

January 12, 2004  
10077.003

Oregon Department of Environmental Quality  
Northwest Region  
2020 SW Fourth Avenue  
Suite 400  
Portland, Oregon 97201-4987

**VIA Hand Delivery**

**Subject: RI/FS Work Plan Addendum  
Historical Shell/Niemi/Mobil Petroleum Pipelines Investigation and  
Decommissioning Work Plan  
Astoria Area-Wide Petroleum Site  
Astoria, Oregon  
DEQ ECSI File #2277**

Dear Ms. Coates:

Enclosed are four copies of the above-referenced document. This work plan addendum is being submitted to you on behalf of Shell Oil Company and ExxonMobil. This proposed plan is intended to comply with the terms of DEQ Order No. ECSR-NWR-01-11.

Please call me at (503)768-5121 if you have any questions or comments.

Sincerely,  
***EnviroLogic Resources, Inc.***

Thomas J. Calabrese, RG, CWRE  
Principal/Hydrogeologist  
Project Manager  
cc: Distribution list attached

Ms. Anna Coates  
January 12, 2004  
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**ASTORIA AREA-WIDE PETROLEUM SITE  
Distribution List**

- 1 Anna Coates, DEQ Project Manager, Site Response
  - 1 Mike Lilly, Attorney for Port of Astoria
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  - 1 Rick Glick, Davis Wright Tremaine, Attorney for Shell Oil Company
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  - 1 Donna LaCombe, Tetra Tech EM, Inc., Consultant for Qwest Communications International
  - 1 Anita W. Lovely, Lovely Consulting, Inc., Consultant for Exxon Mobil Corporation
-

December 18, 2003

Anchorage

Ms. Anna Coates  
Oregon Department of Environmental Quality – Northwest Region  
2020 SW Fourth Avenue, Suite 400  
Portland, Oregon 97201

Boston

**Re: Historical Shell/Niemi/Mobil Petroleum Pipelines Investigation and  
Decommissioning Work Plan  
Addendum To RI/FS and IRAM Development Work Plan Phase 1  
Astoria Area-Wide Petroleum Site  
Astoria, Oregon  
ECSI No. 2277, Order ECSR-NWR-01-11  
15227**

Denver

Edmonds

Dear Ms. Coates:

This letter presents a proposed scope of work for investigating the condition of the historical Shell/Mobil/Niemi petroleum pipelines located at the Port of Astoria, Astoria, Oregon (Figures 1 and 2). The purpose of these activities is to further assess soil conditions adjacent to the historical pipelines, evaluate the current condition of the remaining sections of the pipelines, and decommission the pipelines if warranted. The proposed activities will include soil sampling and analyses, exposing and accessing the pipelines at several locations, inspecting the pipelines, removing any product (if present) from the pipelines, decommissioning in place the pipelines if warranted, and preparing a report documenting the field activities and results.

Eureka

Jersey City

The planned work will be conducted with Oregon Department of Environmental Quality (DEQ) oversight under DEQ Order No. ECSR-NWR-01-11 (Order). The implementation of this work plan is intended satisfy task requirements related to the historical petroleum product pipelines pursuant to Attachment A, Sections III.5 and III.7 of the Order. As you are aware, although the requirement in the Order to investigate the historical pipelines is specific as to Shell Oil Company (Shell) and Niemi Oil Company (Niemi), ExxonMobil has also voluntarily agreed to participate in this investigation as a result of its historical operations at the Port of Astoria.

Long Beach

Portland



## **BACKGROUND**

The following background information is based on reviewing a 1927 utility map, historical aerial and site photographs, geophysical survey data collected as part of the Phase I remedial investigation, and observations during several site visits. Additional site history and other background information is presented in the RI/FS and IRAM Development Work Plan, Phase I, Remedial Investigation/Feasibility Study, Astoria Area-Wide Petroleum Site, Astoria, Oregon, dated July 15, 2002, (Phase I Work Plan) and subsequent documents related to the Astoria Area-Wide Petroleum Site investigation.

**Historical Offloading Pipelines Operated from the Mid 1920s to Early 1970s.** The historical petroleum product pipelines are 6-inch-diameter pipelines that were used from the mid 1920s to about 1972 to offload diesel and/or gasoline product from barges or ships docked at Pier 2/Slip1 to the Shell or Mobil (formerly General Petroleum Corp.) bulk plants. The co-operated or "shared" portion of the pipeline extended from the offload point located on Pier 2 about 800 feet from the head of Slip 1 to a vault located about 50 feet east of the existing Port of Astoria office building. The vault was reportedly equipped with a "T" junction and a pair of gate valves connected to separate 6-inch-diameter pipelines that supplied the Shell and Mobil bulk plants. The pipeline configuration (based on the 1927 utility map and geophysical survey data) and location of the gate valve vault are shown on Figures 2 and 3.

**Marine Filling Stations Operated from the Mid 1920s to 1950s.** Shell operated a marine filling station located at the head of Slip 2 from about the mid 1920s to the mid 1950s. Diesel and/or gasoline product was transferred from the Shell Bulk plant to the filling dock by two 3-inch-diameter pipelines. Mobil also operated a marine filling station in Slip 2 that was supplied by one or more 3-inch-diameter pipelines that extended from the Mobil bulk plant to the marine filling station. Based on historical aerial photographs and Sanborn maps, the marine filling stations ceased operations and filling equipment was removed from the docks in the mid to late 1950s. The approximate location of the historical marine filling stations and product supply pipelines are shown on Figures 2 and 3.

**Geophysical Survey Conducted in 2002.** A geophysical survey was performed at the site in the fall of 2002 to identify/verify and mark the location and extent of the historical petroleum pipeline network at the site. The survey activities and results are presented in the Technical Memorandum, Geophysical Investigation, Remedial Investigation/Feasibility Study, Astoria Area-Wide Petroleum Site, Astoria, Oregon. The traces of the identified pipeline network identified by the survey are shown as solid lines on Figure 2. The survey suggested that portions of the pipelines have been removed from the site (indicated by dashed lines on



Figures 2 and 3). Specifically, the survey suggests that portions of the 6-inch-diameter pipeline beneath Pier 2 have been removed (see below), the 3-inch-diameter pipelines that supplied the historical marine filling docks could not be traced north of the Port's Maintenance building, and the Shell portion of the 6-inch-diameter pipeline and the two 3-inch pipelines appear to terminate beneath the middle of Portway prior to entering the former Shell bulk plant.

**Shell Conducted Limited Pipeline Inspection in 2002.** In October 2002, Hart Crowser reviewed historical site plans, the geophysical survey data, and conducted a site inspection to identify and inspect the historical pipelines where accessible. A metal hatch on Pier 2 located near Outfall No. 4 allowed access beneath the pier in this area and a 6-inch diameter steel pipe was observed beneath Pier 2 running parallel to Slip 1 about 50 feet landward of Outfall No. 4 (Figure 2). The pipe was attached to the bottom of the pier dock with metal brackets. Inspection of the pipeline in both directions from the access point was conducted, and Hart Crowser observed that the pipeline was truncated about 25 feet from the access point in each direction (i.e., the length of remaining piping in this area is about 50 feet). Product or product residue was not observed in the truncated section of pipe. Staining or product residue was not observed beneath the exposed section of pipe. Another access hatch on Pier 2 located about 100 feet seaward of Outfall No. 4, near the receiving terminus of the historical product pipeline, allowed access beneath Pier 2 in this area. There were no remaining sections of the 6-inch-diameter pipe in the area seaward of Outfall No. 4 near the historical terminus of the pipeline.

The bank at the end of Slip 2 in the area of the historical marine filling station dock was also inspected for evidence of piping. Two large (10- to 12-inch-diameter) corrugated steel pipes were noted along the bank at the termini locations (as shown on the 1927 Utility Plan) of the historical 3-inch-diameter marine filling station product supply pipelines. Petroleum pipelines are not constructed using corrugated piping; however, the observed corrugated piping may have served as chases for the historical product pipelines. Product or product residue were not observed in the corrugated pipes. Attempts to trace these pipes landward using a magnetic induction locator were not successful (the geophysical survey contractor also attempted to trace these pipes using magnetic and ground penetrating radar equipment without success). No other indications of the presence of pipelines were observed in the historical marine filling docks area.

## **SCOPE OF WORK**

Our proposed scope of work will include the following tasks:



- Complete and sample push probe explorations;
- Complete and sample test pit excavations;
- Inspect and decommission the pipelines in-place; and
- Prepare a report documenting the field activities and results.

The planned activities are discussed below.

### ***Push Probe Explorations***

Three and possibly four push probe explorations will be completed at the approximate locations shown on Figures 2 and 3 as part of the Phase II soil investigation activities. The purpose of these explorations will be to assess soil conditions adjacent to the historical product pipelines. Two push probe explorations will be completed along the trace of the historical 6-inch diameter product off-loading pipeline: one exploration will be located on the land portion of Pier 2 about 200 feet landward of Outfall No. 4 and one exploration is located about 50 feet north of the Port office. The third planned push probe exploration will be completed west of the Port Maintenance building in the area of the former 3-inch product pipelines that supplied the historical marine filling stations. A fourth push probe exploration will be completed at the EX-5 test pit excavation location only if a test pit is not completed at this location (please refer to the Test Pit Excavation discussion presented below).

A licensed driller will complete the explorations in general accordance with procedures presented in the Phase I Work Plan. The depth of the historical pipelines is estimated to be about 3 to 5 feet below existing grade. Each exploration will be advanced to a depth of 6 feet, and continuous soil samples will be collected to assess soil conditions adjacent to and below the likely depth of the pipelines. Groundwater is not expected to be encountered in the explorations. Soil samples will be handled, described, and field screened using procedures presented in the Phase I Work Plan. At least one soil sample from each exploration, based on field screening and to provide a range of coverage, will be submitted for chemical analyses. Additional samples may be retained for chemical analyses based visual observations and field screening. Each exploration will be abandoned after soil sampling activities are completed in accordance with procedures presented in the Phase I Work Plan.

**Chemical Analyses.** Soil samples submitted for chemical analyses that exhibit field indications of the presence of petroleum hydrocarbons will be analyzed for gasoline and diesel range petroleum hydrocarbons by Northwest Methods NWTPH-Gx and NWTPH-Dx.



Samples will be analyzed and evaluated in accordance with the Quality Assurance Project Plan included in the Phase 1 Work Plan. Samples that do not exhibit field indications of the presence of petroleum hydrocarbons will be analyzed for petroleum hydrocarbon identification by Northwest Method NWTPH-HCID. If petroleum hydrocarbons are detected in the samples, follow-up quantification analyses by NWTPH-Dx and/or NWTPH-Gx will be performed as appropriate.

Samples with reportable quantities of total petroleum hydrocarbons (TPH) will be analyzed for additional petroleum related compounds. Samples containing diesel range petroleum hydrocarbons (as TPH-Dx) will be analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8021B; and polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270-SIM. Samples containing gasoline range petroleum hydrocarbons (as TPH-Gx) will be analyzed for DEQ Risk-Based Decision Making (RBDM) gasoline constituents (BTEX, methyl t-butyl ether [MTBE], naphthalene, iso-propylbenzene, n-propylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,2-dibromoethane [EDB], and 1,2-dichloroethane [EDC]) by EPA Method 8260B, and total lead by EPA 6000/7000 Series Methods.

### ***Test Pit Excavations***

Up to five test pit excavations (designated EX-1 through EX-5) will be completed at the locations shown on Figures 2 and 3. The purpose of these excavations is to expose the pipelines at junctions, elbows, and current inland termini; assess the condition of the pipelines at these points; and assess soil conditions in these areas. Test pit excavations will be performed in general accordance with procedures presented in the Phase I Work Plan.

Excavation EX-1 will be completed at the "T" gate valve junction of the historical 6-inch pipeline from Pier 2 and the two 6-inch pipelines that formerly transferred product from the Pier 2 pipeline to the former Shell and Mobil bulk plants (Figure 3). Excavation EX-2 will be located within Portway in front of the former Mobil bulk plant near the anticipated terminus of the 6-inch Mobil pipeline, and excavation EX-3 will be located at the current terminus (based on the geophysical survey) of the 6-inch Shell pipeline within Portway in front of the former Shell bulk plant. The three excavations are also expected to expose the 3-inch product pipelines that supplied the historical marine filling stations. Excavation EX-4 will be located along the historical Mobil 3-inch marine station supply pipeline at an elbow joint located south of the Port Maintenance building. Excavation EX-5 will be located along the historical 6-inch pipeline at an elbow joint located on the land portion of Pier 2 about 400 feet northwest of Portway.



Each excavation will be completed to a depth sufficient to expose the undersides of the pipelines. Groundwater is not expected to be encountered in the excavations. The excavated soil will be placed on the asphalt surface adjacent to the test pit. Following the completion of the inspection, sampling, and (if necessary) decommissioning activities, each test pit will be backfilled with the excavated material in reverse order (i.e., last out, first in), compacted, and surfaced with asphalt concrete.

Soil conditions in the test pit excavation will be noted and representative soil samples will be collected from beneath the exposed pipelines, field screened, and submitted for NWTPH-Dx and TPH-Gx analyses. Soil samples will be handled, described, and field screened using procedures presented in the Phase I Work Plan. Samples with reportable quantities of TPH will be analyzed for additional petroleum related compounds as described above.

Excavation EX-1 will be completed first and the exposed pipeline and "T" fitting (or gate valves) will be inspected as described below. If the inspection indicates the pipelines were previously decommissioned in-place by grouting or capping, the remaining excavations will not be completed. Sufficient soil sampling data have been (or will be) obtained as part of the Phase I and Phase II soil investigation activities to adequately assess soil conditions in the areas of the planned test pit excavations.

### ***Pipeline Inspections and In-Place Decommissionings***

The exposed pipelines will be visually inspected to assess the general condition and integrity of the exposed section of pipe. All indications of historical decommissioning of the pipelines (e.g., pipelines cut and capped, lines grouted in place, etc.), if any, will be documented and photographed. If the pipelines have been previously decommissioned in-place by grouting or other means, the excavation will be backfilled with excavated soil, compacted, and surfaced with asphalt concrete.

If there are no indications that the pipelines have previously been decommissioned, each exposed pipeline will be cold tapped and any remaining product in the lines will be removed using a vacuum truck. Sorbent pads and buckets will be placed beneath each line prior to tapping to contain and prevent the discharge of product, if present, to the underlying soils. Following product removal (or if there is no indication of product in the pipe after tapping), each pipe will be cold cut and the "T" fittings (or gate valves) will be removed to allow access for inspection of the inside of the pipe. The inside condition of the accessible portions of the pipe will be noted and any remaining product will be removed using a vacuum truck. Plugs will be set in each pipe at each excavation location about 10 feet from the exposed ends and Portland cement based grout will then be pressured pumped into the



pipelines to seal the ends of the lines. Each excavation will then be backfilled with the removed material, compacted, and surfaced with asphalt concrete.

### ***Reporting***

A report will be prepared following the completion of the activities described above and the receipt of analytical data. The report will include a discussion of the soil sampling activities and analytical results and will document the pipeline inspection, decommissioning, and site restoration activities. Analytical laboratory reports, exploration and test pit logs, and photographs will be included in the report. The report will be prepared by Shell and ExxonMobil and submitted to the DEQ by EnviroLogic Resources, Inc. on behalf of Shell and ExxonMobil.

### ***Schedule***

We will schedule the field activities described above as soon as practicable following DEQ review and concurrence with this work plan. We estimate the field activities will take up to one week to complete. Chemical results will be available two to three weeks following the completion of the field activities. The report will be submitted to the DEQ one month following the receipt of analytical results.

Please contact the undersigned if you have questions regarding this work plan.

Sincerely,

**HART CROWSER, INC.**



**LEON LAHIERE, R.G.**  
Associate



Oregon Department of Environmental Quality  
December 18, 2003

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Attachments:

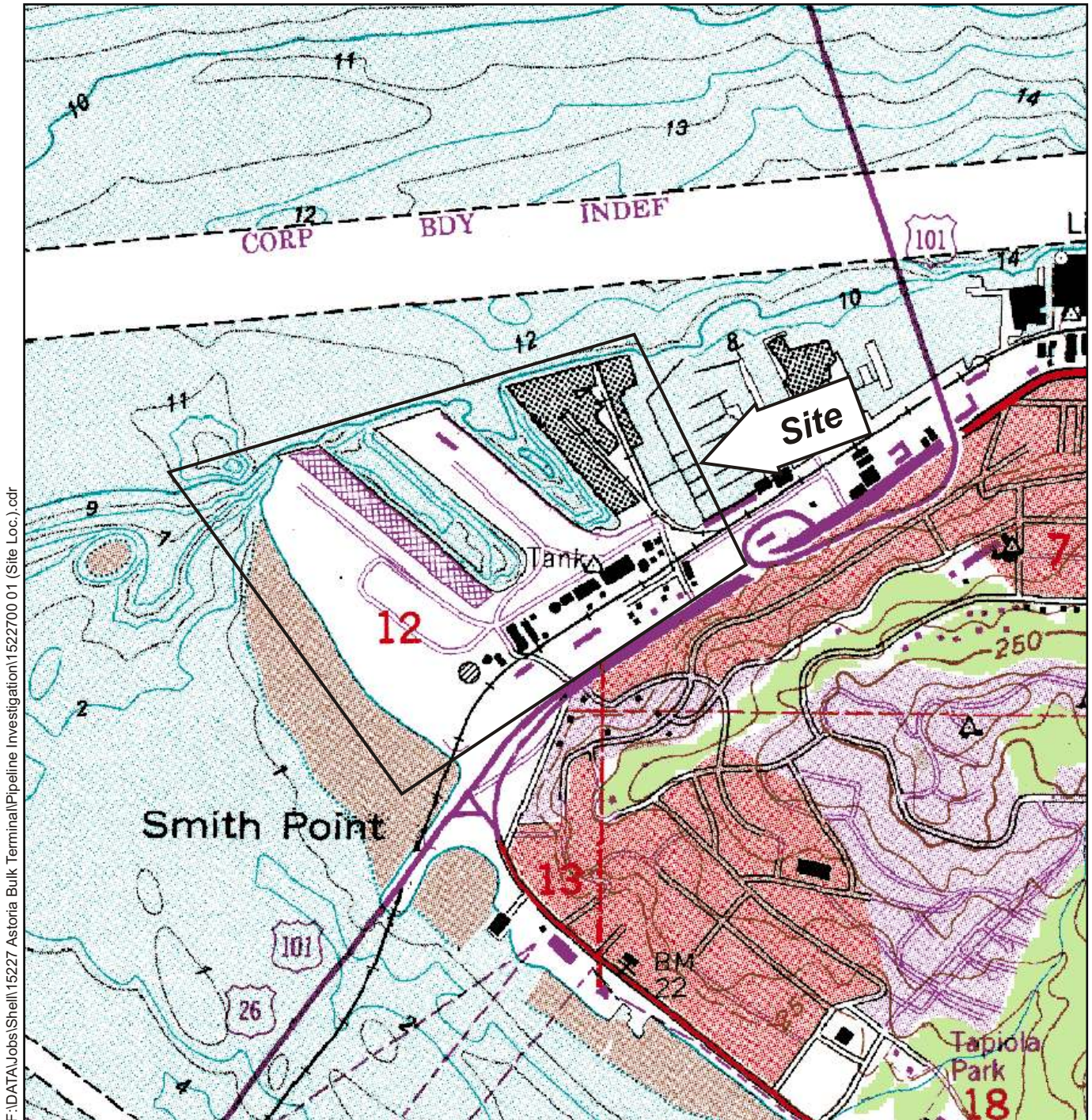
Figure 1 - Site Location Plan

Figure 2 - Proposed Excavation and Push Probe Exploration Locations: Overview

Figure 3 - Proposed Excavation and Push Probe Exploration Locations: Portway and Former  
Marine Filling Station Areas

cc: Ed Platt III, Shell Oil Company  
Anita Lovely, ExxonMobil, c/o Lovely Consulting, Inc.  
Rick Glick, Davis Wright Tremaine  
Tom Calabrese, EnviroLogic Resources, Inc.

**Site Location Map**  
**Shell/Niemi/ExxonMobil Pipeline Investigation**  
**Astoria Areawide Petroleum Site, Astoria, Oregon**



F:\DATA\Jobs\Shell\15227 Astoria Bulk Terminal\Pipeline Investigation\1522700 01 (Site Loc.) .cdr

**Note:** Base map prepared from the USGS 7.5-minute quadrangle of Astoria, OR-WA, photorevised 1984.



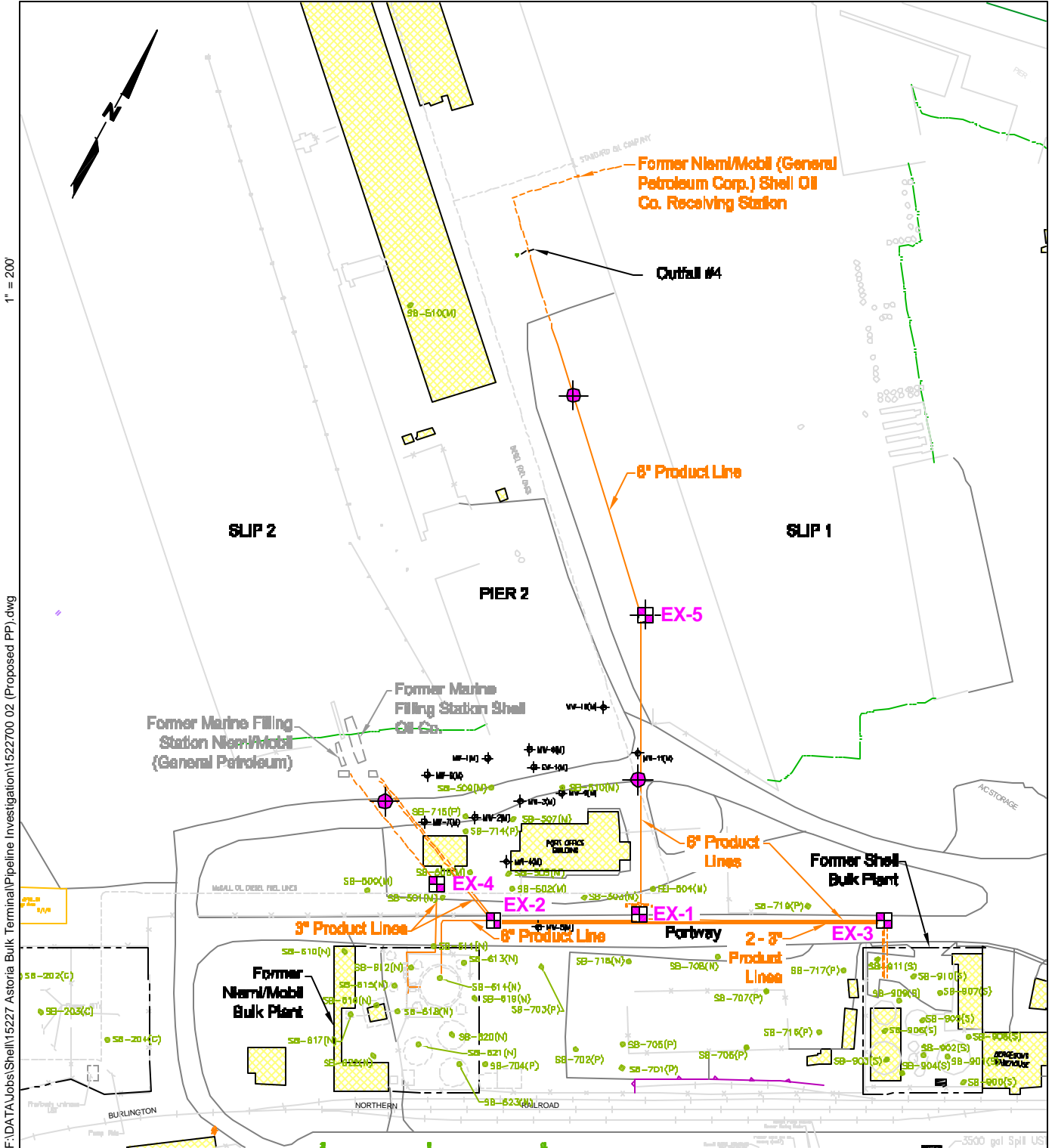
Scale in Feet  
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**HARTCROWSER**  
 15227-00 10/03  
 Figure 1

# Proposed Excavation and Push Probe Exploration Locations: Overview

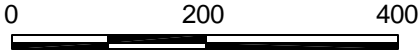
## Shell/Niemi/ExxonMobil Pipeline Investigation

### Astoria Areawide Petroleum Site, Astoria, Oregon






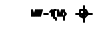
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**Note:** Base map prepared from AutoCAD file provided by EnviroLogic Resources, Inc.



Scale in Feet

**Legend:**

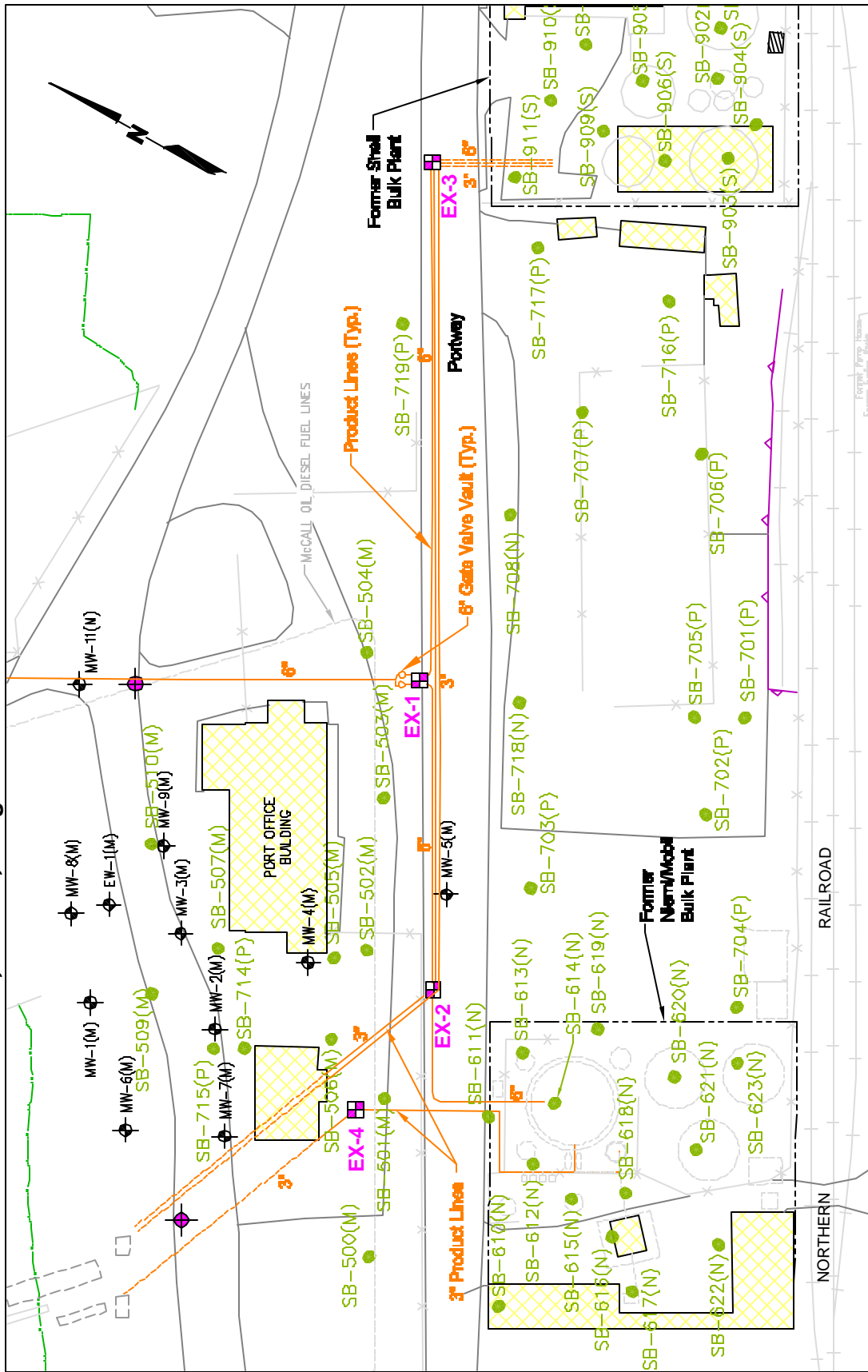
-  Proposed Push Probe Exploration
-  EX-5 Proposed Test Pit Location and Number
-  SB-706(P) Soil Exploration Location and Number
-  MW-104 Monitoring Well Location and Number



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Figure 2

# Proposed Excavation and Push Probe Locations: Portway and Former Marine Filling Station Areas Shell/Niemi/ExxonMobil Pipeline Investigation Astoria Areawide Petroleum Site, Astoria, Oregon



Note: Base map prepared from AutoCAD file provided by Envirologic Resources, Inc.

- Legend:**
- EX-1 Proposed Test Pit Excavation and Number
  - Proposed Push Probe Exploration
  - SB-705(P) Soil Exploration Location and Number
  - MW-1(M) Monitoring Well Location and Number

