
- Following the geogrid and aggregate cap work, general site grading and installation of the remainder of the stormwater system around the perimeter of the TFA will begin.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	T-91 Tank Farm Cleanup - Construction Update #31 (February 20th)
Date:	Friday, February 20, 2015 3:25:34 PM

Greg –

Please find below the update regarding this week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of February 23rd)

- Completed work on the stormwater line extension from the SE corner of the TFA, including final paving of areas around both manholes and the connecting drain line.
- Unconfined compressive strength test results indicate that the SCB cap repair exceeded the interim requirements. Placement of the uniaxial geogrid and aggregate cap installation began on Monday February 16th, continued all week, and should be completed either on Saturday the 21st of Monday the 23rd.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Install LNAPL Recovery Trench #2 (week of February 23rd).
- Following the geogrid and aggregate cap work, Clearcreek may opt to start installation of the triaxial geogrid to prepare for general site grading activities.
- In preparation for general site grading, Clearcreek will be conducting a survey of the existing site surface and begin to prepare the existing subgrade for approval. Once areas are approved by the Engineer, site grading will commence.
- Installation of the remainder of the stormwater system around the perimeter of the TFA will begin.

Let me know if you have any questions or need additional information.

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To:	Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	T-91 Tank Farm Cleanup - Construction Update #32 (March 2nd)
Date:	Monday, March 02, 2015 1:51:36 PM

Greg –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of February 23rd)

- Completed placement of the uniaxial geogrid and aggregate cap. The Triaxial geogrid was installed in the locations of the access roads into and out of the TFA to facilitate reconstruction of these roads.
- Began rough grading portions of the site, including the area of the former Black Oil Yard. Areas that were graded were first proof rolled and any "soft" areas repaired prior to placement of engineered fill.
- Began installation of LNAPL Trench #2. Note that this trench was moved approximately 4 ft north from the location shown on the drawing due to the increased width of the SCB cap over the cutoff wall and the associated location of the anchor trench.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Complete installation of LNAPL Recovery Trench #2.
- Continued installation of the triaxial geogrid to support general site grading activities.
- Continued general site grading activities, Clearcreek will be conducting a survey of the existing site surface and begin to prepare the existing subgrade for approval. Once areas are approved by the Engineer, site grading will commence.
- Installation of the remainder of the stormwater system around the perimeter of the TFA will begin.

Let me know if you have any questions or need additional information.

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To:	Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #33 (March 6th)
Date:	Friday, March 06, 2015 4:02:03 PM

Greg –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of March 2nd)

- Continued rough grading portions of the site, including the area of the former Black Oil Yard. Rough graded areas were proof rolled or compaction tested.
- Completed installation of LNAPL Trench #2, except for surface vaults/top of riser structures, on Saturday February 28th.
- Continued to explore/investigation several of the remaining pipelines that have yet to be decommissioned.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Continued installation of the triaxial geogrid to support general site grading activities.
- Continued general site grading activities, Clearcreek will be conducting a periodic progress surveys of the site as grading progresses.
- Continued investigation and/or decommissioning activities of the remaining pipelines.
- Installation of the remainder of the stormwater system around the perimeter of the TFA will begin.

Let me know if you have any questions or need additional information.

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From:	Brian O"Neal
To:	Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #34 (March 13th)
Date:	Friday, March 13, 2015 3:43:57 PM

Greg –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of March 9th)

- Continued backfill/compaction/grading of the site; rough graded areas were proof rolled or compaction tested. Based on work accomplished this week and the amount of fill material still in stockpiles, it appears that the "peak" of the final surface cover will be closer to the original design grades (i.e., approximately 1 ft higher than the revised grading plan issued in December).

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Continued installation of the triaxial geogrid to support general site grading activities.
- Continued general site grading activities, Clearcreek will be conducting a periodic progress surveys of the site as grading progresses.
- Continued investigation and/or decommissioning activities of the remaining pipelines.
- Installation of the remainder of the stormwater system around the perimeter of the TFA will begin.
- Installation of the retaining wall (block wall) along the north side of Bulding M-28.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

From:	Brian O"Neal
To:	Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #35 (March 20th)
Date:	Friday, March 20, 2015 3:41:41 PM

Greg –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of March 16th)

- Continued backfill/compaction/grading of the site;
- Placement of aggregate cap over the triaxial geogrid; and
- Construction of the stormwater system piping and catch basins.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Continued general site grading activities, Clearcreek will be conducting a periodic progress surveys of the site as grading progresses.
- Continued investigation and/or decommissioning activities of the remaining pipelines.
- Installation of the remainder of the stormwater system around the perimeter of the TFA will begin.
- Installation of the retaining wall (block wall) along the north side of Bulding M-28.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred
Subject:	T-91 Tank Farm Cleanup - Construction Update #36 (March 30th)
Date:	Monday, March 30, 2015 10:24:19 AM

Greg –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of March 23rd)

- Continued backfill/compaction/grading of the site;
- Placement of aggregate cap over the triaxial geogrid;
- Construction of the stormwater system piping and catch basins; and
- Contined investigation and decommissioning activities of remaining pipelines.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Continued general site grading activities, Clearcreek will be conducting a periodic progress surveys of the site as grading progresses.
- Continued investigation and/or decommissioning activities of the remaining pipelines.
- Installation of the remainder of the stormwater system around the perimeter of the TFA will begin.
- Installation of the retaining wall (block wall) along the north side of Bulding M-28.

As you may have seen in the minutes from last Thursday's weekly progress meeting, the current schedule shows site work extending beyond the previously estimated date of "substantial completion" of April 13th, 2015. The Port will be working with Clearcreek Contractors to firm up a revised completion date, at which time Sue Roth will formally notify you of this revised date.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #37 (April 3rd)
Date:	Friday, April 03, 2015 3:49:56 PM

Greg –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of March 30th)

- Continued backfill/compaction/grading of the site;
- Placement of aggregate cap over the triaxial geogrid;
- Construction of the stormwater system piping and catch basins;
- Delivered the concrete blocks for constructing the retaining wall along the north end of Building M-28;
- Replaced the lids on the water quality vault with ones that had the correct hatches; and
- Continued investigation and decommissioning activities of remaining pipelines, including grouting portions of the pipeline leading from south of the guard shack to the pothole north of the Building W-30 loading dock and grouting several lines leading east from the TFA.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Continued general site grading activities, Clearcreek will be conducting a periodic progress surveys of the site as grading progresses.
- Continued investigation and/or decommissioning activities of the remaining pipelines.
- Installation of the remainder of the stormwater system around the perimeter of the TFA will begin.
- Installation of the retaining wall (block wall) along the north side of Building M-28.
- Asphalt paving and restoration activities are currently scheduled to begin the week of April 20th.

The Port will be working with Clearcreek Contractors to firm up a revised completion date, at which time Sue Roth will formally notify you of this revised date.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #39 (April 24th)
Date:	Friday, April 24, 2015 4:40:55 PM

Greg –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup. An e-mail update was not sent last week as I was on vacation, and after checking with Stacy Heilgeist it was determined that the minutes from the regular Thursday progress meeting adequately covered the weeks activities.

Work Performed (Week of April 20th)

- Continued backfill/compaction/grading of the site;
- Managing was materials removed from the vault identified in the roadway near the NE corner of the TFA;
- Construction of the stormwater system piping and catch basins;
- Demobilized the wheel wash from the site;
- Removed the old clay storm line along the western edge of the TFA; and
- Continued decommissioning activities of remaining pipelines.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Complete site grading activities.
- Complete investigation and/or decommissioning activities of the remaining pipelines.
- Placement of Crushed Surfacing Base Course (CSBC) and Crushed Surfacing Top Course (CSTC) scheduled to begin the week April 27th and continue through approximately May 2nd.
- Asphalt paving and restoration activities are currently scheduled to begin the week of May 4th.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

From:	Brian O"Neal
To:	Caron, Greg (ECY); Brian Dixon (BDIC461@ECY.WA.GOV)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #39 (April 24th)
Date:	Friday, May 01, 2015 3:48:06 PM

Greg and Brian –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of April 27th)

- Continued backfill/compaction/grading of the site;
- Completed construction of the stormwater system piping and catch basins;
- Installed conduits for potential future use along the west side of the TFA; and
- Completed decommissioning activities of remaining pipelines.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Complete site grading activities.
- Complete restoration of potholes associated with pipeline decommissioning.
- Placement of Crushed Surfacing Base Course (CSBC) and Crushed Surfacing Top Course (CSTC).
- Asphalt paving and restoration activities.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

From:	Brian O"Neal
To:	Caron, Greg (ECY); Brian Dixon (BDIC461@ECY.WA.GOV)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #40 (May 8th)
Date:	Friday, May 08, 2015 3:20:53 PM

Greg and Brian –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of May 4th)

- Continued minor amounts of backfill/compaction/grading of the site; and
- Paved three "pothole" areas associated with pipeline decommissioning activities.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Complete site grading activities.
- Placement of Crushed Surfacing Base Course (CSBC) and Crushed Surfacing Top Course (CSTC).
- Asphalt paving and restoration activities.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

From:	Brian O"Neal
To:	Caron, Greg (ECY); Brian Dixon (BDIC461@ECY.WA.GOV)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	T-91 Tank Farm Cleanup - Construction Update #41 (May 18th)
Date:	Monday, May 18, 2015 9:30:49 AM

Greg and Brian –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of May 11th)

- Completed spreading, grading, and compacting remaining on-site materials;
- Installed LNAPL recovery trench vaults; and
- Began importing, grading, and compacting Crushed Surfacing Base Course (CSBC).

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Complete placement of CSBC early this week.
- Importing, grading, and compacting Crushed Surfacing Top Course (CSTC) later this week and into the week of May 26th.
- Asphalt paving and restoration activities currently schedule for June 1st and 2nd.
- Monitoring well restoration activities will following final paving.
- Installation of safety fencing on top of block wall north of Building M-28.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

From:	Brian O"Neal
To:	Caron, Greg (ECY); Brian Dixon (BDIC461@ECY.WA.GOV)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	T-91 Tank Farm Cleanup - Construction Update #42 (May 22nd)
Date:	Friday, May 22, 2015 4:55:22 PM

Greg and Brian –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of May 18th)

- Completed the majority of the importing, grading, and compacting Crushed Surfacing Base Course (CSBC).
- Clearcreek surveyed surface of CSBC and Port initiated review.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Conduct any finial finish grading of CSBC early this week based on review or survey information.
- Importing, grading, and compacting Crushed Surfacing Top Course (CSTC) middle to end of this week and into the week of June 1st.
- Asphalt paving and restoration activities currently schedule for June 8th and 9th.
- Monitoring well restoration activities will following final paving.
- Installation of safety fencing on top of block wall north of Building M-28.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

From:	Brian O"Neal
To:	Caron, Greg (ECY); Brian Dixon (BDIC461@ECY.WA.GOV)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	T-91 Tank Farm Cleanup - Construction Update #43 (May 29th)
Date:	Friday, May 29, 2015 2:39:36 PM

Greg and Brian –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of May 25th)

- Confirmed placement and grading of Crushed Surfacing Base Course (CSBC) layer;
- Began placement , grading, and compaction of Crushed Surfacing Top Course (CSTC) layer; and
- Grinding miscellaneous asphalt curbs.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Complete importing, grading, and compacting CSTC by the middle the week of June 1st.
- Survey and inspect final CSTC surface.
- Once CSTC surface is approved, asphalt paving and restoration activities currently schedule to begin on June 8th and 9th during the day (perimeter of the site) and continue for the main portion of the site on June 10th through the 12th.
- Monitoring well restoration activities will following final paving.
- Installation of safety fencing on top of block wall north of Building M-28.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

From:	Brian O"Neal
To:	Caron, Greg (ECY); Brian Dixon (BDIC461@ECY.WA.GOV)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred; Brian O"Neal
Subject:	RE: T-91 Tank Farm Cleanup - Construction Update #44 (May 5th)
Date:	Friday, June 05, 2015 3:02:22 PM

Greg and Brian –

Please find below the update regarding last week's construction activities for the T-91 Tank Farm Cleanup.

Work Performed (Week of June 1st)

- Completed placement , grading, and compaction of Crushed Surfacing Top Course (CSTC) layer;
- Survey and inspect final CSTC surface; and
- Preformed road striping near guard shack.

Work Scheduled for Next Three Weeks (schedule previously sent with weekly meeting minutes)

- Once CSTC surface is approved, asphalt paving and restoration activities currently schedule to begin on June 8th and 9th during the day (perimeter of the site) and continue for the main portion of the site on June 10th through the 12th.
- Monitoring well restoration activities will following final paving.
- Installation of safety fencing on top of block wall north of Building M-28.
- Final site cleanup and punch list items will be address the week of June 15th.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

From:	Brian O"Neal
To:	Brian O"Neal; Caron, Greg (ECY); Brian Dixon (BDIC461@ECY.WA.GOV)
Cc:	Heilgeist, Stacy; "Bahnick, Kathy"; susanjroth@comcast.net; Roger North; Kelly Rankich; Chou, Fred
Subject:	T-91 Tank Farm Cleanup - FINAL Construction Update #45 (July 9th)
Date:	Thursday, July 09, 2015 9:18:12 AM

Greg and Brian –

The previous construction update e-mail for the T-91 Tank Farm Cleanup was sent out approximately one month ago, and at that time the primary activity that remained was the asphalt paving and restoration. Since that previous update, all of the outstanding construction tasks have been completed including:

- Asphalt paving and restoration activities were completed the week of June 8th through the 12th.
- Monitoring well restoration activities for wells within the repaved area of the TFA were completed during the following two weeks.
- Installation of safety fencing on top of block wall north of Building M-28 was completed by June 18th.
- Final site cleanup and punch list items have all been completed.

The only remaining outstanding items that are required prior to establishing the official construction completion date for purposes of agreed order deliverable schedules are key post-construction submittals, including the final cutoff wall report and the redline as-built drawings. This was communicated in Sue Roth's July 6, 2015 e-mail. We expect these final deliverables before the end of the month and will notify you once they are received.

This is will be the final e-mail update regarding the T91 Tank Farm Cleanup construction work.

Let me know if you have any questions or need additional information.

Brian O'Neal, P.E.
PES Environmental, Inc.
ph: (206) 529-3980
cell: (425) 241-2627

APPENDIX F

Pipeline Decommissioning Documentation

- Summary Tables of Pipeline Contents and Grout Quantities are attached.
- Marine Chemist and Emerald Waste Acceptance Forms are attached.
- Video Documentation Records are included on Disk 2.

Summary of Pipeline Contents
Terminal 91 Tank Farm Cleanup
Port of Seattle, Seattle, WA

Contents By Pipeline	
Pipeline #	**Contents**
1	Grouted
2N	Empty/Clean
2S	Previously Grouted
3-1	Empty (Removed to Connection at Bathroom)
3-2	Empty
3-3	Empty
3-4	Stove Oil
3-5	Bunker Oil
5A	Oily Water/Black Oil
5B	Oily Water/Diesel
5C	Oily Water/Black Oil
5E	Oily Water/Black Oil
6	Oily Water/Black Oil
7A	Oily Water/Kerosene
7B	Oily Water/Diesel
7C	Oily Water/Diesel
7D	Oily Water/Waste Oil
8A	Oily Water/Black Oil
8B	Water
8C	Water
9	Oily Water/Waste Oil
E1	Bunker Oil
E2	Oily Water
E3	Oily Water
E4	Oily Water
E5	Oily Water
E6	Oily Water
E7	Oily Water
E8	Oily Water
W1	Empty

George D Blair - Northwest Marine Chemist, Inc.
P. O. Box 7084, Tacoma, WA 98406
Office: 253-752-0149 Fax: 253-759-3523
Email: gbcmc637@gmail.com

MARINE CHEMIST CERTIFICATE

Serial 637-00377

Clearcreek Contractors	Port of Seattle	Feb 16, 2015
Survey Requested by	Vessel Owner Agent	Date
Port of Seattle	Pipeline	Pier 91
Vessel	Type of Vessel	Specific Location of Vessel
Unknown Waste	O_2, LEL, Visual	8:04
Last Three 3 Loadings	Tests Performed	Time Survey Completed

Inspected Spaces:
Group 1. 4" Steel Pipelne East to West

Safety Designations:
ATMOSPHERE SAFE FOR WORKERS
SAFE FOR HOT WORK

Instructions
This line has been filled with CDF Grout and is safe for excavation or abandonment.

Test Results	**% O_2**	**% LEL**
Inspected spaces group 1	20.8%	0%

In the event of physical or atmospheric changes affecting the STANDARD SAFETY DESIGNATIONS assigned to any of the above spaces, this certificate is voided; spaces not listed on the Certificate are not to be entered unless authorized on another Certificate and/or maintained in accordance with OSHA 29 CFR 1915; or if in any doubt, immediately stop all work and contact the undersigned Marine Chemist. Unless otherwise stated on the Certificate, all spaces and affected adjacent spaces are to be reinspected daily or more often as necessary by the competent person or the authority having jurisdiction as applicable in support of work prior to entry or recommencement of work.

QUALIFICATIONS. Transfer of ballast, cargo, fuel or manipulation of valves or closure equipment tending to alter conditions in pipelines, tanks, or compartments subject to gas accumulation, unless specifically approved on this Certificate, requires inspection and a new Certficate for spaces so affected. All lines, vents, heating coils, valves, and similar enclosed appurtenances shall be considered "not safe" unless otherwise specifically designated. Movement of the vessel from its specific location voids the Certificate unless shifting of the vessel within the facility has been specifically authorized on this certificate.

STANDARD SAFETY DESIGNATIONS. (partial list, paraphrased from NFP 306, Subsections 4 3 1 through 4 3 6)

ATMOSPHERE SAFE FOR WORKERS. In the compartment or space so designated (a) the oxygen content of the atmosphere shall be at least 19 5 percent and not greater than 22 percent by volume, (b) the concentration of flammable materials is below 10 percent of the lower explosive limit, (c) any toxic materials in the atmosphere associated with cargo, fuel, tank coatings, inerting mediums, or fumigants are within permissible concentrations at the time of the inspection.

NOT SAFE FOR WORKERS. In the compartment or space so designated, entry shall not be permitted.

ENTER WITH RESTRICTIONS. In the compartment or space so designated, entry for work is permitted only if conditions of proper protective equipment, or clothing, or time, or all of the aforementioned, as appropriate, are as specified.

SAFE FOR HOT WORK. In the compartment or space so designated (a) the oxygen content of the atmosphere is not greater than 22 percent by volume, (b) the concentration of flammable materials in the atmosphere is less than 10 percent of the lower explosive limit, (c) the residues, scale, or preservative coatings are cleaned sufficiently to prevent the spread of fire and are not be capable of producing a higher concentration than permitted by (a) or (b), (d) all adjacent spaces, containing or having contained flammable or combustible materials shall be sufficiently cleaned of residues, scale, or preservative coatings to prevent the spread of fire, or they are inerted. Ship's fuel tanks, lube tanks, or engine room or fire room bilges, or other machinery spaces, are treated in accordance with the Marine Chemist's requirements.

SAFE FOR LIMITED HOT WORK. In the compartment or space so designated (a) portions of the space meet the requirements Safe for Hot Work and Partial Cleaning, as applicable, or (b) the space is inerted, adjacent spaces meet the requirements for Safe for Hot Work, and hot work is restricted to specific locations, (c) portions of the space shall meet the requirements for Safe for Hot Work, as applicable, and the nature or type of hot work shall be limited or restricted.

NOT SAFE FOR HOT WORK. In the compartment or space so designated, hot is not permitted.

CHEMISTS ENDORSEMENT. This is to certify that I have personally determined that all spaces in the foregoing list are in accordance with NFPA 306 Control of Gas Hazards on Vessels and have found the condition of each to be in accordance with its assigned designation.

"The undersigned acknowledges receipt of this Certificate under NFPA 306 and understands conditions and limitations under which it was issued, and the requirements for maintaining its validity."

This Certificate is based on conditions existing at the time the inspection herein set forth was completed and is issued subject to compliance with all qualifications and instructions.

Authorized Representative	Feb 16, 2015	Clearcreek Contractors	Signed Marine Chemist	637
	Date	Company		CMC No.

George D Blair - Northwest Marine Chemist, Inc.
P. O. Box 7084, Tacoma, WA 98406
Office: 253-752-0149 Fax: 253-759-3523
Email: gbcmc637@gmail.com

MARINE CHEMIST CERTIFICATE

Serial 637-00392

Clearcreek Contractors	Port of Seattle	Mar 27, 2015
Survey Requested by	Vessel Owner Agent	Date
Port of Seattle	Pipeline	Pier 91
Vessel	Type of Vessel	Specific Location of Vessel
Unknown Waste	O_2, LEL, Visual, VOC	10:24
Last Three 3 Loadings	Tests Performed	Time Survey Completed

Inspected Spaces:
Group 1. 4" Steel Pipeline Crowley 1

Safety Designations:
SAFE FOR HOT WORK
NOT SAFE FOR WORKERS

Instructions
These lines have been partially filled with CDF Grout and are safe for excavation cutting and capping, or abandonment.

Test Results	% O_2	% LEL	VOC
Inspected spaces group 1	16.5%	0%	.5 ppm

Limits of Detection
0.1 ppm VOC

Inspected Spaces:
Group 1. 8" Steel Pipeline #9

Safety Designations:
NOT SAFE FOR WORKERS
NOT SAFE FOR HOT WORK
INERTED
Inert Medium: *Carbon Dioxide (CO2)*
Method for maintaining safe conditions: *Chemist shall monitor Oxygen level throughout coldwork process.*
Measures for safe disposal of inert gas: *Ventilate and test for 20.8% Oxygen to properly dispose of inerting gas.*
Other Instructions: *Ventilate and clean lines for further work operations.*

Instructions
Chemist prior to any further hotwork operations on this pipeline.
This line was purged with CO2 to < 6% Oxygen and was cold cut to allow access. Chemist in attendance during cold cutting operations.

Test Results	% O_2	% LEL	VOC
Inspected spaces group 1	7.4%	65%%	0.9 ppm

Limits of Detection
0.1 ppm VOC

In the event of physical or atmospheric changes affecting the STANDARD SAFETY DESIGNATIONS assigned to any of the above spaces, this certificate is voided; spaces not listed on the Certificate are not to be entered unless authorized on another Certificate and/or maintained in accordance with OSHA 29 CFR 1915; or if in any doubt, immediately stop all work and contact the undersigned Marine Chemist. Unless otherwise stated on the Certificate, all spaces and affected adjacent spaces are to be reinspected daily or more often as necessary by the competent person or the authority having jurisdiction as applicable in support of work prior to entry or recommencement of work.

QUALIFICATIONS. Transfer of ballast, cargo, fuel or manipulation of valves or closure equipment tending to alter conditions in pipelines, tanks, or compartments subject to gas accumulation, unless specifically approved on this Certificate, requires inspection and a new Certificate for spaces so affected. All lines, vents, heating coils, valves, and similar enclosed appurtenances shall be considered "not safe" unless otherwise specifically designated. Movement of the vessel from its specific location voids the Certificate unless shifting of the vessel within the facility has been specifically authorized on this certificate.

STANDARD SAFETY DESIGNATIONS. (partial list, paraphrased from NFP 306, Subsections 4.3.1 through 4.3.6)

ATMOSPHERE SAFE FOR WORKERS. In the compartment or space so designated (a) the oxygen content of the atmosphere shall be at least 19.5 percent and not greater than 22 percent by volume, (b) the concentration of flammable materials is below 10 percent of the lower explosive limit, (c) any toxic materials in the atmosphere associated with cargo, fuel, tank coatings, inerting mediums, or fumigants are within permissible concentrations at the time of the inspection.

NOT SAFE FOR WORKERS. In the compartment or space so designated, entry shall not be permitted.

ENTER WITH RESTRICTIONS. In the compartment or space so designated, entry for work is permitted only if conditions of proper protective equipment, or clothing, or time, or all of the aforementioned, as appropriate, are as specified.

SAFE FOR HOT WORK. In the compartment or space so designated (a) the oxygen content of the atmosphere is not greater than 22 percent by volume, (b) the concentration of flammable materials in the atmosphere is less than 10 percent of the lower explosive limit, (c) the residues, scale, or preservative coatings are cleaned sufficiently to prevent the spread of fire and are not be capable of producing a higher concentration than permitted by (a) or (b), (d) all adjacent spaces, containing or having contained flammable or combustible materials shall be sufficiently cleaned of residues, scale, or preservative coatings to prevent the spread of fire, or they are inerted. Ship's fuel tanks, lube tanks, or engine room or fire room bilges, or other machinery spaces, are treated in accordance with the Marine Chemist's requirements.

SAFE FOR LIMITED HOT WORK. In the compartment or space so designated (a) portions of the space meet the requirements Safe for Hot Work and Partial Cleaning, as applicable, or (b) the space is inerted, adjacent spaces meet the requirements for Safe for Hot Work, and hot work is restricted to specific locations, (c) portions of the space shall meet the requirements for Safe for Hot Work, as applicable, and the nature or type of hot work shall be limited or restricted.

NOT SAFE FOR HOT WORK. In the compartment or space so designated, hot is not permitted.

CHEMISTS ENDORSEMENT. This is to certify that I have personally determined that all spaces in the foregoing list are in accordance with NFPA 306 Control of Gas Hazards on Vessels and have found the condition of each to be in accordance with its assigned designation.

"The undersigned acknowledges receipt of this Certificate under NFPA 306 and understands conditions and limitations under which it was issued, and the requirements for maintaining its validity."

This Certificate is based on conditions existing at the time the inspection herein set forth was completed and is issued subject to compliance with all qualifications and instructions.

PACIFIC MARINE TESTING CO., Inc.
4457 140th Avenue Southeast
Bellevue, Washington 98006-2337
206 715-4932
425 641-2187

MARINE CHEMIST CERTIFICATE

SERIAL NO. O118110

Page 1 of 1

CABRAHAMSON (CCC)	ClearCreek Contractors, Inc	13 APRIL, 2015
Survey Requested by	Vessel Owner or Agent	Date
VARIOUS UNDERGROUND LINES	(UNDER GROUND LINES)	PIER 91
Vessel	Type of Vessel	Specific Location of Vessel
WASTE OIL & WATER	O2 / LEL / VISUAL	1015 HR
Last Three (3) Loadings	Tests Performed	Time Survey Completed

(SOUTH OF BUILDING 390)
4" LINE (WATER) @ 90° Angle } filled with water } Safe for hotwork.
O2 LEL
8" LINE (WASTE OIL) @ Flange } 16.0% 0% } Safe for limited hotwork
Hotwork limitation: hotwork is restricted to use of drill and sawzall to extract section.

(LOADING RAMP BUILDING SOUTH OF 390) O2 LEL
MAN HOLE to Pipes } 20.9% 0% } Atmosphere safe for workers, safe for limited hotwork.
Hotwork limitation: hotwork restricted to drilling & cutting with sawzall, lines exposed in the manhole.

4" Pipe (WATER) } filled with water } Safe for limited hotwork.

8" Line (WATER) } filled with water } Safe for limited hotwork.
Hotwork limitation: Hotwork is restricted to drilling and cutting section with sawzall to extract section.
O2 LEL
#4" line (WASTE OIL) } 16% 0% } Safe for limited hotwork.
Hotwork limitation: Hotwork is restricted to drilling and cutting section with sawzall to extract section.

Secured limited hotwork 1400 hr.

In the event of physical or atmospheric changes affecting the STANDARD SAFETY DESIGNATIONS assigned to any of the above spaces, this certificate is voided; spaces not listed on the Certificate are not to be entered unless authorized on another Certificate and/or maintained in accordance with OSHA 29 CFR 1915, or if in any doubt, immediately stop all work and contact the undersigned Marine Chemist. Unless otherwise stated on the Certificate, all spaces and affected adjacent spaces are to be reinspected daily or more often as necessary by the competent person in support of work prior to entry or recommencement of work.

QUALIFICATIONS: Transfer of ballast, cargo, fuel, or manipulation of valves or closure equipment tending to alter conditions in pipelines, tanks, or compartments subject to gas accumulation, unless specifically approved on this Certificate, requires inspection and a new Certificate for spaces so affected. All lines, vents, heating coils, valves, and similar enclosed appurtenances shall be considered "not safe" unless otherwise specifically designated. Movement of the vessel from its specific location voids the Certificate unless shifting of the vessel within the facility has been specifically authorized on this Certificate.

STANDARD SAFETY DESIGNATIONS: (partial list, paraphrased from NFPA 306, Subsections 4.3.1 through 4.3.6).

ATMOSPHERE SAFE FOR WORKERS: In the compartment or space so designated (a) the oxygen content of the atmosphere is at least 19.5 percent and not greater than 22 percent by volume; (b) the concentration of flammable materials is below 10 percent of the lower explosive limit; (c) any toxic materials in the atmosphere associated with cargo, fuel, tank coatings, inerting mediums, or fumigants are within permissible concentrations at the time of the inspection.

NOT SAFE FOR WORKERS: In the compartment or space so designated, entry is not permitted.

ENTER WITH RESTRICTIONS: In the compartment or space so designated, entry for work is permitted only if conditions of proper protective equipment, or clothing, or time, or all of the aforementioned, as appropriate, are as specified.

SAFE FOR HOT WORK: In the compartment or space so designated (a) the oxygen content of the atmosphere is not greater than 22 percent by volume; (b) the concentration of flammable materials in the atmosphere is less than 10 percent of the lower explosive limit; (c) the residues, scale, or preservative coatings are cleaned sufficiently to prevent the spread of fire and are not capable of producing a higher concentration than permitted by (a) or (b); (d) all adjacent spaces, containing or having contained flammable or combustible materials shall be sufficiently cleaned of residues, scale, or preservative coatings to prevent the spread of fire, or they are inerted. Ship's fuel tanks, lube tanks, or engine room or fire room bilges, or other machinery spaces, are treated in accordance with the Marine Chemist's requirements.

SAFE FOR LIMITED HOT WORK: In the compartment or space so designated (a) portions of the space meet the requirements for Safe for Hot Work and Partial Cleaning, as applicable, or (b) the space is inerted, adjacent spaces meet the requirements for Safe for Hot Work, and hot work is restricted to specific locations; (c) portions of the space shall meet the requirements for Safe for Hot Work, as applicable, and the nature or type of hot work is limited or restricted.

NOT SAFE FOR HOT WORK: In the compartment or space so designated, hot work is not permitted.

CHEMISTS ENDORSEMENT. This is to certify that I have personally determined that all spaces in the foregoing list are in accordance with NFPA 306 Control of Gas Hazards on Vessels and have found the condition of each to be in accordance with its assigned designation.

"The undersigned acknowledges receipt of this Certificate under NFPA 306 and understands conditions and limitations under which it was issued, and the requirements for maintaining its validity."

This Certificate is based on conditions existing at the time the inspection herein set forth was completed and is issued subject to compliance with all qualifications and instructions.

Signed Jake Shalan / (CCC) 04-13-15
Name / Company / Date

Signed Gregory Lang 562
Marine Chemist / Certificate No.

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PACIFIC MARINE TESTING CO.
4457 140th Avenue Southeast
Bellevue, Washington 98006-2337
206 715-4932
425 641-2187

MARINE CHEMIST CERTIFICATE

SERIAL NO. O 118071

Page 1 of 1

Doren Hess (CCC1) GBLAIR (NWMC1)	CLEARCREEK CONTRACTORS, Inc.	21 JULY 2014
Survey Requested by	Vessel Owner or Agent	Date
UNDERGROUND PIPES	PIPES of VARIOUS SIZES AS INDICATED BELOW	PIER 91
Vessel	Type of Vessel	Specific Location of Vessel
DIESEL/STOVE OIL/BUNKER FUEL	O2/LEL/VISUAL/VOC	1400 HR
Last Three (3) Loadings	Tests Performed	Time Survey Completed

		AT TIME OF INSPECTION CONTENT	O_2	LEL	VOC	
SOUTH PIT #2						Atmosphere
240 PIPE # 8A (8")	WEST	3/4 FULL of WATER	~~5.5%~~ 21%	37%	70ppm	Safe for limited hotwork.
137 PIPE # 8B (4")	EAST	FILLED w/WATER	"	—	—	
120 PIPE # 8C (4")	WEST	FILLED w/ WATER	—	—	—	Hotwork limited to drilling
155 PIPE # 6 (8")	EAST	BUNKER OIL ON WATER	1.4%	~~20%~~ 0%	~~20ppm~~ 20ppm	holes to set plugs in preparation
100 PIPE # 9 (4")	EAST ABOVE #6	DRY	1.5%	25%	60ppm	to clean.

		AT TIME OF INSPECTION CONTENT	O_2	LEL	VOC	
SOUTH PIT #3						Atmosphere
325 PIPE # 7D (4")	EAST	BUNKER OIL ON WATER	95%	0%	9ppm	Safe for limited hotwork.
333 PIPE # 7C (6")	EAST	DIESEL FUEL ON WATER	<5%	0%	100ppm	
343 PIPE # 7B (6")	WEST	DIESEL FUEL ON WATER	23%	0%	20ppm	Hotwork limited to drilling
350 PIPE # 7A (8")	WEST	STOVE OIL (KEROSINE) ON WATER	<1%	0%	86ppm	holes to set plugs in preparation to clean.

		AT TIME OF INSPECTION CONTENT	O_2	LEL	VOC	
MIDDLE PIT #1						Atmosphere
1438 PIPE # 5A (12")	EAST	DRY NOT DECLARED	<3%	2%	120ppm	Safe for limited hotwork.
1453 PIPE # 5B (10")		DRY NOT DECLARED	<1%	30%	100ppm	
1515 PIPE # 5C (6")		DRY NOT DECLARED	<1%	0%	60ppm	Hotwork limited to drilling
1530 PIPE # 5Z (12")	WEST	WATER OIL	<0.5%	0%	80ppm	holes to set plugs in preparation to clean.

In the event of physical or atmospheric changes affecting the STANDARD SAFETY DESIGNATIONS assigned to any of the above spaces, this certificate is voided; spaces not listed on the Certificate are not to be entered unless authorized on another Certificate and/or maintained in accordance with OSHA 29 CFR 1915, or if in any doubt, immediately stop all work and contact the undersigned Marine Chemist. Unless otherwise stated on the Certificate, all spaces and affected adjacent spaces are to be reinspected daily or more often as necessary by the competent person in support of work prior to entry or recommencement of work.

QUALIFICATIONS: Transfer of ballast, cargo, fuel, or manipulation of valves or closure equipment tending to alter conditions in pipelines, tanks, or compartments subject to gas accumulation, unless specifically approved on this Certificate, requires inspection and a new Certificate for spaces so affected. All lines, vents, heating coils, valves, and similar enclosed appurtenances shall be considered "not safe" unless otherwise specifically designated. Movement of the vessel from its specific location voids the Certificate unless shifting of the vessel within the facility has been specifically authorized on this Certificate.

STANDARD SAFETY DESIGNATIONS: (partial list, paraphrased from NFPA 306, Subsections 4.3.1 through 4.3.6).

ATMOSPHERE SAFE FOR WORKERS: In the compartment or space so designated (a) the oxygen content of the atmosphere is at least 19.5 percent and not greater than 22 percent by volume; (b) the concentration of flammable materials is below 10 percent of the lower explosive limit; (c) any toxic materials in the atmosphere associated with cargo, fuel, tank coatings, inerting mediums, or fumigants are within permissible concentrations at the time of the inspection.

NOT SAFE FOR WORKERS: In the compartment or space so designated, entry is not permitted.

ENTER WITH RESTRICTIONS: In the compartment or space so designated, entry for work is permitted only if conditions of proper protective equipment, or clothing, or time, or all of the aforementioned, as appropriate, are as specified.

SAFE FOR HOT WORK: In the compartment or space so designated (a) the oxygen content of the atmosphere is not greater than 22 percent by volume; (b) the concentration of flammable materials in the atmosphere is less than 10 percent of the lower explosive limit; (c) the residues, scale, or preservative coatings are cleaned sufficiently to prevent the spread of fire and are not capable of producing a higher concentration than permitted by (a) or (b); (d) all adjacent spaces, containing or having contained flammable or combustible materials shall be sufficiently cleaned of residues, scale, or preservative coatings to prevent the spread of fire, or they are inerted. Ship's fuel tanks, lube tanks, or engine room or fire room bilges, or other machinery spaces, are treated in accordance with the Marine Chemist's requirements.

SAFE FOR LIMITED HOT WORK: In the compartment or space so designated (a) portions of the space meet the requirements for Safe for Hot Work and Partial Cleaning, as applicable, or (b) the space is inerted, adjacent spaces meet the requirements for Safe for Hot Work, and hot work is restricted to specific locations; (c) portions of the space shall meet the requirements for Safe for Hot Work, as applicable, and the nature or type of hot work is limited or restricted.

NOT SAFE FOR HOT WORK: In the compartment or space so designated, hot work is not permitted.

CHEMISTS ENDORSEMENT. This is to certify that I have personally determined that all spaces in the foregoing list are in accordance with NFPA 306 Control of Gas Hazards on Vessels and have found the condition of each to be in accordance with its assigned designation.

"The undersigned acknowledges receipt of this Certificate under NFPA 306 and understands conditions and limitations under which it was issued, and the requirements for maintaining its validity."

This Certificate is based on conditions existing at the time the inspection herein set forth was completed and is issued subject to compliance with all qualifications and instructions.

Signed [signature] (Name) CLEARCREEK (Company) 7-21-14 (Date)

Signed [signature] (Marine Chemist) 562 (Certificate No.)

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PACIFIC MARINE TESTING CO.
4457 140th Avenue Southeast
Bellevue, Washington 98006-2337
206 715-4932
425 641-2187

MARINE CHEMIST CERTIFICATE

SERIAL NO. 0118073

Page 1 of 1

DARIN NESS (CCC1) G BLAIR (NWMC1)	CLEAR CREEK CONTRACTORS Inc	22 July 2013
Survey Requested by	Vessel Owner or Agent	Date
UNDER GROUND PIPES	PIPES OF VARIOUS SIZES AS INDICATED BELOW	PIER 91
Vessel	Type of Vessel	Specific Location of Vessel
DIESEL/STOVEOIL/BUNKER FUEL	O2/LEL/VISUAL/VOC	1200 HR
Last Three (3) Loadings	Tests Performed	Time Survey Completed

	NORTH END OF LINES	O_2	LEL	VOC	
0826	PIPE # 8C (4") dry	0.3%	10%	30 ppm	Atmosphere tested for limited hotwork
0828	PIPE # 8B (4") dry	20.8%	<1%	1 ppm	
0834	PIPE # 8A (8") BUNKER FUEL/WATER	1%	30%	160 ppm	
0900	PIPE # 5A (12") water/waste oil	<1%	100%	120 ppm	
0935	APE # 5B (10") FILLED W/ WATER	UNDETERMINABLE			Hotwork is limited and restricted to drilling holes to set plugs in preparation to clean.
1030	PIPE # 5C (6") water/waste oil	<1%	100%	200 ppm	
1100	PIPE # 7D (4") water/waste oil	<1%	40%	0	
1114	PIPE # 7C (6") water/diesel	<1%	43%	130 ppm	
1120	PIPE # 7B (6") primarily WATER	<1%	9%	100 ppm	NOTE: ALL LINES HAVE BEEN INERTED BY SOME MEANS AS INDICATED BY THE OXYGEN concentrations.
1123	PIPE # 7A (8") stove oil/WATER	<1%	20%	60 ppm	

FOUR LINES WERE DRILLED AT EASTERN END (7D, 7C, 7B, 7A), plugs were set and secured @1330h

In the event of physical or atmospheric changes affecting the STANDARD SAFETY DESIGNATIONS assigned to any of the above spaces, this certificate is voided; spaces not listed on the Certificate are not to be entered unless authorized on another Certificate and/or maintained in accordance with OSHA 29 CFR 1915; or if in any doubt, immediately stop all work and contact the undersigned Marine Chemist. Unless otherwise stated on the Certificate, all spaces and affected adjacent spaces are to be reinspected daily or more often as necessary by the competent person in support of work prior to entry or recommencement of work.

QUALIFICATIONS: Transfer of ballast, cargo, fuel, or manipulation of valves or closure equipment tending to alter conditions in pipelines, tanks, or compartments subject to gas accumulation, unless specifically approved on this Certificate, requires inspection and a new Certificate for spaces so affected. All lines, vents, heating coils, valves, and similar enclosed appurtenances shall be considered "not safe" unless otherwise specifically designated. Movement of the vessel from its specific location voids the Certificate unless shifting of the vessel within the facility has been specifically authorized on this Certificate.

STANDARD SAFETY DESIGNATIONS: (partial list, paraphrased from NFPA 306, Subsections 4.3.1 through 4.3.6).

ATMOSPHERE SAFE FOR WORKERS: In the compartment or space so designated (a) the oxygen content of the atmosphere is at least 19.5 percent and not greater than 22 percent by volume; (b) the concentration of flammable materials is below 10 percent of the lower explosive limit; (c) any toxic materials in the atmosphere associated with cargo, fuel, tank coatings, inerting mediums, or fumigants are within permissible concentrations at the time of the inspection.

NOT SAFE FOR WORKERS: In the compartment or space so designated, entry is not permitted.

ENTER WITH RESTRICTIONS: In the compartment or space so designated, entry for work is permitted only if conditions of proper protective equipment, or clothing, or time, or all of the aforementioned, as appropriate, are as specified.

SAFE FOR HOT WORK: In the compartment or space so designated (a) the oxygen content of the atmosphere is not greater than 22 percent by volume; (b) the concentration of flammable materials in the atmosphere is less than 10 percent of the lower explosive limit; (c) the residues, scale, or preservative coatings are cleaned sufficiently to prevent the spread of fire and are not capable of producing a higher concentration than permitted by (a) or (b); (d) all adjacent spaces, containing or having contained flammable or combustible materials shall be sufficiently cleaned of residues, scale, or preservative coatings to prevent the spread of fire, or they are inerted. Ship's fuel tanks, lube tanks, or engine room or fire room bilges, or other machinery spaces, are treated in accordance with the Marine Chemist's requirements.

SAFE FOR LIMITED HOT WORK: In the compartment or space so designated (a) portions of the space meet the requirements for Safe for Hot Work and Partial Cleaning, as applicable, or (b) the space is inerted, adjacent spaces meet the requirements for Safe for Hot Work, and hot work is restricted to specific locations; (c) portions of the space shall meet the requirements for Safe for Hot Work, as applicable, and the nature or type of hot work is limited or restricted.

NOT SAFE FOR HOT WORK: In the compartment or space so designated, hot work is not permitted.

CHEMISTS ENDORSEMENT. This is to certify that I have personally determined that all spaces in the foregoing list are in accordance with NFPA 306 Control of Gas Hazards on Vessels and have found the condition of each to be in accordance with its assigned designation.

"The undersigned acknowledges receipt of this Certificate under NFPA 306 and understands conditions and limitations under which it was issued, and the requirements for maintaining its validity."

This Certificate is based on conditions existing at the time the inspection herein set forth was completed and is issued subject to compliance with all qualifications and instructions.

Signed NATHAN HOFFMAN (Name) CCC (Company) (CCC1) 7-22-13 (Date)

Signed [signature] (Marine Chemist) 52 (Certificate No.)

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PACIFIC MARINE TESTING CO.
4457 140th Avenue Southeast
Bellevue, Washington 98006-2337
206 715-4932
425 641-2187

MARINE CHEMIST CERTIFICATE

SERIAL NO. O 118075

GBLAIR(CWMC)/PARENNESS (CCC1)	CLEARCREEK CONTRACTORS Inc	23 JULY 2014
Survey Requested by	Vessel Owner or Agent	Date
UNDERGROUND PIPES OF VARIOUS SIZES	UNDERGROUND FUEL LINES	PIER 91
Vessel	Type of Vessel	Specific Location of Vessel
DIESEL/STOVE OIL/BUNKER FUEL	O2/LEL/VISUAL	1430 HR
Last Three (3) Loadings	Tests Performed	Time Survey Completed

Continuation of drilling and capping underground fuel lines previously drilled and capped at various locations.

LINE	O2	LEL	
#7D(4")/7C(6")/7B(6")/7A(8")	20.6%	0%	} Atmosphere safe for limited Hotwork.
#8A(8")/8B(4")/8C(4")/#6(8")/#9(4")	20.8%	0%	} Hotwork limited to drilling holes to set plugs in preparation to clean.

Lines were previously inerted w/ oxygen levels less than 4%.

Crews drilling and capping were @ B LOT (MID SECTION) and @ GUARD GATE (NORTH SECTION).

2/4/014

In the event of physical or atmospheric changes affecting the STANDARD SAFETY DESIGNATIONS assigned to any of the above spaces, this certificate is voided, spaces not listed on the Certificate are not to be entered unless authorized on another Certificate and/or maintained in accordance with OSHA 29 CFR 1915, or if in any doubt, immediately stop all work and contact the undersigned Marine Chemist. Unless otherwise stated on the Certificate, all spaces and affected adjacent spaces are to be reinspected daily or more often as necessary by the competent person in support of work prior to entry or recommencement of work.

QUALIFICATIONS: Transfer of ballast, cargo, fuel, or manipulation of valves or closure equipment tending to alter conditions in pipelines, tanks, or compartments subject to gas accumulation, unless specifically approved on this Certificate, requires inspection and a new Certificate for spaces so affected. All lines, vents, heating coils, valves, and similar enclosed appurtenances shall be considered "not safe" unless otherwise specifically designated. Movement of the vessel from its specific location voids the Certificate unless shifting of the vessel within the facility has been specifically authorized on this Certificate.

STANDARD SAFETY DESIGNATIONS: (partial list, paraphrased from NFPA 306, Subsections 4.3.1 through 4.3.6).

ATMOSPHERE SAFE FOR WORKERS: In the compartment or space so designated (a) the oxygen content of the atmosphere is at least 19.5 percent and not greater than 22 percent by volume; (b) the concentration of flammable materials is below 10 percent of the lower explosive limit; (c) any toxic materials in the atmosphere associated with cargo, fuel, tank coatings, inerting mediums, or fumigants are within permissible concentrations at the time of the inspection.

NOT SAFE FOR WORKERS: In the compartment or space so designated, entry is not permitted.

ENTER WITH RESTRICTIONS: In the compartment or space so designated, entry for work is permitted only if conditions of proper protective equipment, or clothing, or time, or all of the aforementioned, as appropriate, are as specified.

SAFE FOR HOT WORK: In the compartment or space so designated (a) the oxygen content of the atmosphere is not greater than 22 percent by volume; (b) the concentration of flammable materials in the atmosphere is less than 10 percent of the lower explosive limit; (c) the residues, scale, or preservative coatings are cleaned sufficiently to prevent the spread of fire and are not capable of producing a higher concentration than permitted by (a) or (b); (d) all adjacent spaces, containing or having contained flammable or combustible materials shall be sufficiently cleaned of residues, scale, or preservative coatings to prevent the spread of fire, or they are inerted. Ship's fuel tanks, lube tanks, or engine room or fire room bilges, or other machinery spaces, are treated in accordance with the Marine Chemist's requirements.

SAFE FOR LIMITED HOT WORK: In the compartment or space so designated (a) portions of the space meet the requirements for Safe for Hot Work and Partial Cleaning, as applicable, or (b) the space is inerted, adjacent spaces meet the requirements for Safe for Hot Work, and hot work is restricted to specific locations; (c) portions of the space shall meet the requirements for Safe for Hot Work, as applicable, and the nature or type of hot work is limited or restricted.

NOT SAFE FOR HOT WORK: In the compartment or space so designated, hot work is not permitted.

CHEMISTS ENDORSEMENT. This is to certify that I have personally determined that all spaces in the foregoing list are in accordance with NFPA 306 Control of Gas Hazards on Vessels and have found the condition of each to be in accordance with its assigned designation.

"The undersigned acknowledges receipt of this Certificate under NFPA 306 and understands conditions and limitations under which it was issued, and the requirements for maintaining its validity."

This Certificate is based on conditions existing at the time the inpection herein set forth was completed and is issued subject to compliance with all qualifications and instructions.

Signed NATHAN HOFFMAN (Name) CCC (Company) (CCC1) 7-23-14 (Date)

Signed [signature] (Marine Chemist) 562 (Certificate No)

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Pacific Marine Testing Co., Inc.
14457 140th Avenue Southeast
Bellevue, WA 98006-2337
206-715-4932 / 425 641-2187

MARINE CHEMIST CERTIFICATE

SERIAL NO. 214016 UGTFL 201402

GBLAIR (NWMC)
DAREN NESS (CCC)
Survey Requested by

CLEAR CREEK CONTRACTORS Inc
Vessel Owner or Agent

24 July 2014
Date

UNDER GROUND LINES OF VARIOUS SIZES
Vessel

UNDERGROUND FUEL LINES
Type of Vessel

PIER 91
Specific Location of Vessel

DIESEL / STOVE OIL / BUNKER FUEL
Last Three (3) Cargoes

ORIFLEL / VISUAL
Test Method

1325 HR
Time Survey Completed

Continuation of drilling and capping underground fuel lines that were previously drilled and capped at various locations.

SECTION LINE (SOUTH PIT)		O2	LEL	VOC	
#5C (6")	dry	<1%	20%	—	Atmosphere safe for limited hotwork. Hot work limited and restricted to drilling to cap and in preparation to clean.
#5B (10")	1st indicator Water	<10%	40%	—	
#5A (12")	dry	<4%	20%	—	

NOTE: #5B (10") 1st indicated water, when removed residual fuel (DIESEL) was observed.

SECTION LINE [SOUTH PIT #1 (EAST)]		O2	LEL	VOC	
#5A (12")	bunker fuel residue	<4%	10%	—	Atmosphere safe for limited hotwork. Hot work limited and restricted to drilling to cap and in preparation to clean.
#5B (10")	diesel residue	<40%	40%	—	
#5C (6")	waste oil residue	<1%	10%	—	
#5E (12")	waste oil	<0.5%	0%	—	

Second drilling and capping 1325 hrs.
Cleaning of lines to commence hereafter.

In the event of any physical or atmospheric changes adversely affecting the STANDARD SAFETY DESIGNATIONS assigned to any of the above spaces, or if in any doubt, immediately stop all work and contact the undersigned Marine Chemist.

QUALIFICATIONS: Transfer of ballast or manipulation of valves or closure equipment tending to alter conditions in pipe lines, tanks or compartments subject to gas accumulation, unless specifically approved in this Certificate, requires inspection and endorsement or reissue of Certificate for the spaces so affected. All lines, vents, heating coils, valves, and similarly enclosed appurtenances shall be considered "not safe" unless otherwise specifically designated.

STANDARD SAFETY DESIGNATIONS (partial list, paraphrased from NFPA 306 Subsections 2-3.1 through 2-3.5, and Subsection 6-3.2)

SAFE FOR WORKERS: Means that in the compartment or space so designated: (a) the oxygen content of the atmosphere is at least 19.5 percent by volume; and that, (b) toxic materials in the atmosphere are within permissible concentrations; and that, (c) the residues are not capable of producing toxic materials under existing atmospheric conditions while maintained as directed on the Marine Chemist's Certificate.

NOT SAFE FOR WORKERS: Means that in the compartment or space so designated, the requirements of Safe for Workers have not been met.

ENTER WITH RESTRICTIONS: Means that in any compartment or space so designated, entry for work may be made only if conditions of proper protective equipment, clothing, and time are as specified.

SAFE FOR HOT WORK: Means that in the compartment so designated: (a) oxygen content of the atmosphere is at least 19.5 percent by volume, with the exception of inerted spaces or where external hot work is to .be performed; and that, (b) the concentration of flammable materials in the atmosphere is below 10 percent of the lower flammable limit; and that, directed on the Marine Chemist's Certificate; and further, that, (d) all adjacent spaces containing or having contained flammable or combustible materials have been cleaned sufficiently to prevent the spread of fire, or are satisfactorily inerted, or, in the case of fuel tanks or lube oil tanks, or engine room or fire room bilges, have been treated in accordance with the Marine Chemist's requirements.

NOT SAFE FOR HOT WORK: Means that in the compartment so designated, the requirements of Safe for Hot Work have not been met.

SAFE FOR REPAIR YARD ENTRY: Means that the compartments and spaces of the flammable cryogenic liquid carrier so designated: (a) have been tested by sampling at remote sampling stations, and results indicate the atmosphere tested to be above 19.5 percent oxygen, and less than 10 percent of the lower flammable limit, or (b) are inerted.

CHEMIST'S ENDORSEMENT. This is to certify that I have personally determined that all spaces in the foregoing list are in accordance with NFPA 306 Control of Gas Hazards on Vessels and have found the condition of each to be in accordance with its assigned designation.

The undersigned acknowledges receipt of this Certificate under Section 2-6 of NFPA 306 and understands conditions and limitations under which it was issued."

This Certificate is based on conditions existing at the time the inspection herein set forth was completed and is issued subject to compliance with all qualifications and instructions."

Signed NATHAN HOFFMAN CCC (CCC) 7-24-14 Signed [signature] 562
Name Company Date Name Certificat No

PACIFIC MARINE TESTING CO.
4457 140th Avenue Southeast
Bellevue, Washington 98006-2337
206 715-4932
425 641-2187

MARINE CHEMIST CERTIFICATE

SERIAL NO. 0118076

Page 1 of 1

GDBLAIR (QUMCI) / DKESS (CCLI) — Survey Requested by
CLEAR CREEK CONSTRUCTION Inc. — Vessel Owner or Agent
22 AUG. 2014 — Date
UNDER GROUND PIPE LINES — Vessel
(4) 3" & (1) 4" PIPES — Type of Vessel
PIER 91 - Const. Site — Specific Location of Vessel
UNKNOWN (STOVE OIL, BUNKER FUEL) — Last Three (3) Loadings
O2 / LEL / VISUAL — Tests Performed
1030 HR — Time Survey Completed

LINES RUN NORTH & SOUTH FROM WAREHOUSE. (PIPE RUN #3).

	PRODUCT	O2	LEL	
#1	3" (dry)	UNKNOWN	20.8%	0%	Safe for limited hotwork.
#2	3" (dry)	UNKNOWN	20.8%	0%	
#3	3" (dry)	UNKNOWN	<4%	90%	(INERTED)

*Hotwork limitation: Hotwork is restricted to drilling test hole and to cut with sawzall.

#4	3" (contains product)	POSSIBLY STOVE OIL	Too full to test.
#5	4" (contains product)	BUNKER FUEL	Hotwork beyond drilling shall be performed with chemist present.

(as before, 3" holes shall be drilled and product removed and pipes cleaned for excavation).

#1, #2 & #3; 3" lines are acceptable for excavation. 1100 HR

#3 & #5, 3" & 5" lines are acceptable for drilling of 3" holes to remove product.
1125 hr. hole in ~~#5~~ #3, 3" line drilled (3" hole for cleaning).
1140 hr. hole in #5, 4" line drilled (3" hole for cleaning).

Second hotwork @ 1145 hr.

In the event of physical or atmospheric changes affecting the STANDARD SAFETY DESIGNATIONS assigned to any of the above spaces, this certificate is voided, spaces not listed on the Certificate are not to be entered unless authorized on another Certificate and/or maintained in accordance with OSHA 29 CFR 1915, or if in any doubt, immediately stop all work and contact the undersigned Marine Chemist. Unless otherwise stated on the Certificate, all spaces and affected adjacent spaces are to be reinspected daily or more often as necessary by the competent person in support of work prior to entry or recommencement of work.

QUALIFICATIONS: Transfer of ballast, cargo, fuel, or manipulation of valves or closure equipment tending to alter conditions in pipelines, tanks, or compartments subject to gas accumulation, unless specifically approved on this Certificate, requires inspection and a new Certificate for spaces so affected. All lines, vents, heating coils, valves, and similar enclosed appurtenances shall be considered "not safe" unless otherwise specifically designated. Movement of the vessel from its specific location voids the Certificate unless shifting of the vessel within the facility has been specifically authorized on this Certificate.

STANDARD SAFETY DESIGNATIONS: (partial list, paraphrased from NFPA 306, Subsections 4.3.1 through 4.3.6).

ATMOSPHERE SAFE FOR WORKERS: In the compartment or space so designated (a) the oxygen content of the atmosphere is at least 19.5 percent and not greater than 22 percent by volume; (b) the concentration of flammable materials is below 10 percent of the lower explosive limit; (c) any toxic materials in the atmosphere associated with cargo, fuel, tank coatings, inerting mediums, or fumigants are within permissible concentrations at the time of the inspection.

NOT SAFE FOR WORKERS: In the compartment or space so designated, entry is not permitted.

ENTER WITH RESTRICTIONS: In the compartment or space so designated, entry for work is permitted only if conditions of proper protective equipment, or clothing, or time, or all of the aforementioned, as appropriate, are as specified.

SAFE FOR HOT WORK: In the compartment or space so designated (a) the oxygen content of the atmosphere is not greater than 22 percent by volume; (b) the concentration of flammable materials in the atmosphere is less than 10 percent of the lower explosive limit; (c) the residues, scale, or preservative coatings are cleaned sufficiently to prevent the spread of fire and are not capable of producing a higher concentration than permitted by (a) or (b); (d) all adjacent spaces, containing or having contained flammable or combustible materials shall be sufficiently cleaned of residues, scale, or preservative coatings to prevent the spread of fire, or they are inerted. Ship's fuel tanks, lube tanks, or engine room or fire room bilges, or other machinery spaces, are treated in accordance with the Marine Chemist's requirements.

SAFE FOR LIMITED HOT WORK: In the compartment or space so designated (a) portions of the space meet the requirements for Safe for Hot Work and Partial Cleaning, as applicable, or (b) the space is inerted, adjacent spaces meet the requirements for Safe for Hot Work, and hot work is restricted to specific locations; (c) portions of the space shall meet the requirements for Safe for Hot Work, as applicable, and the nature or type of hot work is limited or restricted.

NOT SAFE FOR HOT WORK: In the compartment or space so designated, hot work is not permitted.

CHEMISTS ENDORSEMENT. This is to certify that I have personally determined that all spaces in the foregoing list are in accordance with NFPA 306 Control of Gas Hazards on Vessels and have found the condition of each to be in accordance with its assigned designation.

"The undersigned acknowledges receipt of this Certificate under NFPA 306 and understands conditions and limitations under which it was issued, and the requirements for maintaining its validity."

This Certificate is based on conditions existing at the time the inspection herein set forth was completed and is issued subject to compliance with all qualifications and instructions.

Signed Jake Shaffan (Name) Clearcreek (Company) 8-22-14 (Date)

Signed [signature] (Marine Chemist) 562 (Certificate No)

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PACIFIC MARINE TESTING CO.
4457 140th Avenue Southeast
Bellevue, Washington 98006-2337
206 715-4932
425 641-2187

MARINE CHEMIST CERTIFICATE

SERIAL NO. O 118078

D NESS (CCI)	CLEAR CREEK CONTRACTORS Inc	26 SEPT., 2014
Survey Requested by	Vessel Owner or Agent	Date
UNDER GRAND LINES	VARIOUS FUEL LINES	PIER 91 Facility
Vessel	Type of Vessel	Specific Location of Vessel
DIESEL / BUNKER FUEL	O2 / LEL / VISUAL	0835 HRS
Last Three (3) Loadings	Tests Performed	Time Survey Completed

LINES	O2	LEL	
8" PIPE 7A	<4%	0	These lines have been inerted. Media is unknown. Safe for limited hotwork.
6" PIPE 7B	<2%	high >10%	
4/6" PIPE 7C	<4%	high >10%	
4" PIPE 7D	<4%	0	

Hotwork limitation: Hotwork is restricted to drilling access holes to clean for removal. Chemist shall be present throughout drilling operations.

Note: 8" PIPE LINE 7A contained waste oil & water.
6" PIPE LINE 7B contained diesel & water.
4/6" Pipe Line 7C contained bunker fuel & water.
4" PIPE LINE 7D contained basically water & oil.

Second drilling 1030 hrs. Access to drain and clean lines are completed. Lines are available for cleaning and excavation.

In the event of physical or atmospheric changes affecting the STANDARD SAFETY DESIGNATIONS assigned to any of the above spaces, this certificate is voided, spaces not listed on the Certificate are not to be entered unless authorized on another Certificate and/or maintained in accordance with OSHA 29 CFR 1915, or if in any doubt, immediately stop all work and contact the undersigned Marine Chemist. Unless otherwise stated on the Certificate, all spaces and affected adjacent spaces are to be reinspected daily or more often as necessary by the competent person in support of work prior to entry or recommencement of work.

QUALIFICATIONS: Transfer of ballast, cargo, fuel, or manipulation of valves or closure equipment tending to alter conditions in pipelines, tanks, or compartments subject to gas accumulation, unless specifically approved on this Certificate, requires inspection and a new Certificate for spaces so affected. All lines, vents, heating coils, valves, and similar enclosed appurtenances shall be considered "not safe" unless otherwise specifically designated. Movement of the vessel from its specific location voids the Certificate unless shifting of the vessel within the facility has been specifically authorized on this Certificate.

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NOT SAFE FOR WORKERS: In the compartment or space so designated, entry is not permitted.

ENTER WITH RESTRICTIONS: In the compartment or space so designated, entry for work is permitted only if conditions of proper protective equipment, or clothing, or time, or all of the aforementioned, as appropriate, are as specified.

SAFE FOR HOT WORK: In the compartment or space so designated (a) the oxygen content of the atmosphere is not greater than 22 percent by volume; (b) the concentration of flammable materials in the atmosphere is less than 10 percent of the lower explosive limit; (c) the residues, scale, or preservative coatings are cleaned sufficiently to prevent the spread of fire and are not capable of producing a higher concentration than permitted by (a) or (b); (d) all adjacent spaces, containing or having contained flammable or combustible materials shall be sufficiently cleaned of residues, scale, or preservative coatings to prevent the spread of fire, or they are inerted. Ship's fuel tanks, lube tanks, or engine room or fire room bilges, or other machinery spaces, are treated in accordance with the Marine Chemist's requirements.

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CHEMISTS ENDORSEMENT. This is to certify that I have personally determined that all spaces in the foregoing list are in accordance with NFPA 306 Control of Gas Hazards on Vessels and have found the condition of each to be in accordance with its assigned designation.

"The undersigned acknowledges receipt of this Certificate under NFPA 306 and understands conditions and limitations under which it was issued, and the requirements for maintaining its validity."

This Certificate is based on conditions existing at the time the inspection herein set forth was completed and is issued subject to compliance with all qualifications and instructions.

Signed Name Company (CCI) 9-26-14 Date — Signed Marine Chemist — Certificate No. 562

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Printed in U.S.A.

PACIFIC MARINE TESTING CO.
4457 140th Avenue Southeast
Bellevue, Washington 98006-2337
206 715-4932
425 641-2187

MARINE CHEMIST CERTIFICATE

SERIAL NO. O 118079

Page 1 of 1

D NESS (CCI)	CLEAR CREEK CONSTRUCTION Inc	30 SEPT, 2014
Survey Requested by	Vessel Owner or Agent	Date
VARIOUS UNDERGROUND LINES	UNDER GROUND LINES	Pier 91 Construction Site
Vessel	Type of Vessel	Specific Location of Vessel
UNKNOWN / BUNKER / WATER	O, LEL / VISUAL	0750 HR
Last Three (3) Loadings	Tests Performed	Time Survey Completed

	O_2	LEL	
EAST CAN BOUNDRY 6"	20.8%	0%	These lines are safe to cut with sawzall. Safe for limited hotwork.
6" BUNKER FUEL LINE	20.8%		
6" UNKNOWN	20.8%		
6" UNKNOWN	18.8%		
4" STEAM LINE	20.8%		These lines may contain small amount of product. Basically bunker fuel.
4" WATER LINE	WATER	WATER	

Chemist shall standby during cutting operations.

Second drilling & cutting of lines 0920 hr.

In the event of physical or atmospheric changes affecting the STANDARD SAFETY DESIGNATIONS assigned to any of the above spaces, this certificate is voided, spaces not listed on the Certificate are not to be entered unless authorized on another Certificate and/or maintained in accordance with OSHA 29 CFR 1915, or if in any doubt, immediately stop all work and contact the undersigned Marine Chemist. Unless otherwise stated on the Certificate, all spaces and affected adjacent spaces are to be reinspected daily or more often as necessary by the competent person in support of work prior to entry or recommencement of work.

QUALIFICATIONS: Transfer of ballast, cargo, fuel, or manipulation of valves or closure equipment tending to alter conditions in pipelines, tanks, or compartments subject to gas accumulation, unless specifically approved on this Certificate, requires inspection and a new Certificate for spaces so affected. All lines, vents, heating coils, valves, and similar enclosed appurtenances shall be considered "not safe" unless otherwise specifically designated. Movement of the vessel from its specific location voids the Certificate unless shifting of the vessel within the facility has been specifically authorized on this Certificate.

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"The undersigned acknowledges receipt of this Certificate under NFPA 306 and understands conditions and limitations under which it was issued, and the requirements for maintaining its validity."

This Certificate is based on conditions existing at the time the location herein set forth was completed and is issued subject to compliance with all qualifications and instructions.

Signed _____ Name C Pearrell (CCI) Company 9-30-14 Date

Signed _____ Marine Chemist 56.2 Certificate No.

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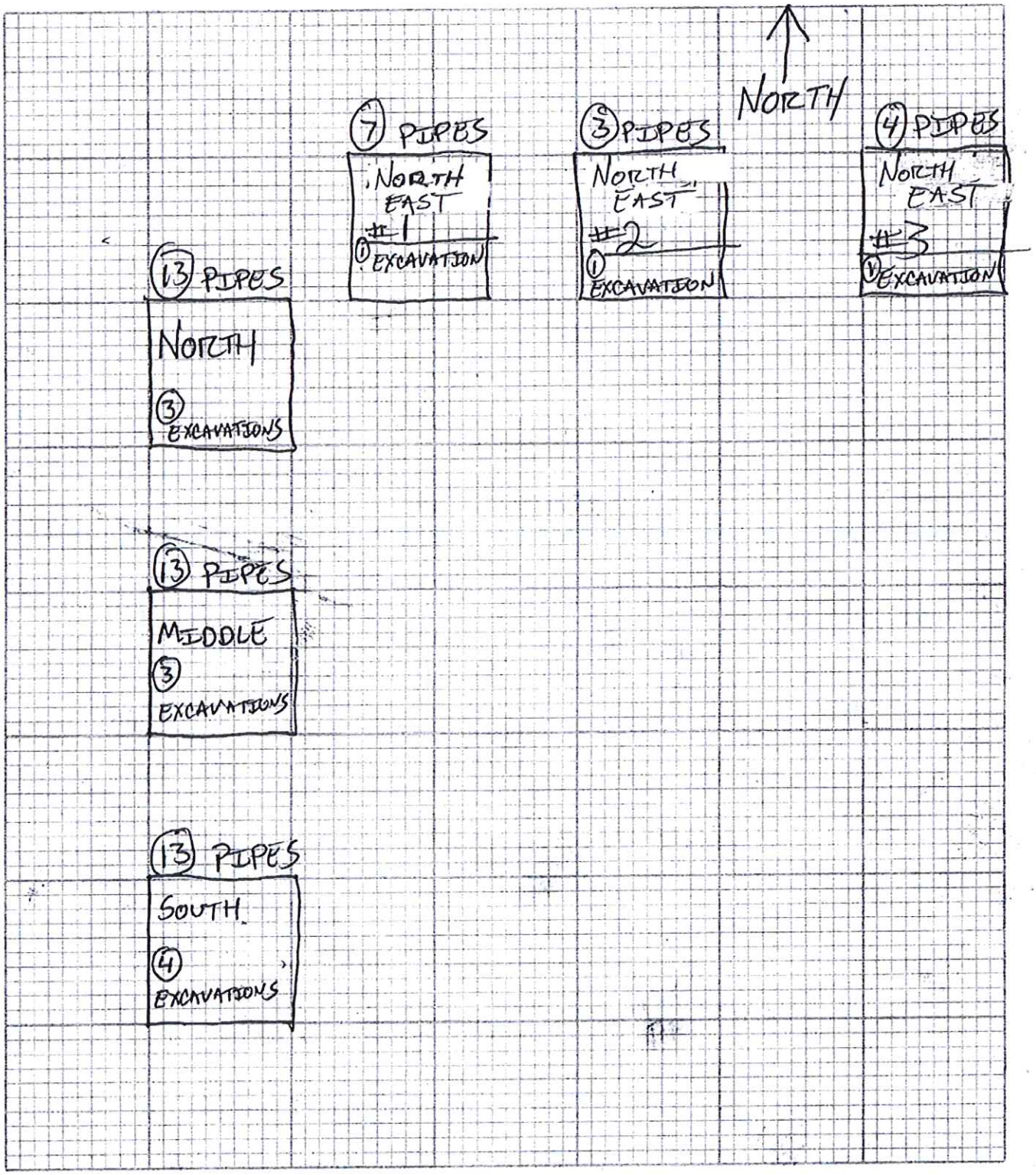
Clearcreek
CONTRACTORS

Job P. O. S.
Description PIPE INVESTIGATION EXCAVATION LAYOUT

Project No. 214016
Computed by N. HOFFMAN
Checked by

Page ____ of ____
Sheet ____ of ____
Date 7-21-14
Date ____

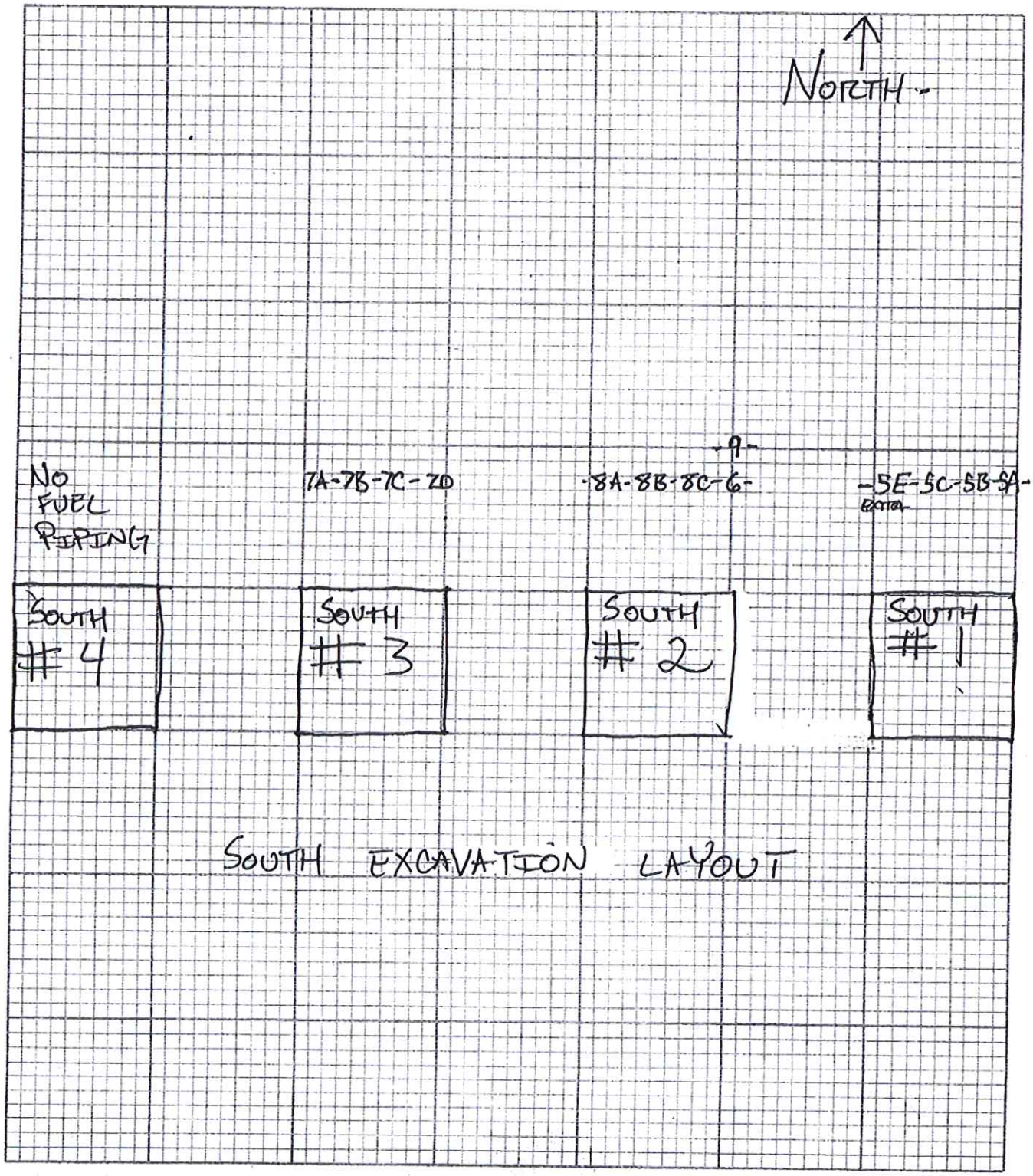


Clearcreek
CONTRACTORS

Job P. O. S.
Description PIPE INVESTIGATION
SOUTH EXCAVATION LAYOUT

Project No. 214016
Computed by N. HOFFMAN
Checked by

Page ___ of ___
Sheet 1 of ___
Date 7-21-14
Date ___

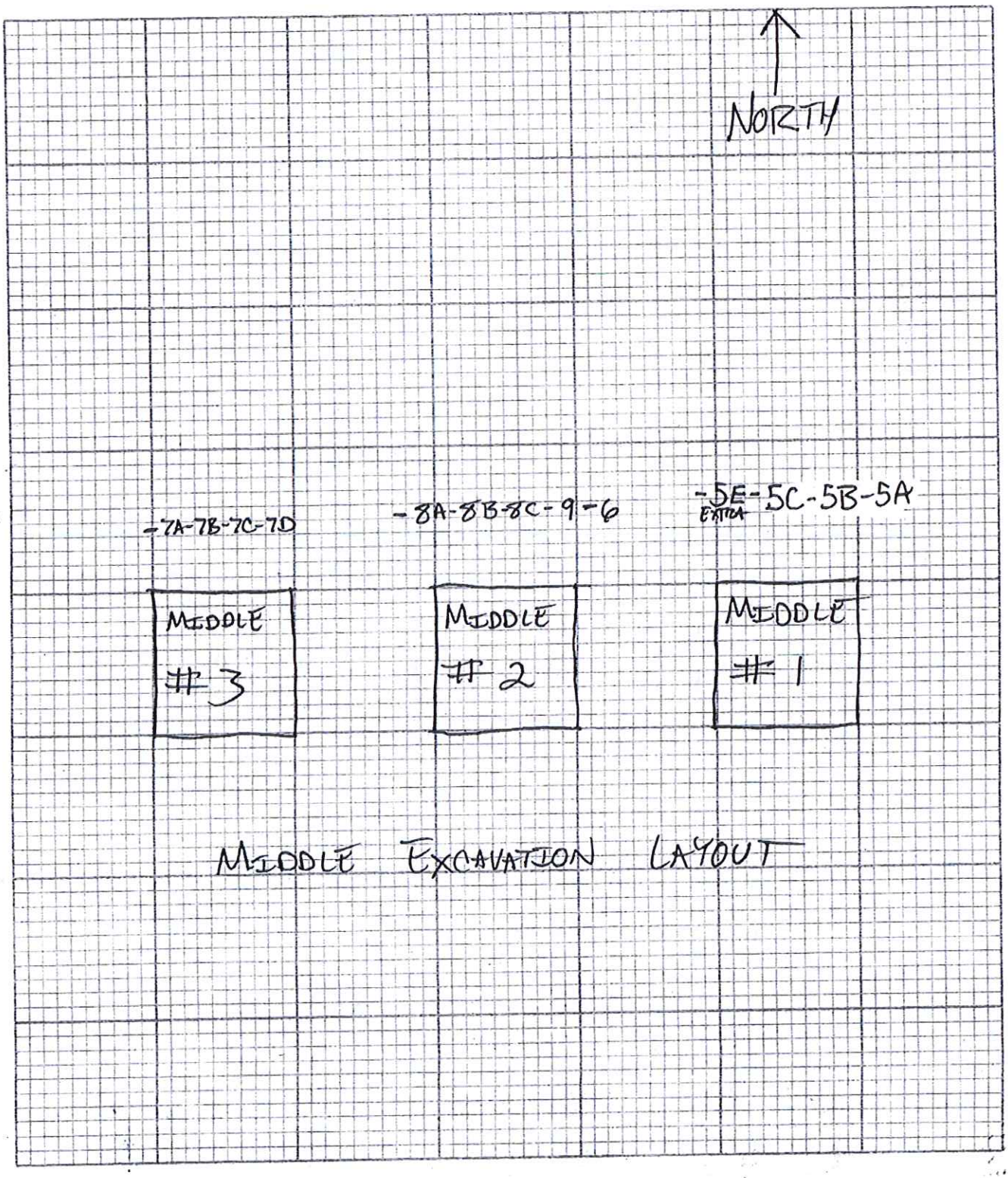


Clearcreek
CONTRACTORS

Job P. O. S.
Description PIPE INVESTIGATION
MIDDLE EXCAVATION LAYOUT

Project No. 2140116
Computed by N. HOFFMAN
Checked by

Page ____ of ____
Sheet ____ of ____
Date 7-21-14
Date ____



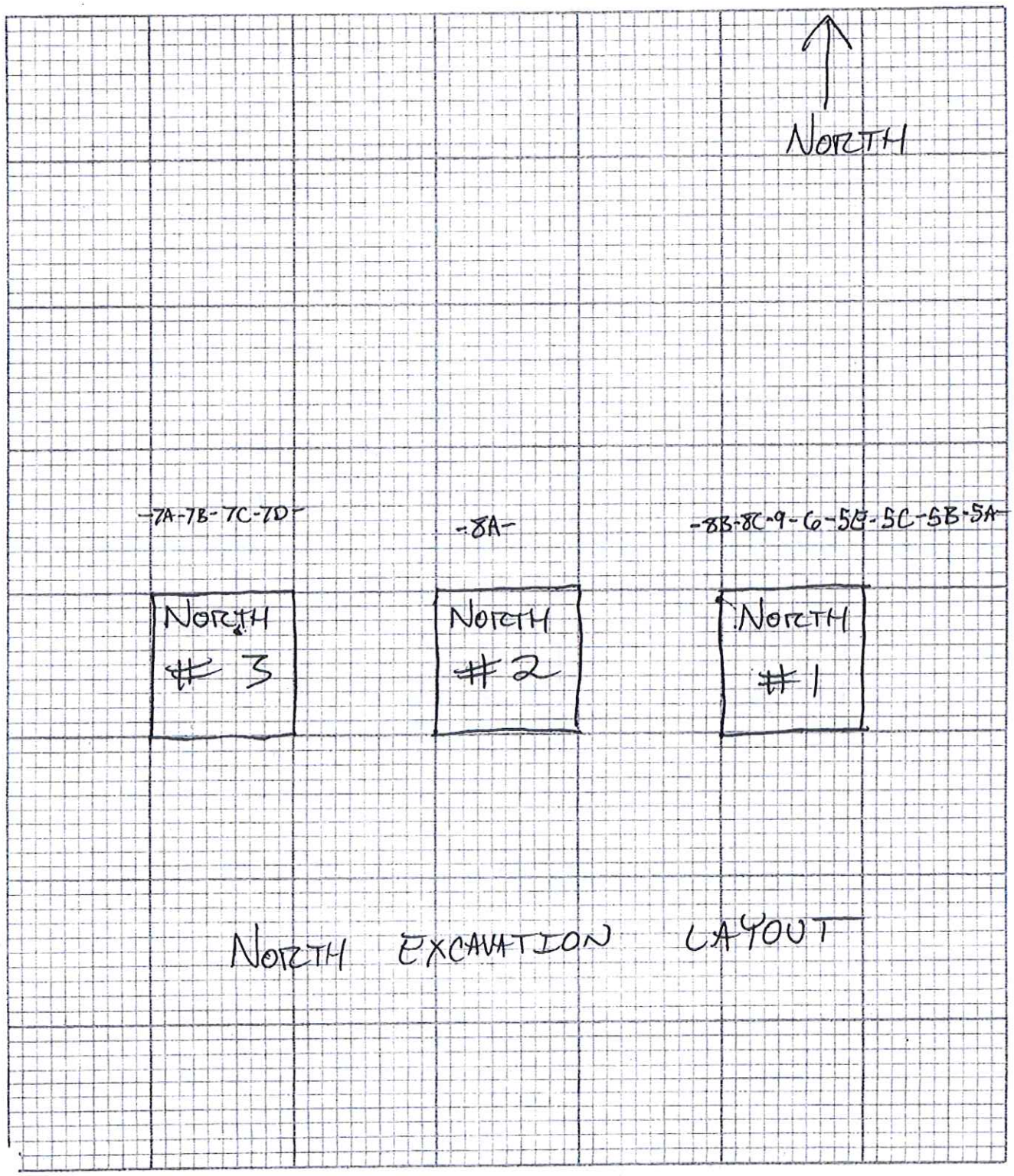
MIDDLE EXCAVATION LAYOUT

Clearcreek
CONTRACTORS

Job P.O.S.
Description PIPE INVESTIGATION
NORTH EXCAVATION LAYOUT

Project No. 214016
Computed by N. HOFFMAN
Checked by

Page ___ of ___
Sheet ___ of ___
Date 7-23-14
Date



NORTH EXCAVATION LAYOUT

MC-0317586

WP 104528

T91 Tank Farm Cleanup

Final As-Built Documents Submittal

Section 5

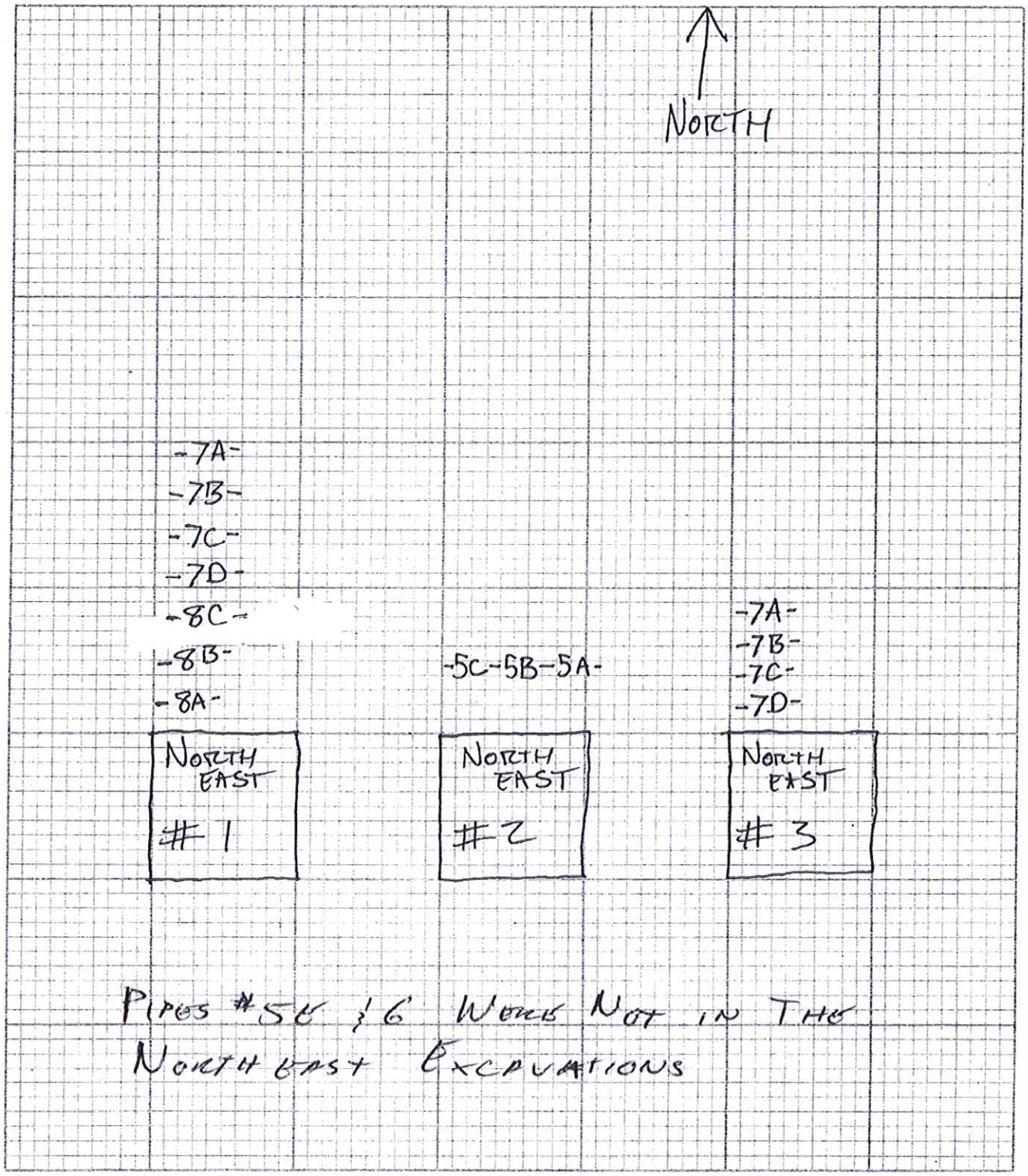
Monitoring Wells

Clearcreek
CONTRACTORS

Job P.O.S.
Description PIPE INVESTIGATION
NORTHEAST EXCAVATION LAYOUT

Project No. 214016
Computed by N. HOFFMAN
Checked by

Page ___ of ___
Sheet ___ of ___
Date 7-22-14
Date



PIPES #5E & 6 WERE NOT IN THE NORTHEAST EXCAVATIONS

Pipe Grout Quantity Takeoff

Hole 1

Pipe Name	Diameter (in)	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date	Stubs: Run Length (LF)	Stubs: Cubic Feet	Stubs: Cubic Yards	Stubs: X?	Stubs: Date
5E	12	447	351	13.0	X	10/13	20	16	0.6	X	10/13
5C	6	447	88	3.3	X	10/13	20	4	0.2	X	10/13
5B	10	447	244	9.0	X	10/1	20	11	0.5	X	10/13
5A	12	447	351	13.0	X	10/2	20	16	0.6	X	10/13
	Subtotal			38.3					1.9		

Hole 2

Pipe Name	Diameter (in)	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date
8A	8	447	156	5.8	X	10/13	20	7	0.3	X	10/13
8B	4	447	39	1.4	X	10/2	20	2	0.1	X	10/13
8C	4	447	39	1.4	X	10/13	20	2	0.1	X	10/13
9	8	447	156	5.8	X	10/13	20	7	0.3	X	10/13
6	4	447	39	1.4	X	10/2	20	2	0.1	X	10/13
	Subtotal			15.9					0.9		

Hole 3

Pipe Name	Diameter (in)	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date
7A	8	447	156	5.8	X	10/1	20	7	0.3	X	10/1
7B	6	447	88	3.3	X	10/1	20	4	0.2	X	10/1
7C	6	447	88	3.3	X	10/1	20	4	0.2	X	10/1
7D	4	447	39	1.4	X	10/13	20	2	0.1	X	10/1
	Subtotal			13.7					0.8		

Total		67.9 CY		3.6 CY
Grand Total		71.5 CY		

Imported			Used	
10/1/2014		27.5 CY	10/1	22.1
10/1/2014	Leftover	-3.5 CY	10/2	15.9
10/2/2014		18 CY	10/13	33.5
10/2/2014	Leftover	-1.5 CY		
10/13/2014		36		
10/13/2014	Leftover	-1 CY		
Subtotal		75.5 CY	Subtotal	71.5

Pipe Grout Quantity Takeoff

Pier 91 to Bridge

Bridge to Site

Hole 1

Pipe Name	Diameter (in)	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date
5E	12	250.5	197	7.3	X	1/16	327	257	9.6	X	1/16
5C	6	250.5	49	1.8	X	1/16	318	62	2.4	X	1/16
5B	10	250.5	137	5.1	X	1/16	400	218	8.1	X	1/16
5A	12		0	0.0				0	0.0		
	Subtotal			14.2					20.1		

Hole 2

Pipe Name	Diameter (in)	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date
8A	8	237	83	3.1	X	1/14		0	0.0		
8B	4	241	21	0.8	X	1/16		0	0.0		
8C	4	237	21	0.8	X	1/16		0	0.0		
6	8		0	0.0				0	0.0		
9	4		0	0.0				0	0.0		
	Subtotal			4.6					0.0		

Hole 3

Pipe Name	Diameter (in)	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date
7A	8	259	90	3.3	X	1/14	185.2	65	2.4	X	1/14
7B	6	266.3	52	1.9	X	1/14	187	37	1.4	X	1/14
7C	6	260	51	1.9	X	1/14	186	37	1.4	X	1/14
7D	4	263.2	23	0.9	X	1/14	186.75	16	0.7	X	1/16
	Subtotal			8.0					5.9		

Total		26.8 CY		26.0 CY
Grand Total		52.8 CY		

Imported			Used	
1/16/2015		40 CY	1/14	16.3
1/16/2015	Leftover	-1.5 CY	1/16	36.5
1/16/2015	Spilled	-1 CY		0.0
1/14/2015		18 CY		
1/14/2015	Leftover	-1.5 CY		
Subtotal		54 CY	Subtotal	52.8

Pipe Grout Quantity Takeoff

West TFA Pipe

Pipe Name	Diameter (in)	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date
9 - P to S	8	36	13	0.5	X	4/22		0	0.0		
8C - P to S	4	44	4	0.1	X	4/22		0	0.0		
8B - B to S	4	371	32	1.2	X	4/22		0	0.0		
8A - B to S	8	371	130	4.8	X	4/22		0	0.0		
9 - P to P	8	159	56	2.1	X	4/22		0	0.0		
Vault			0	3.6	X	4/22		0	0.0		
8C - B to V	4	212	19	0.7	X	4/22		0	0.0		
8C - P to V	4	45	4	0.1	X	4/22		0	0.0		
8C - V to P	4	60	5	0.2	X	4/22		0	0.0		
3	4	40	3	0.1	X	4/22		0	0.0		
W1	4	23	2	0.1	X	4/22		0	0.0		
			0	0.0				0	0.0		
			0	0.0				0	0.0		
			0	0.0				0	0.0		
			0	0.0				0	0.0		
			0	0.0				0	0.0		
			0	0.0				0	0.0		
Subtotal				13.5					0.0		

Total	13.5 CY	0.0 CY
Grand Total	13.5 CY	

Imported			Used		
4/22/2015		16 CY		4/22	13.5
4/22/2015	Leftover	-1 CY			0.0
Subtotal		15 CY	Subtotal		13.5

Note:
P = Pothole
S = Site
B = Bridge
V = Vault

Pipe Grout Quantity Takeoff

Miscellaneous Pipe Remaining Pipe Runs

Hole 1

Pipe Name	Diameter (in)	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date	Run Length (LF)	Cubic Feet	Cubic Yards	X?	Date
9 N to W-39	8	434	151	5.6	X	4/3		0	0.0		
E1	4	142	12	0.5	X	4/3		0	0.0		
E2	4	29.8	3	0.1	X	4/3		0	0.0		
E3	4	37.3	3	0.1	X	4/3		0	0.0		
E4	4	23.8	2	0.1	X	4/3		0	0.0		
E5	6	34	7	0.2	X	4/3		0	0.0		
E6	6	34	7	0.2	X	4/3		0	0.0		
E7	6	31	6	0.2	X	4/3		0	0.0		
E8	6	31	6	0.2	X	4/3		0	0.0		
W1	4	23	2	0.1	X	4/3		0	0.0		
2	4	70	6	0.2	X	4/3		0	0.0		
			0	0.0				0	0.0		
			0	0.0				0	0.0		
			0	0.0				0	0.0		
	Subtotal			7.6					0.0		
	Total			7.6 CY					0.0 CY		
	Grand Total			7.6 CY							

Imported			Used		
4/3/2015		9 CY		4/3	7.6
4/3/2015	Leftover	-0.5 CY			0.0
Subtotal		8.5 CY	Subtotal		7.6

www.emeraldnw.com

EMERALD RECYCLING
WASTE ACCEPTANCE FORM

See Emerald's list of generic profiles for further instructions.
Please complete all portions of this form for approval.

A COPY OF THIS FORM MUST ACCOMPANY EACH SHIPMENT

Generator Name: Port of Seattle

Generator Address: Terminal 91

Seattle, WA 98119

Industry Type: Marine Tank Water - G04707

Waste Name/Description:
Marine greywater

Process Generating Waste:

Greywater and greywater tank rinseout

Composition (include percentages for each constituent and account for 100% of waste):

Water 90-100%

Sediment 0-10%

Physical State at 70°F:

☐ Solid ☐ Sludge
■ Liquid ☐ Powder

pH:

☐ ≤2 ☐ 10-12.5
☐ 2-4 ☐ ≥12.5
■ >4 - <10 ☐ N/A

Flashpoint:

☐ ≤100 ☐ >200
☐ 101-139 ■ No flash
☐ 140-200

Odor (describe):

Metals Constituents: ■ Not suspected ☐ Data report attached* ☐ MSDS attached*

Other regulated contaminants: ■ Not suspected ☐ Data report attached* ☐ MSDS attached*

Shipping and volume information:

Standard shipping container: ■ Drum ☐ Tote ☐ Bulk

Estimated volume per shipment: ≤9000 Gallons

Estimated volume per year: As Needed

Request Submitted by: DAN GOSSETT Date: 3/26/2014

Broker Name (if appropriate):

Profile Number Assigned: A04707 Destination Facility: ■ Airport Way ☐ Vancouver

Approved by: [signature] Approval Date: 3/27/14 Exp. Date: 3/27/16

Special handling instructions:

**All correspondence, data reports, and MSDSs corresponding to this WAF are included with the original WAF only.*
The original WAF is filed in the facility operating record.

August 2008 Revision

APPENDIX G

Waste Disposal Documentation

- Summary Table is attached, the rest of the appendix is included on Disk 1.

Document ID	Job #	Date	Facility	Material Type	Scale Ticket #	Trucking Co.	Truck #	BOL #	Tons	Cubic Yards	Container #	Quantity	Units	Profile #
79417	214016	4/15/2015	Kangley Rock & Recycling	Waste Concrete	571876	Clearcreek	41	7985	23.29					
79418	214016	4/15/2015	Kangley Rock & Recycling	Waste Concrete	571962	Clearcreek	41	7985	25.14					
79419	214016	4/15/2015	Kangley Rock & Recycling	Waste Concrete	572000	Clearcreek	41	7985	21.15					
79451	214016	4/16/2015	Kangley Rock & Recycling	Waste Concrete	572209	Clearcreek	41	7986	23.10					
79454	214016	4/21/2015	Kangley Rock & Recycling	Waste Concrete	573472	Clearcreek	43	7940				1	load	
80037	214016	5/12/2015	Kangley Rock & Recycling	Waste Concrete	578786	Clearcreek	43	7929	19.75					
				Waste Concrete Total					112.43			1		
79416	214016	4/15/2015	Kangley Rock & Recycling	Waste Asphalt	571776	Clearcreek	41	7985	21.09					
79981	214016	5/8/2015	Kangley Rock & Recycling	Waste Asphalt	577994	Clearcreek	43	7940				1	load	
				Waste Asphalt Total					21.09			1		
70991	214016	7/21/2014	Emerald Services	Non-regulated Liquids	65036	Emerald Services	7011	65036				672	gals	G00501
71007	214016	7/22/2014	Emerald Services	Non-regulated Liquids	65037	Emerald Services	7011	65037				2401	gals	G00501
71052	214016	7/23/2014	Emerald Services	Non-regulated Liquids	65038	Emerald Services	7011	65038				415	gals	G00501
71053	214016	7/24/2014	Emerald Services	Non-regulated Liquids	65177	Emerald Services	7011	65177				1477	gals	G00501
71054	214016	7/25/2014	Emerald Services	Non-regulated Liquids	65040	Emerald Services	7011	65040				896	gals	G00501
71055	214016	7/28/2014	Emerald Services	Non-regulated Liquids	65041	Emerald Services	7011	65041				1504	gals	G00501
71079	214016	7/29/2014	Emerald Services	Non-regulated Liquids	65042	Emerald Services	781	65042				1577	gals	G00501
71073	214016	7/30/2014	Emerald Services	Non-regulated Liquids	65043	Emerald Services	781	65043				935	gals.	G00501
71097	214016	7/31/2014	Emerald Services	Non-regulated Liquids	65044	Emerald Services	781	65044				1135	gals.	G00501
71098	214016	8/1/2014	Emerald Services	Non-regulated Liquids	65045	Emerald Services	781	65045				1223	gals.	G00501
71177	214016	8/4/2014	Emerald Services	Non-regulated Liquids	65046	Emerald Services	781	65046				1399	gals	G00501
71176	214016	8/5/2014	Emerald Services	Non-regulated Liquids	65047	Emerald Services	781	65047				2040	gals	G00501
71407	214016	8/6/2014	Emerald Services	Non-regulated Liquids	65048	Emerald Services	781	65048				716	gals	G00501
71479	214016	8/7/2014	Emerald Services	Non-regulated Liquids	65049	Emerald Services	781	65049				1226	gals	G00501
71480	214016	8/8/2014	Emerald Services	Non-regulated Liquids	65050	Emerald Services	781	65050				824	gals	G00501
71457	214016	8/11/2014	Emerald Services	Non-regulated Liquids	64999	Emerald Services	794	64999				703	gals	G00501
71456	214016	8/11/2014	Emerald Services	Non-regulated Liquids	65051	Emerald Services	781	65051				1370	gals	G00501
71455	214016	8/13/2014	Emerald Services	Non-regulated Liquids	65052	Emerald Services	781	65052				813	gals	G00501
71478	214016	8/14/2014	Emerald Services	Non-regulated Liquids	65053	Emerald Services	781	65053				560	gals	G00501
71499	214016	8/18/2014	Emerald Services	Non-regulated Liquids	65289	Emerald Services	787	65289				1034	gals	G00501
71514	214016	8/20/2014	Emerald Services	Non-regulated Liquids	70809	Emerald Services	794	70809				203	gals	G00501
71734	214016	8/21/2014	Emerald Services	Non-regulated Liquids	65054	Emerald Services	781	65054				1582	gals	G00501
71736	214016	8/29/2014	Emerald Services	Non-regulated Liquids	65055	Emerald Services	781	65055				1296	gals	G00501
71735	214016	9/4/2014	Emerald Services	Non-regulated Liquids	65059	Emerald Services	781	65059				1488	gals	G00501
71771	214016	9/9/2014	Emerald Services	Non-regulated Liquids	65060	Emerald Services	781	65060				585	gals	G00501
72080	214016	9/11/2014	Emerald Services	Non-regulated Liquids	70975	Emerald Services	787	70975				1400	gals	G00501
72078	214016	9/15/2014	Emerald Services	Non-regulated Liquids	70986	Emerald Services	787	70986				1400	gals	G00501
72077	214016	9/16/2014	Emerald Services	Non-regulated Liquids	65062	Emerald Services	781	65062				1695	gals	G00501
72079	214016	9/16/2014	Emerald Services	Non-regulated Liquids	70976	Emerald Services	787	70976				500	gals	G00501
72076	214016	9/18/2014	Emerald Services	Non-regulated Liquids	68391	Emerald Services	781	68391				715	gals	G00501
72529	214016	9/26/2014	Emerald Services	Non-regulated Liquids	70939	Emerald Services	788	70939				202	gals	G00501
72530	214016	9/26/2014	Emerald Services	Non-regulated Liquids	70940	Emerald Services	788	70940				1155	gals	G00501

73895	214016	10/24/2014	Emerald Services	Non-regulated Liquids	71246	Emerald Services	781	71246		1135	gals	G00501
73896	214016	10/28/2014	Emerald Services	Non-regulated Liquids	71248	Emerald Services	781	71248		935	gals	G00501
73898	214016	10/30/2014	Emerald Services	Non-regulated Liquids	19713	Emerald Services	781	19713		1000	gals	G00501
79245	214016	3/31/2015	Emerald Services	Non-regulated Liquids	59280	Emerald Services	781	59280		2482	gals	G00501
79243	214016	4/1/2015	Emerald Services	Non-regulated Liquids	59281	Emerald Services	781	59281		369	gals	G00501
79244	214016	4/1/2015	Emerald Services	Non-regulated Liquids	59282	Emerald Services	781	59282		2350	gals	G00501
79322	214016	4/10/2015	Emerald Services	Non-regulated Liquids	59412	Emerald Services	787	59412		1845	gals	G00501
79636	214016	4/17/2015	Emerald Services	Non-regulated Liquids	59468	Emerald Services	788	59468		1353	gals	G00501
79637	214016	4/18/2015	Emerald Services	Non-regulated Liquids	59471	Emerald Services	788	59471		1747	gals	G00501
79638	214016	4/21/2015	Emerald Services	Non-regulated Liquids	59472	Emerald Services	788	59472		1961	gals	G00501
				Non-regulated Liquids Total (Includes Rinsate)						**50318**		
72356	214016	9/19/2014	US Ecology	TSCA Waste	005689724JJK	Steve Forler Trucking	93	33321	23.98			34160
72358	214016	8/21/2014	Waste Management	Lead Contaminated Soil	011873871JJK	R Transport	11	011873871JJJK		5	drums	OR321064
72360	214016	9/18/2014	US Ecology	TSCA Waste	005689722JJK	Steve Forler Trucking		005689722JJK	24.89			34160
79634	214016	4/22/2015	Waste Management	Haz Waste Solid	013468576JJK	R Transport		013468576JJK	13.46			OR325644
				Haz Waste Total					**62.33**	**5**		
71094	214016	7/31/2014	Regional Disposal	Class III/IV Soil	911321	Clearcreek	43	8459	30.84			LW14179
71092	214016	7/31/2014	Regional Disposal	Class III/IV Soil	911338	Clearcreek	43	8459	34.21			LW14179
71091	214016	7/31/2014	Regional Disposal	Class III/IV Soil	911355	Clearcreek	43	8459	33.43			LW14179
71093	214016	7/31/2014	Regional Disposal	Class III/IV Soil	911370	Clearcreek	43	8459	33.84			LW14179
71066	214016	8/1/2014	Regional Disposal	Class III/IV Soil	911393	Clearcreek	43/51	8460	33.61			LW14179
71067	214016	8/1/2014	Regional Disposal	Class III/IV Soil	911415	Clearcreek	43/51	8460	33.56			LW14179
71907	214016	9/9/2014	Regional Disposal	Class III/IV Soil	913008	Clearcreek	44/50	8037	36.59			LW14179
71908	214016	9/11/2014	Regional Disposal	Class III/IV Soil	913138	Clearcreek	44/50	8039	17.87			LW14179
				Class III/IV Soil with Fuel Total (Oil Sands)					**253.95**			
71233	214016	8/5/2014	Regional Disposal	Class III/IV Soil	911497	Clearcreek	44/50	7583	37.42			LW14180
71232	214016	8/5/2014	Regional Disposal	Class III/IV Soil	911511	Clearcreek	44/50	7583	34.04			LW14180
71231	214016	8/5/2014	Regional Disposal	Class III/IV Soil	911524	Clearcreek	44/50	7583	32.34			LW14180
71230	214016	8/5/2014	Regional Disposal	Class III/IV Soil	911540	Clearcreek	44/50	7583	35.82			LW14180
71226	214016	8/6/2014	Regional Disposal	Class III/IV Soil	911573	Clearcreek	44/50	7584	36.75			LW14180
71227	214016	8/6/2014	Regional Disposal	Class III/IV Soil	911587	Clearcreek	44/50	7584	34.50			LW14180
71228	214016	8/6/2014	Regional Disposal	Class III/IV Soil	911600	Clearcreek	44/50	7584	34.16			LW14180
71224	214016	8/7/2014	Regional Disposal	Class III/IV Soil	911662	Clearcreek	44/50	8013	36.02			LW14180
71221	214016	8/8/2014	Regional Disposal	Class III/IV Soil	911692	Clearcreek	44/50	8014	35.64			LW14180
71222	214016	8/8/2014	Regional Disposal	Class III/IV Soil	911710	Clearcreek	44/50	8014	36.83			LW14180
71444	214016	8/11/2014	Regional Disposal	Class III/IV Soil	911750	Clearcreek	44/50	8015	38.08			LW14180
71445	214016	8/11/2014	Regional Disposal	Class III/IV Soil	911774	Clearcreek	44/50	8015	36.01			LW14180
71446	214016	8/11/2014	Regional Disposal	Class III/IV Soil	911795	Clearcreek	44/50	8015	37.68			LW14180
71437	214016	8/12/2014	Regional Disposal	Class III/IV Soil	911827	Clearcreek	44/50	8016	35.45			LW14180
71438	214016	8/12/2014	Regional Disposal	Class III/IV Soil	911843	Clearcreek	44/50	8016	29.15			LW14180
71439	214016	8/12/2014	Regional Disposal	Class III/IV Soil	911853	Clearcreek	44/50	8016	38.39			LW14180
71428	214016	8/13/2014	Regional Disposal	Class III/IV Soil	911870	Clearcreek	44/50	8017	35.82			LW14180

71429	214016	8/13/2014	Regional Disposal	Class III/IV Soil	911882	Clearcreek	44/50	8017	37.29	LW14180
71430	214016	8/13/2014	Regional Disposal	Class III/IV Soil	911889	Clearcreek	44/50	8017	34.30	LW14180
71431	214016	8/13/2014	Regional Disposal	Class III/IV Soil	911900	Clearcreek	44/50	8017	32.42	LW14180
71432	214016	8/13/2014	Regional Disposal	Class III/IV Soil	911915	Clearcreek	44/50	8017	32.89	LW14180
71421	214016	8/14/2014	Regional Disposal	Class III/IV Soil	911944	Clearcreek	44/50	8018	32.36	LW14180
71422	214016	8/14/2014	Regional Disposal	Class III/IV Soil	911956	Clearcreek	44/50	8018	35.03	LW14180
71423	214016	8/14/2014	Regional Disposal	Class III/IV Soil	911975	Clearcreek	44/50	8018	35.54	LW14180
71424	214016	8/14/2014	Regional Disposal	Class III/IV Soil	911995	Clearcreek	44/50	8018	37.67	LW14180
71425	214016	8/14/2014	Regional Disposal	Class III/IV Soil	912009	Clearcreek	44/50	8018	34.05	LW14180
71426	214016	8/14/2014	Regional Disposal	Class III/IV Soil	912023	Clearcreek	44/50	8018	34.22	LW14180
71414	214016	8/15/2014	Regional Disposal	Class III/IV Soil	912037	Clearcreek	44/50	8020	30.19	LW14180
71417	214016	8/15/2014	Regional Disposal	Class III/IV Soil	912042	Clearcreek	44/50	8020	31.77	LW14180
71415	214016	8/15/2014	Regional Disposal	Class III/IV Soil	912058	Clearcreek	44/50	8020	33.48	LW14180
71418	214016	8/15/2014	Regional Disposal	Class III/IV Soil	912064	Clearcreek	44/50	8020	37.23	LW14180
71419	214016	8/15/2014	Regional Disposal	Class III/IV Soil	912079	Clearcreek	44/50	8020	35.78	LW14180
71536	214016	8/18/2014	Regional Disposal	Class III/IV Soil	912091	Clearcreek	44/50	8021	32.18	LW14180
71537	214016	8/18/2014	Regional Disposal	Class III/IV Soil	912098	Clearcreek	44/50	8021	34.16	LW14180
71538	214016	8/18/2014	Regional Disposal	Class III/IV Soil	912108	Clearcreek	44/50	8021	37.81	LW14180
71539	214016	8/18/2014	Regional Disposal	Class III/IV Soil	912111	Clearcreek	44/50	8021	37.80	LW14180
71540	214016	8/18/2014	Regional Disposal	Class III/IV Soil	912120	Clearcreek	44/50	8021	34.54	LW14180
71541	214016	8/18/2014	Regional Disposal	Class III/IV Soil	912126	Clearcreek	44/50	8021	35.55	LW14180
71544	214016	8/25/2014	Regional Disposal	Class III/IV Soil	912370	Clearcreek	44/50	8026	35.82	LW14180
71545	214016	8/25/2014	Regional Disposal	Class III/IV Soil	912382	Clearcreek	44/50	8026	32.56	LW14180
71546	214016	8/25/2014	Regional Disposal	Class III/IV Soil	912397	Clearcreek	44/50	8026	34.11	LW14180
71547	214016	8/25/2014	Regional Disposal	Class III/IV Soil	912410	Clearcreek	44/50	8026	35.11	LW14180
71548	214016	8/25/2014	Regional Disposal	Class III/IV Soil	912423	Clearcreek	44/50	8026	33.20	LW14180
71549	214016	8/25/2014	Regional Disposal	Class III/IV Soil	912439	Clearcreek	44/50	8026	33.76	LW14180
71569	214016	8/26/2014	Regional Disposal	Class III/IV Soil	912453	Clearcreek	44/50	8027	36.57	LW14180
71570	214016	8/26/2014	Regional Disposal	Class III/IV Soil	912460	Clearcreek	44/50	8027	36.41	LW14180
71571	214016	8/26/2014	Regional Disposal	Class III/IV Soil	912479	Clearcreek	44/50	8027	32.67	LW14180
71572	214016	8/26/2014	Regional Disposal	Class III/IV Soil	912488	Clearcreek	44/50	8027	31.98	LW14180
71573	214016	8/26/2014	Regional Disposal	Class III/IV Soil	912496	Clearcreek	44/50	8027	34.67	LW14180
71584	214016	8/27/2014	Regional Disposal	Class III/IV Soil	912505	Clearcreek	44/50	8028	32.73	LW14180
71581	214016	8/27/2014	Regional Disposal	Class III/IV Soil	912514	Clearcreek	44/50	8028	33.80	LW14180
71582	214016	8/27/2014	Regional Disposal	Class III/IV Soil	912533	Clearcreek	44/50	8028	34.62	LW14180
71583	214016	8/27/2014	Regional Disposal	Class III/IV Soil	912546	Clearcreek	44/50	8028	32.96	LW14180
71577	214016	8/28/2014	Regional Disposal	Class III/IV Soil	912576	Clearcreek	44/50	8029	36.30	LW14180
71578	214016	8/28/2014	Regional Disposal	Class III/IV Soil	912588	Clearcreek	44/50	8029	31.72	LW14180
71579	214016	8/28/2014	Regional Disposal	Class III/IV Soil	912609	Clearcreek	44/50	8029	31.90	LW14180
71562	214016	8/29/2014	Regional Disposal	Class III/IV Soil	912648	Clearcreek	44	8030	35.38	LW14180
71632	214016	8/29/2014	Regional Disposal	Class III/IV Soil	912654	Aero Construction	47	912654	29.51	LW14180
71560	214016	8/29/2014	Regional Disposal	Class III/IV Soil	912659	Clearcreek	44	8030	31.71	LW14180

71784	214016	8/29/2014	Regional Disposal	Class III/IV Soil	912661	Aero Construction	47	276260	32.89	LW14180
71779	214016	8/29/2014	Regional Disposal	Class III/IV Soil	912663	Aero Construction	99	271030	34.01	LW14180
71629	214016	8/29/2014	Regional Disposal	Class III/IV Soil	912664	Aero Construction	36	912664	33.13	LW14180
71561	214016	8/29/2014	Regional Disposal	Class III/IV Soil	912666	Clearcreek	44	8030	33.76	LW14180
71628	214016	8/29/2014	Regional Disposal	Class III/IV Soil	912674	Aero Construction	47	912674	32.95	LW14180
71627	214016	8/29/2014	Regional Disposal	Class III/IV Soil	912675	Aero Construction	36	912675	33.28	LW14180
71559	214016	8/29/2014	Regional Disposal	Class III/IV Soil	912680	Clearcreek	44	8030	33.56	LW14180
71625	214016	8/29/2014	Regional Disposal	Class III/IV Soil	912683	Aero Construction	477	912683	32.94	LW14180
71626	214016	8/29/2014	Regional Disposal	Class III/IV Soil	912684	Aero Construction	36	912684	34.63	LW14180
71699	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912697	Clearcreek	44/50	8031	32.79	LW14180
71694	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912698	Aero Construction	47	276261	33.73	LW14180
71682	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912701	Aero Construction	36	271031	34.77	LW14180
71693	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912712	Aero Construction	47	276261	31.19	LW14180
71683	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912714	Aero Construction	36	271031	33.70	LW14180
71704	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912717	Clearcreek	44/50	8031	32.59	LW14180
71692	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912726	Aero Construction	47	276261	31.11	LW14180
71684	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912731	Aero Construction	36	271031	34.92	LW14180
71691	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912738	Aero Construction	47	276261	32.59	LW14180
71700	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912739	Clearcreek	44/50	8031	35.33	LW14180
71685	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912744	Aero Construction	36	271031	36.61	LW14180
71703	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912750	Clearcreek	44/50	8031	36.71	LW14180
71690	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912751	Aero Construction	47	276261	36.00	LW14180
71686	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912759	Aero Construction	36	271031	33.76	LW14180
71702	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912761	Clearcreek	44/50	8031	33.42	LW14180
71689	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912764	Aero Construction	47	276261	31.41	LW14180
71927	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912766	Aero Construction	36	271031	33.24	LW14180
71701	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912767	Clearcreek	44/50	8031	33.70	LW14180
71926	214016	9/2/2014	Regional Disposal	Class III/IV Soil	912770	Aero Construction	47	276261	30.35	LW14180
71914	214016	9/3/2014	Regional Disposal	Class III/IV Soil	912782	Clearcreek	44/50	8032	32.73	LW14180
71913	214016	9/3/2014	Regional Disposal	Class III/IV Soil	912792	Clearcreek	44/50	8032	31.29	LW14180
71912	214016	9/3/2014	Regional Disposal	Class III/IV Soil	912807	Clearcreek	44/50	8032	32.15	LW14180
71911	214016	9/3/2014	Regional Disposal	Class III/IV Soil	912813	Clearcreek	44/50	8032	33.60	LW14180
71910	214016	9/3/2014	Regional Disposal	Class III/IV Soil	912825	Clearcreek	44/50	8032	30.28	LW14180
71855	214016	9/13/2014	Regional Disposal	Class III/IV Soil	913191	Clearcreek	44/50	8041	38.83	LW14180
71925	214016	9/13/2014	Regional Disposal	Class III/IV Soil	913192	Brien Excavating	3	2503	34.65	LW14180
71856	214016	9/13/2014	Regional Disposal	Class III/IV Soil	913193	Clearcreek	44/50	8041	26.52	LW14180
71924	214016	9/13/2014	Regional Disposal	Class III/IV Soil	913194	Clearcreek	44/51	8041	31.37	LW14180
71923	214016	9/13/2014	Regional Disposal	Class III/IV Soil	913196	Brien Excavating	3	2503	22.51	LW14180
71858	214016	9/13/2014	Regional Disposal	Class III/IV Soil	913198	Clearcreek	44/50	8041	29.56	LW14180
71922	214016	9/13/2014	Regional Disposal	Class III/IV Soil	913199	Brien Excavating	3	2503	31.05	LW14180
71859	214016	9/13/2014	Regional Disposal	Class III/IV Soil	913200	Clearcreek	44/50	8041	31.30	LW14180
72005	214016	9/15/2014	Regional Disposal	Class III/IV Soil	913207	Clearcreek	44/50	8042	34.51	LW14180

72006	214016	9/15/2014	Regional Disposal	Class III/IV Soil	913212	Clearcreek	44/50	8042	38.04	LW14180
72007	214016	9/15/2014	Regional Disposal	Class III/IV Soil	913216	Clearcreek	44/50	8042	31.92	LW14180
72008	214016	9/15/2014	Regional Disposal	Class III/IV Soil	913221	Clearcreek	44/50	8042	33.97	LW14180
72009	214016	9/15/2014	Regional Disposal	Class III/IV Soil	913226	Clearcreek	44/50	8042	35.36	LW14180
72010	214016	9/15/2014	Regional Disposal	Class III/IV Soil	913230	Clearcreek	44/50	8042	35.35	LW14180
72255	214016	9/17/2014	Regional Disposal	Class III/IV Soil	913276	Brien Excavating	3	2505	31.41	LW14180
72014	214016	9/17/2014	Regional Disposal	Class III/IV Soil	913282	Clearcreek	44/50	8045	30.11	LW14180
72256	214016	9/17/2014	Regional Disposal	Class III/IV Soil	913290	Brien Excavating	3	2505	31.10	LW14180
72015	214016	9/17/2014	Regional Disposal	Class III/IV Soil	913292	Clearcreek	44/50	8045	33.57	LW14180
72257	214016	9/17/2014	Regional Disposal	Class III/IV Soil	913302	Brien Excavating	3	2505	32.52	LW14180
72016	214016	9/17/2014	Regional Disposal	Class III/IV Soil	913303	Clearcreek	44/50	8045	33.48	LW14180
72258	214016	9/17/2014	Regional Disposal	Class III/IV Soil	913315	Brien Excavating	3	2505	27.59	LW14180
72017	214016	9/17/2014	Regional Disposal	Class III/IV Soil	913318	Clearcreek	44/50	8045	33.14	LW14180
72259	214016	9/17/2014	Regional Disposal	Class III/IV Soil	913324	Brien Excavating	3	2505	32.13	LW14180
72018	214016	9/17/2014	Regional Disposal	Class III/IV Soil	913326	Clearcreek	44/50	8045	32.81	LW14180
72260	214016	9/17/2014	Regional Disposal	Class III/IV Soil	913327	Brien Excavating	3	2505	25.12	LW14180
71999	214016	9/18/2014	Regional Disposal	Class III/IV Soil	913343	Clearcreek	44/50	8046	39.73	LW14180
72248	214016	9/18/2014	Regional Disposal	Class III/IV Soil	913348	Brien Excavating	3	2506	31.49	LW14180
72000	214016	9/18/2014	Regional Disposal	Class III/IV Soil	913354	Clearcreek	44/50	8046	32.88	LW14180
72249	214016	9/18/2014	Regional Disposal	Class III/IV Soil	913360	Brien Excavating	3	2506	31.01	LW14180
72001	214016	9/18/2014	Regional Disposal	Class III/IV Soil	913367	Clearcreek	44/50	8046	33.57	LW14180
72250	214016	9/18/2014	Regional Disposal	Class III/IV Soil	913371	Brien Excavating	3	2506	33.48	LW14180
72251	214016	9/18/2014	Regional Disposal	Class III/IV Soil	913380	Brien Excavating	3	2506	31.42	LW14180
72002	214016	9/18/2014	Regional Disposal	Class III/IV Soil	913385	Clearcreek	44/50	8046	33.37	LW14180
72252	214016	9/18/2014	Regional Disposal	Class III/IV Soil	913388	Brien Excavating	3	2506	18.53	LW14180
72003	214016	9/18/2014	Regional Disposal	Class III/IV Soil	913390	Clearcreek	44/50	8046	33.87	LW14180
72253	214016	9/18/2014	Regional Disposal	Class III/IV Soil	913395	Brien Excavating	3	2506	30.90	LW14180
72068	214016	9/20/2014	Regional Disposal	Class III/IV Soil	913439	Clearcreek	43/50	8477	35.80	LW14180
72069	214016	9/20/2014	Regional Disposal	Class III/IV Soil	913440	Clearcreek	43/50	8477	31.48	LW14180
72070	214016	9/20/2014	Regional Disposal	Class III/IV Soil	913441	Clearcreek	43/50	8477	30.80	LW14180
72071	214016	9/20/2014	Regional Disposal	Class III/IV Soil	913442	Clearcreek	43/50	8477	33.46	LW14180
72032	214016	9/20/2014	Regional Disposal	Class III/IV Soil	913443	Clearcreek	43/50	8477	33.06	LW14180
72033	214016	9/20/2014	Regional Disposal	Class III/IV Soil	913444	Clearcreek	43/50	8477	34.94	LW14180
72184	214016	9/22/2014	Regional Disposal	Class III/IV Soil	913453	Clearcreek	44/51	8049	33.83	LW14180
72185	214016	9/22/2014	Regional Disposal	Class III/IV Soil	913457	Clearcreek	44/51	8049	32.39	LW14180
72186	214016	9/22/2014	Regional Disposal	Class III/IV Soil	913460	Clearcreek	44/51	8049	34.15	LW14180
72187	214016	9/22/2014	Regional Disposal	Class III/IV Soil	913465	Clearcreek	44/51	8049	33.16	LW14180
72218	214016	9/23/2014	Regional Disposal	Class III/IV Soil	913477	Clearcreek	44/51	8050	35.95	LW14180
72219	214016	9/23/2014	Regional Disposal	Class III/IV Soil	913485	Clearcreek	44/51	8050	32.42	LW14180
72220	214016	9/23/2014	Regional Disposal	Class III/IV Soil	913494	Clearcreek	44/51	8050	33.52	LW14180
72221	214016	9/23/2014	Regional Disposal	Class III/IV Soil	913498	Clearcreek	44/51	8050	32.63	LW14180
72222	214016	9/23/2014	Regional Disposal	Class III/IV Soil	913503	Clearcreek	44/51	8050	33.60	LW14180

72223	214016	9/23/2014	Regional Disposal	Class III/IV Soil	913505	Clearcreek	44/51	8050	35.52	LW14180
72398	214016	9/24/2014	Regional Disposal	Class III/IV Soil	913515	Brien Excavating	3	2510	34.99	LW14180
72192	214016	9/24/2014	Regional Disposal	Class III/IV Soil	913522	Clearcreek	44/51	7585	34.26	LW14180
72399	214016	9/24/2014	Regional Disposal	Class III/IV Soil	913523	Brien Excavating	3	2510	30.38	LW14180
72401	214016	9/24/2014	Regional Disposal	Class III/IV Soil	913531	Brien Excavating	3	2510	31.41	LW14180
72191	214016	9/24/2014	Regional Disposal	Class III/IV Soil	913532	Clearcreek	44/51	7585	33.99	LW14180
72400	214016	9/24/2014	Regional Disposal	Class III/IV Soil	913537	Brien Excavating	3	2510	25.33	LW14180
72190	214016	9/24/2014	Regional Disposal	Class III/IV Soil	913540	Clearcreek	44/51	7585	32.08	LW14180
72402	214016	9/24/2014	Regional Disposal	Class III/IV Soil	913547	Brien Excavating	3	2510	31.65	LW14180
72189	214016	9/24/2014	Regional Disposal	Class III/IV Soil	913549	Clearcreek	44/51	7585	32.17	LW14180
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72181	214016	9/25/2014	Regional Disposal	Class III/IV Soil	913571	Clearcreek	44/51	7586	31.96	LW14180
72182	214016	9/25/2014	Regional Disposal	Class III/IV Soil	913578	Clearcreek	44/51	7586	39.16	LW14180
72179	214016	9/25/2014	Regional Disposal	Class III/IV Soil	913588	Clearcreek	44/51	7586	33.46	LW14180
72178	214016	9/25/2014	Regional Disposal	Class III/IV Soil	913596	Clearcreek	44/51	7586	31.71	LW14180
72364	214016	9/26/2014	Regional Disposal	Class III/IV Soil	913610	Clearcreek	44	7587	31.43	LW14180
72365	214016	9/26/2014	Regional Disposal	Class III/IV Soil	913617	Clearcreek	44	7587	31.49	LW14180
72366	214016	9/26/2014	Regional Disposal	Class III/IV Soil	913625	Clearcreek	44	7587	32.52	LW14180
72367	214016	9/26/2014	Regional Disposal	Class III/IV Soil	913628	Clearcreek	44	7587	34.47	LW14180
72518	214016	9/30/2014	Regional Disposal	Class III/IV Soil	913649	Clearcreek	43	8433	34.16	LW14180
72519	214016	9/30/2014	Regional Disposal	Class III/IV Soil	913655	Clearcreek	43	8433	33.01	LW14180
72520	214016	9/30/2014	Regional Disposal	Class III/IV Soil	913662	Clearcreek	43	8433	34.82	LW14180
72521	214016	9/30/2014	Regional Disposal	Class III/IV Soil	913669	Clearcreek	43	8433	32.33	LW14180
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72523	214016	9/30/2014	Regional Disposal	Class III/IV Soil	913688	Clearcreek	43	8433	31.76	LW14180
73445	214016	10/1/2014	Regional Disposal	Class III/IV Soil	913713	Clearcreek	43	8434	32.37	LW14180
73446	214016	10/1/2014	Regional Disposal	Class III/IV Soil	913721	Clearcreek	43	8434	32.05	LW14180
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73454	214016	10/3/2014	Regional Disposal	Class III/IV Soil	913873	Brien Excavating	3	2517	30.92	LW14180
73455	214016	10/6/2014	Regional Disposal	Class III/IV Soil	913902	Clearcreek	43	8439	33.10	LW14180
73456	214016	10/6/2014	Regional Disposal	Class III/IV Soil	913919	Clearcreek	43	8439	35.34	LW14180
73457	214016	10/6/2014	Regional Disposal	Class III/IV Soil	913933	Clearcreek	43	8439	34.03	LW14180
73314	214016	10/7/2014	Regional Disposal	Class III/IV Soil	913944	Clearcreek	43/50	8440	33.53	LW14180
73315	214016	10/7/2014	Regional Disposal	Class III/IV Soil	913948	Clearcreek	43/50	8440	30.82	LW14180
73317	214016	10/7/2014	Regional Disposal	Class III/IV Soil	913958	Clearcreek	43/50	8440	33.14	LW14180
73318	214016	10/7/2014	Regional Disposal	Class III/IV Soil	913969	Clearcreek	43/50	8440	32.05	LW14180

73458	214016	10/8/2014	Regional Disposal	Class III/IV Soil	913989	Clearcreek	43	8441	34.27		LW14180
73459	214016	10/8/2014	Regional Disposal	Class III/IV Soil	913994	Clearcreek	43	8441	31.83		LW14180
73460	214016	10/8/2014	Regional Disposal	Class III/IV Soil	913999	Clearcreek	43	8441	33.01		LW14180
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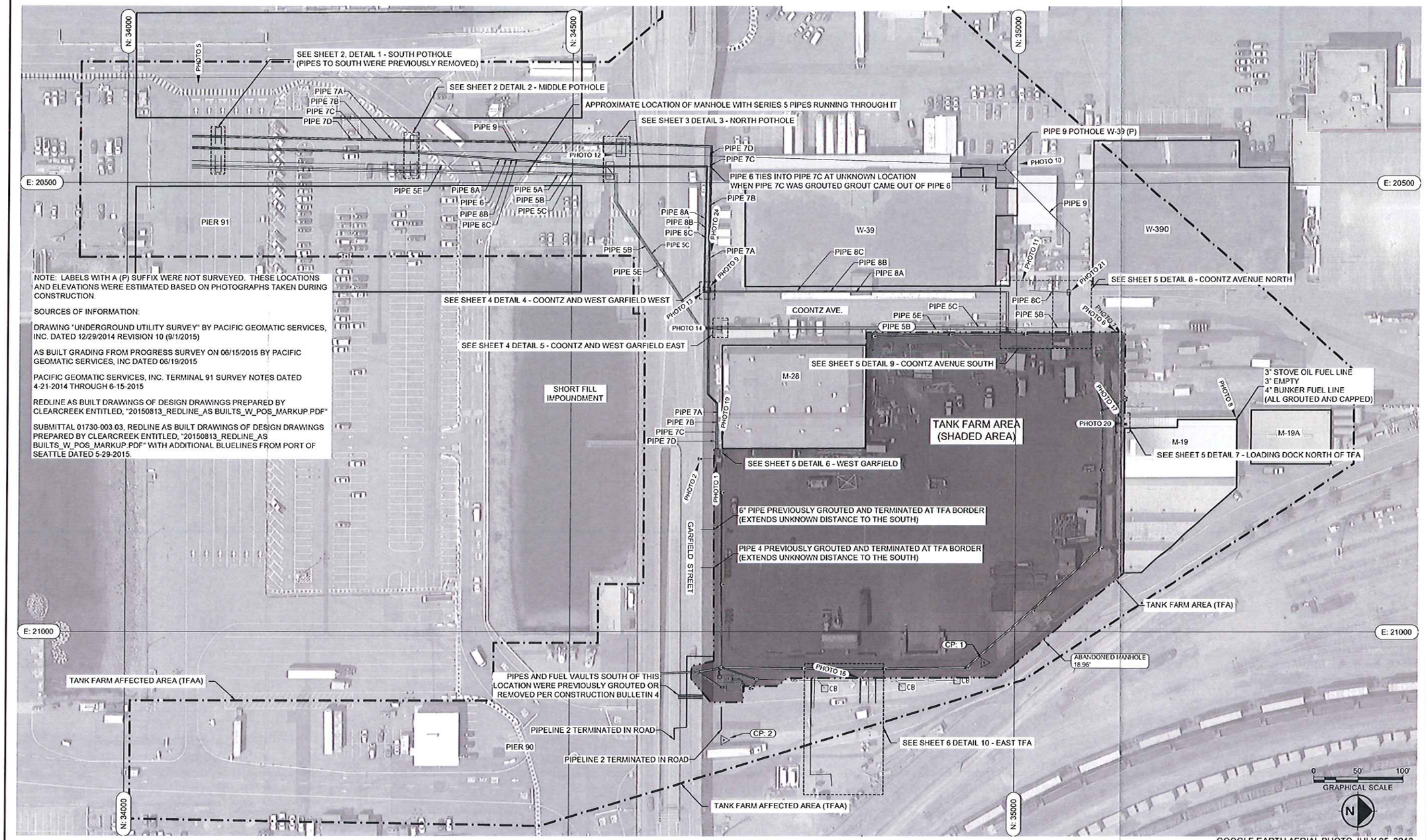
73330	214016	10/13/2014	Regional Disposal	Class III/IV Soil	914103	Clearcreek	43/50	8450	31.66		LW14180
73331	214016	10/13/2014	Regional Disposal	Class III/IV Soil	914116	Clearcreek	43/50	8450	36.55		LW14180
				Class III/IV Soil Total (HCS)					6645.86		
73499	214016	10/8/2014	Roosevelt Landfill	Class III/IV Soil	320710	Clearcreek	41	191462	31.59	RBSU200351	LW14241
73498	214016	10/8/2014	Roosevelt Landfill	Class III/IV Soil	320712	Clearcreek	41	191465	33.15	RBSU200367	LW14241
73497	214016	10/8/2014	Roosevelt Landfill	Class III/IV Soil	320780	Clearcreek	41	191467	30.69	RBSU200232	LW14241
73500	214016	10/14/2014	Roosevelt Landfill	Class III/IV Soil	321138	Clearcreek	41	190303	27.33	CLOU282256	LW14241
73501	214016	10/14/2014	Roosevelt Landfill	Class III/IV Soil	321164	Clearcreek	41	190345	33.18	RBSU200310	LW14241
				Class III/IV Soil Total (Contained Out Soil)					155.94		
78607	214016	3/3/2015	Regional Disposal	CDL	963692	Clearcreek	43	8199	3.62		CDL
70990	214016	7/14/2014	Regional Disposal	CDL	934751	Clearcreek	1	734751	12.35		LW14161
78610	214016	3/3/2015	Regional Disposal	CDL	963709	Clearcreek	43	8199	5.71		CDL
78608	214016	3/3/2015	Regional Disposal	CDL	963736	Clearcreek	43	8199	6.55		CDL
78609	214016	3/3/2015	Regional Disposal	CDL	963764	Clearcreek	43	8199	6.41		CDL
79237	214016	4/1/2015	Regional Disposal	CDL	967440	Clearcreek	44	8373	2.92		CDL
79589	214016	4/24/2015	Regional Disposal	CDL	970524	Clearcreek	44	7990	3.07		CDL
80290	214016	6/18/2015	Regional Disposal	CDL	978054	Clearcreek	35	978054	0.72		CDL
80291	214016	6/18/2015	Regional Disposal	CDL	978090	Clearcreek	35	978090	0.83		CDL
78637	214016	3/4/2015	Regional Disposal	CDL	920376	Clearcreek	43	7903	18.95		LW14180
80289	214016	6/18/2015	Regional Disposal	CDL	924814	Clearcreek	35	924814	3.94		LW14180
				CDL Total					65.07		

APPENDIX H

PES As-Built Drawings



NOTE: LABELS WITH A (P) SUFFIX WERE NOT SURVEYED. THESE LOCATIONS AND ELEVATIONS WERE ESTIMATED BASED ON PHOTOGRAPHS TAKEN DURING CONSTRUCTION.

SOURCES OF INFORMATION:

DRAWING "UNDERGROUND UTILITY SURVEY" BY PACIFIC GEOMATIC SERVICES, INC. DATED 12/29/2014 REVISION 10 (9/1/2015)

AS BUILT GRADING FROM PROGRESS SURVEY ON 06/15/2015 BY PACIFIC GEOMATIC SERVICES, INC DATED 06/19/2015

PACIFIC GEOMATIC SERVICES, INC. TERMINAL 91 SURVEY NOTES DATED 4-21-2014 THROUGH 6-15-2015

REDLINE AS BUILT DRAWINGS OF DESIGN DRAWINGS PREPARED BY CLEARCREEK ENTITLED, "20150813_REDLINE_AS BUILTS_W_POS_MARKUP.PDF"

SUBMITTAL 01730-003.03, REDLINE AS BUILT DRAWINGS OF DESIGN DRAWINGS PREPARED BY CLEARCREEK ENTITLED, "20150813_REDLINE_AS BUILTS_W_POS_MARKUP.PDF" WITH ADDITIONAL BLUELINES FROM PORT OF SEATTLE DATED 5-29-2015.

GOOGLE EARTH AERIAL PHOTO JULY 05, 2012

PES Environmental, Inc.
Engineering & Environmental Services
VISTA CONSULTANTS, LLC
PO BOX 388
LAKE OSWEGO, OREGON 97034
(503) 922-2522

PROJECT ENGR./MGR.: R. NORTH/B. O'NEAL
DESIGNED BY: R. NORTH
DRAWN BY: S. MCCOY
SCALE: AS SHOWN
DATE: 2017-09-28
CHECKED BY: R. NORTH
CHECKED/APPROVED BY: R. NORTH/B. O'NEAL

REVISIONS

NO.	DATE	BY	DESCRIPTION	APP'D	NO.	DATE	BY	DESCRIPTION	APP'D

AS BUILT AND APPROVED
DATE: 2015-11-12
AS CERTIFIED BY THE APPROVAL ON THE COVER SHEET FOR THIS SET, THIS DRAWING REPRESENTS A RECORD OF HOW THE PROJECT WAS CONSTRUCTED AND DOES NOT REPRESENT DESIGN OR CHANGE OF APPROVAL.

PROJECT MANAGER: FRED CHOU
PROJECT ENGINEER: ----
DESIGN ENGINEER: ----
DRAFTER: ----
SCALE: AS SHOWN
DATE: 2015-11-12
CHECKED/APPROVED BY: FRED CHOU

Port of Seattle
PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: SITE PLAN
PIPELINE DECOMMISIONING

WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 1

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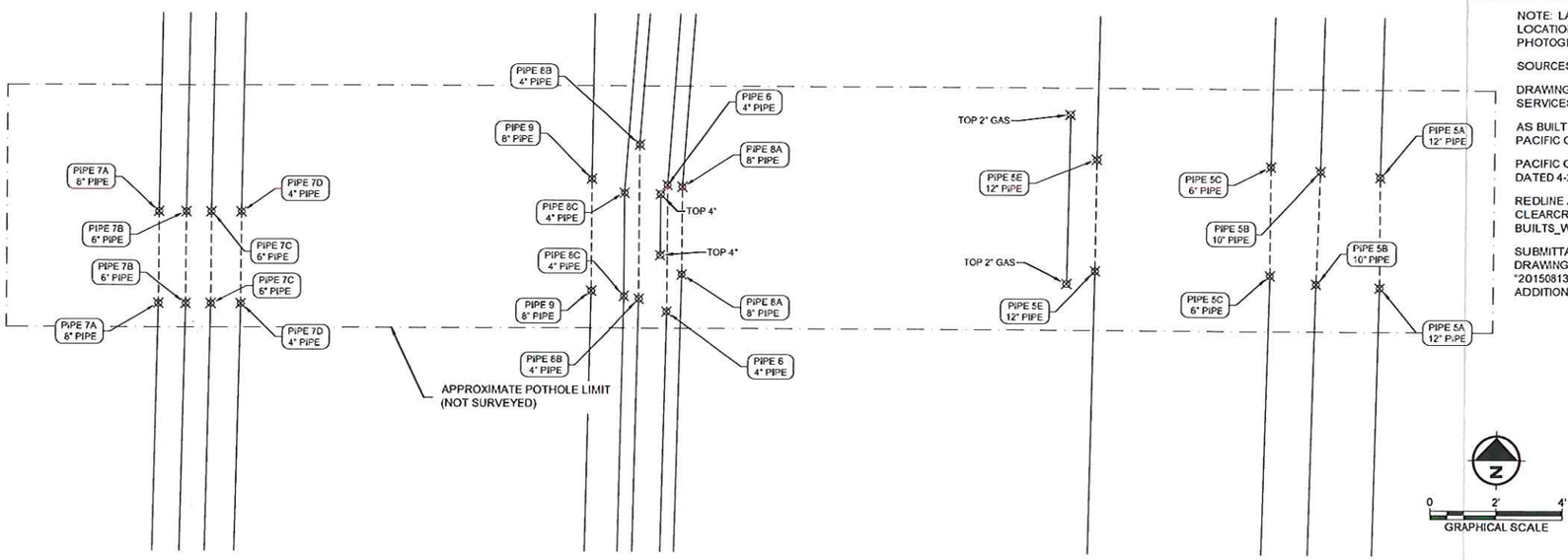
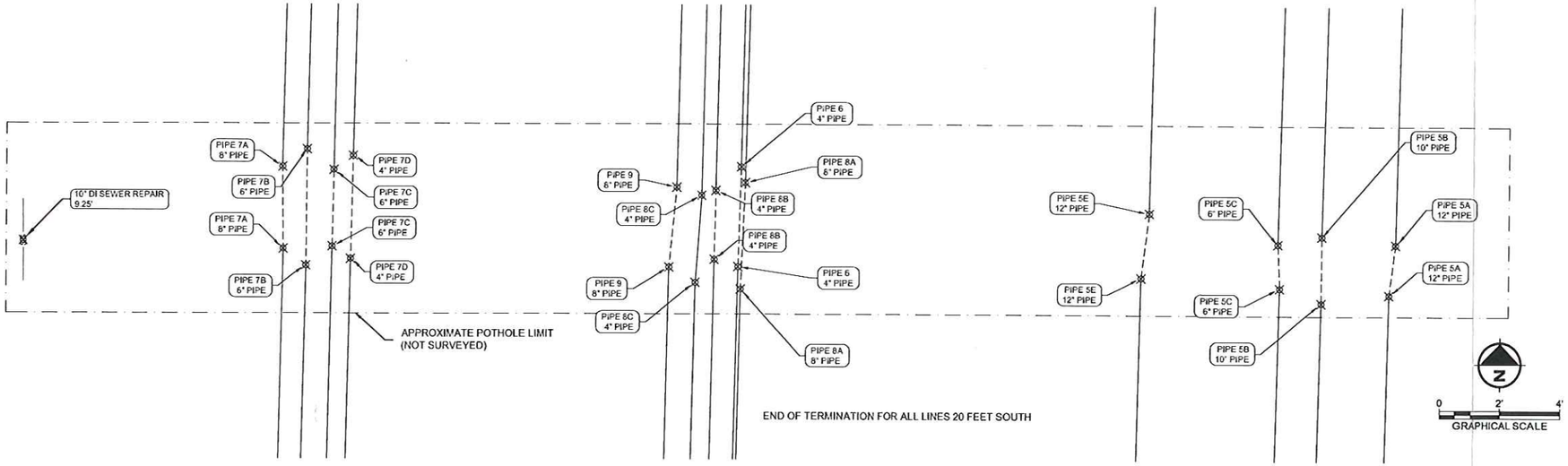


DETAIL 2 / 1" = 2' — MIDDLE POTHOLE



DETAIL 1 / 1" = 2' — SOUTH POTHOLE

NOTE: LABELS WITH A (P) SUFFIX WERE NOT SURVEYED. THESE LOCATIONS AND ELEVATIONS WERE ESTIMATED BASED ON PHOTOGRAPHS TAKEN DURING CONSTRUCTION.

SOURCES OF INFORMATION:

DRAWING "UNDERGROUND UTILITY SURVEY" BY PACIFIC GEOMATIC SERVICES, INC. DATED 12/29/2014 REVISION 10 (9/1/2015)

AS BUILT GRADING FROM PROGRESS SURVEY ON 06/15/2015 BY PACIFIC GEOMATIC SERVICES, INC DATED 06/19/2015

PACIFIC GEOMATIC SERVICES, INC. TERMINAL 91 SURVEY NOTES DATED 4-21-2014 THROUGH 6-15-2015

REDLINE AS BUILT DRAWINGS OF DESIGN DRAWINGS PREPARED BY CLEARCREEK ENTITLED, "20150813_REDLINE_AS BUILTS_W_POS_MARKUP.PDF"

SUBMITTAL 01730-003.03, REDLINE AS BUILT DRAWINGS OF DESIGN DRAWINGS PREPARED BY CLEARCREEK ENTITLED, "20150813_REDLINE_AS BUILTS_W_POS_MARKUP.PDF" WITH ADDITIONAL BLUELINES FROM PORT OF SEATTLE DATED 5-29-2015.

PES Environmental, Inc.
Engineering & Environmental Services
VISTA CONSULTANTS, LLC
PO BOX 388
LAKE OSWEGO, OREGON 97034
(503) 922-2522

PROJECT ENGR/MGR: R. NORTH/B. O'NEAL
DESIGNER: R. NORTH
DRAWN BY: S. MCCOY
SCALE: AS SHOWN
DATE: 2017-09-28
CHECKED BY: R. NORTH
CHECKED/APPROVED BY: R. NORTH/B. O'NEAL

REVISIONS

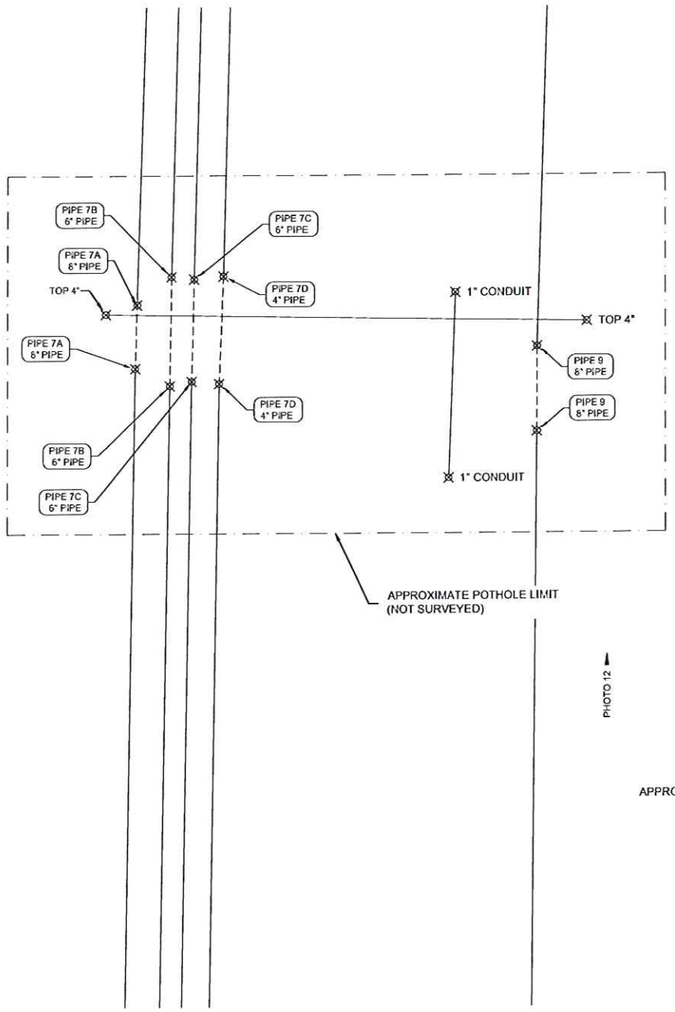
NO.	DATE	BY	DESCRIPTION	APP'D	NO.	DATE	BY	DESCRIPTION	APP'D

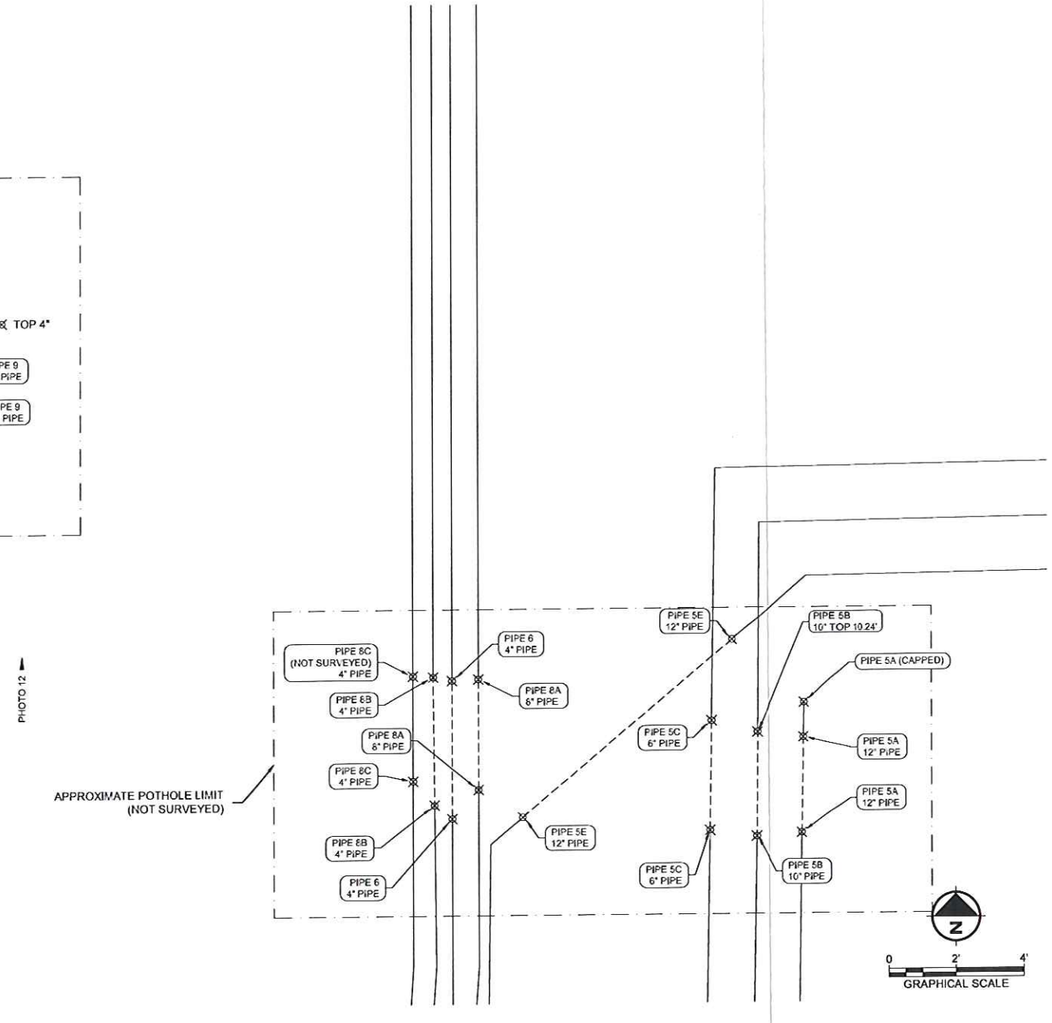
AS BUILT AND APPROVED
DATE: 2015-11-12
AS CERTIFIED BY THE APPROVAL ON THE COVER SHEET FOR THIS SET, THIS DRAWING REPRESENTS A RECORD OF HOW THE PROJECT WAS CONSTRUCTED AND DOES NOT REPRESENT DESIGN OR CHANGE OF APPROVAL.

PROJECT MANAGER: FRED CHOU
PROJECT ENGINEER: ----
DESIGN ENGINEER: ----
DRAFTER: ----
SCALE: AS SHOWN
DATE: 2015-11-12
CHECKED/APPROVED BY: FRED CHOU

Port of Seattle
PROJECT: PORT OF SEATTLE TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: DETAILS 1-2 PIPELINE DECOMMISIONING

WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 2





DETAIL 3/1 NORTH POTHOLE
1" = 2'

PES Environmental, Inc.
Engineering & Environmental Services
VISTA CONSULTANTS, LLC
PO BOX 388
LAKE OSWEGO, OREGON 97034
(503) 922-2522

PROJECT ENGR/MGR: R. NORTH/B. O'NEAL
DESIGNED: R. NORTH
DRAWN BY: S. MCCOY
SCALE: AS SHOWN
DATE: 2017-09-28
CHECKED BY: R. NORTH
CHECKED/APPROVED BY: R. NORTH/B. O'NEAL

REVISIONS

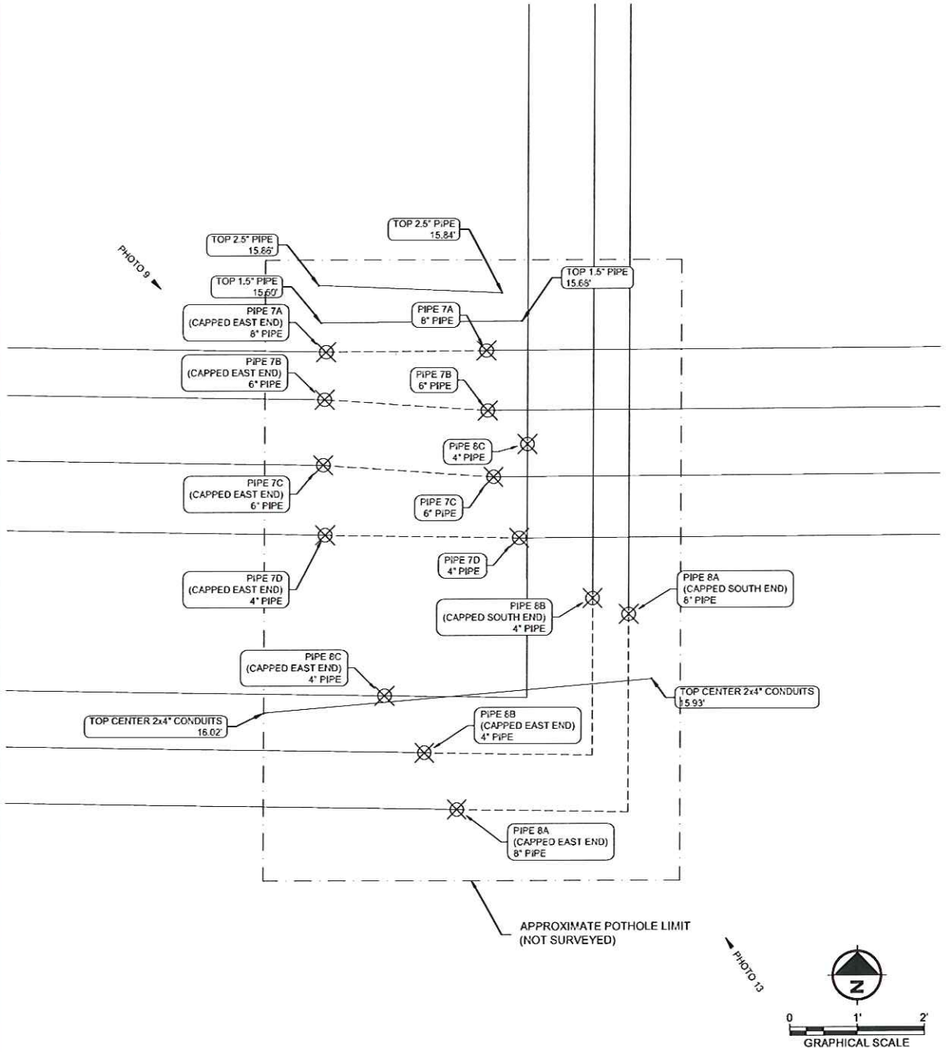
NO.	DATE	BY	DESCRIPTION	APP'D	NO.	DATE	BY	DESCRIPTION	APP'D

AS BUILT AND APPROVED
DATE: 2015-11-12
AS CERTIFIED BY THE APPROVAL ON THE COVER SHEET FOR THIS SET, THIS DRAWING REPRESENTS A RECORD OF HOW THE PROJECT WAS CONSTRUCTED AND DOES NOT REPRESENT DESIGN OR CHANGE OF APPROVAL.

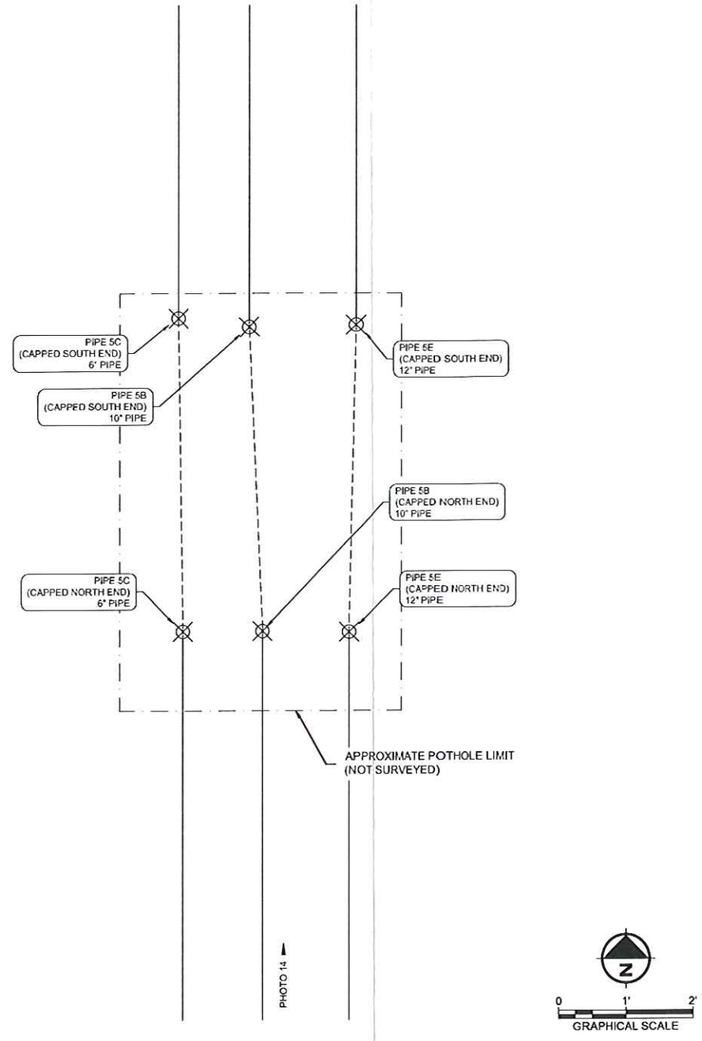
PROJECT MANAGER: FRED CHOU
PROJECT ENGINEER: ----
DESIGN ENGINEER: ----
DRAFTER: ----
SCALE: AS SHOWN
DATE: 2015-11-12
CHECKED/APPROVED BY: FRED CHOU

Port of Seattle
PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: DETAILS 3
PIPELINE DECOMMISIONING

WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 3



DETAIL 4 / 1" = 1' — COONTZ AND WEST GARFIELD WEST



DETAIL 5 / 1" = 1' — COONTZ AND WEST GARFIELD EAST

PES Environmental, Inc.
Engineering & Environmental Services
VISTA CONSULTANTS, LLC
PO BOX 388
LAKE OSWEGO, OREGON 97034
(503) 922-2522

PROJECT ENGR/MGR: R. NORTH/B. O'NEAL
DESIGNED: R. NORTH
DRAWN BY: S. MCCOY
SCALE: AS SHOWN
DATE: 2017-09-28
CHECKED BY: R. NORTH
CHECKED/APPROVED BY: R. NORTH/B. O'NEAL

REVISIONS

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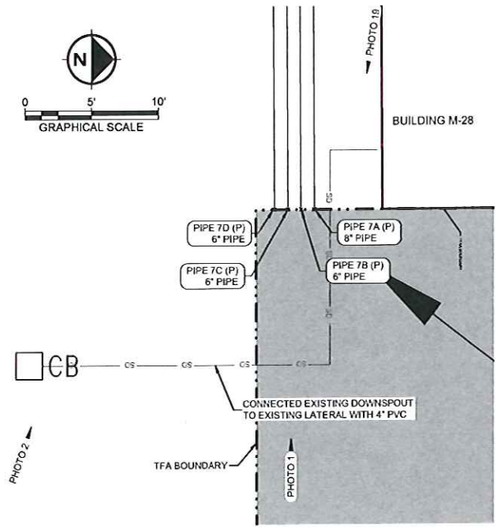
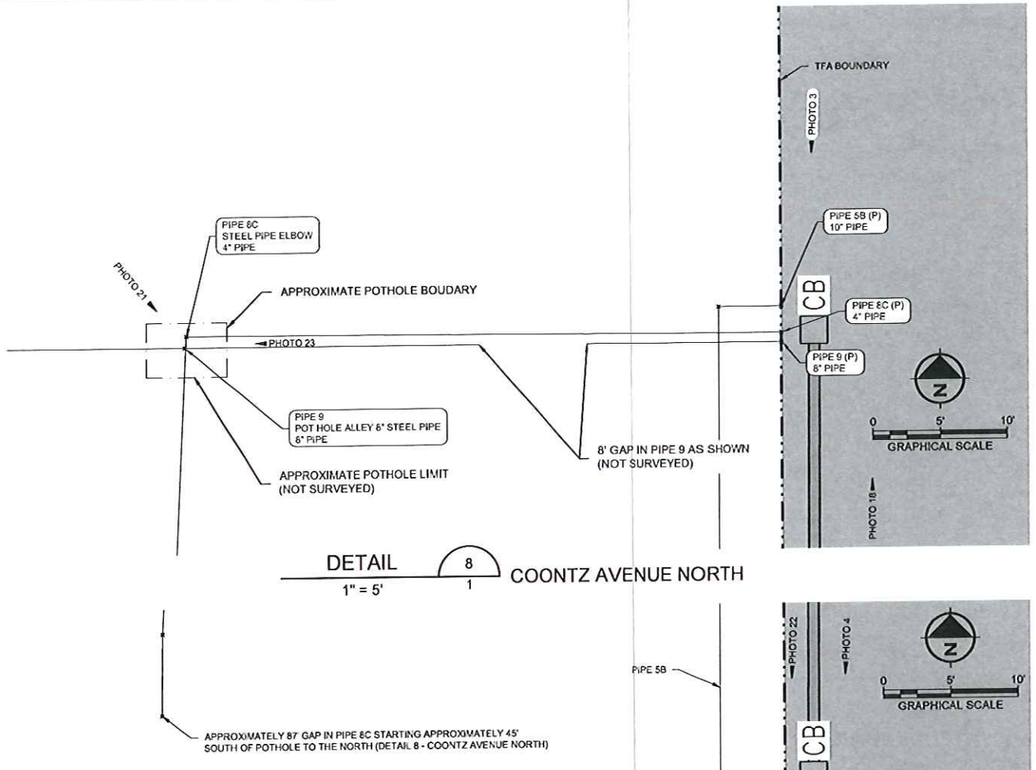
PROJECT MANAGER: FRED CHOU
PROJECT ENGINEER: ----
DESIGN ENGINEER: ----
DRAFTER: ----
SCALE: AS SHOWN
DATE: 2015-11-12
CHECKED/APPROVED BY: FRED CHOU

Port of Seattle
PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: DETAILS 4-5 PIPELINE DECOMMISIONING

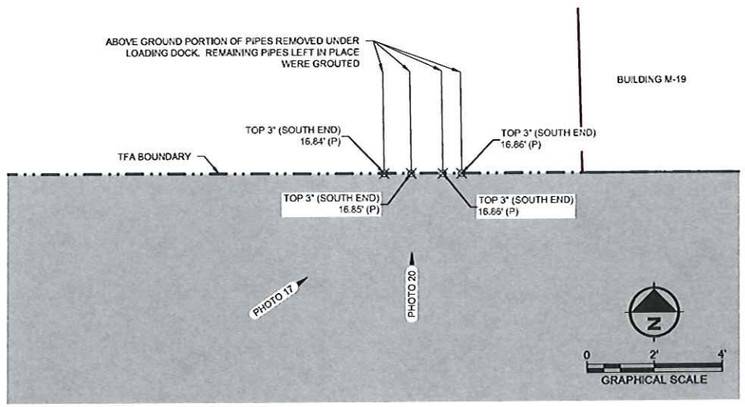
WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 4



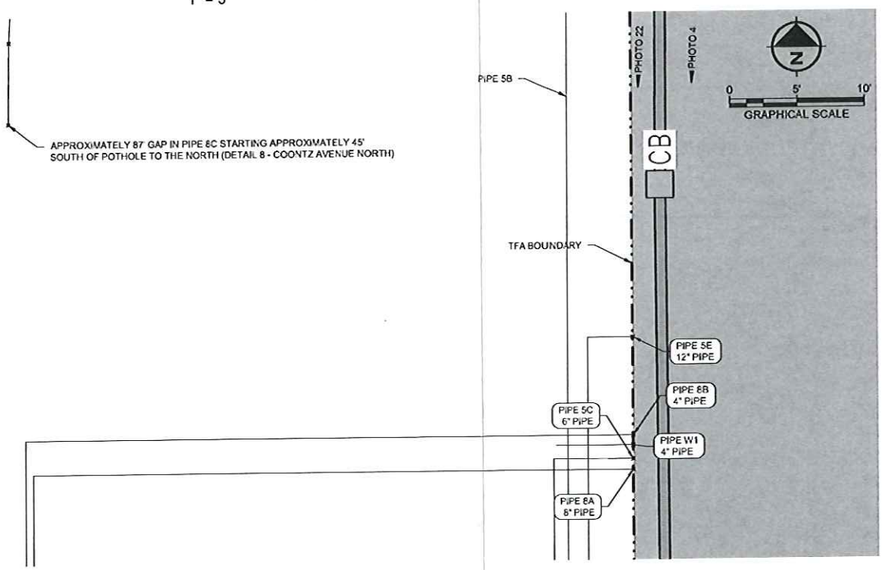
DETAIL 6 / 1" = 5' — WEST GARFIELD



DETAIL 8 / 1" = 5' — COONTZ AVENUE NORTH



DETAIL 7 / 1" = 2' — LOADING DOCK NORTH OF TFA



DETAIL 9 / 1" = 5' — COONTZ AVENUE SOUTH

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VISTA CONSULTANTS, LLC
PO BOX 388
LAKE OSWEGO, OREGON 97034
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PROJECT ENGR/MGR: R. NORTH/B. O'NEAL
DESIGNED BY: R. NORTH
DRAWN BY: S. MCCOY
SCALE: AS SHOWN
DATE: 2017-09-28
CHECKED BY: R. NORTH
CHECKED/APPROVED BY: R. NORTH/B. O'NEAL

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Port of Seattle
PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: DETAILS 6-9
PIPELINE DECOMMISIONING

WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 5

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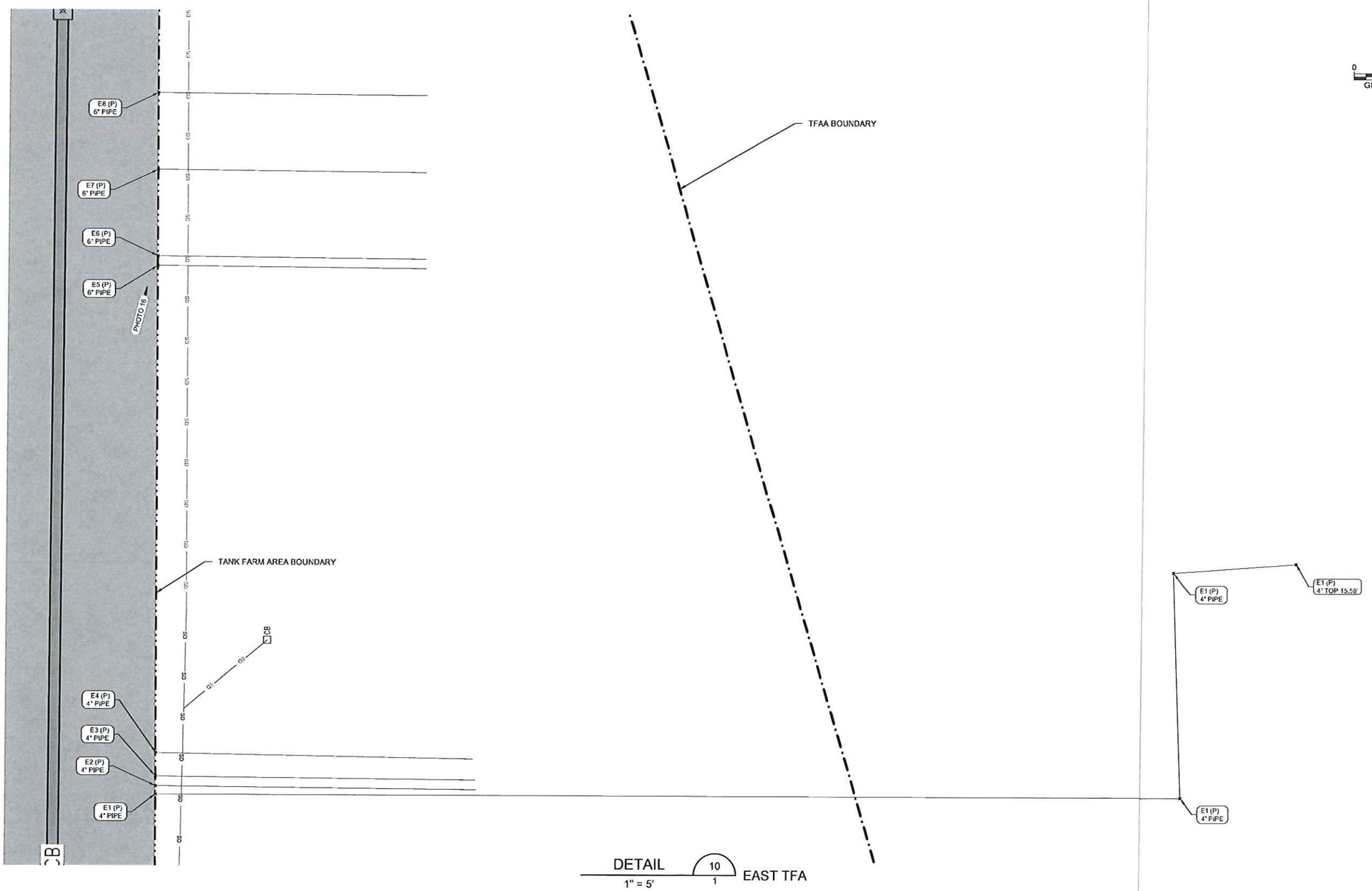

DETAIL 10/1 — EAST TFA
1" = 5'

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PROJECT ENGR./ARCH	R. NORTH/B. O'NEAL
DESIGNER	R. NORTH
DRAWN BY	S. MCCOY
SCALE	AS SHOWN
DATE	2017-09-28
CHECKED BY	R. NORTH
CHECKED/APPROVED BY	R. NORTH/B. O'NEAL

REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON — ROGER B. NORTH — 43591

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DESIGN ENGINEER	----
DRAFTER	----
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Port of Seattle — PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: DETAIL 10
PIPELINE DECOMMISIONING

WORK PROJECT NO.	MC - 0317586 - WP104528
CONSULTANT'S NO.	948.007.003
PORT OF SEATTLE NO.	91-1401 6

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PHOTO 1 - LOOKING WEST AT THE SOUTHEAST CORNER OF BUILDING M-28

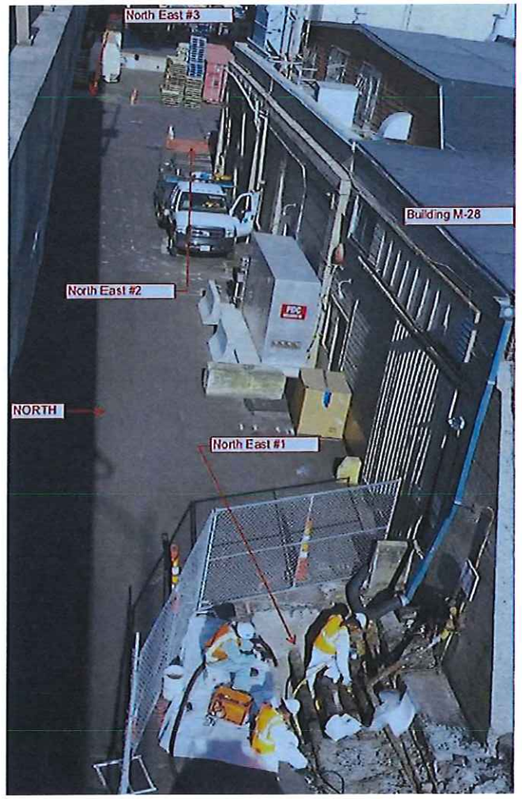

PHOTO 2 - LOOKING WEST DOWN GARFIELD STREET TOWARD BUILDING M-28

PHOTO 3 - LOOKING SOUTH DOWN COONTZ AVE. TOWARD BUILDING M-28

PHOTO 4 - LOOKING SOUTH DOWN COONTZ AVE. TOWARD BUILDING M-28

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Port of Seattle
PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: PHOTOS 1-4
REFERENCE PHOTOGRAPHS

WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 P1

PHOTO 5 - LOOKING EAST TOWARD SOUTH POTHOLE LAYOUT

PHOTO 6 - LOOKING NE TOWARDS MW CP_104B, CP_104A, AND COMMUNICATION JUNCTION BOX

PHOTO 7 - LOOKING NE TOWARDS MW CP_104B AND COMMUNICATION CONDUIT

PHOTO 8 - LOOKING NORTHEAST TOWARD LOCATE PAINT OF GROUTED LINES NW OF BUILDING M-19

PHOTO 9 - LOOKING SOUTHEAST TOWARD POTHOLE 15

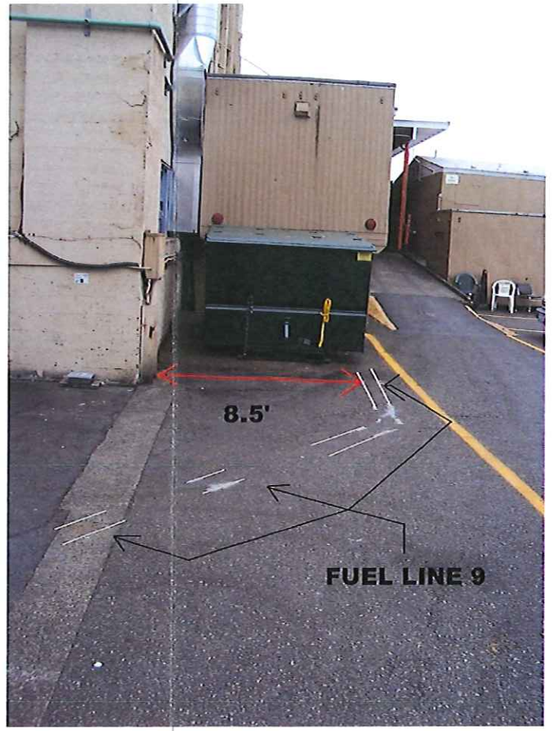

PHOTO 10 - LOOKING SOUTH TOWARDS THE NW CORNER OF BLDG W-39

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DESIGNED BY: R. NORTH
DRAWN BY: S. MCCOY
SCALE: AS SHOWN
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Port of Seattle
PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: PHOTOS 5-10
REFERENCE PHOTOGRAPHS

WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 P2

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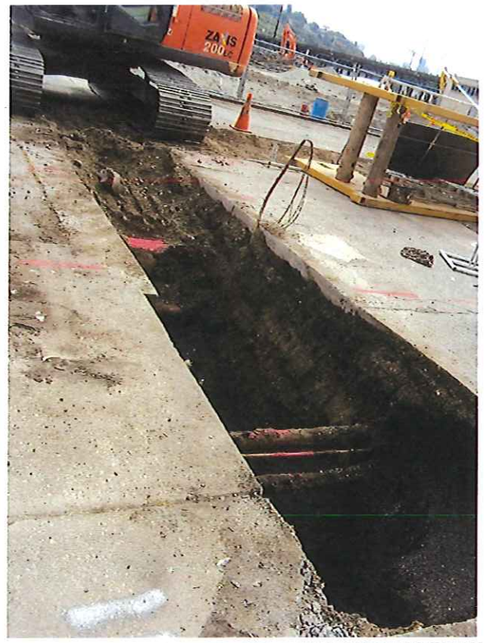

PHOTO 11 - LOOKING SOUTHEAST TOWARD LNAPL RECOVERY TRENCH 5

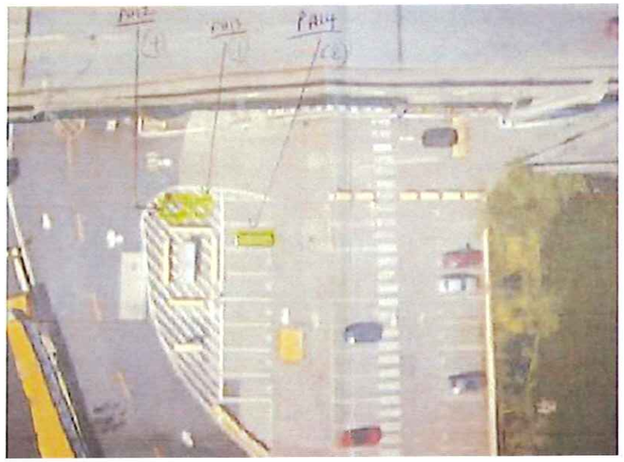

PHOTO 12 - PLAN VIEW SKETCH SHOWING LAYOUT LOCATIONS FOR POTHOLE 12-14 (NORTH POTHOLE)

PHOTO 13 - LOOKING NW TOWARD THE WESTERN POTHOLE IN COONTZ AVE. AND GARFIELD ST.

PHOTO 14 - LOOKING NORTH TOWARD THE EASTERN POTHOLE IN COONTZ AVE. AND GARFIELD ST.

PHOTO 15 - LOOKING EAST AT LNAPL RECOVERY TRENCH 5 DUCT BANK CROSSING

PHOTO 16 - LOOKING NORTH ALONG THE EAST SIDE OF THE TFA BOUNDARY

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Engineering & Environmental Services
VISTA CONSULTANTS, LLC
PO BOX 388
LAKE OSWEGO, OREGON 97034
(503) 922-2522

PROJECT ENGR/MGR: R. NORTH/B. O'NEAL
DESIGNER: R. NORTH
DRAWN BY: S. MCCOY
SCALE: AS SHOWN
DATE: 2017-09-28
CHECKED BY: R. NORTH
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PROJECT ENGINEER: ----
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Port of Seattle
PROJECT: PORT OF SEATTLE
TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: PHOTOS 10-16
REFERENCE PHOTOGRAPHS

WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 P3

PHOTO 17 - LOOKING NORTHEAST TOWARD THE NORTH TFA BOUNDARY

PHOTO 18 - LOOKING NORTH ALONG THE WESTERN TFA BOUNDARY

PHOTO 19 - LOOKING EAST AT THE NEW STORM CONNECTION ON THE SE CORNER OF BUILDING M-28

PHOTO 20 - LOOKING NORTH TOWARD THE NORTH TFA BOUNDARY

PHOTO 21 - CLOSE UP OF ALLEY POTHOLE PIPES AFTER CUTTING

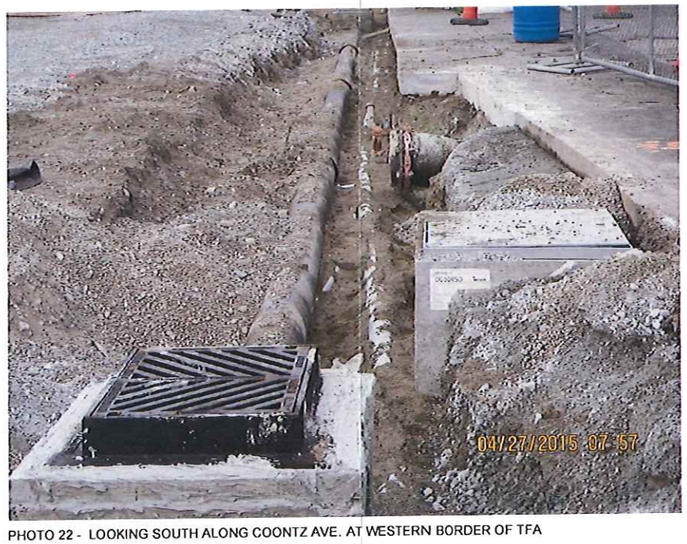

PHOTO 22 - LOOKING SOUTH ALONG COONTZ AVE. AT WESTERN BORDER OF TFA

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Engineering & Environmental Services
VISTA CONSULTANTS, LLC
PO BOX 388
LAKE OSWEGO, OREGON 97034
(503) 922-2522

PROJECT ENGR/MGR: R. NORTH/B. O'NEAL
DESIGNER: R. NORTH
DRAWN BY: S. MCCOY
SCALE: AS SHOWN
DATE: 2017-09-28
CHECKED BY: R. NORTH
CHECKED/APPROVED BY: R. NORTH/B. O'NEAL

REVISIONS

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Port of Seattle
PROJECT: PORT OF SEATTLE
TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: PHOTOS 17-22
REFERENCE PHOTOGRAPHS

WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 P4

PHOTO 23 - LOOKING WEST TOWARD THE ALLEY POTHOLE LAYOUT PAINT

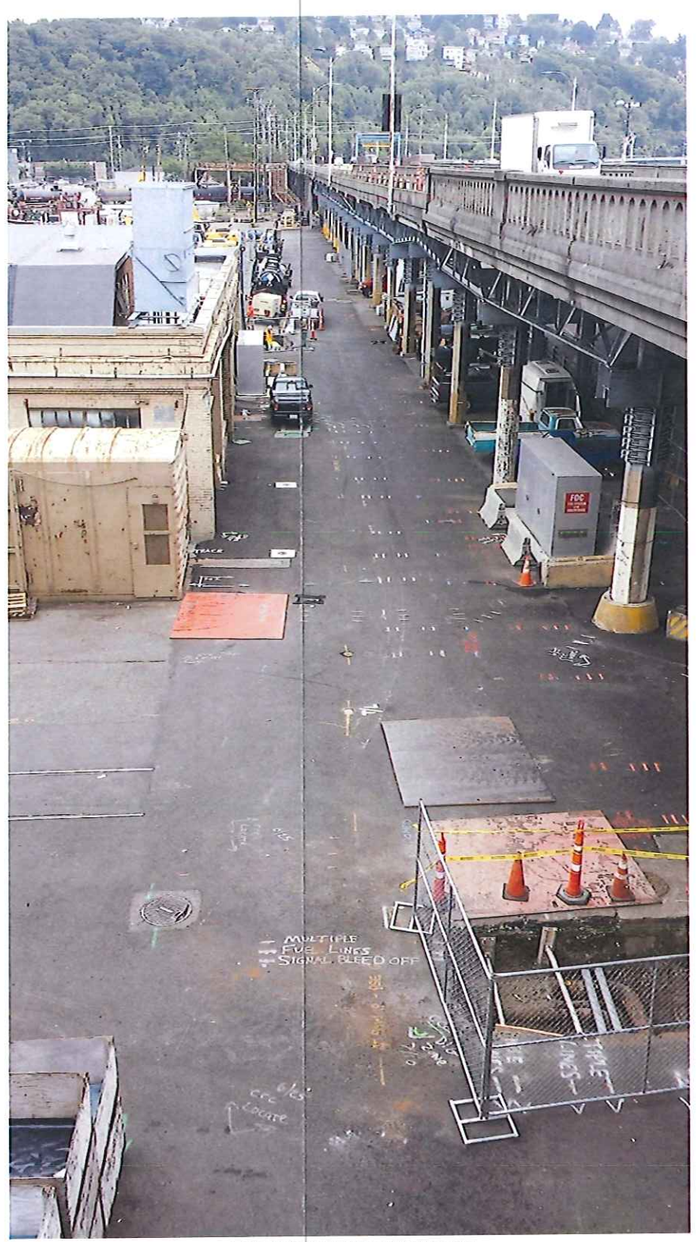

PHOTO 24 - LOOKING EAST ALONG GARFIELD ST. FROM BUILDING W-39

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Engineering & Environmental Services
VISTA CONSULTANTS, LLC
PO BOX 388
LAKE OSWEGO, OREGON 97034
(503) 922-2522

PROJECT ENGR/ARCH:	R. NORTH/B. O'NEAL
DESIGNED BY:	R. NORTH
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CHECKED/APPROVED BY:	R. NORTH/B. O'NEAL

ROGER B. NORTH — STATE OF WASHINGTON — 17751 — REGISTERED PROFESSIONAL ENGINEER

REVISIONS

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Port of Seattle
PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: PHOTOS 23-24
REFERENCE PHOTOGRAPHS

WORK PROJECT NO.	MC - 0317586 - WP104528
CONSULTANT'S NO.	948.007.003
PORT OF SEATTLE NO.	91-1401 P5

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PHOTO 25 - LOOKING EAST ALONG NORTH SIDE OF M-28 AT BLOCK RETAINING WALL

PHOTO 27 - LOOKING SOUTHEAST AT OIL WATER SEPARATOR AND WATER QUALITY VAULT

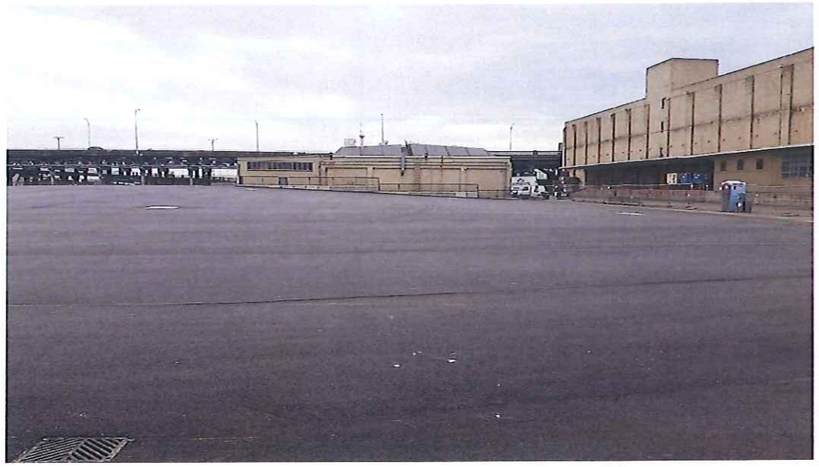

PHOTO 26 - FINAL ASPHALT COVER LOOKING SOUTH TOWARD BUILDING M-28. LNAPL TRENCH 3 VAULT LIDS VISIBLE MIDWAY FROM BUILDING M-28.

PHOTO 28 - FINAL ASPHALT COVER LOOKING NORTHWEST FROM SE CORNER OF TFA

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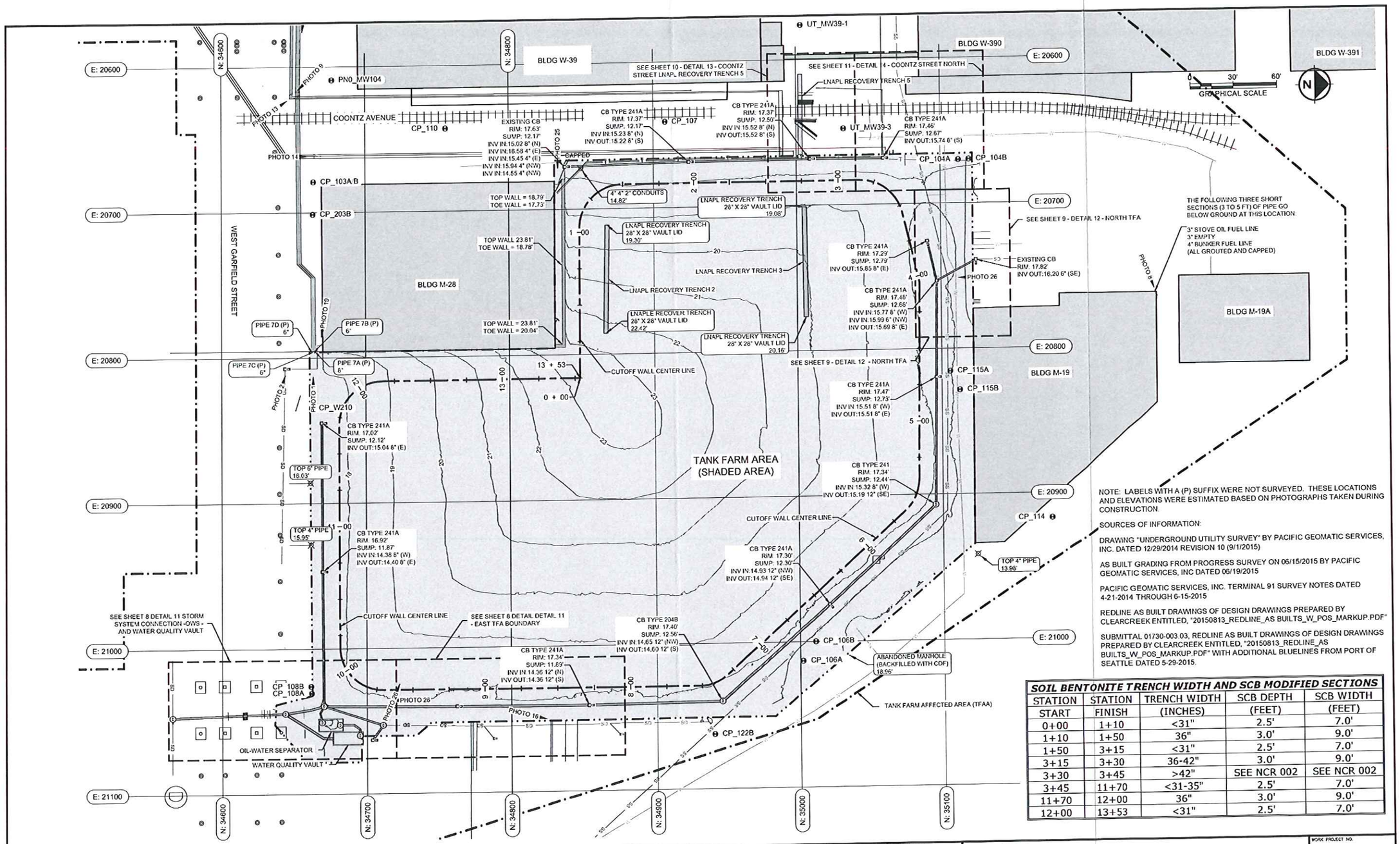
Port of Seattle
PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: PHOTOS 25-28
REFERENCE PHOTOGRAPHS

WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 P6



NOTE: LABELS WITH A (P) SUFFIX WERE NOT SURVEYED. THESE LOCATIONS AND ELEVATIONS WERE ESTIMATED BASED ON PHOTOGRAPHS TAKEN DURING CONSTRUCTION.

SOURCES OF INFORMATION:

DRAWING "UNDERGROUND UTILITY SURVEY" BY PACIFIC GEOMATIC SERVICES, INC. DATED 12/29/2014 REVISION 10 (9/1/2015)

AS BUILT GRADING FROM PROGRESS SURVEY ON 06/15/2015 BY PACIFIC GEOMATIC SERVICES, INC DATED 06/19/2015

PACIFIC GEOMATIC SERVICES, INC. TERMINAL 91 SURVEY NOTES DATED 4-21-2014 THROUGH 6-15-2015

REDLINE AS BUILT DRAWINGS OF DESIGN DRAWINGS PREPARED BY CLEARCREEK ENTITLED, "20150813_REDLINE_AS BUILTS_W_POS_MARKUP.PDF"

SUBMITTAL 01730-003.03, REDLINE AS BUILT DRAWINGS OF DESIGN DRAWINGS PREPARED BY CLEARCREEK ENTITLED, "20150813_REDLINE_AS BUILTS_W_POS_MARKUP.PDF" WITH ADDITIONAL BLUELINES FROM PORT OF SEATTLE DATED 5-29-2015.

SOIL BENTONITE TRENCH WIDTH AND SCB MODIFIED SECTIONS

STATION START	STATION FINISH	TRENCH WIDTH (INCHES)	SCB DEPTH (FEET)	SCB WIDTH (FEET)
0+00	1+10	<31"	2.5'	7.0'
1+10	1+50	36"	3.0'	9.0'
1+50	3+15	<31"	2.5'	7.0'
3+15	3+30	36-42"	3.0'	9.0'
3+30	3+45	>42"	SEE NCR 002	SEE NCR 002
3+45	11+70	<31-35"	2.5'	7.0'
11+70	12+00	36"	3.0'	9.0'
12+00	13+53	<31"	2.5'	7.0'

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SHEET TITLE: TANK FARM AREA SITE PLAN
TANK FARM AREA

WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 7

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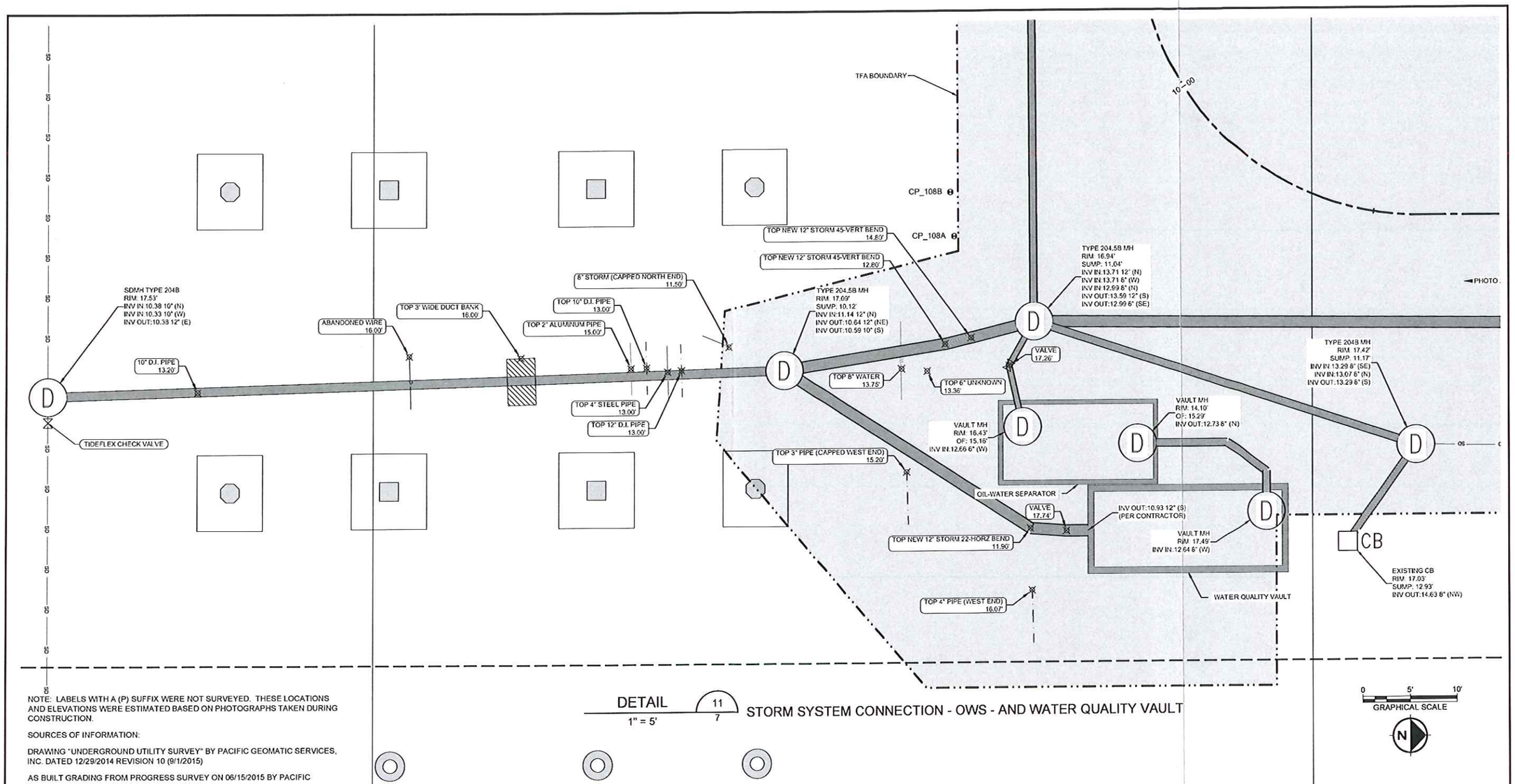

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SOURCES OF INFORMATION:

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PACIFIC GEOMATIC SERVICES, INC. TERMINAL 91 SURVEY NOTES DATED 4-21-2014 THROUGH 6-15-2015

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SUBMITTAL 01730-003.03, REDLINE AS BUILT DRAWINGS OF DESIGN DRAWINGS PREPARED BY CLEARCREEK ENTITLED, "20150813_REDLINE_AS BUILTS_W_POS_MARKUP.PDF" WITH ADDITIONAL BLUELINES FROM PORT OF SEATTLE DATED 5-29-2015.

DETAIL 11/7
1" = 5'

STORM SYSTEM CONNECTION - OWS - AND WATER QUALITY VAULT

PES Environmental, Inc.
Engineering & Environmental Services
VISTA CONSULTANTS, LLC
PO BOX 388
LAKE OSWEGO, OREGON 97034
(503) 922-2522

PROJECT ENGR./MGR.	R. NORTH/B. O'NEAL
DESIGNED BY:	R. NORTH
DRAWN BY:	S. MCCOY
SCALE:	AS SHOWN
DATE:	2017-09-28
CHECKED BY:	R. NORTH
CHECKED/APPROVED BY:	R. NORTH/B. O'NEAL

REVISIONS

NO.	DATE	BY	DESCRIPTION	APP'D	NO.	DATE	BY	DESCRIPTION	APP'D

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DATE: 2015-11-12
AS CERTIFIED BY THE APPROVAL ON THE COVER SHEET OF THIS SET, THIS DRAWING REPRESENTS A RECORD OF HOW THE PROJECT WAS CONSTRUCTED AND DOES NOT REPRESENT DESIGN OR CHANGE OF APPROVAL.

PROJECT MANAGER	FRED CHOU
PROJECT ENGINEER	-----
DESIGN ENGINEER	-----
DRAFTER	-----
SCALE	AS SHOWN
DATE	2015-11-12
CHECKED/APPROVED BY:	FRED CHOU

Port of Seattle
PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: DETAIL 11
TANK FARM AREA

WORK PROJECT NO.	MC - 0317586 - WP104528
CONSULTANT'S NO.	948.007.003
PORT OF SEATTLE NO.	91-1401 8

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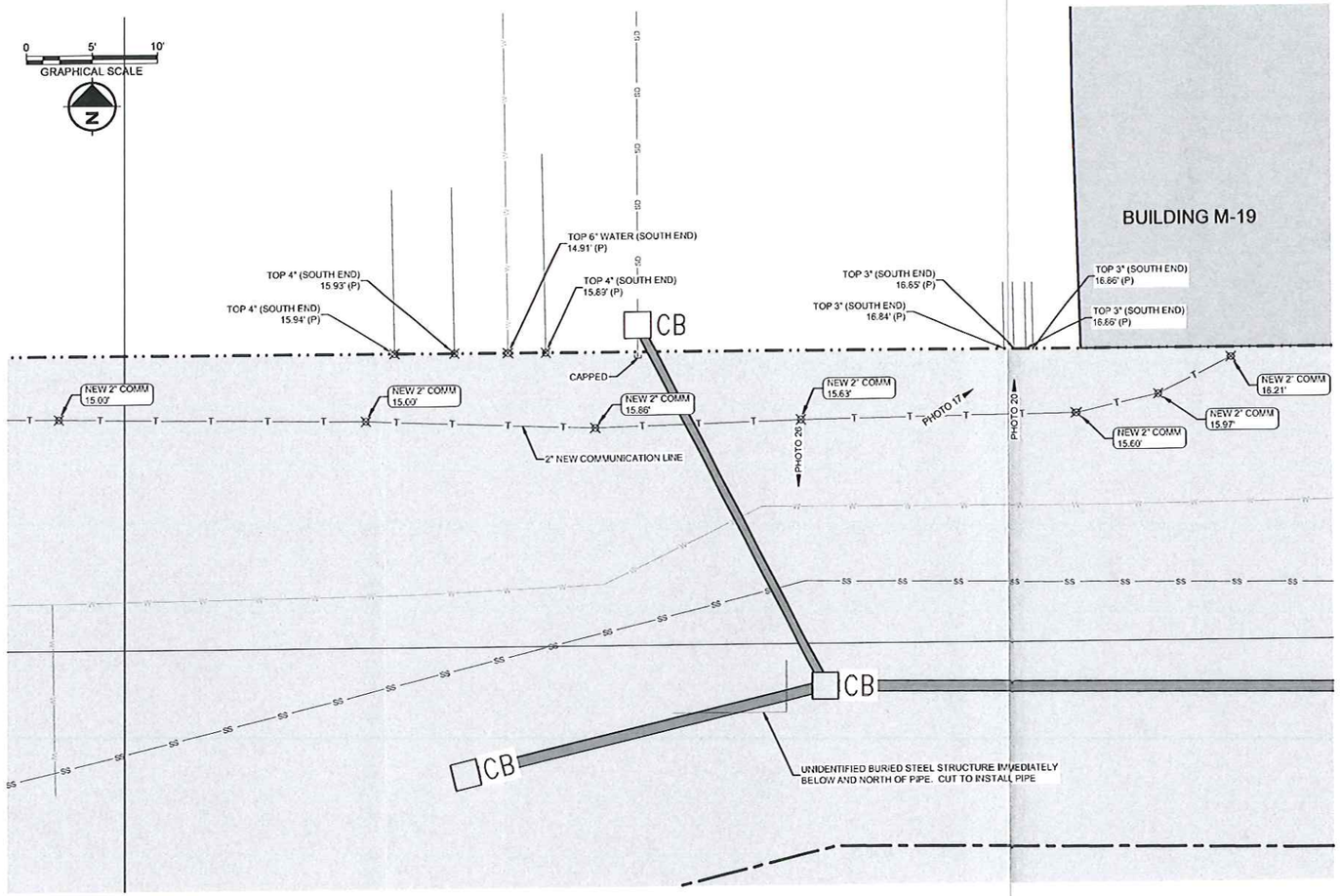

DETAIL 12/7 NORTH TFA
1" = 5'

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PES Environmental, Inc.
Engineering & Environmental Services
VISTA CONSULTANTS, LLC
PO BOX 388
LAKE OSWEGO, OREGON 97034
(503) 922-2522

PROJECT ENGR/MGR: R. NORTH/B. O'NEAL
DESIGNED BY: R. NORTH
DRAWN BY: S. MCCOY
SCALE: AS SHOWN
DATE: 2017-09-28
CHECKED BY: R. NORTH
CHECKED/APPROVED BY: R. NORTH/B. O'NEAL

ROGER B. NORTH — STATE OF WASHINGTON — 43591 — REGISTERED PROFESSIONAL ENGINEER

REVISIONS

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PROJECT ENGINEER: ----
DESIGN ENGINEER: ----
DRAFTER: ----
SCALE: AS SHOWN
DATE: 2015-11-12
CHECKED/APPROVED BY: FRED CHOU

Port of Seattle
PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: DETAIL 12
TANK FARM AREA

WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 9

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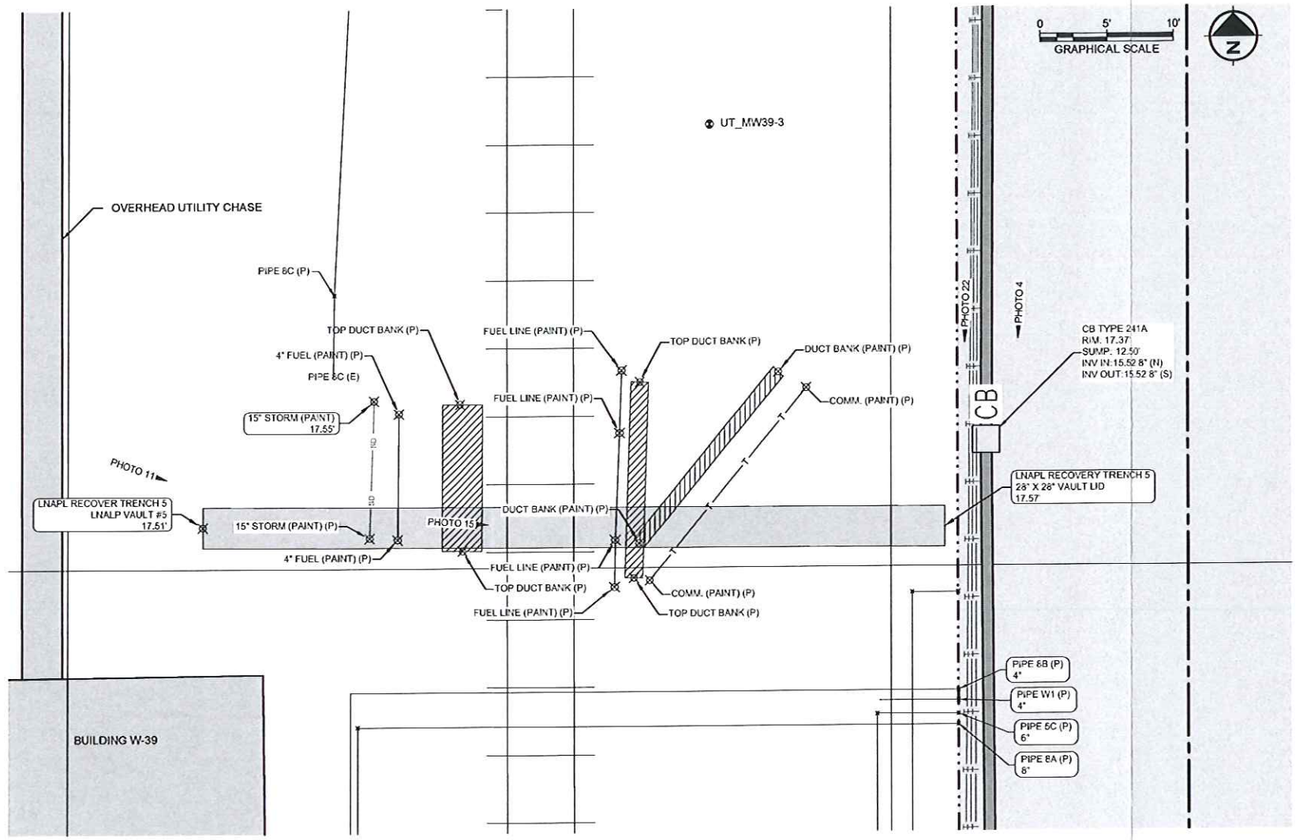

DETAIL 13/7 — 1" = 5'

COONTZ STREET LNAPL RECOVERY TRENCH 5

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PES Environmental, Inc.
Engineering & Environmental Services
VISTA CONSULTANTS, LLC
PO BOX 388
LAKE OSWEGO, OREGON 97034
(503) 922-2522

PROJECT ENGR/ARCH: R. NORTH/B. O'NEAL
DESIGNED: R. NORTH
DRAWN BY: S. MCCOY
SCALE: AS SHOWN
DATE: 2017-09-28
CHECKED BY: R. NORTH
CHECKED/APPROVED BY: R. NORTH/B. O'NEAL

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PROJECT ENGINEER: ----
DESIGN ENGINEER: ----
DRAFTER: ----
SCALE: AS SHOWN
DATE: 2015-11-12
CHECKED/APPROVED BY: FRED CHOU

Port of Seattle
PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: DETAIL 13
TANK FARM AREA

WORK PROJECT NO.: MC - 0317586 - WP104528
CONSULTANT'S NO.: 948.007.003
PORT OF SEATTLE NO.: 91-1401 10

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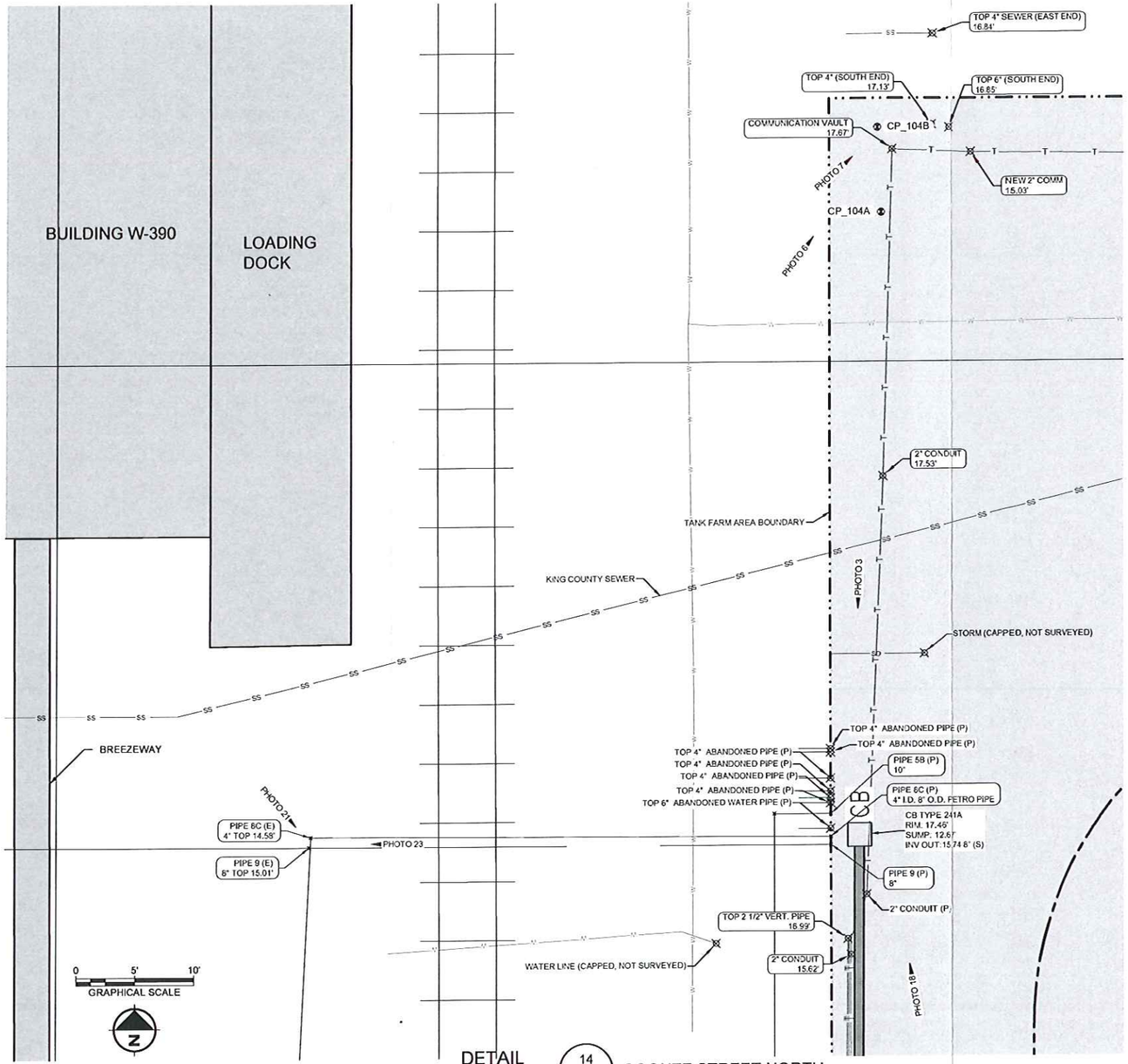

DETAIL 14/7
1" = 5'

COONTZ STREET NORTH

PES Environmental, Inc.
Engineering & Environmental Services
VISTA CONSULTANTS, LLC
PO BOX 388
LAKE OSWEGO, OREGON 97034
(503) 922-2522

PROJECT ENGR/ARCH:	R. NORTH/B. O'NEAL
DESIGNED BY:	R. NORTH
DRAWN BY:	S. MCCOY
SCALE:	AS SHOWN
DATE:	2017-09-28
CHECKED BY:	R. NORTH
CHECKED/APPROVED BY:	R. NORTH/B. O'NEAL

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DRAFTER:	----
SCALE:	AS SHOWN
DATE:	2015-11-12
CHECKED/APPROVED BY:	FRED CHOU

Port of Seattle
PORT OF SEATTLE
PROJECT: TERMINAL 91 TANK FARM CLEANUP
SHEET TITLE: DETAIL 14
TANK FARM AREA

WORK PROJECT NO.	MC - 0317586 - WP104528
CONSULTANT'S NO.	948.007.003
PORT OF SEATTLE NO.	91-1401 11

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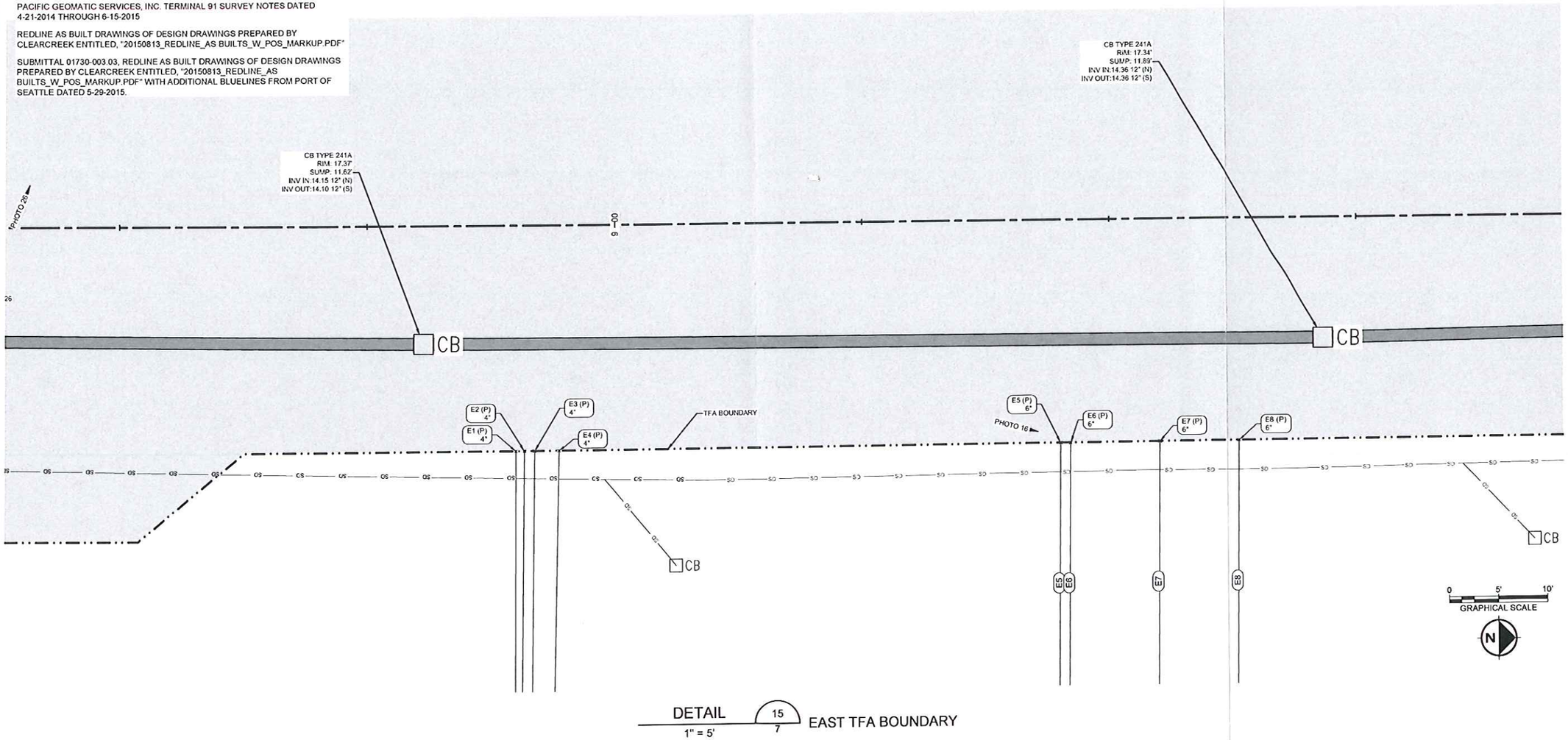

DETAIL 15/7 — EAST TFA BOUNDARY

1" = 5'

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DESIGNED BY:	R. NORTH
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SCALE:	AS SHOWN
DATE:	2017-09-28
CHECKED BY:	R. NORTH
CHECKED/APPROVED BY:	R. NORTH/B. O'NEAL

REGISTERED PROFESSIONAL ENGINEER — ROGER B. NORTH — 43155

REVISIONS

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PROJECT ENGINEER:	----
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DRAFTER:	----
SCALE:	AS SHOWN
DATE:	2015-11-12
CHECKED/APPROVED BY:	FRED CHOU

Port of Seattle

PORT OF SEATTLE

PROJECT: TERMINAL 91 TANK FARM CLEANUP

SHEET TITLE: DETAIL 15
TANK FARM AREA

WORK PROJECT NO.	MC - 0317586 - WP104528
CONSULTANT'S NO.	948.007.003
PORT OF SEATTLE NO.	91-1401 12

APPENDIX O

Environmental Covenant

After Recording Return
Original Signed Covenant to:
Tom Mackie, Ecology Site Manager
Hazardous Waste & Toxics Reduction Program
Department of Ecology
1250 W. Alder St.
Union Gap, WA 98903

20170828000574
COVENANT Rec: $90.00
8/28/2017 2:34 PM
KING COUNTY, WA

Environmental Covenant

Grantor: The Port of Seattle

Grantee: State of Washington, Department of Ecology

Brief Legal Description: THAT PORTION OF THE EAST HALF AND THE SOUTHWEST QUARTER OF SECTION 23; AND THE EAST HALF AND THE NORTHWEST QUARTER OF SECTION 26, ALL IN TOWNSHIP 25 NORTH, RANGE 03 EAST, W.M., IN KING COUNTY, WASHINGTON.

See Exhibit A for full Legal Description.

Tax Parcel Nos.: 7666201530, 7666201516, 7666201146, 7666201153, 2325039018

Cross Reference: NA

RECITALS

a. This document is an environmental (restrictive) covenant (hereafter "Covenant") executed pursuant to the Model Toxics Control Act ("MTCA"), chapter 70.105D RCW and Uniform Environmental Covenants Act ("UECA"), chapter 64.70 RCW.

b. The Property (as defined below) that is the subject of this Covenant is part or all of a site commonly known as Terminal 91, Washington State Department of Ecology Facility ID# 24768. The Property is legally described in Exhibit A, and illustrated in Exhibit B, both of which are attached (hereafter "Property"). The tank farm affected area ("TFAA") and the short fill ("Short Fill"), each as depicted in Exhibit B, are areas located within the Property to which portions of this Covenant specifically apply. If there are differences between these two Exhibits, the legal description in Exhibit A shall prevail.

c. The Property is the subject of remedial actions under MTCA ("Remedial Action"). This Covenant is required because residual contamination remains on the Property after completion of the Remedial Actions. Specifically, the following principal contaminants remain on the Property:

Medium	Principal Contaminants Present
Soil	Petroleum hydrocarbons and limited volatile organic compounds, semivolatile organic compounds, polychlorinated biphenyls, and metals
Groundwater	Petroleum hydrocarbons and limited volatile organic compounds, semivolatile organic compounds, polychlorinated biphenyls, and metals.
Surface Water/Sediment	To be determined

d. It is the purpose of this Covenant to restrict certain activities and uses of the Property to protect human health and the environment and the integrity of Remedial Actions conducted at the site. Records describing the extent of residual contamination and the Remedial Actions conducted are available through the Washington State Department of Ecology. This includes, but is not limited to, the following document with respect to the TFAA: Final Cleanup Action Plan, Port of Seattle Terminal 91 Site (June 2010), *Construction Report, Terminal 91 Tank Farm Affected Area Cleanup Action, Seattle, Washington* (PES 2016); and the documents identified in Exhibit C to this Covenant (Exhibit C is defined below).

e. This Covenant grants the Washington State Department of Ecology, as holder of this Covenant, certain rights specified in this Covenant. The right of the Washington State Department of Ecology as a holder is not an ownership interest under MTCA, Chapter 70.105D RCW or the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") 42 USC Chapter § 9601 et seq.

COVENANT

The Port of Seattle, as Grantor and fee simple owner of the Property, hereby grants to the Washington State Department of Ecology, and its successors and assignees, (hereafter "Ecology") the following covenants. Furthermore, it is the intent of the Grantor that such covenants shall run with the land and be binding on all current and future owners of any portion of, or interest in, the Property.

Section 1. General Restrictions and Requirements.

The following general restrictions and requirements shall apply to the Property:

a. Interference with Remedial Action. The Grantor shall not engage in any activity on the Property that may impact or interfere with the Remedial Actions and any operation, maintenance, inspection or monitoring of the Remedial Actions without prior written approval from Ecology.

b. Protection of Human Health and the Environment. The Grantor shall not engage in any activity on the Property that may threaten the Remedial Actions' continued protection of human health or the environment without prior written approval from Ecology. This includes, but is not limited to, any activity that results in the release of residual contamination that was

contained as a part of the Remedial Actions or that exacerbates or creates a new exposure to residual contamination remaining on the Property.

c. **Continued Compliance Required.** Grantor shall not convey any interest in any portion of the Property without providing for the continued adequate and complete operation, maintenance and monitoring of the Remedial Actions and continued compliance with this Covenant.

d. **Leases.** Grantor shall restrict any lease for any portion of the Property to uses and activities consistent with this Covenant and notify all lessees of the restrictions on the use of the Property.

e. **Amendment to the Covenant.** Grantor must notify and obtain approval from Ecology at least sixty (60) days in advance of any proposed activity or use of the Property in a manner that is inconsistent with this Covenant. Before approving any proposal, Ecology must issue a public notice and provide an opportunity for the public to comment on the proposal. If Ecology approves the proposal, the Covenant will be amended to reflect the change.

Section 2. Specific Prohibitions and Requirements.

In addition to the general restrictions in Section 1 of this Covenant, the following additional specific restrictions and requirements shall apply to the Property.

a. **Land Use; Industrial Land Use.** The remedial action for the TFAA and Short Fill portions of the Property is based on a cleanup designed for industrial property. As such, the TFAA and Short Fill shall be used in perpetuity only for industrial uses, as that term is defined in the rules promulgated under Chapter 70.105D RCW. Prohibited uses of the TFAA or Short Fill portions of the Property include but are not limited to residential uses, childcare facilities, K-12 public or private schools, parks, grazing of animals, and growing of food crops.

b. **Containment of Soil/Waste Materials.** One Remedial Action for the Property is based on containing contaminated soil (with hazardous substances at levels over remediation levels and cleanup levels) under a cover and subsurface barrier consisting low-permeability material. That containment area ("Cut-off Wall Area") is located and depected in Exhibit B. The primary purpose of this cover is to to prevent migration of contamination. As such, the following restrictions shall apply within the area illustrated in Exhibit B:

Any activity at the Property that may result in the release into, or exposure to the environment of, the contaminated soil contained within the Cut-off Wall Area as part of the Remedial Action, or that would create a new exposure pathway involving that contamination, is prohibitied without prior written approval from Ecology, except that the following do not require Ecology approval (1) activities permitted by the Ecology-approved Operations & Maintenance Plan and the Compliance Monitoring Plan or (2) activities conducted under the Agreed Order to monitor hazardous substances or repair or augment Remedial Action components.

c. **Vapor/gas controls.** The residual contamination on the Property includes volatile chemicals that may generate harmful vapors. The Remedial Action requires that the exposure pathway for indoor air be managed in the event that any building or enclosed structure is constructed over the TFAA in the future. If so, one of the following approaches must be taken to address this exposure pathway:

(1) include engineering controls. Any building or other enclosed structure constructed on the TFAA shall include engineering controls (for example, vapor barriers, or sub-slab venting systems in development plans to prevent the potential exposure); or

(2) conduct a development-specific evaluation of the soil/groundwater to indoor air pathway (i.e., develop risk-based cleanup levels for the specific potential exposures related to the proposed development). If concentrations of indicator hazardous substances exceed the cleanup levels developed under this option, appropriate supplemental remedial actions will be evaluated and implemented or engineering controls implemented, as appropriate.

d. Groundwater Use. The groundwater beneath the Property remains contaminated and shall not be extracted for any purpose other than temporary construction dewatering, investigation, monitoring or remediation. Drilling of a well for any water supply purpose is strictly prohibited. Groundwater extracted from the Property for any purpose shall be considered potentially contaminated and any discharge of this water shall be done in accordance with state and federal law.

e. Removal of Structures. Without prior written approval of Ecology, the Grantor shall not alter or remove the existing structures within the TFAA, or within the following discrete units described by Exhibit C: A.1, B.24, B.32, B.33, and B.35, in any manner that would expose contaminated soil or result in a release to the environment of contaminants, or that would create a new exposure pathway. Should the Grantor propose to remove all or a portion of such existing structures so that access to the subsurface contamination is feasible, Ecology may require a remedial action be taken to address the subsurface contaminated soil and waste materials.

f. Worker Protection. Workers carrying out subsurface activities could encounter contamination above applicable remediation or cleanup levels in the TFAA or the discrete units described in Exhibit C. Any subsurface work in these areas must involve qualified personnel to evaluate contaminated media that may be removed as part of the subsurface work, and any materials removed must be managed in compliance with applicable regulations.

Section 3. Access.

a. The Grantor shall maintain clear access to all remedial action components necessary to construct, operate, inspect, monitor and maintain the remedial action.

b. The Grantor freely and voluntarily grants Ecology and its authorized representatives, upon reasonable notice, the right to enter the Property at reasonable times to evaluate the effectiveness of this Covenant and associated Remedial Actions, and enforce compliance with this Covenant and those actions, including the right to take samples, inspect any Remedial Actions conducted on the Property, and to inspect related records.

c. No right of access or use by a third party to any portion of the Property is conveyed by this instrument.

Section 4. Notice Requirements.

a. Conveyance of Any Interest. The Grantor, when conveying any interest, including but not limited to title, easements, leases, and security or other interests, within the area of the TFAA that could involve breaches of the asphalt cover, shall:

(1) Notify Ecology at least thirty (30) days in advance of the conveyance.

(2) Include in the conveying document a notice in substantially the following form, as well as a complete copy of this Covenant:

NOTICE: THIS PROPERTY IS SUBJECT TO AN ENVIRONMENTAL COVENANT GRANTED TO THE WASHINGTON STATE DEPARTMENT OF ECOLOGY ON _____ (date) AND RECORDED WITH THE KING COUNTY AUDITOR UNDER RECORDING NUMBER _____. USES AND ACTIVITIES ON THIS PROPERTY MUST COMPLY WITH THAT COVENANT, A COMPLETE COPY OF WHICH IS ATTACHED TO THIS DOCUMENT.

(3) Unless otherwise agreed to in writing by Ecology, provide Ecology with a complete copy of the executed document within thirty (30) days of the date of execution of such document.

b. Reporting Violations. Should the Grantor become aware of any violation of this Covenant, Grantor shall promptly report such violation to Ecology.

c. Emergencies. For any emergency or significant change in site conditions due to acts of nature (for example, flood, fire) resulting in a violation of this Covenant, the Grantor is authorized to respond to such an event in accordance with state and federal law. The Grantor must notify Ecology of the event and response actions planned or taken as soon as practical but no later than within 24 hours of the discovery of the event.

d. Notices. Any required written notice, approval, or communication shall be personally delivered or sent by first class mail to the following persons. Any change in this contact information shall be submitted in writing to all parties to this Covenant.

Maritime Environmental Legal Services Port of Seattle P.O. Box 1209 Seattle, WA 98111 (206) 787-3000	Environmental Covenants Coordinator Washington State Department of Ecology Toxics Cleanup Program P.O. Box 47600 Olympia, WA 98504 – 7600 (360) 407-6000

As an alternative to providing written notice and change in contact information by mail, these documents may be provided electronically in an agreed upon format at the time of submittal.

Section 5. Modification or Termination.

a. If the conditions at the site requiring a Covenant have changed or no longer exist, then the Grantor may submit a request to Ecology that this Covenant be amended or terminated. Any

amendment or termination of this Covenant must follow the procedures in Chapter 64.70 RCW and Chapter 70.105D RCW and any rules promulgated under these chapters.

Section 6. Enforcement and Construction.

a. This Covenant is being freely and voluntarily granted by the Grantor.

b. Grantor shall provide Ecology with an original signed Covenant and proof of recording within ten (10) days of execution of this Covenant.

c. Ecology shall be entitled to enforce the terms of this Covenant by resort to specific performance or legal process. All remedies available in this Covenant shall be in addition to any and all remedies at law or in equity, including Chapter 70.105D RCW and Chapter 64.70 RCW. Enforcement of the terms of this Covenant shall be at the discretion of Ecology, and any forbearance, delay or omission to exercise its rights under this Covenant in the event of a breach of any term of this Covenant is not a waiver by Ecology of that term or of any subsequent breach of that term, or any other term in this Covenant, or of any rights of Ecology under this Covenant.

d. The Grantor, upon request by Ecology, shall be obligated to pay for Ecology's costs to process a request for any modification or termination of this Covenant and any approval required by this Covenant.

e. This Covenant shall be liberally construed to meet the intent of the Model Toxics Control Act, chapter 70.105D RCW and Uniform Environmental Covenants Act, chapter 64.70 RCW.

f. The provisions of this Covenant shall be severable. If any provision in this Covenant or its application to any person or circumstance is held invalid, the remainder of this Covenant or its application to any person or circumstance is not affected and shall continue in full force and effect as though such void provision had not been contained herein.

g. A heading used at the beginning of any section or paragraph or exhibit of this Covenant may be used to aid in the interpretation of that section or paragraph or exhibit but does not override the specific requirements in that section or paragraph.

The undersigned Grantor warrants that it holds the title to the Property, and the Grantor's signing officer warrants that he has authority to execute this Covenant.

EXECUTED this 23rd day of August, 2017.

PORT OF SEATTLE

Title: Managing Director, Maritime Div. Port of Seattle

Dated: 8.23.17

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Raman Iyer
Section Manager
Hazardous Waste Toxics Reduction Program

Dated: 08/16/17

Exhibit A

LEGAL DESCRIPTION

TERMINAL 91 LAND DESCRIPTION

THAT PORTION OF THE EAST HALF AND THE SOUTHWEST QUARTER OF SECTION 23; AND THE EAST HALF AND THE NORTHWEST QUARTER OF SECTION 26, ALL IN TOWNSHIP 25 NORTH, RANGE 03 EAST, W.M., IN KING COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS:

COMMENCING AT A CITY OF SEATTLE MONUMENT AT THE CENTERLINE INTERSECTION OF 15TH AVENUE WEST AND WEST GARFIELD STREET: PROCEED SOUTH 89°51'38" WEST ALONG THE CENTERLINE OF SAID GARFIELD STREET A DISTANCE OF 713.10 FEET;
THENCE SOUTH 00°08'22" EAST A DISTANCE OF 50.00 FEET TO THE SOUTH MARGIN OF SAID GARFIELD STREET AND THE TRUE POINT OF BEGINNING;
THENCE NORTH 89°51'38" EAST ALONG THE SOUTH MARGIN OF GARFIELD STREET A DISTANCE OF 7.25 FEET;
THENCE SOUTH 41°10'23" EAST ALONG THE WESTERLY MARGIN OF ALASKAN WAY A DISTANCE OF 52.89 FEET;
THENCE SOUTH 00°09'24" EAST A DISTANCE OF 9.04 FEET;
THENCE SOUTH 41°10'23" EAST A DISTANCE OF 319.07 FEET TO THE BEGINNING OF A CURVE TO THE RIGHT HAVING A RADIUS OF 73.00 FEET;
THENCE ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 57°46'05" AN ARC DISTANCE OF 73.60 FEET;
THENCE SOUTH 16°35'43" WEST A DISTANCE OF 67.60 FEET TO THE BEGINNING OF A CURVE TO THE LEFT HAVING A RADIUS OF 170.00 FEET;
THENCE ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 72°37'45" AN ARC DISTANCE OF 215.50 FEET ALONG THE NORTH MARGIN OF WEST GALER STREET;
THENCE NORTH 89°48'38" WEST ALONG THE NORTH MARGIN OF WEST GALER STREET, A DISTANCE OF 31.09 FEET TO THE WEST MARGIN OF 16TH AVENUE WEST;
THENCE SOUTH 00°11'22" WEST ALONG SAID WEST MARGIN AND SAID MARGIN PROJECTED, A DISTANCE OF 1823.90 FEET TO THE INNER HARBOR LINE;
THENCE NORTH 82°19'41" WEST ALONG SAID INNER HARBOR LINE A DISTANCE OF 404.89 FEET;
THENCE SOUTH 00°08'22" EAST A DISTANCE OF 139.32 FEET;
THENCE SOUTH 89°51'38" WEST A DISTANCE OF 310.02 FEET TO A POINT OF INTERSECTION WITH THE EAST LINE OF SMITH'S COVE WATERWAY;
THENCE NORTH 00°08'22" WEST A DISTANCE OF 179.16 FEET TO A POINT OF INTERSECTION WITH THE INNER HARBOR LINE;
THENCE NORTH 82°19'41" WEST ALONG SAID INNER HARBOR LINE A DISTANCE OF 352.39 FEET;
THENCE SOUTH 00°08'22" EAST A DISTANCE OF 253.50 FEET;
THENCE SOUTH 89°51'38" WEST A DISTANCE OF 369.03 FEET;
THENCE NORTH 00°08'22" WEST A DISTANCE OF 303.95 FEET TO A POINT OF INTERSECTION WITH THE INNER HARBOR LINE;
THENCE NORTH 82°19'41" WEST ALONG SAID INNER HARBOR LINE A DISTANCE OF 536.79 FEET TO A POINT ON THE EXTENDED EAST MARGIN OF VACATED 23RD AVENUE WEST;
THENCE NORTH 00°08'22" WEST ALONG SAID EXTENSION OF MARGIN A DISTANCE OF 1521.46 FEET TO THE TOE OF EXISTING RIP-RAP;
THENCE SOUTH 89°00'00" WEST ALONG SAID TOE A DISTANCE OF 212.49 FEET;
THENCE NORTH 00°09'49" WEST A DISTANCE OF 94.40 FEET;
THENCE NORTH 45°10'17" WEST A DISTANCE OF 14.14 FEET;
THENCE NORTH 00°09'49" WEST A DISTANCE OF 262.00 FEET;
THENCE NORTH 33°17'21" WEST A DISTANCE OF 29.28 FEET;
THENCE NORTH 00°09'49" WEST A DISTANCE OF 247.18 FEET;
THENCE NORTH 67°53'22" EAST A DISTANCE OF 31.50 FEET;
THENCE NORTH 89°51'38" EAST A DISTANCE OF 409.89 FEET;
THENCE NORTH 00°08'22" WEST A DISTANCE OF 100.00 FEET;
THENCE SOUTH 89°51'38" WEST A DISTANCE OF 498.70 FEET;

GRANTOR ACKNOWLEDGMENT

STATE OF WASHINGTON

COUNTY OF KING

On this 23rd day of August, 2017, I certify that Lindsay Pulsifer personally appeared before me, acknowledged that **he/she** is the Managing Director, Maritime of the Port of Seattle that executed the within and foregoing instrument, and signed said instrument by free and voluntary act and deed of the Port of Seattle, for the uses and purposes therein mentioned, and on oath stated that **he/she** was authorized to execute said instrument for said corporation.

Notary Public in and for the State of Washington, residing at Renton.
My appointment expires 6/30/19.

THENCE NORTH 00°11'00" WEST A DISTANCE OF 15.49 FEET;
THENCE SOUTH 89°46'23" WEST A DISTANCE OF 386.53 FEET;
THENCE NORTH 03°30'48" EAST A DISTANCE OF 220.93 FEET TO A POINT OF INTERSECTION WITH THE SOUTHEAST LINE OF LOT 29, BLOCK 5, HYDE PARK ADDITION;
THENCE NORTH 36°31'21" EAST ALONG SAID LOT LINE EXTENDED A DISTANCE OF 776.48 FEET;
THENCE NORTH 00°07'22" WEST A DISTANCE OF 101.07 FEET;
THENCE NORTH 85°46'24" EAST A DISTANCE OF 57.67 FEET;
THENCE NORTH 25°00'24" EAST A DISTANCE OF 89.47 FEET;
THENCE NORTH 18°31'09" EAST A DISTANCE OF 59.62 FEET TO A POINT ON THE SOUTH LINE OF LOT 23, BLOCK 194, OF GILMAN'S ADDITION TO THE CITY OF SEATTLE, RECORDED IN VOLUME 5 OF PLATS, PAGE 93, KING COUNTY RECORDS;
THENCE NORTH 10°25'39" EAST A DISTANCE OF 93.56 FEET;
THENCE NORTH 07°33'54" EAST A DISTANCE OF 6.95 FEET TO THE NORTH LINE OF LOT 20, BLOCK 194, OF SAID GILMAN'S ADDITION TO THE CITY OF SEATTLE;
THENCE NORTH 89°52'39" EAST ALONG SAID MARGIN A DISTANCE OF 38.36 FEET TO A POINT OF INTERSECTION WITH THE EAST MARGIN OF 23RD AVENUE WEST;
THENCE NORTH 00°09'21" WEST ALONG SAID MARGIN A DISTANCE OF 1364.90 FEET TO A POINT OF INTERSECTION WITH THE EASTERLY MARGIN OF THORNDYKE AVENUE WEST;
THENCE NORTH 26°51'54" EAST ALONG SAID MARGIN A DISTANCE OF 578.74 FEET TO A POINT OF INTERSECTION WITH THE SOUTH MARGIN OF WEST HALLADAY STREET;
THENCE NORTH 89°52'16" EAST ALONG SAID MARGIN A DISTANCE OF 571.20 FEET;
THENCE NORTH 18°32'58" EAST A DISTANCE OF 15.49 FEET;
THENCE NORTH 89°59'23" EAST A DISTANCE OF 134.64 FEET;
THENCE SOUTH 40°26'13" EAST A DISTANCE OF 133.98 FEET;
THENCE SOUTH 00°08'22" EAST A DISTANCE OF 54.74 FEET;
THENCE SOUTH 51°25'28" EAST A DISTANCE OF 4.29 FEET;
THENCE SOUTH 00°08'22" EAST A DISTANCE OF 1797.05 FEET TO A POINT OF CURVATURE;
THENCE SOUTHEASTERLY ON A CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 41°02'01", A RADIUS OF 1165.78 FEET, WITH AN INITIAL RADIAL BEARING OF NORTH 89°51'38" EAST, AN ARC DISTANCE OF 834.90 FEET;
THENCE SOUTH 41°10'23" EAST A DISTANCE OF 493.85 FEET;
THENCE SOUTH 26°58'51" EAST A DISTANCE OF 112.12 FEET TO THE TRUE POINT OF BEGINNING.

EXCEPT PARCELS A AND B OF BOUNDARY LINE ADJUSTMENT NO. 3016217 AS RECORDED NOVEMBER 5, 2013 AS RECORDING NO. 20131105900005, RECORDS OF KING COUNTY, WASHINGTON.

ALSO EXCEPT THOSE PORTIONS LYING WITHIN THE BOUNDARIES OF PUBLICLY DEDICATED STREET.

Exhibit B

PROPERTY MAP

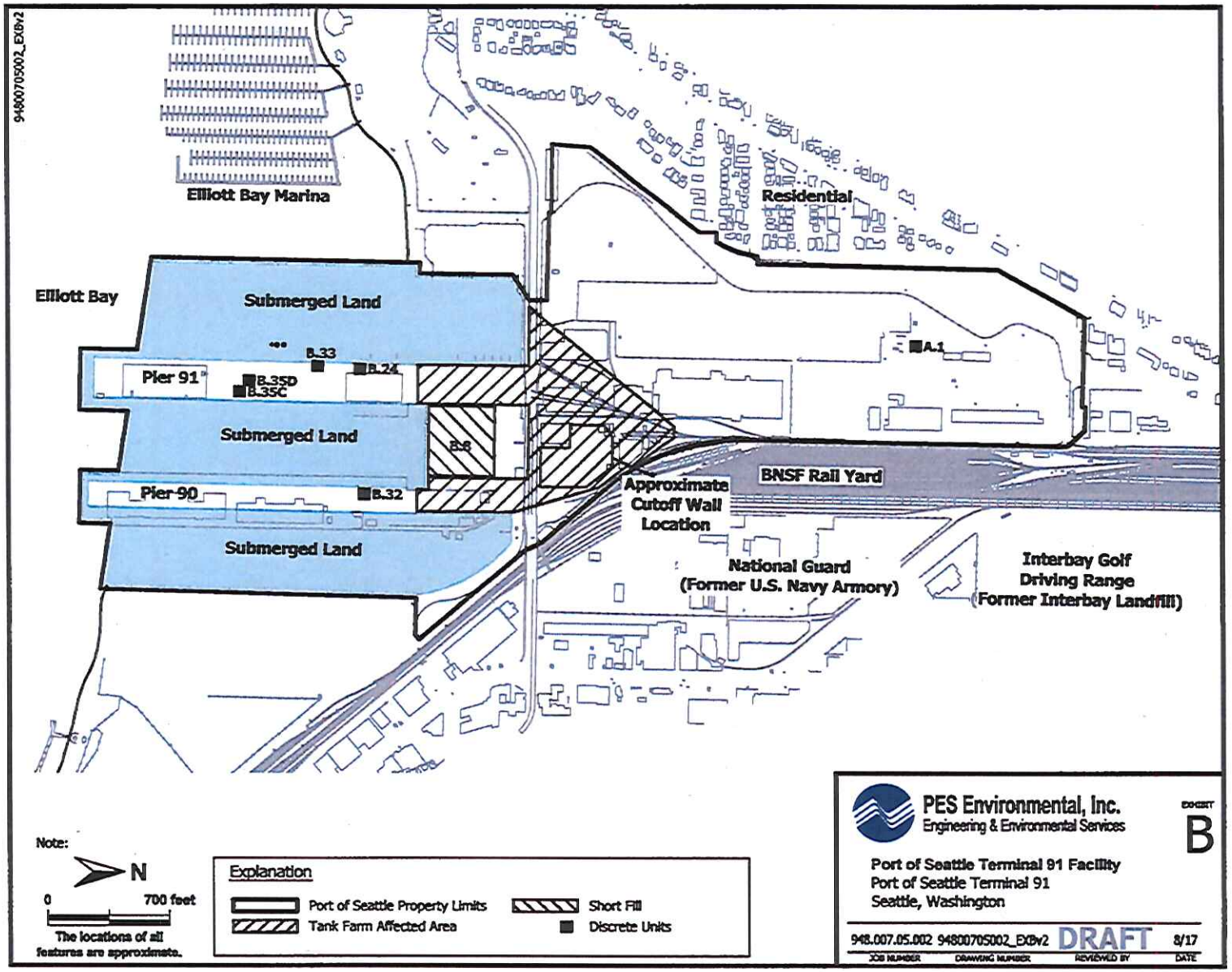
94800705002_EXBv2
Elliott Bay Marina
Residential
Elliott Bay
Submerged Land
B-33
Pier 91
B-35D
B-35C
B-24
A-1
Submerged Land
B-8
Pier 90
B-32
Approximate Cutoff Wall Location
BNSF Rail Yard
Submerged Land
National Guard (Former U.S. Navy Armory)
Interbay Golf Driving Range (Former Interbay Landfill)
Note:
N
0
700 feet
The locations of all features are approximate.
Explanation
Port of Seattle Property Limits
Short Fill
Tank Farm Affected Area
Discrete Units
PES Environmental, Inc.
Engineering & Environmental Services
EXHIBIT
B
Port of Seattle Terminal 91 Facility
Port of Seattle Terminal 91
Seattle, Washington
948.007.05.002
94800705002_EXBv2
DRAFT
8/17
JOB NUMBER
DRAWING NUMBER
REVIEWED BY
DATE

Exhibit C

CERTAIN DISCRETE UNITS

EXHIBIT C TO RESTRICTIVE COVENANT

	SWMU, AOC, or Other Area	Description	Brief Description	Reference Documents
A.1.	AOC 2	USTs and UST Releases on Terminal 91 Premises—Tanks A-G	Cleanup was done as part of a UST decommissioning effort by the Port. Contaminated soil was left in place near underground utilities. Limited localized petroleum-related ground water contamination.	Kennedy/Jenks Consultants. 1997. Terminal 91 Baseline Report, Terminal 91, Seattle, Washington. Prepared for Port of Seattle. April 1997.
B.8	SWMU 40	Short Fill	Contaminated dredge material was placed onsite under a consent agreement between the Port and Ecology.	Kennedy/Jenks Consultants. 1997. Terminal 91 Baseline Report, Terminal 91, Seattle, Washington. Prepared for Port of Seattle. April 1997.
B.24	Other Area (from Baseline Report)	1990 PNO Pipeline Break South of Building T-38, Pier 91	A release of petroleum from a pipeline was cleaned up in 1990 by PNO. About 1.5 cy of petroleum-contaminated soil were left in place due to inaccessibility beneath a valve box, and bacteria were added to the contaminated soil left in place.	Converse Consultants NW. 1990. Site Investigation and Remedial Cleanup Action, Bunker "C" Fuel Oil Line Break, Pacific Northern Oil Pier 91, Seattle, Washington. Prepared for Pacific Northern Oil. 5 November 1990. Kennedy/Jenks Consultants. 1997. Terminal 91 Baseline Report, Terminal 91, Seattle, Washington. Prepared for Port of Seattle. April 1997.
B.32	Other Area (Independent Cleanup)	1999 PNO Pipeline Release on Pier 90	A 1999 release of TPH from a pipeline rupture was cleaned up by PNO/Aspect by excavating petroleum-impacted soil. Small quantities of	PES Environmental, Inc. 2009. Pier 90 Independent Remedial Action Report, Pier 90 Work Plan for Confirmation Sampling,

			petroleum-contaminated soil were left in place next to underground structures. Follow-up ground water investigation by K/J in 2011 found no exceedances of MTCA cleanup levels in ground water.	and Pier 91 Work Plan for Additional Assessment, Terminal 91, Seattle, Washington. Prepared for Port of Seattle. 29 December 2009. Kennedy/Jenks Consultants. 2011. Investigation Summary Report, Piers 90 and 91. Prepared for Port of Seattle. 17 November 2011.
B.33	Other Area (Independent Cleanup)	Pier 91 Pipeline Decommissioning and Historic Pipeline Releases in the Vicinity of the Carnitech Building	A small quantity of petroleum-impacted soil was left in place next to a light standard during cleanup performed during construction for the Carnitech building . Ground water sampling at selected locations along the pier by Aspect in 2012 did not detect TPH in exceedance of MTCA cleanup levels in ground water.	Roth Consulting. 2009. Carnitech Building & Surrounding Area, Independent Remedial Action Report, Terminal 91, Seattle, Washington. Prepared for Port of Seattle. December 2009. Aspect Consulting. 2012. Summary Report for Additional Assessment Activities, Pier 91, Terminal 91--Seattle, Washington. Prepared for Port of Seattle. 22 August 2012.
B.35	Other Area (Independent Cleanup)	Pier 91 Historic Pipeline Releases	Area C--A small quantity of petroleum-impacted soil was left in place next to the fire-suppression line and duct bank and adjacent to a concrete apron. Follow-up ground water investigation showed no exceedances of MTCA cleanup levels in ground water. Area D--Gasoline-impacted soil remains in place at	Kennedy/Jenks Consultants. 2011. Investigation Summary Report, Piers 90 and 91. Prepared for Port of Seattle. 17 November 2011. Landau Associates. 2013. Closure Report, Area D of Discrete Unit B.35, Terminal 91 Site, Seattle,

			Area D. Four consecutive quarters of ground water sampling showed no exceedances of MTCA cleanup levels in ground water.	Washington. Prepared for Port of Seattle. 9 July 2013.

Additional references:

Roth Consulting. 2004. Letter to Department of Ecology re Request for Letter Confirming No Further Action Required, Certain SWMUs, AOCs, and Other Areas, Port of Seattle Terminal 91 Independent Cleanup, Voluntary Cleanup Application Dated March 10, 1999. Prepared for Port of Seattle. 26 May 2004.

Washington Department of Ecology. 2005. Letter to Port of Seattle re Certain SWMUs, AOCs, and Other Areas at the Port of Seattle's Terminal 91 Facility (listed under the March 10, 1999 Voluntary Cleanup Program Application as *Terminal 91 Uplands*). 20 April 2005.

Roth Consulting. 2010. Letter to Department of Ecology re Request for Opinion on T91 Upland Independent Cleanup Areas, Discrete Units B.18, B.22, B.28, B.29, B.30, B.31, B.33, and B.34 from Exhibit C to Draft Agreed Order, Port of Seattle Terminal 91 Site. Prepared for Port of Seattle. 20 May 2010.

Washington Department of Ecology. 2011. Letter to Port of Seattle re Request for Opinion on Some of the Port of Seattle Terminal 91 Discrete Units Identified in Exhibit C of Agreed Order No. DE 7321.