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2014 Construction Completion Report
Cornet Bay Marina Remediation
Cornet Bay, Whidbey Island, Washington

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Prepared for

Washington State Department of Ecology
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List of Acronyms and Abbreviations

ALS	ALS Environmental
ARAR	applicable, relevant, and appropriate requirement
AST	aboveground storage tank
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	Cleanup Action Plan
CCR	Construction Completion Report
CEMEX	CEMEX USA
CMP	Compliance Monitoring Plan
CNW	Concrete Nor'West
COC	chemical of concern
Corps	U.S. Army Corps of Engineers
CSGP	Construction Stormwater General Permit
CSTC	crushed surfacing top course
CUL	cleanup level
cy	cubic yard
DMR	Discharge Monitoring Report
DRO	diesel-range organics
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
ft/ft	feet per foot
ft-lb	foot-pound
GAC	granulated activated carbon
GeoTest	GeoTest Services, Inc.
Glacier	Glacier Environmental Services, Inc.
gpm	gallon per minute
Grette	Grette Associates
GRO	gasoline-range organics
GRI	Geotechnical Resources Inc.
HASP	Health and Safety Plan
HRA	HRA, Inc.
IBC	International Building Code
JARPA	Joint Aquatic Resources Permit Application
JHA	job hazard analysis
JSB	job safety briefing
L&I	Washington Department of Labor and Industries
lb/cf	pounds per cubic foot
LDPE	low density polyethylene piping
MDP	main distribution panel
mg/kg	milligrams per kilogram
MSE	mechanically stabilized earth
MTCA	Model Toxics Control Act
µg/L	micrograms per liter
Nautilus	Nautilus Construction
NEC	National Electric Code

NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWP	Nationwide Permit
NWTPH-DRO	Northwest Total Petroleum Hydrocarbons as Diesel Range Organics
NWTPH-GRO	Northwest Total Petroleum Hydrocarbons as Gasoline Range Organics
ORC	Oxygen Release Compound
PID	photoionization detector
PSE	Pacific Surveying & Engineering
psi	per square inch
PVC	polyvinyl chloride
RFI	request for information
RI/FS	remedial investigation/feasibility study
S&H	Sitts and Hill Structural Engineers
SAP	Sampling and Analysis Plan
SPX	clean stockpile designation
SQUIRT	Screening Quick Reference Tables (NOAA)
SWPPP	Stormwater Pollution Prevention Plan
UST	underground storage tank
VI	vapor intrusion
VOC	volatile organic compound
WAC	Washington Administrative Code
Whatcom	Whatcom House Movers, Inc.
WSPX	waste stockpile designation

Section 1: Introduction

This *Construction Completion Report* (CCR) has been prepared on behalf of the Washington State Department of Ecology (Ecology) and summarizes work completed in 2013 and 2014 at the Cornet Bay Marina (AKA Deception Pass Marina) Remediation Project at Cornet Bay, Island County, Whidbey Island, Washington. This project was undertaken pursuant to Ecology's Model Toxics Control Act (MTCA) to remove petroleum-contaminated soils from the Deception Pass Marina property (site) located at 200 Cornet Bay Road and to mitigate impacts to adjacent wetlands and waterways.

The remedial activities described herein were performed in general accordance with the *Engineering Design Report* (EDR) dated 25 September 2013 (Kennedy/Jenks Consultants 2013a) and the Project Manual dated 22 October 2013 prepared jointly by Ecology and Kennedy/Jenks Consultants. The Project Manual contains construction issue specifications and plans (Project Documents) for construction.

Through a competitive bidding process under a public works contract, Ecology designated Glacier Environmental Services, Inc. (Glacier) as the responsive low bidder. Glacier received Notice to Proceed on 2 December 2014.

This CCR describes remedial actions performed, including contractor means and methods; confirmation soil sampling; and obstacles encountered and changes to construction issue Project Documents. Record Drawings, photographs, and other pertinent field documents are provided in the appendices of this report.

Section 2: Site Description and Background

2.1 Site Description

The Cornet Bay Marina is located at 200 Cornet Bay Road on Whidbey Island, on the southern side of Deception Pass (Figure 1). The site is located at the northern end of Whidbey Island, Island County, in Section 25 of Township 34 North, Range 01 East. The site is bounded on the west by Cornet Bay and on the east by Cornet Bay Road (Figure 2). Deception Pass State Park is north of and adjacent to the site. The tidelands adjacent to the site are privately owned, rather than property of Washington State.

Floating docks for boat moorage and a fuel dock make up the marina located west of the site, which is within Cornet Bay and opening to Deception Pass. Single-family residential homes on large lots lie east of the site, across Cornet Bay Road. A dry (upland) marine service facility belonging to Marine Services is southeast of the site. Mudflats, including a small manmade excavated depression (Sediment Pond), are south of the site on tidelands of Cornet Bay. This sediment pond has been designated as an Estuarine Intertidal Regularly Flooded Emergent wetland and is hydrogeomorphically classified as a saltwater tidal fringe wetland.

The site, which covers approximately 1.1 acres of upland area, includes a flat gravel parking area with a marina store near the western (water) side. An underground fuel tank vault is on the eastern side of the site within a grassy area. A mounded septic leach field is north of the tank vault on the western side. A covered shed area on the southern side of the property was used for waste oil storage and was relocated to the north of the tank vault after excavation was completed.

The site was built on fill material that extended the road grade westward to a wooden piling-and-waler bulkhead wall that extended over the tidelands. A ramp extended from near the center of the bulkhead to the floating marina docks, including a fuel dock close to shore. A second ramp extended from the covered shed on the southern end of the property to additional floating docks.

The topography to the east rises on a slope of about 2 feet per foot (ft/ft) on average, with the slope increasing eastward. The site is at the base of a hillside area that includes residential and other buildings to the east.

In general, no surface water bodies other than Cornet Bay are present onsite. On the northern side of the property, a small drainage pipe intermittently contains surface water and appears to convey surface water runoff from the eastern side of Cornet Bay Road. The drainage pipe discharges directly to Cornet Bay at approximately the high-water mark.

2.2 Site History and Previous Investigations

The Cornet Bay Marina and associated facilities, including a wooden bulkhead that measured approximately 330 feet long and separated the upland facilities (general store and parking areas) from the marina, were constructed in the 1960s. The wooden bulkhead wall was removed as part of this remedial action.

In 1964, four underground storage tanks (USTs) with a total capacity of 18,000 gallons of gasoline and 3,000 gallons of diesel were installed at the site. In January 1989, a release from ruptured underground fuel lines contaminated soil and groundwater behind the bulkhead. A hydrocarbon sheen extending from the bulkhead was observed on the surface of Cornet Bay.

The USTs and piping were emptied in April 1989. According to available documentation, the USTs were located in the same area as the current underground tank vault system [an aboveground storage tank (AST) contained in a belowground vault], and the piping ran in approximately the same location as the current piping, directly from the vault to the bulkhead.

A limited soil investigation conducted by Roxbury Construction (Nelson 1990) indicated that ruptured underground fuel lines had caused the petroleum release. The four USTs were removed in March 1990 by Technical Services, Inc., under contract to Welch Enterprises. Soil from the tank excavation was reportedly placed back into the excavation. The tank removal activities are summarized in a report by Welch (1990).

In 1990, petroleum-contaminated soil and free product were observed when the current underground tank vault system was installed within a portion of the former UST excavation. An unknown volume of petroleum-contaminated water from the excavation was pumped into a drainage ditch along Cornet Bay Road (Ecology 1990). Approximately 10,000 gallons of petroleum-contaminated groundwater was reportedly pumped out of the excavation and disposed offsite (Nelson 1990). In addition, an unknown volume of petroleum-contaminated soil was removed from the excavation and disposed offsite.

Test pits were excavated at four widely spaced locations onsite, and soil and groundwater samples were collected for analysis. Elevated concentrations of gasoline-range organics (GRO), diesel-range organics (DRO), and benzene, toluene ethylbenzene, and xylene (BTEX) constituents were detected at the locations sampled (Welch 1990).

After confirmation of the release, Ecology and the Cornet Bay Marina site owner/operator entered into a Consent Decree, in accordance with MTCA requirements, to assess the extent and degree of gasoline and diesel impacts onsite (Ecology 1993). The scope of work outlined in the Consent Decree included completion of a remedial investigation/feasibility study (RI/FS) as directed by Ecology. Since the Consent Decree, which was signed in 1993, Ecology has conducted a series of investigations to assess the distribution of petroleum contaminated site media.

A draft FS report was prepared for the site in June 2008 by EA Engineering, Science, and Technology, Inc. (EA 2008). In 2005, Ecology performed sampling in the near-shore sediments adjacent to the wood bulkhead; however, sampling results indicated that the sediment had not been adversely impacted by the upland petroleum release. In August 2011, Ecology authorized Kennedy/Jenks Consultants to prepare a RI/FS Work Plan (Work Plan) to collect supplemental information regarding the distribution of contaminated soil and groundwater, assess the potential for vapor intrusion (VI) at the onsite building, evaluate overall site conditions, perform an FS, and select a cleanup action for the site (Kennedy/Jenks Consultants 2011). The Work Plan was implemented from September through November 2011. The final Remedial Investigation/Feasibility Study Report submitted in July 2013 (Kennedy/Jenks Consultants 2013b) provides a complete description of the site history, environmental investigations, and remedial alternatives.

In July 2013, Kennedy/Jenks Consultants prepared a Cleanup Action Plan (CAP) on behalf of Ecology which summarized the final remedial remedy selected for the site (Kennedy/Jenks Consultants 2013c).

In November 2013, Ecology presented the proposed remedial action for the site in a public comment period. There were no substantial comments raised during public comment period.

Section 3: Remedial Activities

3.1 Overview

Glacier's mobilization for the remedial action started on 16 December 2013 following notice to proceed from Ecology. Based on the Project Manual, the initial contract duration set the "Substantial Completion" date as 8 May 2014. Through a series of Change Orders by Ecology, the construction duration was increased to accommodate project activities and Glacier received notice of Final Completion as 1 August 2014 in a letter dated 19 August 2014 from Ecology.

The following primary activities were completed as part of the remedial actions:

- Gain access to the adjacent State Park property.
- Acquire permits needed to perform the construction activities.
- Perform mobilization related activities including preparing necessary plans, mobilizing necessary equipment, establishing onsite temporary facilities, providing temporary dock access and related activities.
- Relocation of the onsite buildings and aboveground facilities to be retained.
- Demolition of onsite facilities and improvements that may impede soil removal.
- Installation of a new sheet pile wall to replace wooden bulkhead wall that required removal as part of the soil removal activities.
- Removal and offsite transportation, disposal of petroleum-contaminated soils.
- Backfilling and compaction of excavations with clean materials.
- Restoring demolished site improvements including underground utilities, the septic system, and disturbed portions of the onsite fueling system.
- Wetland habitat improvements.
- Installation of a new concrete walk-way and bulkhead guardrail system.

The following sections summarize the substantial activities completed during performance of the remedial actions.

3.2 State Park Property Access

Prior to initial construction activities, Ecology coordinated with the Deception Pass State Park (Property Management Program) to gain access to State Park properties located adjacent to the northeastern end of the site, as well as additional nearby properties. Access to the State Park

was needed to facilitate construction activities and support facilities (such as the construction trailers, storage of the store building, onsite mobile laboratory, and other construction-related activities). The original duration of this access agreement was 6 months, beginning on 6 November 2013 and ending at midnight on 6 May 2014. Ecology and the State Park agreed to extend the agreement until construction was complete and no further access was required.

During construction, any items removed from the State Park property, such as the park sign, picnic tables, barbecues, and rope from the rope fence, were taken to the State Park offices north of the site. The State Park had creosote-soaked fence posts which were removed during the contractor's temporary use of the land and were disposed of in accordance with State Park instructions. Following construction completion, all temporary facilities were removed and the State Park was returned to a condition accepted by State Park management personnel.

3.3 Permitting

Cornet Bay remedial construction required multiple federal, state, and local permits. Electronic copies of permits and completed inspections are included in Appendix A (on CD).

3.3.1 Federal and State Permitting

A State of Washington National Pollutant Discharge Elimination System (NPDES) permit, a Construction Stormwater General Permit (CSGP) and a U.S. Army Corps of Engineers (Corps) Nationwide Permit (NWP) 38 were required for this project.

The NPDES permit program in Washington State is administered by Ecology. Ecology's Water Quality Program issued a CSGP for the project (No. WAR301251) in a letter dated 20 September 2013 to Ecology's Toxics Cleanup Program. Subsequently, Ecology transferred this permit to Glacier in a letter dated 11 December 2013, who was responsible for completing the required testing and submitting monthly Discharge Monitoring Reports (DMRs) electronically using Ecology's online system, WQWWebDMR.

Required testing under the permit included turbidity testing of waters adjacent to construction and testing treated construction water discharged to the Bay for petroleum contaminants. Glacier performed the required testing throughout the construction period (December 2013 through June 2014)) and submitted the results to Ecology. Glacier did not report any exceedances of the permit during the project. Glacier's monitoring reports are included in Appendix B (on the attached CD). Ecology provided permit closure in the letter *RE: Notice of Termination of Coverage under the Stormwater General Permit for Construction Activity* dated 6 August 2014.

The NWP 38 Permit – *Cleanup of Hazardous and Toxic Waste* (Federal Register 21 February 2012, Vol. 77, No. 34) was issued to Ecology in a letter dated 19 September 2013. The NWP 38 combined requirements of numerous regulatory agencies into a single combined permit in order to streamline the environmental permitting process associated with in-water work. In-water work was defined as all work below the ordinary high water mark of Cornet Bay. Ecology secured this permit after submitting a Joint Aquatic Resources Permit Application (JARPA) to the Corps.

NWP 38 authorized in-water activities from 16 July through 15 February for every year until permit expiration on 18 March 2017. The permit includes requirements for wetland mitigation and archeological monitoring. Ecology completed the *Certificate of Compliance* on 11 August 2014 stating the authorized work had been completed in accordance with the NWP authorization and that required compensatory mitigation (wetland mitigation and archeological monitoring) had been implemented in accordance with the permit conditions.

The Washington Department of Labor and Industries (L&I) issued three electrical permits to Glacier's electrical subcontractor, S&M Electric, for the project:

- Temporary Service – Connecting electrical generators to the jobsite trailers.
- Altered Service – Disconnecting service for site cleanup.
- New Service – Installing a new main distribution panel and building electrical upgrades.

L&I conducted inspections of construction process while the site was being restored and the building was being replaced. During inspection of the building, L&I notified Glacier that the building electrical had to be updated to current International Building Code (IBC) and National Electric Code (NEC) standards. Upgrades included internal rewiring of a portion of the building and replacement of two of three breaker panels. During temporary disconnection of the existing main distribution panel located at the main dock access, Puget Sound Energy verbally notified Glacier a new meter base would be required. Electrical permits and inspections summaries are included in Appendix A.

3.3.2 Local Permitting

Island County Department of Planning and Community Development required four permits:

1. Building Permit – Temporary Relocation of Building and Return to Site on New Foundation
2. Building Permit – Sheet Pile Bulkhead
3. Building Permit – Demolish and Replace Fuel Lines and Vent System
4. Flood Development Permit.

Island County's inspections for building permits included the marina store building structural modifications, marina store plumbing construction, area final grading, bulkhead steel sheet pile wall construction and backfill compaction, bulkhead guardrail construction, and fuel system piping construction.

Parts of the marina store were removed or modified during temporary relocation to allow for H-beams to carry the building and additional temporary support system inside. Intermediate inspections by Island County determined removed and modified portions requiring replacement must comply with current IBC standards. This requirement necessitated replacement of the inside 3/8-inch plywood paneling with ½-inch sheet rock.

Island County also required insulation around the perimeter of the building foundation and modification of dock access guard rails to current IBC standards. Island County permits and inspections are included in Appendix A.

3.4 Selecting and Sampling of Backfill Materials

Glacier's subcontractor - Concrete Nor'West (CNW), provided all backfill material from its Boulder Hill Pit quarry located at 229 East Henni Road in Oak Harbor, Washington. The Project Manual required all imported backfill materials to be free of organic and inorganic contaminants. Glacier provided analytical analysis results for their Boulder Pit quarry materials (refer to Appendix C).

3.5 Health and Safety

Kennedy/Jenks Consultants and Glacier prepared separate health and safety plans (HASPs) specific to Cornet Bay Marina project (Kennedy/Jenks Consultants 2013d). The HASPs identified key personnel, site descriptions, and planned activities; assessed physical and chemical hazards associated with common construction practices and with work specific to the Cornet Bay marina remediation; and assessed potential community hazards. The HASPs stipulated appropriate protective actions and emergency response plans.

During field activities, Glacier held daily job safety briefings (JSBs) to discuss planned activities for the day. JSBs were attended by Glacier employees, Kennedy/Jenks Consultants, and subcontractors. Detailed job hazard analyses (JHAs) were conducted for specific work and work groups, changing work conditions, and new site visitors/workers. Kennedy/Jenks Consultants performed additional daily JSBs and JHAs for Kennedy/Jenks Consultants' employees and subcontractors. No injuries were reported on the jobsite.

3.6 Mobilization and Area Preparation

3.6.1 Site Security

Glacier provided plans for site security, temporary facilities, and erosion control in their Plan of Operations required in the Project Documents. This plan is included in Appendix D (on the attached CD). Glacier installed a temporary chain-link fence and construction signs around the jobsite, as shown on construction issue drawings. Glacier maintained site security and occasionally redirected marina patrons or other parties to safe locations. Glacier also provided temporary traffic control for the public street (Cornet Bay Road) when required for larger trucks entering and leaving the site. No security incidents were reported.

3.6.2 Owner Property Relocation

Prior to moving the onsite building, the property owner performed an inventory of materials inside the store to be temporarily stored. Glacier packaged all remaining materials in the store and relocated these materials and the refrigeration units to an offsite storage facility in Oak Harbor, Washington.

During the course of store material relocation, certain decisions were discussed directly between Glacier and the property owner regarding methods for handling certain items. Available documentation of these discussions and agreements are provided in the Project Documents included in Appendix E.

3.6.3 Temporary Dock Access

To facilitate installation of the new sheet pile, portions of the existing access docks were removed. A temporary dock access platform was constructed for access to the small dock (E-dock) located on the southwestern corner of the property. Also, Glacier obtained a floating dock from Deception Pass State Park for temporary use. The floating dock connected the small dock to the main dock using the western side gangway to provide complete access to the marina area throughout the construction period.

3.6.4 Construction Sediment and Erosion Control

Glacier provided a Stormwater Pollution Prevention Plan (SWPPP) as required by the Project Documents (refer to Appendix D). Prior to construction activities, Glacier installed and maintained a silt fence, silt boom, oil boom, and silt check dams in accordance with the Project Documents. An existing stormwater runoff channel along the roadside leading to a catch basin and culvert on the eastern end of the site was identified. Silt check dams were placed around the catch basin, and silt and oil booms were placed to intercept water from the culvert discharge to the Bay. The silt boom was placed as the first line of defense, and the oil boom was the second line. Oil and silt booms were placed from east of the culvert discharge to the wetland on the western end. Oil and silt booms were installed between the existing bulkhead wall and main dock. An additional oil and silt boom was placed across the outlet of the semi-enclosed wetland area. Surface waters were monitored in accordance with the CSGP. In general, minor silt run-off and oil sheens were observed during steel bulkhead installation and successfully contained by the oil and silt boom. Photographs of excavation areas and other construction are included in Appendix F.

3.6.5 Utilities

Glacier performed several utility locates using both public and private location services throughout the construction process to prevent unintentional disruption of underground utilities. All utilities to the marina store were temporarily disconnected or replaced, including electrical power, communication, water, sewer, and gas utilities. Electrical power service was maintained to the marina docks with the exception of two scheduled shut downs lasting approximately 3 days each. Water service was disconnected from the marina docks and unavailable for most of the construction until replacement. Only one reported utility incident occurred, when a buried phone cable serving a Deception Pass State Park house on Ben Ure Island north of the marina was severed. A State Park employee and technician with Frontier Communications notified Kennedy/Jenks Consultants on 22 January 2014. Glacier located the severed line, and the Frontier Communications technician repaired the cable the following day.

3.7 Marina Store Temporary Relocation

Glacier provided a Building Relocation Plan in accordance with the Project Documents (refer to Appendix D). The building was temporarily relocated on 31 December 2014 and replaced in its original location on 14 April 2014.

Pacific Surveying & Engineering (PSE) surveyed the building corners and utility locations before it was moved for temporary storage to ensure accurate replacement. Nautilus Construction (Nautilus) installed internal wood bracing. Whatcom House Movers, Inc. (Whatcom) installed two steel H-beams running through the length of the building and one steel H-beam running through the width of the building. The building was lifted by hydraulic jacks and the extending H-beams placed on dollies. The building was placed on the State Park property for temporary storage during the soil removal activities and then returned to its original location following completion of soil removal activities. The original building floor and foundation consisted of imitation tile on plywood and wood beams resting on concrete cinder blocks. A small portion of the flooring in the office space tested positive for asbestos and was removed and disposed of by certified asbestos removal contractors Therma-tec from Tacoma, Washington.

3.8 Steel Bulkhead Wall Installation

The steel bulkhead wall was installed between 6 January 2014 and 30 January 2014. Glacier provided a Bulkhead Construction Plan (see Appendix D) in accordance with the Project Document requirements. The horizontal length of the sheet pile wall was approximately 360 feet and consisted of 74 pairs of AZ38-700N (50-foot lengths) and six pairs of AZ26-700N (35-foot lengths). AZ38-700N sheets are thicker than specified by the Project Documents and the structural engineer. As a result of the increased strength, the geotechnical, structural, and civil engineers determined that the mechanically stabilized earth (MSE) wall included as part of the original design would not be required. See Appendix G, Requests for Information (RFIs), and refer to RFI number 5 – MSE Wall Elimination for additional information.

Dawson Pile Driving, Inc., of Lake Stevens, Washington began installing AZ38 sheet pile on the southwestern side of the project site using an APE Model 150 vibratory driver with an APE Model 375 power unit. Kennedy/Jenks Consultants observed the steel bulkhead wall installation and noted the following items during construction:

- Sheet pile size, length, and material.
- Sheet pile drive sequence and location driven.
- Vibratory or hammer drive rate.
- Sheet pile final driven plumb lines – tilt and lean.
- Sheet pile final driven location – average distance from wood bulkhead wall.
- Sheet pile final driven base and top elevations.

Drive rates in feet per minute down to inches per minute were occasionally noted on daily reports. Vibratory drive rates were greater than 1 inch per minute to the specified tip elevation for the following sheet piles:

- Sheet Piles #1 – 49 driven to (-) 33 feet elevation min.
- Sheet Piles #51 – 55 driven to (-) 33 feet elevation min.
- Sheet Piles #75 – 80 driven to (-) 18 feet elevation min.

The remaining sheet piles encountered different soil conditions or obstructions than were encountered during the initial sheet piles resulting in increased resistance. Consequently, these piles were driven using a Delmag diesel piston drive hammer Model D19-42 on setting 1, approximately 19,000 foot-pounds (ft-lb) driving energy based on blows per inch measured. Due to the increased penetration resistance, these sheet piles were driven to practical refusal and began deforming before reaching the specified tip elevation of -33 feet. To maintain the design strength of the sheet pile wall, the project structural engineer, Sitts and Hill Engineers, Inc. (S&H), provided calculations for the reduced drive lengths and requirements for inside bracing to provide additional support of the northeastern corner of the steel bulkhead wall that could not be driven to the specified -33 feet elevation. The inside corner bracing consisted of 12- by 12-inch tube steel struts welded to the steel sheet pile and walers.

During construction, it was determined the new bulkhead length needed to be extended approximately 25 feet to protect the eastern end during high tides. Sheet piles 75 through 80 consisted of AZ26-700N and were driven to -18 feet tip elevation per S&H requirements.

The sheet piles were measured for tilt and lean (left/right and in/out). Sheet piles were in compliance with 1-inch in 48-inch tolerance requirements of the Project Documents for vertical plumbness. After installation, remaining sheet pile lengths were cut off to 13.5 feet top elevation as measured by Glacier using a laser level and surveyed elevation markers by PSE. Following cutting of the sheet piles to the design length, it was apparent the horizontal pile alignment was outside the allowable tolerance of 3 inches by as much as 8 inches in some locations. As a result, Glacier implemented minor modifications to the walkway design as described in Section 3.15 to meet the original intent of the plans (straight runs on the northern and southern legs of the sheet pile wall).

3.9 Groundwater Dewatering System

In accordance with the Project Documents, Glacier prepared the Dewatering Water Treatment Plan (refer to Appendix D). Water infiltration to excavations was managed by installing a series of 2-inch-diameter slotted polyvinyl chloride (PVC) dewatering wells in pea gravel filter pack across the northern and southern sides of the site. Slead Construction, Inc., of Tacoma, Washington drilled and developed 13 wells on the western side of the site and 12 wells on the eastern side. Wells were installed from approximately 7-foot to 13-foot depths and spaced approximately 10 to 15 feet apart.

Glacier installed 4-inch schedule 40 PVC conveyance header piping connecting the western and eastern segments of the dewater system. The 4-inch header pipe was installed east of the fuel tank vault (parallel to Cornet Bay Road) and buried approximately 2 feet across the

entrance and exit points to the site. A trench was excavated to install header pipe connecting the northern well segment and was covered with 1-inch-thick steel plates to allow access to the jobsite trailers and water treatment system.

Clear Creek Systems, Inc., of Kent, Washington, provided the water treatment equipment for extracted groundwater. The water treatment system was operated by trained Glacier employees. The 100 gallon-per-minute (gpm) chemical treatment system consisted of the following major primary components:

- One 18,000-gallon open-top weir-style settling tank provided the necessary 1-hour hydraulic retention time and the under/over weir design to provide oil/water separation and oil boom.
- One 18,000-gallon settling tank provided operational surge capacity for peak flows, routine maintenance shutdowns and filtration media backwashing.
- One 5-horsepower centrifugal filtration system pump transferred settled water from the surge tank, through the sand filtration system, through the granulated activated carbon (GAC) vessels, and to the discharge location.
- One 100 gpm range industrial sand media filter.
- One Monitoring Module (included polymer storage/delivery, water quality instrumentation, flow measurements and programmable logic controller).
- Two 72-cubic-foot adsorptive media vessels plumbed in series. Each vessel provided 5 minutes of empty bed contact time with the GAC media.
- Miscellaneous interconnecting valving, plumbing, and hoses.

Glacier used a portable generator and Godwin Wellpoint pump to vacuum water from the dewatering wells and pump into the open-top weir tank. Glacier used flexible hoses connected to the 4-inch dewatering well header to vacuum water from excavations. Treated water from the treatment system was discharged through a 2-inch PVC pipe extending approximately 150 feet into Cornet Bay along the outer eastern edge of the marina.

Groundwater recharge into the excavations was limited due to the predominantly fine-grained soils encountered. A total of 117,708 gallons of treated water was reported to be discharged to Cornet Bay from the treatment system. Glacier collected samples of treated water prior to discharge for chemical analysis of the follow parameters in accordance with the Administrative Order (No. 10404):

- Gasoline Range Hydrocarbons (gasoline), by NWTPH-Gx.
- Diesel and Heavy Oil Range Hydrocarbons (diesel), by NWTPH-DX.
- BTEX by EPA Method 8260B.

- Turbidity by method SM 2130.
- pH (using a calibrated ph meter).

Glacier submitted monthly DMRs using Ecology's electronic online system WQWebDMR in accordance with the Administrative Order. Sample analyses were performed by ALS Environmental (ALS) and all results for gasoline, diesel, and BTEX were below detectable levels. Other parameters were within acceptable ranges identified in the Administrative Order. Treatment system data logs and laboratory results are included in Appendix B (included on CD).

3.10 Excavation and Backfill

Excavation of petroleum contaminated soil began on 27 January 2014 and was completed on 27 March 2014. Glacier provided an excavation plan in the Plan of Operations. Glacier excavated contaminated soils in seven separate areas. Backfilling of each area began after performance soil sampling results indicated that the contaminated soils had been removed. During soil removal, clean overburden was segregated from contaminated materials to the extent practicable. Contaminated soils were segregated into piles for Class 2 or Class 3 material to the extent practicable. Figures 3 and 4 show the approximate location of the excavation areas.

Excavation activities began with the onsite wetland, Area 1, and proceeded to the north/east. Sections of soil were left in place along the wetland and bulkhead wall (Areas 2 and 5) to reduce tidally influenced water from infiltrating into excavations. These sections were removed last, after most of the adjacent excavated area had been backfilled.

Clean overburden was first removed from each area and stockpiled. In accordance with the Project Manual, overburden excavations were to be surveyed to determine quantities of in-place volume of clean overburden for payment prior to excavating contaminated soils. Due to the site constraints, the approach identified in the Project Manual for estimating clean overburden amounts was modified. As an alternative, clean reusable overburden stockpiles were surveyed to identify the volume. Glacier proposed the revision to the schedule of values in an email to Ecology dated 17 February 2014 and discussed that eliminating survey between clean and contaminated soils allowed for smaller excavation areas and likely increased the ability to survey Class 2 soils. Ecology responded to this email on 21 February 2014, accepting survey of both clean overburden and clean non-reusable overburden stockpiles. Survey data for clean reusable overburden stockpiles is included in Appendix H. Excavation areas were subsequently excavated to the required depth as determined by field monitoring using a photoionization detector (PID) and performance sampling using an onsite laboratory for analysis of soil samples. Kennedy/Jenks Consultants provided field monitoring of excavated soil to segregate clean and contaminated soils and performed performance soil sampling.

Excavation depths generally followed estimated excavation limits shown on construction issue drawings, with greater excavation depths occurring in Area 2 and Area 7. Excavation depths were surveyed to determine the quantity of contaminated soils removed and record the excavation depths. Surveys of excavated areas and estimated in-place volumes of soil removed are included in Appendix H. HRA, Inc. (HRA) of Seattle, Washington provided archeological monitoring during excavation activities as required by NWP-38 permit. During HRA's monitoring

activities, no archeologically significant artifacts were identified. HRA's monitoring activities are summarized in the *Archaeological Monitoring Report for the Cornet Bay Marina Remediation Project* dated August 2014 included in Appendix I.

PSE surveyed existing elevations and grade at the site prior to excavation and surveyed each completed excavation area in order to determine the volume of soil removed. Table 1 presents the daily totals of exported material. The results of these surveys indicated an estimated composite excavation volume of 14,024 cubic yards (cy), which includes clean overburden and petroleum-contaminated soils. Final reported quantities of soil removed are as follows:

- Total Clean Overburden – 3,180 cy.
    - Clean Overburden Reusable – 144 cy.
    - Clean Overburden Non-Reusable – 3,036 cy.
- Petroleum-Contaminated Soil – 22,983.76 tons.

As indicated above, CNW provided all imported backfill materials for the project. Table 2 summarizes the imported backfill materials and quantities delivered to the site. Imported backfill and quantities delivered to the site include the following:

- "Pit run" – Subgrade material F of Specifications Section 31 20 00. The subgrade material is slightly larger than the general imported backfill and was placed at the bottom 2 feet of all excavations to provide a more stable foundation. Approximately 6,237 tons were imported.
- "Screened fill" – Imported backfill material C of Specifications Section 31 20 00. Imported backfill was the largest quantity of import used to backfill excavated areas to near-finish-grade elevations. Approximately 22,378 tons were imported.
- "2x4 Quarry Rock" – 4-inch quarry spalls material of Construction Issue Plan Drawings C-2 and C-3. Quarry spall provided for stabilized entrance, exit, and decontamination areas. Glacier also used quarry spalls to stabilize the building during temporary relocation. Approximately 81 tons were imported.
- "1-3/8-inch Washed Rock" – Gravel Backfill material B.2 of Specifications Section 31 20 00. Gravel backfill was used along the bottom 4 feet of excavation immediately adjacent to the bulkhead wall to assist in ground and tidal water drainage. Approximately 296 tons were imported.
- 5/8-inch Crushed Rock – Crushed surfacing top course (CSTC) material A of Specifications Section 31 20 00. CSTC was used as structural fill under the building foundation, other concrete slabs, and final site grading. Approximately 166 tons were imported.

- Utility Sand – Pipe bedding material B.4 of Specifications Section 31 20 00. Pipe bedding was used to protect buried utilities, including fuel piping, water lines, septic lines, and electrical/communication lines. Approximately 33 tons were imported.

Pit run and screenings imported materials were used to backfill each area. Reusable overburden was placed only in Area 1 and part of Area 3. Backfill was generally performed in 8- to 12-inch lifts and compacted. The bottom 2 feet of each excavation was backfilled using the larger pit run. The remaining volumes were backfilled using screenings and completed with 6 inches of 5/8-inch crushed rock. Compaction testing was performed by GeoTest Services, Inc. (GeoTest) of Bellingham, Washington, per requirements of Project Documents. All compaction tests were passed; test reports are included in Appendix J (on the attached CD).

The excavation and backfill process for each area is discussed in further detail in the following sections (refer to Appendix H - Survey for excavation area locations). Discussion of performance sampling activities to determine the extent of excavation areas is provided in Section 4.0.

3.10.1 Area 1

Excavation began on 27 January 2014 to remove clean overburden and contaminated soil associated with the wetland area. Because Area 1 was subject to tidal influence, excavation occurred later in the evening during low tide. Glacier notified nearby residents before beginning work. Excavation occurred up to the dewatering well west wing. PSE surveyed the excavated bottom and sidewalls. The reported total quantity excavated, including both clean overburden and contaminated soil, was 271 cy. Clean, reusable overburden was stockpiled and surveyed at 81 cy. The Area 1 stockpile survey is included in Appendix H.

Clean, screened imported material was used to backfill a portion of the wetland area. Imported backfill was used from the bottom to approximately 4 to 6 feet below the existing site grade. The wetland surface grade slopes away from the main site. Backfill was completed using clean reusable overburden from Area 1. No survey was performed of reused overburden after compaction. Because of the tidal influence, no compaction density testing was performed on Area 1. See Section 3.14, Wetland Enhancement, for additional information concerning Area 1.

3.10.2 Area 2

Excavation of Area 2, which contained the waste storage pad and shed, began on 28 January 2014 and was completed on 7 February 2014. During demolition of the concrete pad associated with the waste oil storage area, appreciable oil-contaminated soil was observed directly under and around the pad. The contaminated soil was removed approximately 2 feet in depth until field monitoring and sampling identified clean soil conditions. Soil was left in place along the wooden bulkhead wall to impede surface water infiltration from Cornet Bay. This soil was later removed near the end of the excavation process and added to the excavation survey volume. The reported total quantity, including both clean overburden and contaminated soil, excavated from Area 2 was 4,206 cy. The clean overburden excavation was surveyed to determine its in-place volume, which was reported as 1,377 cy.

Glacier removed soil along the bulkhead wall on 20 February 2014 and prepared to remove the wooden bulkhead wall. Soil was removed to an approximate depth of +2 feet elevation. Drain rock was placed approximately 18 inches in width and 4 feet in height to assist in free drainage of groundwater through the bulkhead wall to reduce hydrostatic pressures.

3.10.3 Area 3

Excavation of Area 3 began on 7 February 2014 to remove clean overburden and contaminated soil between the western side of the wooden bulkhead wall and the dewatering well west wing. Excavation of Area 3 was temporarily halted to allow for staging, and excavation was continued on Area 4 instead. After backfilling of Area 4, excavation of Area 3 resumed on 17 February 2014 and completed on 19 February 2014.

Soil was left in place along the west wing of the dewatering wells to impede surface water infiltration from Cornet Bay. This soil was later removed near the end of the excavation process and the amount added to the excavation survey. The reported total quantity excavated from Area 3, including both clean overburden and contaminated soil, was 1,088 cy. Clean overburden excavation was not surveyed to determine in-place volume. Clean, reusable overburden was stockpiled and surveyed resulting in a calculated volume of 63 cy. Clean, non-reusable overburden was stockpiled with clean, non-reusable overburden from the Area 4 excavation. The combined overburden stockpile survey volume is estimated at 210.1 cy.

Pit run and screened imported materials and clean, reusable overburden from Area 3 were used to backfill Area 3. No survey was performed of backfill and compaction of clean, reusable overburden.

3.10.4 Area 4

Excavation of Area 4 began on 11 February 2014 to remove clean overburden and contaminated soil along the western bulkhead wall and Cornet Bay Road. Area 4 excavation was completed on 14 February 2014. An additional section of contaminated soil was later removed adjacent to the roadway. The reported total quantity of excavated, including both clean overburden and contaminated soil was 1,882 cy. Clean, non-reusable overburden was stockpiled with overburden from Area 3 and surveyed; resulting in a calculated volume of 210.1 cy.

3.10.5 Area 5

Excavation of Area 5 began on 24 February 2014 and was completed on 20 March 2014. Glacier removed soil along the bulkhead wall on 20 March 2014 followed by removal of the wooden bulkhead wall. Soil was removed to an approximate depth of +2 feet elevation. Drain rock was placed approximately 18 inches in width and 4 feet in height to assist in free drainage of groundwater through the bulkhead wall to reduce hydrostatic pressures. The reported total quantity excavated, clean overburden and contaminated soil, was 3,887 cy. Additional soil was later removed along the bulkhead wall. Clean, non-reusable overburden was stockpiled and surveyed; resulting in a calculated volume of 1,032.7 cy.

3.10.6 Area 6

Excavation of Area 6 began on 7 March 2014 and was completed on 12 March 2014. This excavation was adjacent to the septic drain field and eastern end of the fuel tank vault. The reported total quantity excavated, clean overburden and contaminated soil, was 1,667 cy. No clean, non-reusable overburden was recovered from Area 6.

3.10.7 Area 7

Excavation of Area 7 began on 12 March 2014 and was completed on 17 March 2014. The reported total quantity excavated, clean overburden and contaminated soil, was 1,312 cy. No clean, non-reusable overburden was recovered from Area 7.

Following removal of contaminated soil adjacent to the underground concrete vault (located on the eastern side of Area 7), a small amount of petroleum-contaminated soil remained below the vault and was inaccessible without demolishing the vault structure. Because the amount of residual soil was limited and did not represent a threat to site-wide groundwater quality, the contaminated soil was left in place below the vault. To address possible chemicals of concern (COCs) that could possibly leach from the residual hydrocarbon, 275 pounds of powdered Oxygen Release Compound (ORC) was purchased from Regenesis and placed around the western perimeter of the vault structure (adjacent to where contaminated soils remained below the vault).

In addition to the ORC identified above, Kennedy/Jenks Consultants instructed Glacier to install slotted 2-inch schedule 40 PVC piping along the vault footing on the water-facing side. Riser PVC pipe was brought to the surface on either side. This piping was installed to provide a means for possible future application of an oxygen release compound solution or other amendment to address residual petroleum constituents that may remain under the vault.

3.11 Fugitive Dust and Mud Control

To address possible fugitive dust and offsite tracking of soils onto Cornet Bay Road, Glacier created and maintained entrance and exit paths to the site using 2x4-inch quarry spall rock. Glacier occasionally wetted down areas to mitigate dust and used a bobcat with a power take-off brush attachment to remove dust and other construction debris from Cornet Bay Road.

3.12 Soil Stockpiling, Profiling, Disposal, and Transport

Excavated soil consisted of clean, reusable overburden; clean, non-reusable overburden; and contaminated soil. Clean overburden was placed directly on clean backfill, and contaminated soil was placed either on plastic sheeting or directly on contaminated soil not yet excavated. Stockpiles were covered with plastic sheeting and weighted with sandbags to protect against rain or potential exposure.

Excavated soil consisted predominantly of saturated gray silt/clay. In February 2014, Geotechnical Resources, Inc. (GRI) collected samples of excavated silt/clay to analyze the natural moisture content and its suitability as structural fill. The average moisture content was reported between 24 and 26 percent and the dry density as 109 pounds per cubic foot (lb/cf).

GRI provided a compaction-line curve of the excavation spoils which is included in Appendix J. The average wet weight of the silt/clay removed was estimated to average 128 lb/cf to 132 lb/cf. The high moisture content in the fine grained soil made most of the clean overburden unsuitable to be used as backfill. Clean, non-reusable soil was transported by CNW trucks during each import delivery back to the Boulder Pit. Contaminated soil was transported by R-Transport of Arlington, Washington, to CEMEX USA (CEMEX) of Everett, Washington, for appropriate disposal. Glacier lined the beds of the trucks with plastic sheeting for each load of contaminated soil.

Kennedy/Jenks Consultants sampled stockpiled clean overburden and contaminated soil for segregation into Class 2 or Class 3 waste disposal (based on CEMEX's designation criteria). CEMEX's criteria for acceptance of soils are included in Appendix C. According to CEMEX, Class 2 soils had lower concentrations of contaminants and were disposed of at their permitted Class 2 landfill, and Class 3 soils had higher concentrations of contaminants and were treated thermally before disposal. Stockpile samples were analyzed by ALS in Everett, Washington and the onsite mobile laboratory, Libby Environmental, Inc., of Olympia, Washington. Analytical results for disposal are included in Appendix K and tabulated in Table 1 (Stockpile Samples).

According to the truck weight tickets, approximately 1,500 tons of Class 2 material and 21,400 tons of Class 3 material were delivered to CEMEX. Soil adjacent to the wooden bulkhead wall contained creosote and was disposed of as Class 3 soils per CEMEX requirements.

3.13 Wooden Bulkhead Wall Removal and Disposal

The wooden bulkhead wall was removed at excavation depths and included removal of wood deadman anchors and large wire cable. During excavation, it was discovered the bulkhead wall extended from near Cornet Bay Road to the water side wall adjacent to the wetland area (between Excavation Areas 3 and 4 and along Area 2). Wood bulkhead wall and creosote soaked State Park fence posts were disposed of at Republic Services Roosevelt Regional Landfill in Roosevelt, Washington. Approximately 122 tons were disposed.

3.14 Wetland Enhancement

Wetland enhancement consisted of re-grading the excavated and backfilled area, planting shrub species, and securing large woody debris per the 2013 *Cornet Bay Marina Mitigation Plan* (Mitigation Plan) prepared by Grette Associates (Grette 2013). Wetland enhancement work was completed by 20 May 2013. A compliance inspection performed by a Grette biologist on 29 May 2013 indicated the work had been conducted according to the Mitigation Plan, although plants had died due to inundation by salt water. Grette prepared the as-built report, *Cornet Bay Marina Model Toxics Control Act Cleanup Mitigation Plan As-Built Report* dated 25 July 2014 (Grette 2014) documenting conditions and recommending additional actions, including the replacement of plants. Grette As-Built Report is included in Appendix H.

3.15 Concrete Structures

Four concrete pads and two sidewalks were poured following completion of soil removal and backfilling activities. The concrete was 4,000 pounds per square inch (psi) with fiber mesh. GRI performed slump, entrained air, and concrete break strength tests per Project Document requirements. All tests were passed and results are included in Appendix J.

The marina store pad was poured on 9 April 2014. Kennedy/Jenks Consultants inspected the reinforcing steel for compliance with Project Documents. The store sidewalks were poured later. In accordance with the owner's request, no sidewalk was poured on the northern side of the store facing the State Park. The waste storage pad, which was poured at the beginning of May 2014, was located adjacent to the fuel tank vault at the owner's request. Documentation from the owner requesting changes to the Project Documents are included in Appendix E.

The bulkhead wall concrete cap and sidewalk were poured on 20 May 2014. Kennedy/Jenks Consultants inspected the reinforcing steel for compliance with Project Documents. Because the bulkhead wall installation was misaligned beyond allowed tolerances, the bulkhead wall sidewalk cantilevers up to 16 inches beyond the outer steel pile edge. Glacier proposed means and methods for pouring the cantilever bulkhead cap that included additional welded steel sheeting and angle iron to the steel bulkhead wall. S&H required additional reinforcing steel in the concrete cap for sections of 1-foot cantilevers or greater (refer to Appendix D for shop drawing review letters). Approximately 25 feet of concrete cap/sidewalk was added with the increased length of steel bulkhead wall.

The marina store patio and side apron concrete pads were poured on 30 May 2014. The concrete patio was relocated centered on the building and a broom finish applied in lieu of exposed aggregate at the owner's request.

3.16 Property Replacements and Enhancements

3.16.1 Marina Store

Glacier replaced all inside paneling with ½-inch-thick sheet rock and replaced electrical panels per Island County Code requirements. Glacier also provided insulation inside the walls. Glacier was paid separately by the owner for insulation materials and labor.

Glacier used vinyl tile as a replacement for the linoleum inside the building. The marina store office room was reconstructed in an alternative location and the shower plumbing was not reconnected at the owner's request. Glacier designed and constructed a wood pillar outside the building near the roadside door to provide additional vertical support of a beam not supported due to electrical panels in the wall. Kennedy/Jenks Consultants did not direct this work. The outside of the building was repainted to match the original painting.

3.16.2 Main Dock and E-Dock Access

Glacier replaced the main and E-dock access platforms using an L-bracket welded to the sheet pile wall and wood stringers bolted in place. Island County required an additional wooden railing

on the platforms for code compliance. The owner purchased the additional wooden railing, and Glacier installed it at no extra cost to Ecology.

The pre-construction topographic survey included in Appendix H shows elevations varying from 13.5 to 14.78 feet at the main dock access, and the average bulkhead wall at 14 feet. The new bulkhead wall with concrete cap did not vary from the designed 14-foot finish elevation. The property owner requested that the main dock be lowered instead of sloped to meet the 14-foot finish elevation. The property owner purchased the materials and, at no extra cost to Ecology, Glacier modified the main dock access by cutting the vertical support piles to lower it approximately 1 foot.

3.16.3 Bulkhead Guardrail

The bulkhead guardrail was constructed in accordance with the Project Documents. The wire cable guardrail was inspected and approved by the Island County Planning and Community Development Department. Approved inspections are included in Appendix A. Approximately 25 feet of length was added with the increased length of steel bulkhead wall.

3.16.4 Septic System Replacement and Alarm System

Glacier coordinated with Island County and the owner to provide an alternative septic tank system from the Project Documents. The alternative septic system consisted of two concrete tanks and septic pumps sized to match the head and flow rates recorded on Island County Health Department septic system documents for the pre-existing system. Kennedy/Jenks Consultants reviewed the alternatives and Glacier addressed comments.

No permit was required for the septic system, but Island County provided inspection and verbal approval. All piping was hydrostatically tested, with no leakage reported. Septic tanks were filled with water and pumps run to test for correct operation of pumps and float level dosage operation. Glacier provided the owner with operation and maintenance manuals for the septic system. Glacier's pipe leakage test results are included in Appendix I.

3.16.5 Fuel Piping Replacement and Alarm System

Fuel piping was replaced from inside the fuel tank vault to the end of the main dock access platform per Project Document requirements. The owner connected fuel piping from the end of the main dock access to replace fuel dispensers at the fuel dock. Fuel piping was hydrostatically tested per the Project Documents. The first test failed, the fuel sump connections were replaced, and the second testing passed. Island County subsequently inspected and approved the fuel piping construction. Approved inspections are included in Appendix A. Two leak detection sensors were installed: one in the fuel tank vault and one in the fuel piping transition and monitoring sump. The fuel tank sensor was installed approximately 1 inch above the finished floor at the elevation of the bottom of the fuel tank. Sensors monitor both water and fuel and distinguish between fluid media using different lights on the alarm panel located in the marina store. Glacier's pipe leakage test results are included in Appendix I.

3.16.6 Additional Site Improvements

New water piping was installed to the marina store, the two original yard hydrants replaced, and one additional yard hydrant added near the fuel vault at no additional cost by Glacier. Water piping was low density polyethylene piping (LDPE). Water piping pressure tests indicated no leakages. Tests were observed by Kennedy/Jenks Consultants' resident engineer. A new concrete pad was poured for the waste storage area which was relocated to be adjacent to the fuel tank vault per the owner's request. New concrete patio and concrete access apron to the main dock access and marina store side walk was poured and flower pots replaced. Glacier provided the owners with a new concrete manhole ring to replace the original fire pit. Other improvements included a new electrical main distribution panel (MDP), a new electrical meter base, new electrical conduit and communication lines, and concrete for the owners to construct a base for a new flag pole in front of the store.

Section 4: Performance Soil Sampling and Stock Pile Management

This section summarizes the performance monitoring activities completed to confirm adequate removal of petroleum-contaminated soils from the site. This section includes discussion regarding cleanup levels (CULs), field monitoring and sampling activities performed, stockpile management, performance soil sampling results, and the initial round of confirmational groundwater monitoring.

4.1 Cleanup Levels and Remediation Levels

In accordance with Washington Administrative Code (WAC) 173-340-410(1)(b), performance monitoring was performed during the remedial action to confirm that soil CULs established for the site were achieved. Performance soil samples were collected in accordance with the *Compliance Monitoring Plan and Sampling and Analysis Plan* (CMP/SAP) (Kennedy/Jenks Consultants 2014) prepared for the cleanup action at the site.

The soil CULs for site COCs are based on MTCA Method A/B values for unrestricted land use. For gasoline and diesel, MTCA Method A cleanup levels were used for the protection of direct contact pathway. Because the Method A soil CULs for BTEX were established for protection of potable groundwater and not for direct contact, the MTCA Method B values were appropriately used for BTEX compounds. The Method B soil CULs for direct contact (ingestion only) are protective of onsite workers and patrons at the marina. In addition to the Method B soil CULs, compliance with soil cleanup standards will also be evaluated during future confirmational groundwater monitoring to confirm that groundwater standards, including applicable values based on protection of surface water in Cornet Bay, are achieved [e.g., CWA and National Oceanic and Atmospheric Administration's (NOAA) *Screening Quick Reference Tables* (SQUIRT) values]. If the groundwater standards are met, compliance with soil cleanup standards will be considered to be achieved. If groundwater cleanup standards are not achieved, additional remedial action might be conducted and additional monitoring will be performed until groundwater concentrations are below the groundwater CULs/applicable, relevant, and appropriate requirements (ARARs) identified above.

VI could be another potential exposure pathway at the site. As discussed in greater detail below, concentrations of the primary COC (benzene) in site groundwater, are below the Tier 1 VI screening level for groundwater based on Ecology's *Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State* (Ecology 2009). Therefore, VI is not likely to be an issue at this site (see Section 4.5).

As groundwater discharges to surface water directly adjacent to the site, the groundwater cleanup level is based protection of surface water. As surface water is saline and cannot be used as potable water, the primary exposure pathways are consumption of organisms by humans and protection of aquatic organisms. Therefore, groundwater (surface water) cleanup standards for BTEX are based on the Clean Water Act [CWA, Section 304] values, which are protective of human consumption of aquatic organisms.

To evaluate potential chronic effects to aquatic organisms, NOAA SQUIRT values were used to provide comparison values for site groundwater concentrations. While not promulgated by the EPA or Ecology, the NOAA SQUIRT values provide conservative screening values to evaluate potential ecological effects to organisms in marine environments. These values for benzene, ethylbenzene and toluene are 110 micrograms per liter (µg/L), 25 µg/L, and 215 µg/L, respectively.

Lastly, in the absence of appropriate cleanup standards to evaluate potential effects of gasoline- and diesel-range hydrocarbons to organisms in marine water, the Method A groundwater cleanup levels have been used for comparison purposes. Both gasoline- and diesel-range hydrocarbons are based on protection of potable drinking water (non-carcinogenic effects) and are considered adequately protective of surface water. Information from *EPA ECOTOX Database* showed that concentrations of TPH in the range of 2,000 µg/L to 5,000 µg/L had no observable effect on the marine organisms studied. The Method A/B cleanup levels; the CWA ARARs; and NOAA comparison values are summarized below:

Analyte	Method A/B Soil CUL [milligrams per kilogram (mg/kg)]	Method A Groundwater CUL and Surface Water ARARs [micrograms per liter (µg/L)]	NOAA[(a)] SQUIRT Values Marine Chronic Effects (µg/L)
GRO	30[(b)]	800[(b)]	NA
DRO	2,000[(b)]	500	NA
Benzene	18[(c)]	51[(d)]	110
Ethylbenzene	8,000[(c)]	2,100[(d)]	25
Toluene	6,400[(c)]	15,000[(d)]	215
Total Xylenes	16,000[(c)]	1,000[(d)]	NA

Notes:

(a) Value based on NOAA *Screening Quick Reference Tables* (SQUIRT).
(b) Method A CUL. The GRO value is based on the presence of benzene.
(c) CUL is based on Method B standard for direct contact (ingestion only).
(d) Value based on Clean Water Act - CWA 304.

4.2 Field Monitoring, Sample Collection, and Soil Removal

During soil removal activities, a Kennedy/Jenks Consultants staff member was onsite to observe and monitor the excavation and backfilling activities. Excavated soils were screened using a PID and/or using visual/odor observations for indications of hydrocarbon impact. Field screening and collection of performance soil samples for laboratory analysis was performed in compliance with the CMP/SAP. Sample analyses were performed by either an onsite mobile laboratory (Libby Environmental of Olympia, Washington) or a fixed-base laboratory (ALS of Everett, Washington). When field monitoring identified the presence of contaminated soil, excavation of clean overburden was discontinued and sampling was performed to confirm that the remaining underlying soils were chemically contaminated. Clean overburden was stockpiled for later determination as either reusable or non-reusable.

Following removal of the clean overburden, excavation of the underlying contaminated soils was started. Excavation spoils were screened for potential classification as either Class 2 or Class 3 soils and stockpiled separately for sampling and disposal. (Note: Class 2 and 3 are designations

used by CEMEX with Class 3 soils having higher COC concentrations and requiring thermal treatment prior to disposal in the landfill. See Section 3.12.)

Performance soil samples were collected after field-screening indicated low residual COC concentrations. If performance soil samples indicated residual soils exceeded the soil cleanup standards identified above, additional excavation was performed in areas around where the sample was collected. In general, this iterative process continued until residual soil achieved the soil cleanup standards. Results of performance soil sampling are provided in Section 4.4.

4.3 Stockpile Characterization

Samples were routinely collected from both clean overburden and petroleum contaminated soil stockpiles to confirm the concentrations of COCs in the material prior to offsite disposal. These samples were used to document that the soil was clean or to categorize it as Class 2 or Class 3 soil for disposal purposes. Table 3 summarizes the stockpile sample results and Appendix K contains the analytical laboratory reports (on CD).

Discrete stockpile samples were designated as either SPX-XX for clean unsuitable material and disposal at CNW or WSPX-X for contaminated waste material and disposal at CEMEX. The first designation, SPX/WSPX, denotes the stockpile or waste stockpile number and excavation area; the second number is the sample number. Samples were collected at approximately 12 to 18 inches below the surface. Soil was removed from clean stockpiles (SPX) if sample results exceeded MTCA Method A soil CULs and placed into the waste stockpiles (WSPX) for Class 2 or Class 3 disposal. Soil remaining in the clean stockpile was then re-sampled to confirm that analytical results were below MTCA Method A CULs and suitable for disposal at CNW.

Petroleum-containing soils were segregated between Class 2 and Class 3 materials before transporting to the disposal facility. CEMEX's criteria for acceptance as a Class 2 material are summarized below and included in Appendix C.

Analyte	Class 2 Acceptance Limits [milligrams per kilogram (mg/kg)]
Gasoline Range Hydrocarbons	450
Diesel Range Hydrocarbons	450
Benzene	0.5
Ethylbenzene	20
Toluene	40
Total Xylenes	20

Note:

Concentrations shown are maximum allowable values for Class 2 acceptance.

4.4 Performance Monitoring Results

Final performance sampling locations are shown on Figures 3 and 4 and the final sample results (indicative of residual soil conditions) are summarized in Tables 4 through 11. Final performance monitoring analytical reports are provided in Appendix K.

Performance samples in Appendix K analytical reports were labeled using the following designation format; A0X – XX –XX. The first values in the designation sequence (A0X) denote the excavation area (Areas 1 through 7); the second values in the sequence denote the sample number; and the third values in the sequence denote the approximate depth below the pre-existing ground surface where the sample was collected.

A total of 114 performance soil samples were collected during excavation of the seven removal areas (excluding duplicate and split samples). As indicated above, in general, soils were removed from the excavations until the cleanup standards were achieved in the residual soils remaining in the excavation. The following table summarizes the number of bottom samples and sidewall samples collected during the excavation process. The table also identifies the number of samples in each removal area that exceeded the Method A CUL for GRO (the only COC that exceeded cleanup levels):

Excavation Area	Bottom Samples	Sidewall Samples	Samples Exceeding CUL for GRO
Area 1	3	5	0
Area 2	13	4	0
Area 3	8	7	1
Area 4	13	4	1
Area 5	19	3	0
Area 6	10	7	0
Area 7	12	6	0

Of the 114 performance samples, only two samples (one from Area 3 and one from Area 4) contained gasoline-range hydrocarbons at concentrations slightly exceeding the Method A soil CUL of 30 mg/kg. Sample A3-15-7 contained gasoline range hydrocarbons at 33 mg/kg and was collected from the sidewall of the excavation. Sample A04-6-5 contained gasoline range hydrocarbons at 31 mg/kg and was collected from the sidewall of the excavation (refer to Tables 4 through 11). Because the residual concentration of GRO was only slightly above the cleanup level and further excavation may have jeopardized an existing fiber optics communication cable, additional excavation was discontinued.

As indicated above, the Method A CUL (which is based on protection of potable drinking water) is not appropriate for the site so the Method B CUL for BTEX compounds was used. The Method B CUL is appropriate for the site to protect site workers and marina patrons who may come in contact with subsurface soil. Of the 114 final performance soil samples collected, none exceeded the Method B CUL for BTEX compounds (refer to Tables 4 through 11).

4.5 Confirmational Groundwater Monitoring Results

Confirmational groundwater monitoring was conducted in August 2014 (the results for which will be summarized in a separate report). Based on the groundwater monitoring results, all analyte concentrations (including GRO, DRO, benzene, ethylbenzene, toluene and xylene) in groundwater were below detectable levels in all wells except for one groundwater sample that contained low concentrations of benzene at 1.5 µg/L. As indicated above, VI (either through

volatilization from soil or groundwater) is a potential exposure pathway for certain volatile organic compounds (VOCs), primarily benzene. Also noted above, all soil sources were removed during the remedial action; consequently, residual soil does not pose a threat via the VI pathway. While detectable, the benzene concentration in groundwater (1.5 µg/L) is below the conservative MTCA Method B VI groundwater screening level for benzene (of 2.4 µg/L) and indicates VI is not a potential exposure pathway at the site. Furthermore, since ethylbenzene, toluene and xylene concentrations in groundwater were below detectable levels, VI does not appear to be a complete exposure pathway. The MTCA VI groundwater screening levels for BTEX compounds are summarized in the following table:

Analyte	MTCA Method B Groundwater Screening Level (µg/L)
Benzene	2.4
Ethylbenzene	2,800
Toluene	1,500
Total Xylenes	310

In addition, these first quarter groundwater monitoring concentrations are also below the ARARs (CWA values) and available aquatic effects screening levels (NOAA SQUIRT values) identified above, indicating there are no unacceptable risks for either human consumption of organisms or adverse chronic effects to aquatic organisms. Additional groundwater monitoring will be performed to confirm the continuing efficacy of the cleanup.

4.6 Performance Monitoring Summary

Based on WAC 173-340-740, the remedial action achieved the cleanup goals for the site (e.g., residual soil sample concentrations are below either the CULs and groundwater is below ARARs for the site). This is based on the following findings:

- Residual soil concentrations are below their respective Method A/B soil cleanup levels. Two exceptions include low detections of gasoline range hydrocarbons that were only slightly above the cleanup standard. In accordance with WAC 173-340-740(7)(e), no single sample exceeded twice the CUL and less than 10 percent of the total samples collected at the site exceeded the CUL.

- Groundwater concentrations indicate COC concentrations are below detectable levels except for one low detection of benzene at 1.5 µg/L. This value is below the VI screening levels indicating VI into onsite buildings is not a complete exposure pathway. The groundwater monitoring results also indicate ARARs and screening levels for protection of surface water (CWA values and NOAA SQUIRT values) have been achieved and do not pose a threat to humans for consumption of organisms or ecological effects to aquatic organisms.

Confirmation that cleanup standards for the site have been achieved will be based on the additional confirmational groundwater monitoring results to verify residual concentrations of hydrocarbons in soil (primarily benzene) do not result in any exceedances of the surface water ARARs identified above.

Section 5: Resident Engineering Services and Record Drawings

Kennedy/Jenks Consultants provided resident engineering services to observe and document construction, direct excavations, perform inspections, and communicate and troubleshoot field issues encountered. A Kennedy/Jenks Consultants resident engineer or geologist was onsite throughout the project. The resident engineer documented daily construction efforts, coordinated meetings between multiple groups, reviewed contractor-provided products for compliance with specifications, and answered requests for information.

Weekly progress reports are included in Appendix L (on CD). Construction photographs are included in Appendix F. Contractor RFIs are included in Appendix G (on CD) for project records. Record Drawings are included in Appendix M.

Section 6: Summary and Conclusions

The overall intent of the Cornet Bay Marina remedial action was to safely remove contaminated soils behind the marina bulkhead wall to MTCA cleanup standards thereby reducing potential impacts to site workers/patrons and the adjacent surface waters. Actions taken to complete this goal included replacing the existing creosote treated wood bulkhead wall with a steel bulkhead wall and concrete cap. Additional items included rehabilitating/expanding the small wetland area to improve aquatic habitat (as a means of mitigation), replacing fuel lines and testing equipment to prevent leakage, and restoring the owner property to pre-existing conditions.

Based on the performance monitoring results discussed above, the intent of the remedial action was met. Future monitoring of groundwater wells will provide confirmation that residual soil concentrations are protective of both human health and the environment.

References

EA Engineering, Science, and Technology, Inc. 2008. Draft Feasibility Study Report. June 2008.

Grette Associates. 2013. Cornet Bay Marina Mitigation Plan.

Grette Associates. 2014. Cornet Bay Marina Model Toxics Control Act Cleanup Mitigation Plan As-Built Report. 25 July 2014.

HRA, Inc. 2014. Archaeological Monitoring Report for the Cornet Bay Marina Remediation Project. August 2014.

Kennedy/Jenks Consultants. 2011. Draft Remedial Investigation/Feasibility Study Work Plan. Cornet Bay Marina, Whidbey Island, Washington. November 2011.

Kennedy/Jenks Consultants. 2013a. Engineering Design Report, Cornet Bay Marina, Whidbey Island, Washington. 25 September 2013.

Kennedy/Jenks Consultants. 2013b. Remedial Investigation/Feasibility Study Report, Cornet Bay Marina, Whidbey Island, Washington. July 2013.

Kennedy/Jenks Consultants. 2013c. Cleanup Action Plan (CAP), Cornet Bay Marina, Whidbey Island, Washington. July 2013.

Kennedy/Jenks Consultants. 2013d. Health and Safety Plan, Cornet Bay Marina, Whidbey Island, Washington.

Kennedy/Jenks Consultants. 2014. Compliance Monitoring Plan and Sampling and Analysis Plan, Cornet Bay Marina, Whidbey Island, Washington. 14 January 2014.

Nelson, Earl V. 1990. Letter from Earl V. Nelson to Mr. Joe Hickey, dated 22 October 1990.

Washington State Department of Ecology. 1990. Letter from Annette Petrie, Site Inspector to Mr. Milt Woods. Subject: Site Assessment at Cornet Bay Marina. Washington State Department of Ecology. Dated 27 November 1990.

Washington State Department of Ecology. 1993. Consent Decree between State of Washington Department of Ecology and Milton Woods. Consent Decree No. 93-2-00018-3. Dated February 1993.

Washington State Department of Ecology. 2009. Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State.

Washington State Department of Ecology. 2011. Toxics Cleanup Program, Guidance for Remediation of Petroleum Contaminated Sites. Publication No. 10-09-057. September 2011.

Washington State Department of Ecology. 2013a. Project Manual, Cornet Bay Marina Remediation, Cornet Bay Marina, Whidbey Island, Island County, Washington. September 2013.

Washington State Department of Ecology, 2013b. Construction Issue Drawings, Cornet Bay Marina Remediation, Cornet Bay Marina, Whidbey Island, Island County, Washington. September 2013.

Welch Enterprises, Inc. 1990. Tank Removal Report. Cornet Bay Marina, 5191 N. Cornet Bay Rd., Oak Harbor, WA 98277. (Incomplete reference.)

Tables

Table 1: Export Soil Quantities

CEMEX

Date	Class II (ton)[(a)]	Class III (ton)[(a)]	Daily Total
1/29/2014		255.89	255.89
1/30/2014		462.84	462.84
1/31/2014		100.48	100.48
2/4/2014		425.68	425.68
2/5/2014		577.81	577.81
2/6/2014		924.45	924.45
2/7/2014		827.54	827.54
2/10/2014		734.69	734.69
2/11/2014		69.18	69.18
2/12/2014		736.91	736.91
2/13/2014		640.74	640.74
2/14/2014		30.34	30.34
2/17/2014		250.55	250.55
2/18/2014		449.54	449.54
2/19/2014	63.20	416.87	480.07
2/20/2014		804.24	804.24
2/21/2014		34.39	34.39
2/24/2014	598.12	129.11	727.23
3/3/2014		482.04	482.04
3/4/2014	120.10	1,285.47	1,405.57
3/5/2014	158.57	905.55	1,064.12
3/6/2014	33.36	940.29	973.65
3/7/2014	269.88	859.14	1,129.02
3/10/2014	232.68	56.79	289.47
3/11/2014		1,381.63	1,381.63
3/12/2014		1,202.45	1,202.45
3/14/2014		780.86	780.86
3/17/2014		939.51	939.51
3/18/2014		997.32	997.32
3/19/2014		30.74	30.74
3/21/2014		749.81	749.81
3/26/2014		1,390.55	1,390.55
3/27/2014		94.84	94.84
3/31/2014		559.94	559.94
4/2/2014		660.19	660.19
5/2/2014		249.72	249.72
5/5/2014		69.76	69.76
Material Total	1,475.91	21,507.85	22,983.76

CONCRETE NOR'WEST

Date	Non-Reusable Clean Overburden (cy)[(a)]
2/11/2014	968.00
2/14/2014	814.00
2/18/2014	176.00
2/19/2014	88.00
2/27/2014	572.00
2/28/2014	418.00
Total	3,036.00

Table 2: Import Soil Quantities

CONCRETE NOR'WEST

Date	Pit Run (ton)[(a)]	Screenings (ton)[(a)]	2x4 Quarry Rock (ton)[(a)]	1 3/8 Washed Rock (ton)[(a)]	5/8 Crushed Rock (ton)[(a)]	Utility Sand (ton)[(a)]	Daily Total
01/27/14	202.11	398.39					600.50
02/10/14	203.24		15.47				218.71
02/11/14	494.64	971.73					1,466.37
02/14/14	908.23	859.48					1,767.71
02/17/14		2,237.34					2,237.34
02/18/14	304.69	473.22					777.91
02/19/14	301.65	635.70					937.35
02/20/14	371.91	668.59		296.40			1,336.90
02/21/14		1,731.51					1,731.51
02/26/14			65.47				65.47
02/27/14	614.68	747.74					1,362.42
02/28/14		565.97					565.97
03/06/14	294.67						294.67
03/07/14	293.80	694.77					988.57
03/10/14		693.50					693.50
03/12/14	738.85						738.85
03/13/14	268.93	2,459.01					2,727.94
03/17/14	1,005.48						1,005.48
03/18/14		2,066.94					2,066.94
03/19/14	234.42	399.24					633.66
03/20/14		495.94					495.94
03/21/14		1,165.37					1,165.37
03/24/14		648.70					648.70
03/25/14		674.51					674.51
03/26/14		695.25					695.25
03/27/14		332.31					332.31
03/28/14		520.85			165.83		686.68
04/02/14		702.77					702.77
04/03/14		501.56					501.56
04/04/14		65.68				48.90	114.58
04/14/14		406.28					406.28
05/06/14		264.51					264.51
05/07/14		33.06					33.06
05/14/14		62.14					62.14
05/15/14		32.54					32.54
05/16/14		62.05					62.05
05/22/14		111.48					111.48
Material Total	6,237.30	22,378.13	80.94	296.40	165.83	48.90	29,207.50

Note:

(a) Based on delivery receipts.

Table 3: Clean Overburden and Contaminated Soil Stockpile Samples

Sample ID	Collection Date	NWTPH-Gx	NWTPH-Dx/Dx Extended		BTEX			
		Gasoline (mg/kg)	Diesel (mg/kg)	Oil (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
SP1-1	1/27/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
SP1-2	1/27/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
SP2-1	1/29/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
SP2-2	1/29/2014	3.0 U	25 U	50 U	0.037	0.050 U	0.050 U	0.20 U
SP2-3	1/29/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
SP2-4	1/29/2014	3.0 U	25 U	58	0.030 U	0.050 U	0.050 U	0.20 U
SP2-5	1/29/2014	3.0 U	25 U	50 U	0.031	0.050 U	0.050 U	0.20 U
SP2-6	1/29/2014	3.0 U	31	67	0.030 U	0.050 U	0.050 U	0.20 U
SP2-7	1/29/2014	3.0 U	25 U	58	0.030 U	0.050 U	0.050 U	0.20 U
SP2-8[a]	2/3/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP2-9[a]	2/3/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP2-10[a]	2/3/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP2-11[b]	2/6/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP2-12[b]	2/6/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP2-13[b]	2/6/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP2-14[b]	2/6/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP2-15[b]	2/6/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP2-16	2/7/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP2-17	2/7/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP2-18	2/7/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP2-19	2/10/2014	10 U	25 U	297	0.02 U	0.10 U	0.05 U	0.15 U
SP2-20	2/21/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP2-21	2/21/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
SP2-22	2/21/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP3-1	2/10/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP3-2	2/10/2014	10 U	25 U	102	0.02 U	0.10 U	0.05 U	0.15 U
SP3-3	2/10/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP3B-1	2/18/2014	17	44	40 U	0.053	0.10 U	0.17	0.55
WSP1-1	1/29/2014	**76**	460	440	0.049	0.050 U	0.28 U	1.2
WSP2-1	1/29/2014	41	100	190	0.030 U	0.050 U	0.13	0.71
WSP1-2	1/29/2014	4.2	25 U	50 U	0.35	0.050 U	0.050 U	0.20 U
WSP2-2	1/29/2014	5.6	130	250	0.079	0.050 U	0.052	0.20 U
WSP3-1	2/18/2014	**103**	25 U	40 U	0.30	0.25	0.72	1.2
WSP4-1	2/18/2014	25	25 U	40 U	0.23	0.10 U	0.074	0.41
WSP4-2	2/18/2014	23	25 U	40 U	0.48	0.10 U	0.14	0.46
WSP4-3	2/19/2014	**34**	25 U	40 U	0.48	0.11	0.31	0.84
WSP4-4	2/19/2014	28	25 U	40 U	0.11	0.10 U	0.13	0.67
WSP4-5	2/19/2014	**37**	25 U	40 U	0.13	0.10 U	0.29	1.0
A03-SP2-1	2/17/2014	10 U	48	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP5-1-1	2/25/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP5-2-1	2/25/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
SP5-3-1	2/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
SP5-4-1	2/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
SP5-5-1	2/26/2014	10 U	25 U	40 U	0.23	0.10 U	0.05 U	0.15 U
SP5-6-1	2/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
SP5-7-1	2/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
SP5-8-1	2/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
SP5-9-1	2/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
SP5-10-1	2/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
SP5-11	2/27/2014	10 U	25 U	40 U	0.035	0.10 U	0.05 U	0.15 U
WSP5-1	2/27/2014	**229**	952	40 U	2.6	0.45	5.0	3.0
WSP5-2	2/27/2014	**253**	**2,940**	40 U	1.2	0.48	**6.4**	4.7
WSP5-3	2/27/2014	**229**	927	40 U	1.2	0.42	5.1	1.9
WSP5-4	2/27/2014	**236**	1,790	40 U	1.2	0.40	4.1	7.8
WSP5-5	2/27/2014	**178**	1,250	40 U	0.59	0.13	2.2	1.5
WSP5-6	2/27/2014	**78**	1,250	40 U	0.36	0.098	0.92	0.77
MTCA Method A Cleanup Levels[c]		100/30[d]	2,000	2,000	0.03 (18[e])	7	6	9

Notes:

mg/kg = milligrams per kilogram

"U" = Not detected at or above laboratory reporting limits.

Variations in laboratory reporting limits reflect different reporting limits from Libby Environmental, Inc. and ALS Environmental

Concentrations above the cleanup level are shown in bold and highlighted in gray.

MTCA = Washington State Department of Ecology Model Toxics Control Act (WAC 173-340)

(a) Resampled after SP2-2 and SP2-5 had low returns of benzene above 0.03 milligram per kilogram (mg/kg) but below 0.06 mg/kg.

(b) Re-sampling of material removed from SP2 and stockpiled separately.

(c) Cleanup level is based on MTCA Method A value for unrestricted land use [WAC 173-340-740(2)].

(d) Cleanup level with presence of benzene.

(e) Cleanup level is based on MTCA Method B value for unrestricted land use [WAC 173-340-740(3)].

Table 4: Area 1 Final Confirmational Soil Samples

Sample ID	Collection Date	NWTPH-Gx	NWTPH-Dx/Dx Extended		BTEX			
		Gasoline (mg/kg)	Diesel (mg/kg)	Oil (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
A01-01-6	1/27/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
A01-02-10	1/27/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
A01-03-14	1/27/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
A01-04-6	1/27/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
A01-05-7	1/27/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
A01-06-12	1/27/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
A01-07-7	1/27/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
A01-08-6	1/27/2014	3.0 U	25 U	60	0.030 U	0.050 U	0.050 U	0.20 U
MTCA Method A Cleanup Levels[(a)]		100/30[(b)]	2,000	2,000	0.03 (18[(c)])	7	6	9

Notes:

mg/kg = milligrams per kilogram

"U" = Not detected at or above laboratory reporting limits.

MTCA = Washington State Department of Ecology Model Toxics Control Act (WAC 173-340)

(a) Cleanup level is based on MTCA Method A value for unrestricted land use [WAC 173-340-740(2)].

(b) Cleanup level with presence of benzene.

(c) Cleanup level is based on MTCA Method B value for unrestricted land use [WAC 173-340-740(3)].

Table 5: Area 2 Final Confirmational Soil Samples

Sample ID	Collection Date	NWTPH-Gx	NWTPH-Dx/Dx Extended		BTEX			
		Gasoline (mg/kg)	Diesel (mg/kg)	Oil (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
A02-1-12.5	2/3/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A02-2-12.5	2/3/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A02-3-12.5	2/3/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A02-4-15	2/3/2014	10 U	25 U	40 U	0.10	0.10 U	0.05 U	0.15 U
A02-5-16	2/4/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A02-6-16	2/4/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A02-7-17	2/5/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A02-8-17	2/5/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A02-9-15	2/5/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A02-10-12	2/7/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A02-12-14	2/7/2014	10 U	25 U	40 U	0.11	0.10 U	0.05 U	0.15 U
A02-13-12	2/20/2014	10 U/5.9	176/120	40 U/61	0.02 U/0.030 U	0.10 U/0.050 U	0.05 U/0.050 U	0.15 U/0.20 U
A02-14-12	2/20/2014	10 U	60	40 U	0.02 U	0.10 U	0.05 U	0.15 U
MTCA Method A Cleanup Levels[(a)]		100/30[(b)]	2,000	2,000	0.03 (18[(c)])	7	6	9

Notes:

mg/kg = milligrams per kilogram

"U" = Not detected at or above laboratory reporting limits.

Variations in laboratory reporting limits reflect different reporting limits from Libby Environmental, Inc. and ALS Environmental

Where two values are displayed, the second is the analytical result for a field blind duplicate sample.

MTCA = Washington State Department of Ecology Model Toxics Control Act (WAC 173-340)

(a) Cleanup level is based on MTCA Method A value for unrestricted land use [WAC 173-340-740(2)].

(b) Cleanup level with presence of benzene.

(c) Cleanup level is based on MTCA Method B value for unrestricted land use [WAC 173-340-740(3)].

Table 6: Area 3 Final Confirmational Soil Samples

Sample ID	Collection Date	NWTPH-Gx	NWTPH-Dx/Dx Extended		BTEX			
		Gasoline (mg/kg)	Diesel (mg/kg)	Oil (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
A03-1-6	2/17/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A03-2-5	2/17/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A03-3-5.5	2/17/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A03-4-8	2/17/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A03-5-10	2/17/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A03-6-11	2/17/2014	10 U	25 U	40 U	0.27	0.10 U	0.05 U	0.15 U
A03-7-10.5	2/17/2014	10 U	25 U	40 U	0.044	0.10 U	0.083	0.20
A03-8-5	2/17/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A3-9-12	2/18/2014	10 U	25 U	40 U	0.033	0.10 U	0.05 U	0.15 U
A3-10-12	2/18/2014	10 U	25 U	40 U	0.094	0.10 U	0.05 U	0.15 U
A3-11-10	2/18/2014	10 U	25 U	40 U	0.025	0.10 U	0.05 U	0.15 U
A3-12-6	2/18/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A3-13-12	2/18/2014	10 U	25 U	40 U	0.04	0.10 U	0.05 U	0.15 U
A3-14-12	2/19/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A3-15-7	2/19/2014	**33**/26	25 U/25 U	40 U/50 U	0.38/0.54	0.10 U/0.050 U	0.27/0.38	0.54/0.98
MTCA Method A Cleanup Levels[a]		100/30[b]	2,000	2,000	0.03 (18[c])	7	6	9

Notes:

mg/kg = milligrams per kilogram

"U" = Not detected at or above laboratory reporting limits.

Where two values are displayed, the second is the analytical result for a field blind duplicate sample.

Variations in laboratory reporting limits reflect different reporting limits from Libby Environmental, Inc. and ALS Environmental

Concentrations above the cleanup level are shown in bold and highlighted in gray.

MTCA = Washington State Department of Ecology Model Toxics Control Act (WAC 173-340)

(a) Cleanup level is based on MTCA Method A value for unrestricted land use [WAC 173-340-740(2)].

(b) Cleanup level with presence of benzene.

(c) Cleanup level is based on MTCA Method B value for unrestricted land use [WAC 173-340-740(3)].

Table 7: Area 4 Final Confirmational Soil Samples

Sample ID	Collection Date	NWTPH-Gx	NWTPH-Dx/Dx Extended		BTEX			
		Gasoline (mg/kg)	Diesel (mg/kg)	Oil (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
A04-1-7	2/12/2014	10	25 U	40 U	1.3	0.10 U	0.092	0.30
A04-2-8	2/12/2014	10 U	25 U	40 U	0.089	0.10 U	0.05 U	0.15 U
A04-3-7	2/12/2014	10 U	25 U	40 U	0.057	0.10 U	0.05 U	0.15 U
A04-4-3	2/12/2014	10 U	25 U	40 U	0.72	0.10 U	0.05 U	0.20
A04-5-9	2/12/2014	10 U	25 U	40 U	0.041	0.10 U	0.05 U	0.15 U
A04-6-5	2/12/2014	**31**	25 U	40 U	3.2E	0.59	0.35	1.4
A04-7-11	2/13/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A04-8-10	2/13/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A04-9-7	2/13/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A04-10-12	2/13/2014	10 U	25 U	40 U	0.02 U	0.10 U	0.05 U	0.15 U
A04-11-8	2/13/2014	10 U	25 U	40 U	0.051	0.10 U	0.05 U	0.15 U
A04-12-9	2/13/2014	10 U/10 U	25 U/25 U	40 U/40 U	0.073/0.051	0.10 U/0.10 U	0.05 U/0.05 U	0.15 U/0.15 U
A04-13-7	2/13/2014	10 U	25 U	40 U	0.025	0.10 U	0.05 U	0.15 U
A4-14-4	2/19/2014	10 U	25 U	40 U	0.39	0.10 U	0.05 U	0.28
A04-151-3	3/24/2014	10 U	25 U	40 U	0.039	0.10 U	0.053	0.30
A04-16-8	3/24/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A04-17-11	3/24/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
MTCA Method A Cleanup Levels[a]		100/30[b]	2,000	2,000	0.03 (18[c])	7	6	9

Notes:

mg/kg = milligrams per kilogram

"U" = Not detected at or above laboratory reporting limits.

Concentrations above the cleanup level are shown in bold and highlighted in gray.

E = Sample exceeds calibration range. Reported result is an estimate.

Where two values are displayed, the second is the analytical result for a field blind duplicate sample.

Variations in laboratory reporting limits reflect different reporting limits from Libby Environmental, Inc.

MTCA = Washington State Department of Ecology Model Toxics Control Act (WAC 173-340)

(a) Cleanup level is based on MTCA Method A value for unrestricted land use [WAC 173-340-740(2)].

(b) Cleanup level with presence of benzene.

(c) Cleanup level is based on MTCA Method B value for unrestricted land use [WAC 173-340-740(3)].

Table 8: Area 5 Final Confirmational Soil Samples

Sample ID	Collection Date	NWTPH-Gx	NWTPH-Dx/Dx Extended		BTEX			
		Gasoline (mg/kg)	Diesel (mg/kg)	Oil (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
A05-7-10	2/26/2014	10 U	25 U	40 U	0.024	0.10 U	0.05 U	0.15 U
A05-8-9	2/26/2014	10 U	25 U	40 U	0.025	0.10 U	0.05 U	0.15 U
A05-9-8	2/26/2014	10 U	25 U	40 U	0.024	0.10 U	0.05 U	0.15 U
A05-10-10	2/26/2014	10 U	25 U	40 U	0.50	0.10 U	0.05 U	0.15 U
A05-11-10	2/26/2014	10 U	25 U	40 U	0.49	0.10 U	0.05 U	0.15 U
A05-12-9	2/26/2014	10 U	25 U	40 U	0.049	0.10 U	0.05 U	0.15 U
A05-13-4	2/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A05-14-7	2/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A05-15-12	2/28/2014	10 U	25 U	40 U	0.17	0.10 U	0.05 U	0.15 U
A05-16-12	3/6/2014	10 U	25 U	40 U	0.34	0.10 U	0.05 U	0.15 U
A05-17-15	3/6/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A05-18-12	3/6/2014	10 U/3.0 U	25 U/25 U	40 U/50 U	0.03 U/0.030 U	0.10 U/0.050 U	0.05 U/0.050 U	0.15 U/0.20 U
A05-19-12	3/6/2014	10 U	25 U	40 U	0.14	0.10 U	0.05 U	0.15 U
A05-20-14	3/6/2014	10 U	25 U	40 U	0.17	0.10 U	0.05 U	0.15 U
A05-21-11	3/6/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A05-22-14	3/6/2014	10 U	25 U	40 U	0.067	0.10 U	0.05 U	0.15 U
A05-23-11	3/6/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A05-24-7	3/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A05-25-12*	4/30/2014	3.0 U	25 U	50 U	0.005 U	0.010 U	0.010 U	0.010 U
A05-25-15	3/19/2014	3.0 U	25 U	50 U	0.030 U	0.050 U	0.050 U	0.20 U
A05-26-12	3/20/2014	3.0 U	25 U	50 U	0.14	0.050 U	0.050 U	0.20 U
A05-27-13	3/20/2014	3.0 U	25 U	50 U	0.15	0.050 U	0.050 U	0.20 U
A05-28-6	3/20/2014	3.0 U	62	50 U	0.030 U	0.050 U	0.050 U	0.20 U
MTCA Method A Cleanup Levels[a]		100/30[b]	2,000	2,000	0.03 (18[c])	7	6	9

Notes:

mg/kg = milligrams per kilogram

"U" = Not detected at or above laboratory reporting limits.

Variations in laboratory reporting limits reflect different reporting limits from Libby Environmental, Inc. and ALS Environmental

Where two values are displayed, the second is the analytical result for a field blind duplicate sample.

MTCA = Washington State Department of Ecology Model Toxics Control Act (WAC 173-340)

"*" = Potential error in sample identification

(a) Cleanup level is based on MTCA Method A value for unrestricted land use [WAC 173-340-740(2)].

(b) Cleanup level with presence of benzene.

(c) Cleanup level is based on MTCA Method B value for unrestricted land use [WAC 173-340-740(3)].

Table 9: Areas 2 and 4 Boundary Bank Final Confirmational Soil Samples

Sample ID	Date	NWTPH-Gx	NWTPH-Dx/Dx Extended		BTEX			
		Gasoline (mg/kg)	Diesel (mg/kg)	Oil (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
A02/A04-1-11	2/12/2014	10 U	25 U	40 U	0.81	0.10 U	0.05 U	0.15 U
A02/04-2-10	2/12/2014	10 U/10 U	25 U/25 U	40 U/40 U	1.7/2.6E	0.10 U/0.10 U	0.05 U/0.05 U	0.15 U/0.15 U
A02/04-3-9	2/13/2014	10 U	25 U	40 U	0.071	0.10 U	0.05 U	0.15 U
A02/04-4-9	2/14/2014	12	25 U	40 U	0.67	0.10 U	0.065	0.34
MTCA Method A Cleanup Levels[a]		100/30[b]	2,000	2,000	0.03 (18[c])	7	6	9

Notes:

mg/kg = milligrams per kilogram

"U" = Not detected at or above laboratory reporting limits.

Where two values are displayed, the second is the analytical result for a field blind duplicate sample.

E = Sample exceeds calibration range. Reported result is an estimate.

MTCA = Washington State Department of Ecology Model Toxics Control Act (WAC 173-340)

(a) Cleanup level is based on MTCA Method A value for unrestricted land use [WAC 173-340-740(2)].

(b) Cleanup level with presence of benzene.

(c) Cleanup level is based on MTCA Method B value for unrestricted land use [WAC 173-340-740(3)].

Table 10: Area 6 Final Confirmational Soil Samples

Sample ID	Collection Date	NWTPH-Gx	NWTPH-Dx/Dx Extended		BTEX			
		Gasoline (mg/kg)	Diesel (mg/kg)	Oil (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
A06-1-8	3/10/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-2-4	3/10/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-3-3	3/10/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-4-9	3/10/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-5-6	3/10/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-6-11	3/10/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-7-6	3/11/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-8-7	3/11/2014	10 U/3.0 U	25 U/25 U	40 U/50 U	0.03 U/0.030 U	0.10 U/0.050 U	0.05 U/0.050 U	0.15 U/0.20 U
A06-9-11	3/11/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-10-5	3/11/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-11-8	3/11/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-13-7	3/11/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-14-11	3/11/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-15-8	3/12/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-16-8	3/12/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A06-17-7	3/27/2014	10 U/3.0 U	25 U/25 U	40 U/50 U	0.03 U/0.030 U	0.10 U/0.050 U	0.05 U/0.050 U	0.15 U/0.20 U
A06-18-3	3/27/2014	23	25 U	40 U	0.10	0.10 U	0.05 U	0.15 U
MTCA Method A Cleanup Levels[a]		100/30[b]	2,000	2,000	0.03 (18[c])	7	6	9

Notes:

mg/kg = milligrams per kilogram

"U" = Not detected at or above laboratory reporting limits.

Where two values are displayed, the second is the analytical result for a field blind duplicate sample.

Variations in laboratory reporting limits reflect different reporting limits from Libby Environmental, Inc. and ALS Environmental

MTCA = Washington State Department of Ecology Model Toxics Control Act (WAC 173-340)

(a) Cleanup level is based on MTCA Method A value for unrestricted land use [WAC 173-340-740(2)].

(b) Cleanup level with presence of benzene.

(c) Cleanup level is based on MTCA Method B value for unrestricted land use [WAC 173-340-740(3)].

Table 11: Area 7 Final Confirmational Soil Samples

Sample ID	Collection Date	NWTPH-Gx	NWTPH-Dx/Dx Extended		BTEX			
		Gasoline (mg/kg)	Diesel (mg/kg)	Oil (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
A07-1-8	3/14/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-2-6	3/14/2014	10 U/3.0 U	25 U/25 U	40 U/50 U	0.03 U/0.030 U	0.10 U/0.050 U	0.05 U/0.050 U	0.15 U/0.20 U
A07-3-12	3/14/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-4-8	3/14/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-5-6	3/14/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-6-6	3/17/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-7-10	3/17/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-8-8	3/17/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-9-10	3/17/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-10-8	3/24/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-11-10	3/25/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-12-12.5	3/25/2014	10 U	25 U	40 U	0.073	0.10 U	0.05 U	0.15 U
A07-13-11	3/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-14-5	3/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-15-10	3/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-16-10	3/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
A07-17-5	3/26/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
VW-10	3/14/2014	10 U	25 U	40 U	0.03 U	0.10 U	0.05 U	0.15 U
MTCA Method A Cleanup Levels[a]		100/30[b]	2,000	2,000	0.03 (18[c])	7	6	9

Notes:

mg/kg = milligrams per kilogram

"U" = Not detected at or above laboratory reporting limits.

Where two values are displayed, the second is the analytical result for a field blind duplicate sample.

Variations in laboratory reporting limits reflect different reporting limits from Libby Environmental, Inc. and ALS Environmental

MTCA = Washington State Department of Ecology Model Toxics Control Act (WAC 173-340)

(a) Cleanup level is based on MTCA Method A value for unrestricted land use [WAC 173-340-740(2)].

(b) Cleanup level with presence of benzene.

(c) Cleanup level is based on MTCA Method B value for unrestricted land use [WAC 173-340-740(3)].

Figures

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0 0.5 1

Miles

Kennedy/Jenks Consultants

Washington State Department of Ecology
Cornet Bay Marina

Site Location

1396010*00
October 2014

Figure 1

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Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Approximate Property Boundary
- Former Timber Bulkhead and Current Sheet Pile Bulkhead

NOTE:
Approximate property boundary obtained from Survery performed on 17 November 2011.Boundary located on east portion of site is identified as right-of-way. Aerials Express 0.3 to 0.6m resolution imagery for metropolitan areas and the best available United States Department of Agriculture (USDA) National Agriculture Imagery Program (NAIP) imagery and enhanced versions of United States Geological Survey (USGS) Digital Ortho Quarter Quad (DOQQ) imagery for other areas. For more information on this map, visit us online at http://goto.arcgisonline.com/maps/World_Imagery

N

0 50 100

Scale: Feet
1 inch = 50 feet

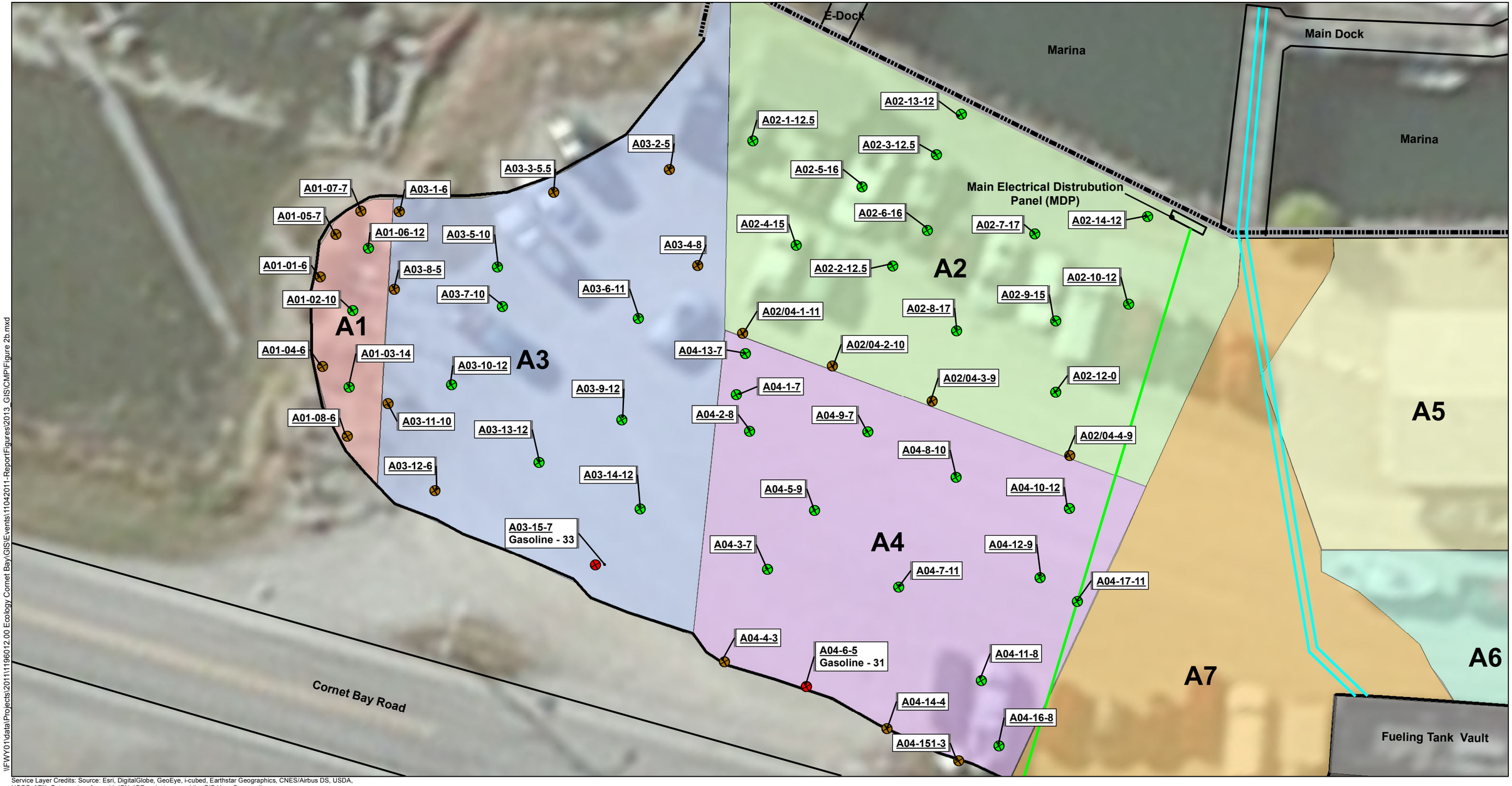
Kennedy/Jenks Consultants

Washington State Department of Ecology
Cornet Bay Marina

Site Plan

1396010*00
October 2014

Figure 2



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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Floor Sample
- Sidewall Sample
- Sample Exeeding Cleanup Standard (see note*)
- Underground Electrical Lines
- Fuel Lines
- New Sheetpile Bulkhead
- Area 1 Excavation
- Area 2 Excavation
- Area 3 Excavation
- Area 4 Excavation
- Area 5 Excavation
- Area 6 Excavation
- Area 7 Excavation

Notes:
MTCA Method A/B Soil Cleanup Levels:
- Gasoline - 30 mg/kg
- Diesel - 2,000 mg/kg
- Oil - 2,000 mg/kg
- Benzene - 18.0 mg/kg
- Ethylbenzene - 8,000 mg/kg
- Toulene - 6,400 mg/kg
- Total Xylenes - 16,000 mg/kg

*Data flag provided for values exceeding the Method A/B Cleanup Level.

N

0 20 40

Approximate Scale: Feet

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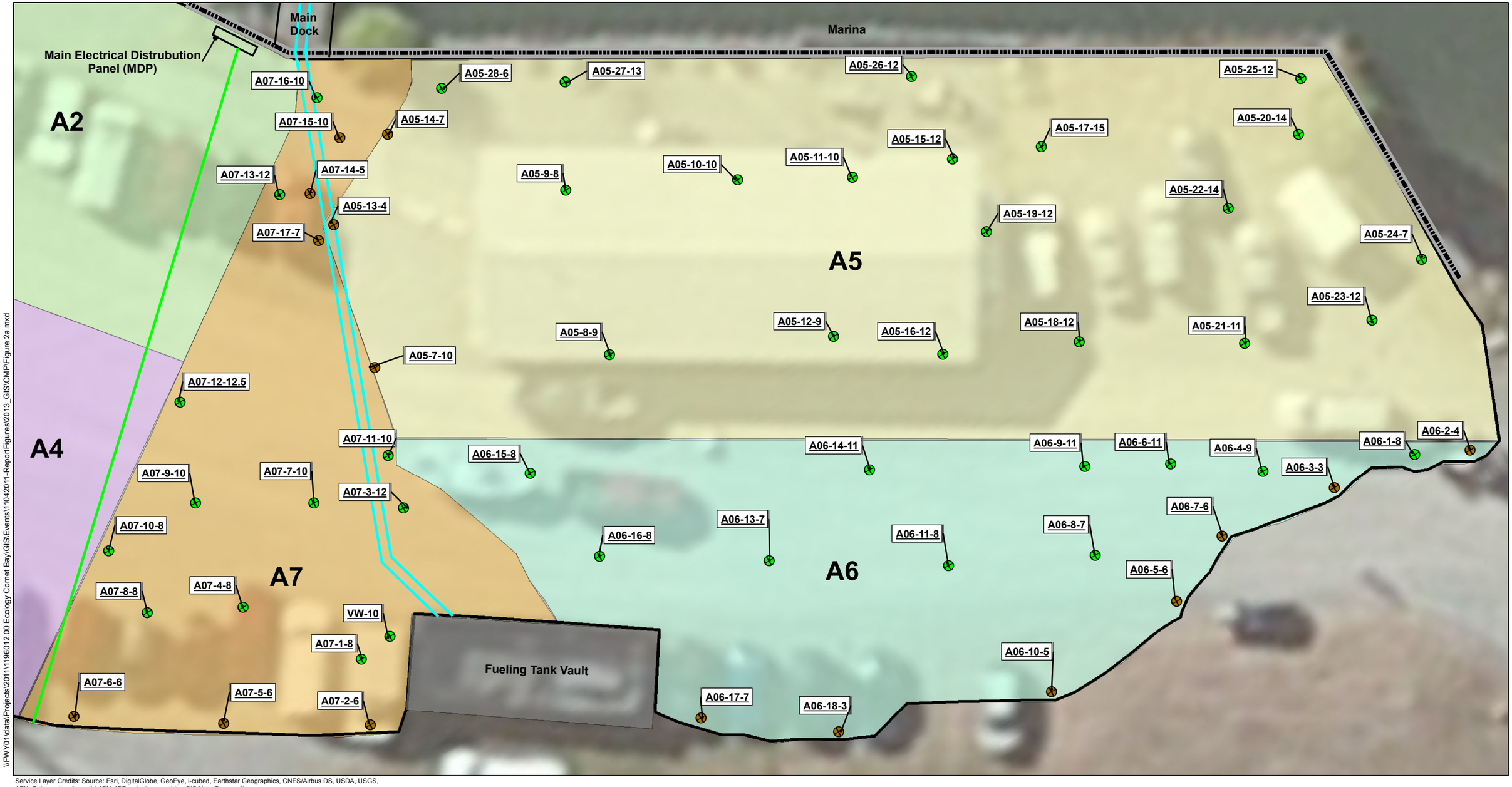
Cornet Bay Marina

Area Excavation and Sampling Locations - South

1396010*00
October 2014

Figure 3



\\FWY01\data\Projects\2011\1196012.00 Ecology Comet Bay\GIS\Events\11042011-ReportFigures\2013_GIS\CMP\Figure 2a.mxd

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Floor Sample
- Sidewall Sample
- Sample Exeeding Cleanup Standard (see note*)
- Underground Electrical Lines
- Fuel Lines
- New Sheetpile Bulkhead
- Area 2 Excavation
- Area 4 Excavation
- Area 5 Excavation
- Area 6 Excavation
- Area 7 Excavation

Notes:
MTCA Method A/B Soil Cleanup Levels:
- Gasoline - 30 mg/kg
- Diesel - 2,000 mg/kg
- Oil - 2,000 mg/kg
- Benzene - 18.0 mg/kg
- Ethylbenzene - 8,000 mg/kg
- Toulene - 6,400 mg/kg
- Total Xylenes - 16,000 mg/kg

*Data flag provided for values exceeding the Method A/B Cleanup Level.

N

0 15 30

Approximate Scale: Feet

Kennedy/Jenks Consultants

Washington State Department of Ecology
Cornet Bay Marina

Area Excavation and Sampling Locations - North

1396010*00
October 2014

Figure 4