

TIME-CRITICAL REMOVAL ACTION REPORT

Bremerton Gas Works Site

Prepared for: Cascade Natural Gas Corporation

Aspect Project No. 080239-003 • Anchor QEA Project No. 131014-01.01
April 2014

Prepared by



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Acronyms

Anchor QEA	Anchor QEA, LLC
AOC	Administrative Settlement Agreement and Order on Consent
Aspect	Aspect Consulting, LLC
Cascade	Cascade Natural Gas Corporation
City	City of Bremerton
Clearcreek	Clearcreek Contractors Inc.
DGPS	differential global positioning system
EPA	U.S. Environmental Protection Agency
Gas Works	Bremerton Gas Works
MLLW	mean lower low water
NPL	National Priorities List
PAH	polycyclic aromatic hydrocarbon
PVC	polyvinyl chloride
RI/FS	Remedial Investigation/Feasibility Study
Site	Bremerton Gas Works Site
TCRA	Time-Critical Removal Action
Work Plan	Removal Action Work Plan

1 Introduction

This Removal Action Report was prepared on behalf of Cascade Natural Gas Corporation (Cascade) to document completion of the 2013 Time-Critical Removal Action (2013 TCRA) at the Bremerton Gas Works Site (Site) in Bremerton, Washington, in accordance with the requirements of the Administrative Settlement Agreement and Order on Consent for Remedial Investigation Feasibility Study (AOC; CERCLA Docket No. 10-2013-0104) and an Action Memorandum issued by the U.S. Environmental Protection Agency (EPA) in September 2013 (Action Memorandum; Appendix A). The Removal Action was performed to address conditions identified during the Removal Evaluation. These conditions are documented in the EPA-approved Removal Evaluation Report (Anchor QEA and Aspect Consulting 2013a). The objective of the 2013 TCRA was to mitigate potential threats to human health, welfare, and the environment attributable to Site-related contaminants prior to completion of the Remedial Investigation/Feasibility Study (RI/FS). The scope of work for the 2013 TCRA is presented in the EPA-approved Final Removal Action Work Plan (Work Plan; Appendix B).

1.1 Site Background

EPA placed the Site on the National Priorities List (NPL) on May 10, 2012. EPA and Cascade subsequently negotiated the AOC, which was executed on May 1, 2013. Consistent with the AOC, the Site includes the area where the gas works was formerly located (Figure 1), and areas that may have been affected by contamination originating from the former gas works.

The former gas works was located along the south shore of Port Washington Narrows in Bremerton, Washington, between Thompson Drive and Pennsylvania Avenue (Figure 1). As shown in Figure 2, the former gas works was located on portions of properties currently owned by the McConkey Family Trust (McConkey Property) and Natacha Sesko (Sesko Property). A dock associated with former gas works operations was located within Port Washington Narrows as shown in Figure 2.

The former gas works supplied residents of Bremerton with gas for lighting, heating, and cooking. From approximately 1930 to 1955, the former gas works manufactured gas from coal and other petroleum products. From approximately 1948 to 1955, liquefied petroleum (propane) was used to enrich the manufactured gas. Between approximately 1955 and 1963, the former gas works switched from manufactured gas production to blending propane and air. Gas works operations terminated in 1963 upon completion of a natural gas pipeline to the region. Aboveground structures associated with the former gas works were removed between 1963 and the early 1970s.

Between 1972 and the present, the McConkey Property and Sesko Property were used for industrial purposes, including metal fabrication, concrete forming, and boat repair. The Sesko Property has also been used for the storage of miscellaneous equipment and debris. Additionally, a bulk petroleum facility operated on a portion of the Sesko Property between the early to mid-1940s and approximately 1993. The Sesko Property and the majority of the McConkey Property are currently vacant.

Two additional petroleum storage and distribution facilities were formerly, or are currently, present in the immediate vicinity of the former gas works as follows:

- A former ARCO bulk petroleum facility operated on property located to the southwest of the former gas works between approximately 1942 and 1992; this property is currently owned and operated by Pipeworks Mechanical & Service, Inc.
- A bulk petroleum facility most recently operated by SC Fuels is located to the east of the Sesko Property, across Pennsylvania Avenue. A bulk petroleum facility has operated in this location since the early to mid-1940s.

Historically, petroleum products were delivered to all three bulk petroleum facilities by barge. Three separate docks were used for product delivery over the years. Use of the docks was consolidated over time, and two or more of the bulk petroleum facilities shared a single dock in later years. Figure 2 shows the locations of the three historical bulk petroleum docks, as well as the former gas works dock.

Previous regulatory activities associated with the Site include the completion of an Incident Action and Time-Critical Removal Action (2010 TCRA) in response to a hydrocarbon sheen associated with an abandoned drain pipe identified in the intertidal area of the Port Washington Narrows. The 2010 TCRA included removal and plugging of the 12-inch drain pipe, placement of a cap over hydrocarbon-impacted sediments, and post-completion beach monitoring inspections (Anchor QEA 2011).

1.2 Removal Evaluation

In 2013, Cascade completed a Removal Evaluation pursuant to the requirements of the AOC and the EPA-approved Removal Evaluation Work Plan (Anchor QEA and Aspect Consulting 2013b). The objective of the Removal Evaluation was to assess whether suspected migration pathways at the Site pose a threat to human health, welfare, or the environment if left unaddressed before completion of the RI/FS. The results of the Removal Evaluation were reported in the EPA-approved Removal Evaluation Report (Anchor QEA and Aspect Consulting 2013a). The Removal Evaluation identified the following conditions that warranted action before completing the RI/FS:

- **Stormwater intrusion into Manhole A.** Manhole A is believed to remain connected to the 12-inch concrete pipe that was plugged as part of the 2010 TCRA. Based on inspections conducted as part of the Removal Evaluation, stormwater could potentially enter Manhole A through surface runoff or via a piping connection to Manhole A from a nearby sump. Stormwater entering Manhole A posed a risk of hydraulically surcharging the pipe plug installed during the 2010 TCRA, which in turn could increase the risk of a hazardous substances release to Port Washington Narrows.
- **Hydrocarbon sheen and deposits of solid hydrocarbon material in the SG-04/SG-05 area.** Hydrocarbon sheens were observed in shallow subsurface sediments in the western area of the beach, near stations SG-04 and SG-05. Surficial solid hydrocarbon material was also observed in the SG-04/SG-05 area. Both the sediments containing hydrocarbon sheen and the solid hydrocarbon

material contained elevated concentrations of polycyclic aromatic hydrocarbon (PAH) compounds in comparison to the surrounding beach sediments.

The Removal Evaluation proposed the following removal actions in response to the identified conditions:

- **Plug the connections to Manhole A.** This action was intended to minimize the risk of hydraulic surcharge to the pipe plug and thereby minimize the risk of hydrocarbon releases from the pipe.
- **Remove the accessible solid hydrocarbon material and place a cap over the sediments containing hydrocarbon sheen in the SG-04/SG-05 area.** These actions were intended to minimize the risk of additional releases of hydrocarbons from this area to surface waters of Port Washington Narrows, and to prevent direct contact of beach users to these materials.
- **Install signage to warn beach users regarding the presence of hydrocarbon contaminants in the beach sediments.** The signage will restrict beach uses and provide agency contact information regarding the Site and the ongoing RI/FS study process.

Upon completion of the Removal Evaluation, Cascade prepared a Removal Action Work Plan describing the proposed removal actions in more detail. EPA approved the Final Work Plan and directed Cascade to perform the proposed removal actions in the Action Memorandum (Appendix A).

1.3 Document Organization

This Removal Action Report is organized as follows:

- **Section 2: Removal Action Scope and Implementation.** This section provides a summary of the removal action including a summary of the scope of work and the details pertaining to mobilization, excavation and cover, demobilization, handling and disposal of removed materials, plugging stormwater connections to Manhole A, and post-construction monitoring activities.
- **Section 3: Completion of Removal Action Objectives.** This section outlines the Removal Action objectives and how each objective was addressed.
- **Section 4: Conclusions and Future Work.** This section presents the conclusions of the 2013 TCRA and a brief summary of the future planned work at the Site.
- **Section 5: References.** This section provides a list of references cited in this Removal Action Report.

2 Removal Action Scope and Implementation

Anchor QEA, LLC (Anchor QEA) and Aspect Consulting, LLC (Aspect) were retained by Cascade to assist with development and oversight of the 2013 TCRA. Cascade selected Clearcreek Contractors Inc. (Clearcreek) as the remediation contractor to implement the 2013 TCRA.

Cascade obtained access from the Washington Department of Natural Resources to perform the Removal Action in the intertidal zone through a Consent for Access to Property. Natacha Sesko and the McConkey Family Trust granted access to the upland portion of the Site pursuant to similar agreements. The access agreements are included in Appendix C.

2.1 Scope of Work

The scope of the Removal Action was described in the Work Plan, which EPA approved and directed Cascade to perform pursuant to the Action Memorandum. The Removal Action consisted of the following elements:

- **Removal of two surface deposits of solid hydrocarbon material:** Two localized surface deposits of solid hydrocarbon material were removed from the SG-04/SG-05 area (Figure 2).
- **Placement of a sediment cap over an area of subsurface hydrocarbon sheen:** A sediment cap was placed over the SG-04/SG-05 area where hydrocarbon sheen was observed in subsurface sediments (Figure 2). The cap consists of an organoclay mat covered by clean beach cobbles.
- **Plugging connections to Manhole A:** Manhole A was capped at the ground surface to prevent surface water runoff from entering the manhole. In addition, a sump drain from the adjacent former tank farm containment area that drained to Manhole A was also plugged. Following plugging of the sump drain, at the direction of EPA, additional work was conducted to prevent surface water from draining and accumulating in the tank farm containment area, which consisted of replacement of a catch basin and connection of the new catch basin to a City of Bremerton (City) storm drain line.
- **Installing signs:** Signs were installed on each end of the intertidal beach area and on a path leading to the beach from Pennsylvania Avenue (Figure 2). These signs contain wording to alert potential beach users to the presence of hydrocarbon contaminants, provide guidance on measures to minimize exposure to Site contaminants, and include EPA contact information.
- **Beach monitoring:** Inspection of the 2013 TCRA sediment cap commenced immediately after installation at regular and frequent intervals until it was confirmed that the cap area was stable. Monitoring activities of both the 2013 TCRA area and the 2010 TCRA area continue to be performed on a quarterly basis.

The details of the mobilization, daily work activities, plugging of Manhole A, demobilization, signage installation, and disposal of investigation and action derived waste are provided in the following sections. Waste characterization for disposal was performed as part of the Removal Evaluation as reported in Appendix C of the Removal Evaluation Report (Anchor QEA and Aspect 2013a). No additional sampling or laboratory analysis was conducted as part of the Removal Action.

2.2 Mobilization

Mobilization and staging of construction materials and equipment, locating and marking of underground utilities, and pre-construction meetings were completed prior to the beginning of the first work shift on October 12, 2013. The mobilization included layout and setup of upland and intertidal exclusion work zones.

The materials and equipment mobilized to the upland staging area on October 11, 2013 included:

- 175-ton mobile crane
- Approved cap material (10-inch streambed cobbles per Section 9-03.11(2) of the 2012 Washington State Department of Transportation Standard Specifications)
- Lined decontamination pad
- Three Magnum light plants
- Deere 310J loader
- Deere 50D mini excavator
- Canycom S25A mini carrier
- Two-yard skip box
- Temporary restroom facilities
- Questar Nova lined super sacks for excavated material
- Measured, pre-cut, and rolled sections of reactive core organoclay mat (see Appendix D for specifications)

In addition to the materials and equipment mobilized, the following installations were completed:

- A temporary 40-foot extension was added to the stormwater outfall in the intertidal exclusion zone to divert any stormwater away from the work area.
- A 5-inch-diameter oil boom containment was deployed and anchored in the water adjacent to the work area.
- A 1.5-inch-diameter mooring line securing a large steel float to an existing timber pile was cut from the pile and secured to an existing steel angle bolted to a concrete retaining wall, using a 1-inch steel shackle.

2.3 Activities of October 12, 2013 (Shift No. 1)

The 2013 TCRA began on October 12, 2013. Work was conducted in the dry during early morning low tides. Activities conducted during Shift No.1 included:

- Holding a pre-work health and safety tailgate meeting to discuss safety procedures, potential hazards, and receive sign-off on the Site Health and Safety Plan from all present.
- Placing equipment (light plant, mini excavator, and mini carrier) on the beach using the 150-ton crane.
- Surveying and marking-out locations for placement of the reactive core mats using a differential global positioning system (DGPS).
- Preparing the surface of the area to be capped by clearing debris and larger cobbles by hand and with the mini excavator.
- Removing the existing timber pile from within the footprint of the cap by cutting it off at the mudline.
- Removing scattered carbonaceous briquettes from the beach area where they were exposed and accessible.
- Excavating the two localized surface deposits of solid hydrocarbon material and placing excavated material into super sacks.
- Placing small sections of organoclay mat directly over the solid hydrocarbon excavated areas and securing them in place with pea gravel to serve as temporary cover during the tide cycles occurring prior to the installation of the larger mat and rock cap.
- Surveying the locations of the two excavations with a DGPS.
- Removing equipment from the intertidal work area with the crane and staging it in the upland area until the next low tide work window.

The Anchor QEA daily construction report from Shift No. 1 is provided in Appendix E.

2.4 Activities of October 14, 2013 (Shift No. 2)

The 2013 TCRA continued on October 14, 2013. Work was conducted in the dry during early morning low tides. Activities conducted during Shift No.2 included:

- Holding a pre-work health and safety tailgate meeting to discuss safety procedures, potential hazards, and lessons learned from the work conducted on the first night.
- Placing equipment (light plant and mini excavator) on the beach using the 175-ton crane.
- Placing pea gravel over the cut-off pile to protect the underside of the organoclay mat.

- Placing the first three sheets (15-foot by 50-foot panels) of organoclay mat starting with the lowest, +2 feet mean lower low water (MLLW), sheet and working upslope within the intertidal area.
- Surveying installed locations of organoclay mats with a DGPS.
- Placing cap rock on the organoclay mat in a 1-foot-thick lift extending 10 feet beyond the edges of the mat using the crane and mini excavator.
- Removing scattered carbonaceous briquettes from the beach area where they were exposed and accessible.
- Installing two sign posts on the beach at the locations specified in the Work Plan for the east and west limits of the intertidal beach area.
- Removing equipment from the intertidal work area with the crane and staging it in the upland area until the next low tide work window.

The Anchor QEA daily construction report from Shift No. 2 is provided in Appendix E.

2.5 Activities of October 15, 2013 (Shift No. 3)

Shift No. 3 of the 2013 TCRA was conducted on October 15, 2013, and included completion of cap installation in the intertidal beach work area, plugging of Manhole A, and contractor demobilization from the Site, as described in the subsections below. The Anchor QEA daily construction report from Shift No. 3 is provided in Appendix E.

2.5.1 Beach Activities

Intertidal beach work was conducted in the dry during early morning low tides. Activities conducted during Shift No.3 included:

- Holding a pre-work health and safety tailgate meeting to discuss safety procedures, potential hazards, and lessons learned from the work conducted on the first and second nights.
- Placing equipment (light plant and mini-excavator) on the beach using the 175-ton crane.
- Placing the fourth sheet (15-foot by 50-foot panel) of organoclay mat along the north edge of the concrete bulkhead and a fifth, smaller, sheet along the east edge of the concrete bulkhead.
- Surveying installed locations of organoclay mats with a DGPS.
- Placing cap rock on the organoclay mat in a 1-foot-thick lift extending 10 feet beyond the edges of the mat using the crane and mini excavator.
- Final grading of the 1-foot-thick layer of cap rock over and extending 10 feet beyond all five sheets.

2.5.2 Plugging of Manhole A

Work was conducted in accordance with the Work Plan with modifications to construction details as approved on site by EPA based on observed conditions. Following removal of surface debris from the shallow subsurface inside the manhole, a concrete ring was set into the ground surface around the manhole. The concrete ring extends

approximately 12 inches above the ground surface and is covered with a steel plate that has been bolted to the concrete for security. The ground surface around Manhole A was graded to divert surface water runoff away from the manhole. In addition, the sump drain that connected the tank containment to Manhole A was plugged by emplacing and securing an expanding cap with rubber gasket seal into the 4-inch drain pipe. Photos of the work at Manhole A and the sump drain are provided in Appendix F.

2.5.3 Demobilization

Demobilization of the upland staging was conducted on October 15, 2013, following completion of the work in the intertidal beach area and Manhole A activities. The following demobilization actions were completed:

- The crane was demobilized from the Site.
- The stormwater outfall extension was removed.
- The mooring line securing the steel float was reattached to the steel angle bolted to the concrete retaining wall, using a 1-inch steel shackle.
- The lined waste containers were covered and secured.
- Rental equipment was decontaminated and the rental agency was contacted for pickup.
- The decontamination pad was disassembled.
- Remaining pieces of organoclay mat were wrapped up and placed in the McConkey storage facility.

2.6 Activities of November 4, 2013

Additional work was performed on November 4, 2013, following coordination with disposal facilities and completion of intensive intertidal area post-construction monitoring. Activities conducted at this time included:

- Removal for off-site disposal of materials generated during Site investigations and during the removal action.
- Removal of the sorbent boom from the intertidal work area.
- Repair of the McConkey Property fence.
- Final demobilization of remaining miscellaneous contractor equipment at the Site.
- Installation of a sign post at the end of Pennsylvania Avenue.

The Anchor QEA daily construction report from November 4, 2013 is provided in Appendix E.

2.7 Activities of December 20, 2013

Following EPA approval of the language and content (Appendix G), the signs were produced and installed at the three locations specified in the Work Plan. This work was

conducted on December 20, 2013. The Anchor QEA daily construction report from December 20, 2013, is provided in Appendix E.

2.8 Characterization and Disposal of Removed Materials

All investigation and action derived wastes were characterized for disposal as prescribed in the Site Specific Sampling Plan (Aspect 2013) and presented in Appendix C of the Removal Evaluation Report (Anchor QEA and Aspect 2013a). The removed materials included the following:

- Soil cuttings generated during sediment sampling activities in the intertidal zone and soil sampling at an upland location.
- Decontamination water generated during sampling activities.
- The solid hydrocarbon material removed from the intertidal zone as part of the Removal Action.

The analytical results were submitted along with the completed disposal profile forms to Chemical Waste Management of the Northwest, Inc. (Chem Waste), which subsequently approved separate solid and liquid disposal profiles and prepared the Non-Hazardous Waste Manifests for transport and disposal of the materials. The material was transported to Arlington, Oregon, for disposal at the Chem Waste Subtitle C landfill as approved by EPA. The manifests and disposal certifications are included in Appendix H.

2.9 Monitoring and Inspections

Monitoring and inspection of the Site and the elements of the completed Removal Action is conducted on an ongoing basis. The intertidal beach area and Manhole A drainage pathways were monitored more intensively immediately following construction activities.

2.9.1 Beach Inspections

Pursuant to the Work Plan, the 2013 TCRA intertidal sediment cap area was inspected weekly for the first 4 weeks following completion, and then monthly through December 2013. Quarterly inspections began in January 2014 and will be conducted concurrently with quarterly inspections of the 2010 TCRA area.

As part of the inspections, the surface of the cap and water surrounding the 2013 TCRA area are visually monitored for the presence of product or sheen and to ensure the stability of the cap materials. Monitoring has shown that the TCRA was successful. There has been no evidence during any inspection of hydrocarbon product or sheen, and the cap has been physically stable.

Inspections have also shown that the TCRA performed in 2010 continues to be successful. No hydrocarbon sheens have been noted in the area capped during that action, and there has been no evidence of leakage from the plugged concrete pipe. The cap continues to be physically stable and has been extensively colonized by algae and invertebrate life (i.e., barnacles).

2.9.2 Manhole A Inspections

Pursuant to the Work Plan, Manhole A area was visually monitored during and following significant rain events to assess whether the actions taken in and around Manhole A

resulted in any adverse impacts (e.g., significant increases in sheet flow). No adverse effects have been observed following plugging of Manhole A. However, inspections noted that a nearby catch basin on property located adjacent and to the south of the McConkey Property, which is owned by Penn Plaza Storage LLC (Penn Plaza Property), was draining into the tank containment area during rain events. This resulted in accumulation of rain water in the bottom of the containment area that formerly drained to Manhole A. As described in Section 2.10, additional actions were taken as directed by EPA to eliminate this source of runoff into the containment area and prevent excessive water accumulations.

2.10 Additional Actions to Control Runoff

At the direction of EPA, Cascade developed a plan to remove and replace the catch basin that was discharging stormwater into the containment area. Cascade discussed the plan with the City, which determined that the stormwater captured by the catch basin could be diverted to the City storm drain line as long as the catch basin was replaced to meet current construction standards. Accordingly, Cascade executed an agreement with Penn Plaza Storage LLC to allow Cascade to replace the catch basin and connect it to the City storm drain line. On March 24 and 25, Clearcreek removed the old catch basin, installed a new, "Type I" catch basin, and connected it to the 18-inch polyvinyl chloride (PVC) storm drain line with an Inserta "T" and a 6-inch PVC pipe. Photos of the catch basin replacement are provided in Appendix F.

During the catch basin installation, approximately 4.54 tons of soil were removed that could not be replaced, primarily due to the larger size of the new catch basin. A faint petroleum odor was noted, and a soil sample was collected for analysis, in accordance with landfill acceptance requirements. Laboratory certificates are provided in Appendix I. Diesel-range petroleum was detected in the soil at a concentration of 1,500 mg/kg. The soil was disposed of at the CEMEX facility in Everett, Washington, which is permitted to accept low-level petroleum-contaminated soil. Disposal receipts are also included in Appendix I.

3 Completion of Removal Action Objectives

The Removal Action met all objectives specified in the Work Plan and completed all work elements described in the Work Plan, including the following:

- Removal of solid hydrocarbon material identified in the western beach area.
- Installation of an organoclay mat and cover over hydrocarbon sheen in subsurface sediments in the western beach area.
- Plugging Manhole A and the sump drain from the tank containment area.
- Completing beach monitoring inspections to confirm the effectiveness of the 2013 TCRA. Quarterly monitoring inspections are ongoing.
- Installing required signage.

Work was completed in general accordance with the Work Plan. Three modifications to the scope of work specified in the Work Plan were made with EPA approval based on observed conditions as summarized below:

- The extent of the organoclay mat and cover in the northeast portion was extended to cover sediments exposed by removal of the solid hydrocarbon material from the intertidal area as shown on Figure 2.
- Manhole A was plugged using a concrete ring extending above ground surface with a bolted steel cover.
- Consistent with approvals obtained from the City and pursuant to an access agreement with Penn Plaza Storage LLC, a catch basin draining into the tank containment area was rerouted to a City storm drain line, to prevent accumulation of stormwater in the containment area.

4 Conclusions and Future Work

As described in Section 3, all objectives of the 2013 TCRA were completed successfully. All work was completed without incident, and there was no incidence of hydrocarbon or sheen release to Port Washington Narrows during performance of the work.

Additional evaluations are to be conducted as part of the RI/FS activities. These activities will be completed in accordance with the AOC. Cascade, its consultants, and EPA are currently conducting scoping for the RI/FS activities in coordination with project stakeholders. Additional investigations to be performed during the RI/FS will fully characterize Site conditions, determine the nature and extent of contamination, and collect data required to assess the risks to human health or the environment and support the development of a feasibility study.

5 References

Anchor QEA, 2011. *Final Completion Report, Former Bremerton MGP Site Incident Action and Time Critical Removal Action*. Prepared for U.S. Coast Guard Sector Puget Sound Incident Management Division on behalf of Cascade Natural Gas Corporation. January 2011.

Anchor QEA and Aspect Consulting, 2013a. *Final Removal Evaluation Report, Bremerton Gas Works Site*. Prepared for Cascade Natural Gas Corporation. December 2013.

Anchor QEA and Aspect Consulting, 2013b. *Final Removal Evaluation Work Plan, Bremerton Gas Works Site*. Prepared for Cascade Natural Gas Corporation. June 2013

Aspect Consulting, LLC, 2013. *Site Specific Sampling Plan, Bremerton Gasworks Waste Profiling*. Prepared for the U.S. Environmental Protection Agency. August 13, 2013.

FIGURES



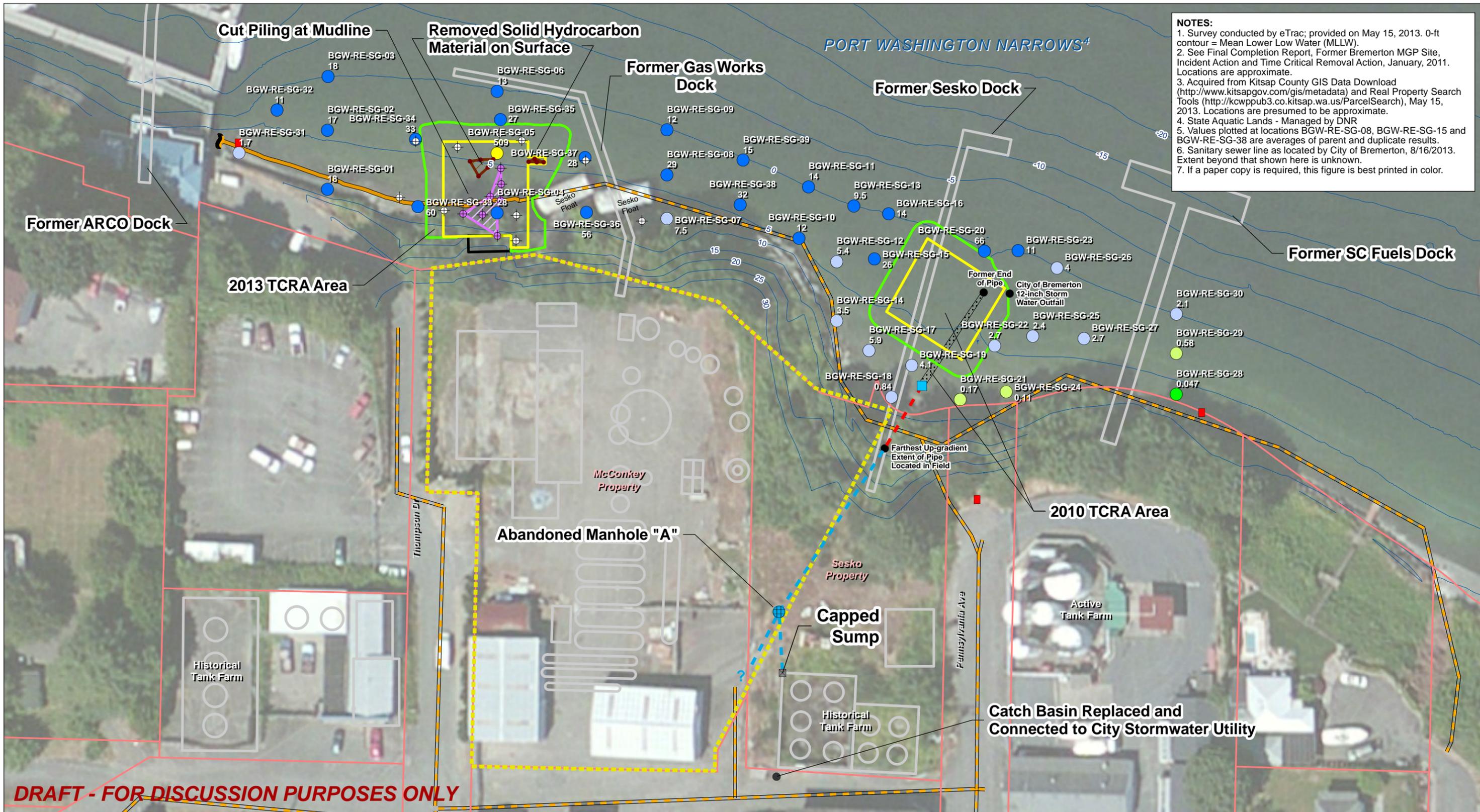
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NOTE:
 If a paper copy is required, this figure is best printed in color.

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Former Gas Works Location and Vicinity
 Removal Action Report
 Bremerton Gas Works
 Bremerton, Washington

		<small>FIRM:</small> ANCHOR QEA	<small>FIGURE NO.</small> 1
		<small>DRAWN BY:</small> cckblinger	

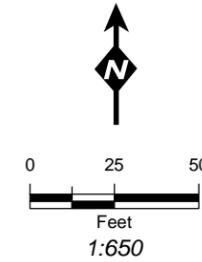


NOTES:

1. Survey conducted by eTrac; provided on May 15, 2013. 0-ft contour = Mean Lower Low Water (MLLW).
2. See Final Completion Report, Former Bremerton MGP Site, Incident Action and Time Critical Removal Action, January, 2011. Locations are approximate.
3. Acquired from Kitsap County GIS Data Download (<http://www.kitsapgov.com/gis/metadata>) and Real Property Search Tools (<http://kcwppub3.co.kitsap.wa.us/ParcelSearch>), May 15, 2013. Locations are presumed to be approximate.
4. State Aquatic Lands - Managed by DNR
5. Values plotted at locations BGW-RE-SG-08, BGW-RE-SG-15 and BGW-RE-SG-38 are averages of parent and duplicate results.
6. Sanitary sewer line as located by City of Bremerton, 8/16/2013. Extent beyond that shown here is unknown.
7. If a paper copy is required, this figure is best printed in color.

DRAFT - FOR DISCUSSION PURPOSES ONLY

<ul style="list-style-type: none"> ⊕ Test Plots with no Observed Sheen ⊕ Test Plots with Observed Sheen • Hydrocarbon Solid Observations ■ Approximate Public Notice Sign Location — Field-located Sanitary Sewer Line⁶ — Sanitary Sewer (Not Field Located) ↪ Sewer Line Continues West from this Location 	<p>Surface Sediment cPAH mg/kg TEQ⁵</p> <ul style="list-style-type: none"> ● 0.047 - 0.08 ● 0.081 - 0.8 ● 0.81 - 8 ● 8.1 - 80 ● 81 - 509 	<ul style="list-style-type: none"> ■ 2010 TCRA/IA Pipe Plug Location² — Remaining 12-inch Concrete Pipe² ● Field Verified Pipe Location ■ Capped Sump ■ Area of Observed Hydrocarbon-like Sheen ■ Solid Hydrocarbon-like Material ■ Historical Structures ■ Former Gas Works Location 	<ul style="list-style-type: none"> ■ Approximate Reactive Core Mat Cover Areas ■ Approximate Reactive Core Mat Areas ■ Pipe Removed and Backfilled to Grade² ■ Parcel Boundaries³ — Storm Sewer (Not Field Located) — Bathymetry/Topography Contours (MLLW ft)¹
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Removal Action
Removal Action Report
Bremerton Gas Works
Bremerton, Washington

		<small>FIRM:</small> ANCHOR QEA <small>DRAWN BY:</small> ckiblinger	<small>FIGURE NO.</small> 2
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GIS Data: Clark County GIS Data Download - Bremerton, 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APPENDIX A
EPA Action Memorandum



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ENVIRONMENTAL
CLEANUP

SUBJECT: Action Memorandum for a Time-Critical Removal Action at the
Bremerton Gas Works Site, Bremerton, Kitsap County, Washington

FROM: Kathy Parker, On-Scene Coordinator *cm Parker*
Emergency Preparedness and Prevention Unit

TO: Chris D. Field, Manager
Emergency Management Program

THRU: Wally Moon, Manager *WJM*
Emergency Preparedness and Prevention Unit

I. Purpose

The purpose of this memorandum is to request and document approval for a time-critical removal action (TCRA) described herein for the Bremerton Gas Works Site (Site), Bremerton, Kitsap County, Washington. The proposed TCRA will be conducted by a potentially responsible party, Cascade Natural Gas Corporation (Cascade). The work will be performed by Cascade in accordance with the Settlement Agreement entered into with EPA on May 1, 2013 pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

II. Site Information

A. Site Description

Site Name:	Bremerton Gas Works Site
Superfund Site ID (SSID):	10JS
NRC Case Number:	N/A
CERCLIS Number:	WAH001002907
Site Location:	1725 Pennsylvania Ave., Bremerton, WA 98310
County:	Kitsap County
Lat/Long:	47.578 North, 122.643 West
Currently Identified Potentially Responsible Parties:	Cascade Natural Gas Corporation
Access:	Partially fenced
NPL Status:	Listed on May 10, 2012
Removal Action Start Date:	October 12, 2013

B. Site Background

1. 2010 TCRA

A TCRA was conducted at the Site in 2010 after multiple observations of hydrocarbon sheen were reported near the Port Washington marina. These reports were investigated by Kitsap County Health District (Kitsap Health). Kitsap Health identified the source of the sheens to be a black oily liquid discharging from a dislocated joint in a cement pipe buried approximately one foot below ground surface (bgs) in the intertidal area due north of the property owned by Natacha Sesko. Kitsap Health reported the release to EPA on October 4, 2010.

The EPA On-Scene Coordinator (OSC) visited the site on October 5, 2010 and collected samples of the oily liquid discharging from the pipe for analysis of its polynuclear aromatic hydrocarbon (PAH) constituents. The results indicated that the liquid contained PAHs. EPA placed a temporary surficial rope-type boom around the impacted beach area to prevent the surface migration of the oily liquid and mitigate the release of PAHs to marine waters.

The EPA OSC notified the USCG of the release in their jurisdiction and put out a temporary boom to contain the sheen. On October 6, 2010, the USCG mobilized to the Site. By October 10, 2010, USCG had replaced the temporary boom installed by EPA with a two-level boom to contain both light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL) fractions of the released material. On October 16, 2010, USCG commenced activities to mitigate the apparent discharge from the pipe. The activities included breaking a 4-foot section of the pipe with a hydraulic hammer, plugging the pipe-end in that area, and placing hydraulic cement over the temporary plug. These activities were implemented by an emergency response contractor working at the direction of the USCG.

After replacement of the boom, EPA and the USCG conducted a joint removal assessment to gain a basic understanding of any risks posed to human health and/or the environment by releases or threatened releases at the Site. The USCG established a Unified Command to assist with the response activities. The Unified Command initially included representatives of USCG, EPA, Ecology, Washington Department of Natural Resources (DNR), and Kitsap Health.

On October 19, 2010, Cascade met with USCG, EPA, and the rest of the Unified Command to discuss additional actions appropriate at the Site. The USCG subsequently added Cascade to the Unified Command and issued Cascade an Administrative Order for a Pollution Incident (Order) to implement response

actions at the Site USCG oversight. Cascade accepted the Order in a letter dated October 29, 2010.

The work conducted pursuant to the Order included:

- Locating the pipe and tracing it to the shoreline;
- Plugging the pipe as close as practicable to the shoreline;
- Removing all pipe sections down gradient of the new plug together with all overburden sediments;
- Filling all excavations to grade with clean beach material; and
- Placing a cap consisting of an organo-clay mat covered with a foot of clean imported beach rock over the area of impacted sediments near the end of the pipe.

2. Removal Evaluation Findings

Cascade completed sampling of sediment in the intertidal beach area during July 2013, consistent with the Removal Evaluation Work Plan approved by EPA pursuant to the Settlement Agreement. The purpose of the sampling was to evaluate sediment quality adjacent to the former gasworks and to provide EPA with the information necessary to determine whether a removal action is required to protect human health and the environment and minimize potential impacts to sediment and surface water quality within Port Washington Narrows prior to completion of the RI/FS.

Sampling activities were initiated July 8, 2013 by Cascade and its contractors. EPA provided oversight during sampling activities. Work included sampling of the intertidal beach sediments, investigation of the existing drainage pipes located in the upland portion of the Site, and inspection of the bluff for evidence of hydrocarbon seeps or other potential ongoing or threatened contaminant migration pathways to the beach.

The following key investigatory findings from the Removal Evaluation are documented in the Removal Evaluation Report:

- The cap in the eastern portion of the beach area continues to be effective. No hydrocarbon-like sheen was observed in this area, which is consistent with the results of previous visual monitoring activities. Concentrations of PAHs and carcinogenic PAHs (cPAHs) (Figure 2 and Attachment 1) were lower in this area than in beach areas to the west. Additionally, the measured concentrations of cPAHs in the vicinity of the cap were lower than those measured previously in 2010.
- Sampling indicated elevated concentrations of cPAHs in surface sediment. The measured cPAH concentrations exceeded preliminary risk screening values defined in the Removal Evaluation Work Plan based on a child beach-play exposure scenario.
- The highest cPAH concentrations were noted at station BGW-RE-SG-05 (Figure 2), located adjacent to a localized surface deposit of solid

hydrocarbon-like material that measured approximately 10-feet by 15-feet. An additional 2-feet by 8-feet deposit of solid hydrocarbon-like material was observed slightly to the east of the larger deposit. A visible hydrocarbon-like sheen was also observed in subsurface sediments between this area and the bluff. All observations are presented in Figure 2.

- Within the upland portion of the Site (the area of the site above the high tide line), two pathways were identified that could result in rain water entering the drainage pipe that was the subject of the 2010 TCRA. Although the drainage pipe has been plugged at the high water line of the beach, the pipe appears to be connected to Manhole A, located on the west side of property owned by Natacha Sesko (see Figure 2). Surface water on the Sesko property appears to drain into Manhole A, which is open at the surface. The drainage pipe is believed to still contain black oily liquid known to contain high levels of PAHs.

Based on the results of the Removal Evaluation, EPA has directed Cascade to prepare a Removal Action Work Plan describing actions to be taken to minimize potential risks to human health and the environment and further protect sediment and surface water quality within the Port Washington Narrows from potential releases of Site-associated hydrocarbon materials. These actions are described in Section IV below.

3. Physical Location and Site Characteristics

The Site vicinity is shown in Figure 1. The geospatial coordinates of the Site are 47.578 North Latitude, 122.643 West Longitude. The Site is located on the southern shoreline of Port Washington Narrows, a tidal inlet connecting Sinclair Inlet to Dyes Inlet.

Operations at the former Gas Works were located within portions of two current shoreline industrial properties as shown on Figure 2. The eastern property is owned by Natacha Sesko (tax parcel 3711-000-022-0101). The western property (tax parcels 3711-000-001-0409 and 3711-000-001-0607) is owned by the McConkey Family Trust.

The former Gas Works also included a former dock located within leased harbor areas owned by the State and managed by the Washington State Department of Natural Resources (DNR). The DNR-managed lands also include portions of the bluff, the intertidal beach area adjacent to the Site, and sediments underlying Port Washington Narrows.

As shown in Figure 2, a City of Bremerton sewer force main is located beneath portions of the beach at the Site. Based on available record drawings, the force main was installed initially around the 1950s and was replaced in the 1980s. The force main is buried several feet beneath the beach within the DNR-managed harbor areas and the northern portion of the Sesko property.

The property located immediately east of the Site is zoned for industrial use, and is used for operation of a bulk petroleum terminal. Properties further east are zoned for residential use and include single-family and multi-family residences.

The properties located immediately south and west of the Site are zoned for industrial uses. The Port of Washington Narrows marina is located to the west of the Site. The marina includes both recreational boat moorage and numerous live-aboard vessels.

A City of Bremerton recreational park, Lions Park, is directly north, across Port Washington Narrows, from the Site.

There are no known or identified historical landmarks or cultural structures with historical significance at the Site although the Suquamish Tribe has stated in comments to EPA that the Site is located in an area where there are native soils with a high potential for archaeological resources.

The Suquamish Tribe is a federally recognized Tribe with usual and accustomed fishing and shellfish harvesting areas in portions of Hood Canal and Puget Sound, including Sinclair Inlet and Dyes Inlet and the vicinity of the Site. Puget Sound (including Sinclair and Dyes Inlets) also includes active commercial and recreational fisheries. The Washington State Department of Health monitors portions of Dyes Inlet under its Shellfish Growing Area Program. Local agencies and the Suquamish Tribe have been working to upgrade water quality and to expand areas of shellfish harvesting that remain restricted by bacterial contamination associated with storm water discharges and combined sewer overflows.

Migratory birds are known to pass through the area of the Site.

4. Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant or Contaminant

As described in the Removal Evaluation Report (Anchor QEA and Aspect, 2013a), sampling confirmed the presence of an existing release and conditions that could threaten to cause further releases of hazardous substances into the environment.

Human Health:

Although the intertidal beach is not a designated public access area, physical access to the beach is currently unrestricted. Use of the beach by the community has been noted by EPA. The Removal Evaluation Work Plan included development of preliminary human health risk screening values for a child beach-play exposure scenario. The screening values developed in that analysis for cPAHs were expressed as the benzo(a)pyrene toxicity equivalent concentrations (TEQ). The resultant screening values were calculated to be

8 mg cPAH TEQ/kg at the 1×10^{-4} risk threshold and 0.08 mg cPAH TEQ/kg at the 1×10^{-6} risk threshold.

Sampling indicated that cPAH compounds are present at elevated concentrations in sediments within the intertidal beach area of the Site. Concentrations were lowest along the eastern edge of the Site and near the sediment cap placed as part of the 2010 TCRA. As shown in Table 1 and in Figure 2, most samples within the central and western portions of the beach exceeded the 1×10^{-4} risk threshold (8 mg cPAH TEQ/kg) and one location (station BGW-RE-SG-05) in the western beach area exceeded the 1×10^{-3} risk threshold (80 mg cPAH TEQ/kg).

Hydrocarbon-like sheen was also noted in shallow subsurface sediments between sampling stations BGW-RE-SG-04 and BGW-RE-SG-05 and the foot of the bluff. The most contaminated sample of these subsurface sediments exceeded 350 mg cPAH TEQ/kg. EPA determined that these subsurface sediments could present an additional human health exposure risk in the event that these subsurface sediments were disturbed (e.g., by people digging on the beach).

Ecological Risk:

As documented in the Removal Evaluation Report, the sediment PAH concentrations were also screened for potential impacts to the sediment benthic community. That screening included comparison of the analytical results to numeric criteria contained within Washington State Sediment Management Standards (SMS) set forth in state regulations (WAC 173-204). Where the total organic carbon (TOC) content was within range for TOC normalization (0.5% to 5%), individual PAHs, low-molecular weight PAHs (LPAH), and high molecular weight PAHs (HPAH) were compared to the SMS criteria on an organic carbon normalized (OCN) basis. For stations where the TOC content was outside of this range, the measured concentrations were compared to the Lowest Apparent Threshold Limit (LAET) or 2LAET (Second LAET) criteria.

Results confirmed that sediments within portions of the beach area had the potential to result in impacts to the benthic community. Although no benthic risk assessment has been performed yet, individual PAH parameters, low molecular weight PAHs, and high molecular weight PAHs results exceeded SMS criteria Cleanup Screening Level (CSL). The highest potential for impacts (based on the level of exceedance of the SMS numeric criteria) was noted in the western beach area at station BGW-RE-SG-05. No confirmatory bioassay or benthic community testing was performed as part of the Removal Evaluation.

Potential for migration to the surrounding environment

Results of visual monitoring and the testing performed during the Removal Evaluation confirmed that the cap placed in the 2010 TCRA area has been effective at controlling hydrocarbon sheens in this area. However, two conditions

were noted at the Site that had the potential to result in migration of hazardous substances into the surrounding environment.

- **Rain Water Pathways to Manhole A:** Manhole A is believed to remain connected to the pipe that was plugged as part of the 2010 TCRA. Based on inspections conducted as part of the Removal Evaluation, rain water can enter Manhole A through surface runoff and a piping connection. That water has the potential to surcharge the plug at the lower end of the pipe that was installed during the 2010 TCRA, which in turn could potentially result in further releases of hazardous substances remaining in the pipe to Port Washington Narrows. This risk can be minimized by appropriately plugging the piping connection and directing surface runoff away from the manhole.
- **Hydrocarbon-Like Sheens in Shallow Subsurface Sediments of the Western Beach Area:** Hydrocarbon-like sheens were observed in shallow subsurface sediments in the vicinity of sample location BGW-RE-SG-04 and BGW-RE-SG-05. These subsurface sediments have the potential to release additional hazardous substances in the form of PAHs to surface waters of Port Washington Narrows if they are disturbed (e.g., by storm action or by people digging in the beach sediment). This risk can be minimized by applying a sediment cap similar to that placed in the eastern beach area during the 2010 TCRA.

III. Threats to Public Health Welfare or the Environment

A. Nature of Actual or Threatened Release of Hazardous Substances, Pollutants or Contaminants.

The current conditions at this Site meet the following factors which indicate that the Site is a threat to public health or welfare or the environment and a TCRA is appropriate under the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) , 40 C.F.R. § 300.415(b)(2).

B. Applicable Factors (from 40 CFR 300.415) Which Were Considered in Determining the Appropriateness of a Removal Action:

1. *Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants [300.415(b)(2)(i)]:*

The elevated concentrations of cPAHs found on the beach at the Site indicate that a direct contact exposure pathway exists. Access to the beach is not restricted and the beach is occasionally used recreationally by nearby community members. Exposure to cPAHs may result in potential health risks through dermal contact, incidental ingestion, and inhalation. Continued exposure to cPAHs can result in an increased risk of developing cancer.

2. *High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate [300.415(b)(2)(iv)]:*

The analytical results show that cPAHs are present at elevated concentrations in the beach surface sediments, particularly in the western beach area near sampling station BGW-RE-SG-05. In addition, hydrocarbon-like sheen was noted in shallow subsurface sediments that could release hazardous substances in the form of PAHs to other beaches on the Port Washington Narrows if these sediments are disturbed by storm action or digging.

3. *Weather conditions that may cause hazardous substances or pollutants to migrate or to be released [300.415(b)(2)(v)]:*

Surface water generated from rain fall may enter Manhole A, which could in turn surcharge the plugged pipe down-gradient of Manhole A. This could potentially result in releases of the hazardous substances in the form of PAHs in the black oily liquid remaining in the pipe (i.e., if the plug or lower pipe sections fail) to Port Washington Narrows.

In addition, tidal action can cause migration of contaminated sediments from the beach to Port Washington Narrows spreading PAHs to the marine environment.

4. *The availability of other appropriate federal or state response mechanisms to respond to the release [300.415(b)(2)(vii)]:*

The proposed TCRA is expected to be conducted by Cascade, pursuant to the Settlement Agreement. The Washington State Department of Ecology and the USCG referred the Site to EPA because they did not have the capacity to oversee the work. There are no other known appropriate federal or state response mechanisms capable of providing the appropriate resources in the prompt manner needed to address the potential human health and ecological risks associated with hydrocarbon-like sheen and elevated cPAH concentrations in the western beach area or the potential for rain water entry and pipe surcharge at Manhole A.

IV. Endangerment Determination

Actual or threatened releases of hazardous substances from the Site may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. Selected Removal Action and Estimated Costs

A. Situation and Removal Activities to Date

1. Current Situation

Cascade has developed a Removal Action Work Plan (Anchor QEA and Aspect, 2013c) that addresses the proposed TCRA elements identified by EPA. That work plan will be reviewed and approved by EPA. Cascade and EPA have also secured property access rights as necessary to implement the actions described in the work plan, including access to the Sesko and McConkey properties and to the State-owned lands managed by DNR. Cascade has retained contractors and is prepared to implement the work under EPA oversight.

2. Removal Activities to Date

In November 2010, Cascade, under order from the USCG, removed the leaking pipe and contaminated sediments on the beach, permanently plugged the beach end of the pipe, covered the vicinity of the former pipe with a reactive core organo-clay mat, and secured the mat with a one-foot-thick layer of imported beach material (streambed cobbles). Visual monitoring conducted by Cascade between 2010 and 2013 demonstrated that the 2010 TCRA has been effective at preventing the recurrence of hydrocarbon sheen in this area. In December 2010, the USCG referred the Site to the EPA for further cleanup under CERCLA since the majority of the site is upland in EPA area of responsibility and the PAHs remaining on the beach appear to be migrating there from the upland.

B. Planned Removal Action

1. Removal Action Description

The proposed TCRA is described in detail in the Removal Action Work Plan and will include specific activities within the beach area and the upland portion of the Site, including the following:

- **Removal of solid hydrocarbon-like material:** The localized surface deposit of solid hydrocarbon-like material (approximately 5 cubic yards) located near sampling station BGW-RE-SG-05 will be removed. The removed material will be sent to an appropriately-permitted off-site treatment/storage/disposal facility.
- **Placement of a sediment cap over an area of subsurface hydrocarbon-like sheen:** As shown in Figure 2, a sediment cap, approximately fifty feet square, will be placed over the western beach area where a hydrocarbon-like sheen was noted in subsurface sediments (i.e., adjacent to locations BGW-RE-SG-04 and BGW-RE-SG-05). Placement of the cap will require removal of a creosote-treated piling within the mat placement area. The cap will use the same design as that used successfully in the eastern beach area in 2010. The cap will consist of an organo-clay mat covered by streambed

cobbles. The cobbles will protect the cap against wave erosion and will limit potential human disturbance (e.g., digging) of the cap. Specifications for the organo-clay mat are provided in Attachment 2. Specifications for the materials that will cover the organo-clay mat are provided in Attachment 3. The cap will be designed to remain in place for several years, throughout the performance of the RI/FS to minimize potential impacts to sediment and surface water quality within Port Washington Narrows. Cascade will continue to perform beach monitoring following completion of the TCRA to confirm that conditions remain stable and that the completed TCRA elements continue to meet their objectives. Cascade is responsible for operation and maintenance of the cap with oversight by the EPA remedial program.

- **Plugging of connections to Manhole A located within the upland area of the Site:** This manhole is associated with the pipe that was plugged at the beach during the 2010 TCRA. Plugging of the remaining connections to Manhole A will minimize potential rain water intrusion into the pipe, and thereby minimize potential risk of future oily liquid and PAHs release from the pipe.
- **Installation of signage:** Signage will be installed on the beach to alert potential beach users to the presence of contamination and provide guidance on measures to protect their health.

Attachment 3 describes Best Management Practices (BMPs) that will be used by Cascade and its contractors to minimize potential impacts to human health and the environment during performance of the TCRA. These BMPs are specified in the Removal Action Work Plan

2. Contribution to Remedial Performance

The Site was added to the National Priorities List in May of 2012. In May of 2013, EPA and Cascade executed the Settlement Agreement for performance of a RI/FS. The scope of work in the Settlement Agreement specified performance of a Removal Evaluation and a possible removal action prior to initiating scoping for the RI/FS.

The proposed removal action will, to the extent practicable, contribute to the efficient performance of any long term remedial action by minimizing the potential for further releases to Port Washington Narrows and by removing hydrocarbon materials containing high concentration of cPAHs from the beach (i.e., materials near sampling station BGW-RE-SG-05). This action was developed in consultation with the EPA remedial program manager, Bill Ryan, for the Site to ensure it is consistent with any potential long term cleanup designs for the Site. Immediate immobilization of the high concentration cPAHs on the beach will prevent further spread of the contamination and protect people from contact until a final remedy can be implemented.

3. Applicable or Relevant and Appropriate Requirements (ARARs)

Removal actions conducted under CERCLA authority must comply with other state and federal Applicable or Relevant and Appropriate Requirements (ARARs) to the extent practicable given the urgency of the situation and the scope of the removal action (40 CFR 300.415[i]). Local regulations may be included as “to be considered” (TBC) standards, but are not designated as ARARs under CERCLA.

ARARs consist of promulgated federal and stricter state environmental or facility siting laws and regulations which are either applicable or relevant and appropriate requirements. EPA, working with the State, consistent with the National Contingency Plan (NCP), is required to identify ARARs that will be met during the implementation of the TCRA. TBCs include other than formally promulgated federal and stricter state standards, local government requirements in ordinances and regulations, and other pertinent published criteria, that are TBC by EPA in the implementation of the TCRA. TBCs are discretionary rather than mandatory, but compliance is recommended.

The Removal Action Work Plan describes the work methods and BMPs to be used to address compliance with substantive provisions of identified ARARs to the extent practicable. The ARARs that have been determined by EPA to potentially apply to the removal action are described in Table 1 below. As part of its review of ARAR consistency, EPA has consulted with federal, state, and local resource and regulatory agencies and with the Suquamish Tribe.

Table 1
Applicable or Relevant and Appropriate Requirements

Topic	Standard or Requirement	Regulatory Citation	Notes
Sediment Quality Standards	Sediment quality standards; cleanup screening levels	Sediment Management Standards (WAC 173-204)	The proposed action will remove or contain materials that have the potential to further degrade sediment quality. The cap to be placed in the western beach area will provide clean surface materials in this area. The TCRA will not achieve SMS criteria throughout the beach area (completion of the RI/FS is required prior to addressing remaining beach areas).
Surface Water Quality	Surface Water Quality Standards	Ambient Water Quality Criteria (Section 304(a) of Clean Water Act) and Surface Water Quality Standards (RCW 90-48; WAC 173-201A)	To protect water quality, construction activities on the beach area will be conducted during low tide conditions, and the work area will be surrounded by an absorbent boom.

Topic	Standard or Requirement	Regulatory Citation	Notes
Land Disposal of Waste	Hazardous Waste	RCRA Land Disposal Restrictions (42 USC 7401-7642; 40 CFR 268) and Dangerous Waste Regulations Land Disposal (RCW 70.105; WAC 173-303, 140-141)	Waste materials removed from the Site will be managed using appropriately-permitted off-site treatment, storage and disposal facilities.
Solid Waste Disposal	Requirements for solid waste handling and disposal	Solid Waste Disposal Act (42 USC 215103259-6901-6991; 40 CFR 257-258)	Waste materials and debris removed from the Site will be managed using appropriately-permitted off-site treatment, storage and disposal facilities.
Fill, in-water work	Discharge of dredge/fill material in navigable waters	Clean Water Act (33 USC 401 et seq.; 33 USC 141; 33 USC 1251-1316; 40 CFR 230, 231, 404; 33 CFR 320-330) River and Harbors Act (33 USC 401 et seq.) and Hydraulic Code Rules (RCW 75.20; WAC 220-110)	The proposed action includes construction, waste removal and cap placement within the intertidal beach area at the Site. EPA has consulted State and Federal agencies. Project work practices and BMPs address ARAR substantive requirements, including minimizing fill placement, use of clean cap and cover materials, minimizing water quality and fisheries impacts by conducting the work “in the dry” under low tide conditions, and implementing the work within appropriate work windows to avoid potential impacts to fisheries resources.
Shorelines	Construction and development	Shoreline Management Act (RCW 90.58; WAC 173-16); City of Bremerton Shoreline Master Program (BMC 20.16)	The proposed action is consistent with the regulation because it will minimize potential risks to human health and the environment, and further protect sediment and surface water quality within Port Washington Narrows from potential releases of Site-associated hydrocarbon materials. Disturbance of shoreline vegetation will be minimized to the extent practicable.

Topic	Standard or Requirement	Regulatory Citation	Notes
Critical Areas – (Note: This is a TBC)	Evaluate and Mitigate Impacts	Growth Management Act (RCW 36.70a) City of Bremerton Critical Areas (BMC 20.14)	The proposed action has been designed to minimize affects to vegetation in shoreline areas. No excavation or fill placement is to be performed in potential steep slope areas. Protection of aquatic areas is addressed through the use of appropriate work practices and BMPs.
Habitat for Fish, Plants or Birds	Evaluate and mitigate habitat impacts	Clean Water Act (Section 404(b)(1); U.S. Fish and Wildlife Mitigation Policy (44 CFR 7644); U.S. Fish and Wildlife Coordination Act (16 USC 661 et seq.) Migratory Bird Treaty Act (16 USC 703-712)	The proposed action is consistent with the regulation because it will minimize potential risks to fish and wildlife habitat from potential releases of Site-associated hydrocarbon materials. BMPs described in the Removal Action Work Plan will be followed, including working “in the dry” at low tide conditions and adhering to work windows. The cap cover material has been selected in consultation with state and federal agencies, and provides improved habitat for fish in comparison to existing conditions.
Endangered Species and Critical Habitat for Endangered Species	Conserve endangered or threatened species	Endangered Species Act (16 USC 1531 et seq.; 50 CFR 200, 402); Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801-1884).	EPA has consulted with the US Fish and Wildlife Service and with the National Marine Fisheries Service. The proposed action incorporates measures to prevent potential impacts to endangered species during construction, including completing construction activities during work windows that minimize potential impacts to fisheries resources, implementing construction “in the dry” during low tide conditions, and incorporating measures to protect water quality. The cap cover material has been selected in consultation with state and federal agencies, and provides improved habitat for fish in comparison to existing conditions.
Native American Graves and Sacred Sites	Evaluate and mitigate impacts to cultural resources	Native American Graves Protection and Repatriation Act (25 USC 3001 et seq.; 43 CFR Pt. 10) and American Indian Religious Freedom Act (42 USC 1996 et seq.)	The proposed work was reviewed for its potential to impact cultural or archaeological resources. The proposed action does not include excavations or disturbance in native soils that could contain potential cultural or archaeological resources.

Topic	Standard or Requirement	Regulatory Citation	Notes
Historic Sites or Structures	Avoid or minimize impacts to historic or cultural resources	National Historic Preservation Act (16 USC 470f; 36 CFR Parts 60, 63, and 800)	No historic sites or structures are expected to be impacted as a part of the proposed action.

4. Project Schedule

The schedule for the TCRA has been established to allow implementation of the construction activities on the beach during daylight, low-tide conditions in mid-October 2013. Construction activities within the beach area are scheduled to be performed between October 12 and October 16. This schedule facilitates implementation of the work during daylight hours when safety conditions are optimized, minimizes potential impacts to water quality, and minimizes potential impacts to fish and sensitive aquatic species including juvenile salmonids. Some upland activities, including mobilization, site preparation, waste disposal and demobilization may occur before or after these dates.

C. Estimated Costs

The Settlement Agreement requires Cascade to pay for the cost of the removal action, including EPA's oversight costs. The estimated oversight costs for the proposed TCRA are estimated at less than \$10,000. If EPA were to undertake implementation of the work described in the action memorandum with its own resources, an action memorandum amendment and cost ceiling increase would be required.

VI. Expected Change in the Situation Should Action Be Delayed or Not Taken

A delay in action or no action at this Site would increase the actual or potential threat to the public health and the environment. Delayed action in placing the cap may increase public health risks to people walking on the beach through prolonged exposure to cPAHs. Delayed action in plugging Manhole A increases the risk that the plug will blow out and release black oily liquid remaining in the pipe onto the beach, spreading PAHs to the beach and Port Washington Narrows.

VII. Outstanding Policy Issues

None.

VIII. Enforcement

Cascade has agreed, through the Settlement Agreement, to conduct the TCRA selected in this Action Memorandum. Concurrent with implementation of the removal action and the RI/FS, EPA will continue to identify viable potentially responsible parties (PRPs) at the Site. EPA will continue to evaluate involving

Conditions at the Site meet the NCP section 300.415(b)(2) criteria for a removal action and I request your approval of the removal action described herein.

X. Approval / Disapproval

Approval


Chris D. Field, Manager
Emergency Management Program

9/30/13
Date

Disapproval

Chris D. Field, Manager
Emergency Management Program

Date

APPENDIX B
Final Removal Action Work Plan

**FINAL REMOVAL ACTION
WORK PLAN**
Bremerton Gas Works Site
Prepared for: Cascade Natural Gas Corporation

Aspect Project No. 080239-003 • Anchor QEA Project No. 131014-01.01
September 2013

Prepared by



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FINAL REMOVAL ACTION WORK PLAN

Bremerton Gas Works Site

Prepared for: Cascade Natural Gas Corporation

Aspect Project No. 080239-003 • Anchor QEA Project No. 131014-01.01

Aspect Consulting, LLC & Anchor QEA, LLC

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Acronyms

AOC	Administrative Settlement Agreement and Order on Consent
ARAR	applicable or relevant and appropriate requirement
BMP	best management practice
Cascade	Cascade Natural Gas Corporation
DGPS	differential global positioning system
DNR	Washington Department of Natural Resources
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
HASP	Health and Safety Plan
MGP	manufactured gas plant
MLLW	mean lower low water
PAH	polycyclic aromatic hydrocarbon
RI	Remedial Investigation
Site	former Bremerton Gas Works Site
TCRA	Time Critical Removal Action
USCG	U.S. Coast Guard
Work Plan	Removal Action Work Plan

1 Introduction

Cascade Natural Gas Corporation (Cascade), under an Administrative Settlement Agreement and Order on Consent (AOC) with the U.S. Environmental Protection Agency (EPA), has been directed to prepare this Removal Action Work Plan (Work Plan) describing details for implementing a Time Critical Removal Action (TCRA). The goal of the TCRA is to take measures necessary to reduce the potential for hazardous substances associated with the Bremerton Gas Works Site (Site) associated hazardous substances to migrate to the beach and surface waters of the adjacent Port Washington Narrows adjacent to the Site.

1.1 Site Location and Background

The Site location and vicinity are shown in Figure 1. A previous TCRA was completed at the Site in 2010 under an order issued by the U.S. Coast Guard (USCG) to address the source of observed sheens and black oily liquid in the eastern portion of the intertidal area adjacent to the Site. That work included removal of a buried pipe and associated beach sediments, plugging of a drain line, placement of a sediment cap, and completion of inspections. The cap placed during the 2010 TCRA is shown in Figure 2.

In May of 2012 the Site was added to the National Priorities List. Cascade and EPA subsequently executed the AOC, which requires Cascade to conduct a Remedial Investigation and Feasibility Study (RI/FS). The AOC also requires Cascade to conduct a Removal Evaluation, and if warranted by the Removal Evaluation, an additional TCRA. The Removal Evaluation has been completed, and the results are summarized in a Removal Evaluation Report (Anchor QEA, 2013). This Work Plan presents the details for the additional TCRA warranted by the Removal Evaluation. The RI/FS is to be initiated in 2014, following completion of the additional TCRA.

1.2 Removal Evaluation Findings

As described in the Removal Evaluation Report, sampling confirmed the cap placed in the 2010 TCRA has been effective at controlling hydrocarbon sheens in the eastern beach area. However, sampling and inspections documented two potential pathways by which Site-associated hydrocarbons could still potentially migrate to and impact sediment and surface water quality within Port Washington Narrows before completion of the RI/FS. These pathways are as follows:

- **Stormwater pathways to Manhole A:** Manhole A is believed to remain connected to the 12-inch concrete pipe that was plugged as part of the 2010 TCRA. Based on inspections conducted as part of the Removal Evaluation, stormwater could potentially enter Manhole A through surface runoff or via a piping connection to Manhole A from a nearby sump. Stormwater entering Manhole A has the potential to surcharge the plug at the lower end of the pipe that was installed during the 2010 TCRA, which in turn could potentially result in further releases of hazardous substances to Port Washington Narrows. This risk can be minimized by appropriately plugging the piping connection and directing surface runoff away from the manhole.

- **Hydrocarbon sheens in shallow subsurface sediments in western area of beach:**
Hydrocarbon sheens were observed in shallow subsurface sediments in the western area of the beach (Figure 2). Surficial solid hydrocarbon material was also observed in the western beach area. If these subsurface sediments are disturbed (e.g., by storm action or by persons digging in the beach sediment) hydrocarbons could be released to surface waters of Port Washington Narrows. This risk can be minimized by applying a sediment cap similar to that placed in the eastern beach area during the 2010 TCRA.

Based on findings of the Removal Evaluation, EPA directed Cascade to prepare this Work Plan describing an additional TCRA to be performed before performance of the RI/FS. This Work Plan proposes a scope of work for the TCRA that addresses the two pathways noted above and includes the following key elements:

- Removal of solid hydrocarbon material identified in the western beach area
- Placement of an organoclay mat and sediment cap over an area of subsurface hydrocarbon sheen
- Temporarily plugging Manhole A, located within the upland area of the Site, and a potential piping connection to Manhole A.
- Installation of signage
- Inspections to confirm the effectiveness of the 2010 TCRA and additional TCRA.

1.3 Document Organization

The remainder of this document is organized into the following sections:

- Section 2: Site Description and Project Scope
- Section 3: Overview of Time Critical Removal Action
- Section 4: Applicable or Relevant and Appropriate Requirements
- Section 5: Best Management Practices
- Section 6: Health and Safety
- Section 7: Access to Removal Action Area
- Section 8: Site Preparation
- Section 9: Plug Connections to Manhole A
- Section 10: Removal of Materials from the Beach Area
- Section 11: Handling, Transport, and Disposal of Materials
- Section 12: Placement of Sediment Cap
- Section 13: Installation of Signage
- Section 14: Completion of Time Critical Removal Action
- Section 15: Post-Completion Inspections
- Section 16: Schedule
- Section 17: References

2 Site Description

The former Bremerton Gas Works was located on the south shore of the Port Washington Narrows, a narrow channel that connects Dyes Inlet to the Puget Sound, between Thompson Drive and Pennsylvania Avenue in west Bremerton, Washington (Figure 1). Land use in the vicinity of the Site is currently industrial and light commercial.

The Gas Works was located on portions of two shoreline industrial properties as shown on Figure 2. The eastern property is owned by Natacha Sesko (Sesko property). The western property is owned by the McConkey Family Trust (McConkey property). Above-ground structures associated with the former Gas Works (see Figure 2) have been removed.

The Gas Works also included a dock, formerly located within leased harbor areas owned by the State and managed by the Washington State Department of Natural Resources (DNR). The DNR-managed lands also include portions of the bluff, the intertidal beach area adjacent to the Site, and the sub-tidal portions lands of Port Washington Narrows. The former dock location is shown in Figure 2.

As shown on Figure 2, a City of Bremerton sanitary sewer force main is located beneath portions of the beach at the Site. Based on available record drawings, the force main was installed initially during the 1950s and was replaced in the 1980s. The force main is buried several feet beneath the beach within the DNR-managed harbor areas and the northern portion of the Sesko property.

The property located immediately east of the Site is zoned for industrial use and is used for operation of a bulk petroleum terminal. Properties further east are zoned for residential use and include single and multi-family residences.

Properties located immediately south and west of the Site are zoned for industrial uses. The Port Washington Marina is located to the west of the Site. The Marina includes recreational boat moorage and live-aboard residents.

3 Overview of Time Critical Removal Action

The Removal Action will include specific activities within the beach area and the upland portion of the Site, including the following:

- **Removal of solid hydrocarbon-like material:** Two localized surface deposits of solid hydrocarbon near sampling station BGW-RE-SG-05 will be removed (see Figure 2; detail on Figure 3). The removed material will be sent to an appropriately permitted, off-site treatment, storage, and disposal facility.
- **Placement of a sediment cap over an area of subsurface hydrocarbon sheen:** As shown on Figure 2 and Figure 3, a sediment cap will be placed over the western beach area where a hydrocarbon sheen was noted in subsurface sediments (i.e., adjacent to locations BGW-RE-SG-04 and BGW-RE-SG-05). The cap will use the same design that was used successfully in the eastern beach area in 2010. The cap will consist of an organoclay mat covered by streambed cobbles. The cobbles will protect the cap against wave erosion and will limit potential human disturbance (e.g., digging) of the cap. Specifications for the organoclay mat and materials that will cover the organoclay mat are provided in Appendix A. The cap will remain in place throughout the performance of the RI/FS to minimize potential impacts to sediment and surface water quality within Port Washington Narrows. Placement of the cap requires removal of one existing creosote-treated piling within the mat placement area. The piling will be cut at the mudline to avoid disturbing the sewer line that is located in the immediate vicinity. Two damaged metal floats are located on the beach adjacent to the proposed capping area (Figure 2 & Figure 3). These structures are outside of the mat placement area and will not be disturbed by the TCRA. However, the piling that will be removed as part of the TCRA currently serves as an anchor for one of the floats. A new 4-inch galvanized steel pipe will be installed above the ordinary high water line to provide a replacement anchor for the float. The mooring line currently attached to the float will be tied-off to the new mooring anchor.
- **Plug Connections to Manhole A:** This manhole, which is located on the Sesko property, drains to the pipe that was plugged at the beach during the 2010 TCRA. The manhole will be plugged with concrete at the ground surface to prevent surface water runoff from entering the manhole. A sump drain from the adjacent former tank farm containment area (also within the Sesko property) that is suspected to drain to Manhole A will also be plugged. The drain will be capped at the containment area with a removable cap. This work will minimize potential stormwater runoff into the manhole and discharge pipe and minimize potential risk of future hydrocarbon releases from the pipe.
- **Installation of signage:** Signage will be installed on the beach to alert potential beach users to the presence of sediment contamination, discourage swimming or seafood gathering, and provide EPA contact information so that the public can obtain information regarding the ongoing work.
- **Beach monitoring:** The ongoing beach monitoring activities will continue after completion of the TCRA, with the scope of work expanded to include the western cap area. Monitoring will be used to document that conditions remain stable and the completed 2010 TCRA and additional TCRA elements continue to meet their objectives.

Additional details for the key activities are provided in the following sections.

4 Applicable or Relevant and Appropriate Requirements

The Removal Action must satisfy the substantive provisions of applicable or relevant and appropriate requirements (ARARs). ARARs determined by EPA to potentially apply to the Removal Action are described in Table 1. As part of its review of ARAR consistency, EPA consulted with federal, state, and local resource and regulatory agencies and with the Suquamish Tribe. The Removal Action addresses the known ARARs by prescribing best management practices (BMPs) to be used during performance of the Removal Action. The BMPs are listed in Section 5.

Table 1
Applicable or Relevant and Appropriate Requirements

Topic	Standard or Requirement	Regulatory Citation	Notes
Sediment Quality Standards	Sediment quality standards; cleanup screening levels	Sediment Management Standards (WAC 173-204)	The proposed action will remove or contain materials that have the potential to further degrade sediment quality. The cap to be placed in the western beach area will provide clean surface materials in this area. The TCRA will not achieve Sediment Management Standards (SMS) criteria throughout the beach area. Completion of the RI/FS is required prior to addressing remaining beach areas.
Surface Water Quality	Surface water quality standards	Ambient Water Quality Criteria (Section 304(a) of Clean Water Act) and Surface Water Quality Standards (RCW 90-48; WAC 173-201A)	The proposed action will protect surface water quality by minimizing the potential release of hydrocarbons or associated contaminants to Port Washington Narrows. To protect water quality, construction activities on the beach area will be conducted during low tide conditions, and the work area will be surrounded by an absorbent boom. Pathways, by which surface water runoff can enter Manhole A, will be addressed, further restricting potential releases that could affect water quality. Inspections will be conducted during and after completion of the TCRA.
Land Disposal of Waste	Hazardous waste	RCRA Land Disposal Restrictions (42 USC 7401-7642; 40 CFR 268) and Dangerous Waste Regulations Land Disposal (RCW 70.105; WAC 173-303, 140-141)	Waste materials removed from the Site will be managed using appropriately-permitted, off-site treatment, storage, and disposal facilities.
Solid Waste Disposal	Requirements for solid waste handling and disposal	Solid Waste Disposal Act (42 USC 215103259-6901-6991; 40 CFR 257-258)	Waste materials and debris removed from the Site will be managed using appropriately-permitted, off-site treatment, storage, and disposal facilities.

Topic	Standard or Requirement	Regulatory Citation	Notes
Fill, in-water work	Discharge of dredge/fill material in navigable waters	Clean Water Act (33 USC 401 et seq.; 33 USC 141; 33 USC 1251-1316; 40 CFR 230, 231, 404; 33 CFR 320-330) River and Harbors Act (33 USC 401 et seq.) and Hydraulic Code Rules (RCW 75.20; WAC 220-110)	The proposed action includes construction, waste removal, and cap placement within the intertidal beach area at the Site. EPA has consulted State and Federal agencies. Project work practices and BMPs address ARAR substantive requirements, including minimizing fill placement, use of clean cap and cover materials, minimizing water quality and fisheries impacts by conducting the work in-the-dry under low tide conditions, and implementing the work within appropriate work windows to avoid potential impacts to fisheries resources.
Shorelines	Construction and development	Shoreline Management Act (RCW 90.58; WAC 173-16); City of Bremerton Shoreline Master Program (BMC 20.16)	The proposed action is consistent with the regulation, because it will minimize potential risks to human health and the environment, and further protect sediment and surface water quality within the Washington Narrows from potential releases of Site-associated hydrocarbon materials. Disturbance of shoreline vegetation will be minimized to the extent practicable.
Critical Areas	Evaluate and mitigate Impacts	Growth Management Act (RCW 36.70a) City of Bremerton Critical Areas (BMC 20.14)	The proposed action has been designed to minimize affects to vegetation in shoreline areas. No excavation or fill placement is to be performed in potential steep slope areas. Protection of aquatic areas is addressed through the use of appropriate work practices and BMPs.
Habitat for Fish, Plants or Birds	Evaluate and mitigate habitat impacts	Clean Water Act (Section 404(b)(1); U.S. Fish and Wildlife Mitigation Policy (44 CFR 7644); U.S. Fish and Wildlife Coordination Act (16 USC 661 et seq.) Migratory Bird Treaty Act (16 ECS 703-712)	The proposed action is consistent with the regulation, because it will minimize potential risks to fish and wildlife habitat from potential releases of Site-associated hydrocarbon materials. BMPs described in this Work Plan will be followed, including working in-the-dry at low tide conditions and adhering to work windows. The cap cover material has been selected in consultation with state and federal agencies and provides improved habitat for fish in comparison to existing conditions.

Topic	Standard or Requirement	Regulatory Citation	Notes
Endangered Species and Critical Habitat for Endangered Species	Conserve endangered or threatened species	Endangered Species Act (16 USC 1531 et seq.; 50 CFR 200, 402); Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801-1884).	EPA has consulted with the US Fish and Wildlife Service and with the National Marine Fisheries Service. The proposed action incorporates measures to prevent potential impacts to endangered species during construction, including completing construction activities during work windows that minimize potential impacts to fisheries resources, implementing construction in-the-dry during low tide conditions, and incorporating measures to protect water quality. The cap cover material has been selected in consultation with state and federal agencies and provides improved habitat for fish in comparison to existing conditions.
Native American Graves and Sacred Sites	Evaluate and mitigate impacts to cultural resources	Native American Graves Protection and Repatriation Act (25 UCS. 3001 et seq.; 43 CFR Pt. 10) and American Indian Religious Freedom Act (42 UCS 1996 et seq.)	The proposed work was reviewed for its potential to impact cultural or archaeological resources. The proposed action does not include excavations or disturbance in native soils that could contain potential cultural or archaeological resources.
Historic Sites or Structures	Avoid or minimize impacts to historic or cultural resources	National Historic Preservation act (16 USC 470f; 36 CFR Parts 60, 63, and 800)	No historic sites or structures are expected to be impacted as a part of this action.

5 Best Management Practices

BMPs to be used during implementation of the Removal Action are described below.

Construction Methods

- To the extent practicable, construction of the Removal Action (including hydrocarbon material removal, piling removal, organoclay mat placement, and cover placement) will be conducted at low tide when the work area is not inundated with tidal waters.
- Prior to and during construction, the work area will be surrounded by an absorbent oil boom.
- The location of the existing, buried sanitary sewer force main within the work area will be marked and will be protected from damage during performance of the work.
- Construction equipment will be placed and retrieved from the beach using a crane or other low-impact methods, and construction materials will be placed using methods that minimize the disturbance of the beach and shoreline areas beyond the immediate vicinity of the capping area.
- Construction equipment operating on the beach will be low ground pressure type (to the extent practicable) to minimize the disturbance of the beach and shoreline areas beyond the immediate vicinity of the capping area.
- Construction equipment will be removed from the beach area during periods of high tide.
- Construction materials will not be stockpiled below the ordinary high water mark.
- Construction personnel will use designated access routes and will minimize disturbance of shoreline and bluff vegetation to the extent practicable.
- Removal or destruction of overhanging bankline vegetation will be limited to that necessary for the construction of the project.
- Trimming of vegetation material from the bluff (where required to facilitate equipment access) will be minimized. Removed vegetation shall be left in as whole pieces as possible and removed from the Site upon completion of the Removal Action.
- The organoclay mat will meet the specifications listed in Appendix A.
- The mat cover material will consist of clean 10-inch streambed cobbles per Section 9-03.11(2) of the Washington State Department of Transportation Standard Specifications, 2012 edition. This material is a well-graded streambed cobble that passes all material smaller than 10 inches.
- The removal of creosote-treated piles within the work area will be consistent with the conditions issued as part of the Derelict Creosote Pile Removal Project Hydraulic Project Approval, issued to Washington State Department of Natural Resources (Control Number 125073-1; issued December 15, 2011). The piling will be cut at the mudline to avoid potential disturbance of the adjacent buried sewer line.

Upland Staging Areas

- Equipment will only be serviced in the upland staging area.
- Equipment will be decontaminated following each work cycle. Wash water from decontaminating activities will be contained (e.g., via the use of containment basins) and will not be discharged to the adjacent water body or to the storm drains.
- All construction materials, debris, and wastes generated during the Removal Action will be removed from upland staging areas at the conclusion of the work.
- No wastes generated during the Removal Action will be disposed of on-site. Wastes removed from the Site will be disposed of using appropriately-permitted treatment, storage, disposal, or recycling facilities.

Spill Prevention and Control

- The contractor will prepare and deploy a Spill Control and Response Plan.
- Construction personnel will be trained in hazardous material handling and will be equipped with appropriate response tools, including absorbent oil booms.
- The contractor will inspect fuel hoses, oil or fuel transfer valves, and fittings on a regular basis for drips or leaks in order to prevent spills into the surface water.
- Oil-absorbent pads will be available to be deployed in the event that hydrocarbon sheens are noted within the work area.
- Inspections will be conducted daily during performance of the Removal Action. On-site inspections will also be conducted weekly for a period of 30 days after construction of the Removal Action is complete as part of the Post-Completion Inspections (see Section 15).

In the event that an unexpected release of a hazardous substance occurs at the Site during performance of the Removal Action (e.g., rupture of a fuel line), notification will be provided to the USCG National Response Center at 1-800-424-8802 and the Washington State Emergency Management Division at 1-800-OILS-911 within one hour of discovery. This reporting obligation will not apply to the disturbance, handling, and removal of hazardous substances anticipated as part of the Removal Action.

6 Health and Safety

The Health and Safety Plan (HASP) developed for the Removal Action is provided in Appendix B. The contractor(s) retained by Cascade to implement the Removal Action will be required to submit contractor-specific HASPs (consistent with the Removal Action HASP) before commencing work at the Site.

7 Access to Removal Action Area

Cascade has secured access agreements necessary to implement the Removal Action. Access agreements currently in place include the following:

- Agreement with DNR that provides access to state-owned lands managed by DNR, including the western intertidal beach where the mat will be placed and adjacent portions of the bluff.
- Agreement with Natacha Sesko that provides access to the area around Manhole A, which is to be plugged.
- Agreement with the McConkey Family Trust that provides access to the property to be used for staging of equipment and materials for the capping of the western beach area.

8 Site Preparation

Cascade's contractor will establish a staging area on the uplands immediately above the affected area of the beach (Figure 3). Site preparation activities will be performed during daylight hours. No modification of the shoreline will be performed. Native riparian vegetation will be left in place along the shoreline to the extent practicable. While not currently planned, limited removal or trimming of select trees and shrubs along the shoreline slope may be required for safe operation of the crane that will be used to lower cap material onto the beach.

Other activities include:

- Setting up a forward command and communication center and sanitation facilities (portable toilets).
- Installing soil and sediment erosion control measures as needed.
- Stockpiling sediment cap materials in the upland staging area.
- Setting up light plants to illuminate the intertidal area.
- Positioning a hydraulic crane in the mobile crane area shown in Figure 3.
- Positioning one or more roll-off boxes for management of hydrocarbon materials to be removed from the beach.
- Mobilizing equipment to the upland staging area
- Temporarily re-routing, or extending, the existing corrugated drain pipe located on the slope surface above the proposed sediment cap area so that it discharges to a location east of the sediment cap area

9 Plug Connections to Manhole A

Manhole A is a round manhole, approximately 3 feet in diameter that is constructed of brick. The manhole is currently filled with debris, including rocks, vegetation and soil. The manhole is uncovered at the ground surface and appears to be filled from the bottom to within approximately 18-to 24-inches of the ground surface. The manhole outlet pipe was cut and plugged down slope of the manhole, in the intertidal zone, during the 2010 TCRA.

Plugging the connections to Manhole A will prevent stormwater from entering the manhole, which will reduce the potential for hydraulic head buildup in the outlet pipe that was plugged in 2010. During the Removal Evaluation, two potential routes of stormwater entry into Manhole A were identified. First, surface water runoff could enter the top of the manhole. Second, a potentially active drainage connection was identified from a sump in the adjacent former tank containment area (see Figure 3).

Abandonment of the manhole is intended to provide temporary mitigation of surface water runoff and allow for future access to the manhole, if necessary during the RI/FS.

The work will involve the following tasks:

- **Capping the drainage connection at the containment area sump:** Based on field inspections, the sump pipe is 4-inches in diameter and constructed of iron. The contractor will verify material and dimensions. The pipe will be plugged using a removable cap (Fernco or equivalent). If subsequent monitoring indicates that the drainage sump is needed to prevent Site safety hazards due to significant accumulations of standing water in the former tank containment area, the cap will be removed (see monitoring program description below).
- **Plugging of the manhole with concrete at the ground surface:** The top of the manhole will be plugged at the ground surface to prevent surface water runoff from entering the manhole. Surface debris will be removed from the manhole as much as possible. Approximately 4 inches of 5/8-minus base course will be placed and hand-tamped to provide a sub-base for the concrete and prevent grout intrusion into void space below. Concrete will be placed above the base course layer to the ground surface neatline and mounded slightly to direct runoff away from the manhole.

10 Removal of Materials from the Beach Area

Prior to subgrade preparation for placement of the organoclay mat, the two localized surface deposits of solid hydrocarbon-like material located near sampling station BGW-RE-SG-05 (Figure 2 and Figure 3) will be removed using a tracked mini excavator. The excavator will place the material directly into a lined transfer container located on the beach. Following completion of the material removal, the container will be lifted to the upland staging area by crane for subsequent transport and disposal off-site at an appropriately-permitted disposal facility landfill.

The hardened material has a thickness of approximately 4 inches. Removal will be conducted during low tide to minimize potential water quality impacts. The lateral extent of removal will be determined in the field, but the removal area is anticipated to be approximately as shown in Figure 2 and Figure 3 with an anticipated volume between 2 and 5 cubic yards.

The single creosote-treated mooring piling located within the sediment cap area will be removed during excavation of the solid hydrocarbon-like material. The piling will be cut off at the mudline elevation subgrade using a chain-saw or other appropriate equipment. The piling will be loaded directly into a separate roll-off container for subsequent transport and disposal off-site.

One of the metal floats located on the beach adjacent to the proposed capping area is moored to the piling that will be removed. In order to provide a replacement mooring line anchor for the float, a new 4-inch galvanized steel pipe will be installed above the ordinary high water line. The mooring line currently attached to the float will then be tied-off to the new mooring anchor in the same configuration as it was tied off to the mooring piling. The new steel pipe anchor will be installed by driving the top of the pile using the bucket on the tracked mini excavator, or alternative method to be determined by the contractor at the time of installation.

11 Handling, Transport, and Disposal of Materials

The removed hydrocarbon-like material and creosote-treated piling will be placed in a transfer container. Once filled, the transfer container will be lifted to the upland staging area by crane. The container will be placed on a truck for delivery, during daytime hours, to a railroad loading facility, and transported from there to a permitted disposal facility. Characterization and profiling of the hydrocarbon-like material was completed during previous sampling activities as part of the Removal Evaluation.

Creosote-treated piling will also be placed in a transfer container for transport to a Subtitle D landfill for disposal.

12 Placement of Sediment Cap

After the hydrocarbon-like material and creosote-treated piling are removed, cobbles will be removed from the planned capping area to provide a smooth surface for placement of the organoclay mat.

Following completion of the subgrade preparation, an organoclay mat will be placed over the identified cap area (Figure 2 and Figure 3). Designed to adsorb low soluble organics (e.g., oil and polycyclic aromatic hydrocarbons), the mat consists of organoclay encapsulated between two layers of geotextile. The organoclay is formed by the modification of sodium bentonite with cationic surfactants. The organoclay mat minimizes the potential release of hydrocarbons from the underlying beach materials.

The organoclay mat will be placed in panels with a minimum overlap of 1 foot with adjacent panels. The proposed cap will be constructed using four 50-foot-by-15-foot panels. The lower panel will be placed at a starting elevation of approximately +2 feet mean lower low water (MLLW). Each panel will be staked and unrolled 50 linear feet in an orientation parallel to Port Washington Narrows. The panel locations will be documented by differential global positioning system (DGPS).

Before the lower extent of the panels are inundated by the tide, clean imported cover material will be placed (moving up slope) at a nominal thickness of 12 inches (plus or minus 2 inches). Import cap material will be 10-inch streambed cobbles per Section 9-03.11(2) of the 2012 Washington State Department of Transportation Standard Specifications. This cap material will act as ballast, protecting the organoclay mat from wind and wave driven erosion, and will create a new habitat substrate.

Cap material will be lowered to the beach area using a 2-cubic-yard skip bucket attached to the hydraulic crane located at the top of the shoreline bluff. To the extent possible, the cap material will be placed as close as possible to its final location on the cap using the crane in order to limit disturbance of the beach by tracked equipment and to protect the existing buried sewer line running beneath the cap area. As needed, the cap material can be stockpiled on the beach for subsequent placement, provided the stockpile is not located directly above the existing buried sanitary sewer line, and is in place prior to the tide rising. The existing buried sanitary sewer line is to be protected during construction.

Starting at the edge of the panels, the cap material will be feathered for approximately another 10 feet. Approximately 200 cubic yards of clean cap material will be used to construct the sediment cap.

13 Installation of Signage

Signage will be installed on the beach to alert potential beach users to the presence of contamination, discourage swimming or seafood gathering, and provide EPA contact information so that the public can obtain information regarding the ongoing work.

Three signs will be installed at the locations shown in Figure 2. These include the east and west limits of the intertidal beach area at an elevation of 5 feet MLLW to alert beach users travelling from either direction along the beach. A sign will also be placed at the terminus of Pennsylvania Avenue. Each sign will be mounted on a weather resistant, aluminum sign material that measures 3 feet tall and 2 feet wide. The sign language, materials, and dimensions are presented in Appendix C. The signs will be mounted on metal poles set in concrete anchors.

14 Completion of Time Critical Removal Action

The Removal Action will be deemed complete when all work activities described in Section 3 of this Work Plan, except the post-completion inspections, are completed to the satisfaction of EPA. Following completion of the Removal Action, a report documenting the Removal Action will be prepared and submitted to EPA for review and approval in accordance with the timeline established in the AOC.

15 Post-Completion Inspections

After completion of the Removal Action, the sediment cap and surrounding intertidal areas will be inspected once a week for the first four weeks, followed by monthly inspections for the next two months, and quarterly inspections thereafter. Inspections will continue throughout the performance of the RI/FS. The inspections will include visual monitoring for the presence of product or sheen on the sediment and nearshore water surrounding the sediment cap area. The sediment cap integrity will also be monitored for erosion of the cap material. If evidence of sheen, product, or cap erosion is present, additional actions will be discussed with EPA.

Inspection of the manhole area will be conducted to ensure that the ground surface plug is intact and directing surface water away from the manhole, and to confirm there is no significant water accumulation above the installed cap in the former tank farm containment area. If water accumulation is observed within the former tank containment area that presents a potential safety hazard, EPA will notify the property owner to correct the problem. If the property owner is not responsive, the sump pipe cap may be removed while alternative stormwater mitigation measures are evaluated. Alternative stormwater mitigation measures will require coordination with Ms. Sesko or the then-current owner of the Sesko property. Inspections of the manhole area will be conducted during two events of measurable rainfall following plugging, and during at least three subsequent significant rainfall events (defined as >0.5 inch of rain in a 24-hour period). The frequency of subsequent monitoring will depend on the results of the initial monitoring events.

16 Schedule

The schedule for the Removal Action has been established to allow implementation of the construction activities on the beach during daylight, low-tide conditions in mid-October 2013. Construction activities within the beach area are scheduled to be performed between October 12 and October 16. This schedule facilitates implementation of critical portions of the work during daylight hours when safety conditions are optimized, minimizes potential impacts to water quality, and minimizes potential impacts to fish and sensitive aquatic species including juvenile salmonids. Some upland activities, including mobilization, site preparation, waste disposal, and demobilization may occur before or after these dates.

Table 2
Schedule for the Time Critical Removal Action

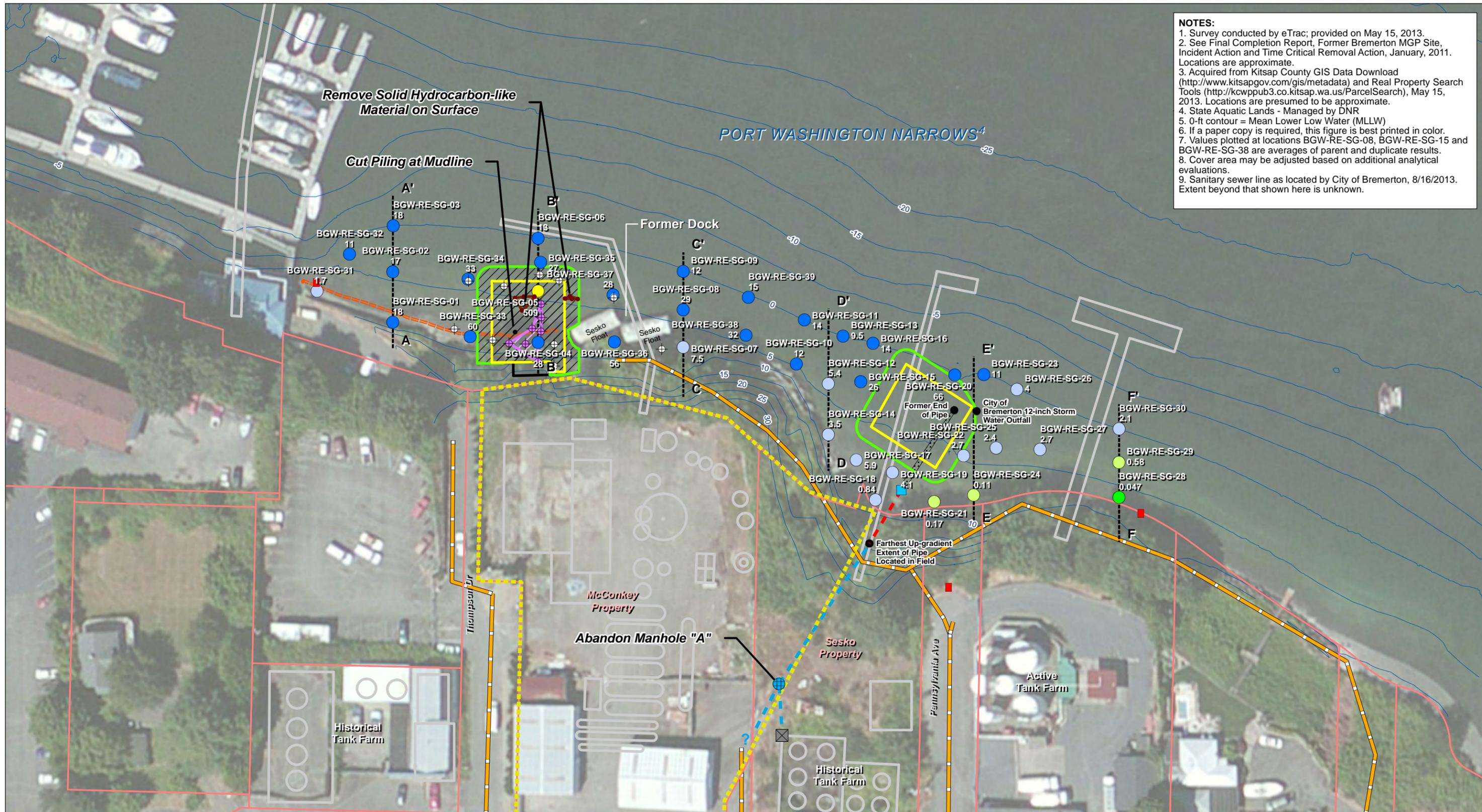
Action Element	Activity Date	Notes
Organoclay mat delivery	September 27-30, 2013	Tentative delivery date. Material will be delivered to McConkey property and staged/stored in storage unit.
Pre-construction meeting	October 8, 2013	Including Sesko and McConkey
Contractor mobilization, staging, and TESC installation	October 9-11, 2013	
Import cap gravel material to staging area	October 10-11, 2013	Approximately 300 tons
Plug connections to Manhole A	October 10-11, 2013	
Mobilize and set hydraulic crane	October 12, 2013	Saturday daytime work
Extend corrugated drain pipe located on slope to location east of sediment cap	October 12, 2013	Saturday daytime work
Install floating boom	October 12, 2013	Saturday daytime work
Remove creosote-treated pile	October 12, 2013	Saturday daytime work
Install new mooring anchor above high water line and re-attach float mooring line	October 12, 2013	Saturday daytime work
Remove solid hydrocarbon material followed by organoclay mat placement, and cover material placement	October 14, 2013	Work to start at 04:00 AM on Monday, October 14 and extend to 11:30 AM. Low tide at 07:39 AM (1.26 feet)

Action Element	Activity Date	Notes
Continue organoclay mat and cover material placement (as needed)	October 15, 2013	Contingency day for installation of cap. Work to occur between 05:00 AM and 12:30 PM. Low tide at 08:44 AM (1.8 feet)
Material handling, transport, and disposal	October 16-17, 2013	Daytime work
Demobilization	October 17-18, 2013	Daytime work
Reporting of project completion	Following October 18, 2013	Completion report will be submitted consistent with the schedule in the AOC.
Monitoring	Oct. 2013 – Oct. 2014	Ongoing throughout performance of the RI/FS

17 References

Anchor QEA, 2013. *Removal Evaluation Report, Bremerton Gas Works Site*. Prepared for Cascade Natural Gas Corporation. Forthcoming.

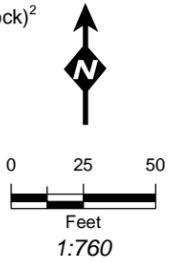
FIGURES



NOTES:

1. Survey conducted by eTrac; provided on May 15, 2013.
2. See Final Completion Report, Former Bremerton MGP Site, Incident Action and Time Critical Removal Action, January, 2011. Locations are approximate.
3. Acquired from Kitsap County GIS Data Download (<http://www.kitsapgov.com/gis/metadata>) and Real Property Search Tools (<http://kcwppub3.co.kitsap.wa.us/ParcelSearch>), May 15, 2013. Locations are presumed to be approximate.
4. State Aquatic Lands - Managed by DNR
5. 0-ft contour = Mean Lower Low Water (MLLW)
6. If a paper copy is required, this figure is best printed in color.
7. Values plotted at locations BGW-RE-SG-08, BGW-RE-SG-15 and BGW-RE-SG-38 are averages of parent and duplicate results.
8. Cover area may be adjusted based on additional analytical evaluations.
9. Sanitary sewer line as located by City of Bremerton, 8/16/2013. Extent beyond that shown here is unknown.

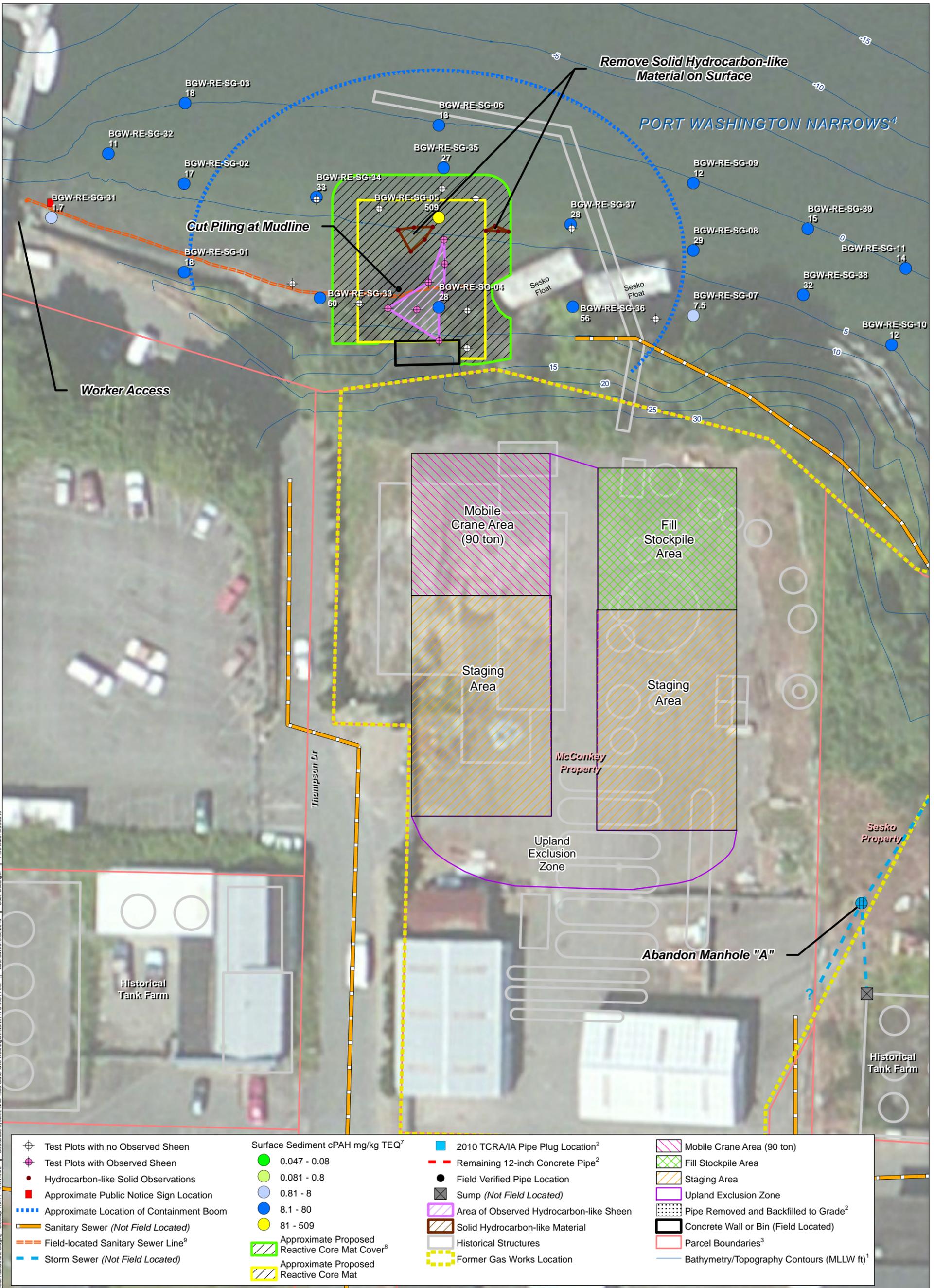
<ul style="list-style-type: none"> ⊕ Test Plots with no Observed Sheen ⊕ Test Plots with Observed Sheen • Hydrocarbon-like Solid Observations ■ Approximate Public Notice Sign Location — Field-located Sanitary Sewer Line⁹ 	<p>Surface Sediment cPAH mg/kg TEQ⁷</p> <ul style="list-style-type: none"> ● 0.047 - 0.08 ● 0.081 - 0.8 ● 0.81 - 8 ● 8.1 - 80 ● 81 - 509 <ul style="list-style-type: none"> ▨ Approximate Proposed Reactive Core Mat Cover⁸ ▨ Approximate Proposed Reactive Core Mat 	<ul style="list-style-type: none"> ■ 2010 TCRA/IA Pipe Plug Location² — Remaining 12-inch Concrete Pipe² ● Field Verified Pipe Location ⊗ Sump (Not Field Located) ▨ Area of Observed Hydrocarbon-like Sheen ▨ Solid Hydrocarbon-like Material ▨ Historical Structures ▨ Former Gas Works Location 	<ul style="list-style-type: none"> ▨ Cover of Existing Organoclay Mat (10-inch minus rock)² ▨ Extent of Existing Organoclay Mat² ▨ Pipe Removed and Backfilled to Grade² --- 100-Foot Transects ▨ Parcel Boundaries³ — Sanitary Sewer (Not Field Located) — Storm Sewer (Not Field Located) — Bathymetry/Topography Contours (MLLW ft)¹
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Proposed Removal Action
Removal Action Work Plan
Bremerton Gas Works
Bremerton, Washington

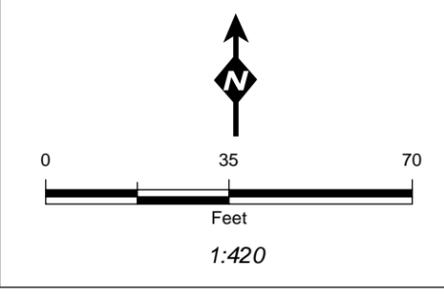
		<small>FIRM:</small> ANCHOR OEA <small>DRAWN BY:</small> ckiblinger	<small>FIGURE NO.</small> 2
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GIS Data: C:\josh\100719-01 - Bremerton_MGP\MapInfo\2013 - Prepared for Removal Action - R4\MapInfo - Coordinates System: NAD 83 - StatePlane - Washington North FIPS 4801 Feet | Date Saved: 9/20/2013 | User: cckiblinger | Print Date: 9/20/2013



AG GIS Path: C:\Users\100719-01-Bremerton_MGP\MapInfo2013_09\Site Access and Staging - Cleanup_11x17P1-MIP.mxd | Coordinate System: NAD 1983 StatePlane WashingtonNorth FIPS 4601 Feet | Date Saved: 9/30/2013 | User: ckblinger | Print Date: 9/30/2013

- NOTES:**
1. Survey conducted by eTrac; provided on May 15, 2013.
 2. See Final Completion Report, Former Bremerton MGP Site, Incident Action and Time Critical Removal Action, January, 2011. Locations are approximate.
 3. Acquired from Kitsap County GIS Data Download (<http://www.kitsapgov.com/gis/metadata>) and Real Property Search Tools (<http://kcwppub3.co.kitsap.wa.us/ParcelSearch>), May 15, 2013. Locations are presumed to be approximate.
 4. State Aquatic Lands - Managed by DNR
 5. 0-ft contour = Mean Lower Low Water (MLLW)
 6. If a paper copy is required, this figure is best printed in color.
 7. Values plotted at locations BGW-RE-SG-08, BGW-RE-SG-15 and BGW-RE-SG-38 are averages of parent and duplicate results.
 8. Cover area may be adjusted based on additional analytical evaluations.
 9. Sanitary sewer line as located by City of Bremerton, 8/16/2013. Extent beyond that shown here is unknown.



Site Access and Staging
Removal Action Work Plan
Bremerton Gas Works
Bremerton, Washington

		<small>FIRM</small> ANCHOR QEA <small>DRAWN BY:</small> ckblinger	<small>FIGURE NO.</small> 3
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**APPENDIX A
SEDIMENT CAP MATERIAL
SPECIFICATIONS**

REACTIVE CORE MAT®

with ORGANOCLAY®

PRODUCT DESCRIPTION

Organoclay® Reactive Core Mat® (RCM) is designed for use in the following applications:

- In-situ subaqueous cap for contaminated sediments or post-dredge residual sediments
- Embankment seepage control
- Groundwater remediation

Organoclay® Reactive Core Mat® is a permeable composite of geotextiles and a non-swelling granular clay compound that reliably adsorbs oil and similar organics from water.

BENEFITS

- RCM provides a reactive material that treats contaminants which are carried by advective or diffusive flow
- Reactive cap allows for thinner cap thickness than a traditional sand cap
- Geotextiles provide stability and physical isolation

PHYSICAL PROPERTIES

PROPERTIES	TEST METHOD	VALUE
ORGANOCLAY¹		
Bulk Density Range	CETCO Test Method	44 – 56 lbs/ft ³
Oil Adsorption Capacity	CETCO Test Method	0.5 lb of oil per lb of organoclay, min
Quaternary Amine Content	CETCO Test Method	25 – 33% quaternary amine loading
FINISHED RCM PRODUCT		
Organoclay Mass per Area	CETCO Test Method	0.8 lb/ft ²
Mat Grab Strength ²	CETCO Test Method	90 lbs. MARV
Hydraulic Conductivity ³	CETCO Test Method	1 x 10 ⁻³ cm/sec minimum

Notes

¹ Apatite properties performed periodically on material prior to incorporation into the RCM.

² All tensile testing is performed in the machine direction.

³ Permittivity at constant head of 2 inches and converted to hydraulic conductivity using Darcy's Law and RCM thickness per ASTM D5199 for geotextiles.

PACKAGING

- 15' x 100' rolls, packaged on 4" PVC core tubes wrapped with polyethylene plastic packaging

AVAILABILITY

Shipping is available from the following location:

- CETCO, 218 NE Industrial Park Rd, Cartersville, GA

Contact your local technical sales manager at:
714-384-0111 or 800-527-9948

TECHNICAL REFERENCE

ORGANOCLAY® FILLED REACTIVE CORE MAT® REACTIVE CAPPING MATERIAL SPECIFICATION GUIDELINES

1.0 GENERAL

1.1 Scope

This specification covers the technical requirements for the furnishing and installation of the reactive capping material described herein. All materials used shall meet the requirements of this specification, and all work shall be performed in accordance with the procedures provided herein and the contract drawings.

1.2 Definitions-For the purposes of this specification guideline, the following terms are defined below:

- ▶ Reactive Capping Material (RCM): A manufactured material consisting of an active media encapsulated between layers of geosynthetics.
- ▶ Geotextile: Any permeable geosynthetic comprised solely of textiles.
- ▶ Minimum Average Roll Value: For geosynthetics, the value calculated as the typical value minus two (2) standard deviations from documented quality control test results for a defined population from one specific test method associated with one specific property.
- ▶ Overlap: Where two adjacent reactive capping material panels contact, the distance measuring perpendicular from the overlying edge of one panel to the underlying edge of the other.
- ▶ Typical Value: The mean value calculated from documented manufacturing quality control test results for a defined population obtained from one test method associated with one specific property.

1.3 Unit Prices (optional)

Measurement will be made of the total surface area in square feet covered by the RCM as shown on the contract drawings. Final quantities will be based on as-built conditions. Allowance will be made for RCM in anchor and trenches but no allowance will be made for waste, overlap, or materials used for the convenience of the Contractor. RCM installed and accepted will be paid for at the respective contract unit price in the bidding schedule.

1.4 Submittals

A. With the bid, the Contractor shall furnish a conceptual description of the proposed plan for placement of the RCM panels over the area of installation and RCM manufacturer's MQC Plan for documenting compliance to Sections 2.1 and 2.2 of these specifications.

B. At the engineer/owner's request, the contractor shall furnish a representative sample of the RCM.

C. Upon shipment, the Contractor shall furnish the RCM manufacturer's Quality Assurance/Quality Control (QA/QC) certifications to verify that the materials supplied for the project are in accordance with the requirements of this specification.

1.5 Qualifications

The RCM Installer must either have installed at least 1 million square feet (100,000 square meters) of RCM, or must provide to the Engineer satisfactory evidence, through similar experience in the installation of other types of geosynthetics, that the RCM will be installed in a competent, professional manner.

2.0 PRODUCTS

The RCM shall consist of a layer of organically modified bentonite clay encapsulated between geotextiles and shall comply with all of the criteria listed in this Section. Prior to using an alternate RCM, the Contractor must furnish independent test results demonstrating that the proposed alternate material meets all requirements of this specification. The Contractor also must obtain prior approval of the alternative RCM by the Project Engineer.

2.1 Materials

A. Acceptable RCM products are Organoclay Reactive Core Mat, as manufactured by CETCO, 2870 Forbs Avenue, Hoffman Estates, IL 60004 USA (800-527-9948), or an engineer-approved equal.

TECHNICAL REFERENCE

B. The RCM and its components shall have the properties shown in Table TR404-RCM.

C. The minimum acceptable dimensions of full-size RCM panels shall be 75 feet in length.

2.2 Product Quality Documentation

The RCM manufacturer shall provide the Contractor or other designated party with manufacturing QC certifications for each shipment of RCM. The certifications shall be signed by a responsible party employed by the RCM manufacturer and shall include:

A. Certificates of analysis for the organically modified bentonite clay used in GCL production demonstrating compliance with the parameters of the reactive media (bulk density, oil adsorption, and quaternary amine content as shown in tables TR404-RCM.

B. Manufacturer's test data for finished RCM product including mass/area, RCM grab tensile and elongation strength and RCM hydraulic conductivity demonstrating compliance with the index parameters shown in tables TR404-RCM.

C. RCM lot and roll numbers supplied for the project with corresponding shipping information.

TABLE TR 404 - RCM			
PROPERTY	TEST METHOD	TEST FREQUENCY	RESULT
ORGANOCLAY¹			
Bulk Density	CETCO Test Method	1/lot	44-56 lb/ft ³
Oil Adsorption Capacity	CETCO Test Method	1/lot	0.5 lb of oil/lb of clay min
Quaternary Amine Content	CETCO Test Method	1/lot	25-33% loading @ 800 °C
FINISHED RCM PRODUCT			
Organoclay Mass/Area	CETCO Test Method	1/40,000 sq.ft.	0.8 lb/ft ² (4.0 kg/m ²) min.
RCM Grab Strength ²	ASTM D4632	1/200,000 sq.ft.	90 lbs (400 N) MARV
Hydraulic Conductivity ³	ASTM D2434 / D4491	1/lot	1 x 10 ⁻³ cm/s minimum

NOTES:

¹ Organoclay properties performed periodically on material prior to incorporation into the RCM.

² All tensile testing is performed in the machine direction.

³ At maximum 2 psi confining pressure.

- ▶ Description: A permeable composite of geotextiles and granular activated carbon that reliably adsorbs organics from water.
- ▶ Roll Width and edge closure: Total Roll width is ~15' 2". Effective product width measures 15'.
- ▶ Roll Length: 100'
- ▶ Packaging: Packaged on min. 4" I.D. core tubes, and wrapped with polyethylene plastic packaging.

2.3 Product Labeling

Prior to shipment, the RCM manufacturer shall label each roll, identifying:

- ▶ Product identification information (Manufacturer's name and address, brand product code)
- ▶ Lot number and roll number
- ▶ Roll length, width and weight

2.4 Packaging

A. The RCM shall be wound around a rigid core whose diameter is sufficient to facilitate handling. The core is not necessarily intended to support the roll for lifting but should be sufficiently strong to prevent collapse during transit.

B. All rolls shall be labeled and bagged in packaging that is resistant to degradation by ultraviolet (UV) light.

3.0 EXECUTION

3.1 Shipping and Handling

A. The manufacturer assumes responsibility for initial loading the RCM. Shipping will be the responsibility of the party paying the freight. Unloading, on-site handling and storage of the RCM are the responsibility of the Contractor, Installer or other designated party.

2870 Forbs Avenue, Hoffman Estates, IL 60192
847.851.1700 | 800.527.9948 | cetco.com



IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice.

TECHNICAL REFERENCE

B. A visual inspection of each roll should be made during unloading to identify if any packaging has been damaged. Rolls with damaged packaging should be marked and set aside for further inspection. The packaging should be repaired prior to being placed in storage.

C. The party responsible for unloading the RCM should contact the Manufacturer prior to shipment to ascertain the appropriateness of the proposed unloading methods and equipment.

3.2 Storage

A. Storage of the RCM rolls shall be the responsibility of the installer. A dedicated storage area shall be selected at the job site that is away from high traffic areas and is level, dry and well drained.

B. Rolls should be stored in a manner that prevents sliding or rolling from the stacks and may be accomplished by the use of chock blocks. Rolls should be stacked at a height no higher than that at which the lifting apparatus can be safely handled (typically no higher than four).

C. All stored RCM materials must be covered with a plastic sheet or tarpaulin until their installation.

D. The integrity and legibility of the labels shall be preserved during storage.

3.3 Bathymetry

A. Any surface upon which the RCM is installed shall be prepared in accordance with the project specifications and drawings.

B. Immediately prior to RCM deployment, the surface shall be approved by the engineer.

C. It shall be the installer's responsibility thereafter to indicate to the Engineer any change in the condition of the surface that could cause it to be out of compliance with any of the requirements listed in this Section.

3.4 RCM Placement

A. RCM rolls should be delivered to the working area of the site in their original packaging. Immediately prior to deployment, the packaging should be carefully removed without damaging the RCM. The orientation of the RCM (i.e., which side faces up) should be in accordance with the Engineer's recommendations. If the engineer does not specify an orientation, then the RCM should be placed with the nonwoven geotextile side facing upward.

B. RCM rolls may be suspended and maneuvered over the surface utilizing a steel pipe placed through the core of the roll and suspended from suitable equipment utilizing a spreader bar to prevent chaffing of the edge of the roll.

C. Care must be taken to minimize the extent to which the RCM is dragged across the surface in order to avoid damage suspension of the contaminants.

D. In sloped areas, the RCM panels shall be placed parallel to the direction of the slope.

E. All RCM panels should lie flat on the underlying surface, with no wrinkles or fold, especially at the exposed edges of the panels.

F. Only as much RCM shall be deployed as can be covered at the end of the working day with a sand or soil cover.

3.5 Anchorage

On sloped areas, if directed by the project drawings and specifications, the end of the RCM roll shall be anchored with a panel runout designed to resist pull out forces encountered during deployment.

3.6 Seaming

A. The RCM seams are constructed by overlapping their adjacent edges. Seams at the ends of the panels should be constructed such that they are shingled in the direction of the grade/slope.

B. The minimum dimension of the longitudinal overlap should be 12 inches (300 mm). End-of-roll overlapped seams should be constructed with a minimum overlap of 24 in. (600mm).

C. RCM panels may be sewn together using geotextile sewing equipment prior to deployment to facilitate material deployment.

TECHNICAL REFERENCE

3.7 Detail Work

Cutting the RCM should be performed using a sharp shears. Care should be taken to minimize spilling of the reactive media after RCM has been cut.

3.8 Damage Repair

If the RCM is damaged (torn, punctured, perforated, etc.) during installation, it may be possible to repair it by cutting a patch to fit over the damaged area. The patch shall be obtained from a new RCM roll and shall be cut to size such that a minimum overlap of 12 inches (300 mm) is achieved around all of the damaged area. Place sand bags directly on top of the patch to prevent displacement of the patch during placement of the cover material.

3.9 Cover Placement

A. Cover materials shall be free of angular stones or other foreign matter that could damage the RCM. Cover material should be approved the project Engineer with respect to particle size, uniformity and chemical compatibility.

B. Cover shall be placed over the RCM using construction methods that minimize stresses on the RCM. A minimum thickness of 6 inches (150 mm) of cover should be placed.

C. Cover materials should be placed in a manner that prevents the material from entering the RCM overlap zones. Cover material shall not be pushed down slopes, to minimize tensile forces on the RCM.

Gravel base shall meet the following requirements for grading and quality when placed in hauling vehicles for delivery to the roadway or during manufacture and placement into a temporary stockpile. The exact point of acceptance will be determined by the Engineer.

Sieve Size	Percent Passing
2"	75-100
No. 4	22-100
No. 200	0-10
Dust Ratio:	¾ max.
Sand Equivalent	30 min.

All percentages are by weight.

Gravel base material retained on a No. 4 sieve shall contain not more than 0.20 percent by weight of wood waste.

9-03.11 Streambed Aggregates

Streambed aggregates shall be naturally occurring water rounded aggregates. Aggregates from quarries, ledge rock, and talus slopes are not acceptable for these applications. Streambed aggregates shall meet the following test requirements for quality:

Aggregate Property	Test Method	Requirement
Degradation Factor	WSDOT T 113	15 min.
Los Angeles Wear, 500 Rev.	AASHTO T 96	50% max.
Bulk Specific Gravity	AASHTO T 85	2.55 min.

9-03.11(1) Streambed Sediment

Streambed sediment shall meet the following requirements for grading when placed in hauling vehicles for delivery to the project or during manufacture and placement into temporary stockpile. The exact point of acceptance will be determined by the Engineer.

Sieve Size	Percent Passing
2½"	99-100
2"	65-95
1"	50-85
No. 4	26-44
No. 40	16 max.
No. 200	5.0-9.0

All percentages are by mass.

The portion of sediment retained on No. 4 sieve shall not contain more than 0.2 percent wood waste.

9-03.11(2) Streambed Cobbles

Streambed cobbles shall be clean, naturally occurring water rounded gravel material.

Streambed cobbles shall have a well-graded distribution of cobble sizes and conform to one

Approximate Size ¹	Percent Passing				
	4" Cobbles	6" Cobbles	8" Cobbles	10" Cobbles	12" Cobbles
12"					99-100
10"				99-100	70-90
8"			99-100	70-90	
6"		99-100	70-90		
5"		70-90			30-60
4"	99-100			30-60	
3"	70-90		30-60		
2"		30-60			
1½"	20-50				
¾"	10 max.	10 max.	10 max.	10 max.	10 max.

¹Approximate Size can be determined by taking the average dimension of the three axes of the rock, Length, Width, and Thickness, by use of the following calculation:

$$\frac{\text{Length} + \text{Width} + \text{Thickness}}{3} = \text{Approximate Size}$$

The grading of the cobbles shall be determined by the Engineer by visual inspection of the load before it is dumped into place, or, if so ordered by the Engineer, by dumping individual loads on a flat surface and sorting and measuring the individual rocks contained in the load.

Length is the longest axis, width is the second longest axis, and thickness is the shortest axis.

9-03.11(3) Streambed Boulders

Streambed boulders shall be hard, sound and durable material, free from seams, cracks, and other defects tending to destroy its resistance to weather. Streambed Boulders shall be rounded to sub-angular in shape and the thickness axis shall be greater than 60 percent of the length axis. Streambed boulders sizes are approximately as follows, see Plans for sizes specified:

Rock Size ¹	Approximate Size
One Man	12" – 18"
Two Man	18" – 28"
Three Man	28" – 36"
Four Man	36" – 48"
Five Man	48" – 54"
Six Man	54" – 60"

¹Approximate Size can be determined by taking the average dimension of the three axes of the rock, Length, Width, and Thickness, by use of the following calculation:

$$\frac{\text{Length} + \text{Width} + \text{Thickness}}{3} = \text{Approximate Size}$$

Length is the longest axis, width is the second longest axis, and thickness is the shortest axis.

9-03.11(4) Habitat Boulders

Habitat boulders shall be hard, sound and durable material, free from seams, cracks, and other defects tending to destroy its resistance to weather. Habitat Boulders shall be rounded to sub-angular in shape and the thickness axis shall be greater than 60 percent of the width axis and the length shall be 1.5 to 3 times the width axis. Habitat boulders sizes are approximately as follows, see Plans for sizes specified:

**APPENDIX B
HEALTH AND SAFETY PLAN**

HEALTH AND SAFETY PLAN BREMERTON GAS WORKS SITE REMOVAL ACTION WORK PLAN

Prepared for

Cascade Natural Gas Corporation

Prepared by

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September 2013

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LIST OF ACRONYMS AND ABBREVIATIONS

BTEX	benzene, toluene, ethylbenzene, and xylene
CPR	cardiopulmonary resuscitation
EPA	U.S. Environmental Protection Agency
FC	field coordinator
FID	flame ionization detector
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
MGP	manufactured gas plant
MSDS	Material Safety Data Sheets
OSHA	Occupational Safety and Health Administration
OVM	organic vapor monitor
PAH	polycyclic aromatic hydrocarbons
PEC	project emergency coordinator
PID	photoionization detector
PM	project manager
Site	Bremerton Gas Works Site
TPH	total petroleum hydrocarbons
VOC	volatile organic compound

1 INTRODUCTION

Cascade Natural Gas Corporation is conducting a removal action at the Bremerton Gas Works Site (Site) in Bremerton, Washington. The work is being conducted under an Administrative Settlement Agreement and Order on Consent with the U.S. Environmental Protection Agency (EPA), executed on May 1, 2013.

This Health and Safety Plan (HASP) is designed to protect Anchor QEA, LLC, personnel from physical, chemical, and other hazards posed by oversight of cleanup and sediment capping activities conducted at the Site. Field activities covered under this HASP include Site investigation, subsurface sediment sampling, and construction oversight activities.

2 SITE DESCRIPTION AND PROJECT SCOPE

The Site is located on the north shore of Dyes Inlet in Bremerton, Washington, between Thompson and Pennsylvania Avenues in West Bremerton. Land use in the Site area is currently industrial and light commercial.

The removal action project scope consists of construction activities to remove limited areas of hardened hydrocarbon materials, and the construction of a sediment cap within the intertidal beach area to reduce the potential for release of hazardous substances into the environment during implementation of a Remedial Investigation and Feasibility Study at the Site. Planned activities also include plugging of an upland stormwater manhole.

Limited investigations have been conducted at the Site, which identified elevated concentration of polycyclic aromatic hydrocarbons (PAHs). Previous experience at manufactured gas plant (MGP) sites is also relied upon to conservatively base the information provided in this HASP.

3 EMERGENCY RESPONSE PLAN

Because of the health and safety hazards associated with the removal action construction activities, the potential exists for an emergency to occur. Emergencies may include personal injury, exposure to hazardous substances, fire, explosion, or release of toxic or non-toxic substances (spills). Occupational Safety and Health Administration (OSHA) regulations require that an emergency response plan be available for use onboard to guide actions in emergencies.

Onshore organizations will be relied upon to provide response in emergencies. The local fire department and ambulance service can provide timely response. Anchor QEA personnel and subcontractors will be responsible for identifying an emergency, providing first aid if applicable, notifying the appropriate personnel or agency, and evacuating any hazardous area. Sampling personnel will attempt to control only very minor hazards that could present an emergency, such as a small fire, and will otherwise rely on outside emergency response resources.

The following subsections address key safety personnel, authority and responsibilities of key personnel, and pre-emergency preparation; identify individual(s) who should be notified in case of emergency; provide a list of emergency telephone numbers; offer guidance for particular types of emergencies; and provide directions and a map for getting from the Site to a hospital.

3.1 Key Safety Personnel

The following people share responsibility for health and safety at the Site. The next section includes a description of the role and responsibility of each.

Project Manager: Mark Larsen	Office: 206-287-9130 Cell: 206-310-2263
Field Coordinator: Nathan Soccorsy	Office: 206-287-9130 Cell: 480-272-2805
Site Supervisor: Delaney Peterson	Office: 206-287-9130 Cell: 206-919-2845
Site Safety and Health Officer: David Templeton	Office: 206-287-9130 Cell: 206-819-6009
Field Personnel: TBD	Cell: TBD

3.2 Authority and Responsibilities of Key Personnel

This section describes the authority and responsibilities of key Anchor QEA personnel. The names and contact information for the following key safety personnel are listed in the previous section of this HASP. Should key site personnel change during the course of the project, a new list will be established and posted immediately at the Site. The emergency phone number for the Site is **911** and should be used first for all medical, fire, and police emergencies.

3.2.1 Project Manager

The project manager (PM) provides overall direction for the project and is responsible for ensuring that the project meets the client's objectives in a safe and timely manner. The PM is responsible for providing qualified staff for the project and adequate resources and budget for the health and safety staff to carry out their responsibilities during the field work. The PM is in regular contact with the field coordinator (FC; see Section 3.2.2) and site safety and health officer (SSHO; see Section 3.2.3) to ensure that appropriate health and safety procedures are implemented into each project task.

The PM has authority to direct response operations; the PM assumes total control over project activities but may assign responsibility for aspects of the project to others. In addition, the PM:

- Oversees the preparation and organization of background review of the project, the work plan, and the field team
- Ensures that the team obtains permission for site access and coordinates activities with appropriate officials
- Briefs the FC and field personnel on specific assignments
- Together with the FC, sees that health and safety requirements are met
- Consults with the SSHO regarding unsafe conditions, incidents, or changes in site conditions or the scope of work

3.2.2 Field Coordinator

The FC reports to the PM and has authority to direct response operations and assumes control over on-site activities. The FC will direct field activities, coordinate the technical and health and safety components of the field program, and is responsible in general for enforcing the HASP and Corporate HASP. The FC will be the primary point of contact for all field personnel and visitors and has direct responsibility for implementation and administration of this HASP. The FC and any field personnel have the authority to stop or suspend work in the event of an emergency, if conditions arise that pose an unacceptable health and safety risk to the personnel or environment, or if conditions arise that warrant revision or amendment of this HASP.

The functions of the FC related to this HASP include but are not necessarily limited to the following:

- Conduct and document daily safety meetings, or designate an alternate FC in his or her absence
- Execute the work plan and schedule
- Periodic field health and safety inspections to ensure compliance with this HASP
- Oversee implementation of safety procedures
- Implement worker protection levels

- Enforce site control measures to ensure that only authorized personnel are allowed on site
- Notify, when necessary, local public emergency officials (all personnel on site may conduct this task as needed)
- Follow-up on incident reports to the PM
- Periodically inspect protective clothing and equipment for adequacy and safety compliance
- See that protective clothing and equipment are properly stored and maintained
- Perform or oversee air monitoring in accordance with this HASP
- Maintain and oversee operation of monitoring equipment and interpretation of data from the monitoring equipment
- Monitor workers for signs of stress, including heat stress, cold exposure, and fatigue.
- Require participants to use the “buddy” system
- Provide (via implementation of this HASP) emergency procedures, evacuation routes, and telephone numbers of the local hospital, poison control center, fire department, and police department
- Communicate incidents promptly to the PM
- Maintain communication with the SSHO on site activities
- If applicable, ensure decontamination and disposal procedures are followed
- Maintain the availability of required safety equipment
- Advise appropriate health services and medical personnel of potential exposures.
- Notify emergency response personnel in the event of an emergency. Coordinate emergency medical care

The FC will record health-and-safety-related details of the project in the field logbook. At a minimum, each day’s entries must include the following information:

- Project name or location
- Names of all on-site personnel
- Level of personal protective equipment (PPE) worn and any other specifics regarding PPE
- Weather conditions
- Type of field work being performed

The FC will have completed the required OSHA 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and annual updates, the 8-hour Supervisor training, current first aid and cardiopulmonary resuscitation (CPR) training, and medical monitoring clearance, if applicable. Other certifications or training may be stipulated based on client or site requirements.

3.2.3 Site Safety and Health Officer

Anchor QEA's SSHO will be responsible for managing on-site health and safety activities and will provide support to the PM and FC on health and safety issues. The specific duties of the SSHO are to:

- Provide technical input into the design and implementation of this HASP.
- Advise on the potential for occupational exposure to project hazards, along with appropriate methods and/or controls to eliminate site hazards.
- Ensure that a hazard assessment has been performed and that the adequacy of the PPE selected was evaluated as required by 29 CFR 1910.132(d), 1910.134, 1926.25, and 1926.55, and is duly noted by the signatures and date appearing on the Certification Page of this document.
- Consult with the FC on matters relating to suspending site activities in the event of an emergency.
- Verify that all on-site Anchor QEA personnel and subcontractors have read and signed the HASP Acknowledgement Form.
- Review daily the on-site health and safety activities for effectiveness and modify as needed.
- Verify that corrective actions resulting from deficiencies identified by daily health and safety reviews and observations are implemented and effective.

The SSHO will have completed the required OSHA 40-hour HAZWOPER training and annual updates, the 8-hour Supervisor training, and have medical monitoring clearance, if applicable. In addition, the SSHO will have current training in first aid and CPR.

3.2.4 Field Personnel

All project field personnel will attend a project-specific meeting conducted by the FC concerning safety issues and project work task review before beginning work. All field personnel must be familiar with and comply with this HASP. Subcontractors will be responsible for developing and complying with their own company HASP. The field personnel have the responsibility to immediately report any potentially unsafe or hazardous conditions to the FC. All members of the field personnel have the authority to stop or suspend work if conditions arise that pose an unacceptable health and safety risk to the field personnel or environment or if conditions arise that warrant revision or amendment of this HASP.

The field team reports to the FC for on-site activities and is responsible for

- Reviewing and maintaining a working knowledge of this HASP
- Safe completion of on-site tasks required to fulfill the work plan
- Compliance with the HASP
- Attendance and participation in daily safety meetings
- Notification to the FC of existing or potential safety conditions at the site
- Reporting all incidents to the FC
- Demonstrating safety and health conscious conduct

3.3 Pre-emergency Preparation

Before the start of field activities, the FC will ensure that preparation has been made in anticipation of emergencies. Preparatory actions include the following:

- All field personnel meeting with the FC concerning the emergency procedures in the event that a person is injured. Appropriate actions for specific scenarios will be reviewed. These scenarios will be discussed and responses determined before the sampling event commences.
- A training session given by the FC informing all field personnel of emergency procedures, locations of emergency equipment and their use, and proper evacuation procedures.
- A training session given by senior staff operating field equipment, to apprise field personnel of operating procedures and specific risks associated with that equipment.

- Ensuring that field personnel are aware of the existence of the emergency response plan, its location, and ensuring that a copy of the HASP accompanies the field team(s).

3.4 Project Emergency Coordinator

The FC will serve as the project emergency coordinator (PEC) in the event of an emergency. The FC will designate a replacement for times when he is not onboard or is not serving as the PEC. The designation will be noted in the logbook. The PEC will be notified immediately when an emergency is recognized. The PEC will be responsible for evaluating the emergency, notifying the appropriate emergency response units, coordinating access with those units, and directing interim actions onboard before the arrival of emergency response units. The PEC will notify the SSHO and the PM as soon as possible after initiating an emergency response action. The PM will have responsibility for notifying the client.

3.5 Emergency Response Contacts

All personnel must know whom to notify in the event of an emergency, even though the FC has primary responsibility for notification. Table 1 lists the names and phone numbers for emergency response services and individuals.

Table 1
Emergency Response Contacts

Emergency Phone Numbers	
Ambulance	911
Fire	911
Police	911
Poison Control	1-800-222-1212
Project Manager	David Templeton Office: 206-287-9130
Field Coordinator	TBD
Corporate Health and Safety Manager	David Templeton Office: 206-287-9130 Cell: 206-910-4279
National Response Center	1-800-424-8802
State Emergency Response System	911
EPA Environmental Response Team	1-201-321-6600

Notes:

In the event of any emergency, the PM, FC, SSHO, or any field personnel may contact emergency responders listed in this table.

3.6 Emergency Response and Alerting Procedures

Each field team will carry a cell phone and an air horn that are in good working order. Cell phone coverage is good at the Site. Site communications will be done with either a cell phone or the air horn. If there is any type of emergency that requires Site evacuation (for example, a severe thunderstorm), the FC or any other site personnel recognizing the condition will blow the air horn three times. When the horn sounds, all personnel will meet at the end of Thompson Drive (Figure 1). All other emergency notifications that do not require evacuation will be conducted using a cell phone. Emergency phone numbers are listed in Table 1.

In the event of an emergency, immediate action must be taken by the first person to recognize the event. The following steps will be used as a guideline:

- Survey the situation to ensure that it is safe for you and the victim. Do not endanger your own life. Do not enter an area to rescue someone who has been overcome unless properly equipped and trained. Ensure that all protocols are followed. If

applicable, review Material Safety Data Sheets (MSDS) to evaluate response actions for chemical exposures.

- Call the appropriate emergency number (911) or direct someone else to do this immediately (see Section 3.1). Explain the physical injury, chemical exposure, fire, or release and location of the incident.
- Have someone retrieve the nearest first aid kit.
- Decontaminate the victim without delaying life-saving procedures (see Section 3.8).
- Administer first aid and CPR, if properly trained, until emergency responders arrive.
- Notify the PM and the FC.
- Complete the appropriate incident investigation reports.

3.7 Recognition and Prevention of Emergency Situations

Everyone on-site is responsible to monitor the environment for conditions that could lead to a release or an injury. Emergencies will generally be recognizable by observation. The Site team must take steps needed to respond to such observations. An injury or illness will be considered an emergency if it requires treatment by a medical professional and cannot be treated with simple first-aid techniques.

3.8 Decontamination

In the case of evacuation, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of site workers. If an injured individual is also heavily contaminated and must be transported by emergency vehicle, the emergency response team will be told of the type of contamination. To the extent possible, contaminated PPE will be removed, but only if doing so does not exacerbate the injury. Plastic sheeting will be used to reduce the potential for spreading contamination to the inside of the emergency vehicle.

3.9 Fire

Personnel will attempt to control only small fires, should they occur. If an explosion appears likely, personnel will follow evacuation procedures specified by the FC in the training session. If a fire cannot be controlled with a fire extinguisher that is part of the required safety equipment, personnel will either withdraw from the vicinity of the fire or use additional firefighting equipment, or evacuate the upland area as specified by the FC in the training session.

3.10 Personal Injury

In the event of serious personal injury, including unconsciousness, possibility of broken bones, severe bleeding or blood loss, burns, shock, or trauma, the first responder will immediately do the following:

- Administer first aid, if qualified.
- If not qualified, seek out an individual who is qualified to administer first aid, if time and conditions permit.

- Notify the PEC of the incident, the name of the individual, the location, and the nature of the injury.

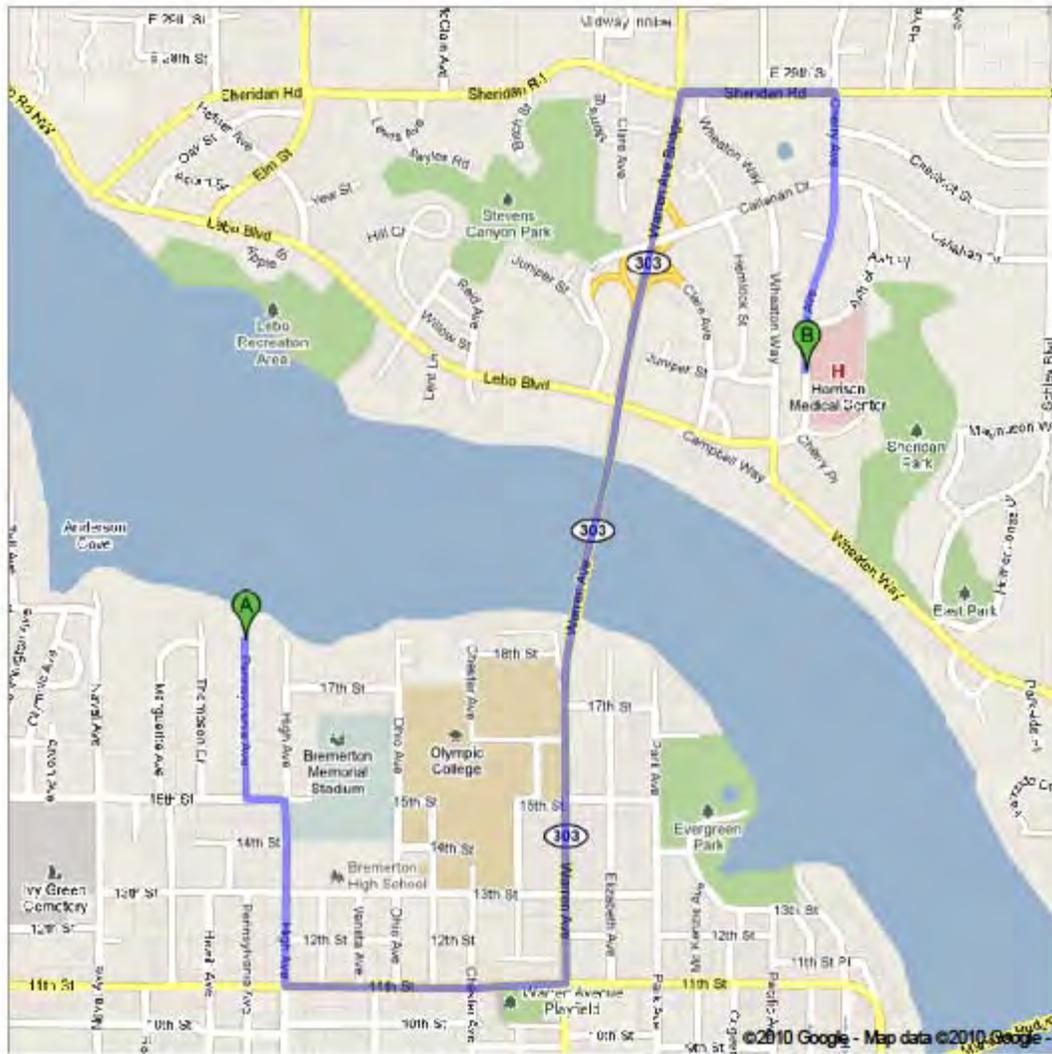
The PEC will immediately do the following:

- Notify the appropriate emergency response organization.
- Assist the injured individual.
- Follow the emergency procedures for retrieving or disposing equipment reviewed in the training session, and leave the Site en route to the predetermined land-based emergency pick-up.
- Designate someone to accompany the injured individual to the hospital.
- If an emergency (for example, broken bones or injury where death is imminent without immediate treatment) occurs, the FC will call 911 and arrange to meet the response unit at the nearest accessible dock.
- Notify the SSHO and the PM.

If the PEC determines that emergency response is not necessary, he may direct someone to decontaminate and transport the individual by vehicle to the nearest hospital. Directions and a map showing the route to the hospital are on Figure 2.

If a worker leaves the Site to seek medical attention, another worker should accompany him or her to the hospital. When in doubt about the severity of an injury or exposure, always seek medical attention as a conservative approach and notify the PEC.

The PEC will have responsibility for completing all accident/incident field reports, OSHA form 200s, and other required follow-up forms.



Harrison Bremerton Medical Center

2520 Cherry Avenue
Bremerton, WA 98310
360-744-3911

Directions from Site (A) to hospital (B):

1. Head south on Pennsylvania Ave toward 15th Street.
2. Turn left at 15th Street.
3. Take the first right onto High Avenue.
4. Take the third left onto 11th Street.
5. Turn left at Warren Avenue.
6. Continue onto Warren Avenue Bridge.
7. Turn right at Sheridan Road.
8. Take the second right onto Cherry Avenue. Destination will be on the left.

3.11 Overt Personal Exposure or Injury

If an overt exposure to toxic materials occurs, the first responder to the victim will initiate actions to address the situation. The following actions should be taken, depending on the type of exposure:

- Skin Contact:
 - Wash/rinse the affected area thoroughly with copious amounts of soap and water.
 - If eye contact has occurred, eyes should be rinsed for at least 15 minutes using the eyewash that is part of the emergency equipment onboard and in the lab.
 - After initial response actions have been taken, seek appropriate medical attention.
- Inhalation:
 - Move victim to fresh air.
 - Seek appropriate medical attention.
- Ingestion:
 - Seek appropriate medical attention.
- Puncture Wound or Laceration:
 - Seek appropriate medical attention.

3.12 Spills and Spill Containment

As necessary, spill control measures will be used to contain contaminated materials that may enter into clean areas. Plastic sheeting, sorbent pads, sorbent booms, or a spill control system will be used to prevent spills and contain contaminated material.

If a spill occurs, the SSHO will immediately discuss the event with the U.S. Coast Guard, EPA, or their oversight contractor to evaluate the need for reporting. Any spill will be reported consistent with state and federal law. In the case of a reportable spill, the National Response Center (800-424-8802) and the Washington State Emergency Response System (911) will be notified by the SSHO or the PM.

4 HAZARD EVALUATION AND CONTROL MEASURES

This section covers potential chemical and physical hazards that may be associated with the proposed field activities and presents control measures to address these potential hazards. Section 4.4 presents the activity hazard analysis, which lists the potential hazards associated with each site activity and the recommended site control to be used to minimize each potential hazard.

4.1 Exposure Routes

Potential routes of exposure to chemicals include inhalation, dermal contact, and ingestion of dust, mist, gas, vapor, or liquid. Exposure will be minimized by using safe work practices and by wearing the appropriate PPE. Further discussion of PPE requirements is presented in Section 7.

4.1.1 Inhalation

Inhalation of particulates, dust, mist, gas, or vapor during the planned activities is possible. Whenever possible, the work activity will be oriented so that personnel are upwind of the location. An organic vapor monitor (OVM), a photoionization detector (PID), or flame ionization detector (FID) will be used to monitor ambient air in the breathing zone within the work area for organic compounds. Table 2 describes air monitoring action levels and response procedures. A daily air monitoring log form is presented in Attachment 1.

Table 2
Air Monitoring Action Levels

Instrument	Job Tasks/Functions	Measurement	Monitoring Schedule ¹	Actions ²
OVM, FID, and/or PID (11.7*eV lamp) - Measures Total Organic Vapors	Conduct continuous air monitoring for volatile organic compounds during activities where contaminated media are present. Make sure that a background reading is taken before the startup of activities and periodically thereafter.	Sustained (for 2 minutes) 0 to 5 ppm above background in breathing zone	Continuous (logging periodically every 15 to 30 minutes)	Continue work
		Sustained (for 2 minutes) greater than 5 ppm above background	Continuous (logging periodically every 15 minutes)	Stop work if sustained readings for longer than 2 minutes. ³ Institute engineering controls. If concentrations decrease to below 1 ppm above background, continue work. If concentrations above 5 ppm persist, stop work and contact the project manager (PM) for further instructions.

Notes:

ppm parts per million

Instruments must be calibrated according to manufacturer's recommendations.

1 Monitoring frequency is at beginning of each task and continuously thereafter (logging periodically every 15 minutes), or when detectable sediment contamination is encountered (as indicated by strong, sustained odor, visual evidence of product or petroleum discolored soils). Air monitoring frequency may be changed based on obtained air data for a work task.

2 For VOCs, sustained reading for greater than 2 minutes in excess of the action level will trigger a protective measure.

3 Contact with the PM must be made prior to continuing work. A hazard review must be conducted before proceeding with work.

4.1.2 Dermal Contact

Dermal contact with potentially contaminated soil, sediment, or groundwater operations is possible. Direct contact will be minimized by using appropriate PPE and decontamination procedures.

4.1.3 Ingestion

Ingestion of contaminants is a less likely route of exposure than inhalation or dermal contact for many of the contaminants of concern. Direct ingestion of contaminants can occur by inhaling airborne dust, mist, or vapors or swallowing contaminants trapped in the upper respiratory tract. Indirect ingestion can occur by introducing the contaminants into the mouth by way of food, tobacco, fingers, or other carriers. Although ingestion of contaminants can occur, proper decontamination/contamination reduction procedures should eliminate the probability of this route of exposure.

4.2 Chemical Hazards

Metals, volatile organic compounds (VOCs), petroleum hydrocarbons, PAHs, and free product (that is, coal tar) typically sourced from MGP activities may be present in sediments at the Site. In addition, there is some potential for exposure to hexane, acetone, or non-phosphate soap (that is, Alconox), which in some cases may be used as a decontamination materials. MSDSs for potential chemical hazards are included in Attachment 2.

4.2.1 Volatile Organic Compounds

Based on previous experience at MGP sites, VOCs possibly present at the Site include volatile components of gasoline (benzene, toluene, ethylbenzene, and xylenes [BTEX]). The primary exposure routes for VOCs during the planned activities are inhalation, dermal contact, and ingestion of contaminated soil, sediment, dust, or water. VOCs readily volatilize and are primarily an inhalation concern. BTEX compounds are known or suspected human carcinogens. MSDSs for BTEX are included in Attachment 2.

An OVM will be used to monitor ambient air and the breathing zone for VOCs. Respiratory protection will be employed if elevated levels of organic compounds are measured by the

OVM, if odors are present, or other conditions warrant its use. Air monitoring action levels are presented in Table 2.

4.2.2 Metals

The primary exposure routes for metals potentially during the planned activities are inhalation or ingestion of dust particles. Metals may also be indirectly ingested, as described in Section 4.1.3. A secondary route of exposure to metals is dermal contact. The target organs primarily affected by prolonged exposure to metals are the respiratory tract, gastrointestinal tract, central nervous system, kidneys, and liver.

Prolonged exposure to metals through any of the potential routes of exposure is not expected. Skin will be washed immediately when exposed to soil, sediment, dust, or water potentially impacted by metals.

4.2.3 Total Petroleum Hydrocarbons

Total petroleum hydrocarbons (TPHs) possibly at the Site include tar and oil related materials in sediments and soils, which contain benzene and aromatic hydrocarbons. Gasoline, diesel, fuel, and waste oil, and heavier hydrocarbons such as grease may also be present associated with sampling equipment. The primary exposure routes for petroleum hydrocarbons during the planned activities are inhalation, dermal contact, and ingestion of contaminated soil, sediment, dust, or water. Lighter petroleum hydrocarbons such as gasoline and benzene readily volatilize and are primarily an inhalation concern (as described in Section 4.2.1), whereas the primary route of exposure to heavier petroleum hydrocarbons such as aromatic hydrocarbons, oil, and grease is dermal contact. The target organs primarily affected by prolonged exposure to petroleum hydrocarbons are the respiratory system, central nervous system, kidneys, liver, and skin. Prolonged dermal contact with petroleum hydrocarbons can cause irritation or dermatitis. MSDSs for TPH are included in Attachment 2.

As described in Section 4.2.1, an OVM will be used to monitor ambient air and the breathing zone for TPH compounds that have volatilized. Respiratory protection will be employed if

elevated levels of organic compounds are measured by the OVM, if odors are present, or other conditions warrant its use. Air monitoring action levels are presented in Table 2.

Petroleum hydrocarbons such as gasoline are also flammable and can be a physical hazard when present in high concentrations. Physical hazards associated with flammable compounds are addressed in Section 4.3.10. Combustion of petroleum hydrocarbons can produce carbon dioxide, carbon monoxide, aldehydes, fumes, smoke (particulate matter), and other products of incomplete combustion. Intentional and inadvertent combustion of petroleum hydrocarbons is not expected during sampling activities; however, personnel will be removed from the area should a fire occur.

4.2.4 Polycyclic Aromatic Hydrocarbons

PAHs are petroleum hydrocarbons which are relatively nonvolatile due to their complex molecular structure and high molecular weight. Consequently, the primary route of exposure to PAHs is through dermal contact. PAHs may also be indirectly ingested, as described in Section 4.1.3. Inhalation of PAHs is unlikely due to their nonvolatile nature. Dermal or eye contact with PAHs can cause irritation or burning. MSDSs for PAHs are included in Attachment 2.

4.2.5 Hydrogen Sulfide

Hydrogen sulfide is a naturally occurring gas often associated with organic clay and peat. Hydrogen sulfide gas is potentially toxic through inhalation, ingestion, and contact with the skin and eyes. Inhalation can result in respiratory irritation, rhinitis, and edema of the lungs. Inhalation of hydrogen sulfide gas can result in headache, dizziness, and agitation. Acute exposure at high concentrations may result in coma and death because of respiratory failure. Hydrogen sulfide gas has a distinct rotten egg odor and, although not expected, will be noted if encountered in the field. MSDSs for hydrogen sulfide are included in Attachment 2.

4.3 Physical Hazards

4.3.1 Slips, Trips, and Falls

As with all fieldwork sites, personnel should exercise caution to prevent slips on slick surfaces. In particular, sampling near or conducting construction observation activities around excavations require careful attention to minimize the risk of falling down. The same care should be used in rainy conditions. Wearing boots with good tread, made of material that does not become overly slippery when wet, can minimize slips.

Trips are always a hazard on uneven surfaces or in a cluttered work area. Personnel will keep work areas as free as possible from items that interfere with walking and movement. See Section 4.3.5 for more details on uneven surfaces.

Falls may be avoided by working as far away from exposed edges as possible. For this project, the potential for falling is associated primarily with sediment sampling activities and construction management. Personnel will keep walkways and work areas clear when possible and use caution when walking along the shoreline and the riverbank slope.

4.3.2 Fatigue

Since personnel may be working during both daytime and nighttime hours (depending on the activity) 5 to 7 days a week, it is important that all personnel are aware of the hazards related to fatigue. Fatigue can occur at any time when working and may cause safety concerns due to decreased manual dexterity, reaction time, and alertness. The following section is provided to help, prevent, detect, and address fatigue-related issues.

Fatigue can be defined as an increasing difficulty in performing physical or mental activities. Signs of fatigue may include tiredness, changes in behavior, loss of energy, and the reduced ability to concentrate. Fatigued workers may have a reduced ability to recognize or avoid risks on the work site, which may lead to an increase in the number and severity of injuries and other incidents.

Fatigue results from insufficient rest and sleep between activities. Contributing factors to fatigue may include:

- The time of day that work takes place
- The length of time spent at work and in work-related duties
- The type and duration of a work task and the environment (such as, weather conditions and ambient noise) in which it is performed
- The quantity and quality of rest obtained prior to, during, and after a work period
- Non-work activities
- Individual factors such as sleeping disorders, medications, or emotional state

Personnel suffering from fatigue may exhibit both physical and mental effects, such as:

- Slower movements
- Poor coordination
- Slower response time to interaction
- Bloodshot eyes
- Slumped or weary appearance
- Nodding off
- Distractedness or poor concentration
- Inability to complete tasks
- Fixed gaze
- Appearing depressed, irritable, frustrated, or disinterested

Fatigue may cause an increased risk of incidents due to tiredness and lack of alertness. When workers are fatigued, they may be more likely to exercise poor judgment and have slower reactions to external and internal stimuli. This may increase all risks on site because fatigued workers may be less able or likely to respond effectively to changing circumstances, leading to an increased likelihood of incidents due to human error.

To stress the importance of managing fatigue, this topic will be covered in pre-work meetings and will include a discussion of what fatigue is, why it is hazardous, signs and symptoms, and ways to control or mitigate it. Employees will be strongly encouraged to get sufficient pre-work rest, to maintain sufficient nutritional intake during work (that is, eat

and drink at regular intervals), and to communicate with team members and leaders if their level of fatigue elevates.

Fatigue management can usually be assisted through the performance of a routine exercise program and an established regular sleep schedule. Workers will be informed that the occurrence of a good night's sleep can be enhanced by avoiding heavy meals or caffeine and minimizing or eliminating the consumption of alcohol and nicotine.

Workers will be periodically observed and directly queried for signs or symptoms of fatigue. Workers that express concern over their level of fatigue, or are observed to be fatigued such that elevated worker risk is evident, will be relieved or their work tasks adjusted so that they may rest sufficiently.

Consistent with applicable labor laws, individuals will not be scheduled to work more than 16 hours (including travel time) in any 24-hour period. Work schedules will consider fatigue factors and optimize continuous periods available for uninterrupted sleep. The employee is responsible for reporting to work properly rested and fit for duty. All personnel will be scheduled to receive a minimum of 8 hours of rest (that is, no work-related tasks) in any 24-hour period. In case of an emergency or operational difficulties (for example, access due to water levels), work hours may require adjustment, with worker consent.

4.3.3 Soil and Sediment Sampling Equipment

Sediment samples will be collected using a hand auger or tripod mounted direct push machine. Prior to initiation of sampling, there will be a training session for all field personnel pertaining to the equipment that will be used.

4.3.4 Precautions When Working Around Heavy Equipment

The following precautions will be taken to minimize heavy equipment hazards:

- All equipment must have back-up alarms.
- Personnel must make eye contact with the operator before approaching the equipment and remain safely outside the swing radius of the equipment.

- Personnel must wear orange visibility vests in addition to standard Level D or modified Level D PPE.
- Personnel must never stand on track-hoe tracks to communicate with the operator.
- Operators must be aware of personnel in the area and use proper hand signals before maneuvering.
- Operators must wear hard hats when operating machines and when going to and from their equipment.
- Operators must use spotters and be cautious when maneuvering equipment within 15 feet of overhead power lines and utility pole guy wires, and maintain safe distances at all times (greater than 10 feet).
- Provisions will be made to prevent the unauthorized start-up of equipment when personnel leave the Site at the end of the shift, such as battery ignition locks.

4.3.5 Uneven Work Surfaces

Slips and trips on uneven surfaces such as an excavation edge or beach slope can be particularly hazardous. Care will be taken when setting up equipment near excavations or along the shore to provide an area for field personnel working on or near the equipment. Wearing boots with good tread that are made of material that does not become overly slippery when wet can minimize slips. Sturdy work gloves shall be worn to protect the hands against sharp or rough rocky surfaces.

4.3.6 Manual Lifting and Material Handling

Equipment and samples must be lifted and carried along the shoreline. Back strain can result if lifting is done improperly. During any manual handling tasks, personnel should lift with the load supported by their legs and not their backs. For heavy loads, an adequate number of people will be used, or if possible, a mechanical lifting/handling device. Leather gloves will be worn when handling metal, wire rope, sharp debris, or transporting material (for example, wood, piping, or drums).

4.3.7 Heat Stress

Scheduled sampling operations will be occurring in late fall, and the potential for high temperatures exists. The potential for heat stress may occur if impermeable PPE is worn or if

strenuous work is performed under hot conditions with inadequate water. When the core body temperature rises above 100.4 degrees Fahrenheit (° F), the body cannot sweat to cool down, and heat stress can occur. Heat stress may be identified by the following symptoms: dizziness, profuse sweating, skin color change, vision problems, confusion, nausea, fatigue, fainting, and clammy skin. Personnel exhibiting such symptoms will be removed to a cool shady area, given water, and allowed to rest. Fresh drinking water will be provided during field activities. All field team members will monitor their own condition and that of their co-workers to detect signs of heat stress.

4.3.8 Hypothermia

Since work will be conducted in the late fall, cold temperatures and hypothermia are also a possibility. Hypothermia is abnormal lowering of the core body temperature caused by exposure to a cold environment. Wind chill as well as wetness or water immersion can play a significant role. Typical signs of hypothermia include fatigue, weakness, lack of coordination, apathy, and drowsiness. Confusion is a key symptom of hypothermia. Shivering and pallor are usually absent, and the face may appear puffy and pink.

Body temperatures below 90° F require immediate treatment to restore the temperature to normal. Current medical practice recommends slow warming of the individual followed by professional medical care. Moving the person to a sheltered area and wrapping them in a blanket can accomplish this portion of the task. If possible, the person should be placed in a warm room. In emergencies where body temperature falls below 90° F and shelter is not available, a sleeping bag, blankets, and body heat from another individual can be used to help raise body temperature.

4.3.9 Weather

In general, field team members will be equipped for the normal range of weather conditions. The designated FC will be aware of current weather conditions and of the potential for those conditions to pose a hazard to the field personnel. Some conditions that might force work stoppage are electrical storms, high winds, or high waves resulting from winds.

4.3.10 Flammable Hazards

Petroleum hydrocarbons are flammable in moderate to high concentrations; therefore, smoking, open flames, and unprotected ignition sources will not be allowed in the work area. An OVM will be used to measure concentrations of organic vapors in the work area. If elevated OVM measurements persist, work will be suspended until corrective measures are taken to ensure a safe work environment. Table 2 includes additional information about air monitoring action levels.

4.3.11 Biological Hazards

Direct contact with Dyes Inlet water may be hazardous due to the potential for combined sewer overflow contamination. All field personnel will avoid contact with potential biological or infectious materials, wear PPE as appropriate, and wash hands and face as soon as possible after contact and before eating or drinking.

4.4 Activity Hazard Analysis

The activity hazard analysis summarizes the field activities to be, outlines the hazards associated with each activity, and presents controls that can reduce or eliminate the risk of the hazard occurring.

Table 3 presents the activity hazard analysis for the following activities:

- Field activities (including construction management)
- Surface sediment sample collection
- Sediment sample handling, packaging, processing, and shipping
- Equipment decontamination

Table 3
Activity Hazard Analysis

Activity	Hazard	Control
Sampling activities including sediment sample collection	Accessing the intertidal work area	The stairway adjacent to the marina or other improved stairway access will be used.
	Falling	Avoid working near the edge of water or excavations, if possible. Stay away from edge of excavations.
	Cuts, amputations	Be aware of and avoid equipment pinch points. Use care when using hand tools to process samples.
	Back or muscle strain	Use appropriate lifting technique when handling heavy equipment and lifting heavy sample containers. Enlist help if necessary.
	Noise	Wear ear plugs or ear muffs when operating loud machinery or cutting cores open with a power saw.
	Skin or eye contact with potentially contaminated sediments or liquids	Wear modified Level D PPE, including eye protection.
	Slipping/tripping on slick or uneven surfaces	Wear steel-toed boots with gripping tread. Be aware of obstacles and wet patches on surfaces and select a path to avoid them.
	Injury from equipment falling or swinging	Wear a hard hat and steel-toed boots at all times; be in the appropriate position on deck when equipment is in operation.
	Electric Shock	Use ground fault-indicator extension cord, and seal plug connections with electrical tape.
	Fire	Avoid fueling operations near hot engines. Mop up any spilled flammable liquids and dispose of absorbent. No smoking or flame sources on site.
Rotating or percussive drilling equipment	Stay clear of area around borehole while drilling activities are underway. Do not wear loose	

Activity	Hazard	Control
		fitting clothing or exposed long hair.
	Injury from winch line snapping	Ensure that winch line is not frayed.
Handling, packaging, and shipping samples	Skin or eye contact with potentially contaminated liquids	Wear modified Level D PPE, including eye protection.
	Back or muscle strain	Use appropriate lifting technique when handling heavy equipment and lifting heavy sample containers. Enlist help if necessary.
	Inhalation of or eye contact with airborne mists or vapors	Wear safety glasses. Perform decontamination activities outdoors or in a well-ventilated area. Stay upwind when spray-rinsing equipment.
Decontaminating equipment	Inhalation of, or eye contact with, airborne mists or vapors	Wear safety glasses. Perform decontamination activities outdoors or in a well-ventilated area. Stay upwind when spray-rinsing equipment.
	Skin contact with potentially contaminated materials	Wear modified Level D PPE, including eye protection.
	Ingestion of contaminated materials	Decontaminate clothing and skin prior to eating, drinking, smoking, or other hand-to-mouth activities. Follow the decontamination procedure for personal decontamination.

5 WORK ZONES AND ACCESS CONTROL

The FC will delineate the boundaries of the work zones and will inform the field personnel of the arrangement. The purpose of the zones is to limit the migration of sample material out of the zones and to restrict access to active work areas by defining work zone boundaries.

5.1 Sampling Work Zones

The following zones are sampling work zones:

- **Exclusion zone:** The exclusion zone will enclose the entire perimeter of the sampling location/machinery and will include the area where sampling is taking place. The exclusion zone will encompass an area 1.5-times the height of the drill rig tower around the drill rig where practical. Where topography and structures preclude this area, adjustments will be made in the field. Only sampling personnel may enter this zone unless assistance is required by other personnel. The exclusion zone will also include a nearby sample processing area along the shoreline or on top of the bank area. Samples will likely be processed under fold-up canopies and the exclusion zone will encompass the entire area under the canopy where samples will be processed or where contact to contaminated soil and sediments is possible. Entry and exit to this zone will be through a designated access point.
- **Contamination reduction zone (CRZ):** The CRZ during sediment handling will encompass the area surrounding the Exclusion zone. Decontamination of both personnel and equipment will occur in this zone to prevent the transfer of chemicals of concern to the support zone. Entry and exit between zones will be through a designated access point.
- **Support zone:** The support zone will be located in the on-site trailer or outside the CRZ.

Sampling staff will instruct people to stay outside the exclusion zone where samples are collected and where sample processing is occurring.

5.2 Decontamination Area

All contaminated materials will be properly contained. A station within the CRZ will be set up for decontaminating sample processing equipment and personnel gear such as boots or PPE. The station will have the buckets, brushes, soapy water, rinse water, or wipes necessary to perform decontamination operations. Plastic bags will be provided for expendable and disposable materials. The decontamination fluids will be stored in sealable containers and will be disposed of in accordance with applicable regulations.

5.3 Access Control

Security and control of access to the Site will be the responsibility of the site supervisor and/or SSHO. Access to the work areas will only be granted to necessary project personnel and authorized visitors. Any security or access control problems will be reported to the client or appropriate authorities.

6 SAFE WORK PRACTICES

Following common sense rules will minimize the risk of exposure or accidents at a work site.

These general safety rules will be followed on site:

- Always use the buddy system.
- Be aware of overhead and underfoot hazards at all times.
- Do not eat, drink, smoke, or perform other hand-to-mouth transfers in the work zones.
- Get immediate first aid for all cuts, scratches, abrasions, or other minor injuries.
- Report all accidents and near-misses, no matter how minor, to the FC.
- Be alert to your own and other workers' physical condition.
- Do not climb over or under obstacles of questionable stability.
- Make eye contact with equipment operators before moving into the range of their equipment.
- Work during daylight hours.

7 PERSONAL PROTECTIVE EQUIPMENT AND SAFETY EQUIPMENT

Appropriate PPE will be worn for all tasks as protection against potential hazards. Prior to donning PPE, the workers will inspect their equipment for any defects that might render the equipment ineffective.

All fieldwork for all tasks will be conducted in Level D or modified Level D as discussed in Sections 7.1, 7.2, and 7.3. Situations requiring PPE beyond modified Level D are not anticipated for this project. Should the FC determine that PPE beyond modified Level D is necessary at a given sampling station, the FC will notify the SSHO to select an appropriate corrective action.

7.1 Level D Personal Protective Equipment

Workers performing general activities in which skin contact with contaminated materials is unlikely and in which inhalation risks are not expected will wear Level D PPE. Level D PPE includes the following:

- Chemical-resistant, steel-toed boots
- Leather, cotton, or chemical-resistant gloves, as the type of work requires
- Safety glasses
- Hard hat (if overhead hazard exists)
- Hearing protection, if necessary

7.2 Modified Level D Personal Protective Equipment

Workers performing activities where skin contact with contaminated materials is possible will wear chemical-resistant outer gloves and an impermeable outer suit. The type of outerwear will be chosen according to the types of chemical contaminants that might be encountered. Modified Level D PPE includes the following:

- Outer garb such as rain gear or rubber or vinyl aprons
- Chemical-resistant steel-toed boots
- Surgical rubber inner gloves
- Chemical-resistant outer gloves
- Safety glasses (or face shield, if significant splash hazard exists)

- Hard hat (if overhead hazard exists)
- Hearing protection, if necessary

7.3 Safety Equipment

In addition to PPE that will be worn by personnel, basic emergency and first aid equipment will also be provided and easily accessible in an unlocked location known to all personnel prior to the start of any activities. Equipment will include:

- A copy of this HASP
- First aid kit adequate for the number of personnel
- Emergency eyewash

Anchor QEA and/or subcontractors will provide this equipment, which must be at the location(s) where field activities are being performed. Equipment will be checked daily to ensure its readiness for use.

8 MONITORING PROCEDURES FOR SITE ACTIVITIES

A monitoring program that addresses the potential site hazards will be maintained. The monitoring program includes self-monitoring by the field personnel and monitoring with instruments.

8.1 Self-monitoring

All personnel will be instructed to look for and inform each other of any negative changes in their physical or mental condition during the performance of all field activities. Examples of such changes are as follows:

- Headaches
- Dizziness
- Nausea
- Blurred vision
- Cramps
- Irritation of eyes, skin, or respiratory system
- Changes in complexion or skin color
- Changes in apparent motor coordination
- Increased frequency of minor mistakes
- Excessive salivation or changes in papillary response
- Changes in speech ability or speech pattern
- Symptoms of heat stress or heat exhaustion (Section 4.3.7)
- Symptoms of hypothermia (Section 4.3.8)

If any of these conditions develop, the affected person(s) will be moved from the immediate work location and evaluated. If further assistance is needed, personnel at the local hospital will be notified, and an ambulance will be summoned if the condition is thought to be serious. If the condition is the result of sample collection or processing activities, procedures and/or PPE will be modified to address the problem.

8.2 Real-time Air Monitoring Equipment

Organic vapor concentrations shall be monitored in the field using an OVM, PID, or FID. During sampling and excavation work, organic vapor measurements shall be taken in the breathing zone of workers while additional area monitoring may be conducted to gather background and environmental impact information.

Other real-time air monitoring equipment may be utilized depending upon the scope of work and compounds of concern. Air monitoring results shall be documented on the air monitoring log form presented in Attachment 1.

The air monitoring scope and frequency may be adjusted based on air data obtained during the initial stages of a work task.

8.2.1 Equipment Calibration and Maintenance

Calibration and maintenance of air monitoring equipment shall follow manufacturer specifications and must be documented. Re-calibration and adjustment of air monitoring equipment shall be completed daily and as site conditions and equipment operation warrant. Records of air monitoring equipment calibration and adjustment information will be recorded in the field logbook or daily log form.

8.2.2 Air Monitoring Action Levels

Air monitoring action levels have been developed for this project and are listed in Table 2.

9 DECONTAMINATION

Decontamination is necessary to prevent the migration of contaminants from the work zone(s) into the surrounding environment and to minimize the risk of exposure of personnel to contaminated materials that might adhere to PPE. The following sections discuss personnel and equipment decontamination.

The following supplies will be available to perform decontamination activities:

- Wash and rinse buckets
- Tap water and phosphate-free detergent (such as Alconox)
- Hexane or acetone (or similar type solution) for more robust equipment decontamination
- Scrub brushes and plastic tubs
- Distilled/deionized water
- Paper towels and plastic garbage bags

9.1 Minimization of Contamination

The following measures will be observed to prevent or minimize exposure to potentially contaminated materials:

- Personnel:
 - Do not walk through spilled sediment or soil
 - Do not handle, touch, or smell sediment or soil directly
 - Make sure PPE has no cuts or tears prior to use
 - Protect and cover any skin injuries
 - Stay upwind of airborne dusts and vapors
 - Do not eat, drink, chew tobacco, or smoke in the work zones
- Sampling Equipment and Machinery:
 - Use care to avoid getting sampled media on the outside of sample containers
 - If necessary, bag sample containers before filling with sampled media
 - Place clean equipment on a plastic sheet to avoid direct contact with contaminated media
 - Keep contaminated equipment and tools separate from clean equipment and tools

- Fill sample containers over a plastic tub to contain spillage
- Clean up spilled material immediately to avoid tracking around the drill rig

9.2 Personal Decontamination

The FC will ensure that all site personnel are familiar with personnel decontamination procedures. Personnel will perform decontamination procedures, as appropriate, when exiting work areas. Following is a description of the decontamination procedure:

- Wash and rinse outer gloves and boots in portable buckets
- If suit is heavily soiled, rinse it off
- Remove outer gloves, inspect and discard if damaged, leave inner gloves on
- Remove inner gloves and wash hands if taking a break
- Don necessary PPE before returning to work
- Dispose of soiled PPE before leaving for the day

10 TRAINING REQUIREMENTS

Individuals performing work at locations where potentially hazardous materials and conditions may be encountered must meet specific training requirements. It is not anticipated that personnel will encounter hazardous concentrations of contaminants in sampled material, so training will consist of site-specific instruction for all personnel and oversight of inexperienced personnel for one working day. The following sections describe the training requirements for work at this Site.

10.1 Project Specific Training

All Anchor QEA personnel must read this HASP and be familiar with its contents before beginning work. They shall acknowledge reading the HASP by signing the field team HASP review form contained in Attachment 3. The form will be kept in the project files.

The FC or a designee will provide and document project-specific training during the project kickoff meeting and whenever new Anchor QEA workers arrive for fieldwork. Anchor QEA personnel will not be allowed to begin work until project-specific training is completed and documented by the FC. Training will address the HASP and all health and safety issues and procedures pertinent to field operations. Training will include, but will not be limited to, the following topics:

- Activities with the potential for chemical exposure
- Activities that pose physical hazards, and actions to control the hazards
- Site access control and procedures
- Use and limitations of PPE
- Decontamination procedures
- Emergency procedures
- Use and hazards of sampling equipment
- Location of emergency equipment

All workers in the exclusion zone or CRZ must have 40-hour HAZWOPER training in accordance with OSHA. An updated 8-hour HAZWOPER refresher training is required for all workers in the exclusion zone or CRZ whose 40-hour HAZWOPER training certificate is more than one year old.

10.2 Daily Safety Briefings

The FC or a designee will conduct daily safety briefings before the start of each day's activities. These briefings will outline the activities expected for the day, update work practices and hazards, and address any specific concerns associated with the work location, and review emergency procedures and routes. The tailgate safety briefings will be documented in the logbook. A checklist of daily safety briefing topics will be conducted and supplemented with the following topics:

- Hazard Exposure Routes
- Chemical Hazards
- Physical Hazards
- Biological Hazards
- Mitigation Procedures
- Safety Communication
- Lines of Authority
- Description of first aid kit, including a discussion of usage (initial comprehensive training session and a brief daily overview)
- Near-water safety

A daily safety briefing log form is presented in Attachment 1.

11 RECORDING AND RECORD KEEPING

The FC or a designee will record health- and safety-related details of the project in the field logbook. The logbook must be bound and the pages must be numbered consecutively.

Entries will be made with indelible ink. At a minimum, each day's entries must include the following information:

- Project name or location
- Names of all personnel
- Level of PPE worn and any other specifics regarding PPE
- Weather conditions
- Type of fieldwork being performed

The person maintaining the entries will initial and date the bottom of each completed page. Blank space at the bottom of an incompletely filled page will be lined out. Each day's entries will begin on the first blank page after the previous workday's entries.

As necessary, other documentation will be obtained or initiated by the FC. Other documentation may include field change requests, medical and training records, exposure records, accident/incident report forms, OSHA Form 200s, and material safety data sheets. Attachment 1 contains copies of key health and safety forms.

12 HEALTH AND SAFETY PLAN APPROVAL RECORD

By their signature, the undersigned certify that this HASP is approved and that it will be used to govern health and safety aspects of fieldwork conducted by Anchor QEA personnel to investigate areas associated within the Site area.

Anchor QEA Project Manager

Date

Anchor QEA Site Supervisor

Date

Anchor QEA Site and Safety Health Officer

Date

13 REFERENCES

U.S. Environmental Protection Agency (EPA), 2001. Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual. EPA/823/B-01-022, October 2001.

ATTACHMENT 1

HEALTH AND SAFETY LOGS AND FORMS



EMPLOYEE EXPOSURE/INJURY INCIDENT/SPILL REPORT

EMPLOYEE NAME: _____ DATE: _____

PROJECT NAME/NO: _____ TIME: _____

TYPE OF OCCURRENCE: employee exposure injury incident spill

SITE NAME AND LOCATION: _____

SITE WEATHER (clear, rain, snow, etc.): _____

NATURE OF ILLNESS/INJURY: _____

SYMPTOMS: _____

ACTION TAKEN: rest first aid medical

TRANSPORTED BY: _____

WITNESSED BY: _____

HOSPITAL NAME: _____ TREATMENT: _____

DESCRIBE IN DETAIL HOW THIS EXPOSURE/INJURY INCIDENT/SPILL OCCURRED
(if a spill, list the name of the compounds, quantities, and method of clean-up/containment): _____

WHAT WAS THE PERSON DOING AT THE TIME OF THE ACCIDENT/INCIDENT?: _____

LIST PERSONAL PROTECTIVE EQUIPMENT WORN: _____

WHAT IMMEDIATE ACTION WAS TAKEN TO PREVENT RECURRENCE?: _____

Employee:

Printed Name Signature Date

Supervisor:

Printed Name Signature Date

Site Safety Representative:

Printed Name Signature Date

NOTE: Use additional page(s) if necessary.

ATTACHMENT 2
MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheet



EPA Methods 550/550.1/610 Polynuclear Aromatic Hydrocarbons (PAH) Standard PN: 8500-6035

1. Product and company identification

Product name	: EPA Methods 550/550.1/610 Polynuclear Aromatic Hydrocarbons (PAH) Standard PN: 8500-6035
Part No.	: 8500-6035
Manufacturer / Supplier	: Agilent Technologies, Inc. Logistics Center - Americas 500 Ships Landing Way New Castle, Delaware 19720
Emergency telephone number	: 1-302-633-8777 1-877-4 Agilent (Information Telephone Number)
Use of the substance/preparation	: Analytical chemistry. A 1ml. ampoule preparation
Validation date	: 10/27/2009

2. Hazards identification

Physical state	: Liquid. [Clear.]
Odor	: Ether-like
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview-Signal Word	: WARNING !
Emergency overview-Label Statement	: FLAMMABLE LIQUID AND VAPOR. HARMFUL IF INHALED. CAUSES EYE IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED. MAY CAUSE RESPIRATORY TRACT AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. Flammable liquid. Toxic by inhalation. Harmful in contact with skin and if swallowed. Irritating to eyes. Slightly irritating to the skin and respiratory system. Keep away from heat, sparks and flame. Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist. Do not ingest. Do not get in eyes. Avoid contact with skin and clothing. Contains material that may cause target organ damage, based on animal data. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling. Contains material which may cause damage to the following organs: kidneys, liver, cardiovascular system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
Routes of entry	: Dermal contact. Eye contact. Inhalation. Ingestion.
Potential acute health effects	
Eyes	: Irritating to eyes.
Skin	: Harmful in contact with skin. Slightly irritating to the skin.
Inhalation	: Toxic by inhalation. Slightly irritating to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
Ingestion	: Harmful if swallowed.
Medical conditions aggravated by over-exposure	: Repeated skin exposure can produce local skin destruction or dermatitis. Repeated or prolonged exposure to the substance can produce lung damage. Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to the substance can produce target organs damage.
Other adverse effects	: Not applicable.

2 . Hazards identification

See toxicological information (section 11)

3 . Composition/information on ingredients

United States

<u>Name</u>	<u>CAS number</u>	<u>%</u>
Acetonitrile	75-05-8	99.2
Pyrene	129-00-0	0.05
Phenanthrene	85-01-8	0.05
Naphthalene	91-20-3	0.05
Indeno[1,2,3-cd]pyrene	193-39-5	0.05
Fluorene	86-73-7	0.05
Fluoranthene	206-44-0	0.05
Dibenz[a,h]anthracene	53-70-3	0.05
Chrysene	218-01-9	0.05
Benzo[k]fluoranthene	207-08-9	0.05
Benzo[ghi]perylene	191-24-2	0.05
Benz[e]acephenanthrylene	205-99-2	0.05
Benzo[a]pyrene	50-32-8	0.05
Benz[a]anthracene	56-55-3	0.05
Anthracene	120-12-7	0.05
Acenaphthylene	208-96-8	0.05
Acenaphthene	83-32-9	0.05

4 . First aid measures

- Eye contact** : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if adverse health effects persist or are severe.
- Skin contact** : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if adverse health effects persist or are severe.
- Inhalation** : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention if adverse health effects persist or are severe.
- Ingestion** : Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if adverse health effects persist or are severe.
- Protection of first-aiders** : Not applicable.
- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

5 . Fire-fighting measures

- Flammability of the product** : Flammable.
- Products of combustion** : Decomposition products may include the following materials:
carbon oxides
nitrogen oxides
- Extinguishing media**
- Suitable** : Use dry chemical, CO₂, water spray (fog) or foam.
- Not suitable** : Do not use water jet.
- Special exposure hazards - fire** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Special exposure hazards - Explosibility** : Flammable liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

5 . Fire-fighting measures

- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Special remarks on fire hazards** : Container explosion may occur under fire conditions or when heated.

6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

- Handling** : Do not ingest. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Avoid breathing vapor or mist. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling.
- Storage** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Product name

United States

Acetonitrile

Exposure limits

ACGIH TLV (United States, 1/2008). Skin

TWA: 20 ppm 8 hour(s).

NIOSH REL (United States, 6/2008).

TWA: 34 mg/m³ 10 hour(s).

TWA: 20 ppm 10 hour(s).

OSHA PEL (United States, 11/2006).

TWA: 70 mg/m³ 8 hour(s).

TWA: 40 ppm 8 hour(s).

OSHA PEL 1989 (United States, 3/1989).

STEL: 105 mg/m³ 15 minute(s).

STEL: 60 ppm 15 minute(s).

TWA: 70 mg/m³ 8 hour(s).

TWA: 40 ppm 8 hour(s).

Consult local authorities for acceptable exposure limits.

8 . Exposure controls/personal protection

- Engineering measures** : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Personal protection**
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Chemical resistant protective gloves and clothing are recommended. The choice of protective gloves or clothing must be based on chemical resistance and other use requirements. Generally, BUNA-N offers acceptable chemical resistance. Individuals who are acutely and specifically sensitive to this chemical may require additional protective clothing.
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Other protection** : Not available.

9 . Physical and chemical properties

- Physical state** : Liquid. [Clear.]
- Flash point** : Lowest known value: Closed cup: 5.85°C (42.5°F). (Acetonitrile)
- Auto-ignition temperature** : Lowest known value: 524°C (975.2°F) (Acetonitrile).
- Color** : Clear. Colorless.
- Odor** : Ether-like
- Boiling/condensation point** : 81.6°C (178.9°F)
- Melting/freezing point** : -45°C (-49°F)
- Vapor pressure** : 11.6 kPa (87 mm Hg) (at 20°C)
- Vapor density** : 1.42 (Air = 1)
- Evaporation rate** : 5.79
- Solubility** : Soluble in the following materials: cold water and hot water.

10 . Stability and reactivity

- Stability and reactivity** : The product is stable. Under normal conditions of storage and use, hazardous polymerization will not occur.
- Incompatibility with various substances** : Highly reactive or incompatible with the following materials: oxidizing materials, reducing materials, metals, acids, alkalis and moisture.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Conditions of reactivity - Flammability** : Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat. Container explosion may occur under fire conditions or when heated.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Acetonitrile	LD50 Dermal	Rabbit	980 mg/kg	-
	LD50 Oral	Rat	2460 mg/kg	-
	LC50 Inhalation	Rat	7551 ppm	8 hours
	Gas.			

- Eyes** : Irritating to eyes.
- Skin** : Harmful in contact with skin. Slightly irritating to the skin.
- Inhalation** : Toxic by inhalation. Slightly irritating to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- Ingestion** : Harmful if swallowed.

Potential chronic health effects

- Chronic effects** : Contains material that may cause target organ damage, based on animal data.
- Carcinogenicity** : No known significant effects or critical hazards.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

Over-exposure signs/symptoms

- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
- Ingestion** : No specific data.
- Skin** : Adverse symptoms may include the following:
irritation
redness
- Eyes** : Adverse symptoms may include the following:
pain or irritation
watering
redness
- Target organs** : Contains material which may cause damage to the following organs: kidneys, liver, cardiovascular system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
- Other adverse effects** : Not available.

12 . Ecological information

- Environmental effects** : This product shows a low bioaccumulation potential.

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
Acetonitrile	-	Acute LC50 3600000 ug/L Fresh water	Daphnia	48 hours
	-	Acute LC50 >100000 ug/L Fresh water	Fish	96 hours

- Octanol/water partition coefficient** : -0.34
- Toxicity of the products of biodegradation** : The products of degradation are less toxic than the product itself.
- Other adverse effects** : No known significant effects or critical hazards.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

RCRA classification : Code: U003

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Class	PG*	Label	Additional information
DOT Classification	UN1648	Acetonitrile	3	II		<p>Limited quantity Yes.</p> <p>Packaging instruction Passenger aircraft Quantity limitation: 5 L Packaging instructions: 173.161</p> <p>Cargo aircraft Quantity limitation: 60 L</p> <p>Special provisions IB2, T7, TP2</p> <p>Remarks Small Quantity</p>
TDG Classification	UN1648	ACETONITRILE	3	II		<p>Explosive Limit and Limited Quantity Index 1</p> <p>Passenger Carrying Road or Rail Index 5</p>
IMDG Class	UN1648	ACETONITRILE	3	II		<p>Emergency schedules (EmS) F-E, S-D</p>

14 . Transport information

IATA Class	UN1648	Acetonitrile	3	II		Passenger and Cargo Aircraft Quantity limitation: 5 L Packaging instructions: 305 Cargo Aircraft Only Quantity limitation: 60 L Packaging instructions: 307 Limited Quantities - Passenger Aircraft Quantity limitation: 1 L Packaging instructions: Y305 Remarks A44 Excepted Quantity
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PG* : Packing group

15 . Regulatory information**United States****HCS Classification**

: Flammable liquid
Toxic material
Irritating material
Target organ effects

Contains material which may cause damage to the following organs: kidneys, liver, cardiovascular system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

U.S. Federal regulations

: TSCA 4(a) final test rules: Acetonitrile; Naphthalene
TSCA 8(a) CAIR: Pyrene; Phenanthrene
TSCA 8(a) PAIR: Acetonitrile; Naphthalene
United States inventory (TSCA 8b): Not determined.
TSCA 12(b) one-time export: Acetonitrile; Naphthalene

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: Acetonitrile

SARA 311/312 MSDS distribution - chemical inventory - hazard identification:

Acetonitrile: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard

Clean Water Act (CWA) 307: Acetonitrile; Pyrene; Phenanthrene; Naphthalene; Indeno[1,2,3-cd]pyrene; Fluorene; Fluoranthene; Dibenz[a,h]anthracene; Chrysene; Benzo[k]fluoranthene; Benzo[ghi]perylene; Benz[e]acephenanthrylene; Benzo[a]pyrene; Benz[a]anthracene; Anthracene; Acenaphthylene; Acenaphthene

Clean Water Act (CWA) 311: Naphthalene

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

SARA 313

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
Form R - Reporting requirements	: Acetonitrile	75-05-8	99.2
Supplier notification	: Acetonitrile	75-05-8	99.2

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

15 . Regulatory information

- State regulations** :
- Connecticut Carcinogen Reporting:** None of the components are listed.
 - Connecticut Hazardous Material Survey:** None of the components are listed.
 - Florida substances:** None of the components are listed.
 - Illinois Chemical Safety Act:** None of the components are listed.
 - Illinois Toxic Substances Disclosure to Employee Act:** None of the components are listed.
 - Louisiana Reporting:** None of the components are listed.
 - Louisiana Spill:** None of the components are listed.
 - Massachusetts Spill:** None of the components are listed.
 - Massachusetts Substances:** The following components are listed: ACETONITRILE
 - Michigan Critical Material:** None of the components are listed.
 - Minnesota Hazardous Substances:** None of the components are listed.
 - New Jersey Hazardous Substances:** The following components are listed: ACETONITRILE
 - New Jersey Spill:** None of the components are listed.
 - New Jersey Toxic Catastrophe Prevention Act:** None of the components are listed.
 - New York Acutely Hazardous Substances:** The following components are listed: Acetonitrile
 - New York Toxic Chemical Release Reporting:** None of the components are listed.
 - Pennsylvania RTK Hazardous Substances:** The following components are listed: ACETONITRILE
 - Rhode Island Hazardous Substances:** None of the components are listed.

- State regulations - California Prop. 65** :
- WARNING:** This product contains a chemical known to the State of California to cause cancer.

<u>Ingredient name</u>	<u>Cancer</u>	<u>Reproductive</u>	<u>No significant risk level</u>	<u>Maximum acceptable dosage level</u>
Pyrene	Yes.	No.	No.	No.
Phenanthrene	Yes.	No.	No.	No.
Naphthalene	Yes.	No.	Yes.	No.
Indeno[1,2,3-cd]pyrene	Yes.	No.	No.	No.
Fluoranthene	Yes.	No.	No.	No.
Dibenz[a,h]anthracene	Yes.	No.	Yes.	No.
Chrysene	Yes.	No.	0.35 µg/day (ingestion)	No.
Benzo[k]fluoranthene	Yes.	No.	No.	No.
Benzo[ghi]perylene	Yes.	No.	No.	No.
Benz[e]acephenanthrylene	Yes.	No.	0.096 µg/day (ingestion)	No.
Benzo[a]pyrene	Yes.	No.	Yes.	No.
Benz[a]anthracene	Yes.	No.	0.033 µg/day (ingestion)	No.
Anthracene	Yes.	No.	No.	No.
Acenaphthylene	Yes.	No.	No.	No.

16 . Other information

- Label requirements** :
- FLAMMABLE LIQUID AND VAPOR. HARMFUL IF INHALED. CAUSES EYE IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED. MAY CAUSE RESPIRATORY TRACT AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Date of issue : 10/27/2009

Date of previous issue : 09/28/2005

Version : 2

Notice to reader

16 . Other information

DISCLAIMER: This Material Safety Data Sheet is offered without charge to the clients of Agilent Technologies. Data is the most current available to Agilent Technologies at the time of preparation and is issued as a matter of information only, no warranty as to its accuracy or completeness is expressed or implied.

ATTACHMENT 3
SAFETY RECORD FORMS

FIELD TEAM HEALTH AND SAFETY PLAN REVIEW

ANCHOR QEA, LLC

I have read a copy of the HASP, which covers field activities that will be conducted to investigate specified areas on and adjacent to the Former Bremerton MGP Site in Bremerton, Washington. I understand the health and safety requirements of the project, which are detailed in this HASP.

Signature

Date

FIELD TEAM HEALTH AND SAFETY PLAN REVIEW
ANCHOR QEA, LLC

Signature

Date

Signature

Date

Signature

Date

Signature

Date

APPENDIX C

SIGN SPECIFICATIONS

As of September 30, 2013, final sign specifications are under review by the U.S. Environmental Protection Agency (EPA). Signs will be installed upon receiving further direction from EPA regarding its preferred sign specifications.

APPENDIX C
Access Agreements

ACCESS AGREEMENT

This ACCESS AGREEMENT ("Agreement"), dated for references purposes as of February _____, 2014, is entered into by and between CASCADE NATURAL GAS CORPORATION ("Cascade"), a Washington corporation, and PENN PLAZA STORAGE LLC, a Washington limited liability company ("Penn Plaza").

RECITALS

A. Penn Plaza owns that certain real property located at 1723 Pennsylvania Avenue, Bremerton Washington, which is identified in the public records of Kitsap County as Tax Parcel No. 3711-000-001-0607 (the "Penn Plaza Property").

B. A manufactured gas plant was formerly located on property adjacent to and north of the Penn Plaza Property (the "former gas works property"). Cascade is conducting a remedial investigation and feasibility study of the former gas works property under an Administrative Settlement Agreement and Order on Consent ("AOC") entered into with the United States Environmental Protection Agency ("EPA").

C. While conducting work required by the AOC, Cascade discovered a catch basin located on the Penn Plaza Property is not tied into the City of Bremerton ("City") storm sewer system, which is causing storm water to flow into an abandoned drainage pipe that is plugged beneath the Port Washington Narrows. EPA has concluded action must be taken to stop the flow of storm water into the abandoned drainage pipe to protect human health and the environment.

D. Cascade has developed a plan to upgrade the catch basin and associated piping and to tie the new improvements into the City storm sewer system (the "Upgrade Plan"). The details of the Upgrade Plan are described in Exhibit A to this Agreement. A drawing depicting the work zone, the location of the new improvements, and the connection point to the City storm sewer system is attached as Exhibit B to this Agreement.

E. Cascade is willing to conduct the work necessary to implement the Upgrade Plan (the "Upgrade Work") under certain conditions and Penn Plaza is willing to grant access for the Upgrade Work under certain conditions.

NOW, THEREFORE, in consideration of the mutual covenants and promises contained in this Agreement, the parties agree, represent, and warrant as follows:

AGREEMENTS

1. Access. Penn Plaza hereby grants to Cascade and its employees, agents, and contractors permission to enter the Penn Plaza Property to conduct the Upgrade Work. Cascade will provide Penn Plaza with no less than five (5) days' notice before accessing the Penn Plaza Property.

2. Cooperation. The parties will cooperate in good faith to perform and complete the Upgrade Work diligently and cost-effectively.

3. Performance of Upgrade Work. Cascade will perform the Upgrade Work in compliance with applicable laws and regulations. Cascade will prepare the permit applications necessary to complete the Upgrade Work, but Penn Plaza will be the applicant for all permits and execute all applications. Cascade will pay all permit application fees. Cascade will perform the Upgrade Work in a manner that minimizes interference with existing uses of the Penn Plaza Property; but Penn Plaza acknowledges and accepts that some interference is unavoidable, such as noise and restricted access to the area of work.

4. Ownership and Operation of Storm Sewer System Improvements. Penn Plaza will own the catch basin, piping, and all other improvements installed by Cascade as part of the Upgrade Work (the "Improvements"). Cascade will have no right, title, or interest in the Improvements, and Penn Plaza will not contend Cascade acquired any such right, title, or interest. Penn Plaza will be solely responsible for the use, operation, maintenance, and repair of the Improvements, including, without limitation, all monitoring, sampling, and best management practices required by federal, state, or local laws in connection with the Improvements.

5. Avoidance and Repair of Damage. Cascade will use best efforts to avoid damage to improvements on the Penn Plaza Property, including utilities and structures. If Cascade causes any damage in the course of performing the Upgrade Work, then it will promptly, and as soon as reasonably practicable, take all action reasonably necessary to repair the damage.

6. No Liens. Cascade will not allow any lien arising out of the Upgrade Work to stand against the Penn Plaza Property. Cascade will remove any such lien at its expense within ten (10) business days after Penn Plaza notifies Cascade of such lien.

7. Liability Insurance. Cascade will require all personnel that access the Penn Plaza Property carry liability insurance to protect against claims for bodily injury and property damage arising out of performance of the Upgrade Work. Such insurance must provide coverage of no less than \$1,000,000 per occurrence.

8. Indemnification for Claims Arising out of Upgrade Work. Cascade will indemnify and hold harmless Penn Plaza and its members, employees, and agents from and against all losses, liabilities, claims, damages, judgments, penalties, fees, costs, and expenses, including attorneys' fees (collectively, "Claims"), to the extent arising out of or in connection with Cascade's performance of the Upgrade Work. In the event a court determines this Agreement is subject to RCW 4.24.115, then to the extent any Claims arise out of the concurrent negligence of Cascade and Penn Plaza, Cascade's indemnity obligation will apply only to the extent of its negligence. The indemnity obligations in this Section 8 will not be limited by any worker's compensation, benefit, or disability laws, and Cascade waives any immunity it may have under the Industrial Insurance Act, Title 51 RCW, and similar worker's compensation,

benefit, or disability laws. The indemnity obligations in this Section 8 were mutually negotiated by the parties and will survive termination or expiration of this Agreement.

9. Indemnification for Claims Arising Out of Improvements. Penn Plaza will indemnify and hold harmless Cascade and its parents, subsidiaries, affiliates, directors, officers, employees, and agents (the "Cascade Parties") from and against all Claims to the extent arising out of or in connection with operation or use of the Improvements, including without limitation, all Claims relating to the condition of water, solids, or any other liquid or material discharged or released from the Improvements. Penn Plaza will also indemnify and hold harmless the Cascade Parties from and against all Claims asserted by any tenant of the Penn Plaza Property for inconvenience, loss or use, or interference with its business operations. In the event a court determines this Agreement is subject to RCW 4.24.115, then to the extent any Claims arise out of the concurrent negligence of Penn Plaza and Cascade, Penn Plaza's indemnity obligation will apply only to the extent of its negligence. The indemnity obligations in this Section 9 will not be limited by any worker's compensation, benefit, or disability laws, and Penn Plaza waives any immunity it may have under the Industrial Insurance Act, Title 51 RCW, and similar worker's compensation, benefit, or disability laws. The indemnity obligations in this Section 9 were mutually negotiated by the parties and will survive termination or expiration of this Agreement.

10. Release of Claims Arising Out of Improvements. Penn Plaza, for itself and on behalf of anyone acting on its behalf, releases and forever discharges all Claims it could assert against the Cascade Parties relating to the improvements, including without limitation, claims for injuries or damages arising out of operation or use of the Improvements, and Claims relating to the condition of water, solids, or any other liquid or material discharged or released from the Improvements.

11. Notices. All notices and communications regarding this Agreement will be in writing, will be directed to the persons and addresses set forth below, and will be deemed duly given: (a) when emailed to a party with an email address; (b) when personally delivered to the other parties; or (c) two (2) days after being mailed to the other parties by regular and certified mail, return receipt requested. Any party may change the designations below by written notice to the other parties.

To Penn Plaza: Paul McConkey
1723 Pennsylvania Avenue
Bremerton, WA 98312
trip@pennplaza.biz

To Cascade: Cascade Natural Gas Corporation
c/o Kalle Godel
Environmental Engineer
Montana-Dakota Utilities Co.
400 North 4th Street

Bismark, ND 58501-4092
kalle.godel@mdu.com

with a copy to: MDU Resources Group, Inc.
1200 West Century Avenue
Bismarck, ND 58506-5650
Attn: Daniel Kuntz
dan.kuntz@mduresources.com

12. Relationship of Parties and Enforceability by Third Parties. Nothing contained in this Agreement will be deemed or construed to create a partnership, joint venture, or any other association between Cascade and Penn Plaza. This Agreement is not intended for any third party's benefit and is not enforceable by any third party.

13. Reservation of Rights. Except as provided otherwise in this Agreement, the parties reserve all claims and defenses they may have against each other. The parties do not waive, and expressly reserve, all claims and defenses they may have against third parties.

14. Effect of Agreement. Nothing in this Agreement will constitute an admission of fact, responsibility, fault, or liability of any kind, or constitute a waiver or limitation of any legal claim or defense available to any party.

15. Waiver and Severability. The waiver of performance of any covenant, term or condition of this Agreement by any party will not be construed as a waiver of any subsequent breach of the same covenant, term or condition. If a court determines any provision of this Agreement is invalid or otherwise unenforceable, all remaining provisions will remain in full force and effect.

16. Binding Effect and Assignment. This Agreement will be binding on and inure to the benefit of the parties and their respective successors and permitted assigns. No party may assign this Agreement without the other parties' prior written consent.

17. Entire Agreement and Amendment. This Agreement contains the parties' entire agreement and supersedes all prior agreements and understandings between the parties relating to this Agreement's subject matter. No amendment or modification of this Agreement will be effective unless made in writing and signed by all parties.

18. Choice of Law and Attorneys' Fees. This Agreement will be construed in accordance with the laws of the State of Washington and any action relating to this Agreement will be filed in a court of competent jurisdiction in King County, Washington. In any action relating to this Agreement, the prevailing party will be entitled to an award of reasonable costs and attorneys' fees, including those incurred at trial or on appeal.

19. Counterparts. The parties may execute this Agreement in counterparts, and all such counterparts once so executed will together be deemed to constitute one final

agreement, as if one document had been signed by all parties, and each such counterpart, upon execution and delivery, will be deemed a complete original, binding on the parties. An email copy of an original signature will be deemed to have the same force and effect as the original signature.

20. Effective Date. This Agreement will be effective as of the latest date of execution below.

CASCADE NATURAL GAS CORPORATION

By: _____

Printed Name: _____

Title: _____

Date: _____

PENN PLAZA STORAGE LLC

By: Paul McCowkey

Printed Name: PAUL McCowKEY

Title: owner

Date: 3/12/14

EXHIBIT A
Upgrade Plan

A contractor retained by Cascade will replace an existing catch basin, located in the northeast portion of the Penn Plaza Property, and connect the new catch basin to the existing City storm sewer line that runs west to east across the Penn Plaza Property. The contractor will perform the following tasks:

- Obtain, on behalf of Penn Plaza, all permits and government approvals necessary to install the new improvements.
- Comply with the conditions of all permits and government approvals, including coordination and performance of required inspections.
- Schedule and execute public and private utility locates to mark existing underground utilities in the work zone.
- Protect all existing active underground utilities in the work zone during construction.
- Cut and remove asphalt over the existing catch basin.
- Excavate and remove the existing catch basin.
- Cut and cap, or remove, the outlet pipe that drains the existing catch basin.
- Install a new "Type I" catch basin.
- Excavate a trench between the new catch basin and the existing 18-inch diameter City storm sewer line, which is located approximately 9 to 14 feet south of the new catch basin.
- Temporarily stockpile excavated soil on plastic sheeting.
- Install a minimum 6-inch diameter pipe from the new catch basin to the City storm sewer line and connect the pipe to the City storm sewer line using an Inserta "T."
- Backfill the trench with excavated or imported soil, as necessary.
- Replace asphalt using 2-inches of Class B asphalt over 6-inches of cement stabilized base course.
- Remove from the Penn Plaza Property and properly dispose of all debris and waste materials generated by the work.
- Prepare as-built drawings showing the locations, dimensions, and details of the installed improvements.

Cascade will retain a licensed environmental consulting firm to oversee the work and assess whether excavated soil is suitable for reuse as backfill. Soil that exhibits odors, staining, or other indications of potential contamination will be deemed unsuitable for use as backfill and will be transported off of the Penn Plaza Property for disposal at an appropriate facility.

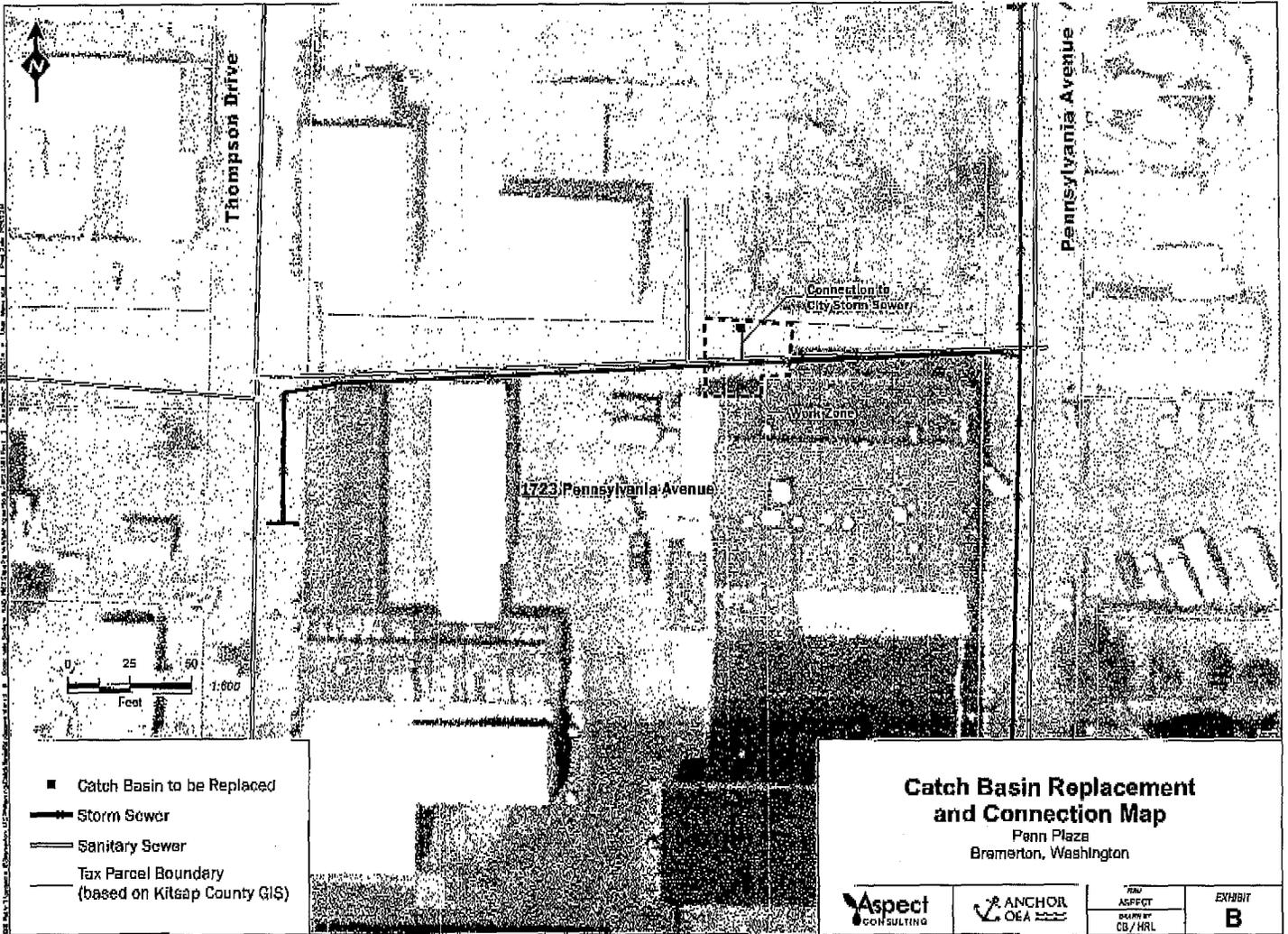
EXHIBIT B
Depiction of Improvements and Work Zone

[Attached]

4844-6120-2456, v. 4

Access Agreement

Exhibit B





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101

CONSENT FOR ACCESS TO PROPERTY

Name: DNR property within the Bremerton MGP Waste Release Site
Location: Tidal land adjacent to and north of 1725 Pennsylvania Avenue, Bremerton, WA

This Consent for Access to Property Agreement replaces the Consent for Access to Property Agreement issued November 10, 2010 for the emergency actions taken at the site. On behalf of Washington State, the Washington State Department of Natural Resources (DNR), hereby gives consent and permission, to the extent of the possessory interest State may have in the property and premises described above ("the property"), and any appurtenances thereto, to the following persons: 1) officers, employees, agents, and authorized representatives of the Environmental Protection Agency ("EPA authorized representatives") and 2) persons acting at the request of EPA including officers, employees, agents, contractors, and authorized representative of Cascade Natural Gas Corporation.

This consent to enter the property is given to those persons described above for the purpose of site investigation and remediation including: sampling for hazardous substances or pollutants or contaminants, and performing necessary response activities, which may include the removal, consolidation and/or stabilization of hazardous substances that have been released into the environment or which present a substantial threat of release. Such actions may include, but are not limited to:

- A. The taking of such soil, surface water, groundwater, and air samples upon the property as may be determined to be necessary;
- B. The taking of a response action at the property including site stabilization and mitigation activities, which include but are not limited to removing, consolidating and stabilizing hazardous substances located within the Site on the property and building a road across the property to access the contamination in the water;
- C. All Applicable or Relevant and Appropriate Requirements (ARARs).

These actions by the EPA and Cascade Natural Gas and its contractors are undertaken pursuant to its response and enforcement authorities contained in the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9601, et seq., as amended, the Federal Water Pollution Control Act (or the "Clean Water Act"), 33 U.S.C. § 1251 et seq., as amended.

DNR requests that sampling plans and reports provided to EPA for review be provided to DNR in a timely manner allowing an appropriate amount of time for DNR to comment. DNR requests that their comments be considered during the development of the Remedial Investigation and selection of remedies for the site.

The Washington State Department of Natural Resources reserves the right to require a use authorization for any permanent occupation of the site by remaining contaminants and a final remedy such as but not limited to a cap.

Date: 8/8/2012
Signature: [Handwritten Signature]
Title: AQR Division Mgr



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

CONSENT FOR ACCESS TO PROPERTY

Name: McConkey Family Trust Property within the
Bremerton MGP Waste Release Site

Location: 1723 Pennsylvania Avenue, Bremerton, WA 98337
Tax Parcel Nos. 3711-000-001-0409 and 3711-000 001-0607

McConkey Family Trust ("Owner") hereby gives its consent and permission to enter its property and premises described above (the "property"), to the extent of the possessory interest it may have and any appurtenances thereto, to the following persons: 1) officers, employees, agents, and authorized representatives of the Environmental Protection Agency ("EPA authorized representatives"), 2) officers, employees, agents, and authorized representatives of the Coast Guard ("Coast Guard authorized representatives"), and 3) persons acting at the request of EPA and the Coast Guard, including officers, employees, agents, contractors, and authorized representative of Cascade Natural Gas Corporation.

This consent to enter the property is given to those persons described above for the purpose of: sampling for hazardous substances or pollutants or contaminants, and to performing necessary response activities, which may include the removal, consolidation and/or stabilization of hazardous substances that have been released into the environment or which present a substantial threat of release. Such actions may include, but are not limited to:

- A. The taking of such soil, surface water, groundwater, and air samples upon the property as may be determined to be necessary;
- B. The taking of a response action at the property including site stabilization and mitigation activities, which include but are not limited to removing, consolidating and stabilizing hazardous substances located within the Site on the property; staging equipment and materials on the property; ingress and egress for workers and equipment; and using the property to access the beach.

Owner recognizes that these actions by the EPA, the Coast Guard and Cascade Natural Gas and its contractors are undertaken pursuant to its response and enforcement authorities contained in the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. § 9601, et seq., as amended.

This written permission is given by Owner voluntarily with knowledge of Owner's right to refuse and without threats or promises of any kind.

Date: 10/29/10

Signature: *Paul A. McConkey*

Printed Name: PAUL A. McCONKEY

Title: GENERAL MANAGER



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

CONSENT FOR ACCESS TO PROPERTY

Name: Sesko Property within the
Bremerton MGP Waste Release Site

Location: 1725 Pennsylvania Avenue, Bremerton, WA 98337
Tax Parcel. No. 3741-000-022-0101

I, Natacha Sesko, hereby give my consent and permission to enter my property and premises described above (the "property") to the extent of the possessory interest I may have and any appurtenances thereto, to the following persons: 1) officers, employees, agents, and authorized representatives of the Environmental Protection Agency ("EPA authorized representatives"), 2) officers, employees, agents, and authorized representatives of the Coast Guard ("Coast Guard authorized representatives"), and 3) persons acting at the request of EPA and the Coast Guard, including officers, employees, agents, contractors, and authorized representative of Cascade Natural Gas Corporation.

This consent to enter the property is given to those persons described above for the purpose of: sampling for hazardous substances or pollutants or contaminants, and to performing necessary response activities, which may include the removal, consolidation and/or stabilization of hazardous substances that have been released into the environment or which present a substantial threat of release. Such actions may include, but are not limited to:

- A. The taking of such soil, surface water, groundwater, and air samples upon the property as may be determined to be necessary;
- B. The taking of a response action at the property including site stabilization and mitigation activities, which include but are not limited to removing, consolidating and stabilizing hazardous substances located within the Site on the property; staging equipment and materials on the property; ingress and egress for workers and equipment; restoring the functionality of an existing access road by clearing vegetation, minor grading, and placing gravel; and using the property to access the beach.

I recognize that these actions by the EPA, the Coast Guard and Cascade Natural Gas and its contractors are undertaken pursuant to its response and enforcement authorities contained in the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. § 9601, et seq., as amended.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

Date: Nov 2nd 2010

Signature: 

APPENDIX D
Organoclay Mat Specifications

REACTIVE CORE MAT®

with ORGANOCLAY®

PRODUCT DESCRIPTION

Organoclay® Reactive Core Mat® (RCM) is designed for use in the following applications:

- In-situ subaqueous cap for contaminated sediments or post-dredge residual sediments
- Embankment seepage control
- Groundwater remediation

Organoclay® Reactive Core Mat® is a permeable composite of geotextiles and a non-swelling granular clay compound that reliably adsorbs oil and similar organics from water.

BENEFITS

- RCM provides a reactive material that treats contaminants which are carried by advective or diffusive flow
- Reactive cap allows for thinner cap thickness than a traditional sand cap
- Geotextiles provide stability and physical isolation

PHYSICAL PROPERTIES

PROPERTIES	TEST METHOD	VALUE
ORGANOCLAY¹		
Bulk Density Range	CETCO Test Method	44 – 56 lbs/ft ³
Oil Adsorption Capacity	CETCO Test Method	0.5 lb of oil per lb of organoclay, min
Quaternary Amine Content	CETCO Test Method	25 – 33% quaternary amine loading
FINISHED RCM PRODUCT		
Organoclay Mass per Area	CETCO Test Method	0.8 lb/ft ²
Mat Grab Strength ²	CETCO Test Method	90 lbs. MARV
Hydraulic Conductivity ³	CETCO Test Method	1 x 10 ⁻³ cm/sec minimum

Notes

¹ Apatite properties performed periodically on material prior to incorporation into the RCM.

² All tensile testing is performed in the machine direction.

³ Permittivity at constant head of 2 inches and converted to hydraulic conductivity using Darcy's Law and RCM thickness per ASTM D5199 for geotextiles.

PACKAGING

- 15' x 100' rolls, packaged on 4" PVC core tubes wrapped with polyethylene plastic packaging

AVAILABILITY

Shipping is available from the following location:

- CETCO, 218 NE Industrial Park Rd, Cartersville, GA

Contact your local technical sales manager at:
714-384-0111 or 800-527-9948

TECHNICAL REFERENCE

ORGANOCLAY® FILLED REACTIVE CORE MAT® REACTIVE CAPPING MATERIAL SPECIFICATION GUIDELINES

1.0 GENERAL

1.1 Scope

This specification covers the technical requirements for the furnishing and installation of the reactive capping material described herein. All materials used shall meet the requirements of this specification, and all work shall be performed in accordance with the procedures provided herein and the contract drawings.

1.2 Definitions-For the purposes of this specification guideline, the following terms are defined below:

- ▶ Reactive Capping Material (RCM): A manufactured material consisting of an active media encapsulated between layers of geosynthetics.
- ▶ Geotextile: Any permeable geosynthetic comprised solely of textiles.
- ▶ Minimum Average Roll Value: For geosynthetics, the value calculated as the typical value minus two (2) standard deviations from documented quality control test results for a defined population from one specific test method associated with one specific property.
- ▶ Overlap: Where two adjacent reactive capping material panels contact, the distance measuring perpendicular from the overlying edge of one panel to the underlying edge of the other.
- ▶ Typical Value: The mean value calculated from documented manufacturing quality control test results for a defined population obtained from one test method associated with one specific property.

1.3 Unit Prices (optional)

Measurement will be made of the total surface area in square feet covered by the RCM as shown on the contract drawings. Final quantities will be based on as-built conditions. Allowance will be made for RCM in anchor and trenches but no allowance will be made for waste, overlap, or materials used for the convenience of the Contractor. RCM installed and accepted will be paid for at the respective contract unit price in the bidding schedule.

1.4 Submittals

A. With the bid, the Contractor shall furnish a conceptual description of the proposed plan for placement of the RCM panels over the area of installation and RCM manufacturer's MQC Plan for documenting compliance to Sections 2.1 and 2.2 of these specifications.

B. At the engineer/owner's request, the contractor shall furnish a representative sample of the RCM.

C. Upon shipment, the Contractor shall furnish the RCM manufacturer's Quality Assurance/Quality Control (QA/QC) certifications to verify that the materials supplied for the project are in accordance with the requirements of this specification.

1.5 Qualifications

The RCM Installer must either have installed at least 1 million square feet (100,000 square meters) of RCM, or must provide to the Engineer satisfactory evidence, through similar experience in the installation of other types of geosynthetics, that the RCM will be installed in a competent, professional manner.

2.0 PRODUCTS

The RCM shall consist of a layer of organically modified bentonite clay encapsulated between geotextiles and shall comply with all of the criteria listed in this Section. Prior to using an alternate RCM, the Contractor must furnish independent test results demonstrating that the proposed alternate material meets all requirements of this specification. The Contractor also must obtain prior approval of the alternative RCM by the Project Engineer.

2.1 Materials

A. Acceptable RCM products are Organoclay Reactive Core Mat, as manufactured by CETCO, 2870 Forbs Avenue, Hoffman Estates, IL 60004 USA (800-527-9948), or an engineer-approved equal.

TECHNICAL REFERENCE

B. The RCM and its components shall have the properties shown in Table TR404-RCM.

C. The minimum acceptable dimensions of full-size RCM panels shall be 75 feet in length.

2.2 Product Quality Documentation

The RCM manufacturer shall provide the Contractor or other designated party with manufacturing QC certifications for each shipment of RCM. The certifications shall be signed by a responsible party employed by the RCM manufacturer and shall include:

A. Certificates of analysis for the organically modified bentonite clay used in GCL production demonstrating compliance with the parameters of the reactive media (bulk density, oil adsorption, and quaternary amine content as shown in tables TR404-RCM.

B. Manufacturer's test data for finished RCM product including mass/area, RCM grab tensile and elongation strength and RCM hydraulic conductivity demonstrating compliance with the index parameters shown in tables TR404-RCM.

C. RCM lot and roll numbers supplied for the project with corresponding shipping information.

TABLE TR 404 - RCM			
PROPERTY	TEST METHOD	TEST FREQUENCY	RESULT
ORGANOCLAY¹			
Bulk Density	CETCO Test Method	1/lot	44-56 lb/ft ³
Oil Adsorption Capacity	CETCO Test Method	1/lot	0.5 lb of oil/lb of clay min
Quaternary Amine Content	CETCO Test Method	1/lot	25-33% loading @ 800 °C
FINISHED RCM PRODUCT			
Organoclay Mass/Area	CETCO Test Method	1/40,000 sq.ft.	0.8 lb/ft ² (4.0 kg/m ²) min.
RCM Grab Strength ²	ASTM D4632	1/200,000 sq.ft.	90 lbs (400 N) MARV
Hydraulic Conductivity ³	ASTM D2434 / D4491	1/lot	1 x 10 ⁻³ cm/s minimum

NOTES:

¹ Organoclay properties performed periodically on material prior to incorporation into the RCM.

² All tensile testing is performed in the machine direction.

³ At maximum 2 psi confining pressure.

- ▶ Description: A permeable composite of geotextiles and granular activated carbon that reliably adsorbs organics from water.
- ▶ Roll Width and edge closure: Total Roll width is ~15' 2". Effective product width measures 15'.
- ▶ Roll Length: 100'
- ▶ Packaging: Packaged on min. 4" I.D. core tubes, and wrapped with polyethylene plastic packaging.

2.3 Product Labeling

Prior to shipment, the RCM manufacturer shall label each roll, identifying:

- ▶ Product identification information (Manufacturer's name and address, brand product code)
- ▶ Lot number and roll number
- ▶ Roll length, width and weight

2.4 Packaging

A. The RCM shall be wound around a rigid core whose diameter is sufficient to facilitate handling. The core is not necessarily intended to support the roll for lifting but should be sufficiently strong to prevent collapse during transit.

B. All rolls shall be labeled and bagged in packaging that is resistant to degradation by ultraviolet (UV) light.

3.0 EXECUTION

3.1 Shipping and Handling

A. The manufacturer assumes responsibility for initial loading the RCM. Shipping will be the responsibility of the party paying the freight. Unloading, on-site handling and storage of the RCM are the responsibility of the Contractor, Installer or other designated party.

TECHNICAL REFERENCE

B. A visual inspection of each roll should be made during unloading to identify if any packaging has been damaged. Rolls with damaged packaging should be marked and set aside for further inspection. The packaging should be repaired prior to being placed in storage.

C. The party responsible for unloading the RCM should contact the Manufacturer prior to shipment to ascertain the appropriateness of the proposed unloading methods and equipment.

3.2 Storage

A. Storage of the RCM rolls shall be the responsibility of the installer. A dedicated storage area shall be selected at the job site that is away from high traffic areas and is level, dry and well drained.

B. Rolls should be stored in a manner that prevents sliding or rolling from the stacks and may be accomplished by the use of chock blocks. Rolls should be stacked at a height no higher than that at which the lifting apparatus can be safely handled (typically no higher than four).

C. All stored RCM materials must be covered with a plastic sheet or tarpaulin until their installation.

D. The integrity and legibility of the labels shall be preserved during storage.

3.3 Bathymetry

A. Any surface upon which the RCM is installed shall be prepared in accordance with the project specifications and drawings.

B. Immediately prior to RCM deployment, the surface shall be approved by the engineer.

C. It shall be the installer's responsibility thereafter to indicate to the Engineer any change in the condition of the surface that could cause it to be out of compliance with any of the requirements listed in this Section.

3.4 RCM Placement

A. RCM rolls should be delivered to the working area of the site in their original packaging. Immediately prior to deployment, the packaging should be carefully removed without damaging the RCM. The orientation of the RCM (i.e., which side faces up) should be in accordance with the Engineer's recommendations. If the engineer does not specify an orientation, then the RCM should be placed with the nonwoven geotextile side facing upward.

B. RCM rolls may be suspended and maneuvered over the surface utilizing a steel pipe placed through the core of the roll and suspended from suitable equipment utilizing a spreader bar to prevent chaffing of the edge of the roll.

C. Care must be taken to minimize the extent to which the RCM is dragged across the surface in order to avoid damage suspension of the contaminants.

D. In sloped areas, the RCM panels shall be placed parallel to the direction of the slope.

E. All RCM panels should lie flat on the underlying surface, with no wrinkles or fold, especially at the exposed edges of the panels.

F. Only as much RCM shall be deployed as can be covered at the end of the working day with a sand or soil cover.

3.5 Anchorage

On sloped areas, if directed by the project drawings and specifications, the end of the RCM roll shall be anchored with a panel runoff designed to resist pull out forces encountered during deployment.

3.6 Seaming

A. The RCM seams are constructed by overlapping their adjacent edges. Seams at the ends of the panels should be constructed such that they are shingled in the direction of the grade/slope.

B. The minimum dimension of the longitudinal overlap should be 12 inches (300 mm). End-of-roll overlapped seams should be constructed with a minimum overlap of 24 in. (600mm).

C. RCM panels may be sewn together using geotextile sewing equipment prior to deployment to facilitate material deployment.

TECHNICAL REFERENCE

3.7 Detail Work

Cutting the RCM should be performed using a sharp shears. Care should be taken to minimize spilling of the reactive media after RCM has been cut.

3.8 Damage Repair

If the RCM is damaged (torn, punctured, perforated, etc.) during installation, it may be possible to repair it by cutting a patch to fit over the damaged area. The patch shall be obtained from a new RCM roll and shall be cut to size such that a minimum overlap of 12 inches (300 mm) is achieved around all of the damaged area. Place sand bags directly on top of the patch to prevent displacement of the patch during placement of the cover material.

3.9 Cover Placement

A. Cover materials shall be free of angular stones or other foreign matter that could damage the RCM. Cover material should be approved the project Engineer with respect to particle size, uniformity and chemical compatibility.

B. Cover shall be placed over the RCM using construction methods that minimize stresses on the RCM. A minimum thickness of 6 inches (150 mm) of cover should be placed.

C. Cover materials should be placed in a manner that prevents the material from entering the RCM overlap zones. Cover material shall not be pushed down slopes, to minimize tensile forces on the RCM.

Gravel base shall meet the following requirements for grading and quality when placed in hauling vehicles for delivery to the roadway or during manufacture and placement into a temporary stockpile. The exact point of acceptance will be determined by the Engineer.

Sieve Size	Percent Passing
2"	75-100
No. 4	22-100
No. 200	0-10
Dust Ratio:	¾ max.
Sand Equivalent	30 min.

All percentages are by weight.

Gravel base material retained on a No. 4 sieve shall contain not more than 0.20 percent by weight of wood waste.

9-03.11 Streambed Aggregates

Streambed aggregates shall be naturally occurring water rounded aggregates. Aggregates from quarries, ledge rock, and talus slopes are not acceptable for these applications. Streambed aggregates shall meet the following test requirements for quality:

Aggregate Property	Test Method	Requirement
Degradation Factor	WSDOT T 113	15 min.
Los Angeles Wear, 500 Rev.	AASHTO T 96	50% max.
Bulk Specific Gravity	AASHTO T 85	2.55 min.

9-03.11(1) Streambed Sediment

Streambed sediment shall meet the following requirements for grading when placed in hauling vehicles for delivery to the project or during manufacture and placement into temporary stockpile. The exact point of acceptance will be determined by the Engineer.

Sieve Size	Percent Passing
2½"	99-100
2"	65-95
1"	50-85
No. 4	26-44
No. 40	16 max.
No. 200	5.0-9.0

All percentages are by mass.

The portion of sediment retained on No. 4 sieve shall not contain more than 0.2 percent wood waste.

9-03.11(2) Streambed Cobbles

Streambed cobbles shall be clean, naturally occurring water rounded gravel material. Streambed cobbles shall have a well-graded distribution of cobble sizes and conform to one or more of the following gradings as shown in the Plans:

Approximate Size ¹	Percent Passing				
	4" Cobbles	6" Cobbles	8" Cobbles	10" Cobbles	12" Cobbles
12"					99-100
10"				99-100	70-90
8"			99-100	70-90	
6"		99-100	70-90		
5"		70-90			30-60
4"	99-100			30-60	
3"	70-90		30-60		
2"		30-60			
1½"	20-50				
¾"	10 max.	10 max.	10 max.	10 max.	10 max.

¹Approximate Size can be determined by taking the average dimension of the three axes of the rock, Length, Width, and Thickness, by use of the following calculation:

$$\frac{\text{Length} + \text{Width} + \text{Thickness}}{3} = \text{Approximate Size}$$

The grading of the cobbles shall be determined by the Engineer by visual inspection of the load before it is dumped into place, or, if so ordered by the Engineer, by dumping individual loads on a flat surface and sorting and measuring the individual rocks contained in the load.

Length is the longest axis, width is the second longest axis, and thickness is the shortest axis.

9-03.11(3) Streambed Boulders

Streambed boulders shall be hard, sound and durable material, free from seams, cracks, and other defects tending to destroy its resistance to weather. Streambed Boulders shall be rounded to sub-angular in shape and the thickness axis shall be greater than 60 percent of the length axis. Streambed boulders sizes are approximately as follows, see Plans for sizes specified:

Rock Size ¹	Approximate Size
One Man	12" – 18"
Two Man	18" – 28"
Three Man	28" – 36"
Four Man	36" – 48"
Five Man	48" – 54"
Six Man	54" – 60"

¹Approximate Size can be determined by taking the average dimension of the three axes of the rock, Length, Width, and Thickness, by use of the following calculation:

$$\frac{\text{Length} + \text{Width} + \text{Thickness}}{3} = \text{Approximate Size}$$

Length is the longest axis, width is the second longest axis, and thickness is the shortest axis.

9-03.11(4) Habitat Boulders

Habitat boulders shall be hard, sound and durable material, free from seams, cracks, and other defects tending to destroy its resistance to weather. Habitat Boulders shall be rounded to sub-angular in shape and the thickness axis shall be greater than 60 percent of the width axis and the length shall be 1.5 to 3 times the width axis. Habitat boulders sizes are approximately as follows, see Plans for sizes specified:

APPENDIX E
Anchor QEA Daily Construction Reports



CONTRACT NO.: PO 50312

REPORT DATE: October 11, 2013

REPORT NO.: 20131011

ANCHOR QEA FIELD REP.: David Cisakowski

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

[Tide Predictions - Bremerton, Sinclair Inlet, Port Orchard 9445958 Tidal Data Daily View - NOAA Tides & Currents](#)

DAILY TIDE PREDICTIONS IN FEET	DATE	DAY	TIME	HEIGHT
NOAA Station ID: 9445958	10/11	Fri	04:17 AM	-0.68 L
Bremerton, WA	10/11	Fri	11:30 AM	11.18 H
Time Zone: LST/LDT	10/11	Fri	05:25 PM	6.56 L
Datum: MLLW	10/11	Fri	10:19 PM	9.57 H

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER TEMP. & PRECIP	
Client	Veris Law Group	General	Clearcreek Contractors Inc. (CCI)	AM:	Cloudy; low 40s; wind <5mph
CC	Mark Larsen	Subs	Peninsula Sand & Gravel (PSG)	PM:	Cloudy; mid 50s; wind <5mph
	Nathan Soccorso		Olympic Trucking (OT)	Times of Site Visits:	
				From	0650 to 1600
				From	To

PROJECT DAILY CONSTRUCTION ACTIVITY LIST

TASK No.	CONSTRUCTION TASK	LOCATION/STATION	GENERAL NOTES
1	Sanitation Facility	McConkey Yard	1 EA
2	10" minus Cobbles	McConkey Yard	Approx. 300 TN
3	Pea Gravel	McConkey Yard	Approx. 10 TN
4	Light Plant	McConkey Yard	3 EA
5	Lined Waste Bag	McConkey Yard	Approx. 7 EA
6	Oil Boom	Dyes Inlet	Approx. 290 LF
7	Organoclay	McConkey Yard	5 pieces
8	Float Anchor Relocation	Beach	1 EA
9	Outfall Pipe Diversion	Beach	1 EA

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REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: October 11, 2013

Page 1 of 5



CONTRACT NO.: PO 50312

REPORT DATE: October 11, 2013

REPORT NO.: 20131011

ANCHOR QEA FIELD REP.: David Cisakowski

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

PERSONNEL ON SITE (EST.)

Name (or Labor Category)	Organization	Notes
Paul Curnett (Superintendent)	Clearcreek Contractors Inc.	
Nate Hoffman (foreman)	Clearcreek Contractors Inc.	
Chase Burns (operator)	Clearcreek Contractors Inc.	
Jake Shalan (laborer)	Clearcreek Contractors Inc.	
Orlando Alvarez (laborer)	Clearcreek Contractors Inc.	

EQUIPMENT ON SITE

Type of Equipment	Organization	Notes
Deere 50D excavator	Clearcreek Contractors Inc.	Rubber-tracked
Canycon S25A mini carrier	Clearcreek Contractors Inc.	Rubber-tracked
Deere 310J backhoe	leased	w/ forks
Kenworth dump truck	Clearcreek Contractors Inc.	
Ford F-250 pickup truck	Clearcreek Contractors Inc.	
Ford F-550 utility truck	Clearcreek Contractors Inc.	

ATTACHMENTS

None

CONSTRUCTION OBSERVATIONS

TIME	TOPIC	DESCRIPTION OF FIELD ACTIVITY/LOCATION	Notes
0650	On site		
0700	Sanitary facility	Northwest Cascade delivered one Honey Bucket.	
0725	10" minus cobble	PSG delivered four truck and transfer box loads of cobble.	PSG used two trucks w/transfer trailers staged on High Avenue south of 15 th Street.
0758	10" minus cobble	OT delivered one truck and pup load of cobble.	
0825	Light plants	Hertz delivered Deere 310J backhoe and three light plants.	
0950	10" minus cobble	PSG delivered four truck and transfer box loads of cobble.	
1019	10" minus cobble	OT delivered one truck and pup load of cobble.	

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Date: October 11, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: October 11, 2013

REPORT NO.: 20131011

ANCHOR QEA FIELD REP.: David Cisakowski

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

TIME	TOPIC	DESCRIPTION OF FIELD ACTIVITY/LOCATION	Notes
1200	Organoclay	CCI cut one of the new rolls into two 15'x50' pieces.	Organoclay was rolled out on AC pavement after any debris that could damage the material was removed from the surface. Material was cut with an X-Acto knife and aluminum straightedge. The rolled-out 50-foot piece was re-rolled around a 3"x3" steel square section found on site.
1230	10" minus cobble	PSG delivered four truck and transfer box loads of cobble.	
1245	10" minus cobble	OT delivered one truck and pup load of cobble.	
1250	Oil boom	CCI deployed 5" diameter oil boom. Boom supplied was a WBoom-510 (white-oil only).	Boom was deployed with the aluminum boat. Each 10-foot section was overlapped 2'. Boom was ballasted using nine 8"x8"x16" concrete blocks.
1430	Organoclay	CCI cut the roll that had been in McConkey storage. Three pieces were cut from the roll: 5'x15', 10'x15', and 19'x15'.	Organoclay was rolled out on AC pavement. Material cut with an X-Acto knife and aluminum straightedge.
1430	Outfall pipe diversion	CCI installed a 6"x4" reducer and approx. 40' of 4" CPE tubing onto the existing 6" CPE tubing.	CCI used a traffic pylon as the reducer and duct-taped the pipes to the reducer. The 6" tubing fit into the reducer and the reducer fit into the 4" tubing. The 4" tubing was routed east along the toe of slope.
1430	Float anchor relocation	CCI cut a hole into the existing steel angle, which was bolted to the existing concrete bin wall located at the toe of slope. CCI installed a 1" steel shackle into the cut hole. The existing 1-1/2" rope was cut from the existing timber pile and tied to the shackle.	CCI used an acetylene torch cut the hole in the existing 3/8" steel angle. CCI also used the torch to deform the shackle pin threads to prevent the pin from backing out.
1500	Pea gravel	CCI returned to site with partial load of pea gravel from Port Orchard Sand & Gravel.	Gravel delivered with Kenworth dump truck; load remained in box.
1530	Light plant	CCI set one light plant in northeast corner of McConkey yard.	
1550	Lined waste bag	CCI assembled one bag. Bag supplied was a Nova waste container manufactured by Questar.	
1600	Left site		

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Field Representative Signature

Date: October 11, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: October 11, 2013

REPORT NO.: 20131011

ANCHOR QEA FIELD REP.: David Cisakowski

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

OTHER GENERAL OBSERVATIONS-Note any Changes, Force Account Work and Materials Testing

0700	CCI delivered a trailer-mounted vacuor unit with the Ford F-550 utility truck. CCI delivered Deere 50D excavator and Canycom mini carrier with the Kenworth dump truck.
0710	CCI delivered a 12" aluminum boat (15-HP outboard) with the Ford F-250 pick-up truck.
0715	CCI unloading spill response kits, oil boom, turbidity curtain, 55-gallon drums, pylons, waste bags, CPE tubing, etc.
0730	Steel fence post set on control point S1-3. Attempted to set steel fence post on control point S1-1, but this location is underwater; set fencepost 8' south of S1-1.
0820	CCI measured inside diameter of 4" PCV at the center of two new rolls of organoclay; ID was approx. 3-7/8". CCI plans to have 3" steel pipe delivered to the site for use in lifting rolls to the beach.
0845	CCI held safety meeting to highlight site-specific hazards and safety protocol for upcoming work tasks.
0900	CCI managed cobble stockpile with Deere 310J backhoe.
0900	CCI unloading portable generator, portable light stands, wheelbarrows, plastic sheeting, etc.
0910	CCI transported aluminum boat to launch located across Dyes Inlet.
0930	CCI attempted to deploy turbidity curtain with aluminum boat.
1120	Ness Cranes delivered steel skiff box; box measured 8'x4'x3' deep.
1220	CCI ceased their attempt to deploy turbidity curtain. Tidal current overcame the concrete block ballast used—the 6' deep curtain created a larger drag force than anticipated.
1330	CCI Kenworth dump truck left site to pick up load of pea gravel.
1515	CCI covering cut pieces of organoclay with plastic sheeting.
1530	CCI assembled two portable light stands for beach use prior to crane-placement of the light plants.
1540	CCI disconnected heavy equipment back-up beepers.

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Date: October 11, 2013

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INSPECTOR DAILY REPORT

CONTRACT NO.: PO 50312

REPORT DATE: October 11, 2013

REPORT NO.: 20131011

ANCHOR QEA FIELD REP.: David Cisakowski

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

PHOTOS



Comment: Delivered 10" minus cobble.



Comment: Deployed oil boom.



Comment: Completed outfall pipe diversion.



Comment: Existing float rope tied to newly installed shackle.

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Field Representative Signature

Date: October 11, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: October 12, 2013

REPORT NO.: 20131012

ANCHOR QEA FIELD REP.: Jason Cornetta

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

[Tide Predictions - Bremerton, Sinclair Inlet, Port Orchard 9445958 Tidal Data Daily View - NOAA Tides & Currents](#)

DAILY TIDE PREDICTIONS IN FEET	DATE	DAY	TIME	HEIGHT
NOAA Station ID: 9445958	10/12	Sat	05:21 AM	-0.01 L
Bremerton, WA	10/12	Sat	12:41 PM	11.19 H
Time Zone: LST/LDT	10/12	Sat	06:54 PM	6.03 L
Datum: MLLW	10/12	Sat	11:44 PM	9.12 H

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER TEMP. & PRECIP	
Client	Veris Law Group	General	Clearcreek Contractors Inc. (CCI)	AM:	Cloudy; mid 40s; calm
CC	Mark Larsen	Subs	Ness Cranes	PM:	N/A
	Nathan Soccorso			Times of Site Visits:	
				From	0200 to 0900
				From	To

PROJECT DAILY CONSTRUCTION ACTIVITY LIST

TASK No.	CONSTRUCTION TASK	LOCATION/STATION	GENERAL NOTES
1	Surface preparation	Throughout area of placement for Sheets 1 through 7	
2	Removal of solid hydrocarbon-like materials	Sheets 6 and 7 areas	
3	Clearing brush	Along concrete bin and adjacent to Sheets 4 and 5	
4	Reactive core mat placement	Sheets 6 and 7	
5	Pea gravel placement	Cover on Sheets 6 and 7	
6	Survey locations of excavation and mat placement	Throughout area of placement for Sheets 1 through 7	

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REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: October 12, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: October 12, 2013

REPORT NO.: 20131012

ANCHOR QEA FIELD REP.: Jason Cornetta

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

PERSONNEL ON SITE (EST.)

Name (or Labor Category)	Organization	Notes
		Refer to contractor's tailgate meeting sign-in sheet

EQUIPMENT ON SITE

Type of Equipment	Organization	Notes
Crane	Ness Cranes	
Deere 50D excavator	Clearcreek Contractors Inc.	Rubber-tracked
Canycon S25A mini carrier	Clearcreek Contractors Inc.	Rubber-tracked
Deere 310J backhoe	leased	w/ forks
Kenworth dump truck	Clearcreek Contractors Inc.	
Ford F-250 pickup truck	Clearcreek Contractors Inc.	
Ford F-550 utility truck	Clearcreek Contractors Inc.	

ATTACHMENTS

None

CONSTRUCTION OBSERVATIONS

TIME	TOPIC	DESCRIPTION OF FIELD ACTIVITY/LOCATION	Notes
0200	On site	Review site layout, equipment/materials, and progress from Friday.	With Anchor QEA.
0240	Ness Cranes on site	Crane arrives on site and is positioned.	
0245	Tailgate Safety Meeting	Hold tailgate safety meeting and review scope of work for the day and site-specific safety procedures.	
0410	Reactive Core Mat	Stake out corner locations of Reactive Core Mat using GPS for S1-3 and S1-1. The corners of optional sheet 6 were located with GPS and exposed areas of solid hydrocarbon-like material were visually verified. The locations of the corners for optional sheet 7 were scaled off of the figure and slightly adjusted based on field observation of the exposed material.	

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REVIEW BY
(PM initial)

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Field Representative Signature

Date: October 12, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: October 12, 2013

REPORT NO.: 20131012

ANCHOR QEA FIELD REP.: Jason Cornetta

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

TIME	TOPIC	DESCRIPTION OF FIELD ACTIVITY/LOCATION	Notes
0440	Placement of equipment on beach	One light plant, super sacks with liners, Deere excavator, and the Canycon mini carrier placed onshore with crane.	
0455	Surface preparation	Pile cut off with chainsaw and large cobbles cleared from sheet 6 and 7 locations.	Cobble cleared with excavator and by hand.
0540	Removal of solid hydrocarbon-like materials	Mark the area of material to be removed from sheet 7 location and excavate the area.	2.5 one-yard super sacks of material removed from sheet 7 location. Excavation was approximately 8" deep in the northwest section and 2" deep in the southeast section.
0612	Removal of solid hydrocarbon-like materials	Excavate material from sheet 6 area.	Area excavated at sheet 6 was approximately 3" deep and filled 0.5 one-yard super sack.
0630	Location of excavations	Coordinates of sheet 7 excavation area collected (S71a to S76a). Coordinates of sheet 6 excavation area collected (S61a to S64a).	Rock and other materials from within the sheet 7 location that could not be segregated from solid hydrocarbon-like material were also disposed of in the super sacks.
0645	Reactive Core Mat	Place Reactive Core Mat (Sheet 6 and 7).	Rolled out and positioned by hand.
0700	Location of Reactive Core Mat (Sheet 6)	4 Corners (S6MC1, S6MC2, S6MC3, S6MC4).	Coordinates saved to GPS.
0716	Location of Reactive Core Mat (Sheet 7)	4 Corners (S7MC1, S7MC2, S7MC3, S7MC4).	Coordinates saved to GPS.
0730	Pea Gravel	Place pea gravel over sheet 6 and 7 and begin removing equipment from beach with crane.	Mat placed directly over excavation. Area of deeper excavation (8") has more pea gravel than the shallower (2") excavated area.
0800	Demob. from beach	All equipment removed from beach.	
0900	Off site		

OTHER GENERAL OBSERVATIONS-Note any Changes, Force Account Work and Materials Testing

None

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(PM initial)

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Date: October 12, 2013

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INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

PHOTOS



Comment: Excavation in area of Sheet 7.



Comment: Placement of Sheet 6.



Comment: Sheet 7 being covered with pea gravel.



Comment: Final placement of pea gravel and Sheets 6 and 7.

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(PM initial)

NWS

Field Representative Signature



Date: October 12, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: October 14, 2013

REPORT NO.: 20131014

ANCHOR QEA FIELD REP.: Jason Cornetta

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

[Tide Predictions - Bremerton, Sinclair Inlet, Port Orchard 9445958 Tidal Data Daily View - NOAA Tides & Currents](#)

DAILY TIDE PREDICTIONS IN FEET	DATE	DAY	TIME	HEIGHT
NOAA Station ID: 9445958	10/14	Mon	01:13 AM	9.10 H
Bremerton, WA	10/14	Mon	07:39 AM	1.26 L
Time Zone: LST/LDT	10/14	Mon	02:36 PM	11.62 H
Datum: MLLW	10/14	Mon	09:07 PM	3.69 L

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER TEMP. & PRECIP	
Client	Veris Law Group	General	Clearcreek Contractors Inc. (CCI)	AM:	Foggy; low 40s; wind calm
CC	Mark Larsen	Subs	Ness Cranes	PM:	N/A
	Nathan Soccorso			Times of Site Visits:	
				From	0245 to 1100
				From	To

PROJECT DAILY CONSTRUCTION ACTIVITY LIST

TASK No.	CONSTRUCTION TASK	LOCATION/STATION	GENERAL NOTES
1	Install Sign Posts	Per Work Plan	2 EA
2	Place Cap Rock	Sheets 1, 2, 3, and 10 feet beyond area covered by sheets	Nominal thickness of 1 foot
3	Place Reactive Core Mat	Sheets 1,2, and 3	

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REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: October 14, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: October 14, 2013

REPORT NO.: 20131014

ANCHOR QEA FIELD REP.: Jason Cornetta

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

PERSONNEL ON SITE (EST.)

Name (or Labor Category)	Organization	Notes
		Refer to contractor's tailgate meeting sign-in sheet

EQUIPMENT ON SITE

Type of Equipment	Organization	Notes
Crane	Ness Cranes	
Deere 50D excavator	Clearcreek Contractors Inc.	Rubber-tracked
Canycon S25A mini carrier	Clearcreek Contractors Inc.	Rubber-tracked
Deere 310J backhoe	leased	w/ forks
Kenworth dump truck	Clearcreek Contractors Inc.	
Ford F-250 pickup truck	Clearcreek Contractors Inc.	
Ford F-550 utility truck	Clearcreek Contractors Inc.	

ATTACHMENTS

None

CONSTRUCTION OBSERVATIONS

TIME	TOPIC	DESCRIPTION OF FIELD ACTIVITY/LOCATION	Notes
0245	On site	Hold tailgate safety meeting and review scope of work for the day and site-specific safety procedures.	
0350	Prep for placement of Reactive Core Mat	Light plant and excavator placed on the beach. Pea gravel placed over pile stub as subgrade to protect mat.	
0606	Cap rock placement	10 buckets of cap rock placed around perimeter of where sheet 1 will be installed	Cycle time is approximately 4 to 5 minutes for crane to place rock using a 2 cubic yard skip bucket. Excavator used to spread rock and for final placement.
0656	Cap rock placement	Approximately 21 loads of rock placed on beach along the outside perimeter area of mats.	Maintaining the 4 to 5 minute cycle time for crane to place rock.
0713	Placement of mat (Sheet 1)	Sheet 1 placed on beach.	Measurement from concrete bin/bulkhead to corners of mat 52.3' and 52.7'.
0730	Mat layout	Measure and mark out overlap between	

LIMITATIONS: The Anchor QEA field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Anchor QEA field representative and our acceptance of any non-conforming work does not relieve the contractor from complying with its contract documents. Anchor QEA does not have the authority to direct the contractor's work. Any information provided by the Anchor QEA field representative is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of the work, and adherence to the contract documents.

REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: October 14, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: October 14, 2013

REPORT NO.: 20131014

ANCHOR QEA FIELD REP.: Jason Cornetta

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

TIME	TOPIC	DESCRIPTION OF FIELD ACTIVITY/LOCATION	Notes
		sheets 1 and 2 (33" to 38" of overlap and 40' off concrete bin/bulkhead).	
0815	Placement of mat (Sheet 2)	Sheet 2 placed on beach.	
0822	Mat layout	Measure and mark out overlap between sheets 2 and 3 (18" of overlap and 25' off concrete bin/bulkhead).	
0915	Placement of mat (Sheet 3)	Sheet 3 placed on beach.	
1007	Placement of cap rock	Sheets 1, 2, and 3 covered with rock. Overlap section on sheet 3 not covered, but some large cobbles placed by hand to hold it in place until next shift when sheet 4 will be placed.	Nominal thickness of cap rock was 1' and cap extends approximately 10' beyond sheets.
1025	Demob. from beach	All equipment removed from beach.	
1100	Off site		

OTHER GENERAL OBSERVATIONS-Note any Changes, Force Account Work and Materials Testing

None

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(PM initial)

NWS

Field Representative Signature

Date: October 14, 2013

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INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

PHOTOS



Comment: Placement of Sheet 1 and perimeter rock.



Comment: Cap rock on Sheet 1 and marked overlap.



Comment: Sheet 2 and cap rock with marked overlap.



Comment: Sheet 3 and cap rock with marked overlap.

LIMITATIONS: The Anchor QEA field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Anchor QEA field representative and our acceptance of any non-conforming work does not relieve the contractor from complying with its contract documents. Anchor QEA does not have the authority to direct the contractor's work. Any information provided by the Anchor QEA field representative is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of the work, and adherence to the contract documents.

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(PM initial)

NWS

Field Representative Signature



Date: October 14, 2013

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INSPECTOR DAILY REPORT

CONTRACT NO.: PO 50312

REPORT DATE: October 14, 2013

REPORT NO.: 20131014

ANCHOR QEA FIELD REP.: Jason Cornetta

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action



Comment: Final rock and mat placement for the day.

Comment: Equipment off beach and activities completed for the day.

LIMITATIONS: The Anchor QEA field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Anchor QEA field representative and our acceptance of any non-conforming work does not relieve the contractor from complying with its contract documents. Anchor QEA does not have the authority to direct the contractors work. Any information provided by the Anchor QEA field representative is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of the work, and adherence to the contract documents.

REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: October 14, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: October 15, 2013

REPORT NO.: 20131015

ANCHOR QEA FIELD REP.: Nik Bacher

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

[Tide Predictions - Bremerton, Sinclair Inlet, Port Orchard 9445958 Tidal Data Daily View - NOAA Tides & Currents](#)

DAILY TIDE PREDICTIONS IN FEET	DATE	DAY	TIME	HEIGHT
NOAA Station ID: 9445958	10/15	Tues	02:35 AM	9.51 H
Bremerton, WA	10/15	Tues	08:44 AM	1.80 L
Time Zone: LST/LDT	10/15	Tues	03:18 PM	11.85 H
Datum: MLLW	10/15	Tues	09:52 PM	2.38 L

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER TEMP. & PRECIP			
Client	Veris Law Group	General	Clearcreek Contractors Inc. (CCI)	AM:	Foggy; low 40s; wind calm		
CC	Mark Larsen	Subs	Ness Cranes	PM:	N/A		
	Nathan Soccorso				Times of Site Visits:		
					From	0545	To
				From		To	

PROJECT DAILY CONSTRUCTION ACTIVITY LIST

TASK No.	CONSTRUCTION TASK	LOCATION/STATION	GENERAL NOTES
1	Place Cap Rock	Sheet 4 and 10 feet beyond area covered by sheet	Nominal thickness of 1 foot
2	Place Reactive Core Mat	Sheet 4	

LIMITATIONS: The Anchor QEA field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Anchor QEA field representative and our acceptance of any non-conforming work does not relieve the contractor from complying with its contract documents. Anchor QEA does not have the authority to direct the contractors work. Any information provided by the Anchor QEA field representative is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of the work, and adherence to the contract documents.

REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: October 15, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: October 15, 2013

REPORT NO.: 20131015

ANCHOR QEA FIELD REP.: Nik Bacher

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

PERSONNEL ON SITE (EST.)

Name (or Labor Category)	Organization	Notes
		Refer to contractor's tailgate meeting sign-in sheet

EQUIPMENT ON SITE

Type of Equipment	Organization	Notes
Crane	Ness Cranes	
Deere 50D excavator	Clearcreek Contractors Inc.	Rubber-tracked
Canycon S25A mini carrier	Clearcreek Contractors Inc.	Rubber-tracked
Deere 310J backhoe	leased	w/ forks
Kenworth dump truck	Clearcreek Contractors Inc.	
Ford F-250 pickup truck	Clearcreek Contractors Inc.	
Ford F-550 utility truck	Clearcreek Contractors Inc.	

ATTACHMENTS

None

CONSTRUCTION OBSERVATIONS

TIME	TOPIC	DESCRIPTION OF FIELD ACTIVITY/LOCATION	Notes
0545	On site	Hold tailgate safety meeting and review scope of work for the day and site-specific safety procedures.	
0635	Prep for placement of Reactive Core Mat	Light plant and excavator placed on the beach.	
0650	Placement of mat (Sheet 4)	Sheet 4 placed on beach with crane and rolled out by hand.	
0855	Cap rock placement	Cap rock placed on beach over and around the perimeter of sheet 4.	Nominal thickness of cap rock 1'. Cap extends approximately 10' beyond sheets.
0900	Cap rock	CCI grading and leveling final cap rock cover.	
0910	Outfall diversion	Temporary outfall diversion removed and outfall routed back to original location adjacent to east side of bulkhead.	
0915	Steel float	Steel float secured to bulkhead anchor. Light	

LIMITATIONS: The Anchor QEA field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Anchor QEA field representative and our acceptance of any non-conforming work does not relieve the contractor from complying with its contract documents. Anchor QEA does not have the authority to direct the contractor's work. Any information provided by the Anchor QEA field representative is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of the work, and adherence to the contract documents.

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(PM initial)

NWS

Field Representative Signature

Date: October 15, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: October 15, 2013

REPORT NO.: 20131015

ANCHOR QEA FIELD REP.: Nik Bacher

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

TIME	TOPIC	DESCRIPTION OF FIELD ACTIVITY/LOCATION	Notes
		plant and mini excavator removed from beach with crane.	
1015	Manhole "A"	CCI places grade rings on manhole to prevent runoff in to catch basin	
1050	Demobilization	Ness Cranes demobilized from site	
1100	Manhole "A"	CCI replaces Manhole "A" cover on grade rings/riser to provide a temporary plug.	
1230	Demobilization	CCI off site. Equipment remaining staged in the upland area includes: Deere 310J Backhoe (Hertz), 3 Magnum light plants (Hertz), and 2-yard skip bucket (Ness Cranes). Oil containment boom remains deployed in the waterway adjacent to the work area.	Staged waste for off-site disposal includes: 5 covered super sacks containing solid hydrocarbon-like material with intermingled rock, sediment, and debris, and two 5-gallon buckets of bricks.
1300	Off site	Site secured.	A slight, non-hydrocarbon, sheen was observed inside the oil containment boom. The source of the sheen was likely the newly placed cap rock. Will continue to monitor during site inspections.

OTHER GENERAL OBSERVATIONS-Note any Changes, Force Account Work and Materials Testing

None

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(PM initial)

NWS

Field Representative Signature

Date: October 15, 2013

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INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

PHOTOS



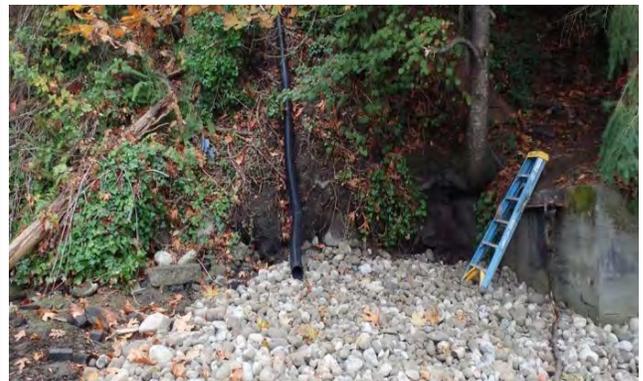
Comment: Placement of Sheet 4.



Comment: Cap rock on Sheet 4 and placement of Sheet 5 along east edge of bulkhead.



Comment: Sheet cap rock along bulkhead.



Comment: Outfall routed back to original location adjacent to east side of bulkhead. Steel float secured to bulkhead anchor.

LIMITATIONS: The Anchor QEA field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Anchor QEA field representative and our acceptance of any non-conforming work does not relieve the contractor from complying with its contract documents. Anchor QEA does not have the authority to direct the contractor's work. Any information provided by the Anchor QEA field representative is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of the work, and adherence to the contract documents.

 REVIEW BY
(PM initial)

NWS

Field Representative Signature



Date: October 15, 2013

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INSPECTOR DAILY REPORT

CONTRACT NO.: PO 50312

REPORT DATE: October 15, 2013

REPORT NO.: 20131015

ANCHOR QEA FIELD REP.: Nik Bacher

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action



Comment: Final graded cap rock in 1-foot lift on mats and extending 10 feet past perimeter of mats. Boom remaining in place until end of monitoring period.



Comment: Excavation of Manhole "A".



Comment: Condition of Manhole "A" prior to placement of grade rings.



Comment: Manhole "A" after placement of grade rings and installation of secure lid.

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REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: October 15, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: November 04, 2013

REPORT NO.: 20131104

ANCHOR QEA FIELD REP.: Nik Bacher

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

[Tide Predictions - Bremerton, Sinclair Inlet, Port Orchard 9445958 Tidal Data Daily View - NOAA Tides & Currents](#)

DAILY TIDE PREDICTIONS IN FEET	DATE	DAY	TIME	HEIGHT
NOAA Station ID: 9445958	11/04	Mon	05:45 AM	12.21 H
Bremerton, WA	11/04	Mon	11:22 AM	5.95 L
Time Zone: LST/LDT	11/04	Mon	04:31 PM	11.88 H
Datum: MLLW	11/04	Mon	11:36 PM	-2.47 L

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER TEMP. & PRECIP	
Client	Veris Law Group	General	Clearcreek Contractors Inc. (CCI)	AM:	Overcast; low 40s; wind calm
CC	Mark Larsen	Subs		PM:	N/A
	Nathan Soccorso			Times of Site Visits:	
				From	0700 To 1030
				From	To

PROJECT DAILY CONSTRUCTION ACTIVITY LIST

TASK No.	CONSTRUCTION TASK	LOCATION/STATION	GENERAL NOTES
1	Load out investigation derived waste (IDW)	IDW stored in supersacks and steel drums in the staging area	Nominal thickness of 1 foot
2	Install unit strut post	At end of Pennsylvania	
3	Repair fence on McConkey property used for beach access during construction	North end of staging area on McConkey property	
4	Remove containment boom around work area	Intertidal work area	

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REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: November 4, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: November 04, 2013

REPORT NO.: 20131104

ANCHOR QEA FIELD REP.: Nik Bacher

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

PERSONNEL ON SITE (EST.)

Name (or Labor Category)	Organization	Notes
		Refer to contractor's tailgate meeting sign-in sheet

EQUIPMENT ON SITE

Type of Equipment	Organization	Notes
JLG 6042 Telehandler	leased	w/ forks
Kenworth dump truck	Clearcreek Contractors Inc.	
Ford F-250 pickup truck	Clearcreek Contractors Inc.	
Ford F-550 utility truck	Clearcreek Contractors Inc.	

ATTACHMENTS

None

CONSTRUCTION OBSERVATIONS

TIME	TOPIC	DESCRIPTION OF FIELD ACTIVITY/LOCATION	Notes
0700	On site	Hold tailgate safety meeting and review scope of work for the day and site-specific safety procedures.	
0720	IDW	Super sacks loaded into dump truck using the telehandler.	5 super sacks and two 5-gallon buckets of briquettes loaded.
0725	Waste Manifests	Cascade representative on site to sign waste manifests.	
0750	IDW	Dump truck off site heading to Arlington, Oregon.	
0800	Fence repair	CCI starts repairing fence on north side of McConkey property.	
0840	Fence repair	Fence repair complete.	2 sections of fence repaired.
0845	IDW	Loading steel drum onto CCI utility truck.	1x55 gallon drum, 2x20 gallon drums. All with waste labels.
0905	Unistrut installation	Installing unistrut at end of Pennsylvania Avenue.	
0915	Containment Boom	Removing containment boom and loading onto pickup truck.	

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REVIEW BY
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NWS

Field Representative Signature

Date: November 4, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: November 04, 2013

REPORT NO.: 20131104

ANCHOR QEA FIELD REP.: Nik Bacher

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

TIME	TOPIC	DESCRIPTION OF FIELD ACTIVITY/LOCATION	Notes
0950	Demobilization	CCI off site. Equipment remaining staged in the upland area includes: JLG 6042 telehandler (Hertz).	
1020	Off site	Site secured.	

OTHER GENERAL OBSERVATIONS-Note any Changes, Force Account Work and Materials Testing

None

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Field Representative Signature

Date: November 4, 2013

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INSPECTOR DAILY REPORT

CONTRACT NO.: PO 50312

REPORT DATE: November 04, 2013

REPORT NO.: 20131104

ANCHOR QEA FIELD REP.: Nik Bacher

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

PHOTOS



Comment: Loading out IDW (super sacks).



Comment: Fence being repaired.



Comment: Fence after repair.



Comment: Loading out IDW (drums).

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Date: November 4, 2013

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INSPECTOR DAILY REPORT

CONTRACT NO.: PO 50312

REPORT DATE: November 04, 2013

REPORT NO.: 20131104

ANCHOR QEA FIELD REP.: Nik Bacher

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action



Comment: Drum labels.

Comment: Unistrut installed at end of Pennsylvania Avenue.



Comment: Containment boom removal.

Comment: Work area after containment boom removal.

LIMITATIONS: The Anchor QEA field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Anchor QEA field representative and our acceptance of any non-conforming work does not relieve the contractor from complying with its contract documents. Anchor QEA does not have the authority to direct the contractors work. Any information provided by the Anchor QEA field representative is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of the work, and adherence to the contract documents.

REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: November 4, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: December 20, 2013

REPORT NO.: 20131220

ANCHOR QEA FIELD REP.: Nik Bacher

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

[Tide Predictions - Bremerton, Sinclair Inlet, Port Orchard 9445958 Tidal Data Daily View - NOAA Tides & Currents](#)

DAILY TIDE PREDICTIONS IN FEET	DATE	DAY	TIME	HEIGHT
NOAA Station ID: 9445958	12/20	Fri	12:16 AM	-0.78 L
Bremerton, WA	12/20	Fri	07:31 AM	12.61 H
Time Zone: LST/LDT	12/20	Fri	01:31 PM	6.64 L
Datum: MLLW	12/20	Fri	06:05 PM	9.82 H

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER TEMP. & PRECIP			
Client	Veris Law Group	General		AM:	Overcast; low 40s; windy		
CC	Mark Larsen	Subs		PM:	N/A		
	Nathan Soccorso			Times of Site Visits:			
				From	1200	To	1415
				From		To	

PROJECT DAILY CONSTRUCTION ACTIVITY LIST

TASK No.	CONSTRUCTION TASK	LOCATION/STATION	GENERAL NOTES
1	Install new beach warning signs	On beach, east and west of work area	
2	Install new trail warning signs	At end of Pennsylvania Avenue	
3	Remove temporary wood steps on marina stairs	At Port Washington Marina	

LIMITATIONS: The Anchor QEA field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Anchor QEA field representative and our acceptance of any non-conforming work does not relieve the contractor from complying with its contract documents. Anchor QEA does not have the authority to direct the contractors work. Any information provided by the Anchor QEA field representative is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of the work, and adherence to the contract documents.

REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: December 20, 2013

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CONTRACT NO.: PO 50312

REPORT DATE: December 20, 2013

REPORT NO.: 20131220

ANCHOR QEA FIELD REP.: Nik Bacher

INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

PERSONNEL ON SITE (EST.)

Name (or Labor Category)	Organization	Notes
Nik Bacher	Anchor QEA	
Evan Malczyk	Anchor QEA	
Kathy Parker	EPA	On site briefly during sign installation at end of Pennsylvania Avenue.

EQUIPMENT ON SITE

Type of Equipment	Organization	Notes
Personal vehicle	Owned by Anchor QEA staff member	

ATTACHMENTS

None

CONSTRUCTION OBSERVATIONS

TIME	TOPIC	DESCRIPTION OF FIELD ACTIVITY/LOCATION	Notes
1200	On site	Hold tailgate safety meeting and review scope of work for the day and site-specific safety procedures.	
1210	Sign Installation	Installing signs in the intertidal area east and west of the newly placed cap.	2 signs installed.
1300	Cap Inspection	Check integrity of cap and look for any observed sheen.	
1310	Temporary Steps	Removal of temporary steps at Port Washington Marina stair to the intertidal area.	3 wood steps removed.
1330	Sign Installation	Installing sign at the end of Pennsylvania Avenue.	1 sign installed.
1345	EPA on site	Kathy Parker on site during installation of sign at end of Pennsylvania Avenue.	
1400	Demobilization	Anchor QEA removes old signs on beach and at end of Pennsylvania Avenue. No equipment remaining on site.	2 signs (yellow) removed.
1415	Off site	Site secured.	

LIMITATIONS: The Anchor QEA field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Anchor QEA field representative and our acceptance of any non-conforming work does not relieve the contractor from complying with its contract documents. Anchor QEA does not have the authority to direct the contractors work. Any information provided by the Anchor QEA field representative is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of the work, and adherence to the contract documents.

REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: December 20, 2013

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INSPECTOR DAILY REPORT

CONTRACT NO.: PO 50312

REPORT DATE: December 20, 2013

REPORT NO.: 20131220

ANCHOR QEA FIELD REP.: Nik Bacher

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action

OTHER GENERAL OBSERVATIONS-Note any Changes, Force Account Work and Materials Testing

None

PHOTOS



Comment: Intertidal area sign installed west of capped areas.



Comment: Intertidal area sign installed east of capped areas.

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REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: December 20, 2013

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INSPECTOR DAILY REPORT

CONTRACT NO.: PO 50312

REPORT DATE: December 20, 2013

REPORT NO.: 20131220

ANCHOR QEA FIELD REP.: Nik Bacher

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action



Comment: Capped area east of bulkhead.

Comment: Looking east over capped area.

LIMITATIONS: The Anchor QEA field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Anchor QEA field representative and our acceptance of any non-conforming work does not relieve the contractor from complying with its contract documents. Anchor QEA does not have the authority to direct the contractors work. Any information provided by the Anchor QEA field representative is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of the work, and adherence to the contract documents.

REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: December 20, 2013

Page 4 of 6

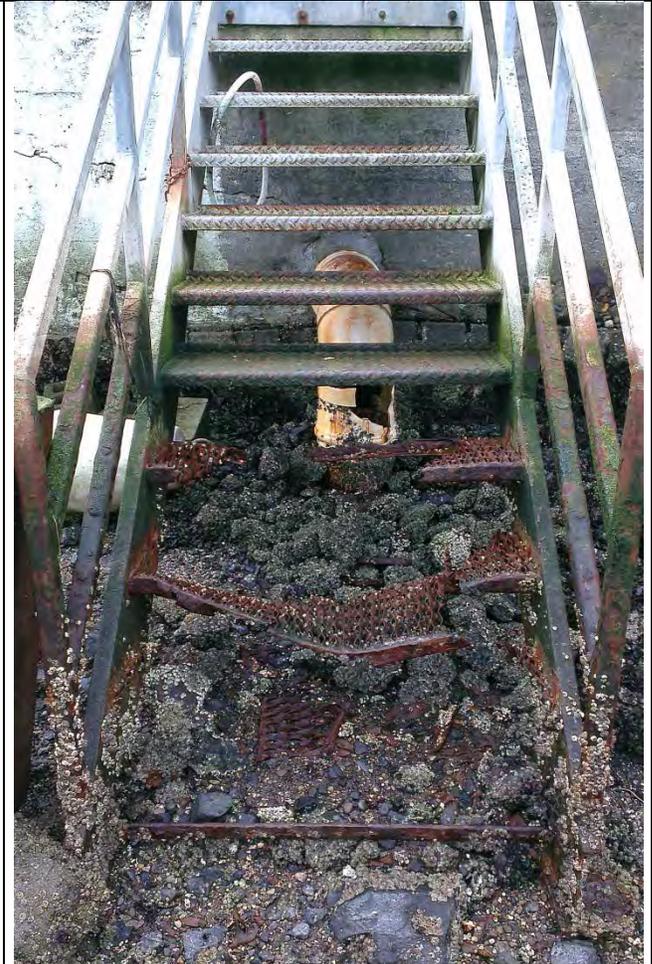
INSPECTOR DAILY REPORT

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action



Comment: Removing temporary steps.



Comment: Temporary steps removed.

LIMITATIONS: The Anchor QEA field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Anchor QEA field representative and our acceptance of any non-conforming work does not relieve the contractor from complying with its contract documents. Anchor QEA does not have the authority to direct the contractor's work. Any information provided by the Anchor QEA field representative is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of the work, and adherence to the contract documents.

REVIEW BY
(PM initial)

NWS

Field Representative Signature



Date: December 20, 2013

Page 5 of 6



INSPECTOR DAILY REPORT

CONTRACT NO.: PO 50312

REPORT DATE: December 20, 2013

REPORT NO.: 20131220

ANCHOR QEA FIELD REP.: Nik Bacher

PROJECT NAME/LOCATION

Bremerton Gas Works Time Critical Removal Action



Comment: Looking east over capped area and newly installed intertidal warning sign.



Comment: Trail warning sign at end of Pennsylvania Avenue.

LIMITATIONS: The Anchor QEA field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Anchor QEA field representative and our acceptance of any non-conforming work does not relieve the contractor from complying with its contract documents. Anchor QEA does not have the authority to direct the contractor's work. Any information provided by the Anchor QEA field representative is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of the work, and adherence to the contract documents.

REVIEW BY
(PM initial)

NWS

Field Representative Signature

Date: December 20, 2013

Page 6 of 6

APPENDIX F
Photo Log of Stormwater System Modifications



Photograph 1 – Manhole A prior to capping on October 16, 2013



Photograph 2 – Manhole A after capping on October 16, 2013



Photograph 3 – Sump drain plug in tank containment area



Photograph 4 – McConkey Property catch basin and tank containment area



Photograph 5 – New catch basin and connection to city storm drain line

APPENDIX G
Final EPA-approved Signage

WARNING!

DO NOT ENTER

U.S. EPA Superfund Site Contaminated Beach Sediments

**This beach is part of the Bremerton Gasworks Superfund site
The sediments contain contaminants that can be harmful to your health**

Do not harvest or consume shellfish

Do not dig on the beach or disturb the sediment

Do not remove sea-life or other objects

Wash your hands if you come into contact with materials on the beach

For information contact:

*Bill Ryan
U.S. Environmental Protection Agency
(206) 553-8561
or
Grant Holdcroft
Kitsap Public Health District
(360) 337-5235*



APPENDIX H
Investigation Derived Waste and Action
Disposal Documentation

430046

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number

WAZ000003781

2. Page 1 of

2

3. Emergency Response Phone

(800)474-9300

4. Waste Tracking Number

213080-02

5. Generator's Name and Mailing Address

CASCADE NATURAL GAS
1725 PENNSYLVANIA AVENUE
BREMERTON WA 98310

Generator's Site Address (if different than mailing address)

Generator's Phone:

(206)423-8120

6. Transporter 1 Company Name

CLEARCREEK CONTRACTORS LLC

U.S. EPA ID Number

WAH001882984

7. Transporter 2 Company Name

ROADLINK INTERMODAL LOGISTICS R Transport

U.S. EPA ID Number

WAH000025338
WAH000021853

8. Designated Facility Name and Site Address

CHEMICAL WASTE MANAGEMENT, INC
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709

U.S. EPA ID Number

ORD088452353

Facility's Phone:

541
(503)454-2643

9. Waste Shipping Name and Description

BMS 12-5-13

10. Containers

No.

Type

11. Total Quantity

12. Unit Wt./Vol.

1 MATERIAL NOT REGULATED BY DOT

3/2 DM

400
300

P

2 Material not regulated by DOT
(Clean up soil)

1 DM

100

P

13. Special Handling Instructions and Additional Information

1 OR321884 DECON WATER
2 OR321683

WVXU970841

14. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Generator's/Officer's Printed/Typed Name

Chris Bossard

Signature

[Signature]

Month Day Year

11 4 13

15. International Shipments

Import to U.S.

Export from U.S.

Port of entry/exit:

Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name

Merrill Finley

Signature

[Signature]

Month Day Year

11 4 12

Transporter 2 Printed/Typed Name

Amanda Payne

Signature

[Signature]

Month Day Year

11 14 13

17. Discrepancy

17a. Discrepancy Indication Space

Quantity

Type

Residue

Partial Rejection

Full Rejection

Drum # 2 16 gal contains soil moved to 22 split per Mark HCCullough/Cascade Natural Gas

Manifest Reference Number:

17b. Alternate Facility (or Generator)

U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator)

Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name

Sue McAheer

Signature

[Signature]

Month Day Year

11 21 13

BMS

430046

NON-HAZARDOUS WASTE MANIFEST
(Continuation Sheet)

19. Generator ID Number

20. Page 2 of 2

21. Waste Tracking Number

WAZ000008761

of 2

213050-02

22. Generator's Name

CASCADE NATURAL GAS

23. Transporter 3 Company Name

UNION PACIFIC RAILROAD

U.S. EPA ID Number

NED001782810

24. Transporter 4 Company Name

COLUMBIA RIDGE LANDFILL

U.S. EPA ID Number

ORD987173457

25. Waste Shipping Name and Description

26. Containers

No. Type

27. Total Quantity

28. Unit Wt./Vol.

	26. Containers		27. Total Quantity	28. Unit Wt./Vol.
	No.	Type		
6				
7				
8				
9				
10				
11				
12				
13				
14				

29. Special Handling Instructions and Additional Information

WMXU970841

30. Transporter Acknowledgment of Receipt of Materials

Printed/Typed Name

Cindi Crey

Signature

Cindi Crey

Month Day Year

11/14/13

31. Transporter Acknowledgment of Receipt of Materials

Printed/Typed Name

Nicole Rees

Signature

Nicole Rees

Month Day Year

11/15/13

32. Discrepancy

GENERATOR

TRANSPORTER

DESIGNATED FACILITY

430299

Printer

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number WA 7 0 0 0 0 0 R 7 8 1	2. Page 1 of 1	3. Emergency Response Phone (300) 424-9300	4. Waste Tracking Number 213050-01
	5. Generator's Name and Mailing Address CASCADE NATURAL GAS 1725 PENNSYLVANIA AVENUE BREMERTON WA 98310 Generator's Phone: (206) 422-9120		Generator's Site Address (if different than mailing address)	
6. Transporter 1 Company Name CLEARCREEK CONTRACTORS INC	7. Transporter 2 Company Name		U.S. EPA ID Number WA H 0 0 1 8 8 2 9 9 4	U.S. EPA ID Number
8. Designated Facility Name and Site Address CHEMICAL WASTE MANAGEMENT, INC 17629 CEDAR SPRINGS LANE ARLINGTON OR 97812-9700 Facility's Phone: (503) 451-2842		U.S. EPA ID Number ORD 0 8 9 4 5 2 3 5 3		
9. Waste Shipping Name and Description 1. MATERIAL NOT REGULATED BY DOT	10. Containers No. Type		11. Total Quantity	12. Unit Wt./Vol.
	001 DT		10000	P
	2.			
	3.			
	4.			
13. Special Handling Instructions and Additional Information OR321883 MGP EXEMPTION SOILS/SOLIDS 9540 P				
14. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.				
Generator's/Officer's Printed/Typed Name Chris Berglund		Signature <i>[Signature]</i>		Month Day Year 11 4 13
15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: Date leaving U.S.:				
16. Transporter Acknowledgment of Receipt of Materials				
Transporter 1 Printed/Typed Name CHRIS BERGLUND		Signature <i>[Signature]</i>		Month Day Year 11 4 13
Transporter 2 Printed/Typed Name		Signature		Month Day Year
17. Discrepancy				
17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection				
17b. Alternate Facility (or Generator) Manifest Reference Number: U.S. EPA ID Number				
17c. Signature of Alternate Facility (or Generator) Month Day Year				
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a				
Printed/Typed Name Robert J. Paulson		Signature <i>[Signature]</i>		Month Day Year 11 15 13

GENERATOR

INT'L

TRANSPORTER

DESIGNATED FACILITY

BMS



**Chemical Waste Management
Of The Northwest**

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I.D.# ORDO89452353

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND
T/D: 08:16:38 2013-11-05
ID: 430299 TRK ID: TRAILER
80800 lb G

OUTBOUND
T/D: 08:33:40 2013-11-05
ID: 430299 TRK ID: TRAILER
80800 lb G
71260 lb PT
9540 lb N

NET 4.77 TONS

GENERATOR _____

213086



WASTE MANAGEMENT
17629 Cedar Springs Lane
Arlington, OR 97812

NOV 22 2013

CASCADE NATURAL GAS
WAZ000008761
1725 PENNSYLVANIA AVENUE
BREMERTON WA 98310

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc., ORD089452353, has received the following waste material:

GENERATOR:	CASCADE NATURAL GAS
MANIFEST #:	213080-01
CWM TRACKING ID:	430299-01
PROFILE #:	OR321683
LINE ITEM:	9.1
QUANTITY:	1 DT
RECEIVED DATE:	11/05/13
DISPOSAL PROCESS(ES):	LANDFILL
FINAL DISPOSAL LOCATION:	LANDFILL 14
DISPOSAL DATE:	11/05/13

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste material was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Becky Sumner

CWMNW RECORDS DEPARTMENT
Date: 11/12/13

APPENDIX I
Excavated Material Characterization Data and
Disposal Documentation



1876072122

214023.10.10

Weighed At: Soil Remediation

6300 Glenwood Ave

Everett, WA 98213

Location: 1876

Order:

Dispatch:

Date:

04/03/2014

Ship To: 3063871 - CLEARCREEK CONTRACTORS NC

3919 88TH STREET NE/MARYSVILLE

MARYSVILLE

MARYSVILLE, WA 98270-7230

Instruct: CLEAR CREEK 48

Job #:

PO: 2140231010

Product: 1192508 - CLASS 3 SOIL DUMPED BY TON

Carrier: -

Vehicle: 2034263 - 1876-1.EVERETT SOIL GENERIC

Tractor / Trailer1 / Trailer 2 -/ -/

Qty: 4.54 ton

--- DRIVER ON AT TARE & GROSS ---

Weighmaster:

CEMEX:

	lb	ton	tne
Gross:	17,640	8.82	8.00
Tare:	8,560	4.28	3.88
Net:	9,080	4.54	4.12

Deputy Weighmaster:

Cadev Funke

Scale:

In 9:31 am

Today Loads:

1

Out 9:42 am

Today Qty:

-4.54 ton

0.00

CEMEX'S STANDARD TERMS AND
CONDITIONS INCORPORATED HEREIN

0.00

Signature of Receiving Agent

Driver:

METRIC CONVERSION FORMULA: (LBS / 2204.62) = METRIC TONNES, ROUNDED TO 2 DECIMALS
SEE REVERSE SIDE FOR PRODUCT LABEL INFORMATION

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Kurt Johnson, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 1, 2014

Carla Brock, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Ms. Brock:

Included are the results from the testing of material submitted on March 26, 2014 from the Bremerton MGP, F&BI 403383 project. There are 12 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures

c: data@aspectconsulting.com, Parker Wittman, Bob Hanford
ASP0401R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 26, 2014 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Bremerton MGP, F&BI 403383 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID
403383 -01

Aspect Consulting, LLC
MGP-SD-Profile-032614

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/14
Date Received: 03/26/14
Project: Bremerton MGP, F&BI 403383
Date Extracted: 03/27/14
Date Analyzed: 03/27/14

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 56-165)
MGP-SD-Profile-032614 403383-01	1,500	<250	91
Method Blank 04-631 MB	<50	<250	86

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	MGP-SD-Profile-032614	Client:	Aspect Consulting, LLC
Date Received:	03/26/14	Project:	Bremerton MGP, F&BI 403383
Date Extracted:	03/31/14	Lab ID:	403383-01
Date Analyzed:	04/01/14	Data File:	403383-01.021
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	101	60	125
Indium	85	60	125
Holmium	89	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	18.1
Arsenic	2.40
Cadmium	<1
Lead	8.14

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Bremerton MGP, F&BI 403383
Date Extracted:	03/31/14	Lab ID:	I4-197 mb
Date Analyzed:	04/01/14	Data File:	I4-197 mb.008
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125
Indium	95	60	125
Holmium	100	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	<1
Arsenic	<1
Cadmium	<1
Lead	<1

Date of Report: 04/01/14
Date Received: 03/26/14
Project: Bremerton MGP, F&BI 403383
Date Extracted: 03/31/14
Date Analyzed: 03/31/14

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL MERCURY
USING EPA METHOD 1631E**

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Total Mercury</u>
MGP-SD-Profile-032614 403383-01	<0.1
Method Blank	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	MGP-SD-Profile-032614	Client:	Aspect Consulting, LLC
Date Received:	03/26/14	Project:	Bremerton MGP, F&BI 403383
Date Extracted:	03/27/14	Lab ID:	403383-01 1/5
Date Analyzed:	03/31/14	Data File:	16.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	59	50	150

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Bremerton MGP, F&BI 403383
Date Extracted:	03/27/14	Lab ID:	04-619 mb 1/5
Date Analyzed:	03/31/14	Data File:	13.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	104	50	150

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/14

Date Received: 03/26/14

Project: Bremerton MGP, F&BI 403383

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL
SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 403348-06 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	114	114	63-146	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	116	79-144

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/14

Date Received: 03/26/14

Project: Bremerton MGP, F&BI 403383

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 403438-11 reex (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Chromium	mg/kg (ppm)	50	7.17	85	83	57-128	2
Arsenic	mg/kg (ppm)	10	1.46	100	97	70-118	3
Cadmium	mg/kg (ppm)	10	<1	105	101	83-116	4
Lead	mg/kg (ppm)	50	1.75	106	101	59-148	5

Laboratory Code: Laboratory Control Sample reex

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	mg/kg (ppm)	50	86	78-121
Arsenic	mg/kg (ppm)	10	97	83-113
Cadmium	mg/kg (ppm)	10	101	54-114
Lead	mg/kg (ppm)	50	100	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/14

Date Received: 03/26/14

Project: Bremerton MGP, F&BI 403383

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES FOR
TOTAL MERCURY
USING EPA METHOD 1631E**

Laboratory Code: 403438-11 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	mg/kg (ppm)	0.125	<0.1	105	97	71-125	8

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	mg/kg (ppm)	0.125	99	63-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/14

Date Received: 03/26/14

Project: Bremerton MGP, F&BI 403383

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES FOR
POLYCHLORINATED BIPHENYLS AS
AROCLOR 1016/1260 BY EPA METHOD 8082A**

Laboratory Code: 403383-01 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.02	96	93	50-150	3
Aroclor 1260	mg/kg (ppm)	0.8	<0.02	104	101	50-150	3

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Aroclor 1016	mg/kg (ppm)	0.8	127	70-130
Aroclor 1260	mg/kg (ppm)	0.8	122	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 - More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr - The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

