

MEMORANDUM

To: Sean Sheldrake, U.S. Environmental Protection Agency
Date: July 18, 2013

From: Ryan Barth, Anchor QEA, LLC
Joy Dunay, Anchor QEA, LLC
Project: 000029-02.25

Cc: Robert Wyatt, NW Natural
Patty Dost, Pearl Legal Group
Carl Stivers, Anchor QEA, LLC

Re: Study Design for Sediment Characterization Adjacent to U.S. Moorings Site
Required by EPA – Addendum 1 to the Project Area Identification Report Quality Assurance Project Plan

This memorandum provides the study design for the collection of five sediment cores adjacent to the U.S. Government Moorings (U.S. Moorings) property and NW Natural Gasco Sediments Site. This study will support investigations regarding the potential presence of substantial product as defined in Remedial Action Objective (RAO) 1 of the Gasco Sediment Site Statement of Work (SOW; EPA 2009) attached to the Administrative Settlement Agreement and Order on Consent for Removal Action (Consent Order; CERCLA Docket No. 10-2009-0255).

The U.S. Environmental Protection Agency's (EPA's) letter dated May 22, 2013 (with further clarification provided on June 30, 2013) provided NW Natural with two options regarding the potential presence of substantial product adjacent to the U.S. Moorings site: 1) assume that substantial product is present at the locations indicated in EPA's November 29, 2012 review of data presented by the U.S. Army Corps of Engineers (USACE; EPA 2012) and incorporate this information into the Gasco Sediments Site Engineering Evaluation/Cost Analysis (EE/CA); or 2) conduct additional sampling to further evaluate the potential presence of substantial product (EPA 2013a, 2013b). Per NW Natural's letter to EPA dated May 15, 2013, NW Natural continues to disagree that the available core log information provided by USACE meets the definition of substantial product in the Gasco Sediments Site SOW (NW Natural 2013). Therefore, NW Natural and Siltronic are opting to conduct additional sampling. The remainder of this memo includes the methods and procedures for the collection of sediment cores/samples, reporting requirements, and the proposed schedule. Other project elements, including project management and responsibilities, sample handling, potential chemical testing, and quality

assurance requirements will be in compliance with the EPA-approved Project Area Identification Report (AIR) Work Plan (Anchor QEA 2010a).

BACKGROUND

NW Natural and Siltronic Corporation (Siltronic) submitted a Draft EE/CA to EPA in May 2012 for the Gasco Sediments Site (Anchor QEA 2012a). The Draft EE/CA evaluated the available data using the multiple lines of evidence (LOE) identified in the SOW attached to the Administrative Settlement Agreement and Order on Consent for Removal Action (Consent Order; CERCLA Docket No. 10-2009-0255). RAO 1 in the SOW includes the following site-specific LOE regarding the “presence of substantial product”. The SOW states:

RAO 1: Removal of sediments containing substantial amounts of product (e.g., solid “tar” and/or NAPL) that may serve as potential future source of risk material, unless it can be shown that the costs of such removal are clearly disproportionate to the degree of risk reduction to be attained through physical removal as compared to other remedial options for the same material. “Substantial” is defined in Section 3.6.2.1 of this SOW.

Section 3.6.2.1 of the SOW defines “substantial presence of product” as those sediments that meet the following specific visual criteria:

- **“Criterion 1:** Bands of product, layers of product, “saturated” sediments, “stained” sediments, and/or seams of product that are greater than 2 inches.
- **Criterion 2:** Any layer or seam of product, regardless of thickness, that is clearly defined as liquid dense non-aqueous phase liquid (DNAPL) that is also mobile (i.e., “oozes” or “drips” out of the core during core observations).

Section 3.6.2.1 of the SOW also identifies the following modifying factors to these criteria:

- If the top 5 feet of a core has no substantial product under Criterion 1, then deeper product should be judged as “not substantial,” even if relatively thick layers of product exist at greater depths. An additional Criterion 3 will consider whether the 5 feet of overlying relatively clean material includes any sediment that would be expected to be removed as part of USACE maintenance dredging in the navigation channel. If so, the 5-foot depth requirement should be judged from the depth to which maintenance dredging would occur.
-

- If there are any seams of mobile liquid DNAPL (not solid or semisolid tar) per Criterion 2, then this is substantial product regardless of depth and the characteristics of overlying sediments.

This study will conduct additional coring to further evaluate the presence of substantial product in the five core locations identified in EPA's contractor letter dated November 29, 2012.

SAMPLING DESIGN

EPA's contractor identified a total of three locations (i.e., 50-BG, GS-01, and SDDA-18) that, based on observations made by the USACE, met the criteria for substantial product (Attachment 1). The contractor also identified two additional core locations (i.e., 20-BF and C528) that, based on observations made by the USACE, met the criteria for substantial product based on the potential future maintenance dredging depths identified in the EPA letter dated August 12, 2013. The primary objective of this sampling effort is to collect a single core co-located at each of these locations to confirm or refute the presence of substantial product through visual observations. Figure 1 presents the proposed core locations. Table 1 presents the study design including location coordinates, rationale, and purpose.

CORE COLLECTION AND PROCESSING PROCEDURES

Cores will be collected using a vibracorer deployed from a research vessel. The core collection procedures will follow the Quality Assurance Project Plan and Field Sampling Plan (QAPP/FSP; Anchor QEA 2010b) with the following exceptions:

- 14-foot core tubes will be used and driven up to 13 feet penetration.
 - Cores with recoveries greater than or equal to 65 percent of the length of core penetration will be accepted. Based on previous coring efforts in the vicinity of the proposed locations, 75 percent recovery may be difficult to achieve in some areas requiring the sampling locations to be re-located. Because co-locating target locations is a priority for this sampling design, slightly lower recoveries are considered more acceptable than collecting material from a different location.
 - If the core recovery is less than 65 percent, a maximum three attempts will be made at each location. The core with the greatest recovery will be kept and processed regardless of percent recovery.
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Cores will be processed (cut open and logged) on the NW Natural property in accordance with the procedures in the QAPP/FSP (Anchor QEA 2010b) and superseded by the procedures in this memorandum. For each core, the determination of “presence of substantial product” will be conducted during core logging based on visual inspection using the tiered decision process shown in Figure 2. This decision process includes a stepwise assessment of substantial product using the SOW substantial product criteria and modifying factors. The use of “stained sediments” in the SOW definition will not be interpreted simply as discoloration or banding, but rather sediments that exhibit staining due to saturation with liquid product (Anchor QEA 2012b).

If both Anchor QEA and EPA oversight either 1) agree that substantial product is present; or 2) disagree that substantial product is present within a core, the impacted (or debatable) sediment from the core will be collected, homogenized, and archived for potential future chemical analysis. If both Anchor QEA and EPA agree that substantial product is not present within a core, no samples will be collected from that core. If only a thin seam of substantial product is present (i.e., dense non-aqueous phase liquid [DNAPL]), a small volume of non-impacted sediment (above and below the DNAPL seam) may be included in the sample to assure enough volume (16-ounce jar) is collected for potential future analysis. Archived samples will be stored frozen at ARI laboratory in Tukwila, Washington. Any analysis conducted will follow the methods and quality control protocols in the QAPP/FSP (Anchor QEA 2010b).

Photographs will be taken along the length of the core, prior to disturbance, to generate a consecutive core overview. Areas with potential substantial product will be photographed at a higher resolution during logging to capture the documented visual observations to the best extent possible.

Field quality control samples will be collected only if field samples are collected, and will include an equipment field wipe and field duplicate (pending sample volume). The field wipe will be a clean filter paper with a pre-measured surface area that is used to swab all processing equipment that comes in contact with the sediment sample. This wipe will be archived at the laboratory for potential future analysis. Field duplicates will only be collected if there is sufficient material to fill two 16-ounce jars from the sampled depth interval.

Each sample will be assigned a unique alphanumeric identifier (ID) by the project description (USM), station ID, sample depth in inches, and collection date in YYYYMMDD format. For

example, the sample identification nomenclature for a sample collected on August 15, 2013 at station 20-BF from 25 to 27 inches is USM-20-BF-25-27-130815. Field equipment wipes will be called EB-YYMMDD. Field duplicates will be identified by adding FD to the end of the sample ID.

DATA REPORTING

All samples will be archived until EPA and NW Natural have evaluated the findings of the field reported visual observations. The field observations will be submitted to EPA in a brief data memorandum. At a minimum, the data memorandum will identify the presence or absence of substantial product in each of the collected cores, and include photographs, field collection forms, and core logs. The memorandum will be submitted to EPA within 60 days of the completion of field work. After evaluating the field observations, EPA and NW Natural will collectively discuss and determine what chemical analysis, if any, should be run on the archived samples. NW Natural and EPA will also determine if the analysis should be performed at that time, or postponed until final EPA comments on the EE/CA have been provided. Tabulated data summaries and data validation findings will be submitted to EPA within 60 days of receipt of the data validation report for any archived samples that are submitted for chemical analysis.

INVESTIGATION SCHEDULE

Core collection, including mobilization, is anticipated to take up to three consecutive days and occur between August 1 and October 31, 2013 following EPA approval of this memorandum. Anchor QEA will coordinate access to the core locations with USACE. Additionally, prior to field sampling Anchor QEA will schedule a call with EPA and its contractor(s) to collectively review the project-specific definition of substantial product. The shared goal of this call is to minimize any possible confusion or uncertainty in the field by core logging personnel during visual observations of the presence/absence of substantial product.

REFERENCES

- Anchor QEA, 2010a. *Final Work Plan: Gasco Sediments Cleanup Action*. Prepared for NW Natural, under Docket No. CERCLA 10-2009-0255. Portland, Oregon. January 2010.
- Anchor QEA, 2010b. *Data Gaps QAPP/FSP (Appendix A to the Project Area Identification Report), Gasco Sediments Cleanup Action*. Prepared by Anchor QEA for NW Natural. July 2010.
- Anchor QEA, 2012a. *Draft Engineering Evaluation/Cost Analysis, Gasco Sediments Cleanup Site*. Prepared by Anchor QEA for NW Natural. May 2012.
- Anchor QEA, 2012 b. Letter to: Sean Sheldrake, EPA. Regarding: NW Natural Review of USACE Memorandum Dated July 27, 2012, Regarding Presence of Substantial Product at U.S. Moorings Site. September 24, 2012.
- EPA (U.S. Environmental Protection Agency), 2009. *Gasco Sediment Site Statement of Work*.
- EPA, 2012. Letter to: Bob Wyatt, NW Natural, and Tom McCue, Siltronic Corporation. Regarding: Substantial Product Evaluation at U.S. Moorings Site. Gasco Sediments Site. November 29, 2012.
- EPA, 2013a. Letter to: Bob Wyatt, NW Natural, and Myron Burr, Siltronic Corporation. Regarding: Supplemental Investigation Work Plan at U.S. Moorings Site. May 22, 2013.
- EPA, 2013b. Letter to: Bob Wyatt, NW Natural, and Myron Burr, Siltronic Corporation. Regarding: Clarification regarding Supplemental Investigation Work Plan at U.S. Moorings Site. June 30, 2013.
- NW Natural, 2013. Letter to: Sean Sheldrake, EPA. Regarding: Evaluations at U.S. Moorings Sediments Area, Gasco Sediments Site. May 15, 2013.
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TABLES

**Table 1
Sampling Design**

Location ID	X coordinates ¹	Y Coordinates ¹	Elevation in feet (NAVD88)	Elevation in feet (CRD)	Maintenance Dredge Area	Maintenance Dredge Depth in feet (CRD) ^{2,3}	Rationale ⁴	Collection Method	Purpose ⁵
20-BF	7622900.723	706328.531	-8.22	-13.22	B	-24	SP noted at: 113-116 inches	Vibracore	Determine the presence or absence of substantial product and archive samples for potential chemical testing
SDDA18	7623004.354	706321.799	-15.93	-20.93	A	-36	SP noted at: 53-56 inches		
C528	7622856.000	706193.000	-8.06	-13.06	B	-24	SP noted at: 61 inches (no interval or end depth noted)		
50-BG	7623183.513	706143.219	1.98	-3.02	--	--	SP noted at: 55-56 inches, 101-103 inches, 124-125 inches, and 138-139 inches		
GS-01	7623088.000	706052.000	-1.75	-6.75	--	--	SP noted at: 0-2 feet		

Notes:

1 Coordinates are provided in northing and easting in North American Datum 1983 (NAD83) State Plane North, International Feet

2 Based on current surface elevations and assumed dredge elevations, locations 20-BF, SDDA18, and C528 are precluded from the 5-foot modifying criteria

3 Assumed dredge depths are based on the USACE letter dated July 27, 2012

4 Potential substantial product determinations are based on the CDM Smith review of USACE observations, as described in the CDM Smith memorandum dated October 26, 2012

5 Samples will be only be collected and archived from core depth intervals that Anchor QEA and the EPA contractor either agree or disagree contain substantial product

NAVD88= North American Vertical Datum of 1988

CRD= Columbia River Datum

SP= CDM Smith identified potential presence of substantial product based on USACE core log observations

FIGURES

Q:\Jobs\000029-02_Gasco\Maps\US_Moorings_Supp\US_Moorings_Proposed_Inves_Locs.mxd nkochie 6/20/2013 10:05:04 AM



- Proposed Sample Location
- ▭ U.S. Moorings Maintenance Dredge Areas
- ⋯ Navigation Channel

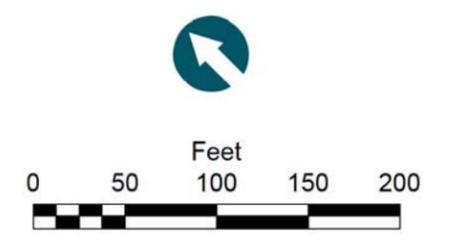
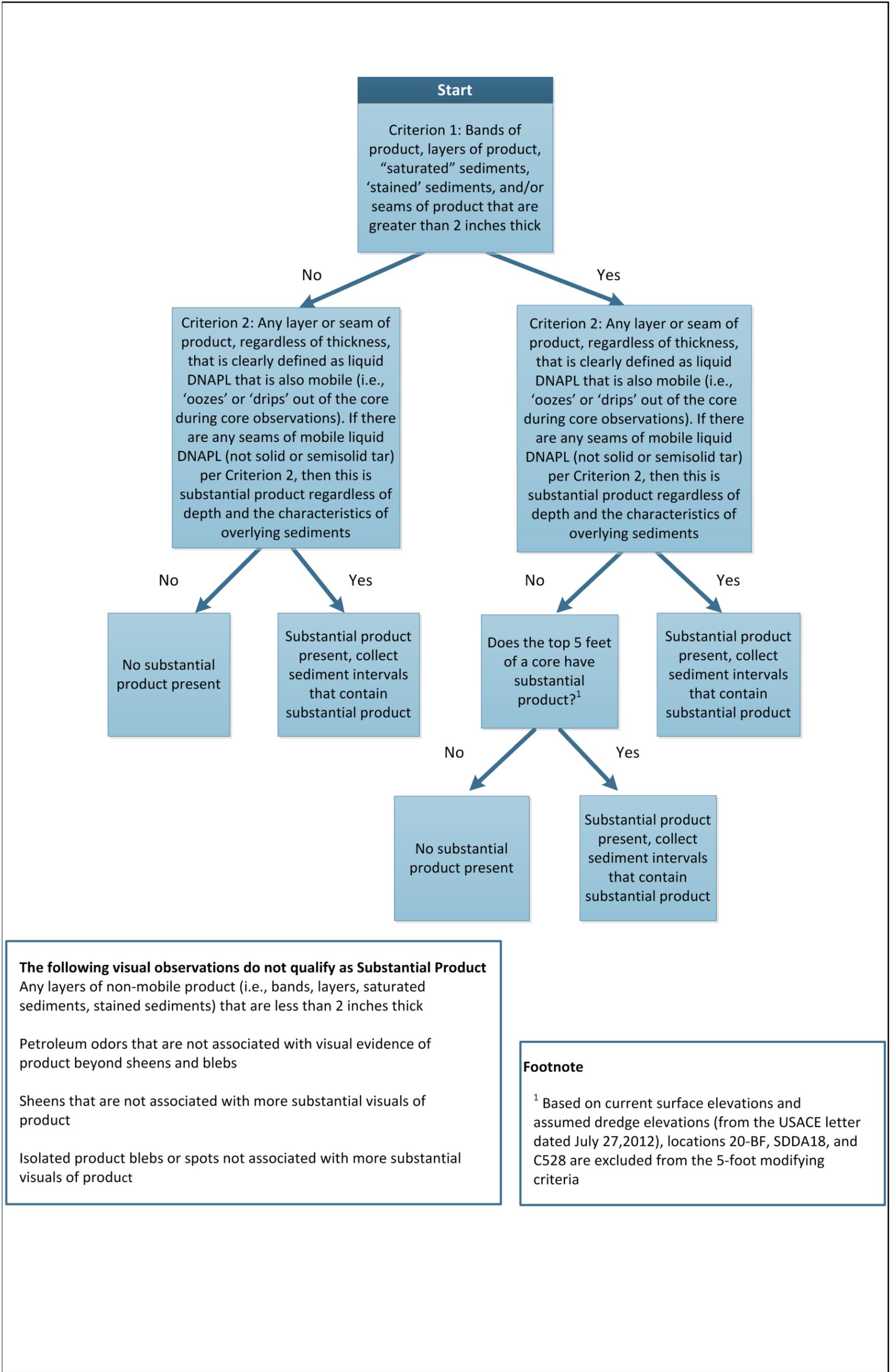


Figure 1
Proposed Sample Locations
Sediment Characterization Adjacent to U.S. Moorings Site
Gasco Sediments Cleanup Action



The following visual observations do not qualify as Substantial Product
 Any layers of non-mobile product (i.e., bands, layers, saturated sediments, stained sediments) that are less than 2 inches thick

Petroleum odors that are not associated with visual evidence of product beyond sheens and blebs

Sheens that are not associated with more substantial visuals of product

Isolated product blebs or spots not associated with more substantial visuals of product

Footnote

¹ Based on current surface elevations and assumed dredge elevations (from the USACE letter dated July 27, 2012), locations 20-BF, SDDA18, and C528 are excluded from the 5-foot modifying criteria

ATTACHMENT 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

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

OFFICE OF
ENVIRONMENTAL CLEANUP

November 29, 2012

Mr. Bob Wyatt
NW Natural
220 NW 2nd Avenue
Portland OR 97209

sent via email only

Mr. Tom McCue
Siltronic Corporation
7200 NW Front Avenue, M/S 20
Portland, Oregon 97210-3676

RE: Substantial Product Evaluation at U.S. Moorings Site
Gasco Sediments Site

Dear Sirs:

Attached is an evaluation of the presence of substantial product in the U.S. Government Moorings (U.S. Moorings) off shore area prepared by EPA's contractor. This effort was initiated as a result of a substantial product evaluation submitted by the U.S. Army Corps of Engineers (USACE) to the EPA in a letter dated August 14, 2012, and a rebuttal letter submitted by Anchor QEA, LLC (Anchor QEA), on behalf of NW Natural, to EPA on September 24, 2012. The USACE's evaluation challenged the conclusion provided in the Gasco Sediments Site draft *Engineering Evaluation/Cost Estimate*¹ (EE/CA) that substantial product is not present in the U.S. Moorings offshore area.

Identification of substantial presence of product is critical to the evaluation of removal action alternatives in the Gasco draft EE/CA. The Gasco Sediments Site 2009 Administrative Settlement Agreement and Order on Consent for Removal Action (AOC) Statement of Work (SOW) indicates the following with respect to substantial product:

“Areas with substantial presence of product in sediments is a line of evidence related to potential mobility of chemicals in the future, and thus related to risks identified in the BLRA [baseline risk assessment]. Visual observations in sediment cores shall be the primary parameter used for this line of evidence. As noted above, the term “substantial” product is intended to 1) target product that is related to potential future mobility and 2) indicate a preference for removal as defined by RAO #1 [Remedial Action Objective #1].”

RAO #1 is defined in the Gasco 2009 AOC SOW as:

¹ Anchor QEA, LLC. 2012. *Draft Engineering Evaluation/Cost Estimate, Gasco Sediments Cleanup Site*. Prepared for U.S. EPA Region 10 on behalf of NW Natural. May 2012.

“1. Removal of sediments containing substantial amounts of product (e.g., solid “tar“ and/or NAPL) that may serve as potential future source of risk material, unless it can be shown that the costs of such removal are clearly disproportionate to the degree of risk reduction to be attained through physical removal as compared to other remedial options for the same material. “Substantial” is defined in Section 3.6.2.1 of this SOW.”

USACE’s substantial product evaluation included a review of sediment core logs and photographs collected during the U.S. Moorings Remedial Investigation (RI) in 2008 and a supplemental investigation conducted by USACE in 2008/2009. USACE identified 9 core locations within the U.S. Moorings offshore area that they believe meet the definition of substantial product as defined in the Gasco Sediments Site 2009 AOC SOW. Anchor QEA’s September 24, 2012 response to the August 14, 2012 USACE letter concluded that none of the locations identified by USACE contained substantial product as defined in the SOW, except for possibly one core location, due to “incorrectly applied assumptions coupled with the likely bias in the logging terminology.”

EPA’s contractor reviewed 24 sediment core logs from the U.S. Moorings offshore area provided by USACE and Anchor QEA. Based on a review of the logs, three core locations were identified as containing substantial product. Two other locations were identified as containing substantial product based on the depth to which future maintenance dredging is anticipated to occur as described by the USACE in their August 14, 2012 letter.

We are available to discuss re-sampling of the areas identified in the memorandum as containing substantial product if NW Natural does not agree with the conclusions. If NW Natural accepts the conclusions, we could discuss additional future sampling that may be needed to further refine the substantial product areas for remedial design.

Please let me know if you have any questions or concerns at (206) 553-1220 or via email at sheldrake.sean@epa.gov.

Sincerely,



Sean Sheldrake, RPM

Enclosures

Cc:

Kristine Koch, EPA
Chip Humphrey, EPA
Mark Ader, EPA
Dana Bayuk, ODEQ

via email only