# APPENDIX E
## Open Space Restoration

# Anchor QEA Memorandum
# "Response to U.S. Army Corp of Engineers' Request for Additional Information"

ANCHOR QEA

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# MEMORANDUM

| | | | |
|---|---|---|---|
| **To:** | Erin Legge, U.S. Army Corps of Engineers | **Date:** | March 28, 2013 |
| **From:** | Heather Griffin, City of Everett<br>Heather Page, Anchor QEA, LLC | | |
| **Re:** | Kimberly Clark DWO Project (NWS-2000-34)<br>Response to U.S. Army Corps of Engineers' Request for Additional Information | | |

On February 11, 2013, the U.S. Army Corps of Engineers (USACE) sent an email requesting additional information on the proposed Kimberly Clark Deep Water Outfall Project (KCDWO Project; NWS-2000-34). The purpose of this memorandum is to address the emailed questions and additional questions raised during our phone conference on March 14, 2013. The following sections contain the requests from USACE followed by the City of Everett's (City) responses.

## NATIONWIDE PERMIT TYPE

Per our conversation on March 14, 2013, USACE was assuming that the project may qualify as a Nationwide Permit (NWP) 13 for bank stabilization. Based on review of USACE NWP guidance, the City believes that the proposed project qualifies as a NWP 3 for repair and maintenance for the reasons outlined below. Please let us know at your earliest convenience if this is the appropriate interpretation.

1. NWP 3 is applicable for the following types of projects: "repair, rehabilitation, or replacement of any previously authorized, currently serviceable structure, or fill, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized mod." The City is proposing to excavate and fill within the permitted area of the original 2004 project (see Figures 1 and 2 in Attachment 1).
2. NWP 3 also states: "There can be minor modifications to the materials, construction techniques, or safety standards to complete the repair, rehabilitation or replacement." It also authorizes the removal of accumulated sediments and debris and the placement of new or additional riprap to protect the structure. The original beach nourishment

at the site, constructed in 2004, used sandy sediments as the primary fill material. Due to relatively steep slopes in the fill area (greater than 8H:1V [horizontal to vertical]) and high wave energy at the project site, the majority of the sand placed on the site at or below mean higher high water (MHHW) were significantly eroded within 1 month of placement (see Figure 3 of Attachment 1). Based on the past performance of the original beach nourishment project and a coastal engineering and coastal geomorphology evaluation completed for the project area and vicinity by Anchor QEA, beach nourishment proposed for the project will consist of beach gravels ranging from approximately 0.75 inches to 3 inches. This size material has been used successfully for other nearshore parks in the Puget Sound area, including Olympic Sculpture Park. The majority of the material is not expected to be moved off site (i.e., offshore) during storm events, as occurred with the original sand placement.

## CLEARLY DESCRIBE THE ORIGINAL BEACH RESTORATION, PHASE 1 (KIMBERLY CLARK) AND PHASE 2 (CITY OF EVERETT)

### Original Beach Restoration

The site was originally uplands and was part of the Port of Everett (Port) as a laydown yard. It extended from the current northwest corner of the Port's laydown area to the southern portion of the project extent (see Figure 1 in Attachment 1).

The project area and vicinity were excavated in late 2003 to place an offshore outfall for Kimberly Clark (KC) and the City. A temporary trestle was built to aid in the placement of the offshore outfall, which extended from its land connection at the project site to the southwest. In February 2004, following construction of the outfall, the site was re-graded and filled to create a pocket beach. The temporary pier was removed and the shoreline was cut back from a straight shoreline to the curved shoreline shown in Figure 2 in Attachment 1. Immediately after construction, the beach sand began eroding due to impacts from wave action (likely between mean high water [MHW] and MHHW), forming a vertical scarp along the shoreline. A month following construction, the beach sand had eroded to the point that the underlying cobble and larger armor rocks became visible (see Figure 3 in Attachment 1). At present, the majority of the placed sand has eroded from the upper intertidal area and the underlying cobble has spread over the area (see Figure 4 in Attachment 1).

## KCDWO Project Phase 1

Phase 1 consisted of armoring the slope immediately adjacent to Port property (1,500 square feet; see Figure 5 in Attachment 1) above the existing MHHW. In addition to the eroded condition of the beach described above in "Original Beach Restoration," a storm on January 26, 2012, destabilized this area and threatened the slope's stability. Under the terms of their easement with the Port, KC needed to repair the beach as soon as possible, as further erosion may have led to additional slope destabilization throughout the site and possible property damage to Port property on the north side of the slope.

Approximately 300 cubic yards of armor stone (4 feet thick) and 75 cubic yards of filter stone (1 foot thick) were placed to stabilize the slope. To construct the slope, approximately 400 cubic yards of mixed sand/cobble material and armor stones were excavated and disposed of or reused as appropriate. Prior to construction, State Environmental Policy Act and Shoreline Substantial Development Permit Exemptions were obtained from the City of Everett Planning and Community Development. This project was completed in 4 days in December 2012.

## KCDWO Project Phase 2 Overlap with Phase 1

In early 2013, the project transitioned from KC to the City, which is when the City engaged Anchor QEA to complete the permitting process and final design of Phase 2.

Phase 2 consists of adding additional toe protection to portions of the Phase 1 slope above and below MHHW (see revised Sheet 2 of the Joint Aquatic Resource Permit Application [JARPA] Drawings in Attachment 2). See Figure 6 in Attachment 1 for a cross-section of the overlap between Phase 1 and Phase 2. The toe of the slope from Phase 1 will be extended 50 square feet beyond MHHW to the extent required to build a stable rock revetment to stabilize that area. The revetment would also be modified from the 1.5H:1V slope for the Phase 1 construction, to achieve a 2H:1V slope for the final Phase 2 construction. Please see the JARPA submitted to USACE for a complete description of Phase 2 (City of Everett 2012).

## WHO IS THE APPLICANT?

The City of Everett is the applicant. As stated previously, the project transitioned from KC to the City in early 2013. The City then engaged Anchor QEA to continue the permitting process that was started with KC in 2012.

## WHERE IS THE SITE IN RELATION TO A MODEL TOXICS CONTROL ACT (MTCA) CLEAN UP AREA?

As an update to the City's response in JARPA Question 9.i., the project site has no known contaminated sediment. According to the Washington State Department of Ecology (Ecology)/Port, the project is within the Weyerhaeuser Mill A Former Model Toxics Control Act (MTCA) Site, which has known sediment contamination. The nature and extent of contamination has not been defined for this Site and will be determined as part of the Remedial Investigation/Feasibility Study (RI/FS). Please note that there have been no documented exceedances of the cleanup standards within the KCDWO Project area (see figures in Attachment 3).

## WHY IS NO MITIGATION PROPOSED? IS A MITIGATION PLAN FORTHCOMING? WHAT BIOENGINEERING TECHNIQUES WERE CONSIDERED?

No mitigation is proposed because the project was designed to avoid and minimize impacts to waters of the United States. To avoid and minimize impacts, the project is proposed within the permitted area of the 2004 beach restoration project. In addition, placement of beach gravels is restricted to the seaward limits of the original beach enhancement project, which did not place fill below +6 feet to +8 feet mean lower low water (MLLW). This would limit the volume of beach material placed on site. In addition to the limited amount of fill below MHHW, the fill material is conducive to fish habitat (as agreed to by the Washington Department of Fish and Wildlife [WDFW] in the issued Hydraulic Project Approval [HPA] – Control 129073-1#) and will represent native beach conditions. Additionally, no aquatic vegetation will be removed or disturbed.

The HPA issued for the project includes the following conditions, which will be adhered to by the City and their contractor:

- Alteration or disturbance of the bank and vegetation will be limited to that necessary.

- Within 6 months of completion, the banks, including riprap areas, will be revegetated with native or other approved woody species.
- Habitat features will be retained on the beach following construction. These habitat features may be moved during construction if necessary.
- Eighty percent survival rate of planted vegetation after 3 years.

In addition, the City has committed to conducting the work at low tide.

In summary, a compensatory mitigation plan is used to compensate for the unavoidable loss of waters of the United States and to ensure that those losses minimize adverse effects to the aquatic environment. The City is working within the area of a previously permitted fill (NWS-2000-24) and replacing with appropriate sized rock based on a coastal engineering evaluation and in agreement with WDFW for suitable fish habitat. The project is not further impacting, but rather replacing fill to maintain the function of the original beach enhancement project.

Bio-engineering techniques, such as live staking and pre-vegetated mats, were considered as part of the alternatives evaluation for the project. However, the wave energy at the site is too high (waves are large and occur frequently) for the successful implementation of these types of solutions.

## IN ORDER TO QUALIFY FOR THIS NWP YOU MUST SUBMIT THE FOLLOWING INFORMATION AND/OR AN EXPLANATION IF NOT APPLICABLE:

### Need for the work, including the cause of the erosion and the threat posed to structures, infrastructure, and/or public safety

The project area and vicinity were excavated in late 2003 to place an offshore outfall for KC and the City (outfall shown on revised Sheet 2 of the JARPA Drawings in Attachment 2). A temporary trestle was built to aid in the placement of the offshore outfall, which extended from its land connection at the project site to the southwest. In February 2004, following construction of the outfall, the site was re-graded and filled to create a pocket beach. The temporary pier was removed and the shoreline was cut back from a straight shoreline to a curved shoreline. Immediately after construction, the beach sand began eroding due to impacts from storm wave action (as described above in "Original Beach Restoration"), forming a vertical scarp along the shoreline. A month following construction, the beach

sand had eroded to the point that the underlying cobble and larger armor rocks became visible. At present, the majority of the placed sand has been removed from the upper intertidal area and the underlying cobble has spread over the area. The bank immediately adjacent to the project site is eroding; and portions of the existing (pre-Phase 1 repair work) rock armor slope had failed. In addition to upland Port property, upland portions of the park area are also continuing to erode with potential loss of public park space.

The site is exposed to relatively large storm waves from the southwest clockwise to due north (3 to 5 feet); this is due to large fetch distances in these directions and the orientation of the project shoreline. Storm waves are the primary mechanism for erosion at the project site; they transport finer sediments located at upper intertidal (and potentially at lower intertidal) elevations offshore into deeper waters, where they are lost to the nearshore system. In addition, the location of the railroad and Port property just upland of the site limits the backshore area available to support a natural cycle of erosion and recovery at the project site, and consequently there is potential for loss of this Port property if the slope is not repaired.

## Current and expected post-project sediment movement and deposition patterns in and near the project area

The project site is located at the down-drift end of a drift cell (Ecology 2002). The unarmored portion of the shoreline/beach generally faces west, has a curved shape, and lies between the armored railroad berm and culvert outlet for Pigeon Creek No. 1 to the southwest, and the corner of an armored shoreline fronting Port property to the northeast. The shoreline is armored with steep rock slopes to the east and west of the site for at least 300 linear feet. The longshore (littoral) transport along the project reach is from west to east (Ecology 2002). Landslides from upland bluffs and sediment deposited at the mouth of Pigeon Creek No. 1 were likely the historical sources of sediment to the project area. Impoundment by the railroad just upland of the site, and associated culverts on Pigeon Creek No. 1, now limit these sources of sediment to the nearshore area and the project site. The Snohomish River, which empties into Possession Sound approximately 3 miles north of the project site, could be a possible source of finer sediments to the shoreline at intertidal or subtidal elevations. However, in general, there appears to be little natural re-supply of sediment (i.e., silts, sands or gravels) to the project area.

The location of the railroad and Port property just upland of the site limit the backshore area available to support beach function at the project site. Substrate ranges from cobble-sized material to fine sand, with the coarser material generally located in the steeper upper intertidal area and finer material in the relatively flat lower intertidal area. While this is true for most of the drift cell, it is especially apparent at the project site, where larger cobbles and armor stone (in addition to beach sand) were placed on site to stabilize the shoreline as part of the previous beach enhancement project. Once the placed sand eroded (likely spread over the lower intertidal areas), the river cobbles and armor stones became exposed in the upper intertidal areas.

Beach nourishment (placement of beach gravels) is proposed as part of Phase 2 to provide additional shoreline protection to upland areas and provide additional beach area at upper intertidal elevations at the site. The original beach nourishment at the site, constructed in 2004, used sandy sediments as the primary fill material. Due to relatively steep slopes in the fill area (greater than 8H:1V) and high wave energy at the project site, the majority of the sand placed on the site at or below MHHW was significantly eroded within 1 month of placement (see Figure 3 in Attachment 1).

Based on the past performance of the original beach nourishment project and a coastal engineering and coastal geomorphology evaluation completed for the project area and vicinity by Anchor QEA, Phase 2 of this project will consist of beach gravels ranging from approximately 0.75 inches to 3 inches. This size material has been used successfully for other nearshore parks in the Puget Sound area, including Olympic Sculpture Park. While the planform and beach profile shape of the placed beach gravels is expected to change over time due to wave action at the site, the bulk of the material is not expected to be moved off site (i.e., offshore) during storm events, as occurred with the original sand placement. As part of final design, an additional layer of finer material may be placed overtop the beach gravels (proposed size range from 2 millimeters [mm] to 7mm) to provide additional habitat benefit, if required. However, this material is not expected to be retained on site for as long as the larger beach gravels.

Erosion of placed beach gravels at the project site will be primarily due to impacts from storm waves, as opposed to littoral drift or other mechanisms. This is due to the orientation

of the shoreline at the site and its location within the larger drift cell. The project site is at the downdrift end of the drift cell where fine sediments transported into the project site due to littoral drift should accumulate. Accumulation of finer sediments is visible at the site just northeast of the outlet of Pigeon Creek No. 1. However, the change in orientation of the shoreline just northeast of the outlet of Pigeon Creek No. 1 results in increased wave energy (due to breaking waves) in that area and limits the ability of fine sediment to accumulate.

Since erosion of placed material will be episodic in nature (due to storms), quantifying the design life of the nourishment is uncertain. Based on studies of storm erosion of gravel and rock beaches, the proposed beach gravels should be "dynamically stable" under design wave conditions. This means that the material is expected to be mobile under storm waves, and beach profile elevations; thus the planform shape will change due to storm wave impacts. However, the material is not expected to be transported off site in large quantities.

The size gradation proposed for the beach gravel is shown below:

| U.S. Standard Sieve | Permissible Limits Percent by Weight, Maximum Passing |
|---|---|
| 2-1/2 inch square | 95-100 |
| 2 inch square | 70-100 |
| 1-1/2 inch square | 40-90 |

## Current and expected post-project habitat conditions, including the presence of fish, wildlife, and plant species, spawning habitat, and special aquatic sites in the project area

The proposed project area includes shoreline habitat from approximately +6 feet MLLW to about +21 feet MLLW, a horizontal extent of about 70 to 90 feet. Existing conditions in the project area include upland vegetation at the upper shoreline area of the project site comprised of a mixture of native and non-native trees, shrubs, and grass and herbaceous species. The majority of the upland shoreline area of the project site is comprised of grass and herbaceous species. Shoreline species include red alder (*Alnus rubra),* western white pine (*Pinus monticola*), Nootka rose (*Rosa nutkana*), oceanspray (*Holodiscus discolor*),

entire-leaved gumweed (*Grindelia integrifolia*), common tansy (*Tanacetum vulgare*), sea plantain (*Plantago maritima*), and American dune grass (*Elymus mollis*).

No aquatic vegetation and potential forage fish spawning areas are located within the project site (WDFW 2012). The dominant substrate type on the beach area of the site is dominated by cobble, gravel, and sand with some riprap and angular rock.

Post-project habitat conditions in the upper shoreline area will remain unchanged in areas that are not disturbed. Disturbances to upland shoreline areas will be temporary and will be replanted with native vegetation and upland grass seed mix. The beach area of the project site will be overlaid with beach gravel that are conducive to fish and represent native beach conditions similar to nearby reference sites.

Current wildlife use of the site likely includes terrestrial and aquatic species typically associated with littoral zone shoreline habitat in Puget Sound. Due to the nature of the proposed project—restoring shoreline and beach habitat conditions—post-construction conditions of the site will provide quality marine shoreline habitat for native terrestrial and aquatic species of Puget Sound. In general, quality shoreline habitat conditions are not present in the vicinity of the site because the surrounding vicinity is dominated by fragmented and disturbed areas associated with industrial development.

## Assessment of the likely impact of the proposed work on upstream, downstream, and cross-stream properties

The project will have no impact on upstream, downstream, or cross-stream properties.

## Describe the type and length of existing bank stabilization within 300 feet up and downstream of the project area

The shoreline is armored with steep rock slopes to the east and west of the site for at least 300 linear feet.

**Demonstration that the proposed project incorporates the least environmentally damaging practicable bank protection methods: [DESCRIBE AND EVALUATE.] If rock must be used due to site erosion conditions, explain how the bank stabilization structure incorporates elements beneficial to fish. Mitigation proposed? Bio-engineering?**

The project proposes to utilize fill material that is conducive to fish habitat. To do this, the installation of beach gravel in the nearshore area will represent native beach conditions using beach gravels that would be sized from 0.75 inches to 3 inches based on results of a coastal evaluation and reference sites within the drift cell. WDFW agreed with these beach gravel sizes and included them within the HPA.

Mitigation is not proposed, as described earlier in this memorandum, because the project was designed to avoid and minimize impacts to waters of the United States.

Bio-engineering techniques, such as live staking and pre-vegetated mats, were considered as part of the alternatives evaluation for the project. However, the wave energy at the site is too high (waves are large and occur frequently) for the successful implementation of these types of solutions at the site.

## Planting plan using native riparian plant species

Please see Attachment 3 the planting plan proposed for the project.

## List of Attachments

Attachment 1 Figures
Attachment 2 Revised JARPA Sheet 2
Attachment 3 MTCA Sampling Figures
Attachment 4 Planting Plans

## REFERENCES

Anchor QEA, 2012. *Alternatives Evaluation and Basis of Design Report. Nearshore Sediment Assessment Project.* Prepared for Snohomish County and the Marine Resources Advisory Board. March 2012.

City of Everett, 2012. *Washington State Joint Aquatic Resources Permit Application Form.* Prepared for the United States Army Corps of Engineers, Washington State Department of Fish and Wildlife, and Washington State Department of Ecology. November 19, 2012.

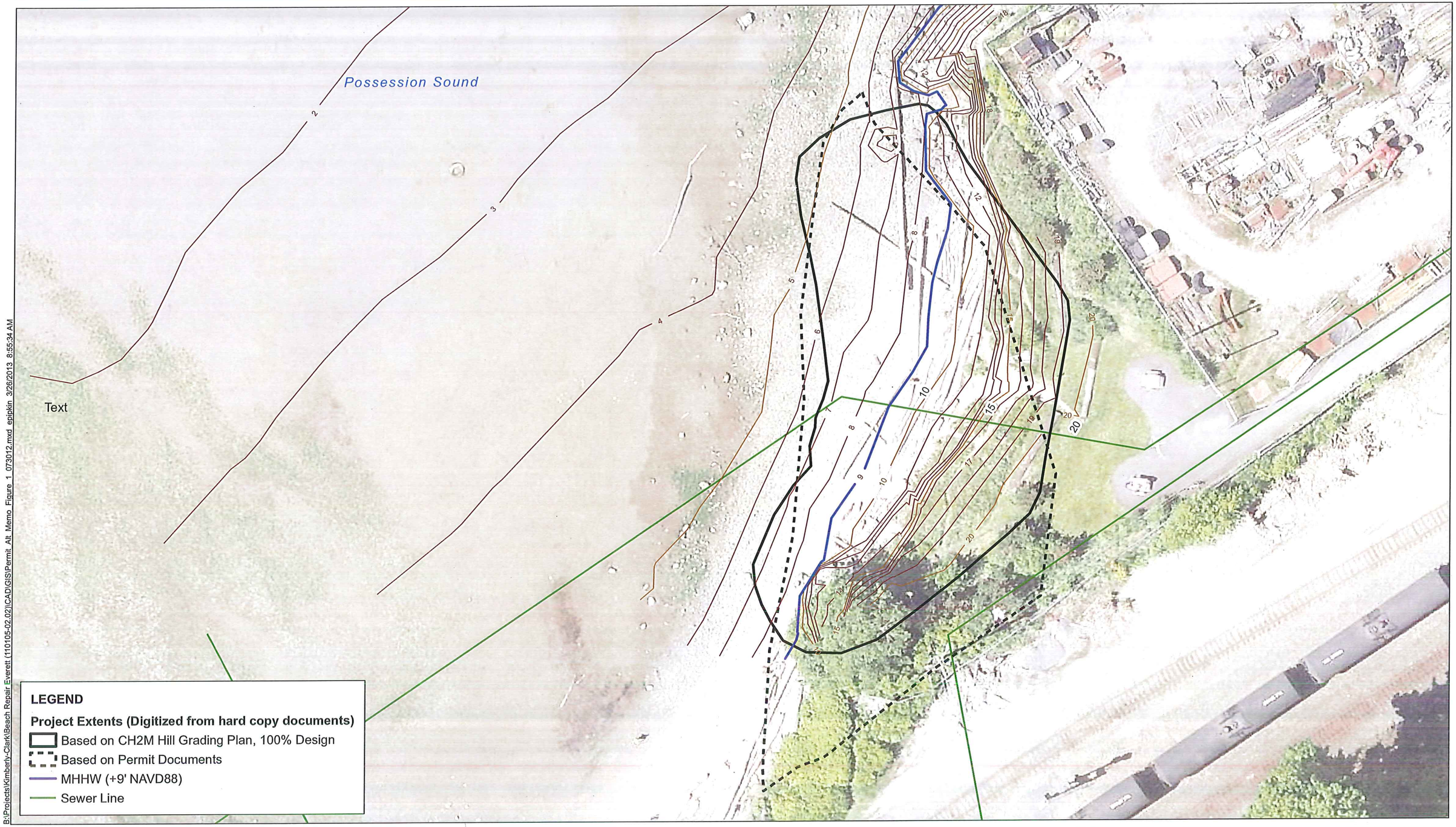
WDFW, 2012. SalmonScape Interactive mapper – Salmon presence; forage fish spawning habitat. Available from: http://wdfw.wa.gov/mapping/salmonscape/. Accessed on: September 28, 2012.

# ATTACHMENT 1
# FIGURES OF ORIGINAL BEACH RESTORATION, PHASE 1, AND PHASE 2



Note: Red line is the fence line digitized in from the 2011 aerial photograph

**Figure 1: Pre-Construction (left) 2001 and Post-Construction (right) 2011 Aerial Photography of Project Site**
Depp Water Outfall Beach Repair Project




B:\Projects\Kimberly-Clark\Beach Repair Everett (110105-02.02)\CAD\GIS\Permit_Alt_Memo_Figure_1_073012.mxd epipkin 3/26/2013 8:55:34 AM

ANCHOR QEA

**NOTES:**
1. Horizontal datum; WA State Plane North, NAD83, Feet.
2. Vertical datum: NAVD88, Feet.
3. Aerial photo is 2011 and provided by City of Everett.
4. Contours are 1-ft interval and were provided by Perteet, Survey Date July 2012
5. Sewer data provided by City of Everett.

Feet
0 20 40 60

**Figure 2: Site Map and Approximate Limits of Grading of Original Beach Enhancement Work**
Deep Water Outfall Beach Repair Project

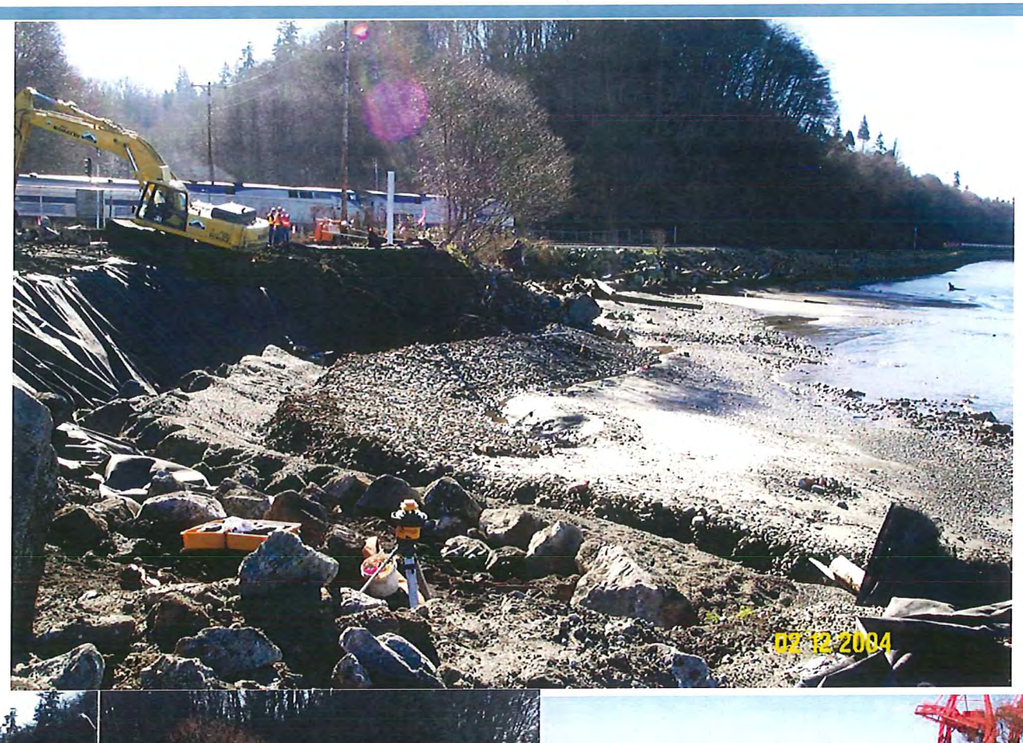
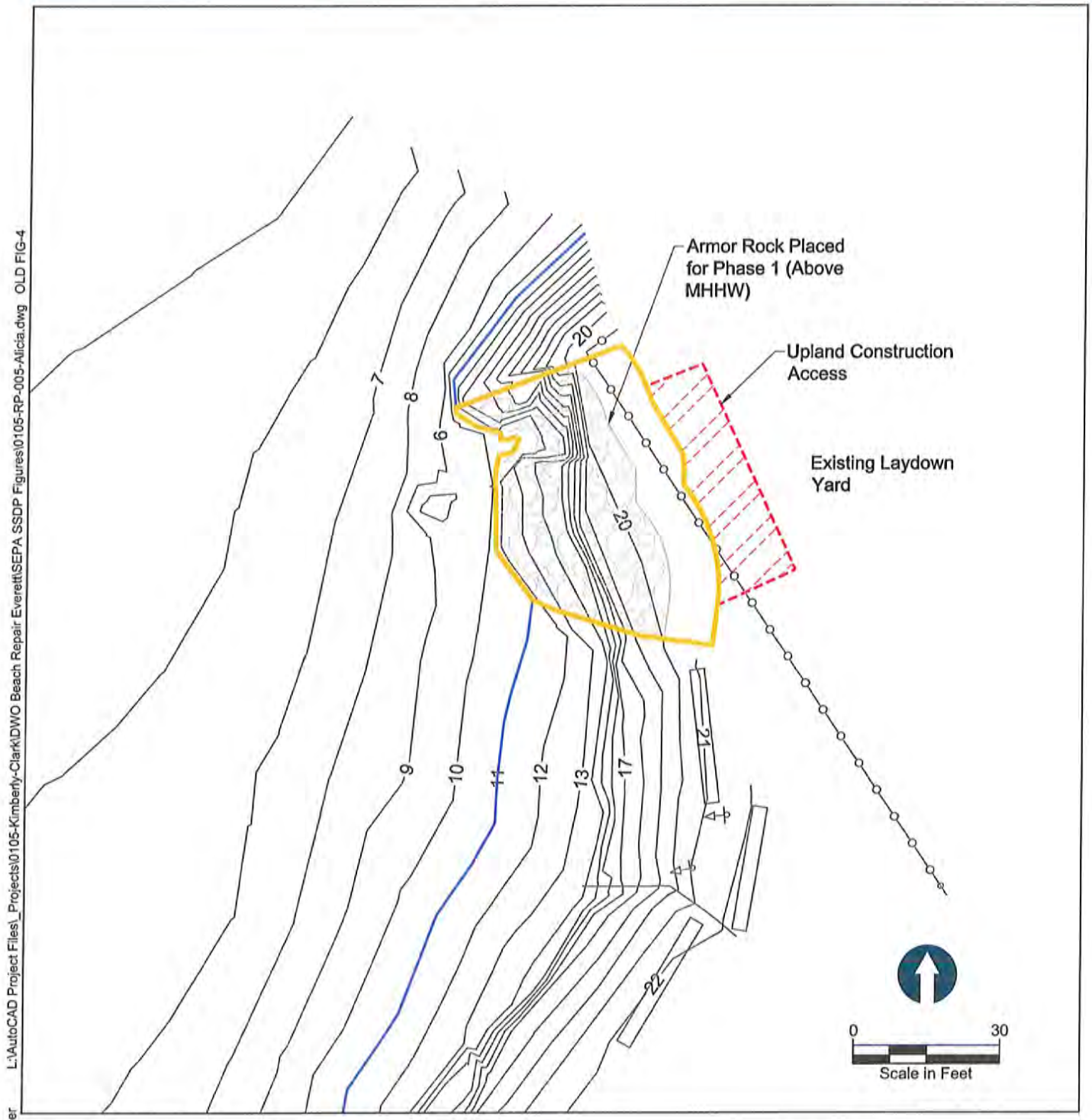





**Figure 3: During Construction (top), Post-Construction (bottom left) February 20, 2004 and Beginning of Erosion (bottom right) March 8, 2004**
Deep Water Outfall Beach Repair Project

**Figure 4: Site Visit May 18, 2012, Low Tide (Left) and Site Visit June 7, 2012, High Tide (Right)**
Deep Water Outfall Beach Repair Project




**SOURCE:** Aerial source from Bing Maps, existing contours from survey by Perteet Inc. dated July 17, 2012.
**HORIZONTAL DATUM:** Washington State Plane North, NAD83.
**VERTICAL DATUM:** Mean Lower Low Water (MLLW)
**NOTE:** See figures 5 and 6 for cross sections.

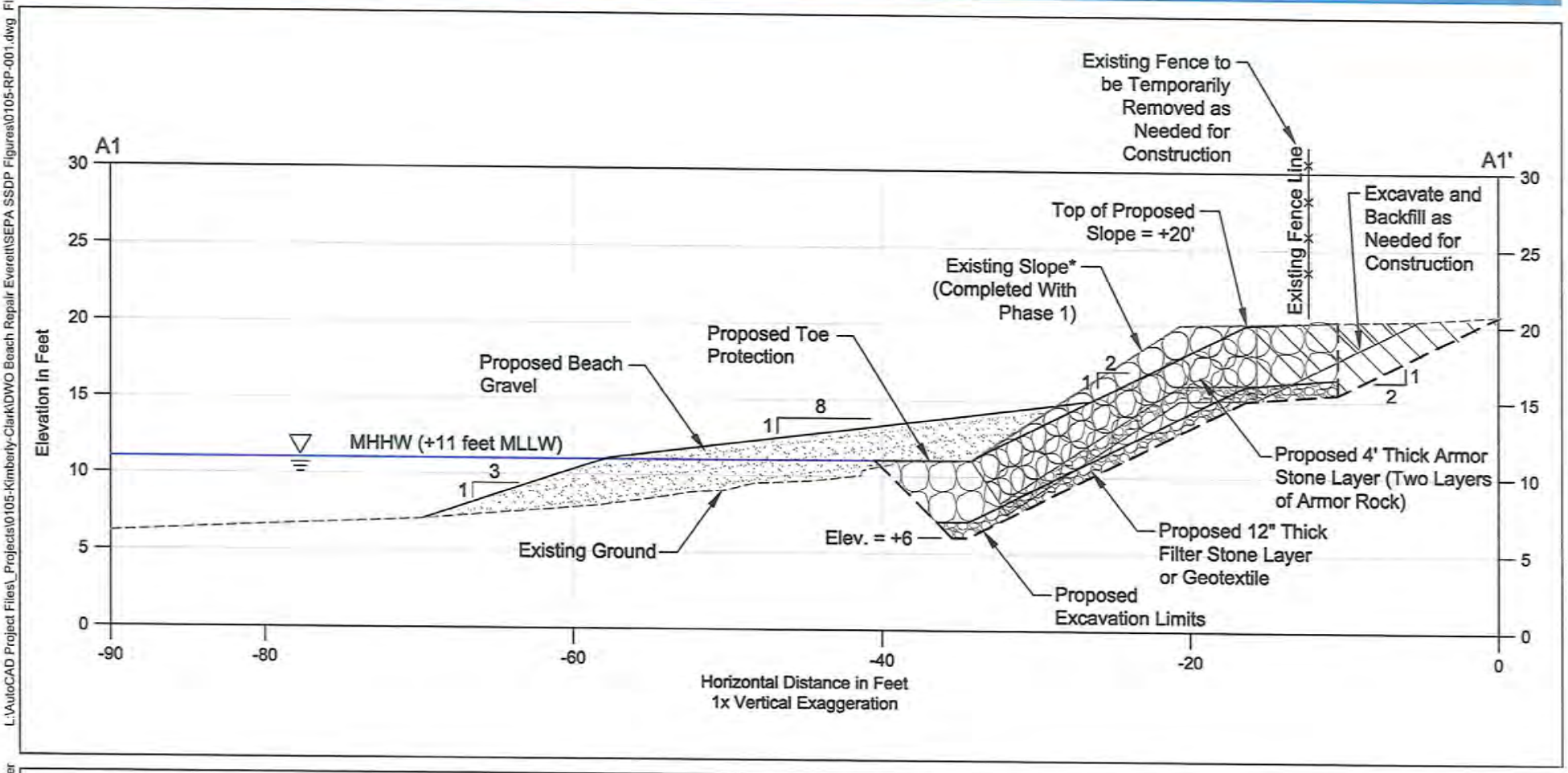
LEGEND:

- Phase 1
- Armor Rock
- 10 Existing Contour
- MHHW Line (11 feet MLLW)
- Existing Fence Line



ANCHOR QEA

**Figure 5**
Plan View, Phase 1
Deep Water Outfall Beach Repair Project




L:\AutoCAD Project Files_Projects\0105-Kimberly-Clark\DWO Beach Repair Everett\SEPA SSDP Figures\0105-RP-001.dwg FIG-6 NEW

Mar 25, 2013 4:24pm mpratschner

**SOURCE:** Existing topographic survey by Perteet Inc. dated July 17, 2012.
**HORIZONTAL DATUM:** Washington State Plane North, NAD83.
**VERTICAL DATUM:** Mean Lower Low Water (MLLW).

**NOTE:**
1. * Deconstruct 1.5H:1V rock armor slope and rebuild as shown. Located above Mean Higher High Water (MHHW).

**LEGEND:**

Phase 1 Work

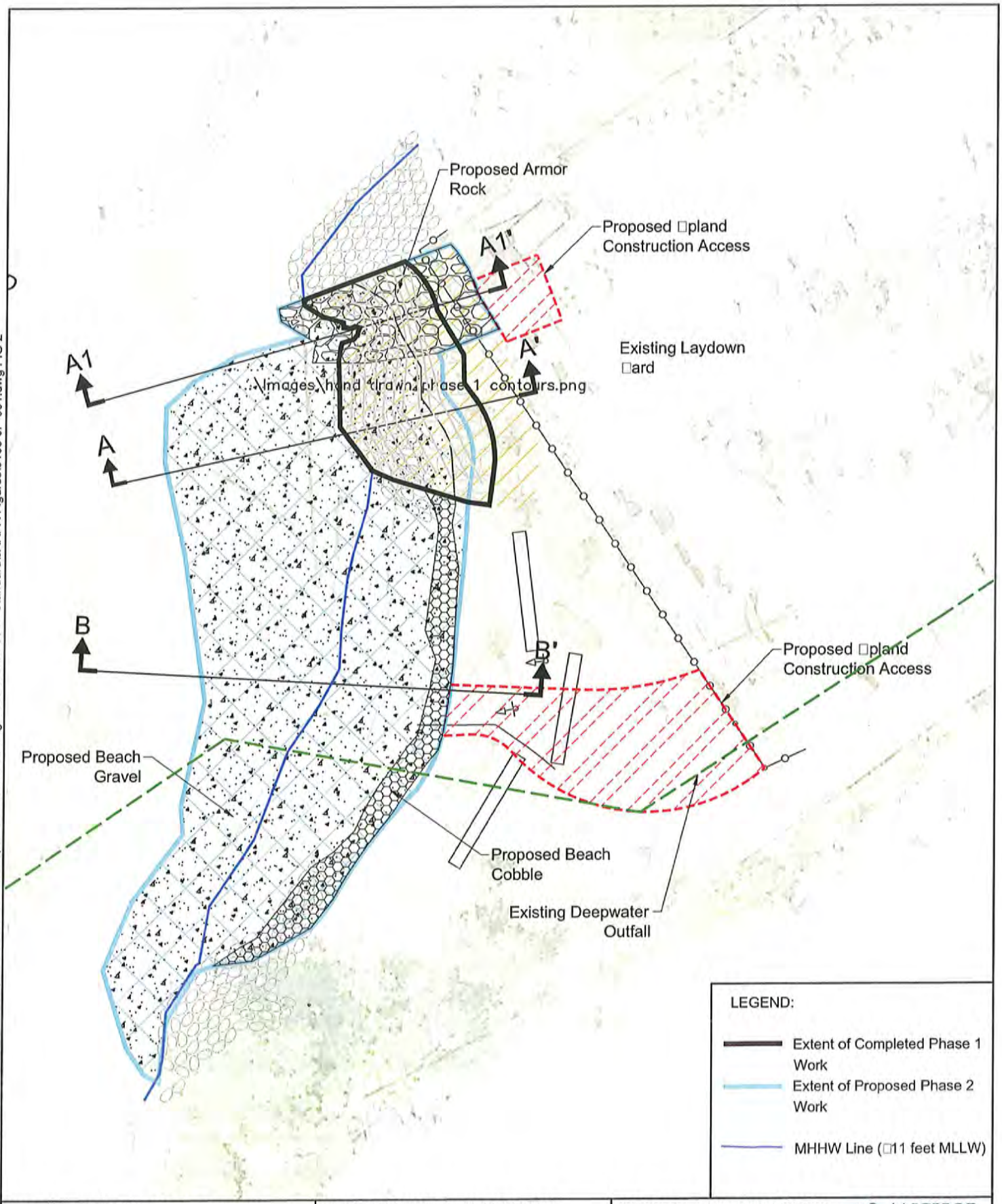
Phase 2 Work

0 10
Scale in Feet

ANCHOR QEA

**Figure 6**
Cross Section of Phase 1 / Phase 2 Overlap
Deep Water Outfall Beach Repair Project

# ATTACHMENT 2
# REVISED JARPA SHEET 2




C:\Gregs\CAD\0105-Kimberly-Clark\DWO Beach Repair Everett\JARPA Figures\0105-JP-001 - Standard\JARPA Figures\0105-JP-001.dwg FIG-2

Mar 28, 2013 1:3□pm ghowell

PURPOSE: REPAIRING BEACH TO PREVENT EROSION AND SLOPE DESTABILIZATION

DATUM: MLLW 0.0'
LATITUDE: 47°58'18"N
LONGITUDE: -122°13'48"W
S-T-R: 25-29N-4E

SITE LOCATION ADDRESS:
3500 TERMINAL AVENUE
EVERETT, WA 98201

NAME: DEEP WATER OUTFALL BEACH REPAIR PROJECT

ADJACENT PROPERTY OWNERS:
1 - CITY OF EVERETT
2 - PORT OF EVERETT

PROPOSED: SLOPE STABILIZATION REPAIR AND REHABILITATION

IN: PUGET SOUND
NEAR/AT: EVERETT
COUNTY OF: SNOHOMISH
STATE: WA

DATE: MARCH 2013

ANCHOR QEA
720 Olive Way, Suite 1900
Seattle, WA 98101
206-287-9130

# ATTACHMENT 3
# MTCA SAMPLING FIGURES



N
W E
S

1,500 0 1,500
Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps, Street Maps 2008

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

# Vicinity Map

Port of Everett
Everett, Washington

GeoEngineers

Figure 1

Office: SEA Path: \\Sea\projects\0\0676018\GIS\067601801_F1_VicinityMap.mxd Map Revised: December 11, 2009 KKS

| EST12 (22.5-23.5 ft) | | |
|---|---|---|
| Contaminant | Concentration | PSL |
| Gasoline-Range | 280 mg/kg | 100 mg/kg' |

| EST10 (12-13 ft) | | |
|---|---|---|
| Contaminant | Concentration | PSL |
| Gasoline-Range | 61 mg/kg | 30 mg/kg' |
| Napthelene | 120,000 ug/kg | 5,000 ug/kg |
| cPAH Total TEC | 2,906 mg/kg | 2,000 mg/kg |

| EST07 (12-13 ft) | | |
|---|---|---|
| Contaminant | Concentration | PSL |
| Gasoline-Range | 160 mg/kg | 100 mg/kg' |

OUTER HARBOR LINE
INNER HARBOR LINE
N46°02'30"E-2103.50'
PARCEL NO 1 39.36 ACRES
PARCEL NO 2 14.72 ACRES
S 23-00
SCRIBE 304.97'
BULKHEAD (OBSERVED IN FIELD 2009)
BULKHEAD (DRAWING C105 1978)
WEST BULKHEAD (PORT OF EVERETT)
WATERTIGHT SEAWALL (GEOMATRIX 2007)
BULKHEAD (PENTEC 1993)
DOCK WAREHOUSE
CARGO DOCK
FUEL CRANE
EST07
EST10
EST09
EST11
EST12
EST13
EST14
APPROXIMATE SCALE IN FEET

## Legend

EST07 Boring Location and Designation

Gasoline at a Concentration Exceeding the Preliminary Screening Levels

SVOCs/cPAHs at Concentrations Exceeding the Preliminary Screening Levels

Metals at Concentrations Exceeding the Preliminary Screening Levels

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Historical site plan from Port of Everett Drawing. Coordinate system: NAD 1983, Washington North (feet)

200 0 200
Feet

1: 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.
cPAH Total TEC = Carcinogenic Polycyclic Aromatic Hydrocarbon Total Toxic Equivalent Concentration
PSL = Preliminary Screening Level

**Contaminants of Potential Concern in Soil at Concentrations Exceeding Preliminary Screening Levels**

Port of Everett
Everett, Washington

GeoEngineers

**Figure 2**

Map Revised: March 23, 2010 KKS
Path: \\Sea\projects\0\0676018\GIS\0676018O4_F2_SoilContaminants.mxd
Office: SEA

| EST14 | | |
|---|---|---|
| **Contaminant** | **Concentration** | **PSL** |
| Arsenic (Dissolved) | 0.008 mg/L | 0.0050 mg/L |
| Copper (Dissolved) | 0.015 mg/L | 0.0024 mg/L |
| Nickel (Dissolved) | 0.019 mg/L | 0.0082 mg/L |

| EST10 | | |
|---|---|---|
| **Contaminant** | **Concentration** | **PSL** |
| Gasoline-Range | 1.2 mg/L | 0.80 mg/L |
| Carbazole | 13 ug/L | 4.4 ug/L |
| 2-Methylnaphthalene | 43 ug/L | 32 ug/L |
| Benzo(a)anthracene | 0.067 ug/L | 0.018 ug/L |
| Benzo(a)pyrene | 0.022 ug/L | 0.018 ug/L |
| Benzo(b)fluoranthene | 0.018 ug/L | 0.018 ug/L |
| Benzo(k)fluoranthene | 0.021 ug/L | 0.018 ug/L |
| Chrysene | 0.064 ug/L | 0.018 ug/L |
| cPAH Total TEC | 0.033 ug/L | 0.03 ug/L |

| EST09 | | |
|---|---|---|
| **Contaminant** | **Concentration** | **PSL** |
| Copper (Dissolved) | 0.019 mg/L | 0.0024 mg/L |
| Nickel (Dissolved) | 0.019 mg/L | 0.0082 mg/L |

| EST13 | | |
|---|---|---|
| **Contaminant** | **Concentration** | **PSL** |
| Arsenic (Dissolved) | 0.007 mg/L | 0.0050 mg/L |
| Copper (Dissolved) | 0.018 mg/L | 0.0024 mg/L |
| Nickel (Dissolved) | 0.038 mg/L | 0.0082 mg/L |

| EST11 | | |
|---|---|---|
| **Contaminant** | **Concentration** | **PSL** |
| Nickel (Dissolved) | 0.0181 mg/L | 0.0050 mg/L |
| DEHP | 4.1 ug/L | 2.2 ug/L |

| EST12 | | |
|---|---|---|
| **Contaminant** | **Concentration** | **PSL** |
| Arsenic (Dissolved) | 0.0061 mg/L | 0.0050 mg/L |
| Gasoline-Range | 1 mg/L | 0.80 mg/L |
| DEHP | 5.1 ug/L | 2.2 ug/L |
| Carbazole | 17 ug/L | 4.4 ug/L |
| 2-Methylnaphthalene | 64 ug/L | 32 ug/L |
| Benzo(a)anthracene | 0.096 ug/L | 0.018 ug/L |
| Chrysene | 0.08 ug/L | 0.018 mg/L |

BULKHEAD (OBSERVED IN FIELD 2009)

BULKHEAD (DRAWING C105 1978)

WEST BULKHEAD (PORT OF EVERETT)

WATERTIGHT SEAWALL (GEOMATRIX 2007)

BULKHEAD (PENTEC 1993)

EST14 EST13 EST12 EST11 EST10 EST09 EST07

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Historical site plan from Port of Everett Drawing. Coordinate system: NAD 1983, Washington North (feet)

**Legend**

- Gasoline at a Concentration Exceeding the Preliminary Screening Level
- SVOCs/cPAHs at Concentrations Exceeding the Preliminary Screening Levels
- Metals at Concentrations Exceeding the Preliminary Screening Levels
- EST07 Groundwater Sampling Not Performed as Part of Stage 1 Event

200 0 200
Feet

cPAH Total TEC = Carcinogenic Polycyclic Aromatic Hydrocarbon Total Toxic Equivalent Concentration
DEHP = Bis(2-ethylhexyl)phthalate
SVOC = Semi-Volatile Organic Compound
PSL = Preliminary Screening Level

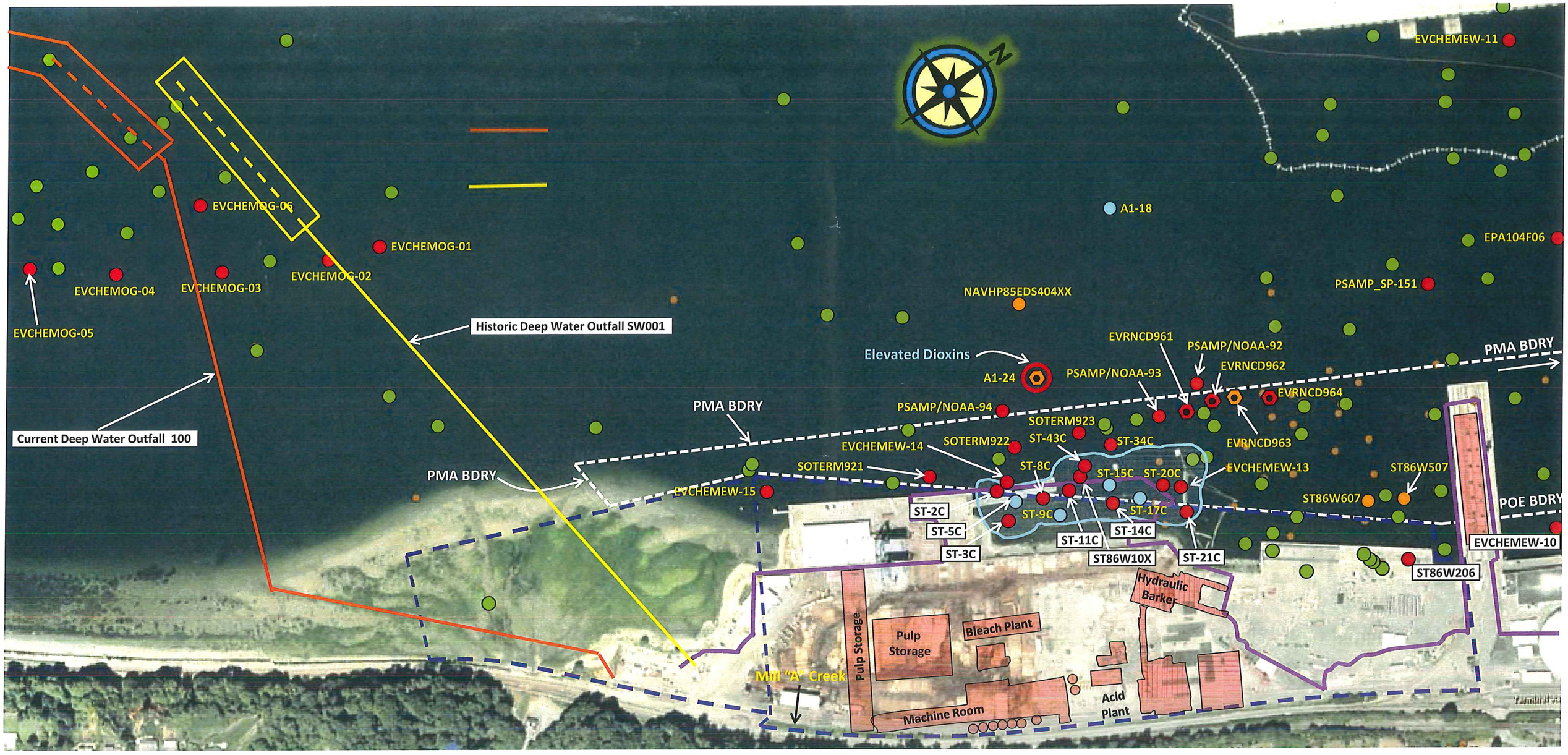
**Contaminants of Potential Concern in Groundwater at Concentrations Exceeding Preliminary Screening Levels**

Port of Everett
Everett, Washington

GeoEngineers

**Figure 3**

Map Revised: March 23, 2010 KKS
Path: \\Sea\projects\0\0676018\GIS\0676018_F3_GWContaminants.mxd
Office: SEA




# Attachment A – Figure A-6[1] Weyerhaeuser Mill A Former Historical In-Water Sampling Map

[1]The base map including all sampling information presented on this figure were obtained from Ecology's EIM Database.

- Sediment Sample: SMS CSL Chemistry Exceedance
- Sediment Sample: SMS SQS Chemistry Exceedance
- Sediment Chemistry Sample (no exceedance)
- Bioassay SMS CSL Exceedance
- Bioassay SMS SQS Exceedance
- Bioassay SMS SQS Exceedance/ Sediment CSL Chemistry Exceedance
- Sediment Samples with elevated dioxins

Major Structures (1947)

Sawdust Deposit – Estimated Boundary. Geomatrix, 2007

BDRY = Boundary

PMA = Port Management Agreement

Source: PMA No. 20-080027 between DNR, POE, and WA State

POE = Port of Everett

CSL = Cleanup Screening Level

SMS = Sediment Management Standard

SQS = Sediment Quality Standard

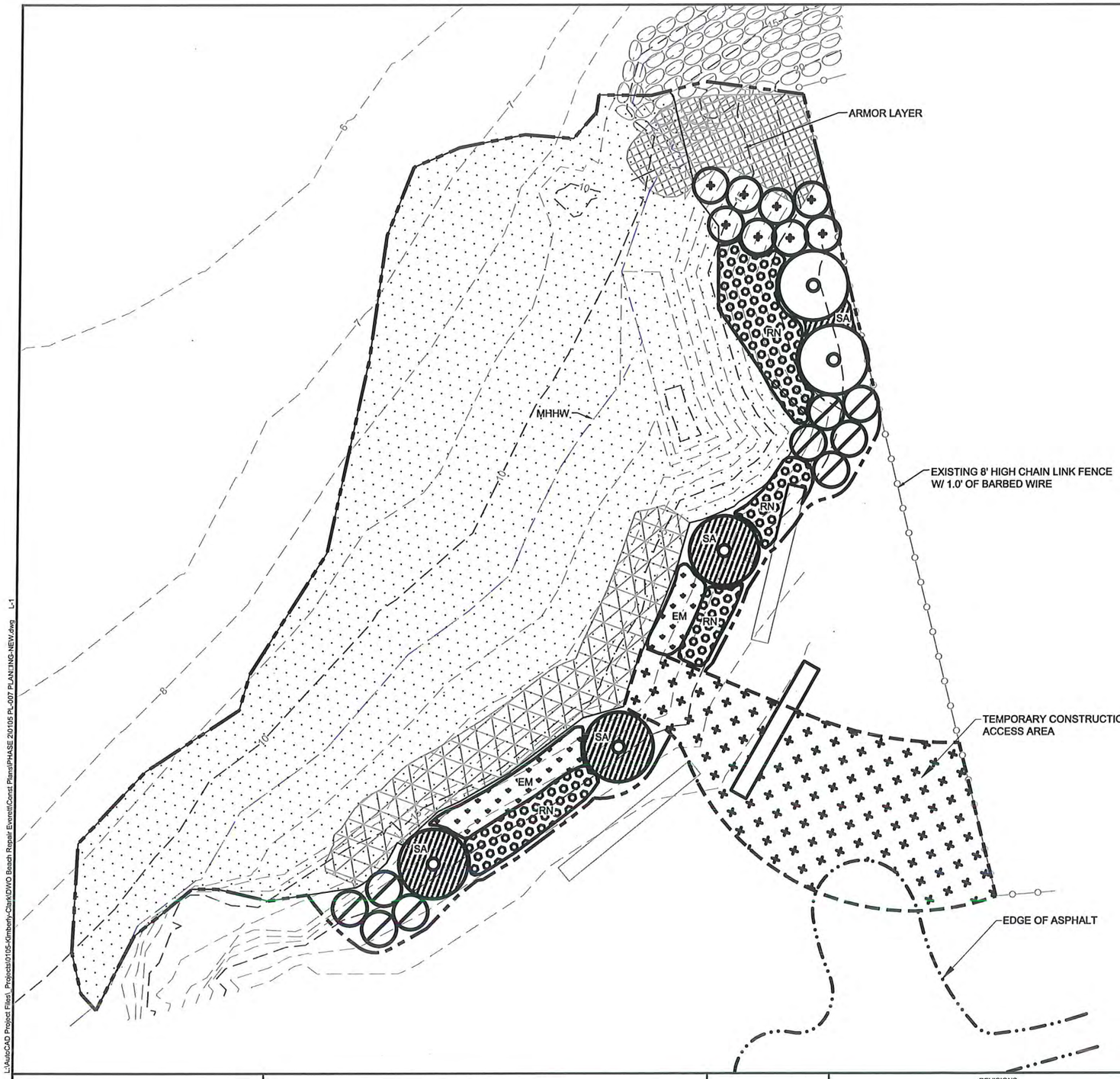
Approx. Shoreline (1947)

Former Weyerhaeuser Mill A Property Boundary

Source: 11/22/72 Weyerhaeuser Company Mill Site Drawing (Drawing No. 5041 D)

Geomatrix 2007. *Data Report. Former Mill A MTCA Support Sample Collection*. Everett, Washington. November 2007.

# ATTACHMENT
# PLANTING PLANS




**NOTES:**

1. HORI□ON□AL DA□□M: WASHING□ON S□A□E PLANE NOR□H NAD83, FEE□.
2. VER□ICAL DA□□M: MEAN LOWER LOW WA□ER (MLLW), □.S. FEE□.
3. □OPOGRAPHIC S□RVE□ PERFORMED B□ PER□EE□ INC., J□L□ 2012, COMBINED WI□H □0□ DESIGN CON□O□RS FROM PHASE 1 DESIGN.

**PLANTING NOTES:**

1. SEE PLAN□ SCHED□LE SHEE□ L-2 FOR SPECIES DEFINI□ION
2. EVENLY SPREAD TOPSOIL (SALVAGED AND IMPORTED) IN ALL PLANTING AREAS; SEE SPECIFICA□IONS
3. FOR PLAN□ING BED PREPARA□ION AND PLAN□ INS□ALLA□ION SEE SPECIFICA□IONS
4. RES□ORE ALL DIS□□RBED LAWN AREAS WI□H H□DROSEED, AND FILL AND SMOO□H O□□ AN□ R□□S CA□SED B□ CONS□R□C□ION AC□IVI□IES

**LEGEND:**

- PROJECT LIMITS
- POST-EXCAVATION MAJOR CONTOUR (5' INTERVAL)
- POST-EXCAVATION MINOR CONTOUR (1' INTERVAL)
- MHHW (+11' MLLW)
- EXISTING FENCE
- PROPSOED ROCK ARMOR LIMITS
- PROPOSED BEACH GRAVEL
- PROPOSED COBBLE STONE TOE

NOR□H

0 10 20

SCALE IN FEE□

ONE INCH

A□ FULL SIZE. IF NO□ ONE INCH SCALE ACCORDINGL□

L:\AutoCAD Project Files_Projects\0105-Kimberly-Clark\DWO Beach Repair Everett\Const Plans\PHASE 2\0105 PL-007 PLAN□ING-NEW.dwg L-1

Dec 21, 2012 □:45am ghowell

ANCHOR QEA

| REVISIONS | | | | |
|---|---|---|---|---|
| REV | DA□E | B□ | APP□D | DESCRIP□ION |
| | | | | |

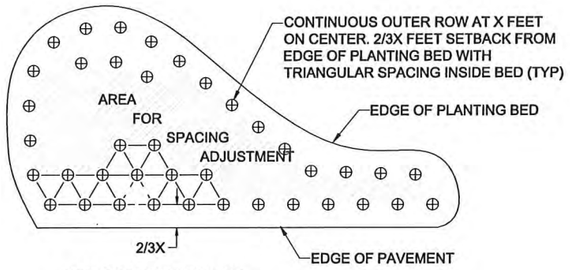
DESIGNED B□: □. S□OFFERAHN
DRAWN B□: G. HOWELL
CHECKED B□: K. KE□□ERIDGE
APPROVED B□: □. WANG
SCALE: AS INDICA□ED
DA□E: -

**DWO BEACH REPAIR PHASE 2**

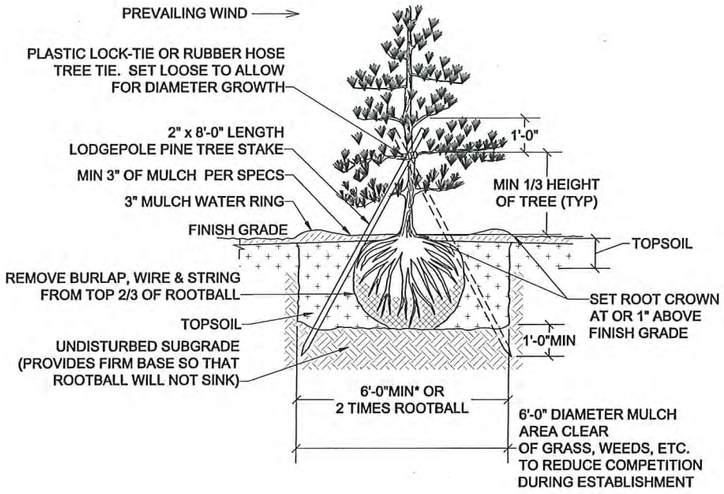
**PLANTING PLAN**

**L-1**

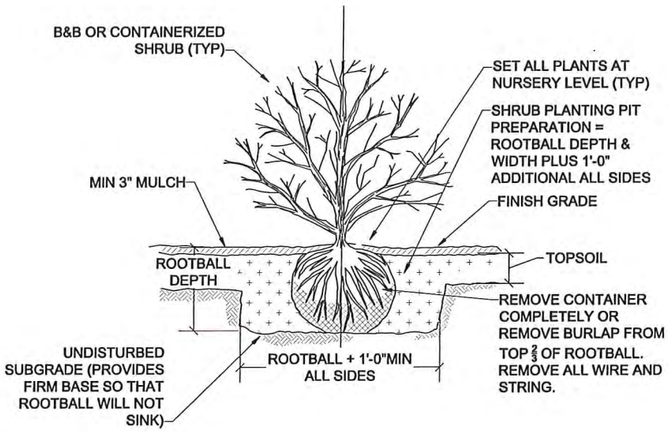
SHEE□ NO. 11 OF 12



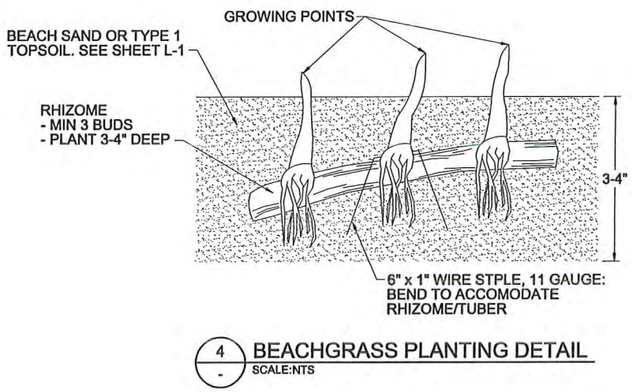

1 / - PLANTING PATTERN
SCALE:NTS




2 / - CONIFEROUS TREE PLANTING & STAKING
SCALE:NTS




3 / - SMALL TREE AND SHRUB PLANTING
SCALE:NTS




4 / - BEACHGRASS PLANTING DETAIL
SCALE:NTS

| | SCIEN□IFIC NAME | COMMON NAME | SI□E | SPACING | NO□ES | LOCA□ION |
|---|---|---|---|---|---|---|
| ○ | **Trees** *Pinus contorta var. "contorta"* | Shore Pine | 6-7 feet ht. | As shown | Matched specimens□straight trunk□well branched | 2 / L-2 |
| ⊕ | **Shrubs** *Myrica californica* | Pacific Waxmyrtle | 5 gal. | As shown | | 1□3 / L-2 |
| ⊘ | *Holodiscus discolor* | Oceanspray | 5 gal. | As shown | | |
| | *Rosa nutkana* | Nootka Rose | 2 gal | 3' O.C. | | |
| | *Symphoricarpos albus* | Snowberry | 2 gal. | 3' O.C. | | |
| | Beach Grass *Elymus mollis* | American Beach Grass | 1 gal. | 18" O.C. | | 4 / L-2 |
| | Seeding *Ecology Lawn-Eco Turf* | See specifications | | | | |

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0 10 20
SCALE IN FEE□

ONE INCH
A□ FULL SI□E, IF NO□ ONE INCH SCALE ACCORDINGL□

ANCHOR

| REVISIONS | | | | |
|---|---|---|---|---|
| REV | DA□E | B□ | APP□D | DESCRIP□ION |
| | | | | |
| | | | | |

DESIGNED B□: □. S□OFFERAHN
DRAWN B□: G. HOWELL
CHECKED B□: K. KE□□ERIDGE

**DWO BEACH REPAIR PHASE 2**

**L-2**

# March 2014 Photographs

# APPENDIX E
# MARCH 2014 PHOTOGRAPHS

**PHOTOGRAPH 1**
Looking south from upland portion of open space beach area.


**PHOTOGRAPH 2**
Looking southwest from upland portion of open space beach area.

**PHOTOGRAPH 3**
Looking east from marine portion of open space beach area.

**PHOTOGRAPH 4**
Looking southeast from marine portion of open space beach area.