NewFields

# 2013 Sediment Profile Imaging Surveys

## Commencement Bay and Elliott Bay DMMP Sites

Final

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NewFields
115 2nd Ave N, Suite 100
Edmonds, WA 98020

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Photo taken during transit to Commencement Bay – September 2013

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# 1.0 Introduction

The Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Seattle District, U.S. Environmental Protection Agency, Washington Departments of Ecology and Natural Resources) jointly manage eight open-water dredged material disposal sites in Puget Sound, including five non-dispersive and three dispersive sites. The Washington Department of Natural Resources (DNR) is the lead agency for conducting chemical and biological monitoring at the non-dispersive sites and the U.S. Army Corps of Engineers, Seattle District (USACE) is the lead agency for conducting physical monitoring at both dispersive and non-dispersive sites. Physical monitoring includes bathymetric surveys at all eight sites and sediment profile imaging (SPI) surveys at the non-dispersive sites.

This report presents the results of the 2013 Sediment Profile Imaging (SPI) surveys conducted in support of physical monitoring at the Commencement Bay and Elliott Bay DMMP disposal sites. The SPI Image Collection and Analysis Plan (ICAP) (Appendix A) outlines the sampling methods and analysis protocols used for conducting the SPI surveys to determine the spatial extent of recent dredged material deposits and to examine near-surface, benthic habitat conditions at selected locations at the sites. NewFields, Edmonds, WA was contracted by ANAMAR Environmental Consulting, Inc., Gainesville, FL, to perform the SPI surveys.

# 2.0 Background

## 2.1 DMMP Disposal Site Monitoring Program

The original environmental monitoring plans for unconfined, open-water, dredged material disposal sites in central Puget Sound were published by the Puget Sound Dredged Disposal Analysis program agencies in 1988 (PSDDA 1988a). The monitoring plans were designed to verify that dredged material disposed at the sites remains within the disposal site boundaries and that unacceptable adverse effects do not occur either onsite or offsite due to dredged material disposal. Numerous revisions to the physical, chemical, and biological monitoring plans were made by the Dredged Material Management Program agencies between 1988 and 2007. The Updated Environmental Monitoring Plan (SAIC 2007) incorporated those changes, bringing the monitoring plans up to date. While changes have been adopted in the chemical and biological monitoring plans and procedures since 2007 (see USACE 2013), no changes have occurred to the physical monitoring plans.

DMMP disposal site monitoring is designed to answer three monitoring questions through the evaluation of six testable hypotheses (Table 2-1). An SPI survey is used to evaluate the first testable hypothesis under Question 1. Dredged material is determined to have remained on site if deposits of dredged material are no greater than 3 cm at the perimeter stations.

## 2.2 Commencement Bay and Elliott Bay DMMP Sites

The Updated Environmental Monitoring Plan (UEMP) includes the current physical monitoring requirements and procedures for the Commencement Bay (CB) and Elliott Bay (EB) sites. A description of these two sites is included in Table 2-2 and site maps are provided in Figures 2-1 and 2-2. The monitoring triggers listed in Table 2-2 are considered “soft” triggers, meaning that best professional judgment is applied by the DMMP agencies to determine the actual time at which monitoring will occur. At the EB site, approximately 590,000 cubic yards of material have been placed since the last SPI monitoring survey was conducted in 2002 (SEA 2002) (Table 2-3).

At the CB site, approximately 429,000 cubic yards have been placed since the last SPI survey in 2007 (SAIC 2008), which is short of the soft trigger (Table 2-3). However, the target disposal coordinates for the CB site were changed after the 2007 survey in order to reduce the height of the disposal mound (DMMP 2007). The revised coordinates are at the edge of the target area. After six years of disposal at the new coordinates, the DMMP agencies agreed that an SPI survey was appropriate to ensure that the new disposal coordinates are working as intended and the dredged material footprint is contained within the disposal site boundary.

**Table 2-1.** The DMMP monitoring framework

| Question | Hypothesis | Monitored Variable | Interpretive Guideline | Action Item (When exceedances noted)[1] |
|---|---|---|---|---|
| **No. 1**<br><br>**Does the deposited dredged material stay on site?** | 1. Dredged material remains within the site boundary. | Sediment Profile Imaging (SPI) System<br><br>Onsite and Offsite | Dredged material layer is greater than 3 cm at the perimeter stations. | Further assessment is required to determine full extent of dredged material deposit. |
| | 2. Chemical concentrations do not measurably increase over time due to dredged material disposal at offsite stations. | Sediment Chemistry<br><br>Offsite | Washington State Sediment Quality Standards<br>and<br>Temporal analysis | Post-disposal benchmark station chemistry is analyzed and compared with appropriate baseline benchmark station data. |
| **No. 2**<br><br>**Are the biological effects conditions for site management [PSDDA-defined Site Condition II] exceeded at the site due to dredged material disposal? (PSDDA 1988b)** | 3. Sediment chemical concentrations at the onsite monitoring stations do not exceed the chemical concentrations associated with PSDDA Site Condition II guidelines due to dredged material disposal. | Sediment Chemistry<br><br>Onsite | Onsite chemical concentrations are compared to DMMP maximum levels. | DMMP agencies may seek adjustments of disposal guidelines <u>and</u> compare post-disposal benchmark chemistry with appropriate baseline benchmark station data. |
| | 4. Sediment toxicity at the onsite stations does not exceed the PSDDA Site Condition II biological response guidelines due to dredged material disposal. | Sediment Bioassays<br><br>Onsite | DMMP Bioassay Guidelines (Section 401 Water Quality Certification) | Benchmark station bioassays are performed (if archived after monitoring) and compared with baseline benchmark bioassay data. |
| **No. 3**<br><br>**Are unacceptable adverse effects due to dredged material disposal occurring to biological resources off site?** | 5. No significant increase due to dredged material disposal has occurred in the chemical body burden of benthic infauna species collected downcurrent of the disposal site. | Tissue Chemistry<br><br>Transect | Guideline values<br>Metals: 3x the baseline concentrations<br>Organics: 5x the baseline concentrations | Compare post-disposal benchmark tissue chemistry with baseline benchmark tissue chemistry data. |
| | 6. No significant decrease due to dredged material disposal has occurred in the abundance of dominant benthic infaunal species collected downcurrent of the disposal site. | Infaunal Community Structure<br><br>Transect | Guideline values<br>Abundance of major taxa < ½ baseline macrobenthic infauna abundances | Compare post-disposal benchmark benthic data with baseline benchmark data. |

1. To determine if observed changes in chemical conditions or infaunal benthos are due to dredged material disposal, data from the benchmark stations are considered. All decisions are subject to DMMP agency review and best professional judgment.

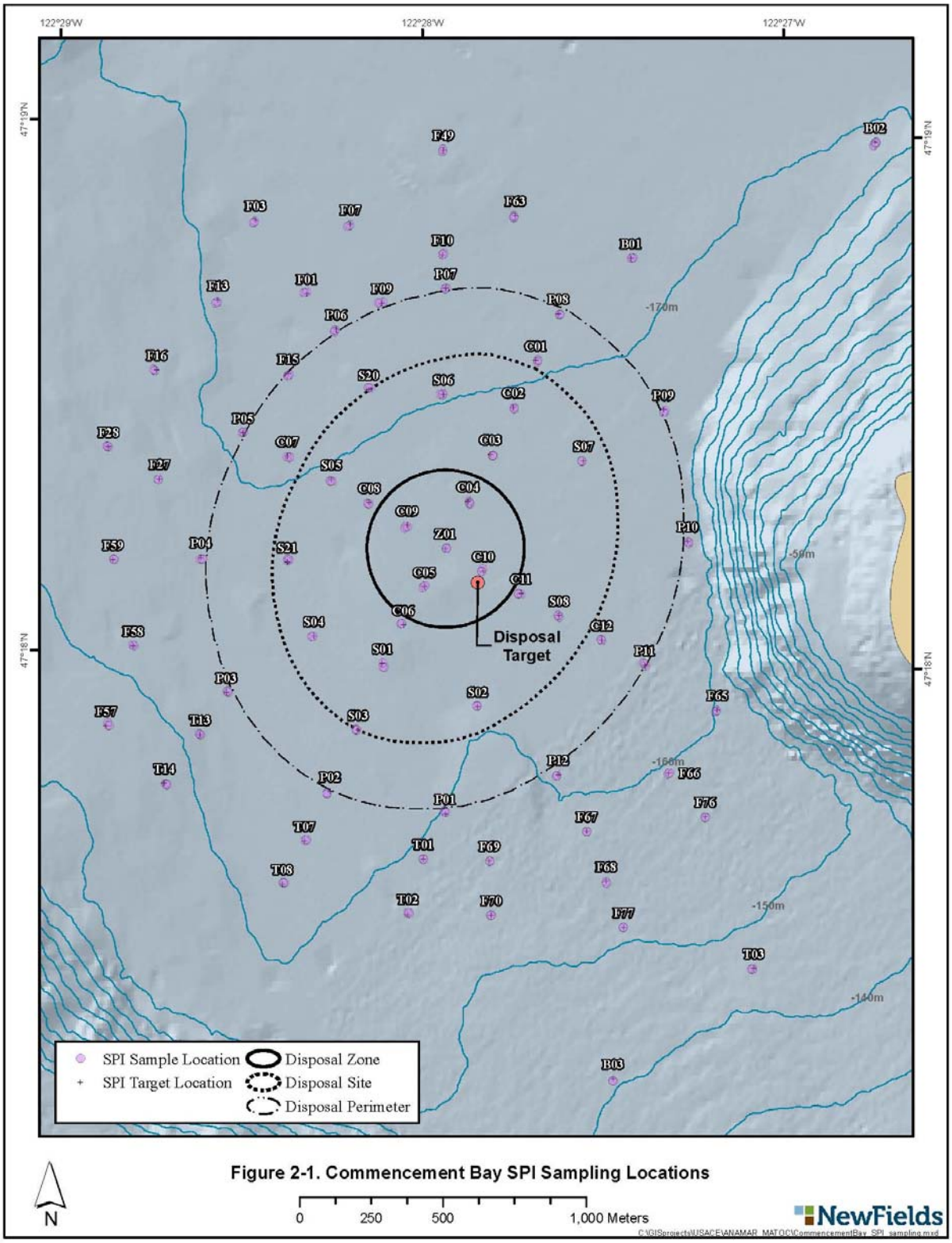



**Figure 2-1. Commencement Bay SPI Sampling Locations**

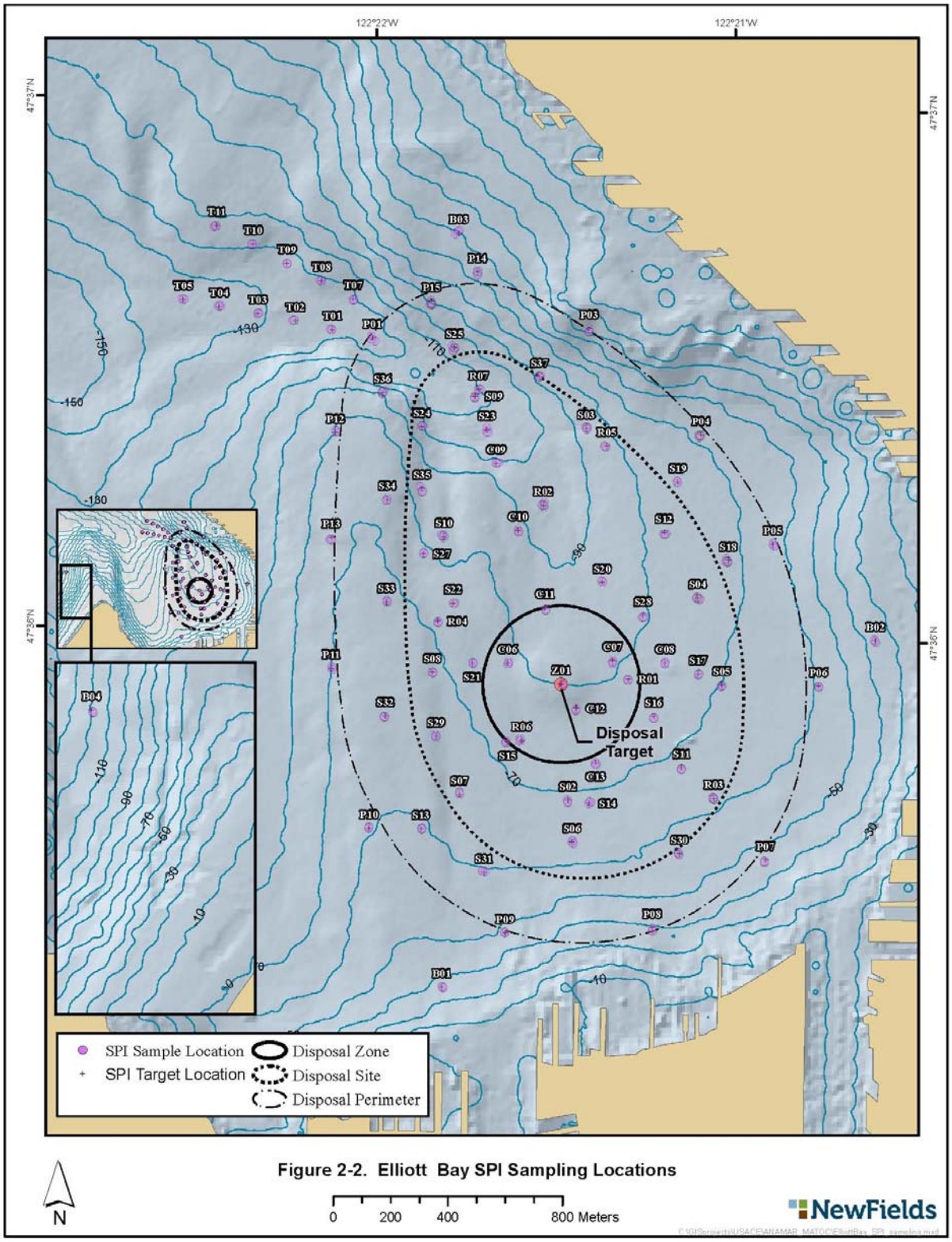



**Figure 2-2. Elliott Bay SPI Sampling Locations**

**Table 2-2.** CB and EB dredged material disposal site characteristics and monitoring trigger volumes

| Site | Area (acres) | Depth (feet) | Disposal Zone Diameter (feet) | Target Area Diameter (feet) | Disposal Site Dimensions (feet) | Site Coordinates (Lat/Long: NAD83) | Monitoring Trigger Volume (cy) |
|---|---|---|---|---|---|---|---|
| Commencement Bay[1] | 310 | 540–560 | 1,800 (circle) | 1,200 (circle) | 4,600 x 3,800 (ellipsoid) | 47° 18.145’<br>122° 27.815’ | 500,000 |
| Elliott Bay[2] | 415 | 300–360 | 1,800 (circle) | 1,200 (circle) | 6,200 x 4,000 (tear drop shape) | 47° 35.91’<br>122° 21.45’ | 500,000 |

Notes:
[1]The disposal coordinates were shifted to the location listed in this table on June 16, 2007. From 1988 to June 15, 2007 the disposal coordinates were as follows: 47° 18.21’, 122° 27.91’ (NAD 83). All disposal since the last full monitoring event in 2007 has occurred at the coordinates listed in the table.
[2] Following site monitoring in 1990, the original EB disposal coordinates were shifted 300 feet to the south by the DMMP agencies (Striplin 1991). The disposal zone was not changed, so the disposal coordinates plotted within the disposal zone will show the disposal coordinates are off center to the south relative to the center of the disposal zone.

**Table 2-3.** Disposal volumes (cubic yards) at the CB and EB dredged material disposal site since the last full SPI surveys

| Dredge Year | Commencement Bay | Elliott Bay |
|---|---|---|
| 2002 | --- | Last full SPI survey |
| 2003 | --- | 0 |
| 2004 | --- | 15,602 |
| 2005 | --- | 77,838 |
| 2006 | --- | 3,801 |
| 2007 | Last full SPI survey | 24,250 |
| 2008 | 214,858 | 172,999 |
| 2009 | 18,803 | 20,133 |
| 2010 | 14,812 | 96,046 |
| 2011 | 179,160 | 11,486 |
| 2012 | 0 | 152,349 |
| 2013 | 1,673[a] | 15,266[b] |
| **Total:** | **429,306** | **589,770** |

a. Last dredged material disposal at Commencement Bay occurred on 9/28/12
b. Last dredged material disposal at Elliott Bay occurred on 10/8/12

# 3.0 Methods

## 3.1 Field Survey and Deviations from the ICAP

Sediment profile images were collected using a sediment-profile camera system (Figure 3-1), deployed from the research vessel (R/V) *Kittiwake,* as outlined in the ICAP (Appendix A). The SPI survey at the Commencement Bay (CB) DMMP site was conducted on September 13 and 14, 2013. The SPI survey at the Elliott Bay (EB) DMMP site was conducted on September 16 and 17, 2013. A total of 68 stations were sampled at the CB site and 79 stations at the EB site (see Figures 2-1 and 2-2, respectively). The ICAP specified a target of 68 stations at the CB site and 75 stations at the EB site. Triplicate images were collected at each location.

The SPI surveys require 2 field days to complete at each disposal site. The "traditional across-site approach" of sampling SPI stations was followed at both the CB and EB disposal sites (see SAIC 2007). At the conclusion of the first day of SPI collection at each site, the DMMP agencies were consulted regarding target stations for Day 2 in order to delineate the dredged material footprint. Due to the shift in the CB target disposal coordinates in 2007, eight additional floating stations (CBF65, CBF66, CBF67, CBF68, CBF69, CBF70, CBF76, and CBF77) were designated to confirm the absence of dredged material in the southeast portion of the CB site. At the EB site, SPI images were also collected at the seven randomly placed dioxin sampling locations (EBR01 through EBR07) identified and sampled as part of the chemical and biological monitoring program conducted by DNR in the summer of 2013 (Integral 2013).

Positioning and navigation were accomplished using the *Kittiwake's* differential Global Positioning System (DGPS) integrated to a computerized navigation and survey system. Geographic coordinates for each SPI replicate image are provide in Appendix B. All CB sampling stations were identified with a "CB" prefix and all EB stations were identified with an "EB" prefix. Due to the short duration of the SPI surveys, establishing a reference location at each site (e.g., marina slip) to conduct navigation checks was not feasible. Instead, the geographic coordinates obtained from the primary DGPS system were periodically compared to the *Kittiwake's* secondary Nobeltec® DGPS system to ensure that the navigation and survey system was operating correctly.

## 3.2 Sediment Profile Imaging Overview

SPI images were collected using a Benthos model 3731 sediment-profile camera (Benthos, Inc., North Falmouth, MA) equipped with an Ocean Imaging Systems digital camera (Figure 3-2). The sediment-profile camera consists of a wedge-shaped prism with a Plexiglas face plate and a back mirror mounted at a 45 degree angle. Light was provided by an internal strobe. The camera obtains images of up to 20 cm of the upper sediment column in profile.

The camera prism was mounted on an assembly that can be moved up and down within a stainless steel frame by allowing tension or slack on the winch wire. As the camera was lowered, tension on the winch wire kept the prism in the up position. When the camera frame touched the seafloor, slack on the winch wire allowed the prism to vertically intersect the seafloor. The rate of fall of the prism (6 cm/second) was controlled by an adjustable passive hydraulic piston, which minimized the disturbance of the sediment-water interface.

A trigger was tripped on impact with the bottom, activating a 13 second time-delay on the shutter release, allowing the prism to obtain maximum penetration before an image was taken. The camera was then raised from the bottom, a wiper blade automatically cleaned off any sediment

adhering to the prism faceplate, and the strobes were recharged. The camera was then lowered to collect another replicate image.

## 3.3 SPI Image Analysis

Computer image analysis of SPI images followed a formal and standardized technique developed by Rhoads and Germano (1982, 1986). Physical and biological parameters were measured directly from the digital images by an SPI image analyst using computer image analysis software. The image analysis parameters included:

- Camera prism penetration depth;
- Sediment grain size (major mode and range);
- Surface boundary roughness;
- Presence of mud clasts;
- Presence of methane;
- Depth of the apparent redox potential discontinuity (RPD);
- Infaunal successional stage;
- Calculation of the Organism-Sediment Index (OSI); and
- Dredged material thickness, including determination of recent or historical if possible.

All data were edited and verified by a senior-level scientist before final data synthesis, statistical analysis, and interpretation. Additional details regarding the specific measurement techniques and interpretive criteria for each parameter can be found in the ICAP (Appendix A).

**Figure 3-1.** SPI camera operations in Commencement and Elliott Bays.

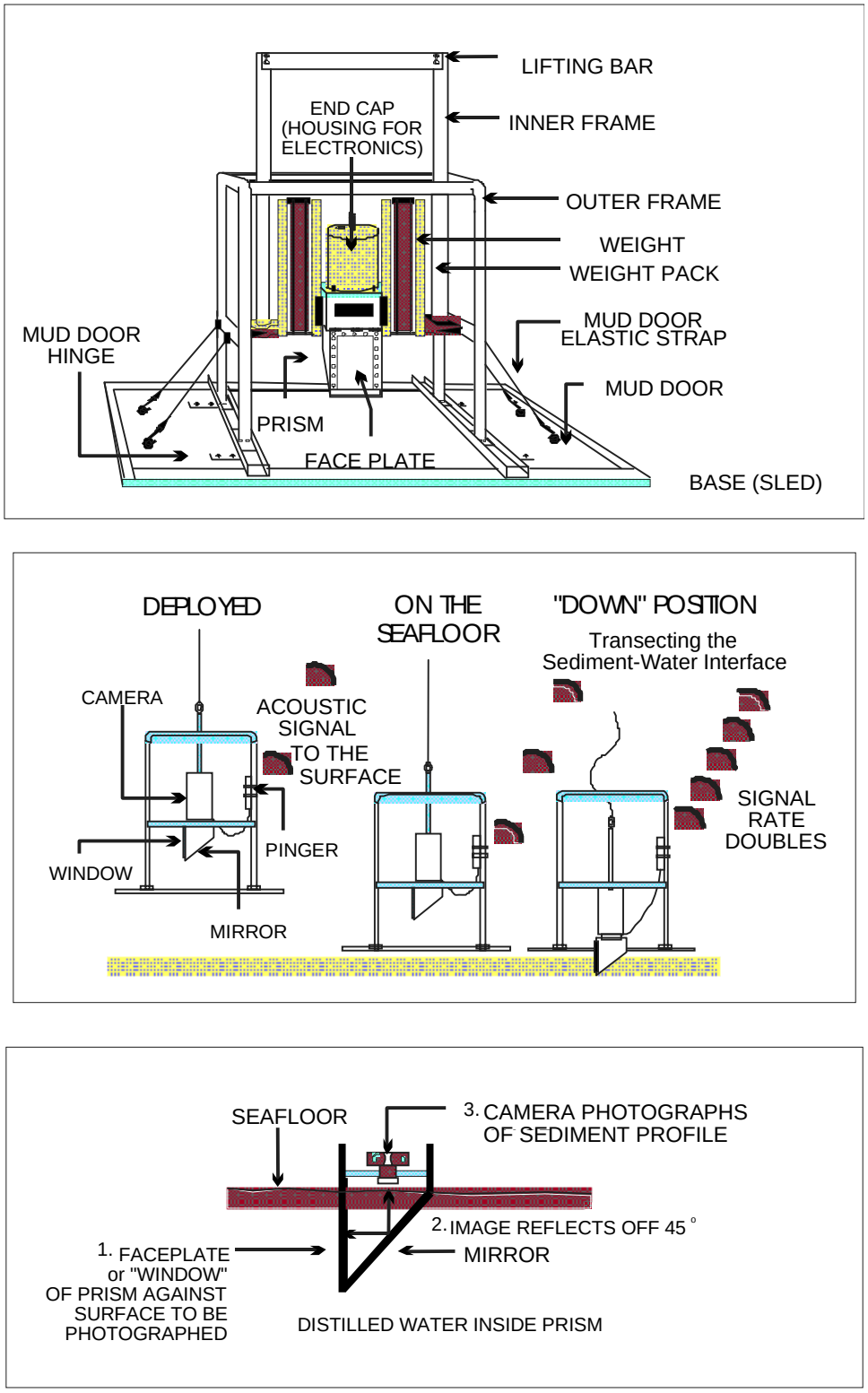



**Figure 3-2.** Schematic diagram of the sediment profile camera and sequence of operation on deployment.

# 4.0 Results

This section presents the results of the 2013 SPI surveys conducted at the Commencement Bay (CB) and Elliott Bay (EB) DMMP dredged material disposal sites. The CB results are presented in Section 4.1, and the EB results are presented in Section 4.2. An evaluation of the SPI data in accordance with the DMMP monitoring framework is provided in Section 5.0.

## 4.1 Commencement Bay

Triplicate SPI images were analyzed at 68 CB stations to map the dredged material footprint (see Figure 2-1). In addition, other physical (grain size major mode, prism penetration depth, boundary roughness), chemical (apparent RPD), and biological (successional stage and OSI) characteristics of site sediments were determined from the SPI images. A summary of mean and median values of the SPI results is provided in Table 4-1. A full summary of the image analysis results is provided in Appendix C. The primary objectives of the 2013 survey were to map the distribution of dredged material at the CB disposal site and examine near-surface, benthic habitat conditions. In addition, the survey was used to assess whether the shift in the CB target disposal coordinates in 2007 had affected the dredged material deposition patterns at the site.

### 4.1.1 CB Ambient Sediment Characteristics

Ambient sediment characteristics near the CB site were similar to previous disposal site observations (e.g., SEA 2001, SAIC 2005, SAIC 2008), consisting of tan brown to olive gray, unconsolidated (water-rich) silts and clays with minor amounts of fine sand. The apparent RPD depths were relatively deep in these ambient sediments. Feeding voids were visible, indicating extensive bioturbation of surface sediments by head-down deposit-feeding infaunal organisms. Representative SPI images showing ambient sediment conditions at the CB site are provided in Figure 4-1.

Based on previous monitoring surveys, it is known that ambient sediments to the north and northwest of the disposal site (approximately 0.5 mile or more from the northern site perimeter) consist primarily of medium to fine sands with silt. This distribution of coarse-grained sediments was observed at Commencement Bay during the original disposal site evaluation studies in central Puget Sound (PSDDA 1988a). The SPI survey grid utilized in 2013 did not extend as far to the northwest compared to previous surveys. However, five stations occupied in this northwest region in 2013 (CBF13, CBF16, CBF27, CBF28, and CBF59) showed evidence of sandy ambient sediment conditions (Figure 4-2).

### 4.1.2 Dredged Material Distribution

Dredged material is normally identified in SPI images by its contrasting optical appearance relative to the ambient seafloor. Multiple disposal events at a site can result in sedimentary layering with varying colors and textures, or a mixed and chaotic sedimentary fabric. Diagnostic characteristics can include differences in grain size, color and reflectivity, high boundary roughness, and a mixed or chaotic sedimentary fabric. The optical and physical characteristics of the dredged material may change over time due to the addition of newly deposited dredged material and subsequent biological mixing. However, many of the stratigraphic and textural features associated with dredged material deposits can remain the same over time.

Where possible, the dredged material observed in the SPI images collected at the CB site was classified as historical or recently placed. The dredged material was identified as historic when

enough time had passed for a deep apparent RPD to be developed, feeding voids were present, and sedimentary layering due to dredged material disposal (if present) was not completely obscured through bioturbation. The CB disposal site had not received significant amounts of dredged material since 2011 (see Table 2-3). Therefore, enough time had also passed for the most recently placed dredged material to also show characteristics that could be considered historical (e.g., presence of Stage III infauna and well developed apparent RPD depths). For this survey, dredged material was classified as recent if either of the following conditions was observed:

1. The majority of sedimentary layering related to dredged material disposal was still intact
2. Significant deposits of reduced dredged material was present at depth, with minimal biological mixing

The distribution of recent dredged material observed at the CB site is presented in Figure 4-3. Recent dredged material was detected in SPI images collected from 23 CB stations and the dredged material was confined within the perimeter of the disposal site, with the exception of trace or very thin accumulations detected just north of the site. A north to northwest trending pattern of dredged material is consistent with general depositional trends observed during previous monitoring surveys at the CB site (SEA 2001, SAIC 2007). Dredged material at the site center was composed of tan and gray medium and fine sands with silt (Figure 4-4). Prism penetration at stations within the disposal zone was low due to the presence of coarse-grained, consolidated dredged material. Recent dredged material along the outer flanks of the deposit consisted of trace amounts of fine sand or thin layers (0.68 to 1.44 cm) of tan and gray silt enriched with fine sand, overlying ambient sediments or historical dredged material deposits (Figure 4-5). The accumulation of recent dredged material beyond the site perimeter did not exceed the 3 cm DMMP criterion.

Dredged material identified as historic was detected in images from 22 stations, primarily within the disposal site perimeter (Figure 4-6). Historic dredged material consisted of discontinuous layers of dredged material at depth, where enough time has passed for significant biological mixing of the dredged material but some evidence of the layering remains visible in the SPI images (Figure 4-7). Historic dredged material was detected at 19 stations within or along the disposal site perimeter, and three floating stations located to the north outside of the disposal site perimeter (CBF07, CBF10, and CBF63).

### 4.1.3 Physical and Sedimentary Features

Physical and sedimentary features determined from SPI images include grain size major mode, camera prism penetration, and boundary roughness. Grain size major mode within the CB disposal zone generally consisted of fine sand (3-2 $\phi$) and very fine sand (4-3 $\phi$) due to the presence of coarse grained dredged material (Figure 4-8). Outside of the disposal zone, the sediment grain size consisted of very fine sand (4-3 $\phi$) to silt-clays (> 4 $\phi$). As discussed in Section 4.1.1, fine and very fine sand were present in ambient areas to the north and northwest of the disposal site. However, the major mode for those locations was still silt-clay. Where multiple sediment layers were present, the grain size major mode represented the sediment layer most prevalent within the SPI image.

The distribution of SPI camera prism penetration (in centimeters) in CB sediments is presented in Figure 4-9. Prism penetration provides a relative measure of sediment bearing capacity. Unconsolidated, fine-grained sediments that experience bioturbation generally have higher water

content and deeper prism penetration than coarse grained, compact sediments. The shallowest prism penetration was measured in the disposal zone (2.3 to 6.6 cm) due to the presence of compact, coarse-grained dredged material (see Figure 4-4). Prism penetration was deeper outside of the disposal zone, with an average of 15.5 cm (± 2.7 cm).

Mean bottom boundary roughness measurements during the 2013 SPI survey are shown in Figure 4-10. Mean small-scale boundary roughness (surface relief) can be physical or biological in nature, and is the difference between the highest and lowest penetration depth measured in an SPI image. Physical boundary relief can include surface ripples, mud clasts, and irregular surface features due to dredged material disposal or bottom currents. Biogenic activity that creates boundary roughness includes fecal mounds, burrow excavations, and foraging and feeding pits. The average surface relief during the 2013 survey was 2.03 cm (± 1.38 cm). The majority of surface relief was identified as biogenic (94% of stations). Mean boundary roughness at stations within the disposal site boundary were generally less than surrounding areas. Higher concentrations of dredged material were present onsite, particularly the disposal zone, which contained a higher proportion of sand and tended to maintain a lower surface relief (see Figure 4-6).

### 4.1.4 Chemical and Biological Features

Chemical and biological parameters include the apparent RPD depth, benthic infaunal successional stage, and calculation of the OSI. These parameters provide an assessment of the overall health of the benthic habitat at the Commencement Bay disposal site.

#### *Apparent Redox Potential Discontinuity*

The apparent RPD depth estimates the depth of oxygenation in the upper sediment column and provides an estimate of the biological mixing depth by infaunal organisms. Mean apparent RPD depths at the CB site range from 1.74 to 5.68 cm, with an average depth of 3.83 cm (Figure 4-11). The shallowest apparent RPD depths (<2.0 cm) were measured at the center of the disposal site, where the most dredged material disposal has occurred. The major mode of mean apparent RPD depths during the 2013 SPI survey was 3.5 to 4.0 cm, which is deeper than the most recent survey in 2007 (major mode of 2.5 to 3.0 cm) and the survey in 2005 (major mode of 3.0 to 3.5 cm). The deeper apparent RPD depths in 2013 are consistent with the hiatus of significant dredged material disposal at the CB site since 2011, allowing time for the benthic organisms to recolonize and biologically mix the dredged material sediments.

#### *Benthic Infaunal Successional Stage*

Benthic infaunal communities generally follow a three-stage succession following a disturbance of the seafloor (Figure 4-12) (Pearson and Rosenberg 1978, Rhoads and Germano 1986). Stage I infauna typically colonize the sediment surface soon after disturbance (e.g., following dredged material disposal). These opportunistic organisms may consist of small, tubicolous, surface-dwelling polychaetes. Stage II organisms are typically shallow-dwelling bivalves or tube-dwelling amphipods. Stage II communities are considered a transitional community before reaching Stage III, the high-order successional stage consisting of long-lived, infaunal deposit-feeding organisms. Stage III invertebrates may feed at depth in a head-down orientation and create distinctive feeding voids visible in SPI images.

Stage I on III benthic communities were observed at 55 stations at the CB site. Five stations within the site boundary (CBC04, CBC05, CBC08, CBS06, and CBZ01) showed the presence of

only Stage I succession. (Figure 4-13). Seven stations, including one within the disposal site (CBC06), one perimeter station (CBP02), three floating stations (CBF63, CBF70, CBF77), and two transect stations (CBT01, and CBT02), showed the presence of only Stage III succession. Stage II on III succession was observed at two stations; one within the disposal site (CBS21) and one floating station to the north (CBF07). The indicator species for Stage II classification at Commencement Bay was the stick building amphipod (*Podoceridae*) (see Figure 4-7). The benthic community appears to be in the last stages of transition to the highest order of succession (full Stage III community) following the most recent dredged material disposal.

### *Organism Sediment Index (OSI)*

The Organism Sediment Index (OSI) provides a measure of general benthic habitat quality in shallow water environments based on dissolved oxygen conditions, depth of apparent RPD, infaunal successional stage, and presence or absence of sedimentary methane measured from SPI images (Rhoads and Germano 1986). The OSI is a numerical index ranging from -10 to +11. The lowest value is given to bottom sediments with low or no dissolved oxygen in the overlying bottom water, no apparent macrofaunal life, and methane gas present in the sediment. The OSI for such a condition is -10 (highly disturbed or degraded benthic habitat quality). High OSI values are given to aerobic bottom sediments with deep apparent RPD depths, mature macrofaunal community, and no methane gas (unstressed or undisturbed benthic habitat quality). Previous SPI surveys conducted in various marine and coastal regions have shown that OSI values between +7 and +11 are typical of natural, undisturbed, fine grained sediments. OSI values less than +6 can indicate a stressed or disturbed benthic environment, and values less than 0 indicate degraded benthic habitat.

The distribution of median OSI values calculated at the CB site is presented in Figure 4-14. Median OSI values ranged from +5 to +11 within the disposal site boundary as well as offsite. The lowest median OSI values in Commencement Bay (+5) were observed at two stations (CBZ01 and CBC08) within or close to the disposal zone boundary. The vast majority of stations (97%) had OSI values equal to or greater than +6, which indicated natural or undisturbed benthic habitat in nearly all areas of the CB site. The two year hiatus of significant dredged material disposal at the CB site has confirmed that a healthy and resilient benthic infaunal community continues to thrive in Commencement Bay sediments.

**Table 4-1.** Commencement Bay SPI summary table

| Station | Avg Prism Pen. (cm) | Dredged Material Thickness Recent (cm) | Dredged Material Thickness Historical (cm) | Grain Size Major Mode (phi) | Avg. Surface Boundary Roughness (cm) | Mud Clasts | Mean RPD | Highest Successional Stage | Median OSI |
|---|---|---|---|---|---|---|---|---|---|
| CBB01 | 17.71 | | | >4 phi | 2.13 | present | 4.85 | Stage I on III | 7 |
| CBB02 | 19.76 | | | 4 to 3 phi | 1.82 | | 3.67 | Stage I on III | 11 |
| CBB03 | 16.27 | | | 4 to 3 phi | 1.61 | present | 3.8 | Stage I on III | 11 |
| CBC01 | 16.56 | | 0.64 | >4 phi | 1.3 | present | 3.53 | Stage I on III | 10 |
| CBC02 | 16.9 | | 2.26 | >4 phi | 1.32 | | 4.31 | Stage I on III | 11 |
| CBC03 | 15.42 | 0.75 | | 3 to 2 phi | 2.21 | present | 4.12 | Stage I on III | 11 |
| CBC04 | 6.57 | > 6.57 | | 3 to 2 phi | 1.67 | | 3.34 | Stage I | 6 |
| CBC05 | 2.98 | > 2.98 | | >4 phi | 1.11 | | >2.28 | Stage I | 7 |
| CBC06 | 8.96 | > 5.94 | 2.23 | 4 to 3 phi | 2.52 | | 3.45 | Stage III | 7 |
| CBC07 | 13.35 | | | >4 phi | 3.89 | | 3.7 | Stage I on III | 10 |
| CBC08 | 5.04 | 2.29 | 2.75 | >4 phi | 1.37 | | 3.2 | Stage I | 5 |
| CBC09 | 5.98 | > 3.95 | > 1.81 | >4 phi | 1.41 | | >3.24 | Stage I on III | 7 |
| CBC10 | 6.28 | > 6.28 | | >4 phi | 1.77 | | >2.19 | Stage I on III | 8 |
| CBC11 | 7.8 | > 7.80 | | >4 phi | 1.2 | | 1.89 | Stage I on III | 8 |
| CBC12 | 14.4 | 0.59 | > 9.86 | >4 phi | 1.59 | present | 2.17 | Stage I on III | 8 |
| CBF01 | 16.95 | | 2.79 | >4 phi | 1.61 | present | 3.85 | Stage I on III | 11 |
| CBF03 | 16.64 | | | >4 phi | 1.56 | | 3.95 | Stage I on III | 11 |
| CBF07 | 16.39 | 0.23 | 1.41 | 4 to 3 phi | 3 | present | 4.53 | Stage II on III | 11 |
| CBF09 | 16.81 | | | >4 phi | 2.27 | | 4.53 | Stage I on III | 11 |
| CBF10 | 16.53 | | | >4 phi | 1.33 | | 4.6 | Stage I on III | 11 |
| CBF13 | 12.87 | | | >4 phi | 1.92 | | 3.74 | Stage I on III | 10 |
| CBF15 | 15.15 | | | 3 to 2 phi | 2.1 | | 3.65 | Stage I on III | 10 |
| CBF16 | 15.23 | | | 4 to 3 phi | 1.13 | | 4.19 | Stage I on III | 11 |
| CBF27 | 15.23 | | | >4 phi | 1.53 | | 4.5 | Stage I on III | 11 |
| CBF28 | 15.26 | | | >4 phi | 1.73 | | 4.31 | Stage I on III | 11 |
| CBF49 | 15.86 | 0.25 | | >4 phi | 1.08 | | 3.73 | Stage I on III | 10 |
| CBF57 | 16.88 | | | >4 phi | 1.5 | | 4.09 | Stage I on III | 11 |
| CBF58 | 13.7 | | | >4 phi | 3.04 | | 2.79 | Stage I on III | 10 |
| CBF59 | 15.14 | | | >4 phi | 2.65 | present | 4.57 | Stage I on III | 11 |
| CBF63 | 17.14 | | > 3.80 | >4 phi | 1.21 | present | 4.68 | Stage III | 11 |
| CBF65 | 16.53 | | | >4 phi | 2.26 | | 5.11 | Stage I on III | 11 |
| CBF66 | 16.37 | | | >4 phi | 2 | | 3.76 | Stage I on III | 10 |
| CBF67 | 15.74 | | | >4 phi | 2.28 | | 4.11 | Stage I on III | 10 |
| CBF68 | 15.86 | | | >4 phi | 1.64 | present | 5.68 | Stage I on III | 11 |
| CBF69 | 15.92 | | | >4 phi | 2.26 | | 4.82 | Stage I on III | 11 |
| CBF70 | 16.27 | | | >4 phi | 3.16 | | 4.3 | Stage III | 11 |
| CBF76 | 15.78 | | | >4 phi | 2.13 | | 4.41 | Stage I on III | 11 |
| CBF77 | 18.12 | | | >4 phi | 0.82 | present | 5.03 | Stage III | 11 |
| CBP01 | 17.22 | | | >4 phi | 1.24 | | 4.37 | Stage I on III | 11 |
| CBP02 | 16.97 | | | >4 phi | 2.2 | present | 3.45 | Stage III | 10 |
| CBP03 | 17.08 | | | >4 phi | 3.66 | | 2.32 | Stage I on III | 9 |
| CBP04 | 14.98 | | > 10.79 | >4 phi | 2.15 | | 3.15 | Stage I on III | 10 |
| CBP05 | 12.62 | | | >4 phi | 1.49 | | 2.88 | Stage I on III | 9 |
| CBP06 | 16.28 | | | 4 to 3 phi | 4.82 | present | 4.09 | Stage I on III | 11 |
| CBP07 | 15.91 | 0.09 | | >4 phi | 1.73 | | 3.84 | Stage I on III | 11 |
| CBP08 | 17.21 | | | >4 phi | 3.43 | | 3.95 | Stage I on III | 11 |
| CBP09 | 16.74 | | | >4 phi | 3.13 | | 3.98 | Stage I on III | 10 |
| CBP10 | 15.95 | | | >4 phi | 1.71 | | 3.71 | Stage I on III | 10 |
| CBP11 | 16.12 | | | >4 phi | 1.51 | present | 3.52 | Stage I on III | 10 |

| Station | Avg Prism Pen. (cm) | Dredged Material Thickness Recent (cm) | Dredged Material Thickness Historical (cm) | Grain Size Major Mode (phi) | Avg. Surface Boundary Roughness (cm) | Mud Clasts | Mean RPD | Highest Successional Stage | Median OSI |
|---|---|---|---|---|---|---|---|---|---|
| CBP12 | 16.28 | | > 1.02 | >4 phi | 2.16 | present | 4.56 | Stage I on III | 11 |
| CBS01 | 13.8 | 0.52 | | >4 phi | 1.38 | present | 3.74 | Stage I on III | 11 |
| CBS02 | 16.36 | 1.03 | > 12.10 | >4 phi | 1.11 | present | 3.88 | Stage I on III | 11 |
| CBS03 | 16.31 | | 3.85 | >4 phi | 0.93 | present | 2.8 | Stage I on III | 9 |
| CBS04 | 17.78 | | > 13.62 | >4 phi | 1.77 | present | 4.33 | Stage I on III | 11 |
| CBS05 | 11.08 | 0.83 | > 8.29 | >4 phi | 2.83 | | 3.33 | Stage I on III | 10 |
| CBS06 | 13.21 | 0.63 | > 11.40 | >4 phi | 3.2 | | 3.53 | Stage I | 6 |
| CBS07 | 18.11 | | > 14.05 | >4 phi | 2.32 | | 3.47 | Stage I on III | 10 |
| CBS08 | 14.49 | 1.12 | > 10.31 | >4 phi | 1.79 | | 3.94 | Stage I on III | 7 |
| CBS20 | 14.1 | 0.43 | > 11.55 | >4 phi | 2 | | 3.99 | Stage I on III | 11 |
| CBS21 | 14.37 | 0.11 | > 9.65 | >4 phi | 3.11 | present | 3.37 | Stage II on III | 10 |
| CBT01 | 17.74 | | | >4 phi | 1.63 | | 4.59 | Stage III | 11 |
| CBT02 | 16.61 | | | >4 phi | 1.93 | | 3.36 | Stage III | 9 |
| CBT03 | 14.12 | | | >4 phi | 3.13 | | 3.46 | Stage I on III | 7 |
| CBT07 | 16.46 | | | >4 phi | 2.39 | | 4.17 | Stage I on III | 10 |
| CBT08 | 16.65 | | | >4 phi | 1.5 | present | 4.64 | Stage I on III | 11 |
| CBT13 | 16.52 | | | >4 phi | 3.66 | | 3.25 | Stage I on III | 10 |
| CBT14 | 16.27 | | | >4 phi | 2 | present | 3.45 | Stage I on III | 10 |
| CBZ01 | 15.78 | present | | >4 phi | 1.19 | | >1.74 | Stage I | 5 |

Note: Grain size major mode ranges can be found in Appendix C.

**CBB03-A** **CBF77-B**

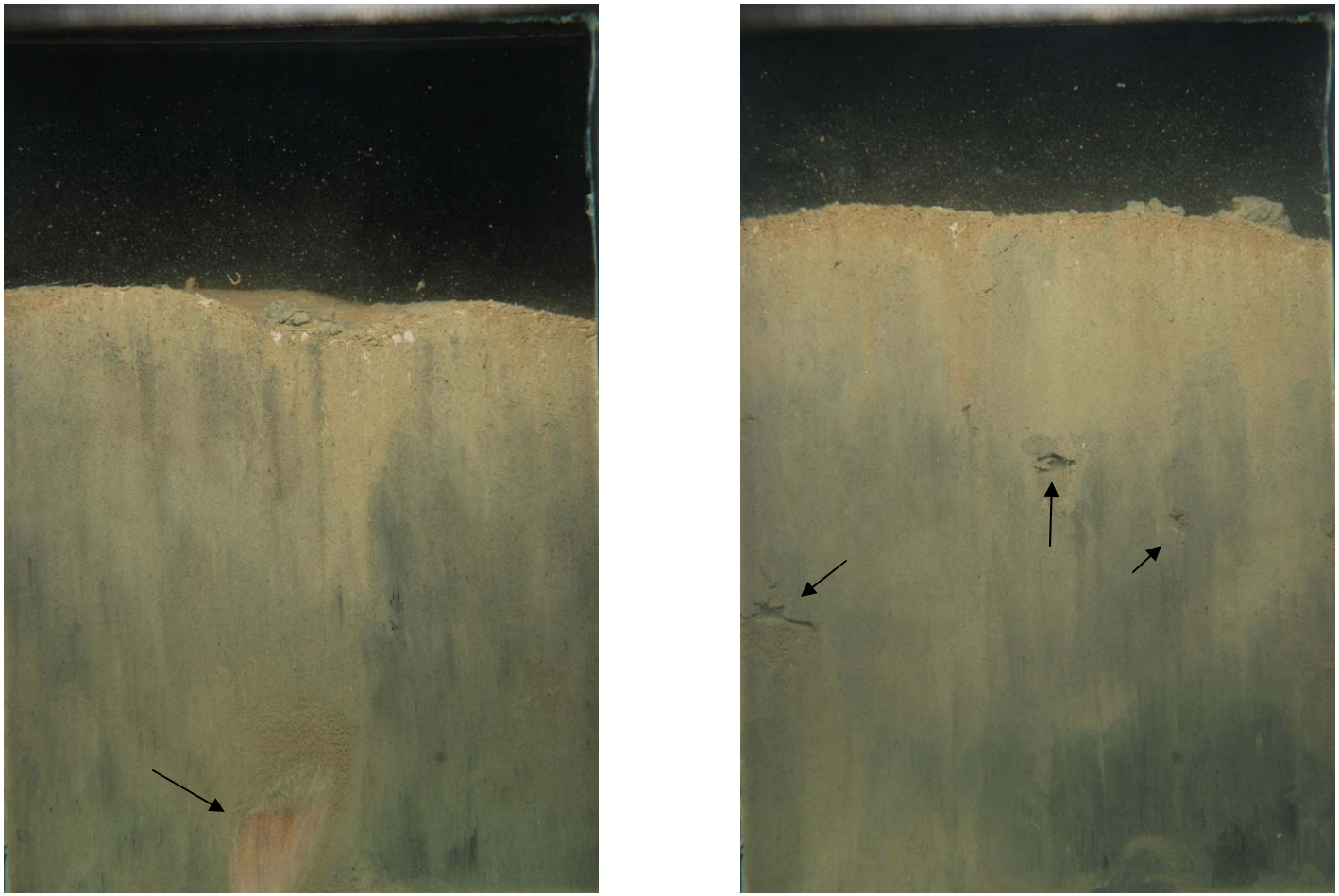


**Figure 4-1.** SPI images from stations CBB03-A and CBF77-A

Station CBB03 replicate A (CBB03-A) and Station CBF77 replicate B (CBF77-B) showed fine-grained ambient sediments observed near the Commencement Bay DMMP disposal site. Both locations showed relatively deep apparent RPD depths and evidence of well-established benthic infaunal communities. A sea cucumber (*Molpadia intermedia*) was observed at depth at CBB03-A (arrow), and well developed feeding voids were observed at CBF77-B (arrows) created by head-down deposit-feeding organisms (Stage III successional stage). Image width is 14.6 cm.

**CBF13-A** **CBF28-B**

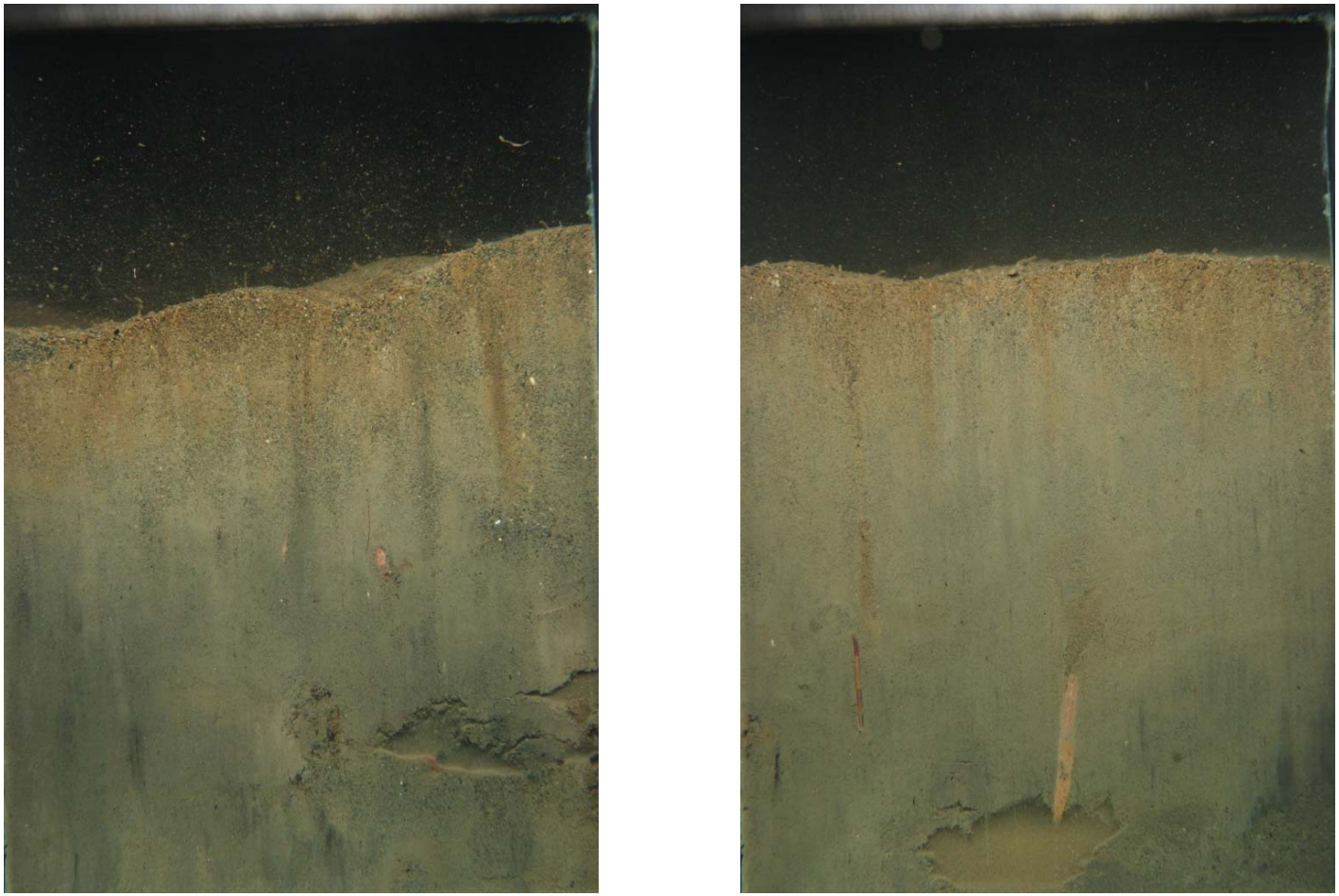


**Figure 4-2.** SPI images from stations CBF13-A and CBF28-B

Stations CBF13-A and CBF28-A are located to the northwest of the disposal site and showed the presence of ambient sediments containing higher proportions of sand. The sediments consisted of brown to gray silty fine sands grading to gray silt with depth. Both images showed polychaetes at depth with well developed feeding voids created by head-down deposit feeding organisms. Image width is 14.6 cm.

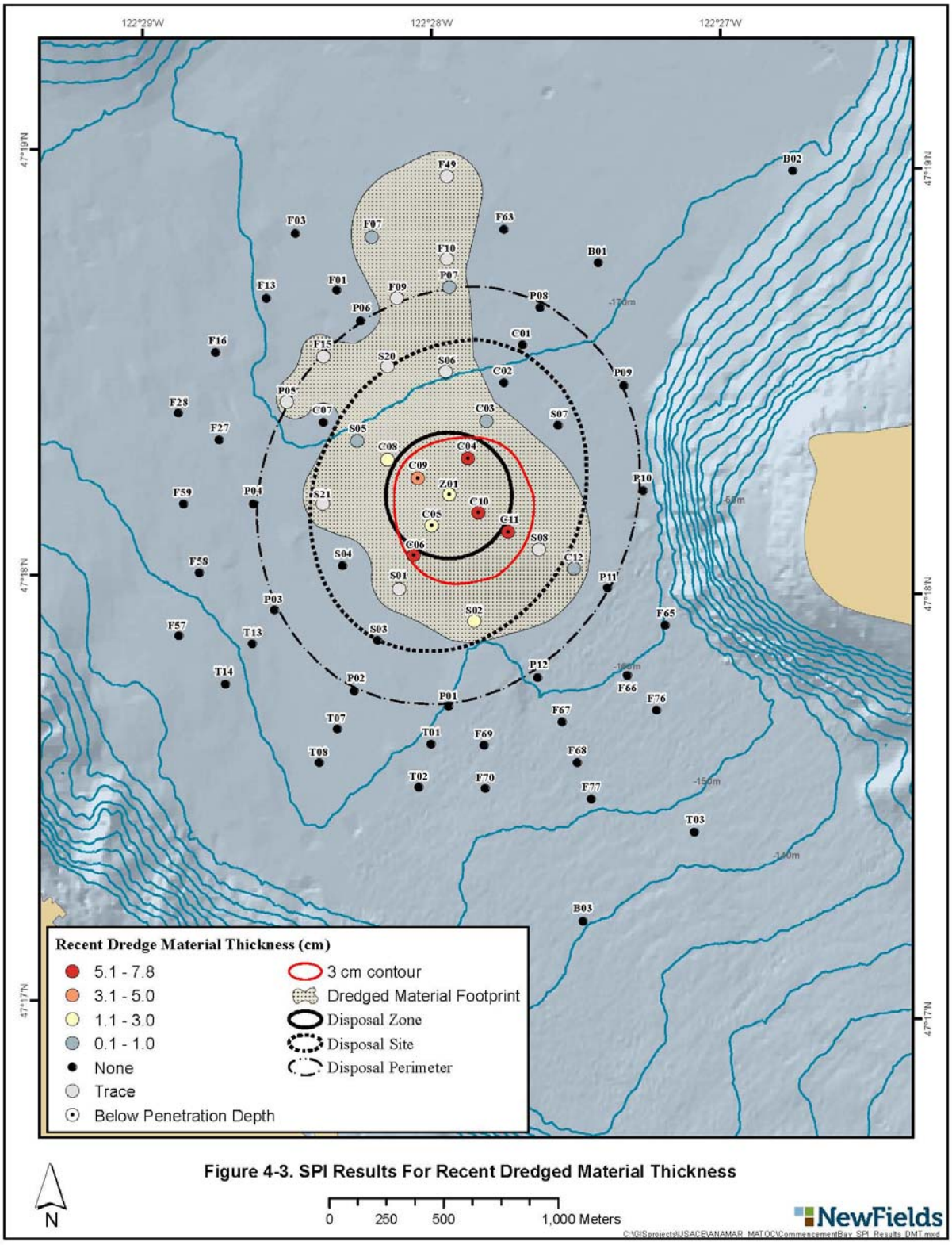



**Figure 4-3. SPI Results For Recent Dredged Material Thickness**

**CBZ01-B** **CBC10-C**

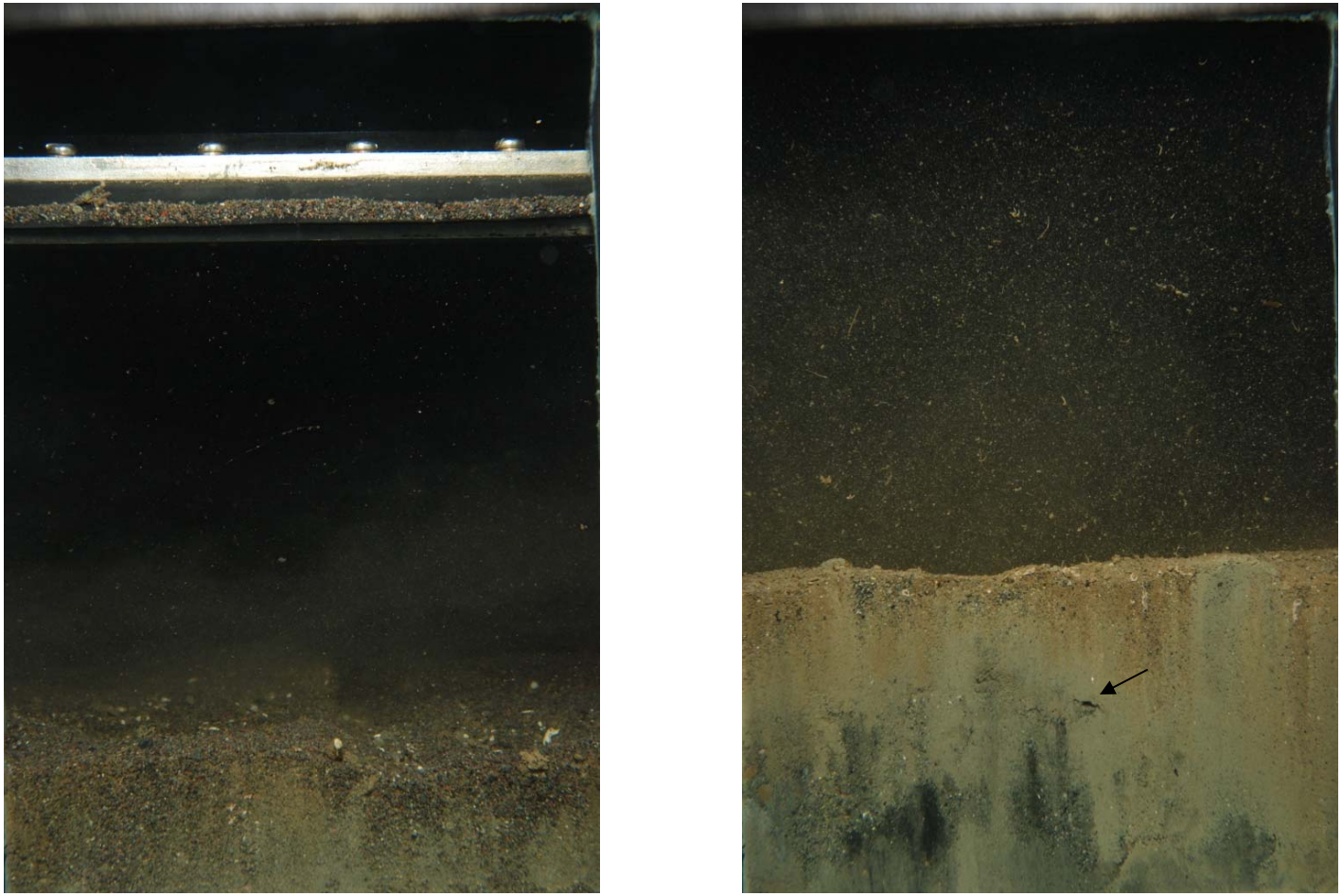


**Figure 4-4.** SPI images from stations CBZ01-B and CBC10-C

Stations CBZ01-B and CBC10-C are located within the disposal zone and showed the presence of recent dredged material deposits consisting of compact sands intermixed with silt. Camera prism penetration was relatively low due to the coarse-grained consolidated nature of the dredged material. A small feeding void (arrow) was visible within the sediment column at CBC-10A, indicating the recolonization of head-down deposit feeding organisms near the site center. Image width is 14.6 cm.

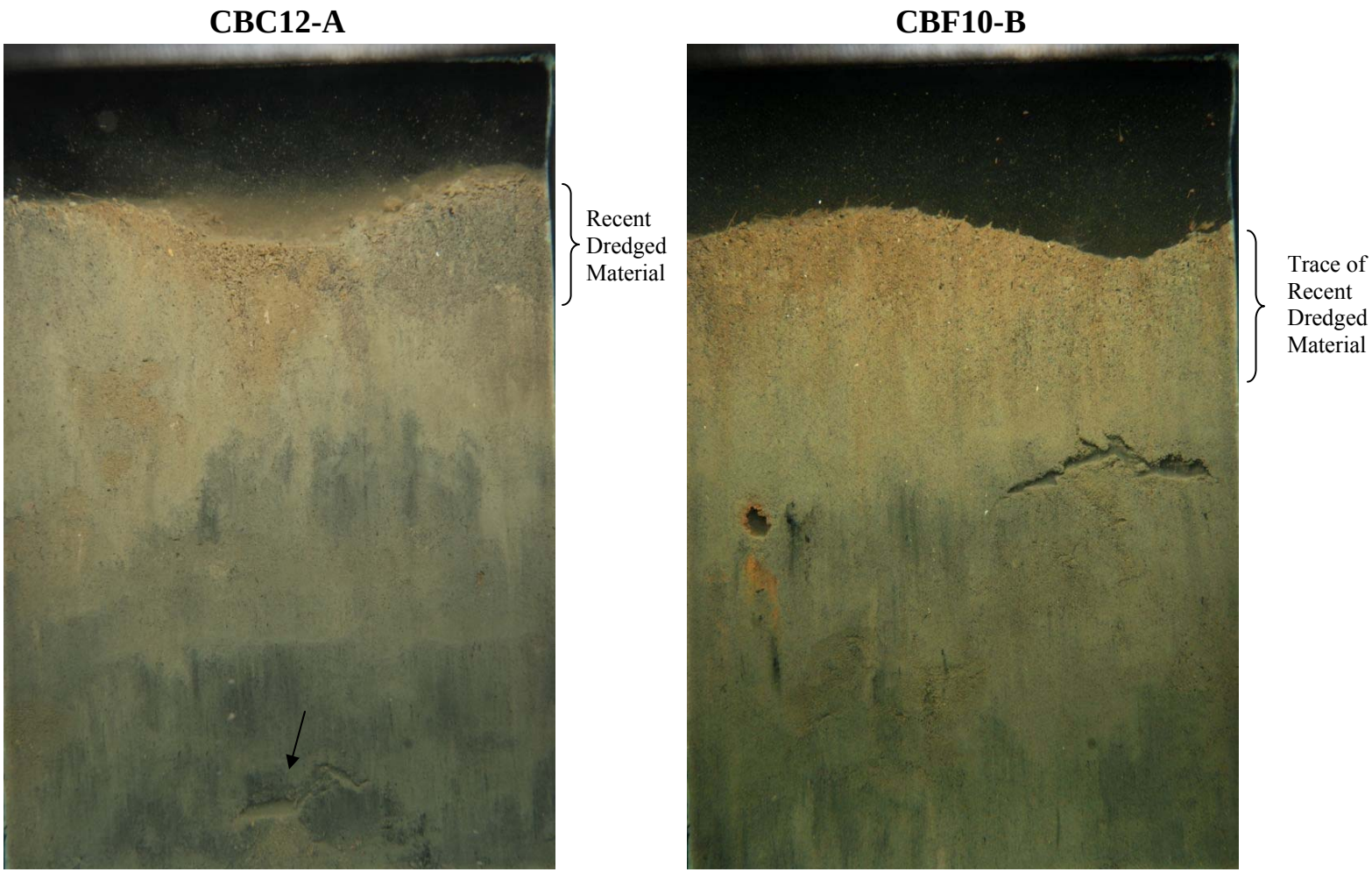



**Figure 4-5.** SPI images from stations CBC12-A and CBF10-B

Thin layers of dredged material were observed at stations CBC12-A and CBF10-B along the flanks of the dredged material deposit. CBC12-A showed surface concentrations of gray fine sand interpreted to be recent dredged material. Historical dredged material was visible at depth evidenced by discontinuous reduced sedimentary layers and extensive biological mixing (arrow pointing to feeding void at depth). Traces of fine sand mixed in the surface at CBF10-B along the northern flanks of the deposit were interpreted to be recent dredged material. Subsurface sediments are well mixed indicative of ambient sediment conditions. Image width is 14.6 cm.

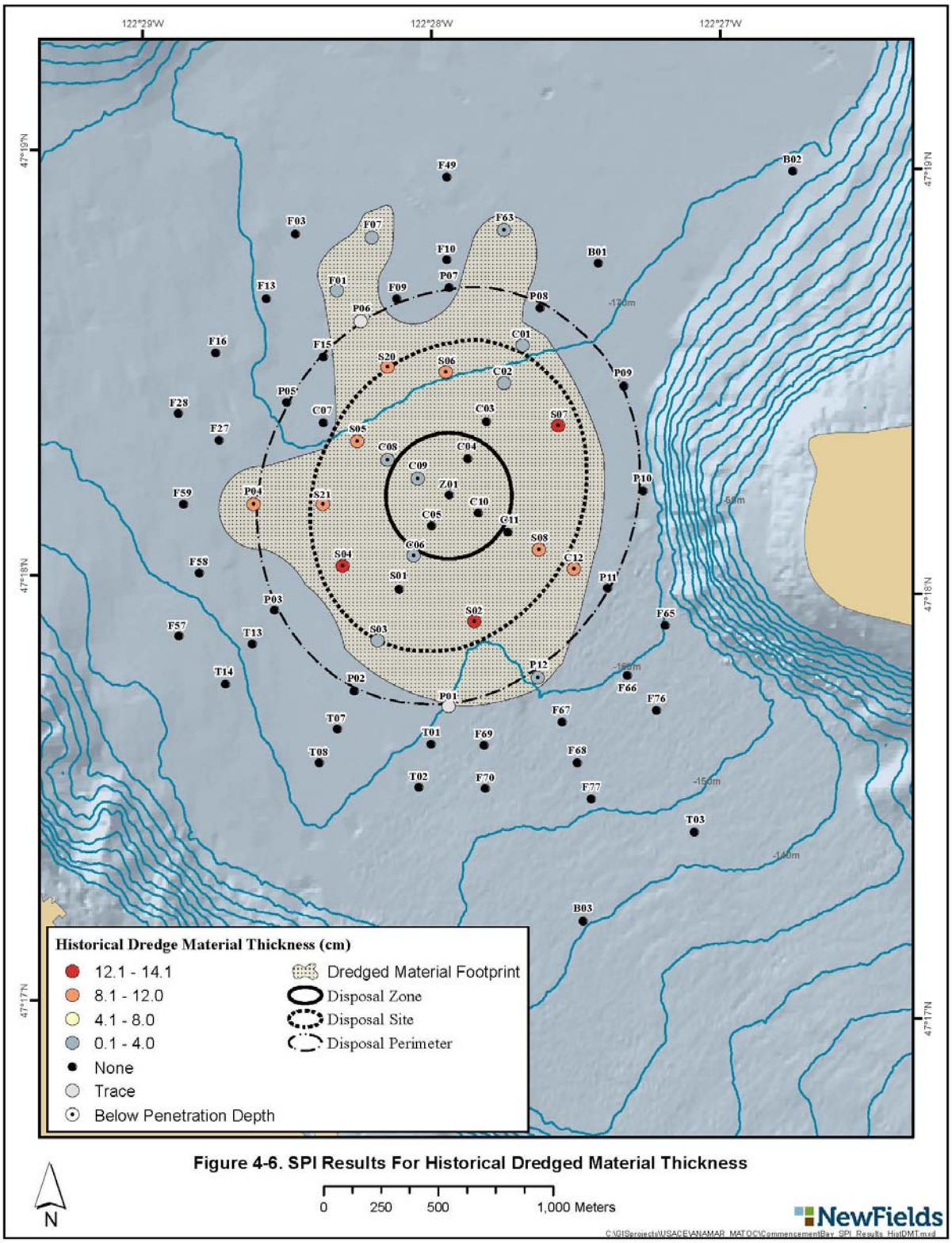



**Figure 4-6. SPI Results For Historical Dredged Material Thickness**

**CBS07-B** **CBS21-C**

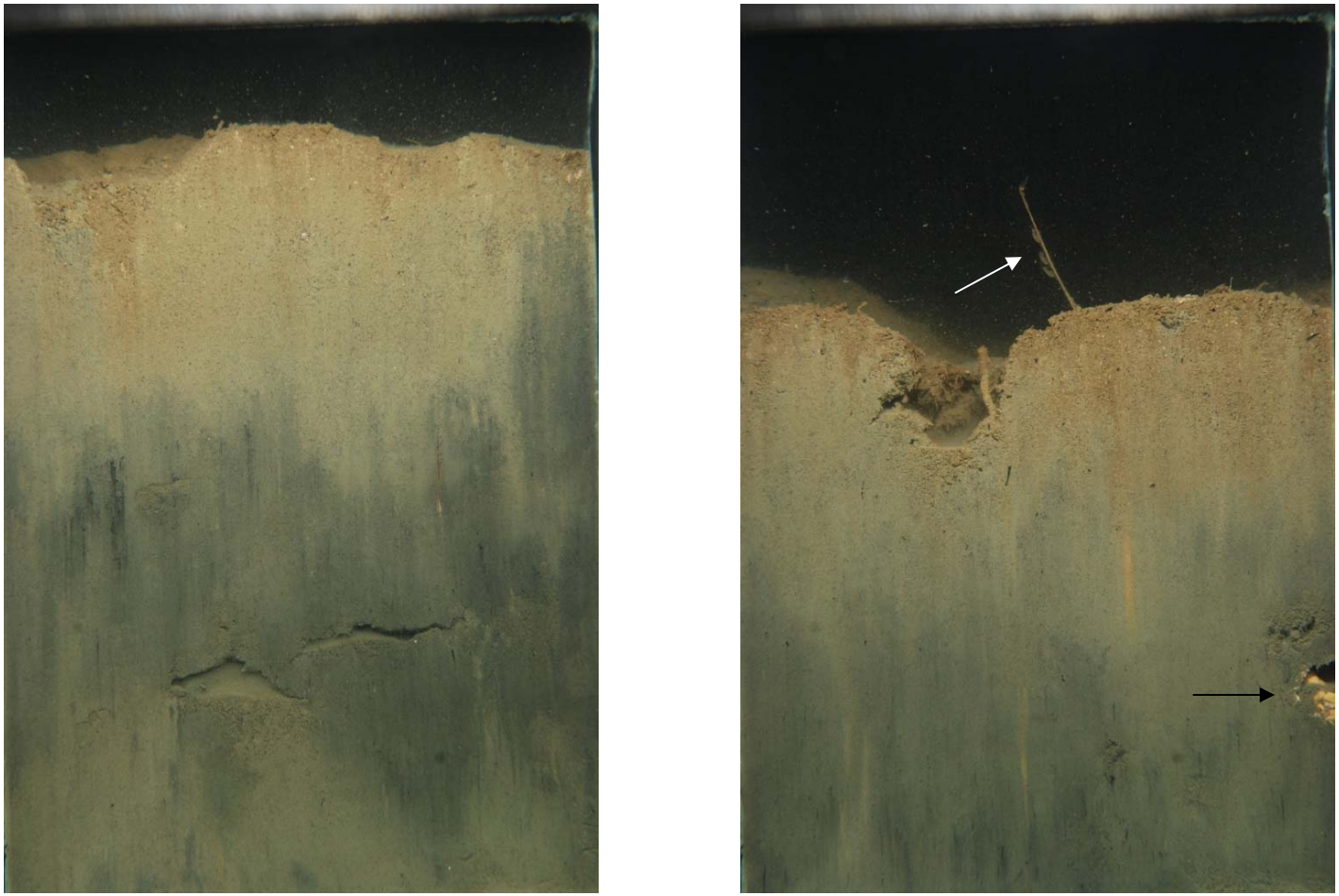


**Figure 4-7.** SPI images from stations CBS07-B and CBS21-C

Stations CBS07-B and CBS21-C are located onsite within the disposal site boundary and showed the presence of historical dredged material deposits. The historical dredged material consisted of reduced sediments at depth that have experienced extensive mixing by infaunal organisms. CBS07-B showed well developed feeding voids within the reduced sediment layer. The optical signature of the reduced layer was further obscured in CBS21-C with a possible burrowing shrimp (black arrow) at depth. Stick building amphipods (*Podoceridae*) are present on the sediment surface (white arrow), a Stage II infaunal organism. Image width is 14.6 cm.

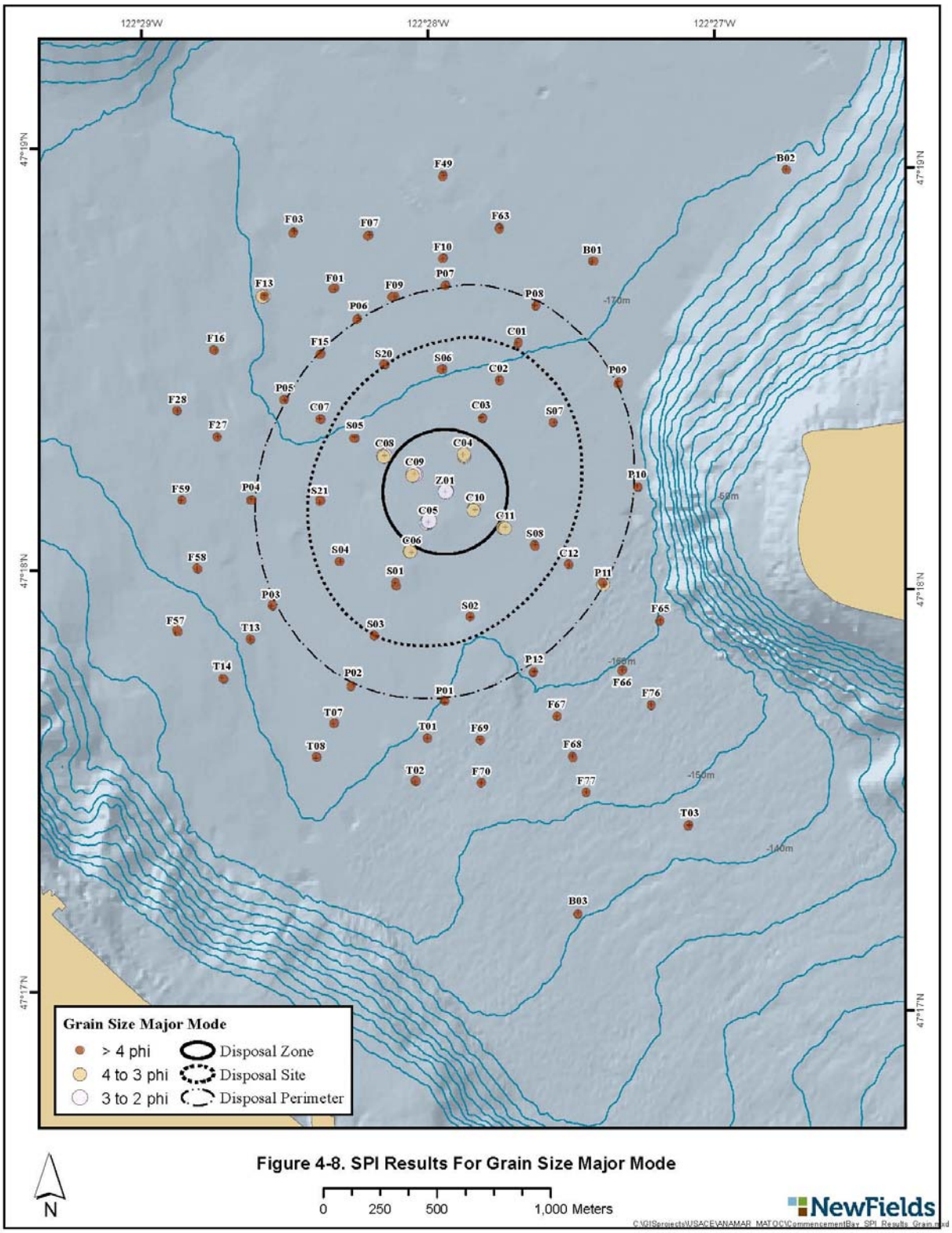



Figure 4-8. SPI Results For Grain Size Major Mode

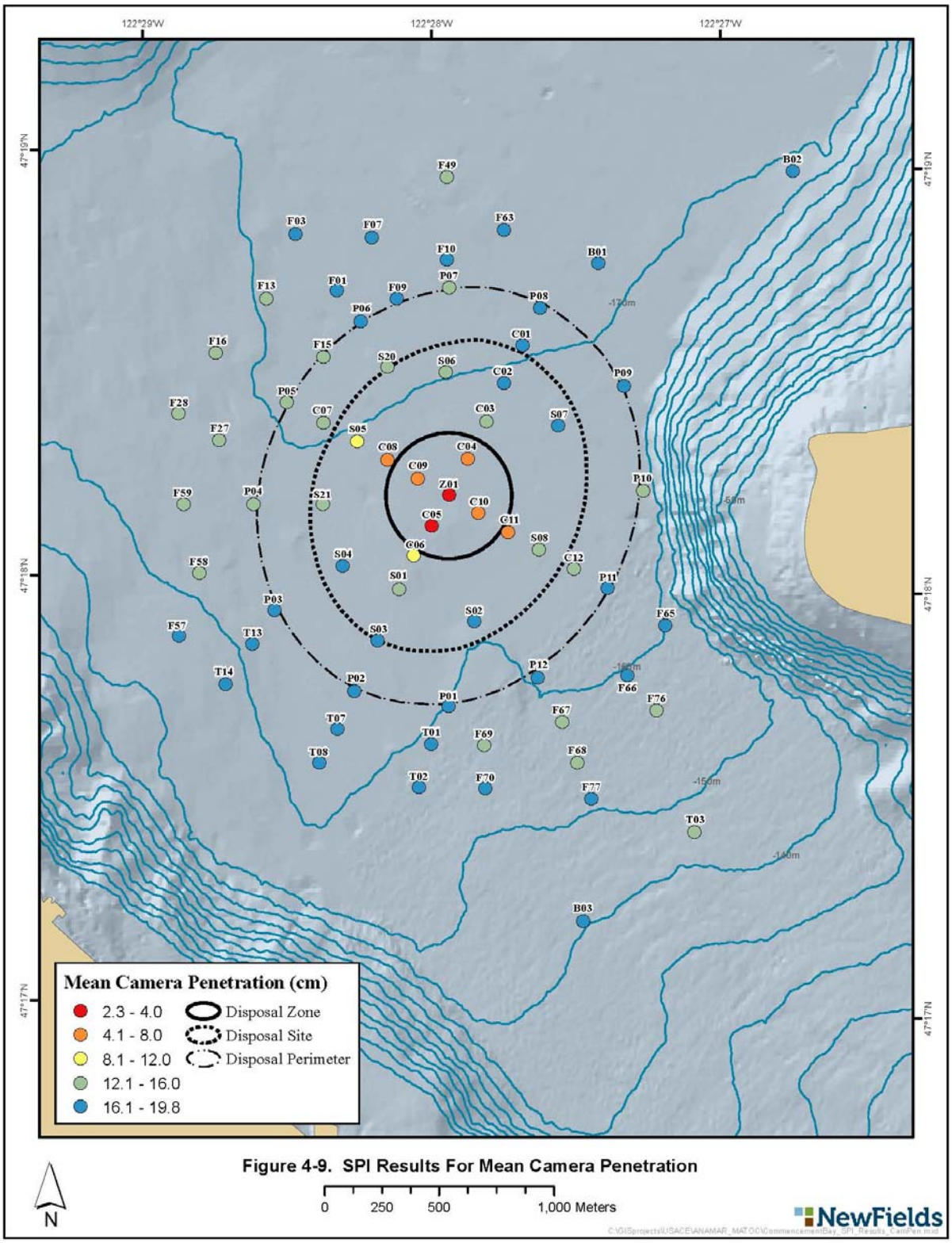



Figure 4-9. SPI Results For Mean Camera Penetration

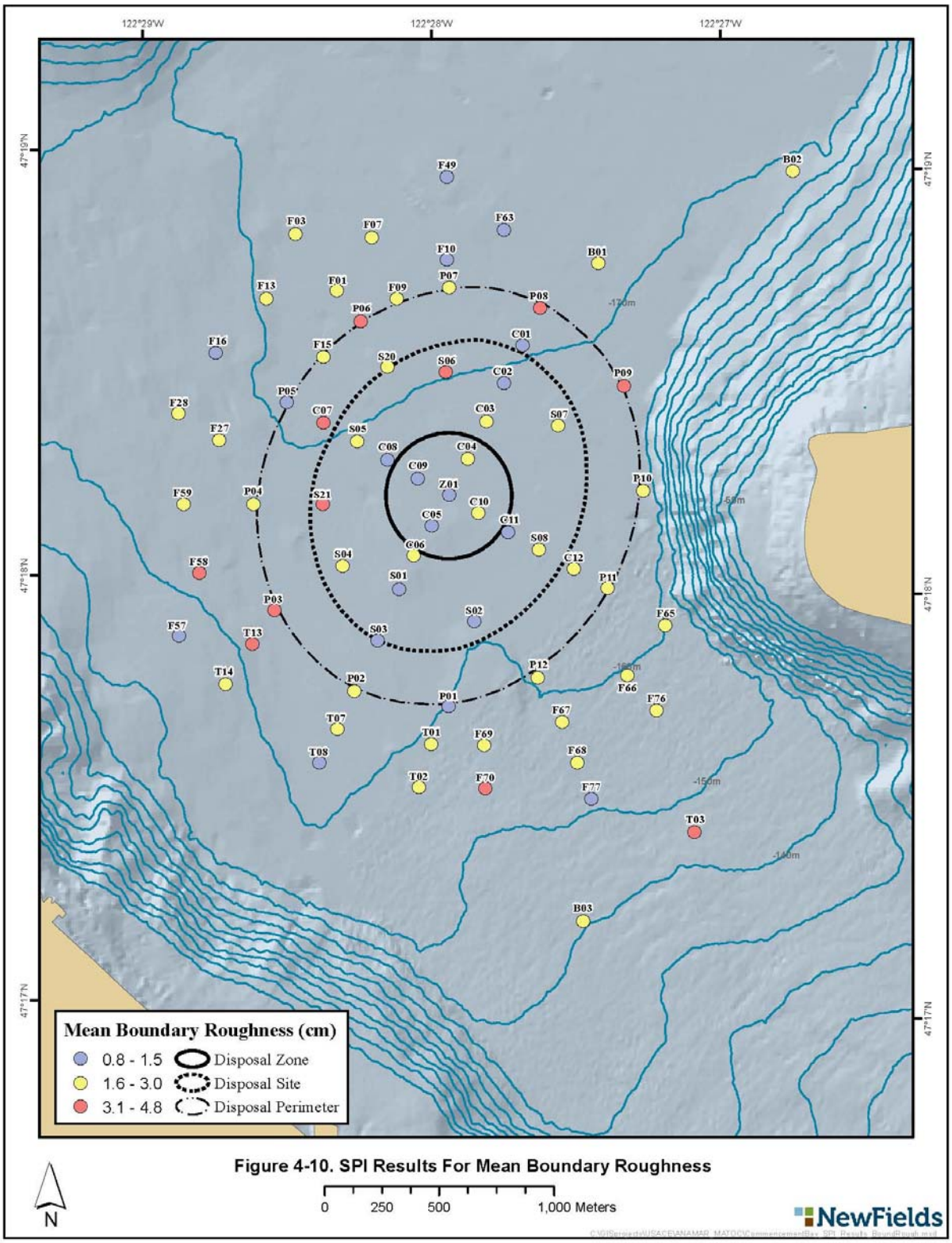



Figure 4-10. SPI Results For Mean Boundary Roughness

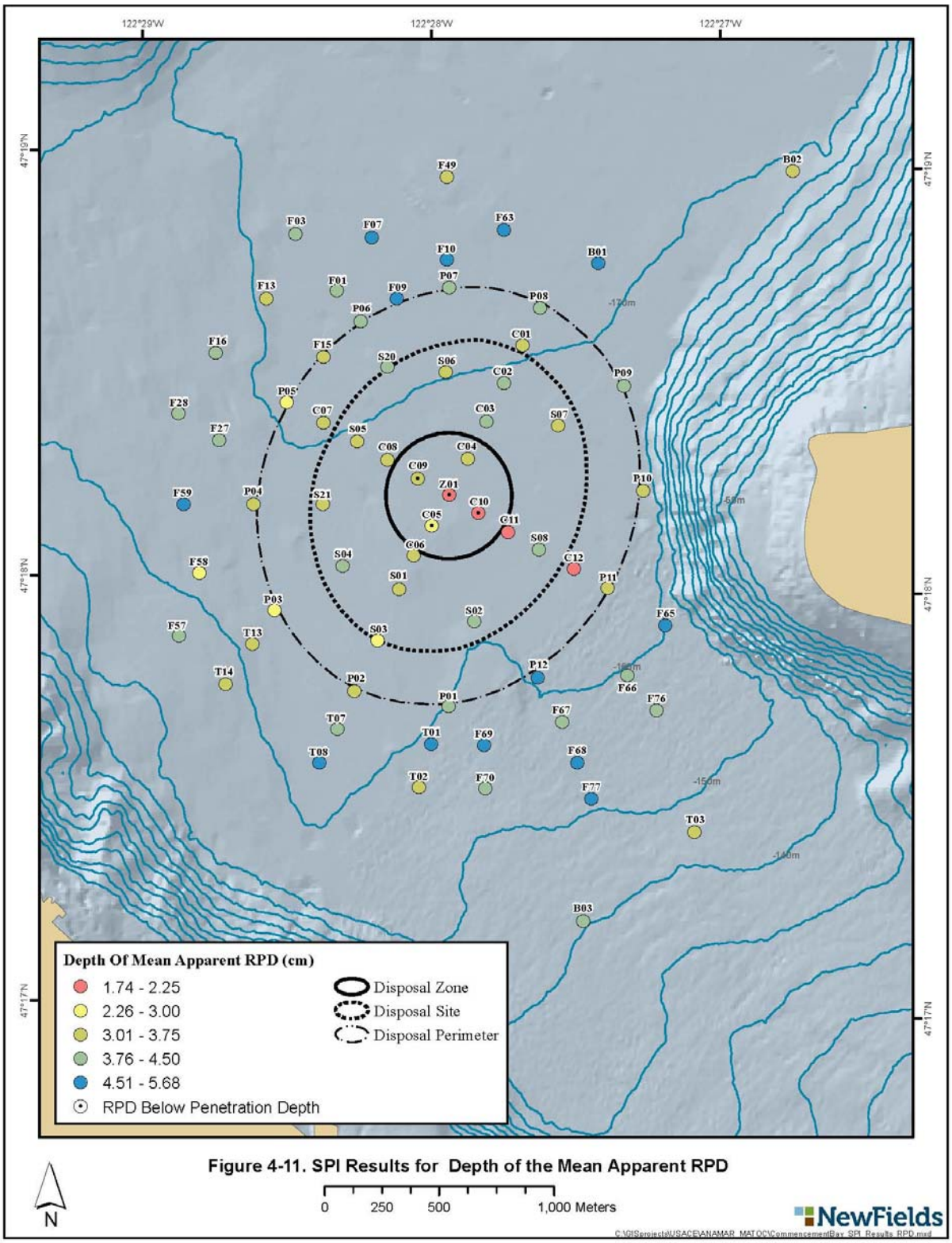



Figure 4-11. SPI Results for Depth of the Mean Apparent RPD

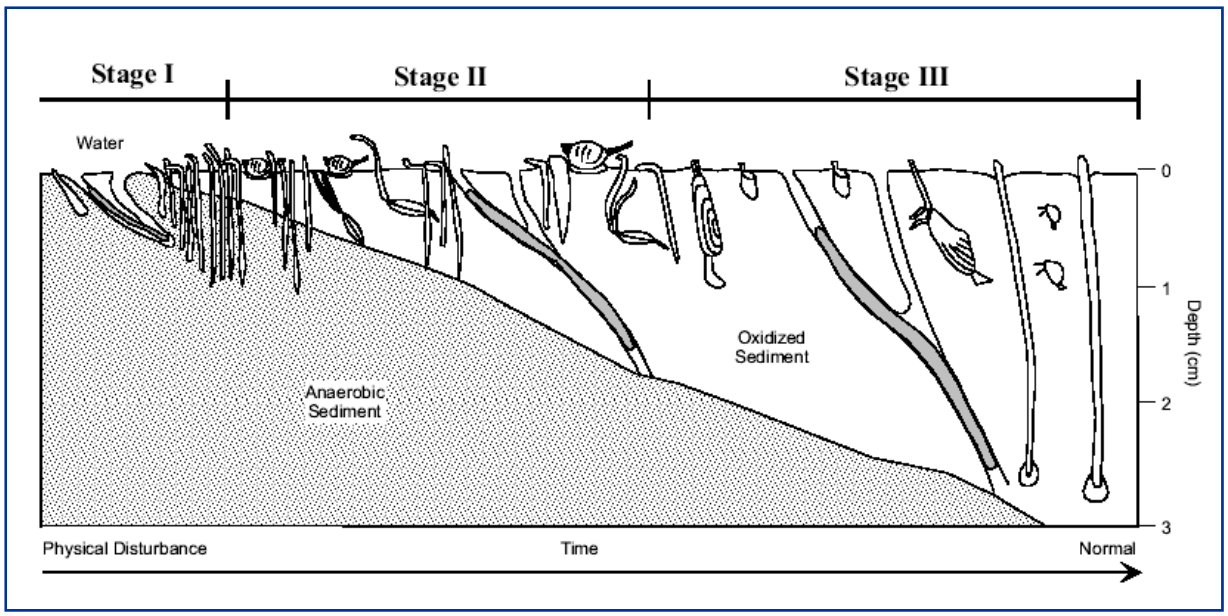



**Figure 4-12.** Idealized development of infaunal succession stages over time following a physical disturbance

Source: Rhodes and Germano (1986), modified from Pearson and Rosenberg (1978)

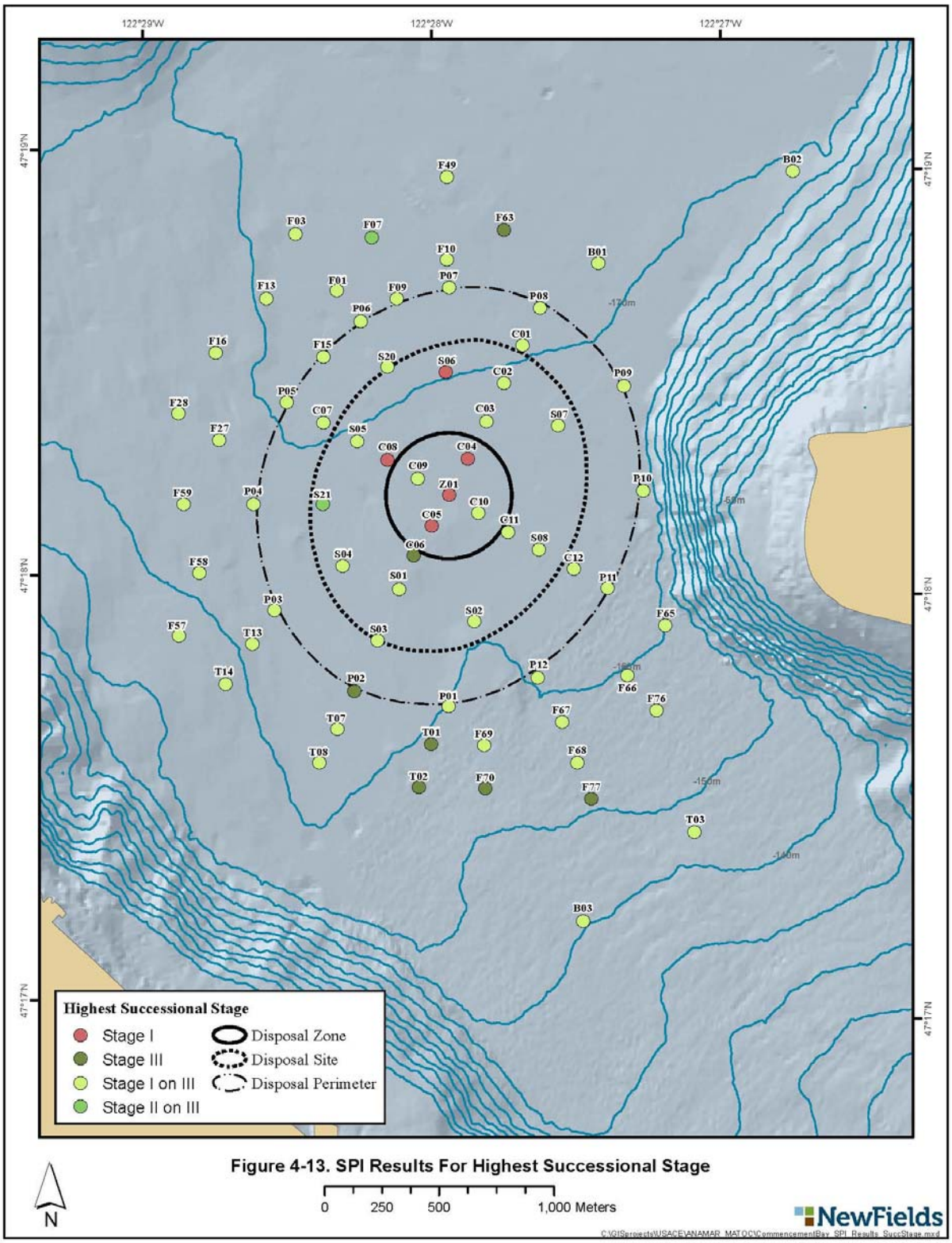



**Figure 4-13. SPI Results For Highest Successional Stage**

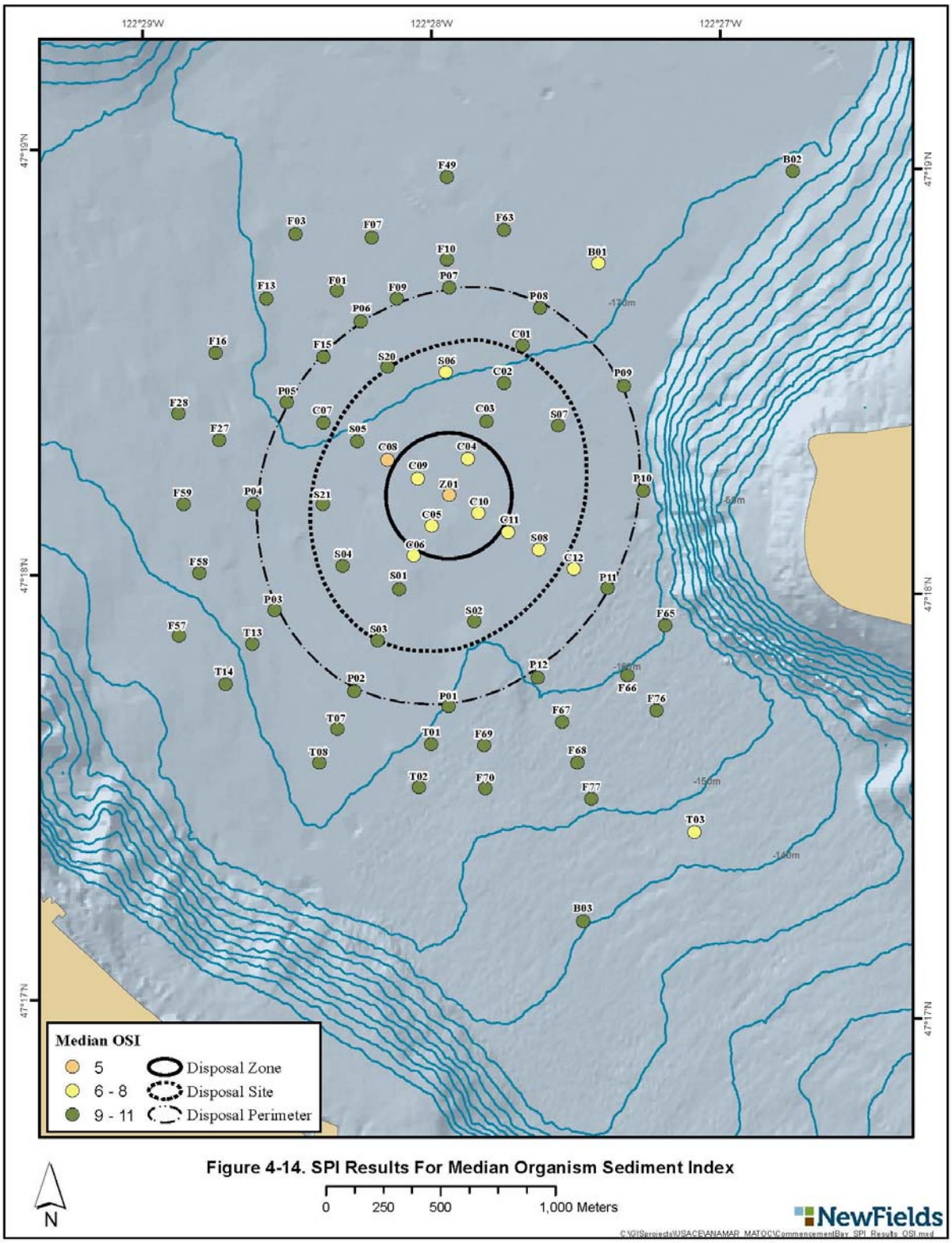



**Figure 4-14. SPI Results For Median Organism Sediment Index**

## 4.2 Elliott Bay

Triplicate SPI images were analyzed at 79 EB stations to map the dredged material footprint and physical (grain size major mode, prism penetration depth, boundary roughness), chemical (apparent RPD depth), and biological (successional stage and OSI) characteristics of site sediments. A summary of mean and median values of the SPI results is provided in Table 4-2. The full summary of the image analysis results is provided in Appendix C.

### 4.2.1 EB Ambient Sediment Characteristics

Ambient sediment characteristics in Elliott Bay have historically consisted of silty fine sand to fine sandy silt in shallower areas to the south and near-shore, and water-rich unconsolidated silt and clay in the central trough region. The 2013 SPI results at the EB site were consistent with these characteristics and example SPI images showing fine-grained ambient sediments are provided in Figure 4-15. Apparent RPD depths were relatively deep in these ambient sediments. Feeding voids were visible indicating extensive bioturbation of surface sediments by head-down deposit-feeding infaunal organisms. The ambient sediment grain size in the southern portion of EB is influenced by the sediment loadings from the Duwamish River. Consequently, coarser tan to gray fine sand was present along the southern and eastern shores of Elliott Bay, appearing in SPI images as homogeneous silty fine sand to fine sandy silt, or sand inter-mixed into the underlying fine-grained sediments (Figure 4-16).

### 4.2.2 Dredged Material Distribution

Recent dredged material was detected in SPI images collected from 18 stations at the EB site, and the dredged material was confined within the perimeter of the disposal site (Figure 4-17). Dredged material within the disposal zone was composed of light gray silt and clay with some very fine sand, or layers of reduced organic silt and fine sand (Figure 4-18). At the site center (CBZ01), light gray and dark gray silt and clay layers were overlain by tan brown oxidized sandy silt. Along the flanks of the dredged material deposit, recent dredged material consisted of elevated concentrations of fine sand in surface sediments typically overlying historical dredged material deposits (Figure 4-19). The accumulation of recent dredged material was contained within the site perimeter and the 3 cm DMMP criterion for dredged material accumulation was not exceeded.

Historic dredged material was detected in images from 14 stations (three central cross stations and 11 site stations), all located within the disposal site boundary (Figure 4-20). The dredged material was identified as historic primarily if sedimentary layering of the dredged material had been obscured by bioturbation, but the optical signature of the dredged material layers could still be recognized. Examples of historical dredged material observed at the EB site are provided in Figure 4-19. In these examples, a thin layer of recent dredged material was also present above the historical deposit. The overall footprint of historical dredged material was similar to the recent dredged material, which suggests that the dredged material deposition pattern following disposal at the EB site has remained relatively consistent. When disposed, the dredged material appears to settle in and around the disposal zone region and is contained within the disposal site perimeter.

### 4.2.3 Physical and Sedimentary Features

Physical and sedimentary features determined from SPI images included grain size major mode in phi (Φ) sizes and camera prism penetration. The grain size major mode was >4 Φ at 81% of

the EB stations (64 stations) and 4–3 Φ at 16 stations to the southwest and extending to the northwest along the western rise originating near the mouth of the West Waterway of the Duwamish River (Figure 4-21). The coarser grained sediment observed along this rise is likely attributed to sediment loading by the Duwamish River, which enters Elliott Bay in the southeast and flows across the EB disposal site to the northwest. The Denny Hill re-grade area also appeared to contribute to the coarser grain material observed in the northeast region of the disposal site near the disposal perimeter (Figure 4-22).

Camera penetration depths varied significantly throughout the disposal site (range of 1.34 to 21.07 cm) with a mean of 13.98 cm (± 4.02 cm) (Figure 4-23). The deepest penetration depths were observed in the northern portion of the disposal site and northwest of the disposal perimeter along the transect stations. Generally shallower penetration was observed near the disposal zone. The lowest camera penetration within the disposal zone occurred at a single station within the disposal zone (EBC06) due the presence of compact dredged material (see Figure 4-22). Lower camera penetration was observed at several stations located along the western rise, including two stations within the disposal site boundary (EBS29 and EBS32) as well as perimeter station EBP13. Low penetration was also observed at northeastern perimeter station CBP03 where sands and rocks were present.

Mean bottom boundary roughness measurements (surface relief) during the 2013 SPI survey are shown in Figure 4-24. Similar to Commencement Bay, the boundary roughness was classified as biological at nearly all SPI stations (96 percent of stations) at the EB site. The average surface relief during the 2013 survey was 1.80 cm (±1.21 cm) with a range of 0.2 cm to 7.39 cm. Much of the high surface relief observed could be attributed to biogenic activity that has created large surface burrow excavations (e.g., Figure 4-15). Mean boundary roughness at stations within the disposal site boundary, particularly near the disposal zone, were generally less than surrounding areas due to the presence of dredged material where the presence of large burrows was less frequent.

### 4.2.4 Chemical and Biological Features

Chemical and biological parameters include the apparent RPD depth, benthic infaunal successional stage, and calculation of the OSI. These parameters provide an assessment of the overall health of the benthic habitat at the Elliott Bay disposal site.

#### *Apparent Redox Potential Discontinuity*

The apparent RPD depth estimates the depth of oxygenation in the upper sediment column and provides an estimate of the biological mixing depth by infaunal organisms. Mean apparent RPD depths at the Elliott Bay site range from 1.34 to 4.67 cm, with an average depth of 3.16 cm (± 0.87 cm) (Figure 4-25). The shallowest apparent RPD depths (<2.25 cm) were measured just outside the disposal zone (Stations EBS11, EBS16, EBS20, EBS21 and EBC08). Interestingly, the apparent RPD depths within the disposal zone were slightly deeper, ranging from 1.39 to 4.38 cm with an average of 2.83 cm (± 0.82 cm) (see Figure 4-18).

#### *Benthic Infaunal Successional Stage*

Stage I on III benthic communities were observed at 67% of the EB stations (53 stations) and Stage III succession was observed at 27% of the EB stations (21 stations). Two stations within the site boundary (EBC06 and EBS29) and two perimeter stations (EBP03 and EBP08) showed the presence of only Stage I succession. (Figure 4-26). Overall, the EB site benthic community

appears to be in a climax situation with the highest order of succession (Stage III communities) present at 95% of the stations following the most recent dredged material disposal.

### *Organism Sediment Index (OSI)*

The distribution of median OSI values calculated at the EB site is presented in Figure 4-27. Median OSI values ranged from +3 to +11 within the disposal site boundary as well as offsite. The lowest OSI value in Elliott Bay (+3) was observed just outside the disposal zone at station EBS21. Five additional stations within the disposal site boundary (EBS16, EBS29, EBS32 EBC12 and EBC06) had OSI values of +5 or less indicating a potentially distressed or disturbed benthic habitat. The disposal of dredged material within the disposal site boundary is expected to have a short term impact on the benthic community, and lower OSI values are expected following recent dredged material disposal. OSI values of +5 or less were also observed at three perimeter stations (EBP03, EBP08 and EBP13). The sediments at these locations consisted of consolidated coarse grained sediments where Stage III infauna was not present and camera penetration was very low. The majority of stations (87%) had OSI values equal to or greater than +6, which indicates natural or undisturbed benthic habitat throughout much of Elliott Bay.

**Table 4-2.** Elliott Bay SPI summary table

| Station | Avg Prism Pen. (cm) | Dredged Material Thickness Recent (cm) | Dredged Material Thickness Historical (cm) | Grain Size Major Mode (phi) | Avg. Surface Boundary Roughness (cm) | Mud Clasts | Mean RPD | Highest Successional Stage | Median OSI |
|---|---|---|---|---|---|---|---|---|---|
| EBB01 | 7.47 | | | 4 to 3 phi | 1.32 | | 2.3 | Stage I on III | 8 |
| EBB02 | 13.60 | | | > 4 phi | 0.84 | | 3.39 | Stage I on III | 7 |
| EBB03 | 17.94 | | | > 4 phi | 1.29 | | 3.16 | Stage I on III | 9 |
| EBB04 | 15.21 | | | > 4 phi | 1.68 | | 2.46 | Stage III | 9 |
| EBC06 | 4.04 | > 4.04 | | 4 to 3 phi | 0.51 | present | >2.43 | Stage I | 5 |
| EBC07 | 11.65 | > 11.65 | | > 4 phi | 1.22 | | 2.96 | Stage I on III | 8 |
| EBC08 | 13.08 | > 5.83 | > 8.37 | > 4 phi | 1.58 | | 2.18 | Stage I on III | 8 |
| EBC09 | 16.58 | | | > 4 phi | 2.87 | | 4.53 | Stage I on III | 11 |
| EBC10 | 16.68 | | > 7.87 | > 4 phi | 1.5 | | 2.91 | Stage I on III | 10 |
| EBC11 | 16.32 | > 16.33 | | > 4 phi | 0.81 | | 3.66 | Stage III | 11 |
| EBC12 | 10.68 | > 10.68 | | > 4 phi | 1.08 | | 2.3 | Stage I on III | 5 |
| EBC13 | 16.40 | 3.02 | > 11.14 | > 4 phi | 1.41 | | 2.83 | Stage I on III | 10 |
| EBP01 | 17.84 | | | > 4 phi | 3.05 | | 2.6 | Stage III | 9 |
| EBP03 | 4.60 | | | 4 to 3 phi | 1.48 | | 2.77 | Stage I | 5 |
| EBP04 | 17.06 | | | > 4 phi | 1.51 | | 3.04 | Stage I on III | 10 |
| EBP05 | 17.93 | | | > 4 phi | 1.81 | present | 4.43 | Stage I on III | 7 |
| EBP06 | 17.00 | | | > 4 phi | 1.55 | | 3.26 | Stage I on III | 10 |
| EBP07 | 12.28 | | | 4 to 3 phi | 2.28 | | 2.87 | Stage I on III | 9 |
| EBP08 | 11.46 | | | 4 to 3 phi | 1.23 | | 2.55 | Stage I | 5 |
| EBP09 | 12.21 | | | 4 to 3 phi | 0.83 | | 2.83 | Stage I on III | 9 |
| EBP10 | 13.36 | | | 4 to 3 phi | 1.51 | | 2.87 | Stage I on III | 9 |
| EBP11 | 11.89 | | | > 4 phi | 1.16 | present | 2.79 | Stage I on III | 9 |
| EBP12 | 12.74 | | | > 4 phi | 2.05 | | 3.1 | Stage I on III | 10 |
| EBP13 | 5.42 | | | 4 to 3 phi | 3.55 | | 2.33 | Stage I on III | 5 |
| EBP14 | 18.17 | | | > 4 phi | 1.44 | | 2.88 | Stage I on III | 9 |
| EBP15 | 17.03 | | | > 4 phi | 2.26 | present | 3.65 | Stage III | 11 |
| EBR01 | 15.62 | > 15.60 | | > 4 phi | 1.37 | | 3.79 | Stage III | 11 |
| EBR02 | 14.34 | | | > 4 phi | 3.18 | | 3.42 | Stage III | 10 |
| EBR03 | 8.00 | | | > 4 phi | 1.06 | | >3.04 | Stage I on III | 7 |
| EBR04 | 17.65 | 1.49 | | > 4 phi | 1 | | 3.63 | Stage I on III | 11 |
| EBR05 | 16.78 | | | > 4 phi | 1.69 | | 3.46 | Stage I on III | 11 |
| EBR06 | 15.76 | > 15.73 | | > 4 phi | 1.38 | | 2.57 | Stage III | 9 |
| EBR07 | 16.25 | | | > 4 phi | 1.77 | present | 3.62 | Stage I on III | 10 |
| EBS02 | 17.31 | 1.36 | > 6.71 | > 4 phi | 1.17 | | 2.27 | Stage I on III | 7 |
| EBS03 | 17.77 | | | > 4 phi | 1.48 | | 3.99 | Stage III | 11 |
| EBS04 | 16.10 | | | > 4 phi | 2.1 | | 3.49 | Stage I on III | 10 |
| EBS05 | 13.53 | | | > 4 phi | 1.49 | | 2.61 | Stage III | 9 |
| EBS06 | 17.11 | 1.84 | 2.66 | > 4 phi | 2.12 | | 3.5 | Stage III | 11 |
| EBS07 | 15.49 | | | > 4 phi | 0.99 | present | 3.34 | Stage III | 10 |
| EBS08 | 8.69 | 0.45 | 1.79 | > 4 phi | 1.65 | present | 3.25 | Stage I on III | 9 |
| EBS09 | 14.96 | 0.66 | | > 4 phi | 1.97 | | 3.77 | Stage I on III | 11 |
| EBS10 | 15.07 | | | > 4 phi | 1.48 | | 3.24 | Stage I on III | 10 |
| EBS11 | 11.75 | | > 8.5 | > 4 phi | 2.23 | | 1.98 | Stage I on III | 8 |
| EBS12 | 14.47 | | | > 4 phi | 2.5 | | 4.02 | Stage III | 10 |
| EBS13 | 15.47 | | | 4 to 3 phi | 1.69 | | 3.61 | Stage I on III | 11 |
| EBS14 | 16.27 | | 2.5 | > 4 phi | 1.17 | | 4.31 | Stage III | 11 |
| EBS15 | 10.67 | 1.88 | > 8.04 | 4 to 3 phi | 1.73 | | 2.34 | Stage I on III | 9 |
| EBS16 | 9.92 | > 3.63 | > 4.58 | > 4 phi | 1.15 | present | 1.99 | Stage I on III | 4 |
| EBS17 | 15.69 | | 4.07 | > 4 phi | 1.93 | | 3.11 | Stage III | 9 |

| Station | Avg Prism Pen. (cm) | Dredged Material Thickness Recent (cm) | Dredged Material Thickness Historical (cm) | Grain Size Major Mode (phi) | Avg. Surface Boundary Roughness (cm) | Mud Clasts | Mean RPD | Highest Successional Stage | Median OSI |
|---|---|---|---|---|---|---|---|---|---|
| EBS18 | 15.91 | | | > 4 phi | 4.41 | | 4.38 | Stage III | 11 |
| EBS19 | 15.76 | | | > 4 phi | 1.85 | | 3.14 | Stage III | 10 |
| EBS20 | 11.67 | > 7.77 | > 3.47 | > 4 phi | 1.78 | present | 2.16 | Stage I on III | 8 |
| EBS21 | 9.60 | > 9.61 | | > 4 phi | 1.56 | present | 1.34 | Stage I on III | 3 |
| EBS22 | 10.43 | | 2.93 | > 4 phi | 3.64 | present | 4.32 | Stage III | 11 |
| EBS23 | 12.27 | | | > 4 phi | 5.23 | | 3.67 | Stage III | 10 |
| EBS24 | 14.82 | | | > 4 phi | 1.48 | | 2.94 | Stage I on III | 10 |
| EBS25 | 18.70 | 0.51 | | > 4 phi | 2.46 | present | 4.67 | Stage I on III | 11 |
| EBS27 | 12.52 | | | > 4 phi | 2.08 | | 4.41 | Stage III | 11 |
| EBS28 | 16.86 | > 11.43 | > 4.60 | > 4 phi | 1.78 | | 3.13 | Stage I on III | 6 |
| EBS29 | 4.17 | | | > 4 phi | 1.86 | present | 2.5 | Stage I | 5 |
| EBS30 | 12.64 | | | 4 to 3 phi | 1.64 | | 4.11 | Stage III | 11 |
| EBS31 | 11.64 | | | > 4 phi | 0.84 | present | 3.38 | Stage I on III | 10 |
| EBS32 | 7.44 | | | > 4 phi | 1.61 | present | 2.08 | Stage I on III | 5 |
| EBS33 | 10.39 | | | > 4 phi | 1.29 | | 3.01 | Stage I on III | 9 |
| EBS34 | 12.03 | | | > 4 phi | 1.32 | | 2.95 | Stage I on III | 9 |
| EBS35 | 18.22 | | | > 4 phi | 2.13 | present | 4.64 | Stage III | 11 |
| EBS36 | 9.89 | | | > 4 phi | 0.92 | | 3.3 | Stage I on III | 10 |
| EBS37 | 17.05 | | | > 4 phi | 1.5 | | 4.27 | Stage I on III | 11 |
| EBT01 | 13.78 | 0.23 | | > 4 phi | 2.94 | | 2.58 | Stage I on III | 9 |
| EBT02 | 16.39 | | | 4 to 3 phi | 2.76 | | 2.88 | Stage I on III | 5 |
| EBT03 | 15.35 | | | > 4 phi | 2.08 | | 2.46 | Stage I on III | 8 |
| EBT04 | 16.79 | | | 4 to 3 phi | 1.59 | | 3.9 | Stage I on III | 10 |
| EBT05 | 17.64 | | | 4 to 3 phi | 2.07 | | 2.92 | Stage I on III | 6 |
| EBT07 | 17.98 | | | 4 to 3 phi | 1.97 | | 3.38 | Stage I on III | 10 |
| EBT08 | 16.38 | | | > 4 phi | 2.28 | | 2.85 | Stage I on III | 9 |
| EBT09 | 18.30 | | | > 4 phi | 1.62 | present | 3 | Stage I on III | 10 |
| EBT10 | 16.99 | | | > 4 phi | 1.78 | | 3.18 | Stage I on III | 9 |
| EBT11 | 17.47 | | | > 4 phi | 2.08 | | 3.6 | Stage III | 7 |
| EBZ01 | 12.42 | > 12.40 | | 4 to 3 phi | 2.04 | | 2.43 | Stage I on III | 9 |

Note: Grain size major mode ranges can be found in Appendix C.

**EBS18-E** **EBT03-B**

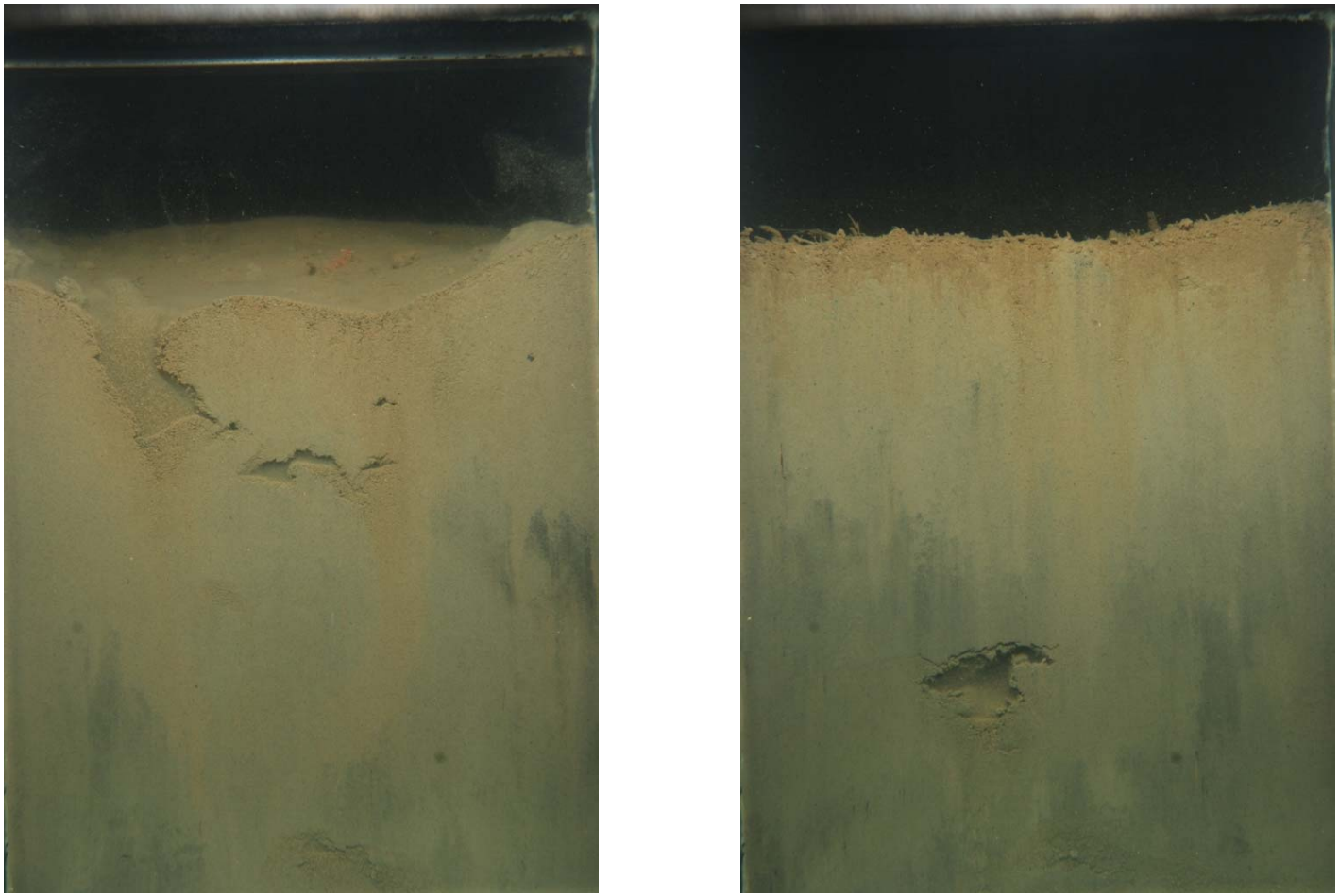


**Figure 4-15.** SPI images from stations EBS18-E and EBT03-B

Station EBS18-E and EBT03-B showed fine-grained ambient sediments observed in the vicinity of the Elliott Bay DMMP disposal site. Both locations showed homogeneous silt clay with deep apparent RPD depths and evidence of well-established benthic infaunal communities with Stage III infauna. A large surface burrow and void were present at EBS18-E, and a large, well formed feeding void was observed at EBT03-B. Image width is 14.6 cm.

**EBP08-B** **EBP10-B**

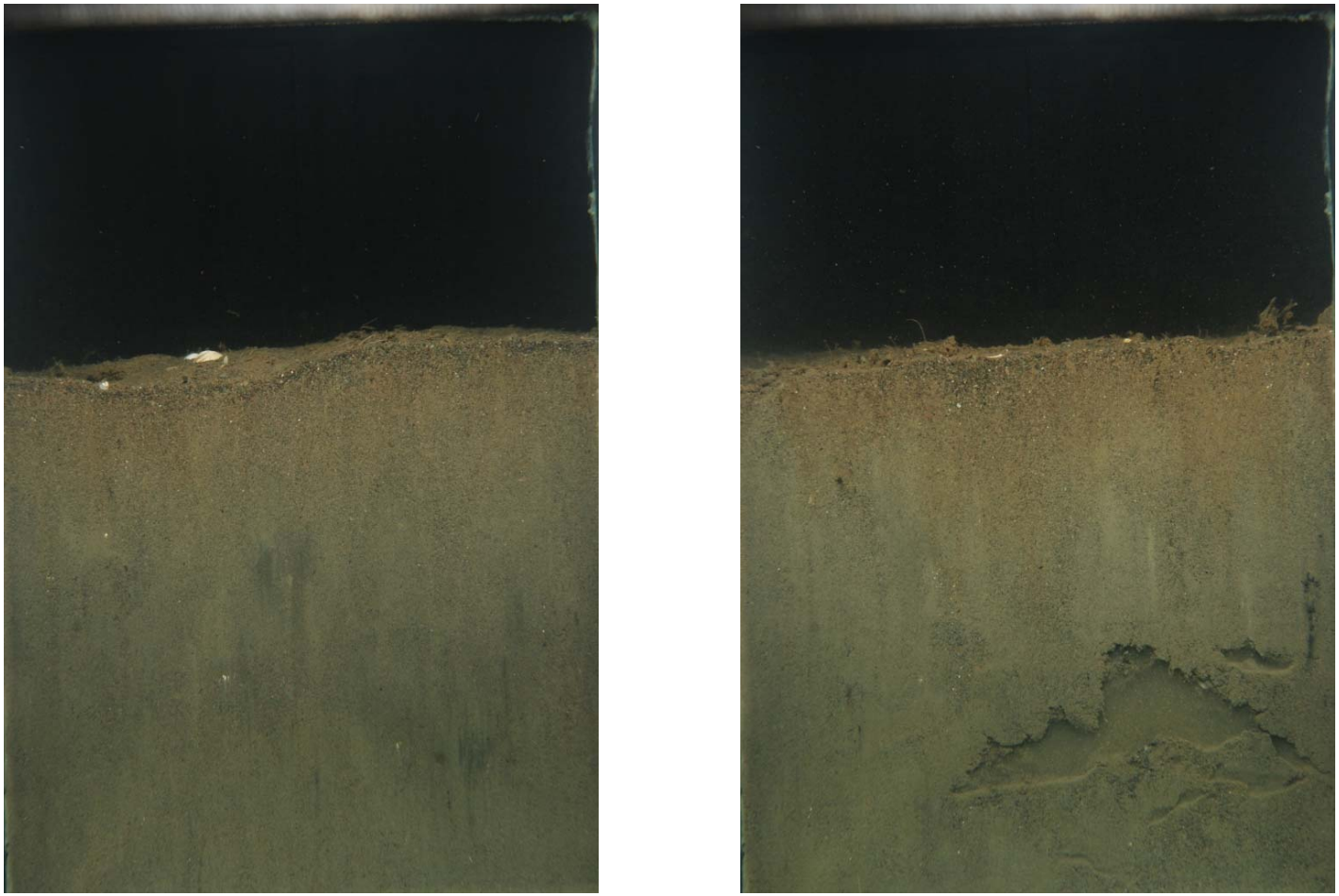


**Figure 4-16.** SPI images from stations EBP08-B and EBP10-B

Station EBP08-B and EBP10-B, along the south and southwest perimeter showed ambient sediments consisting of tan to gray fine sandy silt. The elevated concentration of sand present in the southern portion of EB was likely due to sediment loadings from the Duwamish River. Stage I surface tubes were visible in both images, and a very large, well developed feeding void was present at depth at EBP10-B. Image width is 14.6 cm.

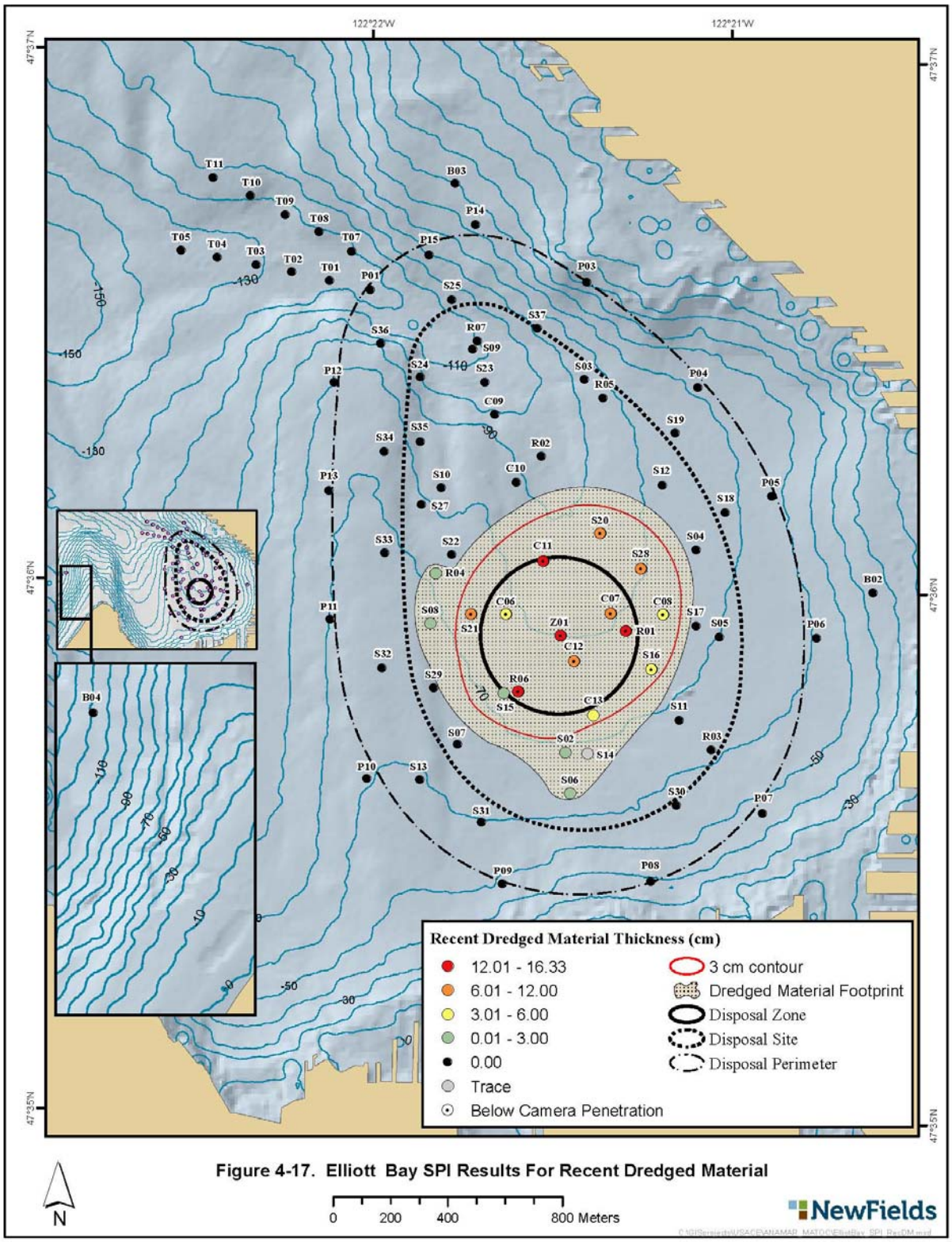



Figure 4-17. Elliott Bay SPI Results For Recent Dredged Material

**EBZ01-B** **EBR01-B**

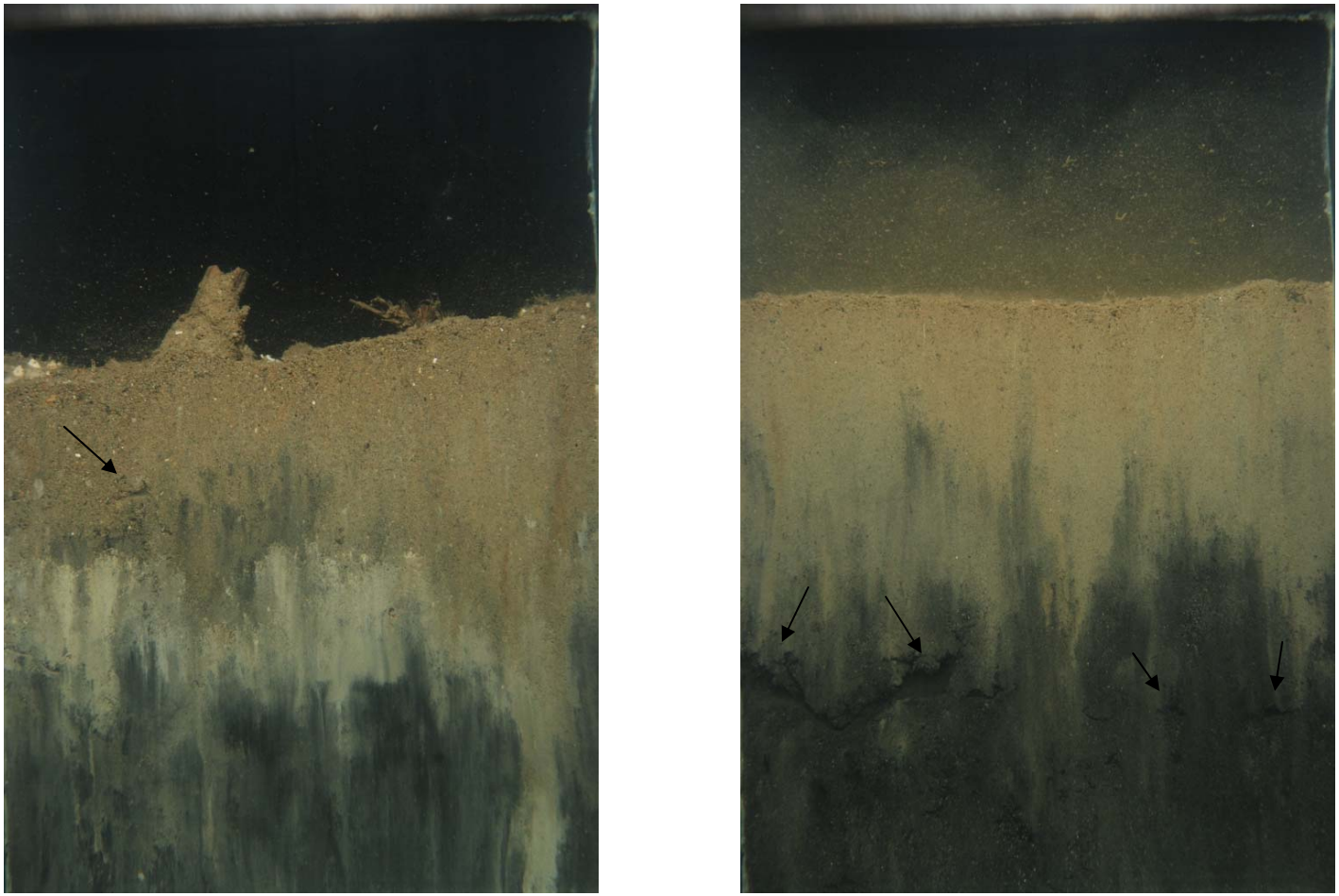


**Figure 4-18.** SPI images from stations EBZ01-B and EBR01-B

Stations EBZ01-B and EBR01-B showed recent dredged material greater than camera penetration observed at the disposal zone. The recent dredged material consisted of light and dark gray silt clay layers with sand. Both images showed brownish gray fine sand and silt surface layers, which signified relatively deep apparent RPD depths. Woody debris was present at the surface of EBZ01-B and feeding voids (Stage III infauna) were present at the dredged material layer interface (arrows). The subsurface dredged material layers have remained mostly intact. Image width is 14.6 cm.

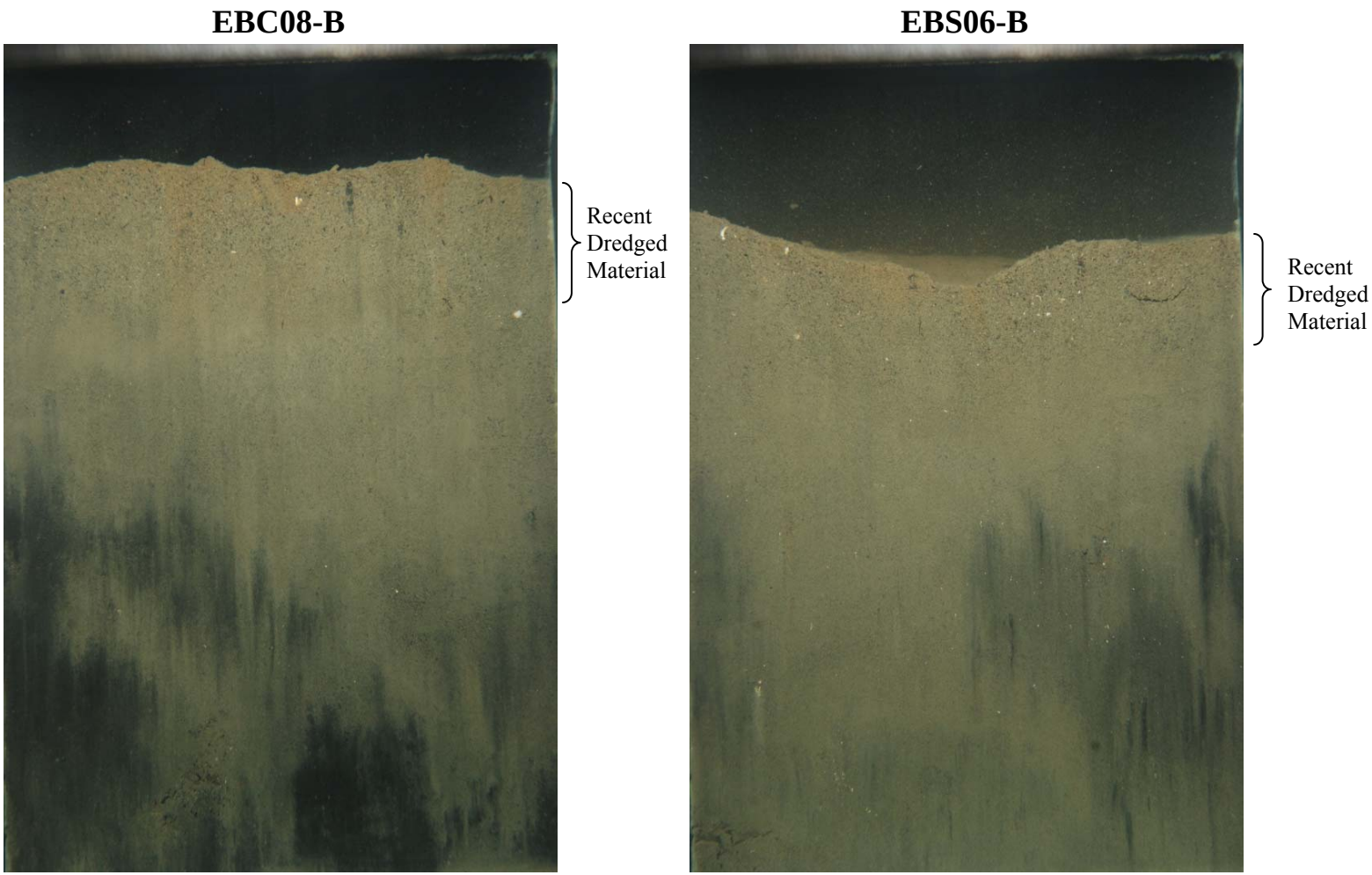



**Figure 4-19.** SPI images from stations EBC08-B and EBS06-B

Stations EBC08-B and EBS06-B showed thin surface layers of recent dredged material overlying historic dredged material. The recent dredged material consisted of elevated concentrations of fine sand in the upper few centimeters of the sediment surface. The historic dredged material at depth consisted of discontinuous reduced sedimentary layers. Enough time had passed for extensive bioturbation of the dredged material, which masked much of the sedimentary layering. Image width is 14.6 cm.

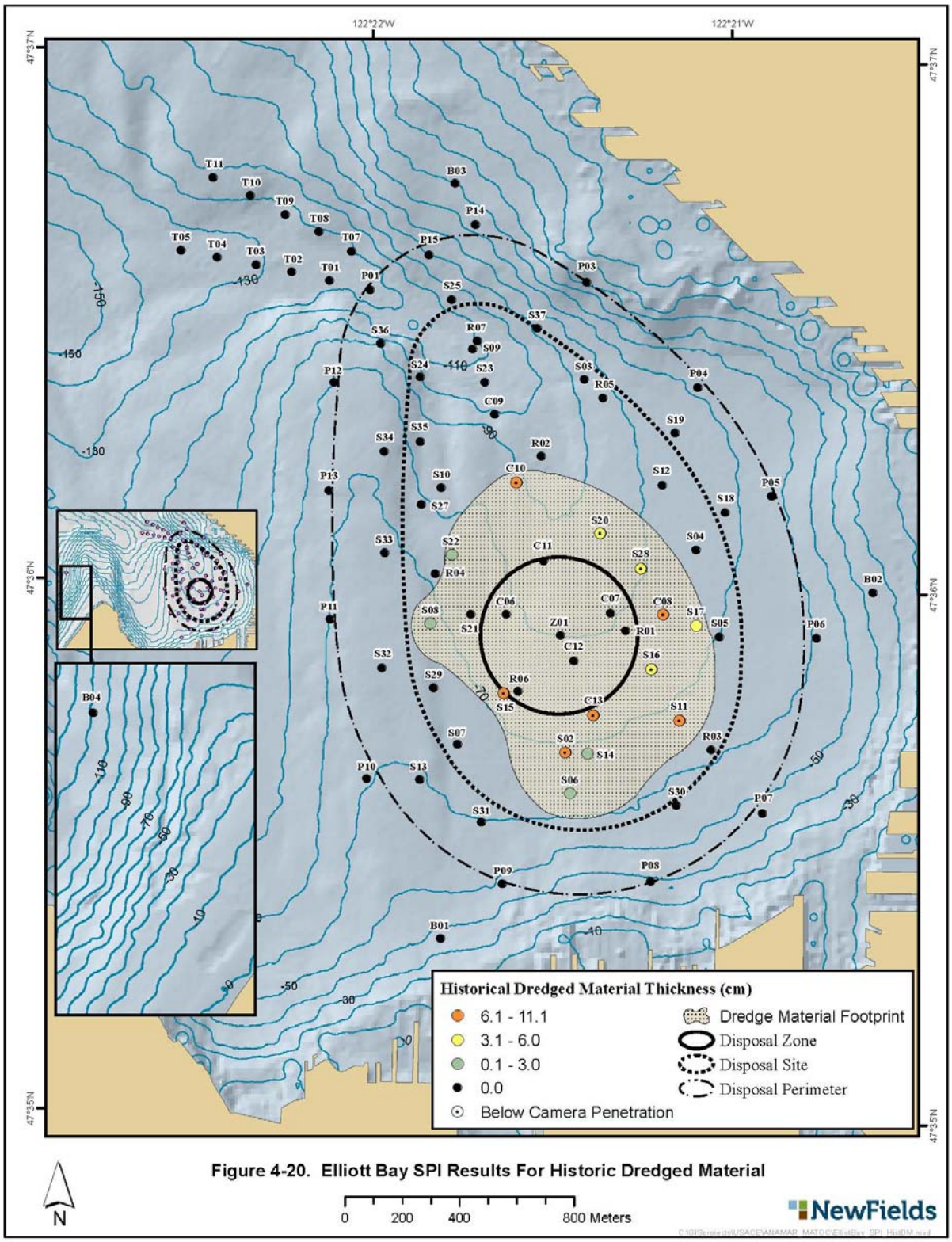



**Figure 4-20. Elliott Bay SPI Results For Historic Dredged Material**

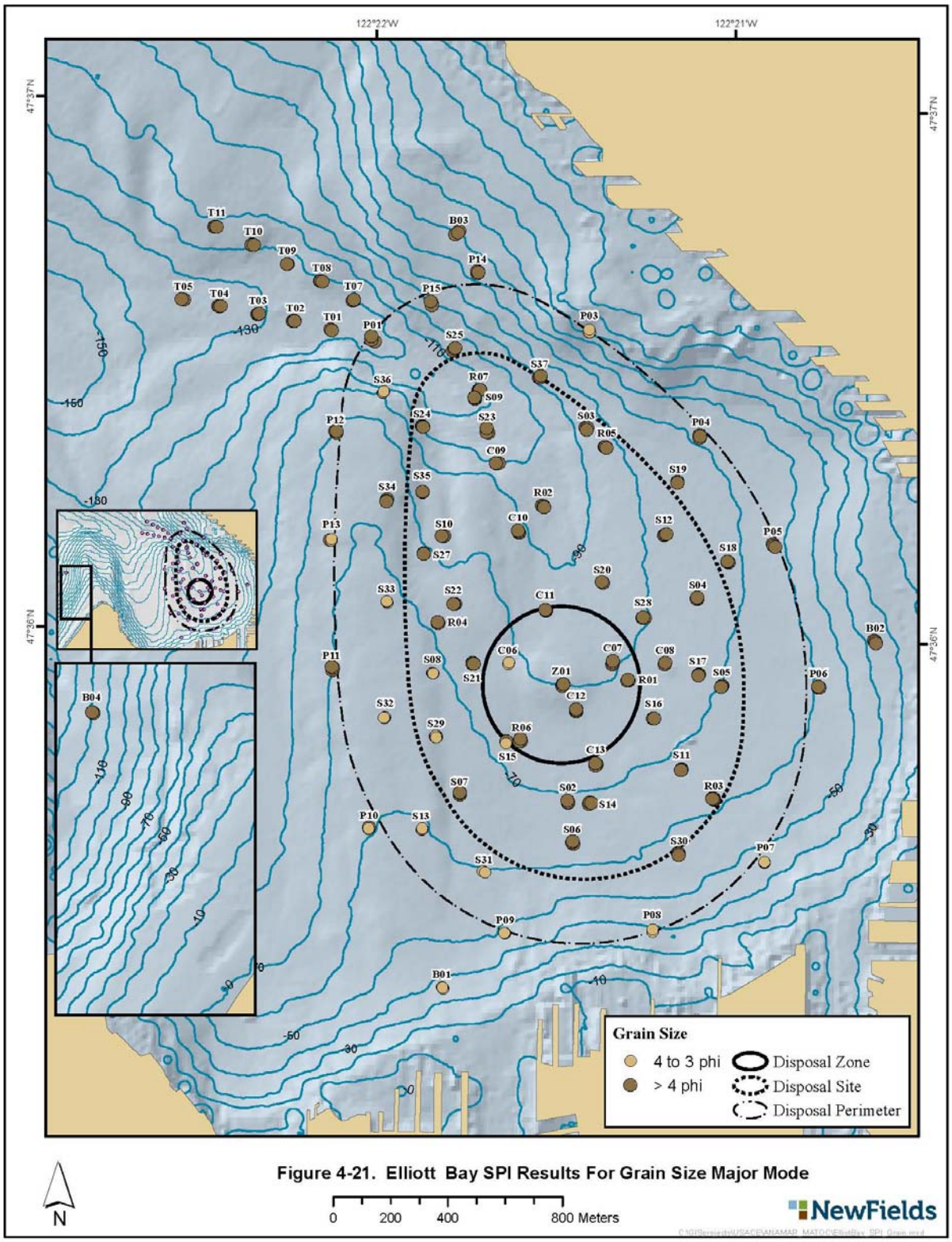
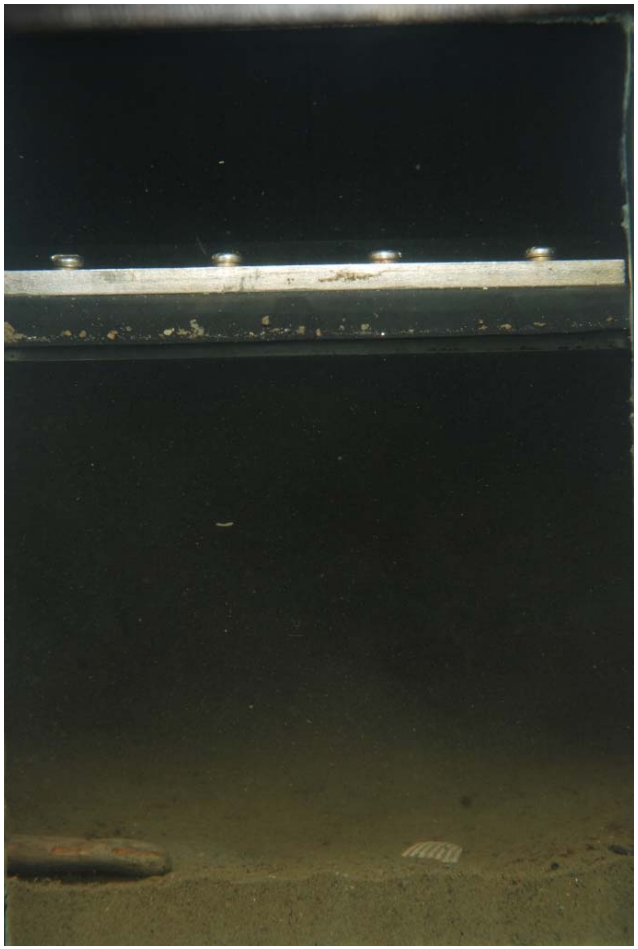



**Figure 4-21. Elliott Bay SPI Results For Grain Size Major Mode**

**EBC06-A**



**EBP03-B**

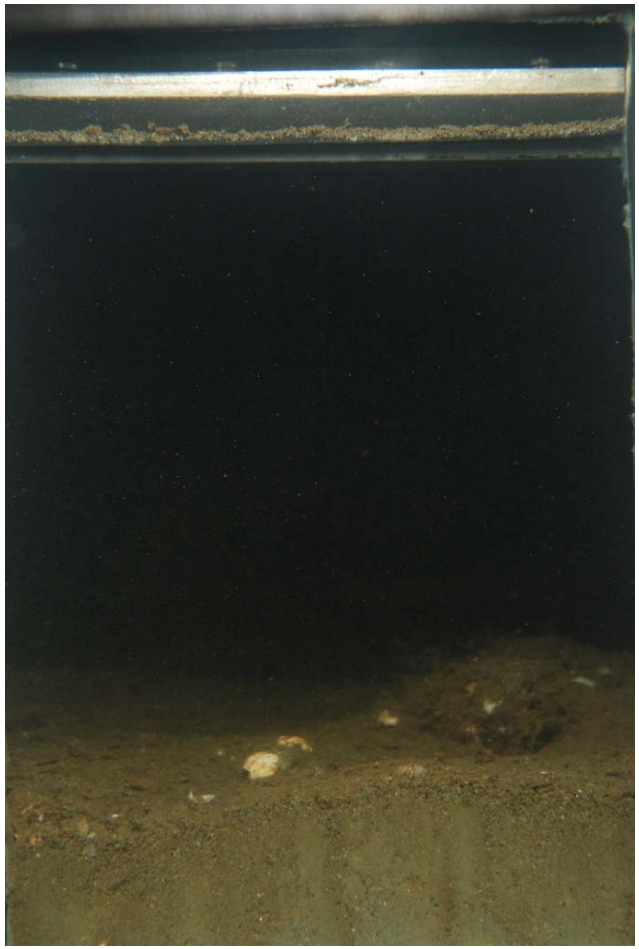


**Figure 4-22.** SPI images from stations EBC06-A and EBP03-B

Onsite station EBC06-A showed very low camera penetration due to the presence of compact sands, presumed to be dredged material. A rounded wood piece and shell were present on the sediment surface. Perimeter station EBP03-B is located along the northeast perimeter of the site and showed the presence of compact sands and rocks with shell debris. This coarse grained sediment may be related to materials deposited from the Denny Hill re-grade. Image width is 14.6 cm.

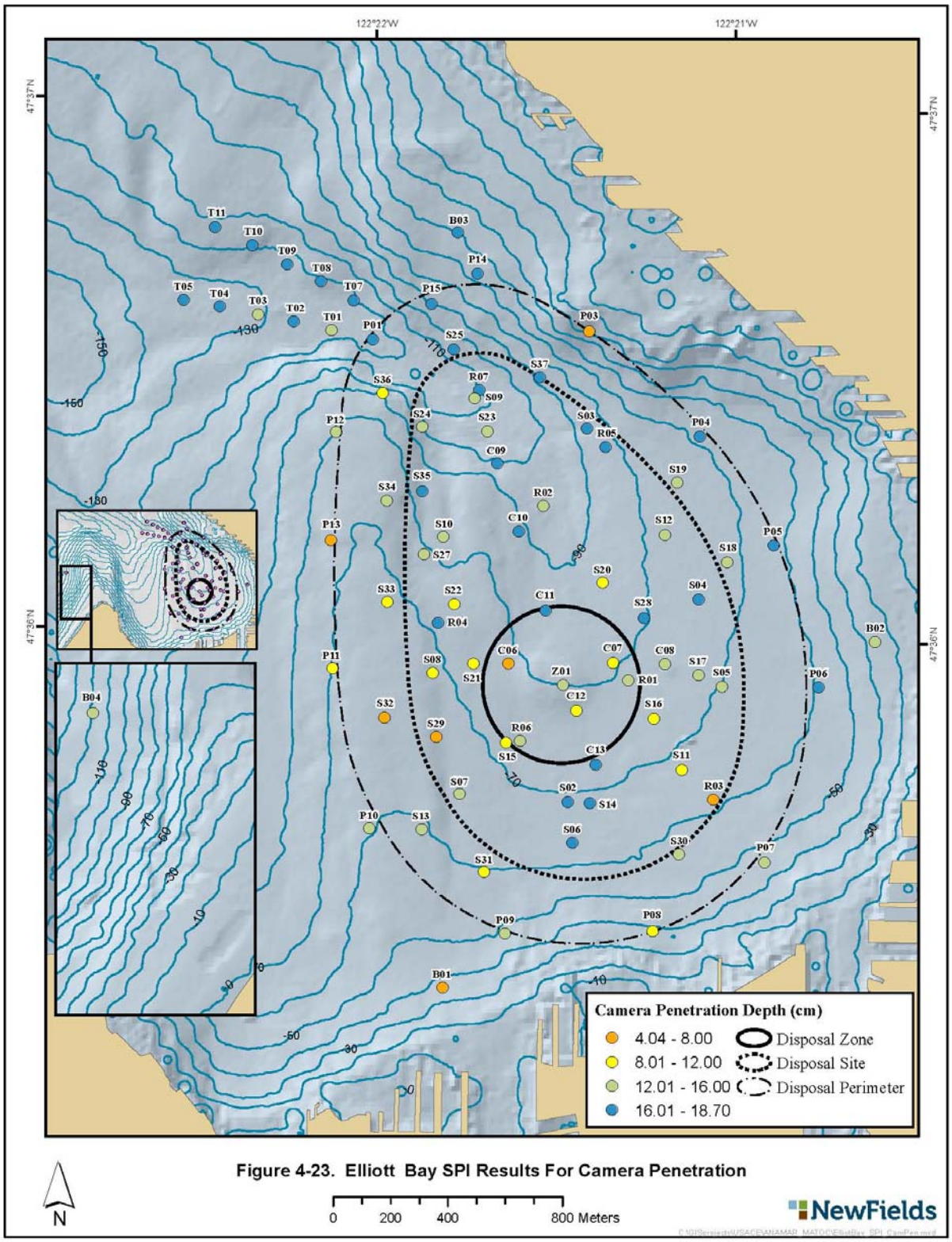



Figure 4-23. Elliott Bay SPI Results For Camera Penetration

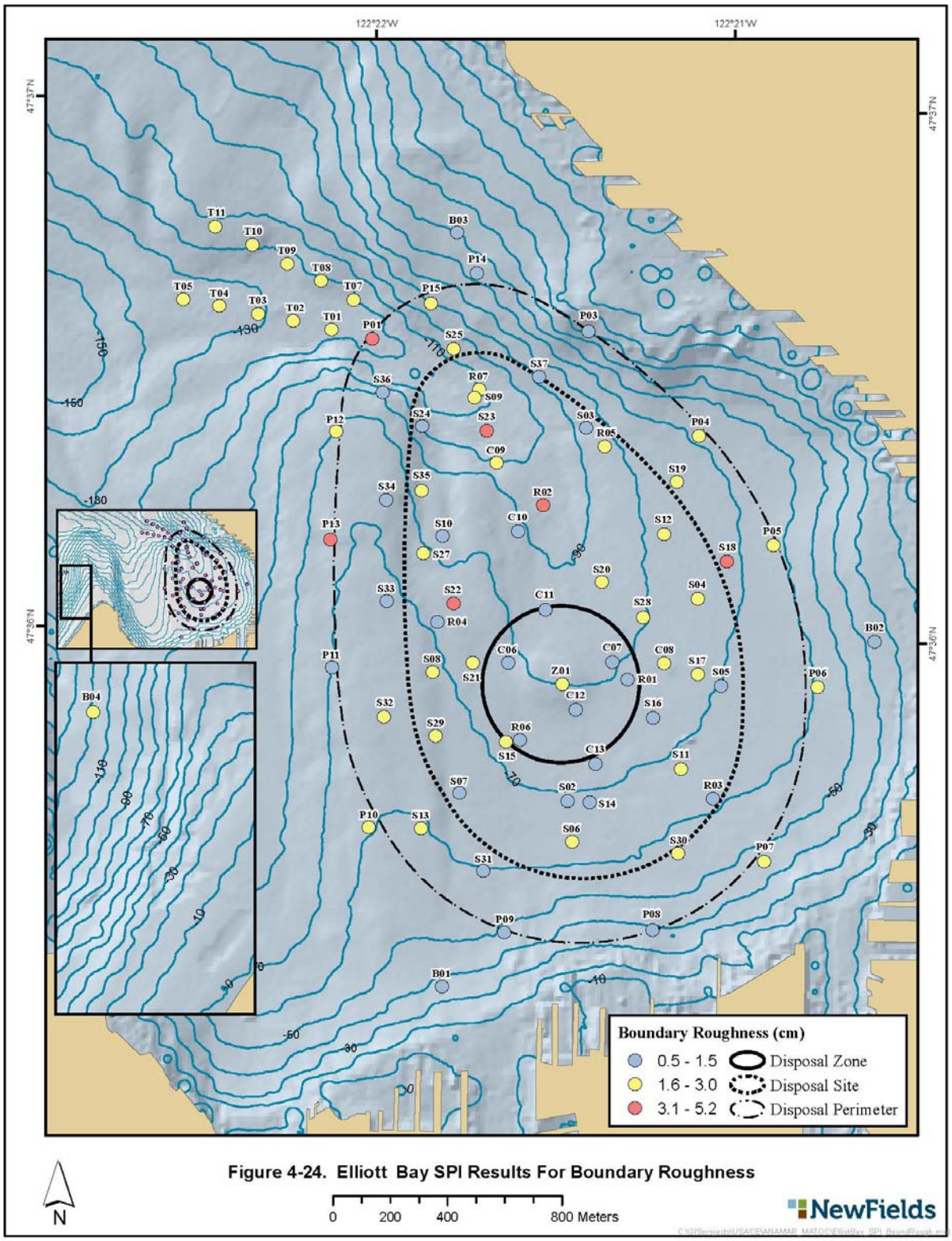



**Figure 4-24. Elliott Bay SPI Results For Boundary Roughness**

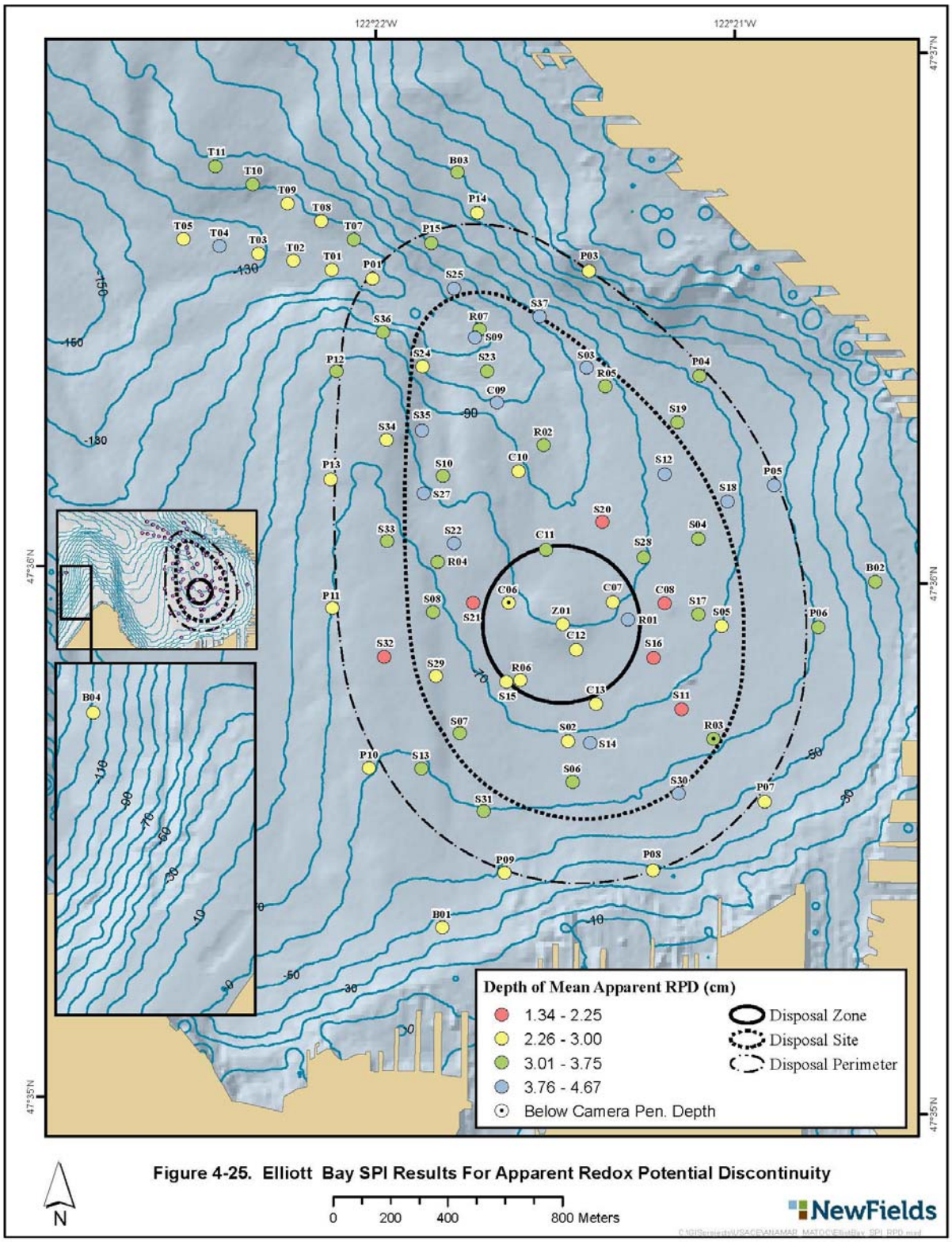



**Figure 4-25. Elliott Bay SPI Results For Apparent Redox Potential Discontinuity**

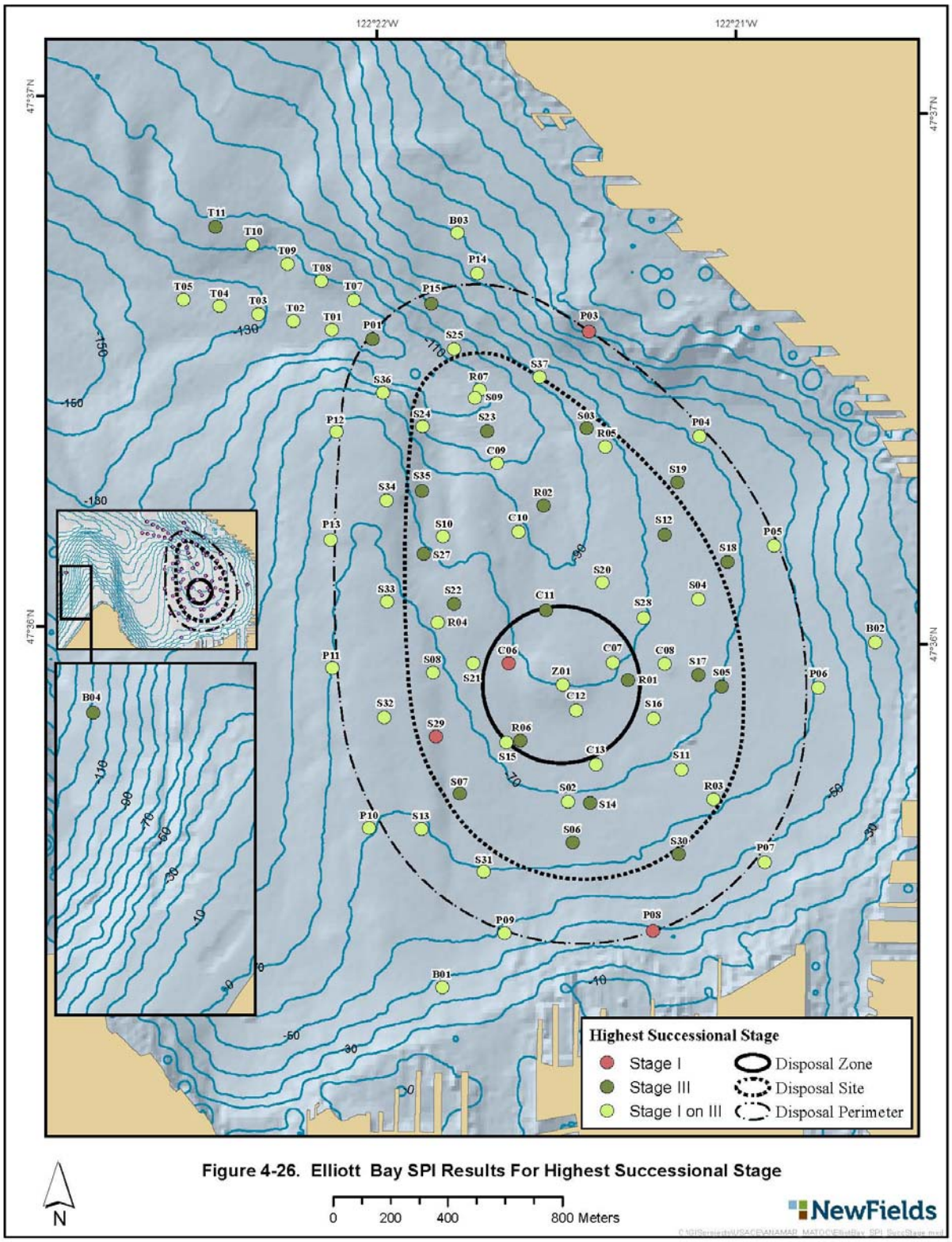



Figure 4-26. Elliott Bay SPI Results For Highest Successional Stage

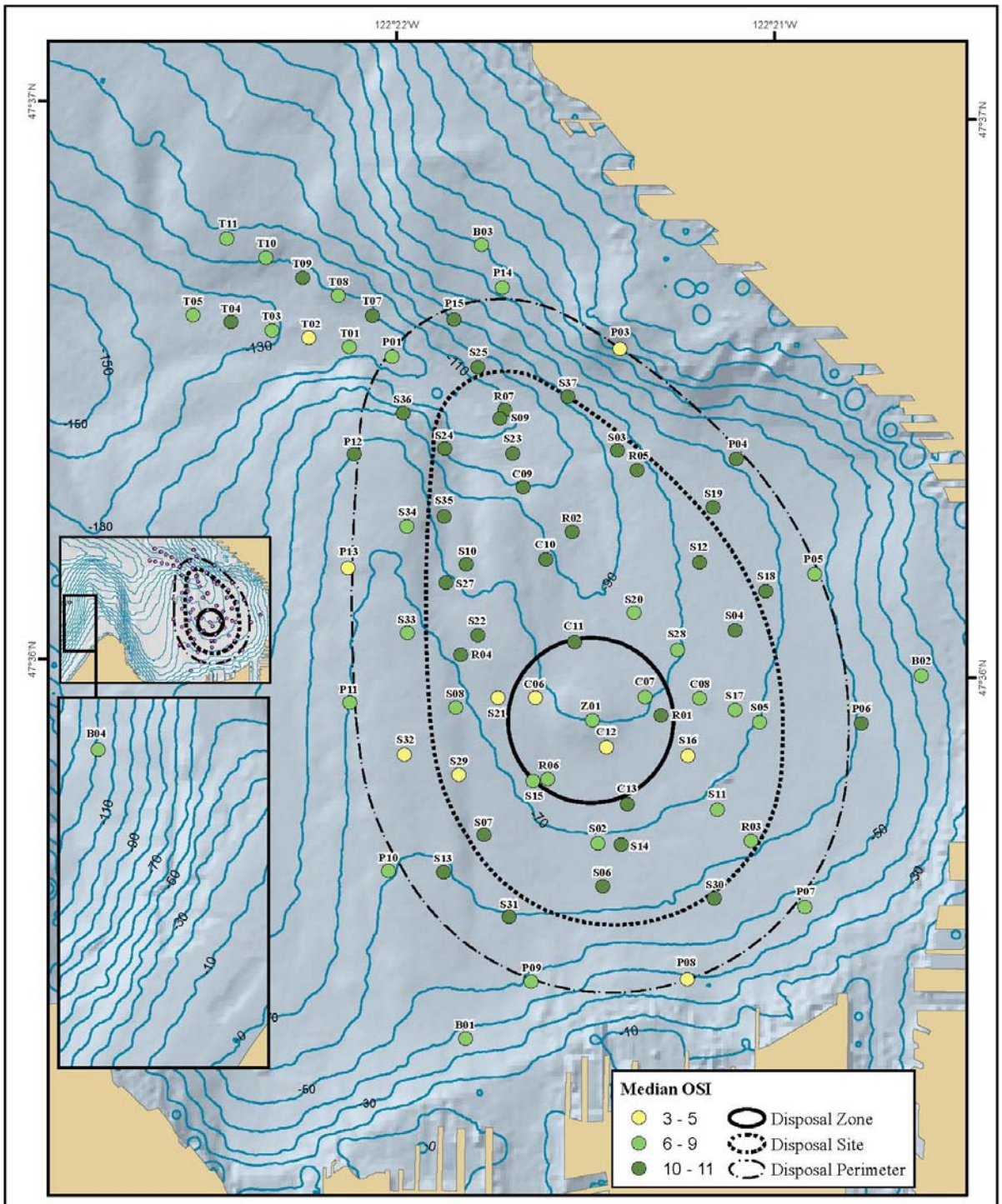



**Figure 4-27. Elliott Bay SPI Results For Median Organism Sediment Index**

# 5.0 Evaluation of the Physical Monitoring Data

This section evaluates the 2013 SPI physical monitoring data collected at the Commencement Bay and Elliott Bay sites using the DMMP interpretive guidelines described in Section 2.0. The evaluation is organized according to the questions and hypotheses of the DMMP monitoring framework.

## 5.1 Question 1: Does the Dredged Material Stay On Site?

### 5.1.1 Commencement Bay SPI Results

*Hypothesis No. 1: Dredged material remains within the disposal site boundary.*

The 2013 SPI survey at Commencement Bay did not identify the presence of recent dredged material beyond the disposal site perimeter that exceeded the 3 cm DMMP interpretive criteria. Under the monitoring framework for non-dispersive dredged material disposal sites, ***Hypothesis No. 1 is accepted*** (i.e., dredged material remains within the disposal site boundary). In addition, the 2007 revision of the target disposal coordinates at the Commencement Bay site appears to have shifted the deposition pattern of dredged material slightly to the southeast (see 3 cm contour in Figure 4-3) but the dredged material footprint remains contained within the southeast disposal perimeter.

### 5.1.2 Elliott Bay SPI Results

*Hypothesis No. 1: Dredged material remains within the disposal site boundary.*

The 2013 SPI survey at Elliott Bay did not identify the presence of dredged material beyond the disposal site perimeter that exceeded the 3 cm DMMP interpretive criteria. Both recent and historic dredged material remained within the disposal site, which suggests relatively stable dredged material deposition patterns at the site. Under the monitoring framework for non-dispersive dredged material disposal sites, ***Hypothesis No. 1 is accepted*** (i.e., dredged material remains within the disposal site boundary).

# 6.0 References


DMMP. 2007. DMMP clarification paper. Management of the Commencement Bay non-dispersive disposal site. Final 6/2/07. Prepared by Courtney Wasson and John Hanson, WA State Dept of Natural Resources, David Kendall and David Fox, U.S. Army Corps of Engineers, Seattle District, and Jonathan Freedman, U.S. Environmental Protection Agency, Region 10, for he Dredged Material Management Program Agencies. http://www.nws.usace.army.mil/Portals/27/docs/civilworks/dredging/Updates/2007-CB-Site-Management-07-Clarification.pdf

Integral. 2013. Sampling and Analysis Plan. Partial monitoring at the Elliot Bay non-dispersive unconfined open-water dredged material disposal site. July 26, 2013. Prepared for the Washington State Department of Natural Resources, Olympia, WA. Prepared by Integral Consulting, Inc., Seattle, WA.

Johnson, R.G. 1972. Conceptual models of benthic communities. In: Models of Paleobiology (Schopf, ed.), Freeman, Cooper, and Co. San Francisco. Pp. 145-159.

Pearson, T.H. and R. Rosenberg. 1978. Macrobenthic succession in relation to organic enrichment and pollution of the marine environment. Oceanogr. Mar. Biol. Ann. Rev. 16: 229-311.

PSDDA. 1988a. Management Plan Report - Unconfined open-water disposal of dredged material, Phase I (Central Puget Sound). Puget Sound Dredged Disposal Analysis Program. Cooperatively published by (in alphabetical order) U.S. Army Corps of Engineers, Seattle District; U.S. Environmental Protection Agency, Region 10; Washington State Department of Ecology; and Washington State Department of Natural Resources.

PSDDA. 1988b. Final environmental impact statement – unconfined open-water disposal sites for dredged material, Phase I (Central Puget Sound). Puget Sound Dredged Disposal Analysis Reports Series. Cooperatively published by (in alphabetical order) U.S. Army Corps of Engineers, Seattle District; U.S. Environmental Protection Agency, Region 10; Washington State Department of Ecology; and Washington State Department of Natural Resources.

Rhoads, D.C. and J.D. Germano. 1982. Characterization of benthic processes using sediment-profile imaging: An efficient method of Remote Ecological Monitoring of the Seafloor (REMOTS® System). Mar. Ecol. Prog. Ser. 8: 115-128.

Rhoads, D.C. and J.D. Germano. 1986. Interpreting long-term changes in benthic community structure: a new protocol. Hydrobiology 142: 291-308.

SAIC. 2005. Physical monitoring and phenol study at the Commencement Bay PSDDA site, Tacoma, Washington. Draft Data Report. December 9, 2005. Submitted to the Washington State Department of Natural Resources, Olympia, WA. Submitted by Science Applications International Corporation, Bothell, WA.

SAIC. 2007. Updated Environmental Monitoring Plan. Unconfined, open-water, dredged material disposal sites, non-dispersive PSDDA sites in Puget Sound. Final. January 2007. Submitted to the Washington State Department of Natural Resources, Olympia, WA. Submitted by Science Applications International Corporation, Bothell, WA.

SAIC. 2008. 2007 full monitoring at the Commencement Bay non-dispersive unconfined open-water dredged material disposal site. Data Report. April 2, 2008. Submitted to Washington State Department of Natural Resources, Olympia, WA. Submitted by Science Applications International Corporation, Bothell, WA.

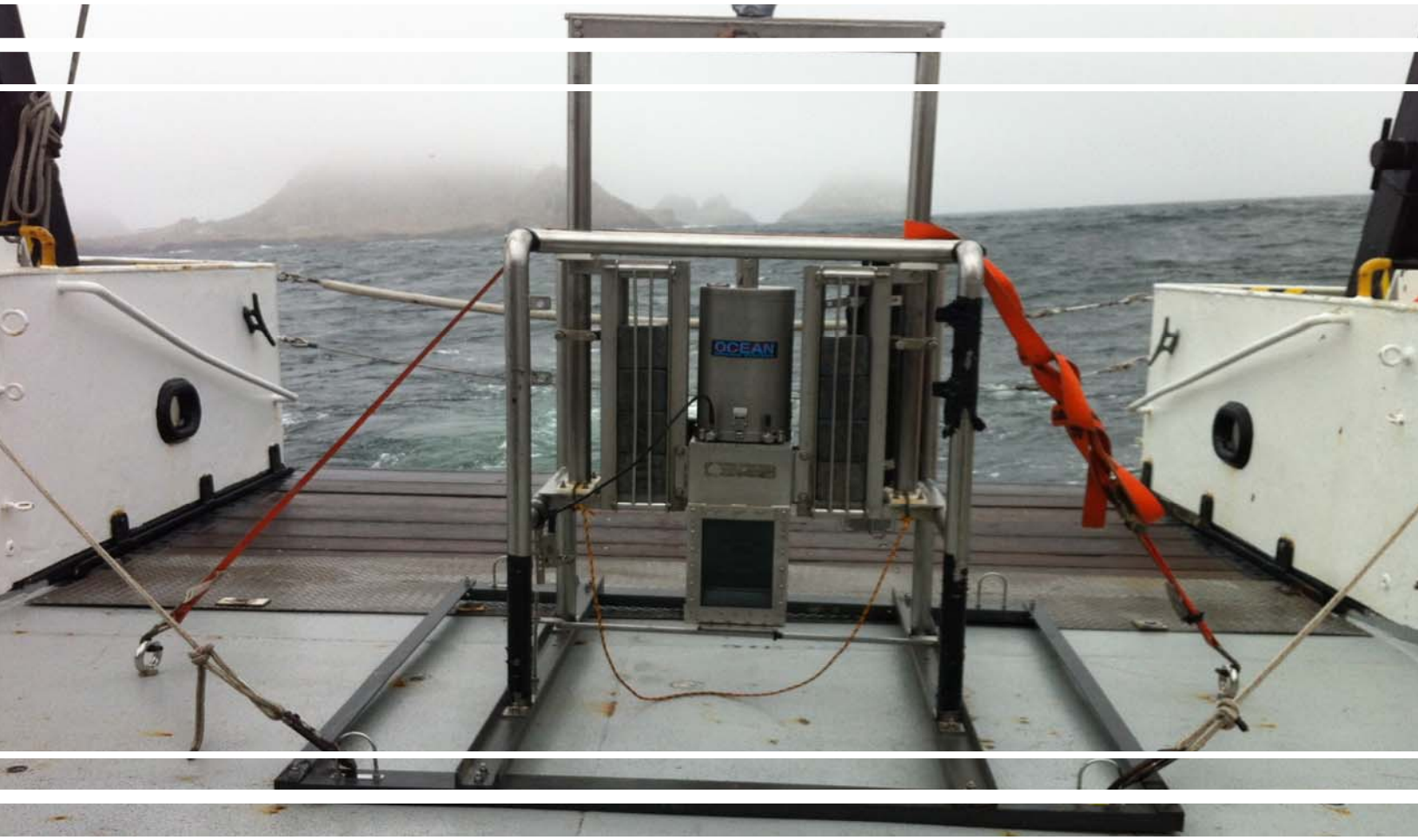
Striplin, B. 1991. Management of the Port Gardner and Elliott Bay sites. Clarification paper. Prepared by Betsy Striplin, Washington State Department of Natural Resources for the PSDDA agencies. Prepared for the 1991 Sediment Management Annual Review Meeting.

Striplin Environmental Associates. 2001. 2001 full monitoring in Commencement Bay, Tacoma, WA. Submitted to the Washington State Department of Natural Resources, Olympia, WA. Submitted by Striplin Environmental Associates, Inc., Olympia, WA.

Striplin Environmental Associates. 2002. Final Data Report, 2002 Tiered-Partial Monitoring in Elliott Bay, Seattle, WA. Prepared by Striplin Environmental Associates for the Washington State Department of Natural Resources. October 30, 2002.

USACE. 2013. Updates to DMMP program via Sediment Management Annual Review Meeting (SMARM) presentation and review. USACE Seattle District website. Accessed August 7, 2013. http://www.nws.usace.army.mil/Missions/CivilWorks/Dredging/SMARMs.aspx

NewFields




# Sediment Profile Imaging
# Image Collection and Analysis Plan

## Commencement Bay and Elliott Bay DMMP Sites

Final

August14, 2013

NewFields
115 2nd Ave N, Suite 100
Edmonds, WA 98020

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# 1.0 Introduction

The Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Seattle District, U.S. Environmental Protection Agency, Washington Departments of Ecology and Natural Resources) jointly manage eight open-water dredged material disposal sites in Puget Sound, including five non-dispersive and three dispersive sites. The Washington Department of Natural Resources (DNR) is the lead agency for conducting chemical and biological monitoring at the non-dispersive sites and the U.S. Army Corps of Engineers, Seattle District (USACE) is the lead agency for conducting physical monitoring at both dispersive and non-dispersive sites. Physical monitoring includes bathymetric surveys at all eight sites and sediment profile imaging (SPI) surveys at the non-dispersive sites.

In 2013, SPI surveys are planned at the Commencement Bay and Elliott Bay DMMP disposal sites. This SPI Image Collection and Analysis Plan (ICAP) outlines the sampling methods and analysis protocols for conducting a sediment profile imaging (SPI) survey to determine the spatial extent of recent dredged material deposits and to examine near-surface, benthic habitat conditions at selected locations at the Site. NewFields, Edmonds, WA has been contracted by ANAMAR Environmental Consulting, Inc., Gainesville, FL, to perform the SPI surveys.

# 2.0 Background

## 2.1 DMMP Disposal Site Monitoring Program

The original environmental monitoring plans for unconfined, open-water, dredged material disposal sites in central Puget Sound were published by the Puget Sound Dredged Disposal Analysis program agencies in 1988 (PSDDA 1988). The monitoring plans were designed to verify that dredged material disposed at the sites remains within the disposal site boundaries and that unacceptable adverse effects do not occur either onsite or offsite due to dredged material disposal. Numerous revisions to the physical, chemical, and biological monitoring plans were made by the Dredged Material Management Program agencies between 1988 and 2007. The Updated Environmental Monitoring Plan (SAIC 2007) incorporated those changes, bringing the monitoring plans up to date. While changes have been adopted in the chemical and biological monitoring plans and procedures since 2007 (see USACE 2013), no changes have occurred to the physical monitoring plans.

DMMP disposal site monitoring is designed to answer three monitoring questions through the evaluation of six testable hypotheses (Table 1). An SPI survey is used to evaluate the first testable hypothesis under Question 1. Dredged material is determined to have remained on site if deposits of dredged material are no greater than 3 cm at the perimeter stations.

## 2.1 Commencement Bay and Elliott Bay DMMP Sites

The Updated Environmental Monitoring Plan (UEMP) includes the current physical monitoring requirements and procedures for the Commencement Bay (CB) and Elliott Bay (EB) sites. A description of these two sites is included in Table 2 and site maps are provided in Figures 1 and 2. The monitoring triggers listed in Table 2 are considered “soft” triggers, meaning that best professional judgment is applied by the DMMP agencies to determine the actual time at which monitoring will occur. At the EB site, approximately 590,000 cubic yards of material have been placed since the last SPI monitoring survey was conducted in 2002 (SEA 2002). Chemical and biological monitoring of the EB site is planned by DNR in the summer of 2013. At the CB site, approximately 429,000 cubic yards have been placed since the last SPI survey in 2007 (SAIC

2007), which is short of the soft trigger. However, the target disposal coordinates for the CB site were changed after the 2007 survey in order to reduce the height of the disposal mound. The revised coordinates are at the edge of the target area. After six years of disposal at the new coordinates, the DMMP agencies agreed that an SPI survey was appropriate to ensure that the new disposal coordinates are working as intended and the dredged material footprint is contained within the disposal site boundary.

**Table 1.** The DMMP monitoring framework

| Question | Hypothesis | Monitored Variable | Interpretive Guideline | Action Item (When exceedances noted)[1] |
|---|---|---|---|---|
| **No. 1**<br><br>**Does the deposited dredged material stay on site?** | 1. Dredged material remains within the site boundary. | Sediment Vertical Profiling System (SVPS)<br><br>Onsite and Offsite | Dredged material layer is greater than 3 cm at the perimeter stations. | Further assessment is required to determine full extent of dredged material deposit. |
| | 2. Chemical concentrations do not measurably increase over time due to dredged material disposal at offsite stations. | Sediment Chemistry<br><br>Offsite | Washington State Sediment Quality Standards<br>and<br>Temporal analysis | Post-disposal benchmark station chemistry is analyzed and compared with appropriate baseline benchmark station data. |
| **No. 2**<br><br>**Are the biological effects conditions for site management [PSDDA-defined Site Condition II] exceeded at the site due to dredged material disposal? (PSDDA 1988b)** | 3. Sediment chemical concentrations at the onsite monitoring stations do not exceed the chemical concentrations associated with PSDDA Site Condition II guidelines due to dredged material disposal. | Sediment Chemistry<br><br>Onsite | Onsite chemical concentrations are compared to DMMP maximum levels. | DMMP agencies may seek adjustments of disposal guidelines <u>and</u> compare post-disposal benchmark chemistry with appropriate baseline benchmark station data. |
| | 4. Sediment toxicity at the onsite stations does not exceed the PSDDA Site Condition II biological response guidelines due to dredged material disposal. | Sediment Bioassays<br><br>Onsite | DMMP Bioassay Guidelines (Section 401 Water Quality Certification) | Benchmark station bioassays are performed (if archived after monitoring) and compared with baseline benchmark bioassay data. |
| **No. 3**<br><br>**Are unacceptable adverse effects due to dredged material disposal occurring to biological resources off site?** | 5. No significant increase due to dredged material disposal has occurred in the chemical body burden of benthic infauna species collected downcurrent of the disposal site. | Tissue Chemistry<br><br>Transect | Guideline values<br>Metals: 3x the baseline concentrations<br>Organics: 5x the baseline concentrations | Compare post-disposal benchmark tissue chemistry with baseline benchmark tissue chemistry data. |
| | 6. No significant decrease due to dredged material disposal has occurred in the abundance of dominant benthic infaunal species collected downcurrent of the disposal site. | Infaunal Community Structure<br><br>Transect | Guideline values<br>Abundance of major taxa < ½ baseline macrobenthic infauna abundances | Compare post-disposal benchmark benthic data with baseline benchmark data. |

1. To determine if observed changes in chemical conditions or infaunal benthos are due to dredged material disposal, data from the benchmark stations are considered. All decisions are subject to DMMP agency review and best professional judgment.

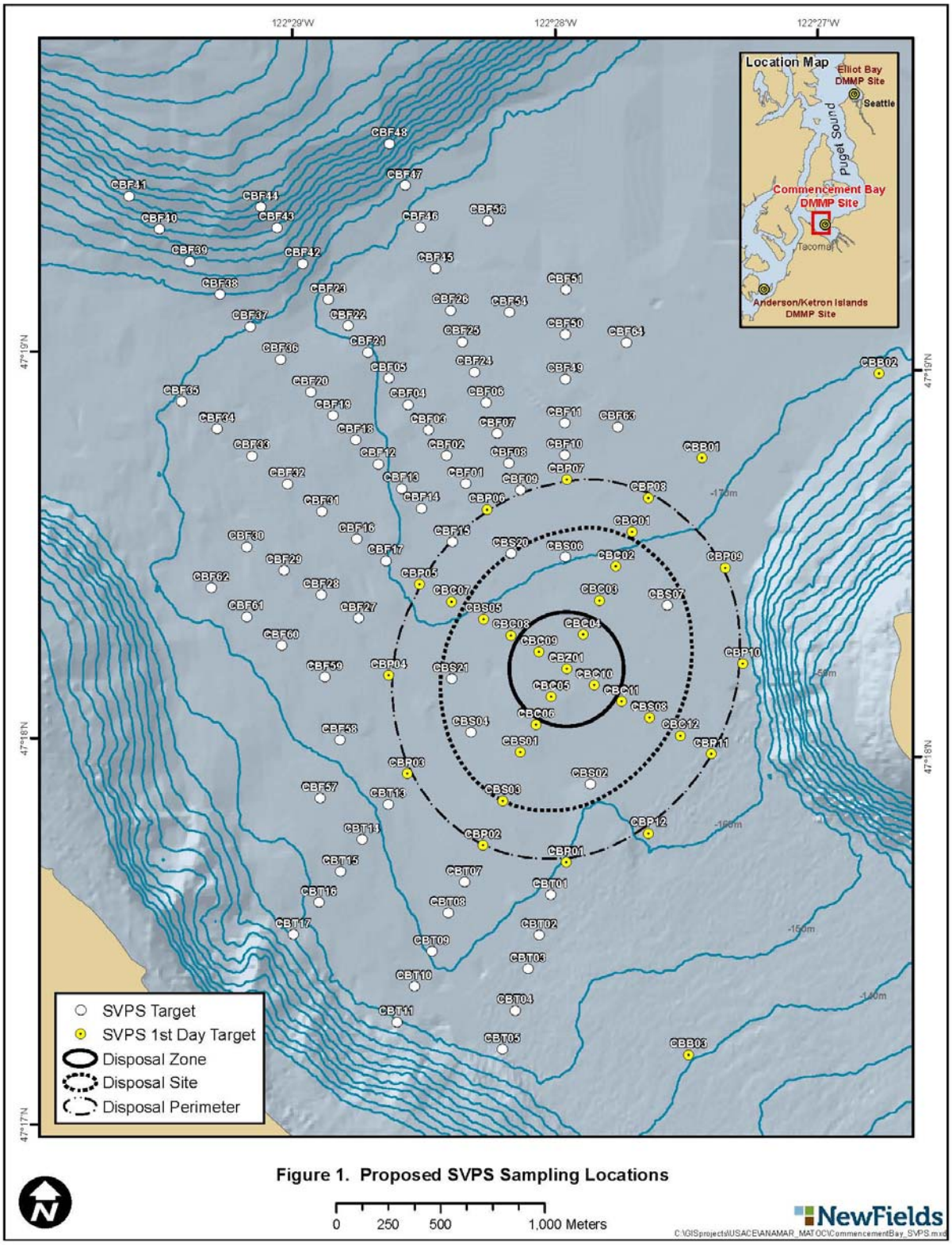


**Figure 1. Proposed SVPS Sampling Locations**

0 250 500 1,000 Meters

NewFields

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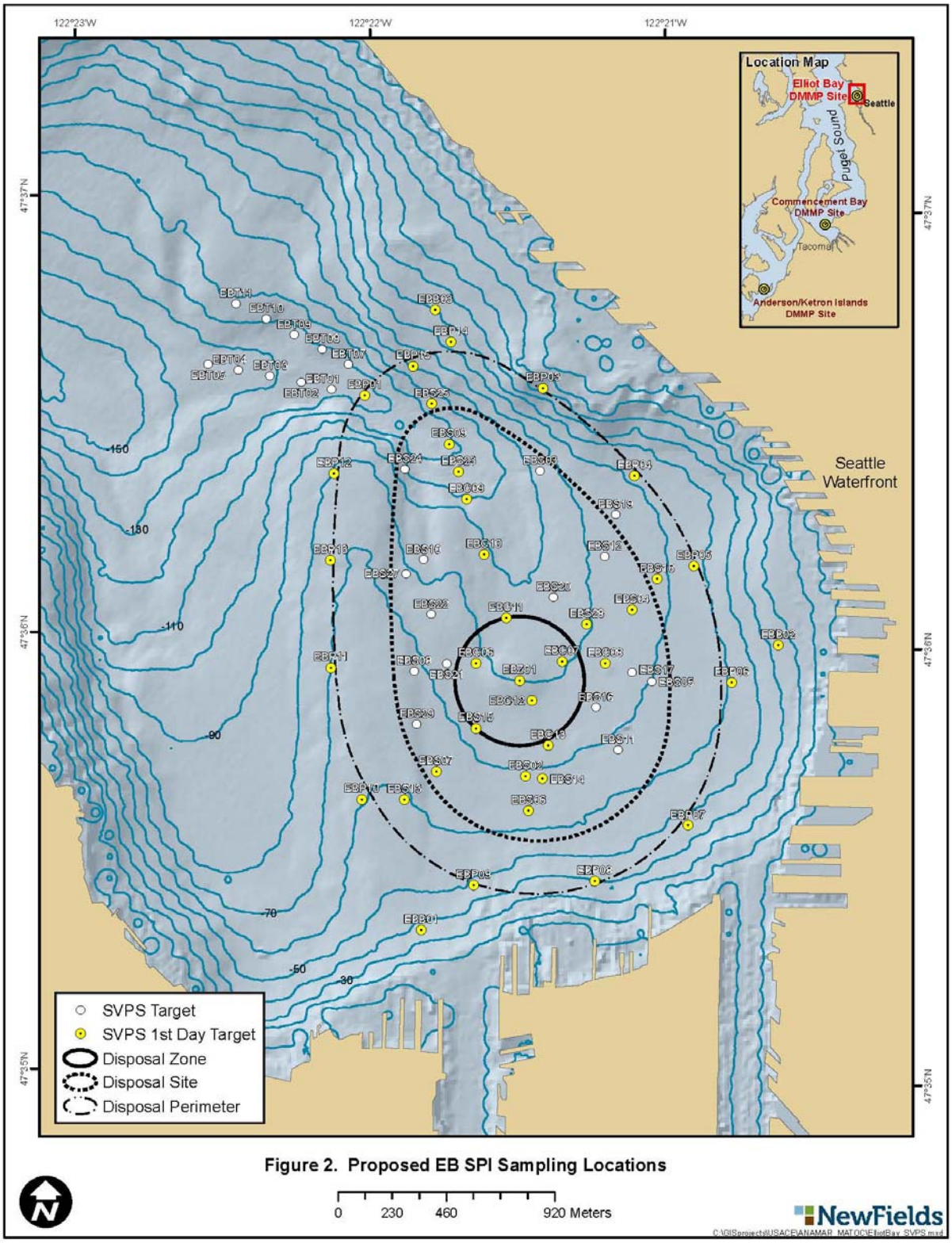


**Figure 2. Proposed EB SPI Sampling Locations**

Table 2. CB and EB dredged material disposal site characteristics and monitoring trigger volumes.

| Site | Area (acres) | Depth (feet) | Disposal Zone Diameter (feet) | Target Area Diameter (feet) | Disposal Site Dimensions (feet) | Site Coordinates (Lat/Long: NAD83) | Monitoring Trigger Volume (cy) |
|---|---|---|---|---|---|---|---|
| Commencement Bay[1] | 310 | 540–560 | 1,800 (circle) | 1,200 (circle) | 4,600 x 3,800 (ellipsoid) | 47° 18.145’<br>122° 27.815’ | 500,000 |
| Elliott Bay[2] | 415 | 300–360 | 1,800 (circle) | 1,200 (circle) | 6,200 x 4,000 (tear drop shape) | 47° 35.91’<br>122° 21.45’ | 500,000 |

Notes:
[1]The disposal coordinates were shifted to the location listed in this table on June 16, 2007. From 1988 to June 15, 2007 the disposal coordinates were as follows: 47° 18.21’, 122° 27.91’ (NAD 83). All disposal since the last full monitoring event in 2007 has occurred at the coordinates listed in the table.
[2] Following site monitoring in 1990, the original EB disposal coordinates were shifted 300 feet to the south by the DMMP agencies (Striplin 1991). The disposal zone was not changed, so the disposal coordinates plotted within the disposal zone will show the disposal coordinates are off center to the south relative to the center of the disposal zone.

# 3.0 SPI Survey Operations

## 3.1 Station Locations and Sampling Requirements

SPI image collection is proposed at approximately 68 stations at the CB site and 75 stations at the EB site (Figures 1 and 2). Geographic coordinates for the CB and EB stations are provided in Tables 3 and 4, respectively. The listed coordinates reference the North American Datum of 1983 (NAD 1983). All CB sampling stations are identified with a "CB" prefix and all EB stations are identified with an "EB" prefix. Seven "station type" designations are identified: zone (Z), site (S), perimeter (P), transect (T), benchmark (B), central cross (C), and floating (F). Central cross stations are located across the disposal site and are selected to delineate the extent of the dredged material deposit. SPI replicates will be identified by letter. For example, the first SPI replicate image collected at Elliott Bay Zone Station 01 will be identified as EBZ01-A.

The SPI surveys will require 2 field days to complete at each disposal site. The first day at each site is known as "Day 1"; the second day at each site is known as "Day 2." The "traditional across-site approach" of sampling SPI stations will be followed at both the CB and EB disposal sites (see SAIC 2007). Day 1 SPI stations at the CB site will target all Z, C, P, B, and a selection of S stations for a total of 32 locations to provide the across-site grid (Figure 1). Day 1 SPI stations at the EB site will also target all Z, C, P, B, and a selection of S stations for a total of 39 locations to provide the across-site grid (Figure 2). At the conclusion of Day 1 at each site, the DMMP agencies will be consulted regarding target stations for Day 2. Day 2 stations will include T and F stations as needed. The station locations may be modified or additional stations added to improve delineation of the dredged material footprint.

## 3.2 Navigation

Positioning and navigation will be accomplished using a differential Global Positioning System (DGPS) integrated to a computerized navigation and survey system (PSEP 1998). Sampling locations, range and bearing to target, and the vessel's track line are displayed along with vessel position to aid the helmsman in steering. Navigation positional accuracy using DGPS will be ± 2 meters for all sampling activities. The following are quality control (QC) procedures for navigation during the 2013 SPI surveys:

1. Daily navigation system checks (horizontal control checks) will be conducted by comparing the DGPS coordinates to a known reference point. These comparisons will be made daily to check for possible errors in the DGPS or navigation system.
2. Before field operations, the system's hardware, software, and DGPS system will be checked to make sure all systems are functional.
3. Field, station, and sample logs will be maintained to document all information related to station keeping and sample taking. Logging procedures will follow those described in PSEP (1986).
4. The vessel operator is directly responsible for the accurate operation of the navigation system and will act as the quality assurance officer for vessel positioning throughout the project.
5. A proper supply of electronic and mechanical spares will be maintained aboard the research vessel to ensure minimal downtime.

**Table 3.** Commencement Bay target coordinates.

| Station | Type | Latitude (N) | | Longitude (W) | |
|---|---|---|---|---|---|
| CBB01 | Benchmark | 47° | 18.7610’ | 122° | 27.4092’ |
| CBB02 | Benchmark | 47° | 18.9893’ | 122° | 26.7408’ |
| CBB03 | Benchmark | 47° | 17.2160’ | 122° | 27.4108’ |
| CBC01 | Central Cross | 47° | 18.5650’ | 122° | 27.6673’ |
| CBC02 | Central Cross | 47° | 18.4757’ | 122° | 27.7270’ |
| CBC03 | Central Cross | 47° | 18.3863’ | 122° | 27.7867’ |
| CBC04 | Central Cross | 47° | 18.2970’ | 122° | 27.8463’ |
| CBC05 | Central Cross | 47° | 18.1348’ | 122° | 27.9622’ |
| CBC06 | Central Cross | 47° | 18.0622’ | 122° | 28.0182’ |
| CBC07 | Central Cross | 47° | 18.3752’ | 122° | 28.3492’ |
| CBC08 | Central Cross | 47° | 18.2910’ | 122° | 28.1192’ |
| CBC09 | Central Cross | 47° | 18.2493’ | 122° | 28.0125’ |
| CBC10 | Central Cross | 47° | 18.1670’ | 122° | 27.7998’ |
| CBC11 | Central Cross | 47° | 18.1265’ | 122° | 27.6937’ |
| CBC12 | Central Cross | 47° | 18.0410’ | 122° | 27.4677’ |
| CBF61 | Floating | 47° | 18.3252’ | 122° | 29.1294’ |
| CBF62 | Floating | 47° | 18.3978’ | 122° | 29.2656’ |
| CBF01 | Floating | 47° | 18.6820’ | 122° | 28.3048’ |
| CBF02 | Floating | 47° | 18.7530’ | 122° | 28.3805’ |
| CBF03 | Floating | 47° | 18.8182’ | 122° | 28.4513’ |
| CBF04 | Floating | 47° | 18.8828’ | 122° | 28.5317’ |
| CBF05 | Floating | 47° | 18.9505’ | 122° | 28.6078’ |
| CBF06 | Floating | 47° | 18.8923’ | 122° | 28.2340’ |
| CBF07 | Floating | 47° | 18.8137’ | 122° | 28.1885’ |
| CBF08 | Floating | 47° | 18.7363’ | 122° | 28.1430’ |
| CBF09 | Floating | 47° | 18.6677’ | 122° | 28.0975’ |
| CBF10 | Floating | 47° | 18.7608’ | 122° | 27.9307’ |
| CBF11 | Floating | 47° | 18.8438’ | 122° | 27.9332’ |
| CBF12 | Floating | 47° | 18.7273’ | 122° | 28.6410’ |
| CBF13 | Floating | 47° | 18.6657’ | 122° | 28.5502’ |
| CBF14 | Floating | 47° | 18.6152’ | 122° | 28.4713’ |
| CBF15 | Floating | 47° | 18.5303’ | 122° | 28.3520’ |
| CBF16 | Floating | 47° | 18.5325’ | 122° | 28.7160’ |
| CBF17 | Floating | 47° | 18.4772’ | 122° | 28.6030’ |
| CBF18 | Floating | 47° | 18.7880’ | 122° | 28.7280’ |
| CBF19 | Floating | 47° | 18.8500’ | 122° | 28.8150’ |
| CBF20 | Floating | 47° | 18.9100’ | 122° | 28.9030’ |
| CBF21 | Floating | 47° | 19.0160’ | 122° | 28.6880’ |
| CBF22 | Floating | 47° | 19.0830’ | 122° | 28.7660’ |
| CBF23 | Floating | 47° | 19.1510’ | 122° | 28.8430’ |
| CBF24 | Floating | 47° | 18.9710’ | 122° | 28.2820’ |
| CBF25 | Floating | 47° | 19.0490’ | 122° | 28.3310’ |
| CBF26 | Floating | 47° | 19.1290’ | 122° | 28.3770’ |
| CBF27 | Floating | 47° | 18.3270’ | 122° | 28.7020’ |
| CBF28 | Floating | 47° | 18.3860’ | 122° | 28.8450’ |
| CBF29 | Floating | 47° | 18.4470’ | 122° | 28.9900’ |
| CBF30 | Floating | 47° | 18.5060’ | 122° | 29.1340’ |
| CBF31 | Floating | 47° | 18.6020’ | 122° | 28.8510’ |
| CBF32 | Floating | 47° | 18.6710’ | 122° | 28.9850’ |
| CBF33 | Floating | 47° | 18.7410’ | 122° | 29.1210’ |
| CBF34 | Floating | 47° | 18.8100’ | 122° | 29.2570’ |

| Station | Type | Latitude (N) | Longitude (W) |
|---|---|---|---|
| CBF35 | Floating | 47° 18.8780’ | 122° 29.3950’ |
| CBF36 | Floating | 47° 18.9930’ | 122° 29.0200’ |
| CBF37 | Floating | 47° 19.0760’ | 122° 29.1370’ |
| CBF38 | Floating | 47° 19.1580’ | 122° 29.2560’ |
| CBF39 | Floating | 47° 19.2410’ | 122° 29.3740’ |
| CBF40 | Floating | 47° 19.3230’ | 122° 29.4920’ |
| CBF41 | Floating | 47° 19.4070’ | 122° 29.6100’ |
| CBF42 | Floating | 47° 19.2420’ | 122° 28.9440’ |
| CBF43 | Floating | 47° 19.3340’ | 122° 29.0460’ |
| CBF44 | Floating | 47° 19.3860’ | 122° 29.1070’ |
| CBF45 | Floating | 47° 19.2360’ | 122° 28.4370’ |
| CBF46 | Floating | 47° 19.3430’ | 122° 28.4990’ |
| CBF47 | Floating | 47° 19.4500’ | 122° 28.5610’ |
| CBF48 | Floating | 47° 19.5570’ | 122° 28.6230’ |
| CBF49 | Floating | 47° 18.9580’ | 122° 27.9350’ |
| CBF50 | Floating | 47° 19.0730’ | 122° 27.9390’ |
| CBF51 | Floating | 47° 19.1890’ | 122° 27.9410’ |
| CBF54 | Floating | 47° 19.1280’ | 122° 28.1526’ |
| CBF56 | Floating | 47° 19.3632’ | 122° 28.2426’ |
| CBF57 | Floating | 47° 17.8602’ | 122° 28.8348’ |
| CBF58 | Floating | 47° 18.0120’ | 122° 28.7646’ |
| CBF59 | Floating | 47° 18.1734’ | 122° 28.8258’ |
| CBF60 | Floating | 47° 18.2526’ | 122° 28.9938’ |
| CBF63 | Floating | 47° 18.8370’ | 122° 27.7320’ |
| CBF64 | Floating | 47° 19.0560’ | 122° 27.7060’ |
| CBZ01 | Zone | 47° 18.2077’ | 122° 27.9058’ |
| CBS01 | Site | 47° 17.9893’ | 122° 28.0742’ |
| CBS02 | Site | 47° 17.9110’ | 122° 27.8075’ |
| CBS03 | Site | 47° 17.8627’ | 122° 28.1375’ |
| CBS04 | Site | 47° 18.0377’ | 122° 28.2658’ |
| CBS05 | Site | 47° 18.3327’ | 122° 28.2258’ |
| CBS06 | Site | 47° 18.4977’ | 122° 27.9208’ |
| CBS07 | Site | 47° 18.3777’ | 122° 27.5292’ |
| CBS08 | Site | 47° 18.0860’ | 122° 27.5875’ |
| CBS20 | Site | 47° 18.5040’ | 122° 28.1281’ |
| CBS21 | Site | 47° 18.1760’ | 122° 28.3430’ |
| CBP01 | Perimeter | 47° 17.7077’ | 122° 27.8908’ |
| CBP02 | Perimeter | 47° 17.7460’ | 122° 28.2108’ |
| CBP03 | Perimeter | 47° 17.9277’ | 122° 28.5042’ |
| CBP04 | Perimeter | 47° 18.1810’ | 122° 28.5825’ |
| CBP05 | Perimeter | 47° 18.4177’ | 122° 28.4725’ |
| CBP06 | Perimeter | 47° 18.6160’ | 122° 28.2208’ |
| CBP07 | Perimeter | 47° 18.6977’ | 122° 27.9208’ |
| CBP08 | Perimeter | 47° 18.6543’ | 122° 27.6075’ |
| CBP09 | Perimeter | 47° 18.4777’ | 122° 27.3108’ |
| CBP10 | Perimeter | 47° 18.2310’ | 122° 27.2358’ |
| CBP11 | Perimeter | 47° 17.9960’ | 122° 27.3475’ |
| CBP12 | Perimeter | 47° 17.7860’ | 122° 27.5808’ |
| CBT01 | Transect | 47° 17.6227’ | 122° 27.9492’ |
| CBT02 | Transect | 47° 17.5177’ | 122° 27.9892’ |
| CBT03 | Transect | 47° 17.4293’ | 122° 28.0292’ |
| CBT04 | Transect | 47° 17.3210’ | 122° 28.0742’ |
| CBT05 | Transect | 47° 17.2193’ | 122° 28.1208’ |

| Station | Type | Latitude (N) | Longitude (W) |
|---|---|---|---|
| CBT07 | Transect | 47° 17.6510’ | 122° 28.2792’ |
| CBT08 | Transect | 47° 17.5693’ | 122° 28.3375’ |
| CBT09 | Transect | 47° 17.4693’ | 122° 28.3975’ |
| CBT10 | Transect | 47° 17.3777’ | 122° 28.4608’ |
| CBT11 | Transect | 47° 17.2843’ | 122° 28.5242’ |
| CBT13 | Transect | 47° 17.8475’ | 122° 28.5742’ |
| CBT14 | Transect | 47° 17.7543’ | 122° 28.6708’ |
| CBT15 | Transect | 47° 17.6710’ | 122° 28.7508’ |
| CBT16 | Transect | 47° 17.5893’ | 122° 28.8292’ |
| CBT17 | Transect | 47° 17.5060’ | 122° 28.9242’ |

Note: Station names in red indicate Day 1 targets.

**Table 4.** Elliott Bay target coordinates (NAD83).

| Station | Type | Latitude (N) | Longitude (W) |
|---|---|---|---|
| EBZ01 | Zone | 47° 35.9100' | 122° 21.4500' |
| EBS02 | Site | 47° 35.6908' | 122° 21.4243' |
| EBS03 | Site | 47° 36.3925' | 122° 21.3943' |
| EBS04 | Site | 47° 36.0775' | 122° 21.0743' |
| EBS05 | Site | 47° 35.9141' | 122° 21.0026' |
| EBS06 | Site | 47° 35.6125' | 122° 21.4110' |
| EBS07 | Site | 47° 35.6974' | 122° 21.7276' |
| EBS08 | Site | 47° 35.9275' | 122° 21.8093' |
| EBS09 | Site | 47° 36.4491' | 122° 21.706' |
| EBS10 | Site | 47° 36.1831' | 122° 21.7846' |
| EBS11 | Site | 47° 35.7561' | 122° 21.1113' |
| EBS12 | Site | 47° 36.1991' | 122° 21.1713' |
| EBS13 | Site | 47° 35.6321' | 122° 21.8323' |
| EBS14 | Site | 47° 35.6861' | 122° 21.3663' |
| EBS15 | Site | 47° 35.7991' | 122° 21.5963' |
| EBS16 | Site | 47° 35.8521' | 122° 21.1903' |
| EBS17 | Site | 47° 35.9341' | 122° 21.0693' |
| EBS18 | Site | 47° 36.1491' | 122° 20.9913' |
| EBS19 | Site | 47° 36.2951' | 122° 21.1363' |
| EBS20 | Site | 47° 36.1031' | 122° 21.3413' |
| EBS21 | Site | 47° 35.9461' | 122° 21.6993' |
| EBS22 | Site | 47° 36.0582' | 122° 21.7553' |
| EBS23 | Site | 47° 36.3861' | 122° 21.6713' |
| EBS24 | Site | 47° 36.3901' | 122° 21.8523' |
| EBS25 | Site | 47° 36.5401' | 122° 21.7663' |
| EBS27 | Site | 47° 36.1501' | 122° 21.8413' |
| EBS28 | Site | 47° 36.0422' | 122° 21.2263' |
| EBS29 | Site | 47° 35.8061' | 122° 21.7953' |
| EBP01 | Perimeter | 47° 36.5558' | 122° 21.9943' |
| EBP03 | Perimeter | 47° 36.5808' | 122° 21.391' |
| EBP04 | Perimeter | 47° 36.3841' | 122° 21.0743' |
| EBP05 | Perimeter | 47° 36.1808' | 122° 20.8676' |
| EBP06 | Perimeter | 47° 35.9158' | 122° 20.7326' |
| EBP07 | Perimeter | 47° 35.5858' | 122° 20.8710' |
| EBP08 | Perimeter | 47° 35.4541' | 122° 21.1826' |
| EBP09 | Perimeter | 47° 35.4391' | 122° 21.5926' |
| EBP10 | Perimeter | 47° 35.6308' | 122° 21.9776' |
| EBP11 | Perimeter | 47° 35.9308' | 122° 22.0909' |
| EBP12 | Perimeter | 47° 36.3758' | 122° 22.0926' |
| EBP13 | Perimeter | 47° 36.1771' | 122° 22.0983' |
| EBP14 | Perimeter | 47° 36.6831' | 122° 21.7053' |
| EBP15 | Perimeter | 47° 36.6261' | 122° 21.8323' |
| EBT01 | Transect | 47° 36.5691' | 122° 22.1076' |
| EBT02 | Transect | 47° 36.5841' | 122° 22.2109' |
| EBT03 | Transect | 47° 36.5974' | 122° 22.3159' |
| EBT04 | Transect | 47° 36.6091' | 122° 22.4243' |
| EBT05 | Transect | 47° 36.6208' | 122° 22.5259' |
| EBT07 | Transect | 47° 36.6274' | 122° 22.051' |
| EBT08 | Transect | 47° 36.6608' | 122° 22.141' |
| EBT09 | Transect | 47° 36.6925' | 122° 22.2376' |
| EBT10 | Transect | 47° 36.7275' | 122° 22.3326' |

| Station | Type | Latitude (N) | Longitude (W) |
|---|---|---|---|
| EBT11 | Transect | 47° 36.7608' | 122° 22.4359' |
| EBB01 | Benchmark | 47° 35.3341' | 122° 21.766' |
| EBB02 | Benchmark | 47° 36.0025' | 122° 20.5776' |
| EBB03 | Benchmark | 47° 36.7558' | 122° 21.7609' |
| EBB04 | Benchmark | 47° 36.1075' | 122° 23.9076' |
| EBC06 | Cross | 47° 35.9471' | 122° 21.6003' |
| EBC07 | Cross | 47° 35.9561' | 122° 21.3083' |
| EBC08 | Cross | 47° 35.9531' | 122° 21.1623' |
| EBC09 | Cross | 47° 36.3231' | 122° 21.6433' |
| EBC10 | Cross | 47° 36.1981' | 122° 21.5793' |
| EBC11 | Cross | 47° 36.0532' | 122° 21.5003' |
| EBC12 | Cross | 47° 35.8651' | 122° 21.4073' |
| EBC13 | Cross | 47° 35.7631' | 122° 21.3503' |

Note: Station names in red indicate Day 1 targets.

## 3.3 Sediment Profile Imaging

### 3.3.1 SPI Overview

SPI images will be collected using a Benthos model 3731 sediment-profile camera (Benthos, Inc., North Falmouth, MA) equipped with an Ocean Imaging Systems digital camera (Figure 3). The sediment-profile camera consists of a wedge-shaped prism with a Plexiglas face plate and a back mirror mounted at a 45 degree angle. Light is provided by an internal strobe. The mirror reflects the image of the profile of the sediment-water interface up to a 35 mm camera that is mounted horizontally on top of the prism. The camera can obtain images of up to 20 cm of the upper sediment column in profile.

The camera prism is mounted on an assembly that can be moved up and down within a stainless steel frame by allowing tension or slack on the winch wire. As the camera is lowered, tension on the winch wire keeps the prism in the up position. Once the camera frame touches the bottom, slack on the winch wire allows the prism to vertically intersect the seafloor. The rate of fall of the prism (6 cm/second) is controlled by an adjustable passive hydraulic piston, which minimizes the disturbance of the sediment-water interface.

A trigger is tripped on impact with the bottom, activating a 13 second time-delay on the shutter release; this gives the prism a chance to obtain maximum penetration before a photograph is taken. After a photograph is taken, the camera is raised from the bottom, a wiper blade automatically cleans off any sediment adhering to the prism faceplate, and the strobes are recharged. The camera can then be lowered to collect another replicate image.

When the camera is brought to the surface, optical prism penetration is measured from a penetration indicator, which measures the distance the prism falls relative to the camera base. Two weight racks, each capable of holding 125 lb. of lead (in 25 lb. increments) can be loaded to increase penetration. If penetration is too great, adjustable stops, which control the distance the prism can descend, can be lowered, and “mud” doors can be attached to each side of the frame to increase the bearing surface of the entire unit.

### 3.3.2 SPI Procedures

Prior to survey mobilization, the SPI camera electronics are "bench-tested" to ensure that the camera is focused, firing properly, and the strobe is operational. Spare camera parts, fully-charged battery packs, and spare cables will be carried in the field to ensure uninterrupted sample acquisition.

At the beginning of the survey, the time on the digital SPI camera will be synchronized with the navigation system clock. Each SPI station replicate is identified by the time stamp recorded as part of the digital image file and the corresponding time and position recorded by the navigation system. A redundant sample log will be kept by the field crew. Test shots are fired on deck at the beginning of each field day to verify all internal electronic systems are working according to specifications. These test shots include taking pictures of a standard gray/color card to ensure proper color balance of the digital images during collection and for verifying the calibration of the image analysis system during post-processing.

For these studies, the SPI camera will be lifted and dropped at each sampling station a minimum of three times to provide three SPI images per stations. The frame counter on the SPI camera is checked to make sure that the desired number of replicates has been taken. SPI images will be downloaded to a laptop computer periodically throughout the day to verify successful image

collection. These images then can be viewed to confirm that the settings on the digital camera are optimal for the conditions in the survey area. These settings will be adjusted, if necessary. In addition, if images have been missed or penetration depth is insufficient, then proper adjustments can be made (e.g., weight is added to the frame) and additional replicates can be taken.

## 3.4 Vessel and Schedule

SPI survey operations will be conducted aboard the research vessel (R/V) *Kittiwake* provided by Bio-Marine Enterprises, Seattle, WA. The vessel is equipped with winch and boom, which will allow deployment and recovery of the SPI camera system. At this time, SPI survey operations are scheduled to occur between September 11 through 18, 2013 and consist of four 10 hour days during daylight hours (Table 5). Mobilization of the vessel for SPI operations is currently scheduled to occur on September 11 or the morning of September 12, with SPI operations in CB planned for September 12 and 13, 2013. SPI operations at the EB site are scheduled for September 16 and 17, 2013. Demobilization in Seattle is scheduled to occur on September 18, 2013. The project schedule is dependent on vessel, equipment schedules, and weather conditions and may be modified in coordination with ANAMAR and the USACE.

**Table 5.** Proposed SPI field schedule.

| Date | Site | Activity |
|---|---|---|
| September 11 or 12 | Commencement Bay | Mobilization |
| September 12-13 | Commencement Bay | SPI Survey |
| September 14-15 | Transit | Transit to Elliott Bay |
| September 16-17 | Elliott Bay | SPI Survey |
| September 18 | Elliott Bay or Fisherman's Terminal | Demobilization |

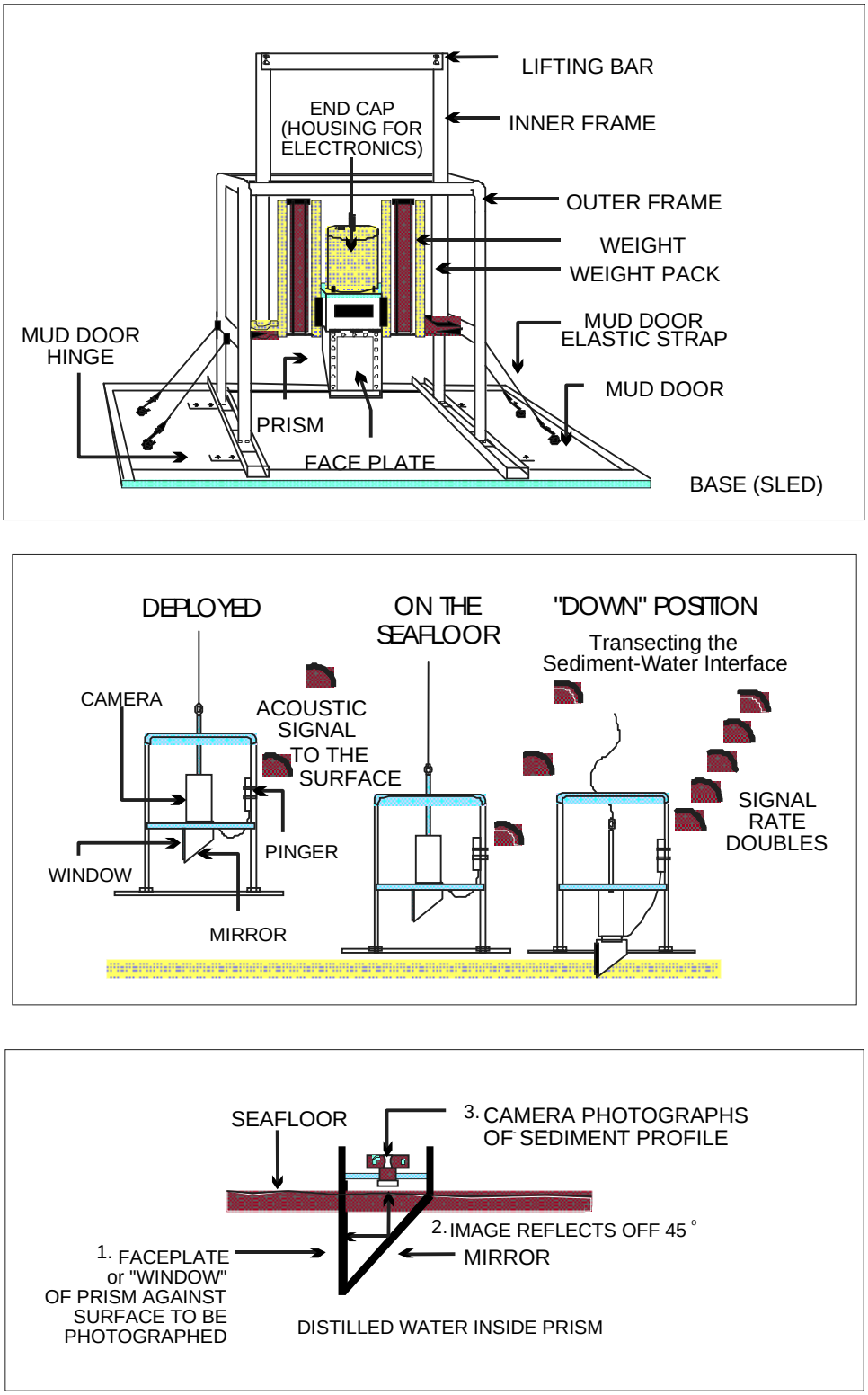


**Figure 3.** Schematic diagram of the sediment profile camera and sequence of operation on deployment.

# 4.0 SPI Image Analysis

Computer image analysis of SPI images follows a formal and standardized technique developed by Rhoads and Germano (1982, 1986). Physical and biological parameters are measured directly from the digital SPI images by an SPI image analyst using computer image analysis software. At a minimum the image analysis parameters will include:

- Camera prism penetration depth;
- Sediment grain size (major mode and range);
- Surface boundary roughness;
- Presence of mud clasts;
- Presence of methane;
- Depth of the apparent redox potential discontinuity (RPD);
- Infaunal successional stage;
- Calculation of the Organism-Sediment index (OSI); and
- Dredged material thickness

All data will be edited and verified by a senior-level scientist before final data synthesis, statistical analysis, and interpretation. Specific measurement techniques and interpretive criteria for each parameter are presented below.

## 4.1 Prism Penetration Depth

The prism penetration depth is determined by measuring both the largest and smallest linear distance between the sediment-water interface and the bottom of the film frame. Observations regarding the nature and condition of the sediment-water interface are also recorded. Comparative penetration depths from stations of similar grain-size give an indication of relative sediment water content and shear strength.

## 4.2 Grain Size Major Mode

The sediment grain-size major mode and range, in phi units, are visually determined from the SPI images by overlaying a grain-size comparator at the same scale. This comparator was prepared by photographing a series of Udden-Wentworth size classes (equal to or less than coarse silt up to granule and larger sizes) through the SPI optical system. Seven grain-size classes are on this comparator: ≥ 4 phi (silt/clay), 4 to 3 phi (very fine sand), 3 to 2 phi (fine sand), 2 to 1 phi (medium sand), 1 to 0 phi (coarse sand), 0 to -1 phi (very coarse sand), and < -1 phi (gravels). The lower limit of optical resolution is approximately 62 μm, allowing recognition of grain sizes equal to or greater than coarse silt. The accuracy of this method has been documented by comparing SPI estimates with grain-size statistics determined from laboratory sieve analyses (SAIC 1986).

## 4.3 Surface Boundary Roughness

Surface boundary roughness is determined by measuring the vertical distance (parallel to the image border) between the highest and lowest points of the sediment-water interface. In addition, the origin (physical or biogenic) of this small-scale topographic relief is sometimes evident and can be recorded. In sandy sediments, boundary roughness can be a measure of sand-wave height. On silt-clay bottoms, boundary roughness values often reflect biogenic features such as fecal mounds or surface burrows. These features are abundant only in areas where

boundary shear stresses are low enough that such delicate features are preserved. Disposed dredged material often introduces high surface relief on an otherwise "smooth" bottom. Other surface features are noted when evident, including shell fragments/lag deposits, mud-clay clasts, and wood debris.

## 4.4 Mud Clasts

When fine-grained, cohesive sediments are disturbed, either by physical bottom scour or faunal activity (e.g., fish foraging), intact clumps of sediment can be scattered about on the seafloor. These mud or clay clasts can be seen at the sediment-water interface in SPI images and their abundance, distribution, oxidation state, and appearance of mud clasts may be used to make inferences about the recent pattern of seafloor disturbance.

## 4.5 Sedimentary Methane

Gas-filled voids in sediment are readily discernible in SPI images because of their irregular, generally circular shape and glassy appearance (due to the reflection of the camera strobe off the gas). The presence of sedimentary methane indicates high organic matter loading to a sediment system as methanogenesis predominates and sulfate is depleted.

## 4.6 Apparent Redox Potential Discontinuity (RPD) Depth

The apparent RPD depth estimates the depth of oxygenation in the upper sediment column and can be considered the depth to which biological mixing by organisms and/or physical mixing are most prevalent. The upper surface of aerobic sediments has a higher light reflectance value than underlying anaerobic sediments. This is apparent in SPI images and is due to oxidized surface sediment that contains minerals in an oxidized state (typically a tan, reddish-brown, or olive color), while the reduced sediments below this oxygenated layer are generally gray or black. The boundary between these layers is called the apparent RPD.

The apparent RPD depth provides an estimate of the biogenic sediment mixing depth because bioturbating organisms mix the oxidized sediment particles downward into the sediment column. Bioturbation also vertically transports buried reduced compounds to the sediment surface and exposes them to an oxidized water column (Aller 1982).

Another important characteristic of the apparent RPD is the contrast in reflectance values at this boundary. This contrast is related to the interactions among the degree of organic-loading in the sediment, bioturbation, and bottom-water dissolved oxygen levels. High inputs of labile organic material increase sediment oxygen demand, stimulate sulfate reduction rate, and result in sulfitic products. This results in more highly reduced (lower-reflectance) sediments at depth and higher RPD contrasts. In a region where generally low RPD contrasts exist, images with high RPD contrasts indicate localized sites of relatively high inputs of organic-rich material, such as dredged material.

## 4.7 Infaunal Successional Stage

In marine and estuarine systems, the mapping of infaunal successional stages from SPI images is based on the theory that organism-sediment interactions follow a predictable sequence after a major seafloor perturbation. This theory states that primary succession results in "the predictable appearance of macrobenthic invertebrates belonging to specific functional types following a benthic disturbance and these invertebrates interact with sediments in specific ways. Moreover, functional types are the biological units of interest and by definition do not demand a sequential

appearance of particular invertebrate species or genera" (Rhoads and Boyer 1982).

Benthic disturbance can result from natural processes, such as seafloor erosion, changes in seafloor chemistry, and predator foraging, as well as from human activities like dredged material disposal, pollution from industrial discharge, and excessive organic loading. Evaluation of successional stages involves deducing dynamics from structure, a technique pioneered by R. G. Johnson (1972) for marine soft-bottom habitats. The application of this approach to benthic monitoring requires in situ measurements of salient structural features of organism-sediment relationships as imaged through SPI photography.

Infaunal succession following a major seafloor disturbance initially involves pioneering populations (Primary or Stage I succession) of very small organisms that live at or near the sediment/water interface (Pearson and Rosenberg 1978, Rhoads and Germano 1986). In the absence of further disturbance, infaunal deposit feeders eventually replace these early successional assemblages. The start of this "infaunalization" process is designated as Stage II. Large, deep-burrowing infauna (Stage III taxa) represents a high order successional stage typically found in areas of low disturbance.

## 4.8 Organism-Sediment Index

The Organism-Sediment Index (OSI) provides a measure of general benthic habitat quality in shallow water environments based on dissolved oxygen conditions, depth of the apparent RPD, infaunal successional stage, and presence or absence of sedimentary methane measured from SPI images (Rhoads and Germano 1986). The OSI is a numerical index ranging from -10 to +11. The lowest value is given to bottom sediments with low or no dissolved oxygen in the overlying bottom water, no apparent macrofaunal life, and methane gas present in the sediment. The OSI for such a condition is –10 (highly disturbed or degraded benthic habitat quality). High OSI values are given to aerobic bottom sediments with a deep apparent RPD, mature macrofaunal community, and no methane gas (unstressed or undisturbed benthic habitat quality). The numerical values and ranges used in calculating the OSI are provided in Table 6.

## 4.9 Dredged Material Thickness

The ability to detect dredged material in SPI images is a function of the sedimentary characteristics of the disposed material relative to the characteristics of the ambient seafloor. Dredged material often consists of fine-grained, sulfide-rich, organic-rich sediments characteristic of port or harbor environments. This dark gray or black sedimentary material is readily apparent when overlying olive brown or light gray oxidized sediments. These layers may or may not be greater than the camera prism penetration depth. If less than penetration depth, the thickness of the dredged material layer is measured. Disposed dredged material may also be apparent because it contrasts in texture with the ambient sediments (e.g., sand over mud). Dredged material often exhibits an anomalous "chaotic" or disturbed fabric which contrasts with the ambient bottom.

**Table 6.** Calculation of the Organism-Sediment Index

**Choose One Value:**

| Mean RPD Depth Classes | Index Value |
|---|---|
| 0.00 cm | 0 |
| > 0 - 0.75 cm | 1 |
| 0.76 - 1.50 cm | 2 |
| 1.51 - 2.25 cm | 3 |
| 2.26 - 3.00 cm | 4 |
| 3.01 - 3.75 cm | 5 |
| > 3.75 cm | 6 |

**Choose One Value:**

| Successional Stage | Index Value |
|---|---|
| Azoic | - 4 |
| Stage I | 1 |
| Stage I - II | 2 |
| Stage II | 3 |
| Stage II - III | 4 |
| Stage III | 5 |
| Stage I on III | 5 |
| Stage II on III | 5 |

**Choose One or Both if Appropriate:**

| Chemical Parameters | Index Value |
|---|---|
| Methane Present | - 2 |
| No/Low Dissolved Oxygen | - 4 |

**SPI Organism-Sediment Index =** Range: - 10 + 11

# 5.0 Reporting and Deliverables

Project deliverables for the CB and EB SPI surveys are summarized in Table 7. Following completion of the SPI surveys, NewFields will analyze the SPI images for the parameters outlined in Section 4.0. NewFields will prepare a draft report summarizing the findings of the CB and EB SPI surveys, with particular emphasis on presence and location of dredged material relative to the DMMP monitoring objectives. The report at a minimum will include the following:

- Summary of the SPI surveys, image analysis, and deviations from the approved ICAP;
- Tables with sampling station coordinates;
- Figures showing SPI stations;
- Figures showing dredged material thickness, including historical vs. recent dredged material deposits if possible;
- Tables, figures and narrative with the following information: prism penetration depth, presence/absence of dredged material, thickness of dredged material layer, sediment grain size major mode and range, surface boundary roughness, presence or absence of mud clasts, apparent redox potential discontinuity (RPD) depth, infaunal successional stage, and organism-sediment index (OSI);
- Descriptions of ambient sediment characteristics and dredged material characteristics and distribution;
- Selected SPI images to illustrate descriptions made in the narrative;
- Analysis of the survey results relative to the goals and management objectives of the disposal site management plan;
- An appendix with all photographs, image analysis results, navigation report, and summary of the daily position checks;
- An appendix with the final ICAP; and
- GIS shapefiles with SPI station coordinates and relatable table/s with image data.

**Table 7.** Project and reporting schedule.

| Date | Activity |
|---|---|
| August 9, 2013 | Submit draft ICAP |
| August 13, 2013 | Comments on draft ICAP |
| August 23, 2013 | Submit final ICAP |
| September 11-18, 2013 | SPI surveys at CB and EB sites |
| October 11, 2013 | Submit draft report, including draft dredged material footprints |
| October 21, 2013 | Submit final report, including final dredged material footprints |

# 6.0 Staffing

Mr. John Nakayama is NewFields' proposed project manager and will coordinate and participate in the field sampling program. He will coordinate with the DMMP agencies regarding the selection of Day 2 SPI stations and provide senior review of SPI image analysis and reporting for the project.

Mr. Jasper Boas is NewFields' proposed SPI lead technician and will participate in the field program. He is also NewFields' SPI image analyst. He will manage the SPI equipment preparation and mobilization and perform the computer image analysis of the SPI images following completion of the survey.

Mr. Leon Delwiche is NewFields' proposed GIS analyst and will prepare the required station maps and shape files presenting the CB and EB SPI results.

Ms. Michelle Rau is ANAMAR's project manager. She will review deliverables prior to submittal to USACE and provide contract oversight.

# 7.0 References


Aller, R. 1982. The effects of macrobenthos on chemical properties of marine sediments and overlying waters. In: P.L. McCall and M.J.S. Tevesz (eds.), Animal-Sediment Relations. Topics in Geobiology, Plenum Press, N.Y., N.Y. 2: 53-102.

Johnson, R.G. 1972. Conceptual models of benthic communities. In: Models of Paleobiology (Schopf, ed.), Freeman, Cooper, and Co. San Francisco. Pp. 145-159.

Pearson, T.H. and R. Rosenberg. 1978. Macrobenthic succession in relation to organic enrichment and pollution of the marine environment. Oceanogr. Mar. Biol. Ann. Rev. 16: 229-311.

PSDDA. 1988. Management Plan Report - Unconfined open-water disposal of dredged material, Phase I (Central Puget Sound). Puget Sound Dredged Disposal Analysis Program.

PSEP. 1986. Puget Sound Estuary Program. Recommended protocols for measuring selected environmental variables in Puget Sound. Final Report. Prepared for the U.S. Environmental Protection Agency Region X, Office of Puget Sound, and the U.S. Army Corps of Engineers. Tetra Tech, Bellevue, WA.

PSEP. 1998. Puget Sound Estuary Program. Recommended protocols for station positioning in Puget Sound. Final Report. Prepared for the U.S. Environmental Protection Agency, Region 10.

Rhoads, D.C. and L.F. Boyer. 1982. The effects of marine benthos on physical properties of sediments. In: P.L. McCall and M.J.S. Tevesz (eds.), Animal-Sediment Relations. Topics in Geobiology, Plenum Press, N.Y., N.Y. 2: 3-52.

Rhoads, D.C. and J.D. Germano. 1982. Characterization of benthic processes using sediment-profile imaging: An efficient method of Remote Ecological Monitoring of the Seafloor (REMOTS® System). Mar. Ecol. Prog. Ser. 8: 115-128.

Rhoads, D.C. and J.D. Germano. 1986. Interpreting long-term changes in benthic community structure: a new protocol. Hydrobiology 142: 291-308.

SAIC. 1986. Environmental information in support of site designation documents for the Foul Area Disposal Site - Volume 1: Technical Report. Report No. SAIC-85/7528&93. Submitted to the U.S. Corps of Engineers, New England Division, Waltham, WA.

SAIC. 2007. Updated Environmental Monitoring Plan. Unconfined, open-water, dredged material disposal sites, non-dispersive PSDDA sites in Puget Sound. Final. January 2007. Submitted to the Washington State Department of Natural Resources, Olympia, WA. Submitted by Science Applications International Corporation, Bothell, WA.

Striplin, B. 1991. Management of the Port Gardner and Elliott Bay sites. Clarification paper. Prepared by Betsy Striplin, Washington State Department of Natural Resources for the PSDDA agencies. Prepared for the 1991 Sediment Management Annual Review Meeting.

Striplin Environmental Associates. 2002. Final Data Report, 2002 Tiered-Partial Monitoring in Elliott Bay, Seattle, WA. Prepared by Striplin Environmental Associates for the Washington State Department of Natural Resources. October 30, 2002.

USACE. 2013. Updates to DMMP program via Sediment Management Annual Review Meeting (SMARM) presentation and review. USACE Seattle District website. Accessed August 7, 2013. http://www.nws.usace.army.mil/Missions/CivilWorks/Dredging/SMARMs.aspx

# Appendix A

# Health and Safety Plan

# Sediment Profile Imaging Surveys Elliott Bay and Commencement Bay Disposal Sites

## Health and Safety Plan

Prepared for:

U.S. Army Corps of Engineers
Seattle District
4735 East Marginal Way S.
Seattle, WA 98134-2385

Prepared by:

NewFields
115 2nd Avenue North, Suite 100
Edmonds, Washington 98020

August 14, 2013

# 1.0 Introduction

This Site-Specific Health & Safety Plan (HASP) has been developed as part of the Elliott Bay (Seattle, WA) and Commencement Bay (Tacoma, WA) Sediment Profile Imaging (SPI) Investigations. This plan is intended to incorporate sampling activities in support of the SPI Investigations, and must be re-evaluated should project conditions change.

The procedures and protocols in this plan have been established to ensure that a mechanism is in place to address project personnel in the event that hazards from field work or site contamination are encountered during the project. This plan addresses typical on-site activities such as marine vessel use and SPI equipment procedures. This HASP is not designed to replace existing procedures or to address all health and safety procedures that could be required during typical emergency response activities.

Compliance with this HASP is required from all authorized NewFields project personnel, project support personnel, and visitors who enter the work areas of this project. No field work will be conducted without meeting the requirements of this HASP.

The content of this HASP may change or undergo revision based upon unexpected field conditions, modifications to the technical scope of work or additional information made available to health and safety (H&S) personnel. Any proposed changes must also be reviewed and approved by designated NewFields personnel.

## *1.1 Project Location*

Project work will be conducted in Elliott and Commencement Bays. In-water work in Elliott and Commencement Bays will be conducted from the R/V Kittiwake.

## *1.2 Personnel and Emergency Contact Information*

Table 1 lists relevant project personnel and local emergency contact information. Additional detailed emergency information is found in Section 6.0 along with written hospital directions and accompanying maps.

All project personnel, project support personnel, and visitors present during field work must sign in the space provided in Table 1 prior to initiating project work. A signature below indicates commitment to implement this plan and to ensure that project fieldwork is conducted safely. A signature below also indicates review and approval of the plan and agreement that the anticipated hazards are correct and that planned hazard controls are sufficient.

**Table 1. Project Personnel and Local Emergency Contact Information**

| Project Personnel | | |
|---|---|---|
| Project Manager, Michelle Rau | | (352) 377-5773 |
| Field Manager, John Nakayama | | (206) 276-0257 |
| Health and Safety Officer, Jasper Boas | | (425) 314-0977 |
| Emergency Contact Information | | |
| Seattle Police Department<br>Tacoma Police Department | | 911 or (206) 625-5011<br>911 or (253) 798-4721 |
| Seattle Fire Department<br>Tacoma Fire Department | | 911 or (206) 386-1400<br>911 or (253) 591-5737 |
| Ambulance | | 911 |
| Hospitals:<br>Harborview Medical Center<br>325 9th Ave<br>Seattle, WA 98104<br><br>Tacoma General Hospital<br>315 Martin Luther King Jr Way<br>Tacoma, WA 98405 | | (206) 744-3000<br><br>(253) 403-1000 |
| U.S. Coast Guard | | (360) 417-5800 |
| National Response Center (NRC) for Oil/Chemical Spills | | (800) 424-8802 |
| Poison Control Center | | (800) 222-1222 |
| Name | Signature | Date |
| | | |
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# 2.0 Health and Safety Personnel

The following briefly describes the health and safety designations and general responsibilities for this project.

## *2.1 Project Manager – NewFields*

The Project Manager or designee has overall executive responsibility for all activities and personnel on the site during all project activities described in this HASP.

## *2.2 On-Site Health and Safety Officer*

The HSO is responsible for the development of safety protocols and procedures, pursuant to the all hazardous aspects of this project, implementation and enforcement of this HASP. The HSO has the authority to modify this HASP based on actual site working conditions and procedures. The HSO will also be responsible for the resolution of any outstanding health and safety issues which arise during the conduct of site work.

Health and safety-related duties and responsibilities will be assigned only to qualified individuals by the HSO. The HSO has stop-work authorization, which will be executed upon determination of an imminent safety hazard, emergency situation, or other potentially dangerous situation, such as extreme weather conditions. An Authorization to Proceed with work will be issued by the HSO after such action. The HSO or designee will initiate and execute contact with support facilities and personnel when this action is appropriate. The HSO may periodically conduct QA/QC surveys of the health and safety procedures implemented onsite.

# 3.0 Site and Project Description

Elliott Bay is located in the Central Basin region of Puget Sound and extends southward between West Point in the north to Alki Point in the south. Elliott Bay is roughly 8 square miles in size and its shorelines are heavily industrialized, particularly to the south where the Duwamish River enters the Bay. Harbor Island, at the mouth of the Duwamish River waterway, separates the river into two channels, the East and West Waterways, and is one of two Superfund cleanup sites in Elliott Bay along with the former location of Lockheed West Seattle. Sub-title and intertidal habitat is limited in Elliott Bay by the industrial development along its shores.

Commencement Bay is located in the southern portion of Puget Sound with the port of Tacoma, one of the most active commercial ports in the world, occupying the southeastern end. Commencement Bay if roughly 7.5 square miles in size.

The current investigation will involve sediment profile image collection throughout Elliott and Commencement Bays to determine the condition and quality of the benthic environment.

## 3.1 Scope of Work

NewFields will conduct a Sediment Profile Imaging (SPI) survey at locations throughout Elliot and Commencement Bays. SPI imaging is proposed at 75 locations in Elliott Bay and 68 locations in Commencement Bay with the potential for additional stations depending on time available. A more detailed description of the scope of work and maps of the sample locations can be found in the Image Collection and Analysis Plan (ICAP).

### 3.1.1 Sediment Profile Imaging

SPI provides a cross-sectional photograph of the sediment/water interface and near surface sediment (15 by 20 cm area). Images will be collected using a Benthos Model 3731 SPI camera frame and housing equipped with an Ocean Imaging System digital camera. The SPI camera consists of a wedge-shaped prism with a plexiglass faceplate and a back mirror mounted at a 45-degree angle. Light is provided by an internal strobe. The mirror reflects the sediment/water interface profile image to a digital camera mounted horizontally and down-facing on top of the prism. Three replicate images will be collected from each SPI sampling location. All three images will be analyzed for grain size major mode, depth of apparent redox potential discontinuity, infaunal successional stage, and habitat classification type.

The camera system weighs approximately 700 lbs and will be deployed from the Kittiwake using a winch and boom. Two persons will guide the camera over the stern of the vessel during deployment and recovery operations. Photographs are collected automatically when the SPI camera system is lowered to the seafloor. Vessel personnel will operate the vessel and furnished equipment, including the winch and differential Global Positioning System (DGPS) navigation system used to position the vessel.

Slipping/tripping hazards are present on the sampling vessel when the deck is wet. There are numerous pinch points on the sampling equipment as well as the vessel itself. All personnel will

be trained in the operation and deployment of the field gear, and will receive a vessel-specific safety briefing from the operator of the supplied vessel. All members of the sampling crew will wear slip-resistant boots and personal flotation devices (PFDs).

# 4.0 Hazard Assessment

This section summarizes hazards that may exist during project related tasks.

## *4.1 Task Specific Hazard Assessment*

For the field sampling tasks described in Section 3, the overall hazard level is low. Hazards encountered during this sampling program are due to physical safety hazards associated with the field operations. Types of potential hazards associated with the field sampling effort are summarized in Table 2. Potential hazards while working at the site include, but are not limited to, the following:

- Physical hazards from use of sampling equipment and operations on a vessel
- Physical hazards from working conditions (e.g., slips/trips/falls, drowning, hypothermia).
- Physical hazards from operating a motor vehicle to transit to and from the work site.

As described below, protective equipment and safe working procedures will help prevent accidents caused by these hazards.

**Table 2. Sediment Sampling – Types of Potential Hazards**

| **Physical Hazards** | | | |
|---|---|---|---|
| **Name of Physical Hazard** | **Source** | **Exposure Level/ Potential** | **Exposure Limit** |
| Vessel Operations | boat deck | Likely | N/A |
| Cold Weather Operations | boat deck area | Unlikely | N/A |
| Heavy Manual Lifting/Moving | SPI equipment | Likely | N/A |
| Slips/Trips/Falls | boat deck area | Likely | N/A |
| Inclement Weather – Rain | boat deck area | Possible | N/A |
| Vehicular Travel | car | Likely | N/A |
| Working Over Water | boat deck area | Likely | N/A |
| | | | |
| | | | |
| **Biological Hazards** | | | |
| **Name of Biological Hazard** | **Source** | **Exposure Level/ Potential** | **Exposure Limit** |
| Insect bites and stings | boat area | Unlikely | N/A |
| **Control Measures Used** | | | |
| **Engineering Controls:** | | | |
| **Level of PPE: D** | | | |
| **Location:** on boat deck | **PPE Equipment:** Chemical-resistant steel toe boots or waders, PVC Bib-style overalls (and jacket with hood as necessary), PFD Type III.<br>Long sleeve protective clothing. | | |
| Work Practices: | Watch for trip or slip hazards on boat deck.<br>Keep hands and other appendages out of pinch points between vessel and SPI equipment. | | |

NA = Not applicable.

## *4.2 Physical Hazards*

The following is a general discussion of the hazards that may be encountered on site. Exposure to chemical contaminants is not expected during this project.

### 4.2.1 Sampling Vessel Operations

The physical hazards associated with the deployment and retrieval of sampling equipment result from their weight and the method of deployment. Only appropriate personnel whose presence is required will deploy and retrieve the sampling gear. Under circumstances of potentially dangerous waves or winds, the sampling leader will employ best professional judgment to ensure safe field operations.

To avoid injuries from slipping on wet surfaces, rubber boots or waders with appropriate tread will be worn when working on the work deck or loading/unloading heavy equipment from the vessel. No overhead gear will be deployed; however, hard hats will be worn if overhead hazards exist. SPI equipment and deck lines not in immediate use will be kept clear of walkways and work areas until needed. Life vests will be provided for and worn by all personnel working on the deck, or as directed by the Site Safety Officer or vessel operator.

If someone falls overboard, the vessel should shift into neutral immediately and throw a buoyant cushion or life jacket near the victim (try to get it close, but do not aim directly at the victim). Make sure you are well clear of the person in the water before shifting into gear again. Circle around quickly, selecting a course that will allow you to approach the person with the boat headed into the wind. Approach him slowly, taking care to come alongside and not over him. Stop the motor before attempting to get the victim aboard. When alongside, extend a paddle or boathook to him, or one end of a line. With the motor stopped, lead him around to the stern, where the dive step will be deployed. If this is not feasible, help the victim aboard near amid-ship, at the lowest height to the water. When helping a person aboard, hold him under the armpits and lift gently.

### 4.2.2 Motor Vehicle Operation

Motor vehicles will be used to transport field personnel, equipment, and supplies to the sampling site. Only sampling team personnel with valid drivers licenses and liability insurance will operate motor vehicles required for work activities. All field staff will use best professional judgment at all times to ensure safe operation of motor vehicles, including:

- Operators are to practice defensive driving and drive in a courteous manner
- Be aware of pedestrians and give them the right-of-way
- All vehicles are to be operated in a safe manner and in compliance with statutory traffic regulations and ordinances
- Verifying safety seat belts are in proper operating order
- Seat belts are to be worn by the driver and all passengers whenever the vehicle is in motion
- No persons are allowed to ride in the back of any vehicles, unless equipped with seatbelts
- Vehicles are to be driven in conformance with local speed limits

- Avoid excessively long driving periods
- Personnel who are impaired by fatigue, illness, alcohol, illegal or prescription drugs, or who are otherwise physically unfit, are not allowed to drive
- Personnel are to avoid using cellular phones or engaging in other distractions while driving
- Motor vehicle accidents are to be reported to the responsible law enforcement agency, the NewFields manager, and the NewFields HSO.

#### 4.2.3 Weather

If severe weather occurs that may affect the safety of site workers, the NewFields PM or their designee shall stop affected field operations. The PM or their designee will resume operations when weather conditions improve to acceptable levels.

#### 4.2.4 Heat and Cold Stress

Depending on the time of year and weather conditions, cold or heat stress may be a potential problem. The PM will ensure that the heat and cold stress programs are implemented and that adequate rest breaks and liquid (i.e., water, Gatorade) consumption occur.

Proposed work/rest schedules will be dependent upon the weather conditions encountered and the level of personal protective equipment being utilized by on-site personnel. The PM or designee will establish work/rest schedules prior to the commencement of the project tasks and will adjust as needed.

#### 4.2.5 Illumination

Work is proposed during daylight hours. If work activities need to occur before sunrise and/or after sunset, lighting will be provided at each work area to meet the requirements of 29 CFR 1910.120(m). The Standard states that while any work is in progress, the general site areas shall be lighted to not less than 5 foot-candles; excavation, waste areas, access ways, active storage areas, loading platforms, and field maintenance areas shall be lighted to not less than 3 foot-candles; and first aid stations not less than 30 foot-candle.

#### 4.2.6 Slip, Trip and Fall Hazards

The potential for slipping, tripping, and falling is present. Severe trip hazards will be identified prior to commencement of project activities and demarcated by flags or caution tape.

#### 4.2.7 Manual Lifting

Manual lifting of heavy objects may be required. Failure to follow proper lifting technique can result in back injuries and strains. Site workers will be instructed to use power equipment to lift heavy loads when ever possible and to evaluate loads before trying to lift them (i.e. they should be able to easily tip the load and then return it to its original position). Carrying heavy loads with a buddy and proper lifting techniques, 1) make sure footing is solid, 2) make back straight with no curving or slouching, 3) center body over feet, 4) grasp the object firmly and as close to your body as possible, 5) lift with legs, and 6) turn with your feet, don't twist, will be stressed. Back injuries are a serious concern as they are the most common workplace injury, often resulting in lost or restricted work time, and long treatment and recovery periods.

### 4.2.8 Other Physical Hazards

Incorporating the following basic safety procedures can prevent many of the most common causes of injury or accident during field sampling:

- Implement good housekeeping practices, including immediate cleanup of spills and safe storage of all materials. All equipment or materials not in immediate use will be removed from the immediate work area.
- Use proper lifting and moving techniques to prevent back or muscle strain or injury. Any heavy equipment, boxes, coolers etc. should be tested before lifting and if it is too heavy, the equipment should be broken into smaller components or assistance requested. Lifting should be done with the legs, not the back.
- Use extra caution when handling sharp tools or sampling devices and when possible, wear protective gloves.

### 4.2.9 Biological Hazards

The project location is such that risks from biological hazards are low.

# 5.0 Work Clothing and Levels of Personnel Protection

## *5.1 Work Clothing and Personal Protective Equipment*

The PM or designee will recommend appropriate levels of protective clothing to be worn in the event that hazardous materials are encountered. The SPI field sampling activities described in this site-specific HASP will be performed in Level D or modified Level D PPE, as specified in Table 2. If site conditions include hazards that exceed the protection of Level D or modified Level D PPE, work will be halted and personnel will immediately exit the area while site conditions and PPE levels are re-evaluated by the Site Supervisor and HSO.

**Definition of Levels of Protection:**

Level D: Work coveralls
Gloves
Appropriate work boots
Hardhat (if overhead gear is present)
Safety glasses with side shields or splash goggles as needed
A respirator is not required.

## *5.2 Donning and Doffing*

Manufacturers procedures for donning and removing PPE ensembles will be followed in order to prevent damage to PPE, reduce and eliminate migration from the work area and a transfer of contaminants to the wearer's body or others.

## *5.3 Storage and Inspection*

Protective equipment will be stored and maintained in the company vehicles on site or aboard the vessel. Employees are responsible for inspecting personal protective equipment prior to donning, during use and at the end of the shift. Defective equipment shall be removed from service and reported to the PM. All reusable equipment will be maintained in a sanitary condition, in accordance with the manufacturer’s recommendations.

**Table 3. Level D Storage and Cleaning Procedures.**

| |
|---|
| Level D Cleaning Procedures:<br>If necessary, cleaning procedures for PPE require that hard hats, nitrile gloves, rain gear, boots, and personal floatation devices be brushed thoroughly with a solution of Alconox and rinsed with tap water. |

# 6.0 Emergency Plan

Emergency situations can be characterized as an accident or injury to the field personnel. Emergency phone numbers are listed in Section 1 of this Health and Safety Plan. In case of emergency, it is important that the following Incident Reporting Procedure be observed:

It is important to assure the rapid and accurate transfer of information appropriate personnel in the event of an emergency situation. To simplify the procedure, emergency situations can be reported by dialing 911. This includes incidents requiring police assistance, fire department, or medical emergencies.

Be sure to provide the following information to the dispatcher:

1. Caller full name
2. The nature of the incident (i.e. "Fire")
3. The location of the incident (i.e., "Street location and nearest intersection”) The more specific the better.
4. What you need (i.e. "Fire Department and First Aid")
5. If you are able, where you will meet emergency responders (i.e. At end of West Street, near train tracks)
6. If applicable, a call back number or your cell phone number (e.g., "I'll be at the scene; my cell phone number is 123-4567").
7. Status of the situation. (e.g., is the situation stabilized or “I have the fire under control”)
8. If anyone is injured or in need of emergency assistance (e.g., "A mechanic working on a pump was burned.")

## *6.1 Site Emergency Coordinator*

Site Emergency Coordinator: John Nakayama (Field Manager)

## *6.2 Personnel Injury*

In the event of an emergency situation, the local emergency response group will be called. In case of a life-threatening situation, emergency first aid may be applied on-site as deemed necessary. The individual should be transported to the nearest medical facility if needed.

The local rescue squad shall be contacted for transport as necessary in an emergency. Since some situations may require transport of an injured party by other means, transportation by automobile may be required.

## *6.3 Hospitals*

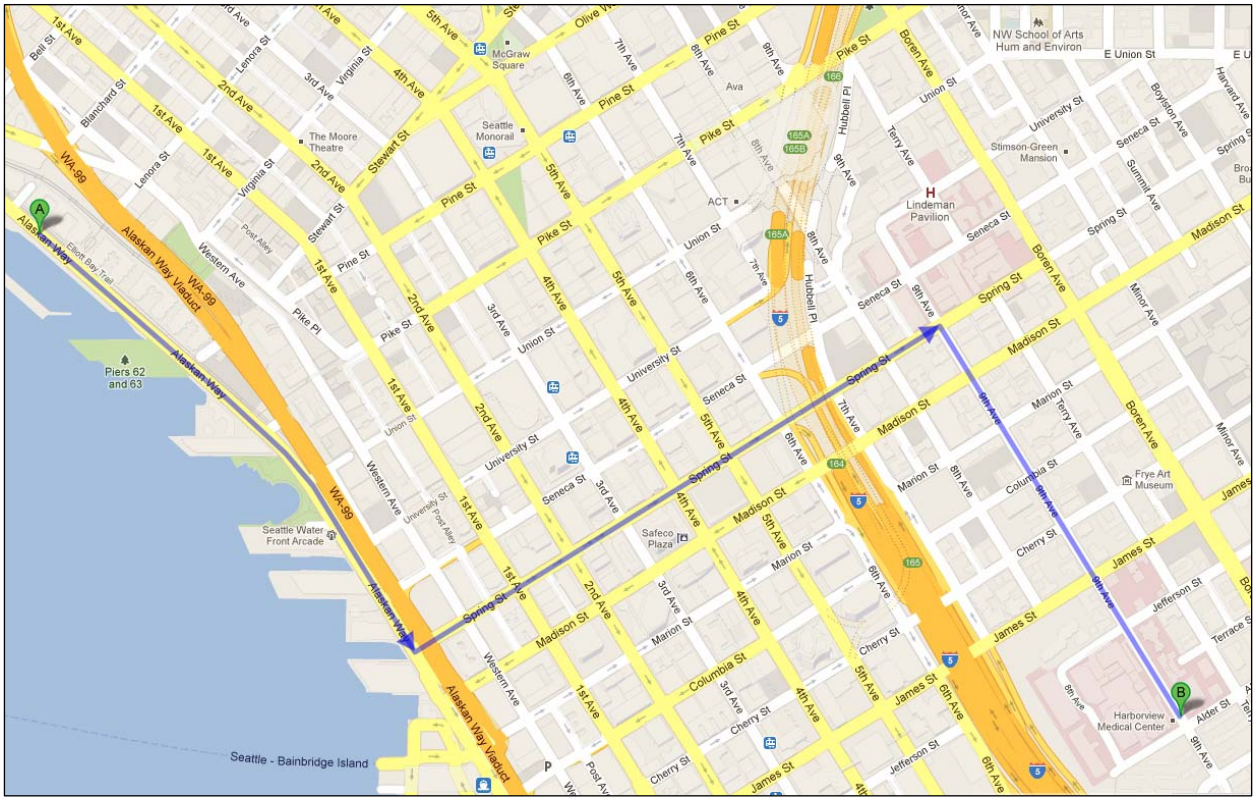
The following lists the hospitals nearest to Elliott Bay and Commencement Bay.

**Elliott Bay**:

**Harborview Medical Center**
325 9th Ave
Seattle, WA 98104
(206) 744-3000

**Direction to Harborview Medical Center**
**From: Bell Harbor Marina**

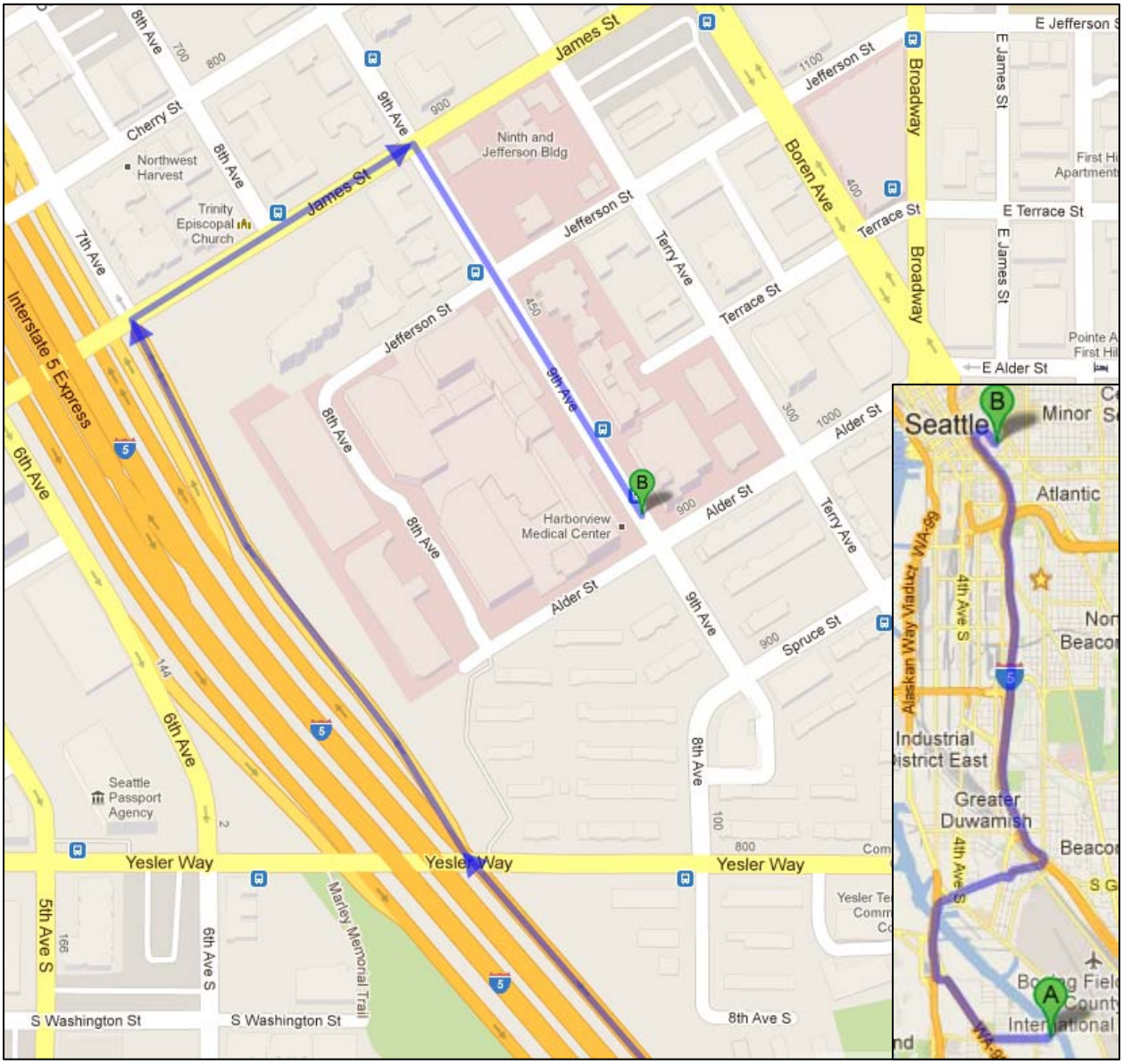
1) From Bell Harbor Marina,
   Head south on Alaskan Way
2) Turn left on Spring St.
3) Turn right on 9th Ave.
4) Hospital is on the right



**Directions to Harborview Medical Center**

**<u>From: South Park Marina</u>**

1) From South Park Marina, head west on Dallas Ave S
2) Take 1st left onto 16th Ave S
3) Take the 1st right onto S Cloverdale St.
4) Turn right onto WA-99 N ramp
5) Merge onto WA-99 N
6) Take exit on the left onto WA-99 N toward Seattle
7) Take the Michigan St exit toward I-5
8) Slight left onto S Michigan St.
9) Continue onto S Bailey St.
10) Turn left onto the I-5 N ramp
11) Merge onto I-5 N
12) Take exit 164A for Dearborn St.
13) Turn right onto James St.
14) Take 1st right onto 9th Ave
15) Hospital is on the right

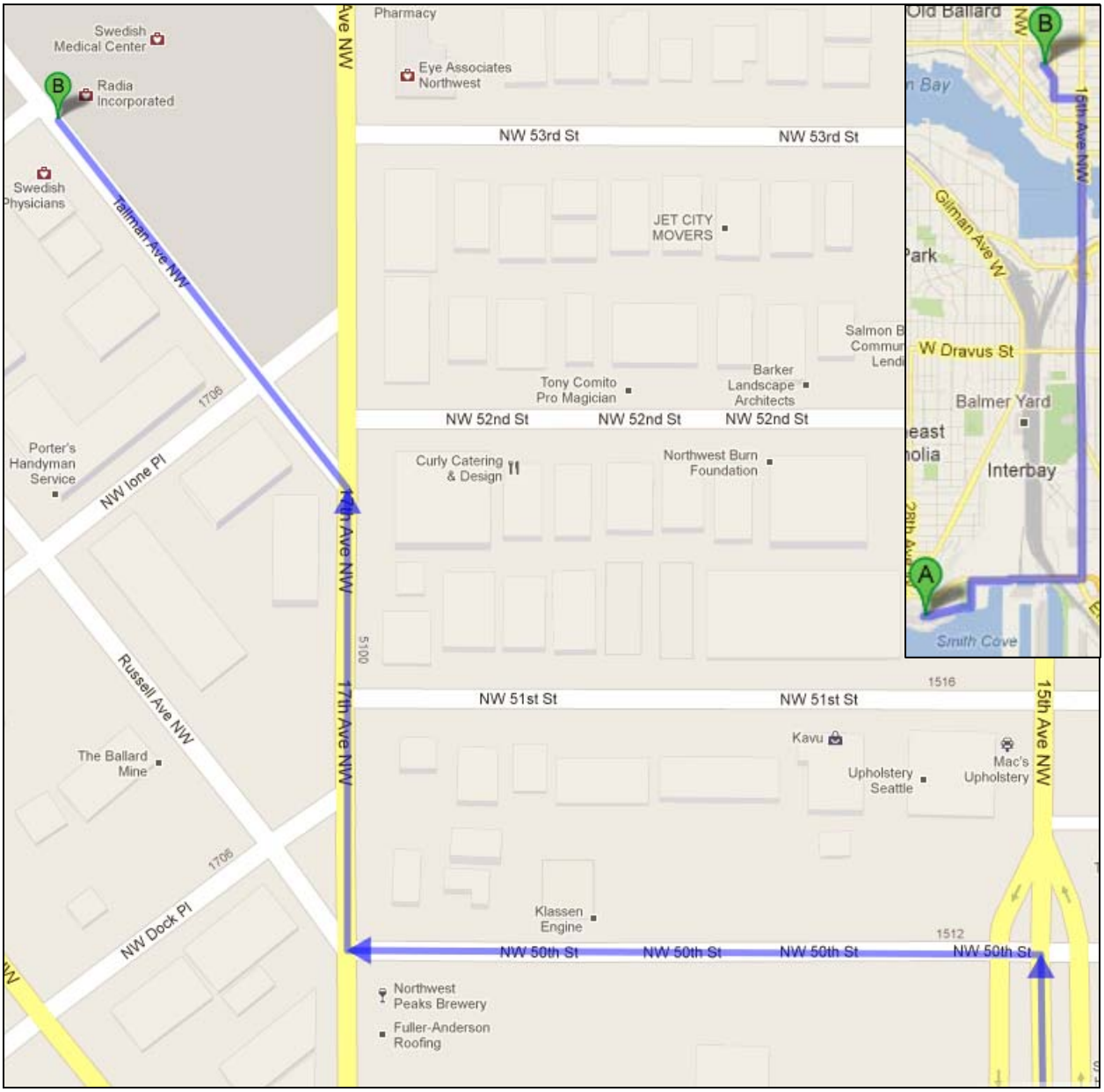


Swedish Medical Center is the nearest hospital to the Elliott Bay Marina.

**Directions to Swedish Medical Center**

**<u>From: Elliott Bay Marina</u>**

1) From Elliott Bay Marina, head east on W Marina Pl toward Elliott Bay Trail
2) Turn right onto 23rd Ave W
3) Continue onto W Garfield AT/Magnolia Bridge
4) Keep left at the fork
5) Turn left onto 15th Ave W
6) Turn left onto NW 50th St
7) Turn right onto 17th Ave NW
8) Slight left onto Tallman Ave NW
9) Hospital is on the right



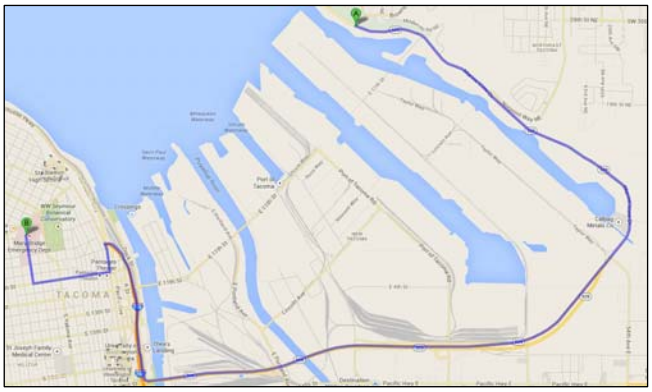
**Commencement Bay**:

**Tacoma General Hospital**
315 Martin Luther King Jr Way
Tacoma, WA 98405
(253) 403-1000

**Directions to Tacoma General Hospital**

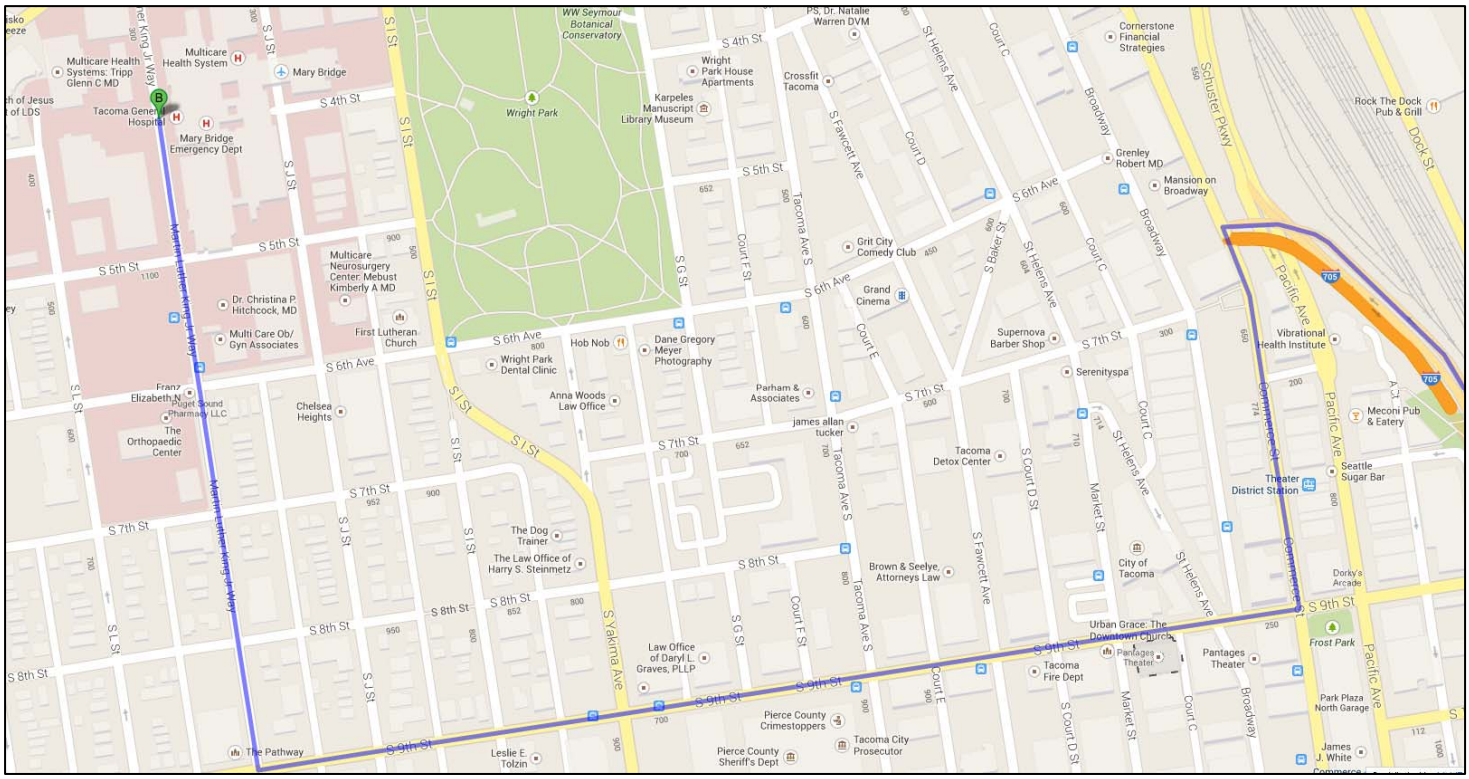
**From: Chinook Landing Marina**

1) From Chinook Landing Marina, head east on WA-509 S/Marine View Dr toward E 11th St
2) Merge onto WA-509 S
3) Take the exit onto I-705 N
4) Keep right at the fork, follow signs for Stadium Way
5) Turn left onto Commerce St
6) Turn right onto S 9th St
7) Turn right onto Martin Luther King Jr Way
8) Hospital will be on the right



**Note:** For non-emergency treatment, an urgent care clinic is located in Federal Way, WA:

**Multicare Urgent Care**
1413 South 348th St
Federal Way, WA 98003
(253) 847-2000


WW Seymour Botanical Conservatory
Wright Park
Multicare Health Systems: Tripp Glenn C MD
Multicare Health System
Mary Bridge
Tacoma General Hospital
Mary Bridge Emergency Dept
Martin Luther King Jr Way
S 4th St
S 5th St
S 6th Ave
S 7th St
S 8th St
S 9th St
S I St
S J St
S G St
S Yakima Ave
Tacoma Ave S
Court F St
Court E
Court D
Court C
S Fawcett Ave
S Baker St
S Helens Ave
Broadway
Market St
S Court D St
Schuster Pkwy
Pacific Ave
Commerce St
Dock St
Wright Park Apartments
Karpeles Manuscript Library Museum
Crossfit Tacoma
PS, Dr. Natalie Warren DVM
Cornerstone Financial Strategies
Rock The Dock Pub & Grill
Grenley Robert MD
Mansion on Broadway
Grit City Comedy Club
Grand Cinema
Supernova Barber Shop
Serenityspa
Vibrational Health Institute
Meconi Pub & Eatery
Seattle Sugar Bar
Theater District Station
Dorky's Arcade
Frost Park
Park Plaza North Garage
James J. White
Multicare Neurosurgery Center: Mebust Kimberly A MD
Dr. Christina P. Hitchcock, MD
Multi Care Ob/Gyn Associates
First Lutheran Church
Franz Elizabeth N
Puget Sound Pharmacy LLC
The Orthopaedic Center
Chelsea Heights
Wright Park Dental Clinic
Hob Nob
Dane Gregory Meyer Photography
Anna Woods Law Office
Parham & Associates
james allan tucker
Tacoma Detox Center
The Dog Trainer
The Law Office of Harry S. Steinmetz
Brown & Seelye, Attorneys Law
City of Tacoma
Urban Grace: The Downtown Church
Pantages Theater
Law Office of Daryl L. Graves, PLLP
Tacoma Fire Dept
Pierce County Crimestoppers
Tacoma City Prosecutor
Pierce County Sheriff's Dept
Leslie E. Tolzin
The Pathway
705

**NewFields**

**Commencement Bay DMMP, September, 2013**

Arranged Alphabetically

SOFTWARE: Corpscon 5.11.08

| Station No. | Sample Rep. | Date | GPS Time | Meter Wheel Depth m. | Predicted Nearest Tide m. | Predicted Mudline Depth, m. (MLLW) | Sample Target NAD 1983, Decimal Minutes Latitude Northing (y) | Sample Target NAD 1983, Decimal Minutes Longitude Easting (x) | Sample Target NAD 1983, SPCS, Wa. S. Northing (y) | Sample Target NAD 1983, SPCS, Wa. S. Easting (x) | Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. S. Northing (y) | Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. S. Easting (x) | Sample Location DGPS Trimble NT300D NAD 1983, Decimal Minutes Latitude | Sample Location DGPS Trimble NT300D NAD 1983, Decimal Minutes Longitude | Distance to Target (m.) | GPS Status HDOP good < 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B01 | 1 | 13-Sep | 1323 | 178.0 | 3.13 | -175 | 47 18.7610 | 122 27.4092 | 727850.9 | 1155045.1 | 727858.8 | 1155045.7 | 47 18.7623 | 122 27.4091 | 2.4 | |
| | 2 | | 1323 | 178.0 | 3.13 | -175 | 727850.9 | 1155045.1 | 727850.9 | 1155045.1 | 727858.5 | 1155056.9 | 47 18.7623 | 122 27.4064 | 4.3 | 1.2 |
| | 3 | | 1324 | 178.0 | 3.12 | -175 | | | 727850.9 | 1155045.1 | 727862.4 | 1155072.3 | 47 18.7630 | 122 27.4027 | 9.0 | |
| B02 | 1 | 13-Sep | 1309 | 174.2 | 3.13 | -171 | 47 18.9893 | 122 26.7408 | 729170.3 | 1157841.9 | 729135.7 | 1157827.9 | 47 18.9836 | 122 26.7440 | 11.4 | |
| | 2 | | 1310 | 174.0 | 3.13 | -171 | 729170.3 | 1157841.9 | 729170.3 | 1157841.9 | 729152.4 | 1157840.7 | 47 18.9864 | 122 26.7410 | 5.5 | 1.1 |
| | 3 | | 1310 | 174.0 | 3.13 | -171 | | | 729170.3 | 1157841.9 | 729174.6 | 1157851.6 | 47 18.9901 | 122 26.7385 | 3.2 | |
| | 4 | 14-Sep | 1149 | 172.0 | 2.63 | -169 | lighter SPI camera skipping | | 729170.3 | 1157841.9 | 729171.2 | 1157844.5 | 47 18.9895 | 122 26.7402 | 0.8 | |
| | 5 | | 1150 | 172.0 | 2.63 | -169 | on meter wheel | | 729170.3 | 1157841.9 | 729168.5 | 1157853.1 | 47 18.9891 | 122 26.7381 | 3.5 | 1.2 |
| | 6 | | 1150 | 172.0 | 2.64 | -169 | | | 729170.3 | 1157841.9 | 729164.9 | 1157853.4 | 47 18.9885 | 122 26.7380 | 3.9 | |
| B03 | 1 | 13-Sep | 1724 | 144.5 | 2.20 | -142 | 47 17.2160 | 122 27.4108 | 718461.7 | 1154805.4 | 718441.7 | 1154799.7 | 47 17.2127 | 122 27.4121 | 6.3 | |
| | 2 | | 1725 | 144.5 | 2.20 | -142 | 718461.7 | 1154805.4 | 718461.7 | 1154805.4 | 718439.9 | 1154800.8 | 47 17.2124 | 122 27.4118 | 6.8 | 1.1 |
| | 3 | | 1726 | 144.5 | 2.20 | -142 | | | 718461.7 | 1154805.4 | 718442.9 | 1154802.2 | 47 17.2129 | 122 27.4115 | 5.8 | |
| C01 | 1 | 13-Sep | 1433 | 178.0 | 2.97 | -175 | 47 18.5650 | 122 27.6673 | 726686.2 | 1153948.6 | 726669.3 | 1153969.4 | 47 18.5623 | 122 27.6622 | 8.2 | |
| | 2 | | 1434 | 177.5 | 2.97 | -175 | 726686.2 | 1153948.6 | 726686.2 | 1153948.6 | 726697.2 | 1153973.8 | 47 18.5669 | 122 27.6613 | 8.4 | 1.2 |
| | 3 | | 1435 | 177.5 | 2.96 | -175 | | | 726686.2 | 1153948.6 | 726689.3 | 1153972.8 | 47 18.5656 | 122 27.6615 | 7.4 | |
| C02 | 1 | 13-Sep | 1423 | 175.0 | 3.00 | -172 | 47 18.4757 | 122 27.7270 | 726149.5 | 1153688.4 | 726157.9 | 1153700.3 | 47 18.4771 | 122 27.7242 | 4.4 | |
| | 2 | | 1424 | 175.0 | 3.00 | -172 | 726149.5 | 1153688.4 | 726149.5 | 1153688.4 | 726139.1 | 1153699.0 | 47 18.4740 | 122 27.7244 | 4.5 | 1.2 |
| | 3 | | 1425 | 175.0 | 3.00 | -172 | | | 726149.5 | 1153688.4 | 726137.8 | 1153702.2 | 47 18.4738 | 122 27.7236 | 5.5 | |
| C03 | 1 | 13-Sep | 1413 | 172.5 | 3.03 | -169 | 47 18.3864 | 122 27.7867 | 725613.1 | 1153428.2 | 725595.5 | 1153451.7 | 47 18.3836 | 122 27.7809 | 8.9 | |
| | 2 | | 1414 | 172.5 | 3.03 | -169 | 725613.1 | 1153428.2 | 725613.1 | 1153428.2 | 725605.7 | 1153456.5 | 47 18.3853 | 122 27.7798 | 8.9 | 1.2 |
| | 3 | | 1415 | 173.0 | 3.03 | -170 | | | 725613.1 | 1153428.2 | 725602.9 | 1153449.0 | 47 18.3848 | 122 27.7816 | 7.1 | |
| C03 | 4 | | 1416 | 173.0 | 3.03 | -170 | | | 725613.1 | 1153428.2 | 725605.8 | 1153452.8 | 47 18.3853 | 122 27.7807 | 7.8 | |
| | 1 | 13-Sep | 1402 | 163.0 | 3.06 | -160 | 47 18.2970 | 122 27.8463 | 725076.0 | 1153168.2 | 725047.5 | 1153187.0 | 47 18.2924 | 122 27.8416 | 10.4 | |
| | 2 | | 1403 | 163.0 | 3.06 | -160 | 725076.0 | 1153168.2 | 725076.0 | 1153168.2 | 725060.9 | 1153185.7 | 47 18.2946 | 122 27.8420 | 7.0 | 0.9 |
| | 3 | | 1403 | 164.0 | 3.06 | -161 | | | 725076.0 | 1153168.2 | 725082.3 | 1153181.3 | 47 18.2981 | 122 27.8432 | 4.4 | |
| | 4 | | 1404 | 164.0 | 3.06 | -161 | | | 725076.0 | 1153168.2 | 725067.6 | 1153186.3 | 47 18.2957 | 122 27.8419 | 6.1 | |
| C05 | 1 | 13-Sep | 1514 | 158.0 | 2.80 | -155 | 47 18.1348 | 122 27.9622 | 724102.4 | 1152664.8 | 724092.3 | 1152644.5 | 47 18.1331 | 122 27.9670 | 6.9 | |
| | 2 | | 1515 | 158.0 | 2.80 | -155 | 724102.4 | 1152664.8 | 724102.4 | 1152664.8 | 724110.7 | 1152662.8 | 47 18.1362 | 122 27.9627 | 2.6 | 1.0 |
| | 3 | | 1515 | 158.0 | 2.80 | -155 | | | 724102.4 | 1152664.8 | 724118.9 | 1152674.5 | 47 18.1376 | 122 27.9599 | 5.9 | |
| C06 | 1 | 13-Sep | 1524 | 166.5 | 2.76 | -164 | 47 18.0622 | 122 28.0182 | 723666.7 | 1152422.1 | 723684.3 | 1152399.4 | 47 18.0650 | 122 28.0238 | 8.8 | |
| | 2 | | 1524 | 166.5 | 2.76 | -164 | 723666.7 | 1152422.1 | 723666.7 | 1152422.1 | 723680.8 | 1152392.3 | 47 18.0644 | 122 28.0255 | 10.1 | 1.1 |
| | 3 | | 1525 | 166.5 | 2.75 | -164 | | | 723666.7 | 1152422.1 | 723683.6 | 1152404.3 | 47 18.0649 | 122 28.0226 | 7.5 | |
| C07 | 1 | 13-Sep | 1131 | 176.5 | 2.91 | -174 | 47 18.3752 | 122 28.3492 | 725602.9 | 1151101.5 | 725596.4 | 1151126.8 | 47 18.3742 | 122 28.3430 | 8.0 | |
| | 2 | | 1132 | 176.5 | 2.91 | -174 | 725602.9 | 1151101.5 | 725602.9 | 1151101.5 | 725588.0 | 1151122.4 | 47 18.3728 | 122 28.3440 | 7.8 | 1.2 |
| | 3 | | 1132 | 176.5 | 2.91 | -174 | | | 725602.9 | 1151101.5 | 725598.3 | 1151099.5 | 47 18.3744 | 122 28.3496 | 1.5 | |
| C08 | 1 | 13-Sep | 1113 | 170.5 | 2.81 | -168 | 47 18.2910 | 122 28.1192 | 725067.7 | 1152039.4 | 725060.5 | 1152031.7 | 47 18.2898 | 122 28.1210 | 3.2 | |
| | 2 | | 1114 | 170.5 | 2.82 | -168 | 725067.7 | 1152039.4 | 725067.7 | 1152039.4 | 725063.3 | 1152016.8 | 47 18.2902 | 122 28.1246 | 7.0 | 1.3 |
| | 3 | | 1115 | 170.5 | 2.82 | -168 | | | 725067.7 | 1152039.4 | 725050.2 | 1152030.2 | 47 18.2881 | 122 28.1213 | 6.0 | |
| C09 | 1 | 13-Sep | 1050 | 151.5 | 2.65 | -149 | 47 18.2493 | 122 28.0125 | 724803.4 | 1152474.1 | 724792.8 | 1152475.0 | 47 18.2476 | 122 28.0122 | 3.2 | |
| | 2 | | 1051 | 152.0 | 2.65 | -149 | 724803.4 | 1152474.1 | 724803.4 | 1152474.1 | 724799.4 | 1152455.3 | 47 18.2486 | 122 28.0170 | 5.8 | 1.3 |
| | 3 | | 1105 | 153.0 | 2.76 | -150 | | | 724803.4 | 1152474.1 | 724774.2 | 1152442.3 | 47 18.2444 | 122 28.0200 | 13.2 | |
| C10 | 1 | 13-Sep | 1025 | 162.5 | 2.43 | -160 | 47 18.1670 | 122 27.7998 | 724281.2 | 1153340.7 | 724310.5 | 1153331.6 | 47 18.1718 | 122 27.8022 | 9.4 | |
| | 2 | | 1025 | 162.3 | 2.44 | -160 | 724281.2 | 1153340.7 | 724281.2 | 1153340.7 | 724283.5 | 1153320.2 | 47 18.1673 | 122 27.8048 | 6.3 | 0.9 |
| | 3 | | 1026 | 162.0 | 2.45 | -160 | | | 724281.2 | 1153340.7 | 724272.5 | 1153320.4 | 47 18.1655 | 122 27.8047 | 6.7 | |

**NewFields**

**Commencement Bay DMMP, September, 2013**

Arranged Alphabetically

SOFTWARE: Corpscon 5.11.08

| Station No. | Sample Rep. | Date | GPS Time | Meter Wheel Depth m. | Predicted Nearest Tide m. | Predicted Mudline Depth, m. (MLLW) | Sample Target NAD 1983, Decimal Minutes Latitude Northing (y) | Sample Target NAD 1983, Decimal Minutes Longitude Easting (x) | Sample Target NAD 1983, SPCS, Wa. S. Northing (y) | Sample Target NAD 1983, SPCS, Wa. S. Easting (x) | Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. S. Northing (y) | Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. S. Easting (x) | Sample Location DGPS Trimble NT300D NAD 1983, Decimal Minutes Latitude | Sample Location DGPS Trimble NT300D NAD 1983, Decimal Minutes Longitude | Distance to Target (m.) | GPS Status HDOP good < 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C11 | 1 | 13-Sep | 1017 | 169.5 | 2.36 | -167 | 47 18.1265 | 122 27.6937 | 724024.1 | 1153773.4 | 724018.2 | 1153739.3 | 47 18.1254 | 122 27.7019 | 10.6 | |
| | 2 | | 1018 | 169.5 | 2.37 | -167 | 724024.1 | 1153773.4 | 724024.1 | 1153773.4 | 724020.6 | 1153739.7 | 47 18.1258 | 122 27.7018 | 10.3 | 0.9 |
| | 3 | | 1018 | 169.5 | 2.37 | -167 | | | 724024.1 | 1153773.4 | 724011.3 | 1153771.4 | 47 18.1244 | 122 27.6941 | 3.9 | |
| C12 | 1 | 13-Sep | 0956 | 170.5 | 2.16 | -168 | 47 18.0410 | 122 27.4677 | 723481.3 | 1154694.9 | 723493.0 | 1154685.1 | 47 18.0429 | 122 27.4701 | 4.7 | |
| | 2 | | 0957 | 170.1 | 2.17 | -168 | 723481.3 | 1154694.9 | 723481.3 | 1154694.9 | 723478.9 | 1154691.8 | 47 18.0406 | 122 27.4684 | 1.2 | 0.1 |
| | 3 | | 0958 | 170.2 | 2.17 | -168 | | | 723481.3 | 1154694.9 | 723489.4 | 1154685.8 | 47 18.0423 | 122 27.4699 | 3.7 | |
| F01 | 1 | 14-Sep | 1029 | 178.0 | 1.78 | -176 | 47 18.6820 | 122 28.3049 | 727463.0 | 1151331.1 | 727486.1 | 1151330.4 | 47 18.6858 | 122 28.3052 | 7.1 | |
| | 2 | | 1030 | 178.0 | 1.79 | -176 | 727463.0 | 1151331.1 | 727463.0 | 1151331.1 | 727474.8 | 1151296.2 | 47 18.6838 | 122 28.3134 | 11.2 | 1.0 |
| | 3 | | 1031 | 178.0 | 1.80 | -176 | | | 727463.0 | 1151331.1 | 727477.5 | 1151310.7 | 47 18.6843 | 122 28.3099 | 7.6 | |
| F03 | 1 | 14-Sep | 1109 | 179.0 | 2.24 | -177 | 47 18.8182 | 122 28.4512 | 728305.8 | 1150747.1 | 728297.6 | 1150737.8 | 47 18.8168 | 122 28.4534 | 3.8 | |
| | 2 | | 1110 | 179.0 | 2.24 | -177 | 728305.8 | 1150747.1 | 728305.8 | 1150747.1 | 728283.9 | 1150726.3 | 47 18.8145 | 122 28.4561 | 9.2 | 1.2 |
| | 3 | | 1110 | 179.0 | 2.25 | -177 | | | 728305.8 | 1150747.1 | 728276.1 | 1150720.7 | 47 18.8132 | 122 28.4574 | 12.1 | |
| F07 | 1 | 14-Sep | 1100 | 179.0 | 2.13 | -177 | 47 18.8137 | 122 28.1885 | 728250.8 | 1151831.7 | 728249.6 | 1151830.9 | 47 18.8134 | 122 28.1888 | 0.4 | |
| | 2 | | 1100 | 178.5 | 2.14 | -176 | 728250.8 | 1151831.7 | 728250.8 | 1151831.7 | 728238.4 | 1151816.9 | 47 18.8115 | 122 28.1921 | 5.9 | 0.9 |
| | 3 | | 1101 | 179.0 | 2.15 | -177 | | | 728250.8 | 1151831.7 | 728233.3 | 1151801.9 | 47 18.8106 | 122 28.1957 | 10.5 | |
| F09 | 1 | 14-Sep | 1040 | 179.0 | 1.92 | -177 | 47 18.6677 | 122 28.0975 | 727354.5 | 1152186.1 | 727365.3 | 1152200.0 | 47 18.6695 | 122 28.0942 | 5.4 | |
| | 2 | | 1041 | 178.5 | 1.93 | -177 | 727354.5 | 1152186.1 | 727354.5 | 1152186.1 | 727363.7 | 1152166.9 | 47 18.6691 | 122 28.1022 | 6.5 | 1.0 |
| | 3 | | 1041 | 178.0 | 1.93 | -176 | | | 727354.5 | 1152186.1 | 727356.3 | 1152146.9 | 47 18.6678 | 122 28.1070 | 12.0 | |
| F10 | 1 | 14-Sep | 1050 | 178.0 | 2.03 | -176 | 47 18.7608 | 122 27.9306 | 727903.3 | 1152890.1 | 727921.2 | 1152902.1 | 47 18.7638 | 122 27.9278 | 6.6 | |
| | 2 | | 1050 | 178.0 | 2.03 | -176 | 727903.3 | 1152890.1 | 727903.3 | 1152890.1 | 727908.7 | 1152893.9 | 47 18.7617 | 122 27.9297 | 2.0 | 1.0 |
| | 3 | | 1051 | 178.0 | 2.04 | -176 | | | 727903.3 | 1152890.1 | 727904.7 | 1152882.2 | 47 18.7610 | 122 27.9325 | 2.4 | |
| F13 | 1 | 14-Sep | 1020 | 177.0 | 1.66 | -175 | 47 18.6656 | 122 28.5501 | 727388.7 | 1150315.0 | 727373.0 | 1150309.3 | 47 18.6630 | 122 28.5514 | 5.1 | |
| | 2 | | 1021 | 176.5 | 1.67 | -175 | 727388.7 | 1150315.0 | 727388.7 | 1150315.0 | 727371.2 | 1150309.3 | 47 18.6627 | 122 28.5514 | 5.6 | 0.9 |
| | 3 | | 1021 | 176.5 | 1.69 | -175 | | | 727388.7 | 1150315.0 | 727365.1 | 1150288.0 | 47 18.6616 | 122 28.5565 | 10.9 | |
| F15 | 1 | 14-Sep | 1010 | 177.0 | 1.56 | -175 | 47 18.5303 | 122 28.3520 | 726546.1 | 1151113.3 | 726542.5 | 1151128.5 | 47 18.5298 | 122 28.3483 | 4.8 | |
| | 2 | | 1011 | 177.0 | 1.56 | -175 | 726546.1 | 1151113.3 | 726546.1 | 1151113.3 | 726530.0 | 1151118.7 | 47 18.5277 | 122 28.3506 | 5.2 | 0.9 |
| | 3 | | 1011 | 177.0 | 1.57 | -175 | | | 726546.1 | 1151113.3 | 726526.1 | 1151106.6 | 47 18.5270 | 122 28.3535 | 6.4 | |
| F16 | 1 | 14-Sep | 0947 | 174.0 | 1.29 | -173 | 47 18.5325 | 122 28.7160 | 726597.0 | 1149609.0 | 726589.7 | 1149586.6 | 47 18.5312 | 122 28.7214 | 7.2 | |
| | 2 | | 0948 | 174.0 | 1.30 | -173 | 726597.0 | 1149609.0 | 726597.0 | 1149609.0 | 726604.6 | 1149571.6 | 47 18.5336 | 122 28.7251 | 11.6 | 1.0 |
| | 3 | | 0949 | 174.0 | 1.31 | -173 | | | 726597.0 | 1149609.0 | 726595.2 | 1149583.8 | 47 18.5321 | 122 28.7221 | 7.7 | |
| F27 | 1 | 14-Sep | 0929 | 172.5 | 1.08 | -171 | 47 18.3270 | 122 28.7020 | 725346.7 | 1149635.6 | 725345.9 | 1149619.5 | 47 18.3268 | 122 28.7059 | 4.9 | |
| | 2 | | 0929 | 172.5 | 1.08 | -171 | 725346.7 | 1149635.6 | 725346.7 | 1149635.6 | 725342.7 | 1149623.5 | 47 18.3263 | 122 28.7049 | 3.9 | 1.0 |
| | 3 | | 0930 | 172.5 | 1.09 | -171 | | | 725346.7 | 1149635.6 | 725344.6 | 1149621.9 | 47 18.3266 | 122 28.7053 | 4.2 | |
| F28 | 1 | 14-Sep | 0937 | 172.0 | 1.17 | -171 | 47 18.3860 | 122 28.8450 | 725720.1 | 1149053.9 | 725720.1 | 1149053.9 | 47 18.3860 | 122 28.8449 | 0.0 | |
| | 2 | | 0938 | 172.0 | 1.18 | -171 | 725720.1 | 1149053.9 | 725720.1 | 1149053.9 | 725726.5 | 1149041.7 | 47 18.3870 | 122 28.8479 | 4.2 | 0.9 |
| | 3 | | 0939 | 171.5 | 1.20 | -170 | | | 725720.1 | 1149053.9 | 725729.7 | 1149035.1 | 47 18.3875 | 122 28.8495 | 6.4 | |
| F49 | 1 | 14-Sep | 1132 | 176.0 | 2.47 | -174 | 47 18.9580 | 122 27.9350 | 729102.2 | 1152902.2 | 729115.1 | 1152896.3 | 47 18.9601 | 122 27.9364 | 4.3 | |
| | 2 | | 1133 | 176.0 | 2.48 | -174 | 729102.2 | 1152902.2 | 729102.2 | 1152902.2 | 729090.8 | 1152892.8 | 47 18.9561 | 122 27.9371 | 4.5 | 1.2 |
| | 3 | | 1134 | 176.0 | 2.49 | -174 | | | 729102.2 | 1152902.2 | 729084.3 | 1152888.5 | 47 18.9550 | 122 27.9381 | 6.9 | |
| F57 | 1 | 14-Sep | 1416 | 163.0 | 3.26 | -160 | 47 17.8602 | 122 28.8348 | 722523.6 | 1149015.4 | 722531.0 | 1149035.5 | 47 17.8615 | 122 28.8300 | 6.5 | |
| | 2 | | 1417 | 163.0 | 3.26 | -160 | 722523.6 | 1149015.4 | 722523.6 | 1149015.4 | 722534.8 | 1149053.3 | 47 17.8622 | 122 28.8257 | 12.1 | 1.2 |
| | 3 | | 1417 | 163.0 | 3.26 | -160 | | | 722523.6 | 1149015.4 | 722564.6 | 1149031.3 | 47 17.8670 | 122 28.8312 | 13.4 | |

**NewFields**

**Commencement Bay DMMP, September, 2013**

Arranged Alphabetically

SOFTWARE: Corpscon 5.11.08

| Station No. | Sample Rep. | Date | GPS Time | Meter Wheel Depth m. | Predicted Nearest Tide m. | Predicted Mudline Depth, m. (MLLW) | Sample Target NAD 1983, Decimal Minutes Latitude Northing (y) | Sample Target NAD 1983, Decimal Minutes Longitude Easting (x) | Sample Target NAD 1983, SPCS, Wa. S. Northing (y) | Sample Target NAD 1983, SPCS, Wa. S. Easting (x) | Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. S. Northing (y) | Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. S. Easting (x) | Sample Location DGPS Trimble NT300D NAD 1983, Decimal Minutes Latitude | Sample Location DGPS Trimble NT300D NAD 1983, Decimal Minutes Longitude | Distance to Target (m.) | GPS Status HDOP good < 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F58 | 1 | 14-Sep | 1425 | 170.5 | 3.26 | -167 | 47 18.0120 | 122 28.7646 | 723438.9 | 1149328.8 | 723436.7 | 1149340.3 | 47 18.0117 | 122 28.7618 | 3.6 | |
| | 2 | | 1426 | 170.0 | 3.26 | -167 | 723438.9 | 1149328.8 | 723438.9 | 1149328.8 | 723438.0 | 1149339.5 | 47 18.0119 | 122 28.7620 | 3.3 | 1.0 |
| | 3 | | 1427 | 170.0 | 3.26 | -167 | | | 723438.9 | 1149328.8 | 723453.6 | 1149321.7 | 47 18.0144 | 122 28.7664 | 5.0 | |
| F59 | 1 | 14-Sep | 1435 | 172.0 | 3.25 | -169 | 47 18.1734 | 122 28.8258 | 724426.1 | 1149100.4 | 724433.1 | 1149110.1 | 47 18.1746 | 122 28.8235 | 3.7 | |
| | 2 | | 1436 | 172.0 | 3.25 | -169 | 724426.1 | 1149100.4 | 724426.1 | 1149100.4 | 724437.5 | 1149106.9 | 47 18.1753 | 122 28.8243 | 4.0 | 1.0 |
| | 3 | | 1436 | 172.0 | 3.25 | -169 | | | 724426.1 | 1149100.4 | 724431.2 | 1149115.4 | 47 18.1743 | 122 28.8222 | 4.8 | |
| F63 | 1 | 14-Sep | 1122 | 178.5 | 2.37 | -176 | 47 18.8370 | 122 27.7320 | 728345.9 | 1153722.5 | 728352.9 | 1153709.4 | 47 18.8381 | 122 27.7352 | 4.5 | |
| | 2 | | 1123 | 178.5 | 2.38 | -176 | 728345.9 | 1153722.5 | 728345.9 | 1153722.5 | 728338.6 | 1153701.2 | 47 18.8357 | 122 27.7371 | 6.9 | 1.2 |
| | 3 | | 1124 | 178.5 | 2.39 | -176 | | | 728345.9 | 1153722.5 | 728325.1 | 1153704.1 | 47 18.8335 | 122 27.7363 | 8.4 | |
| F65 | 1 | 14-Sep | 1512 | 166.5 | 3.16 | -163 | 47 17.9140 | 122 27.1450 | 722676.4 | 1156009.7 | 722665.7 | 1155997.0 | 47 17.9122 | 122 27.1480 | 5.0 | |
| | 2 | | 1513 | 167.0 | 3.16 | -164 | 722676.4 | 1156009.7 | 722676.4 | 1156009.7 | 722657.9 | 1155994.7 | 47 17.9109 | 122 27.1485 | 7.2 | 1.0 |
| | 3 | | 1514 | 167.0 | 3.15 | -164 | | | 722676.4 | 1156009.7 | 722677.7 | 1156004.3 | 47 17.9142 | 122 27.1463 | 1.7 | |
| F66 | 1 | 14-Sep | 1522 | 165.0 | 3.13 | -162 | 47 17.7940 | 122 27.2750 | 721960.4 | 1155454.1 | 721963.8 | 1155465.0 | 47 17.7946 | 122 27.2724 | 3.5 | |
| | 2 | | 1523 | 165.5 | 3.13 | -162 | 721960.4 | 1155454.1 | 721960.4 | 1155454.1 | 721963.4 | 1155454.2 | 47 17.7945 | 122 27.2750 | 0.9 | 1.0 |
| | 3 | | 1523 | 165.5 | 3.13 | -162 | | | 721960.4 | 1155454.1 | 721949.1 | 1155441.9 | 47 17.7921 | 122 27.2779 | 5.1 | |
| F67 | 1 | 14-Sep | 1541 | 162.5 | 3.06 | -159 | 47 17.6810 | 122 27.4990 | 721296.6 | 1154511.0 | 721290.5 | 1154515.0 | 47 17.6800 | 122 27.4980 | 2.2 | |
| | 2 | | 1542 | 162.5 | 3.06 | -159 | 721296.6 | 1154511.0 | 721296.6 | 1154511.0 | 721290.6 | 1154507.5 | 47 17.6800 | 122 27.4998 | 2.1 | 1.0 |
| | 3 | | 1542 | 162.5 | 3.06 | -159 | | | 721296.6 | 1154511.0 | 721300.2 | 1154512.7 | 47 17.6816 | 122 27.4986 | 1.2 | |
| F68 | 1 | 14-Sep | 1550 | 159.0 | 3.03 | -156 | 47 17.5870 | 122 27.4420 | 720719.5 | 1154732.5 | 720715.3 | 1154732.4 | 47 17.5863 | 122 27.4420 | 1.3 | |
| | 2 | | 1551 | 159.0 | 3.03 | -156 | 720719.5 | 1154732.5 | 720719.5 | 1154732.5 | 720715.3 | 1154730.7 | 47 17.5863 | 122 27.4424 | 1.4 | 1.2 |
| | 3 | | 1551 | 159.0 | 3.02 | -156 | | | 720719.5 | 1154732.5 | 720698.1 | 1154737.7 | 47 17.5835 | 122 27.4406 | 6.7 | |
| F69 | 1 | 14-Sep | 1608 | 163.0 | 2.95 | -160 | 47 17.6210 | 122 27.7670 | 720959.5 | 1153393.8 | 720958.8 | 1153400.0 | 47 17.6209 | 122 27.7655 | 1.9 | |
| | 2 | | 1609 | 163.0 | 2.94 | -160 | 720959.5 | 1153393.8 | 720959.5 | 1153393.8 | 720964.3 | 1153398.5 | 47 17.6218 | 122 27.7659 | 2.0 | 1.5 |
| | 3 | | 1610 | 163.0 | 2.94 | -160 | | | 720959.5 | 1153393.8 | 720955.6 | 1153406.2 | 47 17.6204 | 122 27.7640 | 3.9 | |
| F70 | 1 | 14-Sep | 1619 | 161.0 | 2.89 | -158 | 47 17.5190 | 122 27.7580 | 720338.7 | 1153415.6 | 720344.7 | 1153421.2 | 47 17.5200 | 122 27.7567 | 2.5 | |
| | 2 | | 1620 | 161.0 | 2.89 | -158 | 720338.7 | 1153415.6 | 720338.7 | 1153415.6 | 720341.3 | 1153412.4 | 47 17.5194 | 122 27.7588 | 1.3 | 1.9 |
| | 3 | | 1620 | 161.0 | 2.88 | -158 | | | 720338.7 | 1153415.6 | 720341.4 | 1153407.8 | 47 17.5194 | 122 27.7599 | 2.5 | |
| F76 | 1 | 14-Sep | 1531 | 163.0 | 3.10 | -160 | 47 17.7130 | 122 27.1720 | 721457.6 | 1155867.8 | 721456.9 | 1155871.5 | 47 17.7129 | 122 27.1711 | 1.1 | |
| | 2 | | 1532 | 163.0 | 3.10 | -160 | 721457.6 | 1155867.8 | 721457.6 | 1155867.8 | 721449.0 | 1155870.1 | 47 17.7116 | 122 27.1714 | 2.7 | 1.0 |
| | 3 | | 1533 | 163.0 | 3.10 | -160 | | | 721457.6 | 1155867.8 | 721452.7 | 1155869.7 | 47 17.7122 | 122 27.1715 | 1.6 | |
| F77 | 1 | 14-Sep | 1558 | 156.5 | 3.00 | -154 | 47 17.5020 | 122 27.3910 | 720197.7 | 1154930.5 | 720199.1 | 1154925.2 | 47 17.5022 | 122 27.3923 | 1.7 | |
| | 2 | | 1558 | 157.0 | 2.99 | -154 | 720197.7 | 1154930.5 | 720197.7 | 1154930.5 | 720193.0 | 1154924.6 | 47 17.5012 | 122 27.3924 | 2.3 | 1.5 |
| | 3 | | 1559 | 157.0 | 2.99 | -154 | | | 720197.7 | 1154930.5 | 720200.8 | 1154928.1 | 47 17.5025 | 122 27.3916 | 1.2 | |
| P01 | 1 | 13-Sep | 1547 | 167.0 | 2.60 | -164 | 47 17.7077 | 122 27.8908 | 721499.2 | 1152895.1 | 721523.1 | 1152887.4 | 47 17.7116 | 122 27.8928 | 7.6 | |
| | 2 | | 1548 | 167.0 | 2.59 | -164 | 721499.2 | 1152895.1 | 721499.2 | 1152895.1 | 721535.4 | 1152881.9 | 47 17.7136 | 122 27.8942 | 11.7 | 1.2 |
| | 3 | | 1549 | 167.0 | 2.59 | -164 | | | 721499.2 | 1152895.1 | 721520.3 | 1152900.2 | 47 17.7112 | 122 27.8897 | 6.6 | |
| P02 | 1 | 13-Sep | 1557 | 168.5 | 2.55 | -166 | 47 17.7460 | 122 28.2108 | 721764.9 | 1151577.8 | 721750.7 | 1151541.5 | 47 17.7435 | 122 28.2195 | 11.9 | |
| | 2 | | 1558 | 168.5 | 2.55 | -166 | 721764.9 | 1151577.8 | 721764.9 | 1151577.8 | 721737.3 | 1151540.4 | 47 17.7413 | 122 28.2197 | 14.2 | 1.5 |
| | 3 | | 1559 | 168.5 | 2.54 | -166 | | | 721764.9 | 1151577.8 | 721742.8 | 1151540.1 | 47 17.7422 | 122 28.2198 | 13.3 | |
| P03 | 1 | 13-Sep | 1650 | 171.5 | 2.34 | -169 | 47 17.9278 | 122 28.5043 | 722900.2 | 1150392.1 | 722900.8 | 1150414.4 | 47 17.9280 | 122 28.4989 | 6.8 | |
| | 2 | | 1651 | 172.0 | 2.34 | -170 | 722900.2 | 1150392.1 | 722900.2 | 1150392.1 | 722912.1 | 1150402.3 | 47 17.9298 | 122 28.5019 | 4.8 | 0.9 |
| | 3 | | 1651 | 171.5 | 2.33 | -169 | | | 722900.2 | 1150392.1 | 722921.7 | 1150407.5 | 47 17.9314 | 122 28.5007 | 8.1 | |

**NewFields**

**Commencement Bay DMMP, September, 2013**

Arranged Alphabetically

SOFTWARE: Corpscon 5.11.08

| Station No. | Sample Rep. | Date | GPS Time | Meter Wheel Depth m. | Predicted Nearest Tide m. | Predicted Mudline Depth, m. (MLLW) | Sample Target NAD 1983, Decimal Minutes Latitude Northing (y) | Sample Target Longitude Easting (x) | Sample Target NAD 1983, SPCS, Wa. S. Northing (y) | Sample Target Easting (x) | Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. S. Northing (y) | Sample Location Easting (x) | Sample Location DGPS Trimble NT300D NAD 1983, Decimal Minutes Latitude | Sample Location Longitude | Distance to Target (m.) | GPS Status HDOP good < 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P04 | 1 | 13-Sep | 1641 | 173.0 | 2.38 | -171 | 47 18.1810 | 122 28.5826 | 724447.0 | 1150107.0 | 724429.7 | 1150095.8 | 47 18.1781 | 122 28.5852 | 6.3 | |
| | 2 | | 1641 | 173.5 | 2.38 | -171 | 724447.0 | 1150107.0 | 724447.0 | 1150107.0 | 724433.3 | 1150119.8 | 47 18.1788 | 122 28.5794 | 5.7 | 1.5 |
| | 3 | | 1642 | 173.5 | 2.37 | -171 | | | 724447.0 | 1150107.0 | 724431.3 | 1150128.1 | 47 18.1785 | 122 28.5774 | 8.0 | |
| P05 | 1 | 13-Sep | 1140 | 177.8 | 2.96 | -175 | 47 18.4177 | 122 28.4725 | 725874.1 | 1150598.1 | 725886.2 | 1150600.1 | 47 18.4197 | 122 28.4721 | 3.8 | |
| | 2 | | 1141 | 177.8 | 2.96 | -175 | 725874.1 | 1150598.1 | 725874.1 | 1150598.1 | 725879.1 | 1150594.9 | 47 18.4185 | 122 28.4733 | 1.8 | 1.3 |
| | 3 | | 1141 | 177.8 | 2.96 | -175 | | | 725874.1 | 1150598.1 | 725876.3 | 1150582.9 | 47 18.4180 | 122 28.4762 | 4.7 | |
| P06 | 1 | 13-Sep | 1151 | 179.0 | 3.00 | -176 | 47 18.6160 | 122 28.2207 | 727053.3 | 1151669.1 | 727042.7 | 1151651.4 | 47 18.6142 | 122 28.2249 | 6.3 | |
| | 2 | | 1152 | 179.0 | 3.01 | -176 | 727053.3 | 1151669.1 | 727053.3 | 1151669.1 | 727048.1 | 1151654.9 | 47 18.6151 | 122 28.2241 | 4.6 | 1.3 |
| | 3 | | 1153 | 179.0 | 3.01 | -176 | | | 727053.3 | 1151669.1 | 727026.5 | 1151643.2 | 47 18.6115 | 122 28.2268 | 11.4 | |
| P07 | 1 | 13-Sep | 1204 | 179.0 | 3.05 | -176 | 47 18.6977 | 122 27.9208 | 727518.8 | 1152921.0 | 727523.4 | 1152931.1 | 47 18.6985 | 122 27.9184 | 3.4 | |
| | 2 | | 1205 | 179.0 | 3.05 | -176 | 727518.8 | 1152921.0 | 727518.8 | 1152921.0 | 727514.6 | 1152918.4 | 47 18.6970 | 122 27.9214 | 1.5 | 1.2 |
| | 3 | | 1206 | 179.0 | 3.05 | -176 | | | 727518.8 | 1152921.0 | 727514.7 | 1152915.5 | 47 18.6970 | 122 27.9221 | 2.1 | |
| P08 | 1 | 13-Sep | 1443 | 177.0 | 2.93 | -174 | 47 18.6543 | 122 27.6076 | 727222.8 | 1154209.0 | 727212.2 | 1154222.0 | 47 18.6526 | 122 27.6044 | 5.1 | |
| | 2 | | 1444 | 177.0 | 2.93 | -174 | 727222.8 | 1154209.0 | 727222.8 | 1154209.0 | 727222.3 | 1154229.2 | 47 18.6543 | 122 27.6027 | 6.2 | 1.2 |
| | 3 | | 1444 | 177.0 | 2.93 | -174 | | | 727222.8 | 1154209.0 | 727218.2 | 1154222.9 | 47 18.6536 | 122 27.6042 | 4.5 | |
| P09 | 1 | 13-Sep | 1336 | 175.3 | 2.85 | -172 | 47 18.4777 | 122 27.3108 | 726119.1 | 1155409.1 | 726087.3 | 1155415.4 | 47 18.4725 | 122 27.3091 | 9.9 | |
| | 2 | | 1336 | 175.3 | 2.85 | -172 | 726119.1 | 1155409.1 | 726119.1 | 1155409.1 | 726087.5 | 1155409.6 | 47 18.4725 | 122 27.3105 | 9.6 | 1.1 |
| | 3 | | 1337 | 175.3 | 2.85 | -172 | | | 726119.1 | 1155409.1 | 726114.5 | 1155423.1 | 47 18.4770 | 122 27.3074 | 4.5 | |
| P10 | 1 | 13-Sep | 1350 | 174.0 | 3.09 | -171 | 47 18.2310 | 122 27.2358 | 724612.2 | 1155682.0 | 724589.3 | 1155694.3 | 47 18.2273 | 122 27.2327 | 7.9 | |
| | 2 | | 1350 | 174.0 | 3.09 | -171 | 724612.2 | 1155682.0 | 724612.2 | 1155682.0 | 724604.6 | 1155692.2 | 47 18.2298 | 122 27.2333 | 3.9 | 1.1 |
| | 3 | | 1351 | 174.0 | 3.08 | -171 | | | 724612.2 | 1155682.0 | 724605.5 | 1155680.6 | 47 18.2299 | 122 27.2361 | 2.1 | |
| P11 | 1 | 13-Sep | 0936 | 168.0 | 1.96 | -166 | 47 17.9959 | 122 27.3475 | 723194.9 | 1155184.8 | 723192.3 | 1155188.5 | 47 17.9955 | 122 27.3466 | 1.4 | |
| | 2 | | 0937 | 168.0 | 1.97 | -166 | 723194.9 | 1155184.8 | 723194.9 | 1155184.8 | 723211.4 | 1155180.3 | 47 17.9986 | 122 27.3487 | 5.2 | 0.9 |
| | 3 | | 0938 | 168.0 | 1.99 | -166 | | | 723194.9 | 1155184.8 | 723226.8 | 1155168.7 | 47 18.0011 | 122 27.3516 | 10.9 | |
| P12 | 1 | 13-Sep | 1536 | 166.5 | 2.67 | -164 | 47 17.7860 | 122 27.5807 | 721943.1 | 1154189.1 | 721926.7 | 1154163.8 | 47 17.7832 | 122 27.5867 | 9.2 | |
| | 2 | | 1537 | 166.5 | 2.67 | -164 | 721943.1 | 1154189.1 | 721943.1 | 1154189.1 | 721933.8 | 1154173.9 | 47 17.7844 | 122 27.5843 | 5.4 | 1.0 |
| | 3 | | 1538 | 166.5 | 2.66 | -164 | | | 721943.1 | 1154189.1 | 721940.4 | 1154178.2 | 47 17.7855 | 122 27.5833 | 3.4 | |
| S01 | 1 | 13-Sep | 1641 | 168.5 | 2.38 | -166 | 47 17.9893 | 122 28.0742 | 723229.6 | 1152179.6 | 723187.9 | 1152188.0 | 47 17.9825 | 122 28.0719 | 13.0 | |
| | 2 | | 1641 | 168.5 | 2.38 | -166 | 723229.6 | 1152179.6 | 723229.6 | 1152179.6 | 723182.0 | 1152205.7 | 47 17.9816 | 122 28.0676 | 16.5 | 2.0 |
| | 3 | | 1642 | 169.0 | 2.37 | -167 | | | 723229.6 | 1152179.6 | 723237.8 | 1152185.1 | 47 17.9907 | 122 28.0729 | 3.0 | |
| S02 | 1 | 13-Sep | 1710 | 168.5 | 2.26 | -166 | 47 17.9110 | 122 27.8075 | 722726.1 | 1153270.3 | 722737.3 | 1153262.3 | 47 17.9128 | 122 27.8095 | 4.2 | |
| | 2 | | 1711 | 168.5 | 2.26 | -166 | 722726.1 | 1153270.3 | 722726.1 | 1153270.3 | 722739.2 | 1153256.9 | 47 17.9131 | 122 27.8108 | 5.7 | 1.0 |
| | 3 | | 1711 | 168.5 | 2.25 | -166 | | | 722726.1 | 1153270.3 | 722742.0 | 1153265.7 | 47 17.9136 | 122 27.8087 | 5.1 | |
| S03 | 1 | 13-Sep | 1607 | 168.5 | 2.55 | -166 | 47 17.8627 | 122 28.1375 | 722466.4 | 1151898.6 | 722476.4 | 1151871.6 | 47 17.8642 | 122 28.1441 | 8.8 | |
| | 2 | | 1607 | 168.5 | 2.55 | -166 | 722466.4 | 1151898.6 | 722466.4 | 1151898.6 | 722467.2 | 1151875.5 | 47 17.8627 | 122 28.1431 | 7.1 | 1.5 |
| | 3 | | 1608 | 168.5 | 2.54 | -166 | | | 722466.4 | 1151898.6 | 722468.2 | 1151885.0 | 47 17.8629 | 122 28.1408 | 4.2 | |
| S04 | 1 | 13-Sep | 1659 | 172.0 | 2.30 | -170 | 47 18.0377 | 122 28.2658 | 723543.2 | 1151394.6 | 723540.5 | 1151388.1 | 47 18.0372 | 122 28.2674 | 2.2 | |
| | 2 | | 1700 | 172.0 | 2.30 | -170 | 723543.2 | 1151394.6 | 723543.2 | 1151394.6 | 723539.7 | 1151371.1 | 47 18.0370 | 122 28.2715 | 7.2 | 0.9 |
| | 3 | | 1700 | 172.0 | 2.30 | -170 | | | 723543.2 | 1151394.6 | 723541.2 | 1151386.1 | 47 18.0373 | 122 28.2679 | 2.7 | |
| S05 | 1 | 13-Sep | 1122 | 175.0 | 2.86 | -172 | 47 18.3327 | 122 28.2258 | 725332.1 | 1151605.0 | 725315.4 | 1151615.7 | 47 18.3300 | 122 28.2231 | 6.1 | |
| | 2 | | 1123 | 175.0 | 2.87 | -172 | 725332.1 | 1151605.0 | 725332.1 | 1151605.0 | 725320.6 | 1151599.3 | 47 18.3308 | 122 28.2271 | 3.9 | 1.2 |
| | 3 | | 1124 | 175.0 | 2.87 | -172 | | | 725332.1 | 1151605.0 | 725317.2 | 1151588.9 | 47 18.3302 | 122 28.2296 | 6.7 | |

**NewFields**

**Commencement Bay DMMP, September, 2013**

Arranged Alphabetically

SOFTWARE: Corpscon 5.11.08

| Station No. | Sample Rep. | Date | GPS Time | Meter Wheel Depth m. | Predicted Nearest Tide m. | Predicted Mudline Depth, m. (MLLW) | Sample Target NAD 1983, Decimal Minutes Latitude Northing (y) | Sample Target Longitude Easting (x) | Sample Target NAD 1983, SPCS, Wa. S. Northing (y) | Sample Target Easting (x) | Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. S. Northing (y) | Sample Location Easting (x) | Sample Location DGPS Trimble NT300D NAD 1983, Decimal Minutes Latitude | Sample Location Longitude | Distance to Target (m.) | GPS Status HDOP good < 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S06 | 1 | 14-Sep | 0850 | 174.5 | 0.67 | -174 | 47 18.4977 | 122 27.9208 | 726303.1 | 1152890.6 | 726318.7 | 1152884.9 | 47 18.5002 | 122 27.9223 | 5.0 | |
| | 2 | | 0851 | 174.5 | 0.68 | -174 | 726303.1 | 1152890.6 | 726303.1 | 1152890.6 | 726302.4 | 1152879.9 | 47 18.4975 | 122 27.9234 | 3.3 | 1.1 |
| | 3 | | 0852 | 174.0 | 0.68 | -173 | | | 726303.1 | 1152890.6 | 726306.7 | 1152852.8 | 47 18.4981 | 122 27.9300 | 11.6 | |
| S07 | 1 | 14-Sep | 0839 | 171.0 | 0.56 | -170 | 47 18.3777 | 122 27.5292 | 725533.5 | 1154491.4 | 725535.4 | 1154475.6 | 47 18.3779 | 122 27.5330 | 4.8 | |
| | 2 | | 0839 | 171.0 | 0.56 | -170 | 725533.5 | 1154491.4 | 725533.5 | 1154491.4 | 725537.3 | 1154470.3 | 47 18.3782 | 122 27.5343 | 6.5 | 1.1 |
| | 3 | | 0840 | 171.0 | 0.57 | -170 | | | 725533.5 | 1154491.4 | 725539.8 | 1154469.1 | 47 18.3786 | 122 27.5346 | 7.1 | |
| S08 | 1 | 13-Sep | 1005 | 170.0 | 2.25 | -168 | 47 18.0860 | 122 27.5876 | 723767.1 | 1154205.9 | 723775.2 | 1154196.9 | 47 18.0873 | 122 27.5898 | 3.7 | |
| | 2 | | 1006 | 170.0 | 2.25 | -168 | 723767.1 | 1154205.9 | 723767.1 | 1154205.9 | 723769.2 | 1154191.0 | 47 18.0863 | 122 27.5912 | 4.6 | 0.9 |
| | 3 | | 1006 | 170.2 | 2.26 | -168 | | | 723767.1 | 1154205.9 | 723747.6 | 1154205.3 | 47 18.0828 | 122 27.5876 | 5.9 | |
| S20 | 1 | 14-Sep | 0859 | 173.5 | 0.76 | -173 | 47 18.5040 | 122 28.1281 | 726363.0 | 1152034.8 | 726380.1 | 1152054.3 | 47 18.5069 | 122 28.1235 | 7.9 | |
| | 2 | | 0900 | 173.5 | 0.77 | -173 | 726363.0 | 1152034.8 | 726363.0 | 1152034.8 | 726383.6 | 1152039.0 | 47 18.5074 | 122 28.1272 | 6.4 | 1.1 |
| | 3 | | 0900 | 173.5 | 0.77 | -173 | | | 726363.0 | 1152034.8 | 726386.3 | 1152028.4 | 47 18.5078 | 122 28.1298 | 7.3 | |
| S21 | 1 | 14-Sep | 0910 | 172.0 | 0.87 | -171 | 47 18.1760 | 122 28.3430 | 724391.9 | 1151096.7 | 724417.4 | 1151118.4 | 47 18.1803 | 122 28.3379 | 10.2 | |
| | 2 | | 0911 | 172.0 | 0.87 | -171 | 724391.9 | 1151096.7 | 724391.9 | 1151096.7 | 724429.5 | 1151100.1 | 47 18.1822 | 122 28.3424 | 11.5 | 1.0 |
| | 3 | | 0911 | 172.0 | 0.89 | -171 | | | 724391.9 | 1151096.7 | 724407.6 | 1151097.5 | 47 18.1786 | 122 28.3429 | 4.8 | |
| T01 | 1 | 14-Sep | 1355 | 166.0 | 3.21 | -163 | 47 17.6227 | 122 27.9492 | 720988.4 | 1152640.9 | 720992.5 | 1152634.3 | 47 17.6233 | 122 27.9508 | 2.4 | |
| | 2 | | 1355 | 166.0 | 3.21 | -163 | 720988.4 | 1152640.9 | 720988.4 | 1152640.9 | 720981.3 | 1152642.2 | 47 17.6215 | 122 27.9488 | 2.2 | 1.0 |
| | 3 | | 1356 | 166.0 | 3.21 | -163 | | | 720988.4 | 1152640.9 | 720989.2 | 1152643.7 | 47 17.6228 | 122 27.9485 | 0.9 | |
| T02 | 1 | 14-Sep | 1346 | 164.0 | 3.20 | -161 | 47 17.5176 | 122 27.9891 | 720354.0 | 1152459.9 | 720374.8 | 1152454.6 | 47 17.5210 | 122 27.9905 | 6.6 | |
| | 2 | | 1347 | 164.5 | 3.20 | -161 | 720354.0 | 1152459.9 | 720354.0 | 1152459.9 | 720359.2 | 1152471.6 | 47 17.5185 | 122 27.9863 | 3.9 | 1.1 |
| | 3 | | 1348 | 164.0 | 3.20 | -161 | | | 720354.0 | 1152459.9 | 720374.9 | 1152475.7 | 47 17.5211 | 122 27.9854 | 8.0 | |
| T03 | 1 | 14-Sep | 1338 | 163.0 | 3.19 | -160 | 47 17.4294 | 122 27.0291 | 719719.4 | 1156416.0 | 719721.5 | 1156407.4 | 47 17.4297 | 122 27.0312 | 2.7 | |
| | 2 | | 1339 | 163.0 | 3.19 | -160 | 719719.4 | 1156416.0 | 719719.4 | 1156416.0 | 719704.7 | 1156398.7 | 47 17.4269 | 122 27.0332 | 6.9 | 1.1 |
| | 3 | | 1340 | 163.0 | 3.19 | -160 | | | 719719.4 | 1156416.0 | 719713.3 | 1156392.7 | 47 17.4283 | 122 27.0347 | 7.3 | |
| T07 | 1 | 14-Sep | 1317 | 168.5 | 3.16 | -165 | 47 17.6510 | 122 28.2792 | 721194.6 | 1151280.8 | 721206.3 | 1151302.5 | 47 17.6530 | 122 28.2740 | 7.5 | |
| | 2 | | 1317 | 168.5 | 3.16 | -165 | 721194.6 | 1151280.8 | 721194.6 | 1151280.8 | 721217.9 | 1151301.5 | 47 17.6549 | 122 28.2743 | 9.5 | 1.2 |
| | 3 | | 1318 | 168.5 | 3.16 | -165 | | | 721194.6 | 1151280.8 | 721204.3 | 1151283.8 | 47 17.6526 | 122 28.2785 | 3.1 | |
| T08 | 1 | 14-Sep | 1326 | 166.5 | 3.19 | -163 | 47 17.5693 | 122 28.3375 | 720704.2 | 1151027.2 | 720720.0 | 1151052.0 | 47 17.5720 | 122 28.3316 | 9.0 | |
| | 2 | | 1327 | 166.5 | 3.19 | -163 | 720704.2 | 1151027.2 | 720704.2 | 1151027.2 | 720726.5 | 1151034.4 | 47 17.5730 | 122 28.3359 | 7.1 | 1.1 |
| | 3 | | 1328 | 167.0 | 3.19 | -164 | | | 720704.2 | 1151027.2 | 720722.2 | 1151036.7 | 47 17.5723 | 122 28.3353 | 6.2 | |
| T13 | 1 | 14-Sep | 1255 | 169.0 | 3.07 | -166 | 47 17.8474 | 122 28.5742 | 722418.8 | 1150090.8 | 722416.9 | 1150095.0 | 47 17.8471 | 122 28.5732 | 1.4 | |
| | 2 | | 1256 | 169.0 | 3.08 | -166 | 722418.8 | 1150090.8 | 722418.8 | 1150090.8 | 722417.5 | 1150095.4 | 47 17.8472 | 122 28.5731 | 1.4 | 1.1 |
| | 3 | | 1257 | 169.0 | 3.08 | -166 | | | 722418.8 | 1150090.8 | 722431.8 | 1150082.9 | 47 17.8495 | 122 28.5762 | 4.6 | |
| T14 | 1 | 14-Sep | 1305 | 163.5 | 3.12 | -160 | 47 17.7543 | 122 28.6709 | 721863.1 | 1149676.9 | 721846.3 | 1149712.0 | 47 17.7517 | 122 28.6623 | 11.9 | |
| | 2 | | 1306 | 163.5 | 3.12 | -160 | 721863.1 | 1149676.9 | 721863.1 | 1149676.9 | 721854.5 | 1149701.5 | 47 17.7530 | 122 28.6649 | 7.9 | 1.2 |
| | 3 | | 1307 | 163.5 | 3.12 | -160 | | | 721863.1 | 1149676.9 | 721861.5 | 1149690.5 | 47 17.7541 | 122 28.6676 | 4.2 | |
| Z01 | 1 | 13-Sep | 1033 | 138.8 | 2.51 | -136 | 47 18.2076 | 122 27.9058 | 724538.8 | 1152908.8 | 724548.3 | 1152918.5 | 47 18.2092 | 122 27.9035 | 4.2 | |
| | 2 | | 1034 | 138.0 | 2.52 | -135 | 724538.8 | 1152908.8 | 724538.8 | 1152908.8 | 724547.7 | 1152914.8 | 47 18.2091 | 122 27.9044 | 3.3 | 0.9 |
| | 3 | | 1034 | 138.8 | 2.52 | -136 | | | 724538.8 | 1152908.8 | 724538.6 | 1152916.2 | 47 18.2076 | 122 27.9040 | 2.3 | |

Charles M. Eaton
Bio-Marine Enterprises
(206) 282-4945
cmeaton@msn.com



## NewFields

;SOFTWARE: Corpscon for Windows 5.11.08

### Elliott Bay DMMP, SPI Stations

### 2013

See file "PSDDA original targets.xy"

**Arranged Alphabetically**

| Station No. | Sample Rep. | Date | GPS Time Start | Meter Block Depth m. | Predicted Nearest Tide m. | Predicted Mudline Depth, m. (MLLW) | Station Target NAD 1983 Degrees Decimal Minutes Latitude | Station Target NAD 1983 Degrees Decimal Minutes Longitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Latitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Longitude | Station Target Wa. State Plane North NAD 83 Northing (y) | Station Target Wa. State Plane North NAD 83 Easting (x) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Northing (y) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Easting (x) | Distance to Target (m.) | GPS Status HDOP good < 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EBB01 | 1 | 16-Sep | 1305 | 43.0 | 2.35 | -40.7 | 47 35.3542 | 122 21.7660 | 47 35.3334 | 122 21.7620 | 218564.1 | 1263025.8 | 218559.2 | 1263042.2 | 5.2 | |
| | 2 | | 1305 | 43.5 | 2.35 | -41.2 | | | 47 35.3362 | 122 21.7656 | 218564.1 | 1263025.8 | 218576.5 | 1263027.7 | 3.8 | 1.2 |
| | 3 | | 1306 | 43.5 | 2.37 | -41.1 | | | 47 35.3353 | 122 21.7643 | 218564.1 | 1263025.8 | 218570.9 | 1263033.0 | 3.0 | |
| EBB02 | 1 | 16-Sep | 1626 | 40.5 | 3.33 | -37.2 | 47 36.0025 | 122 20.5777 | 47 36.0046 | 122 20.5803 | 222529.9 | 1267992.0 | 222542.9 | 1267981.4 | 5.1 | |
| | 2 | | 1627 | 40.5 | 3.33 | -37.2 | | | 47 36.0026 | 122 20.5781 | 222529.9 | 1267992.0 | 222530.6 | 1267990.2 | 0.6 | 1.8 |
| | 3 | | 1628 | 40.0 | 3.33 | -36.7 | | | 47 35.9995 | 122 20.5759 | 222529.9 | 1267992.0 | 222511.6 | 1267998.9 | 6.0 | |
| EBB03 | 1 | 16-Sep | 0847 | 63.0 | -0.03 | -63.0 | 47 36.7558 | 122 21.7610 | 47 36.7547 | 122 21.7699 | 227204.9 | 1263218.2 | 227198.8 | 1263181.4 | 11.3 | |
| | 2 | | 0848 | 62.0 | -0.03 | -62.0 | | | 47 36.7615 | 122 21.7595 | 227204.9 | 1263218.2 | 227239.3 | 1263225.0 | 10.7 | 1.1 |
| | 3 | | 0849 | 61.0 | -0.03 | -61.0 | | | 47 36.7585 | 122 21.7634 | 227204.9 | 1263218.2 | 227221.3 | 1263208.6 | 5.8 | |
| EBB04 | 1 | 17-Sep | 0856 | 124.0 | 0.16 | -123.8 | 47 36.1075 | 122 23.9077 | 47 36.1044 | 122 23.9034 | 223441.7 | 1254315.0 | 223422.5 | 1254332.1 | 7.8 | |
| | 2 | | 0857 | 124.0 | 0.15 | -123.9 | | | 47 36.1030 | 122 23.9021 | 223441.7 | 1254315.0 | 223413.9 | 1254337.3 | 10.9 | 1.0 |
| | 3 | | 0857 | 123.5 | 0.14 | -123.4 | | | 47 36.1060 | 122 23.9054 | 223441.7 | 1254315.0 | 223432.4 | 1254324.1 | 4.0 | |
| EBC06 | 1 | 16-Sep | 1155 | 79.0 | 1.46 | -77.5 | 47 35.9472 | 122 21.6003 | 47 35.9469 | 122 21.6001 | 222276.6 | 1263781.0 | 222274.9 | 1263781.9 | 0.6 | |
| | 2 | | 1156 | 79.0 | 1.47 | -77.5 | | | 47 35.9466 | 122 21.5988 | 222276.6 | 1263781.0 | 222273.0 | 1263787.2 | 2.2 | 1.1 |
| | 3 | | 1156 | 79.0 | 1.48 | -77.5 | | | 47 35.9505 | 122 21.5973 | 222276.6 | 1263781.0 | 222296.6 | 1263793.9 | 7.3 | |
| EBC07 | 1 | 16-Sep | 1520 | 83.0 | 3.33 | -79.7 | 47 35.9562 | 122 21.3083 | 47 35.9506 | 122 21.3084 | 222307.5 | 1264982.5 | 222273.7 | 1264981.6 | 10.3 | |
| | 2 | | 1520 | 83.0 | 3.33 | -79.7 | | | 47 35.9536 | 122 21.3076 | 222307.5 | 1264982.5 | 222291.8 | 1264985.3 | 4.8 | 1.0 |
| | 3 | | 1521 | 83.5 | 3.34 | -80.2 | | | 47 35.9565 | 122 21.3085 | 222307.5 | 1264982.5 | 222309.5 | 1264981.9 | 0.7 | |
| EBC08 | 1 | 16-Sep | 1527 | 80.0 | 3.35 | -76.7 | 47 35.9532 | 122 21.1632 | 47 35.9516 | 122 21.1632 | 222277.4 | 1265582.4 | 222267.9 | 1265578.7 | 3.1 | |
| | 2 | | 1527 | 80.0 | 3.35 | -76.7 | | | 47 35.9526 | 122 21.1632 | 222277.4 | 1265582.4 | 222274.0 | 1265578.8 | 1.5 | 1.0 |
| | 3 | | 1528 | 80.5 | 3.35 | -77.2 | | | 47 35.9552 | 122 21.1617 | 222277.4 | 1265582.4 | 222289.7 | 1265585.3 | 3.9 | |
| EBC09 | 1 | 16-Sep | 1050 | 104.0 | 0.68 | -103.3 | 47 36.3232 | 122 21.6433 | 47 36.3242 | 122 21.6426 | 224565.5 | 1263649.6 | 224571.7 | 1263652.7 | 2.1 | |
| | 2 | | 1051 | 104.0 | 0.70 | -103.3 | | | 47 36.3252 | 122 21.6368 | 224565.5 | 1263649.6 | 224577.3 | 1263676.7 | 9.0 | 1.1 |
| | 3 | | 1053 | 104.0 | 0.71 | -103.3 | | | 47 36.3255 | 122 21.6446 | 224565.5 | 1263649.6 | 224579.8 | 1263644.7 | 4.6 | |
| EBC10 | 1 | 16-Sep | 1042 | 90.5 | 0.60 | -89.9 | 47 36.1982 | 122 21.5793 | 47 36.1951 | 122 21.5764 | 223800.5 | 1263897.6 | 223781.6 | 1263909.3 | 6.8 | |
| | 2 | | 1043 | 90.5 | 0.61 | -89.9 | | | 47 36.1965 | 122 21.5774 | 223800.5 | 1263897.6 | 223790.2 | 1263905.3 | 3.9 | 1.0 |
| | 3 | | 1044 | 90.5 | 0.62 | -89.9 | | | 47 36.1984 | 122 21.5793 | 223800.5 | 1263897.6 | 223801.9 | 1263897.8 | 0.4 | |
| EBC11 | 1 | 16-Sep | 1536 | 89.0 | 3.36 | -85.6 | 47 36.0532 | 122 21.5003 | 47 36.0479 | 122 21.4979 | 222912.7 | 1264204.9 | 222880.5 | 1264214.3 | 10.2 | |
| | 2 | | 1536 | 88.5 | 3.36 | -85.1 | | | 47 36.0496 | 122 21.4972 | 222912.7 | 1264204.9 | 222890.8 | 1264217.3 | 7.7 | 1.0 |
| | 3 | | 1537 | 89.0 | 3.36 | -85.6 | | | 47 36.0512 | 122 21.4992 | 222912.7 | 1264204.9 | 222900.7 | 1264209.3 | 3.9 | |
| EBC12 | 1 | 16-Sep | 1501 | 78.0 | 3.28 | -74.7 | 47 35.8652 | 122 21.4073 | 47 35.8603 | 122 21.4076 | 221762.4 | 1264564.6 | 221732.9 | 1264562.9 | 9.0 | |
| | 2 | | 1502 | 78.0 | 3.28 | -74.7 | | | 47 35.8623 | 122 21.4082 | 221762.4 | 1264564.6 | 221745.1 | 1264560.7 | 5.4 | 1.1 |
| | 3 | | 1502 | 78.0 | 3.28 | -74.7 | | | 47 35.8644 | 122 21.4064 | 221762.4 | 1264564.6 | 221757.7 | 1264568.3 | 1.8 | |
| EBC13 | 1 | 16-Sep | 1356 | 77.0 | 2.87 | -74.1 | 47 35.7632 | 122 21.3503 | 47 35.7604 | 122 21.3473 | 221137.8 | 1264786.7 | 221120.7 | 1264798.8 | 6.4 | |
| | 2 | | 1356 | 77.0 | 2.87 | -74.1 | | | 47 35.7590 | 122 21.3511 | 221137.8 | 1264786.7 | 221112.5 | 1264783.0 | 7.8 | 1.1 |
| | 3 | | 1357 | 77.0 | 2.88 | -74.1 | | | 47 35.7631 | 122 21.3513 | 221137.8 | 1264786.7 | 221137.5 | 1264782.7 | 1.2 | |
| EBP01 | 1 | 16-Sep | 0915 | 130.5 | 0.00 | -130.5 | 47 36.5558 | 122 21.9943 | 47 36.5500 | 122 21.9882 | 226008.4 | 1262234.9 | 225972.4 | 1262259.4 | 13.3 | |
| | 2 | | 0915 | 130.5 | 0.00 | -130.5 | | | 47 36.5533 | 122 21.9977 | 226008.4 | 1262234.9 | 225993.3 | 1262220.8 | 6.3 | 1.1 |
| | 3 | | 0916 | 130.0 | 0.01 | -130.0 | | | 47 36.5591 | 122 21.9987 | 226008.4 | 1262234.9 | 226028.6 | 1262217.4 | 8.2 | |
| EBP03 | 1 | 16-Sep | 0933 | 44.5 | 0.08 | -44.4 | 47 36.5808 | 122 21.3910 | 47 36.5752 | 122 21.3927 | 226111.1 | 1264717.8 | 226077.0 | 1264710.2 | 10.7 | |
| | 2 | | 0934 | 44.5 | 0.08 | -44.4 | | | 47 36.5756 | 122 21.3915 | 226111.1 | 1264717.8 | 226079.3 | 1264715.2 | 9.7 | 1.0 |
| | 3 | | 0935 | 44.0 | 0.08 | -43.9 | | | 47 36.5801 | 122 21.3923 | 226111.1 | 1264717.8 | 226106.7 | 1264712.4 | 2.1 | |

Charles M. Eaton
Bio-Marine Enterprises
(206) 282-4945
cmeaton@msn.com



## NewFields

;SOFTWARE: Corpscon for Windows 5.11.08

### Elliott Bay DMMP, SPI Stations

### 2013

See file "PSDDA original targets.xy"

**Arranged Alphabetically**

| Station No. | Sample Rep. | Date | GPS Time Start | Meter Block Depth m. | Predicted Nearest Tide m. | Predicted Mudline Depth, m. (MLLW) | Station Target NAD 1983 Degrees Decimal Minutes Latitude | Station Target NAD 1983 Degrees Decimal Minutes Longitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Latitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Longitude | Station Target Wa. State Plane North NAD 83 Northing (y) | Station Target Wa. State Plane North NAD 83 Easting (x) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Northing (y) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Easting (x) | Distance to Target (m.) | GPS Status HDOP good < 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EBP04 | 1 | 16-Sep | 1707 | 74.5 | 3.18 | -71.3 | 47 36.3842 | 122 21.0743 | 47 36.3820 | 122 21.0788 | 224890.0 | 1265995.9 | 224877.2 | 1265977.3 | 6.9 | |
| | 2 | | 1708 | 74.5 | 3.18 | -71.3 | | | 47 36.3801 | 122 21.0788 | 224890.0 | 1265995.9 | 224865.6 | 1265977.0 | 9.4 | 0.9 |
| | 3 | | 1709 | 74.5 | 3.18 | -71.3 | | | 47 36.3848 | 122 21.0780 | 224890.0 | 1265995.9 | 224894.1 | 1265980.9 | 4.7 | |
| | 4 | 17-Sep | 1145 | 72.0 | 0.79 | -71.2 | | | 47 36.3842 | 122 21.0801 | 224890.0 | 1265995.9 | 224890.6 | 1265972.2 | 7.2 | |
| | 5 | | 1145 | 72.0 | 0.80 | -71.2 | | | 47 36.3838 | 122 21.0770 | 224890.0 | 1265995.9 | 224888.0 | 1265984.9 | 3.4 | 1.4 |
| | 6 | | 1146 | 72.0 | 0.81 | -71.2 | | | 47 36.3841 | 122 21.0739 | 224890.0 | 1265995.9 | 224889.5 | 1265997.7 | 0.6 | |
| EBP05 | 1 | 16-Sep | 1656 | 69.5 | 3.23 | -66.3 | 47 36.1808 | 122 20.8677 | 47 36.1828 | 122 20.8681 | 223637.3 | 1266821.1 | 223649.3 | 1266819.5 | 3.7 | |
| | 2 | | 1657 | 69.5 | 3.23 | -66.3 | | | 47 36.1797 | 122 20.8669 | 223637.3 | 1266821.1 | 223630.4 | 1266824.1 | 2.3 | 0.9 |
| | 3 | | 1657 | 69.0 | 3.23 | -65.8 | | | 47 36.1780 | 122 20.8631 | 223637.3 | 1266821.1 | 223619.7 | 1266839.5 | 7.8 | |
| EBP06 | 1 | 16-Sep | 1619 | 65.5 | 3.35 | -62.2 | 47 35.9158 | 122 20.7327 | 47 35.9143 | 122 20.7341 | 222015.7 | 1267344.4 | 222006.5 | 1267338.3 | 3.4 | |
| | 2 | | 1620 | 65.5 | 3.35 | -62.2 | | | 47 35.9136 | 122 20.7316 | 222015.7 | 1267344.4 | 222002.0 | 1267348.5 | 4.3 | 1.8 |
| | 3 | | 1621 | 65.5 | 3.34 | -62.2 | | | 47 35.9157 | 122 20.7344 | 222015.7 | 1267344.4 | 222015.0 | 1267337.3 | 2.2 | |
| EBP07 | 1 | 16-Sep | 1327 | 49.5 | 2.60 | -46.9 | 47 35.5858 | 122 20.8710 | 47 35.5810 | 122 20.8739 | 220021.0 | 1266736.2 | 219991.9 | 1266723.7 | 9.7 | |
| | 2 | | 1328 | 50.0 | 2.60 | -47.4 | | | 47 35.5823 | 122 20.8745 | 220021.0 | 1266736.2 | 219999.8 | 1266721.4 | 7.9 | 1.1 |
| | 3 | | 1328 | 50.0 | 2.61 | -47.4 | | | 47 35.5843 | 122 20.8743 | 220021.0 | 1266736.2 | 220012.0 | 1266722.4 | 5.0 | |
| EBP08 | 1 | 16-Sep | 1319 | 44.0 | 2.51 | -41.5 | 47 35.4542 | 122 21.1827 | 47 35.4483 | 122 21.1825 | 219246.0 | 1265438.9 | 219210.3 | 1265438.9 | 10.9 | |
| | 2 | | 1320 | 44.0 | 2.52 | -41.5 | | | 47 35.4486 | 122 21.1819 | 219246.0 | 1265438.9 | 219212.1 | 1265441.4 | 10.4 | 1.1 |
| | 3 | | 1321 | 45.0 | 2.52 | -42.5 | | | 47 35.4529 | 122 21.1818 | 219246.0 | 1265438.9 | 219238.2 | 1265442.3 | 2.6 | |
| EBP09 | 1 | 16-Sep | 1312 | 55.0 | 2.43 | -52.6 | 47 35.4392 | 122 21.5927 | 47 35.4395 | 122 21.5939 | 219188.2 | 1263751.3 | 219190.3 | 1263746.2 | 1.7 | |
| | 2 | | 1313 | 55.0 | 2.43 | -52.6 | | | 47 35.4408 | 122 21.5930 | 219188.2 | 1263751.3 | 219198.2 | 1263750.1 | 3.1 | 1.2 |
| | 3 | | 1313 | 54.5 | 2.45 | -52.1 | | | 47 35.4402 | 122 21.5958 | 219188.2 | 1263751.3 | 219194.7 | 1263738.5 | 4.4 | |
| EBP10 | 1 | 16-Sep | 1410 | 65.0 | 2.99 | -62.0 | 47 35.6308 | 122 21.9777 | 47 35.6311 | 122 21.9780 | 220384.7 | 1262191.4 | 220386.3 | 1262190.1 | 0.6 | |
| | 2 | | 1411 | 65.0 | 3.00 | -62.0 | | | 47 35.6328 | 122 21.9780 | 220384.7 | 1262191.4 | 220396.6 | 1262190.3 | 3.7 | 1.2 |
| | 3 | | 1411 | 65.0 | 3.00 | -62.0 | | | 47 35.6343 | 122 21.9769 | 220384.7 | 1262191.4 | 220405.7 | 1262195.0 | 6.5 | |
| EBP11 | 1 | 16-Sep | 1138 | 74.0 | 1.25 | -72.8 | 47 35.9308 | 122 22.0910 | 47 35.9293 | 122 22.0886 | 222217.4 | 1261761.8 | 222207.9 | 1261771.5 | 4.1 | |
| | 2 | | 1139 | 74.5 | 1.25 | -73.3 | | | 47 35.9330 | 122 22.0880 | 222217.4 | 1261761.8 | 222230.3 | 1261774.4 | 5.5 | 1.3 |
| | 3 | | 1139 | 75.0 | 1.26 | -73.7 | | | 47 35.9349 | 122 22.0912 | 222217.4 | 1261761.8 | 222242.2 | 1261761.5 | 7.5 | |
| EBP12 | 1 | 16-Sep | 1116 | 81.5 | 0.98 | -80.5 | 47 36.3758 | 122 22.0927 | 47 36.3759 | 122 22.0914 | 224922.4 | 1261808.9 | 224922.7 | 1261814.1 | 1.6 | |
| | 2 | | 1117 | 81.5 | 0.99 | -80.5 | | | 47 36.3796 | 122 22.0937 | 224922.4 | 1261808.9 | 224945.3 | 1261805.1 | 7.1 | 1.2 |
| | 3 | | 1118 | 81.5 | 1.00 | -80.5 | | | 47 36.3798 | 122 22.0901 | 224922.4 | 1261808.9 | 224946.3 | 1261819.9 | 8.0 | |
| EBP13 | 1 | 16-Sep | 1126 | 76.5 | 1.11 | -75.4 | 47 36.1772 | 122 22.0983 | 47 36.1734 | 122 22.0981 | 223715.3 | 1261761.5 | 223692.4 | 1261762.0 | 7.0 | |
| | 2 | | 1127 | 77.0 | 1.11 | -75.9 | | | 47 36.1736 | 122 22.1025 | 223715.3 | 1261761.5 | 223693.9 | 1261744.0 | 8.4 | 1.3 |
| | 3 | | 1128 | 77.0 | 1.12 | -75.9 | | | 47 36.1762 | 122 22.0990 | 223715.3 | 1261761.5 | 223709.5 | 1261758.7 | 2.0 | |
| EBP14 | 1 | 16-Sep | 0858 | 70.0 | -0.03 | -70.0 | 47 36.6832 | 122 21.7053 | 47 36.6766 | 122 21.7068 | 226758.7 | 1263438.2 | 226718.9 | 1263431.4 | 12.3 | |
| | 2 | | 0859 | 69.5 | -0.03 | -69.5 | | | 47 36.6819 | 122 21.7080 | 226758.7 | 1263438.2 | 226751.2 | 1263427.1 | 4.1 | |
| | 3 | | 0900 | 69.5 | -0.03 | -69.5 | | | 47 36.6858 | 122 21.7070 | 226758.7 | 1263438.2 | 226774.8 | 1263431.6 | 5.3 | 1.0 |
| | 4 | | 0958 | 70.0 | 0.21 | -69.8 | | | 47 36.6796 | 122 21.7051 | 226758.7 | 1263438.2 | 226737.0 | 1263438.7 | 6.6 | |
| | 5 | | 0958 | 70.0 | 0.21 | -69.8 | | | 47 36.6842 | 122 21.7045 | 226758.7 | 1263438.2 | 226764.9 | 1263441.7 | 2.2 | |

Charles M. Eaton
Bio-Marine Enterprises
(206) 282-4945
cmeaton@msn.com



## NewFields

;SOFTWARE: Corpscon for Windows 5.11.08

### Elliott Bay DMMP, SPI Stations

### 2013

See file "PSDDA original targets.xy"

**Arranged Alphabetically**

| Station No. | Sample Rep. | Date | GPS Time Start | Meter Block Depth m. | Predicted Nearest Tide m. | Predicted Mudline Depth, m. (MLLW) | Station Target NAD 1983 Degrees Decimal Minutes Latitude | Station Target NAD 1983 Degrees Decimal Minutes Longitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Latitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Longitude | Station Target Wa. State Plane North NAD 83 Northing (y) | Station Target Wa. State Plane North NAD 83 Easting (x) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Northing (y) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Easting (x) | Distance to Target (m.) | GPS Status HDOP good < 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EBP15 | 1 | 16-Sep | 0906 | 95.5 | -0.02 | -95.5 | 47 36.6262 | 122 21.8323 | 47 36.6202 | 122 21.8369 | 226422.6 | 1262909.3 | 226386.7 | 1262889.8 | 12.4 | |
| | 2 | | 0906 | 95.0 | -0.02 | -95.0 | | | 47 36.6211 | 122 21.8351 | 226422.6 | 1262909.3 | 226392.1 | 1262897.3 | 10.0 | 1.2 |
| | 3 | | 0907 | 94.5 | -0.01 | -94.5 | | | 47 36.6242 | 122 21.8341 | 226422.6 | 1262909.3 | 226410.8 | 1262901.8 | 4.3 | |
| | 4 | | 1006 | 94.5 | 0.28 | -94.2 | | | 47 36.6206 | 122 21.8319 | 226422.6 | 1262909.3 | 226388.8 | 1262910.4 | 10.3 | |
| | 5 | | 1007 | 95.0 | 0.28 | -94.7 | | | 47 36.6223 | 122 21.8312 | 226422.6 | 1262909.3 | 226399.0 | 1262913.5 | 7.3 | |
| | 6 | | 1007 | 95.0 | 0.28 | -94.7 | | | 47 36.6233 | 122 21.8336 | 226422.6 | 1262909.3 | 226405.3 | 1262903.7 | 5.5 | 0.9 |
| | 7 | | 1031 | 95.5 | 0.49 | -95.0 | | | 47 36.6195 | 122 21.8314 | 226422.6 | 1262909.3 | 226382.0 | 1262912.3 | 12.4 | |
| | 8 | | 1032 | 95.0 | 0.50 | -94.5 | | | 47 36.6239 | 122 21.8342 | 226422.6 | 1262909.3 | 226409.0 | 1262901.3 | 4.8 | |
| | 9 | | 1033 | 94.5 | 0.51 | -94.0 | | | 47 36.6282 | 122 21.8345 | 226422.6 | 1262909.3 | 226435.2 | 1262900.6 | 4.6 | |
| EBR01 | 1 | 16-Sep | 1514 | 82.0 | 3.32 | -78.7 | 47 35.9220 | 122 21.2640 | 47 35.9203 | 122 21.2637 | 222096.2 | 1265160.7 | 222085.9 | 1265161.7 | 3.2 | |
| | 2 | | 1514 | 82.0 | 3.32 | -78.7 | | | 47 35.9207 | 122 21.2656 | 222096.2 | 1265160.7 | 222088.4 | 1265154.0 | 3.1 | 1.0 |
| | 3 | | 1515 | 82.0 | 3.32 | -78.7 | | | 47 35.9220 | 122 21.2648 | 222096.2 | 1265160.7 | 222096.3 | 1265157.4 | 1.0 | |
| EBR02 | 1 | 17-Sep | 1612 | 101.5 | 3.47 | -98.0 | 47 36.2460 | 122 21.5100 | 47 36.2517 | 122 21.5085 | 224085.6 | 1264188.4 | 224120.1 | 1264195.2 | 10.7 | |
| | 2 | | 1613 | 101.5 | 3.47 | -98.0 | | | 47 36.2471 | 122 21.5140 | 224085.6 | 1264188.4 | 224092.6 | 1264172.1 | 5.4 | 2.0 |
| | 3 | | 1621 | 101.5 | 3.47 | -98.0 | | | 47 36.2463 | 122 21.5093 | 224085.6 | 1264188.4 | 224087.3 | 1264191.3 | 1.0 | |
| | 4 | | 1622 | 101.5 | 3.47 | -98.0 | | | 47 36.2443 | 122 21.5076 | 224085.6 | 1264188.4 | 224075.0 | 1264198.0 | 4.4 | |
| | 5 | | 1623 | 101.0 | 3.47 | -97.5 | | | 47 36.2466 | 122 21.5085 | 224085.6 | 1264188.4 | 224089.1 | 1264194.6 | 2.2 | |
| EBR03 | 1 | 16-Sep | 1636 | 67.0 | 3.31 | -63.7 | 47 35.7000 | 122 21.0180 | 47 35.7024 | 122 21.0231 | 220726.9 | 1266145.5 | 220741.9 | 1266124.8 | 7.8 | |
| | 2 | | 1637 | 67.0 | 3.30 | -63.7 | | | 47 35.7019 | 122 21.0193 | 220726.9 | 1266145.5 | 220738.5 | 1266140.3 | 3.9 | 0.9 |
| | 3 | | 1637 | 67.0 | 3.30 | -63.7 | | | 47 35.6984 | 122 21.0197 | 220726.9 | 1266145.5 | 220717.3 | 1266138.3 | 3.7 | |
| | 4 | 17-Sep | 1416 | 65.5 | 2.72 | -62.8 | | | 47 35.6987 | 122 21.0186 | 220726.9 | 1266145.5 | 220719.0 | 1266142.8 | 2.5 | |
| | 5 | | 1416 | 65.5 | 2.74 | -62.8 | | | 47 35.6989 | 122 21.0198 | 220726.9 | 1266145.5 | 220720.3 | 1266137.9 | 3.0 | 1.2 |
| | 6 | | 1417 | 66.0 | 2.75 | -63.3 | | | 47 35.7007 | 122 21.0222 | 220726.9 | 1266145.5 | 220731.5 | 1266128.3 | 5.4 | |
| EBR04 | 1 | 16-Sep | 1545 | 78.0 | 3.37 | -74.6 | 47 36.0240 | 122 21.7980 | 47 36.0212 | 122 21.7974 | 222759.7 | 1262977.6 | 222742.6 | 1262979.8 | 5.2 | |
| | 2 | | 1546 | 78.0 | 3.37 | -74.6 | | | 47 36.0214 | 122 21.7963 | 222759.7 | 1262977.6 | 222743.8 | 1262984.3 | 5.3 | 1.2 |
| | 3 | | 1546 | 78.0 | 3.37 | -74.6 | | | 47 36.0234 | 122 21.7980 | 222759.7 | 1262977.6 | 222756.1 | 1262977.6 | 1.1 | |
| EBR05 | 1 | 17-Sep | 1137 | 86.0 | 0.71 | -85.3 | 47 36.3600 | 122 21.3360 | 47 36.3603 | 122 21.3427 | 224764.3 | 1264917.4 | 224766.7 | 1264889.9 | 8.4 | |
| | 2 | | 1138 | 86.0 | 0.72 | -85.3 | | | 47 36.3598 | 122 21.3413 | 224764.3 | 1264917.4 | 224763.5 | 1264895.6 | 6.7 | 1.3 |
| | 3 | | 1139 | 86.0 | 0.73 | -85.3 | | | 47 36.3581 | 122 21.3383 | 224764.3 | 1264917.4 | 224753.0 | 1264907.7 | 4.6 | |
| EBR06 | 1 | 16-Sep | 1454 | 79.0 | 3.25 | -75.8 | 47 35.8020 | 122 21.5580 | 47 35.8021 | 122 21.5595 | 221390.8 | 1263938.4 | 221391.5 | 1263931.4 | 2.2 | |
| | 2 | | 1454 | 79.0 | 3.25 | -75.8 | | | 47 35.8013 | 122 21.5635 | 221390.8 | 1263938.4 | 221387.0 | 1263914.8 | 7.3 | 1.2 |
| | 3 | | 1455 | 79.0 | 3.25 | -75.8 | | | 47 35.8061 | 122 21.5617 | 221390.8 | 1263938.4 | 221416.0 | 1263922.8 | 9.0 | |
| EBR07 | 1 | 17-Sep | 1056 | 114.5 | 0.32 | -114.2 | 47 36.4620 | 122 21.6960 | 47 36.4615 | 122 21.6977 | 225413.6 | 1263449.8 | 225410.7 | 1263442.8 | 2.3 | |
| | 2 | | 1057 | 114.5 | 0.32 | -114.2 | | | 47 36.4625 | 122 21.6948 | 225413.6 | 1263449.8 | 225416.6 | 1263454.8 | 1.8 | 1.3 |
| | 3 | | 1057 | 114.5 | 0.33 | -114.2 | | | 47 36.4633 | 122 21.6931 | 225413.6 | 1263449.8 | 225421.3 | 1263461.9 | 4.4 | |
| EBS02 | 1 | 16-Sep | 1350 | 74.0 | 2.81 | -71.2 | 47 35.6908 | 122 21.4243 | 47 35.6871 | 122 21.4254 | 220704.2 | 1264473.7 | 220681.6 | 1264468.9 | 7.0 | |
| | 2 | | 1350 | 74.0 | 2.82 | -71.2 | | | 47 35.6889 | 122 21.4252 | 220704.2 | 1264473.7 | 220692.5 | 1264469.9 | 3.7 | 0.9 |
| | 3 | | 1351 | 74.0 | 2.83 | -71.2 | | | 47 35.6920 | 122 21.4264 | 220704.2 | 1264473.7 | 220711.4 | 1264465.4 | 3.4 | |
| EBS03 | 1 | 17-Sep | 1104 | 92.0 | 0.39 | -91.6 | 47 36.3925 | 122 21.3943 | 47 36.3951 | 122 21.3970 | 224966.6 | 1264681.5 | 224982.6 | 1264670.8 | 5.9 | |
| | 2 | | 1105 | 91.5 | 0.40 | -91.1 | | | 47 36.3945 | 122 21.3941 | 224966.6 | 1264681.5 | 224978.8 | 1264682.7 | 3.7 | 1.2 |
| | 3 | | 1127 | 91.0 | 0.60 | -90.4 | | | 47 36.3951 | 122 21.3918 | 224966.6 | 1264681.5 | 224982.2 | 1264692.2 | 5.8 | |
| | 4 | | 1128 | 90.5 | 0.62 | -89.9 | | | 47 36.3933 | 122 21.3913 | 224966.6 | 1264681.5 | 224971.2 | 1264694.0 | 4.1 | |
| | 5 | | 1128 | 91.0 | 0.62 | -90.4 | | | 47 36.3913 | 122 21.3930 | 224966.6 | 1264681.5 | 224959.2 | 1264686.8 | 2.8 | |

Charles M. Eaton
Bio-Marine Enterprises
(206) 282-4945
cmeaton@msn.com



## NewFields

;SOFTWARE: Corpscon for Windows 5.11.08

### Elliott Bay DMMP, SPI Stations

### 2013

See file "PSDDA original targets.xy"

**Arranged Alphabetically**

| Station No. | Sample Rep. | Date | GPS Time Start | Meter Block Depth m. | Predicted Nearest Tide m. | Predicted Mudline Depth, m. (MLLW) | Station Target NAD 1983 Degrees Decimal Minutes Latitude | Station Target NAD 1983 Degrees Decimal Minutes Longitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Latitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Longitude | Station Target Wa. State Plane North NAD 83 Northing (y) | Station Target Wa. State Plane North NAD 83 Easting (x) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Northing (y) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Easting (x) | Distance to Target (m.) | GPS Status HDOP good < 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EBS04 | 1 | 16-Sep | 1610 | 79.0 | 3.36 | -75.6 | 47 36.0775 | 122 21.0743 | 47 36.0766 | 122 21.0678 | 223026.0 | 1265959.1 | 223020.0 | 1265985.9 | 8.4 | |
| | 2 | | 1611 | 78.5 | 3.36 | -75.1 | | | 47 36.0734 | 122 21.0704 | 223026.0 | 1265959.1 | 223000.7 | 1265974.8 | 9.1 | 1.9 |
| | 3 | | 1613 | 79.0 | 3.36 | -75.6 | | | 47 36.0759 | 122 21.0729 | 223026.0 | 1265959.1 | 223016.1 | 1265964.8 | 3.5 | |
| | 4 | 17-Sep | 1258 | 77.0 | 1.75 | -75.3 | | | 47 36.0767 | 122 21.0771 | 223026.0 | 1265959.1 | 223021.3 | 1265947.6 | 3.8 | |
| | 5 | | 1259 | 77.0 | 1.76 | -75.2 | | | 47 36.0774 | 122 21.0779 | 223026.0 | 1265959.1 | 223025.7 | 1265944.4 | 4.5 | 1.1 |
| | 6 | | 1259 | 77.0 | 1.76 | -75.2 | | | 47 36.0795 | 122 21.0770 | 223026.0 | 1265959.1 | 223038.4 | 1265948.4 | 5.0 | |
| EBS05 | 1 | 17-Sep | 1425 | 74.0 | 2.83 | -71.2 | 47 35.9142 | 122 21.0027 | 47 35.9138 | 122 21.0023 | 222027.4 | 1266234.2 | 222025.1 | 1266235.6 | 0.8 | |
| | 2 | | 1426 | 73.5 | 2.84 | -70.7 | | | 47 35.9136 | 122 21.0031 | 222027.4 | 1266234.2 | 222024.0 | 1266232.3 | 1.2 | 1.3 |
| | 3 | | 1427 | 74.0 | 2.85 | -71.2 | | | 47 35.9116 | 122 21.0053 | 222027.4 | 1266234.2 | 222012.0 | 1266223.0 | 5.8 | |
| EBS06 | 1 | 16-Sep | 1337 | 69.0 | 2.70 | -66.3 | 47 35.6125 | 122 21.4110 | 47 35.6099 | 122 21.4082 | 220227.0 | 1264519.1 | 220210.9 | 1264530.3 | 6.0 | |
| | 2 | | 1337 | 69.0 | 2.70 | -66.3 | | | 47 35.6130 | 122 21.4116 | 220227.0 | 1264519.1 | 220230.0 | 1264516.7 | 1.2 | 1.1 |
| | 3 | | 1338 | 69.0 | 2.71 | -66.3 | | | 47 35.6154 | 122 21.4105 | 220227.0 | 1264519.1 | 220244.5 | 1264521.5 | 5.4 | |
| EBS07 | 1 | 16-Sep | 1446 | 72.0 | 3.21 | -68.8 | 47 35.6975 | 122 21.7277 | 47 35.6994 | 122 21.7275 | 220769.4 | 1263227.4 | 220781.0 | 1263228.3 | 3.5 | |
| | 2 | | 1447 | 72.0 | 3.22 | -68.8 | | | 47 35.7021 | 122 21.7276 | 220769.4 | 1263227.4 | 220797.4 | 1263228.2 | 8.5 | 1.2 |
| | 3 | | 1448 | 72.0 | 3.22 | -68.8 | | | 47 35.7026 | 122 21.7280 | 220769.4 | 1263227.4 | 220800.5 | 1263226.6 | 9.5 | |
| EBS08 | 1 | 17-Sep | 1348 | 72.0 | 2.41 | -69.6 | 47 35.9275 | 122 21.8093 | 47 35.9280 | 122 21.8111 | 222174.1 | 1262919.4 | 222177.3 | 1262912.2 | 2.4 | |
| | 2 | | 1349 | 72.0 | 2.41 | -69.6 | | | 47 35.9273 | 122 21.8091 | 222174.1 | 1262919.4 | 222172.9 | 1262920.3 | 0.5 | 1.1 |
| | 3 | | 1349 | 72.0 | 2.42 | -69.6 | | | 47 35.9273 | 122 21.8074 | 222174.1 | 1262919.4 | 222172.7 | 1262927.3 | 2.5 | |
| EBS09 | 1 | 16-Sep | 1104 | 115.5 | 0.84 | -114.7 | 47 36.4492 | 122 21.7060 | 47 36.4453 | 122 21.7061 | 225336.5 | 1263407.2 | 225313.0 | 1263406.3 | 7.2 | |
| | 2 | | 1105 | 115.0 | 0.85 | -114.2 | | | 47 36.4470 | 122 21.7072 | 225336.5 | 1263407.2 | 225323.4 | 1263402.0 | 4.3 | 1.2 |
| | 3 | | 1106 | 115.0 | 0.86 | -114.1 | | | 47 36.4483 | 122 21.7082 | 225336.5 | 1263407.2 | 225331.4 | 1263398.0 | 3.2 | |
| EBS10 | 1 | 17-Sep | 1313 | 86.5 | 1.95 | -84.6 | 47 36.1832 | 122 21.7847 | 47 36.1847 | 122 21.7873 | 223726.1 | 1263051.7 | 223735.6 | 1263041.0 | 4.4 | |
| | 2 | | 1313 | 86.5 | 1.96 | -84.5 | | | 47 36.1858 | 122 21.7854 | 223726.1 | 1263051.7 | 223742.1 | 1263049.0 | 5.0 | 1.2 |
| | 3 | | 1314 | 87.0 | 1.97 | -85.0 | | | 47 36.1861 | 122 21.7920 | 223726.1 | 1263051.7 | 223744.5 | 1263021.9 | 10.7 | |
| | 4 | | 1316 | 86.5 | 1.99 | -84.5 | | | 47 36.1816 | 122 21.7865 | 223726.1 | 1263051.7 | 223716.7 | 1263044.0 | 3.7 | |
| EBS11 | 1 | 17-Sep | 1409 | 72.0 | 2.66 | -69.3 | 47 35.7562 | 122 21.1113 | 47 35.7555 | 122 21.1108 | 221075.8 | 1265768.5 | 221071.7 | 1265770.6 | 1.4 | |
| | 2 | | 1410 | 72.0 | 2.67 | -69.3 | | | 47 35.7544 | 122 21.1109 | 221075.8 | 1265768.5 | 221065.1 | 1265770.0 | 3.3 | 1.2 |
| | 3 | | 1411 | 72.0 | 2.68 | -69.3 | | | 47 35.7534 | 122 21.1116 | 221075.8 | 1265768.5 | 221059.0 | 1265767.0 | 5.1 | |
| EBS12 | 1 | 17-Sep | 1204 | 77.5 | 1.03 | -76.5 | 47 36.1992 | 122 21.1713 | 47 36.1970 | 122 21.1731 | 223773.4 | 1265574.9 | 223760.3 | 1265567.4 | 4.6 | |
| | 2 | | 1205 | 77.5 | 1.04 | -76.5 | | | 47 36.1959 | 122 21.1724 | 223773.4 | 1265574.9 | 223753.6 | 1265570.2 | 6.2 | 1.4 |
| | 3 | | 1206 | 77.5 | 1.06 | -76.4 | | | 47 36.1969 | 122 21.1688 | 223773.4 | 1265574.9 | 223759.4 | 1265585.1 | 5.3 | |
| | 4 | | 1206 | 77.5 | 1.06 | -76.4 | | | 47 36.1971 | 122 21.1660 | 223773.4 | 1265574.9 | 223760.4 | 1265596.6 | 7.7 | |
| EBS13 | 1 | 16-Sep | 1404 | 63.5 | 2.94 | -60.6 | 47 35.6322 | 122 21.8323 | 47 35.6316 | 122 21.8316 | 220380.9 | 1262789.1 | 220377.4 | 1262792.1 | 1.4 | |
| | 2 | | 1405 | 63.5 | 2.95 | -60.6 | | | 47 35.6324 | 122 21.8305 | 220380.9 | 1262789.1 | 220382.1 | 1262796.7 | 2.3 | 1.2 |
| | 3 | | 1406 | 63.5 | 2.95 | -60.6 | | | 47 35.6344 | 122 21.8307 | 220380.9 | 1262789.1 | 220394.3 | 1262796.1 | 4.6 | |
| EBS14 | 1 | 16-Sep | 1344 | 73.0 | 2.77 | -70.2 | 47 35.6862 | 122 21.3663 | 47 35.6857 | 122 21.3666 | 220671.1 | 1264711.6 | 220668.3 | 1264710.5 | 0.9 | |
| | 2 | | 1344 | 73.0 | 2.77 | -70.2 | | | 47 35.6891 | 122 21.3653 | 220671.1 | 1264711.6 | 220688.8 | 1264716.2 | 5.6 | 1.0 |
| | 3 | | 1345 | 73.0 | 2.78 | -70.2 | | | 47 35.6884 | 122 21.3612 | 220671.1 | 1264711.6 | 220684.2 | 1264733.0 | 7.7 | |
| EBS15 | 1 | 16-Sep | 1148 | 75.0 | 1.37 | -73.6 | 47 35.7992 | 122 21.5963 | 47 35.7979 | 122 21.6013 | 221376.7 | 1263779.6 | 221369.4 | 1263759.0 | 6.7 | |
| | 2 | | 1149 | 75.0 | 1.39 | -73.6 | | | 47 35.7971 | 122 21.6011 | 221376.7 | 1263779.6 | 221364.5 | 1263759.7 | 7.1 | 1.2 |
| | 3 | | 1149 | 75.0 | 1.39 | -73.6 | | | 47 35.8011 | 122 21.6005 | 221376.7 | 1263779.6 | 221388.8 | 1263762.7 | 6.3 | |
| EBS16 | 1 | 17-Sep | 1403 | 78.0 | 2.59 | -75.4 | 47 35.8522 | 122 21.1903 | 47 35.8494 | 122 21.1908 | 221665.8 | 1265455.2 | 221649.0 | 1265452.9 | 5.2 | |
| | 2 | | 1404 | 78.0 | 2.60 | -75.4 | | | 47 35.8494 | 122 21.1926 | 221665.8 | 1265455.2 | 221649.1 | 1265445.5 | 5.9 | 1.2 |
| | 3 | | 1404 | 78.0 | 2.60 | -75.4 | | | 47 35.8498 | 122 21.1896 | 221665.8 | 1265455.2 | 221651.3 | 1265457.9 | 4.5 | |

Charles M. Eaton
Bio-Marine Enterprises
(206) 282-4945
cmeaton@msn.com



## NewFields

;SOFTWARE: Corpscon for Windows 5.11.08

### Elliott Bay DMMP, SPI Stations

### 2013

See file "PSDDA original targets.xy"

**Arranged Alphabetically**

| Station No. | Sample Rep. | Date | GPS Time Start | Meter Block Depth m. | Predicted Nearest Tide m. | Predicted Mudline Depth, m. (MLLW) | Station Target NAD 1983 Degrees Decimal Minutes Latitude | Station Target NAD 1983 Degrees Decimal Minutes Longitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Latitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Longitude | Station Target Wa. State Plane North NAD 83 Northing (y) | Station Target Wa. State Plane North NAD 83 Easting (x) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Northing (y) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Easting (x) | Distance to Target (m.) | GPS Status HDOP good < 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EBS17 | 1 | 17-Sep | 1432 | 76.0 | 2.90 | -73.1 | 47 35.9342 | 122 21.0693 | 47 35.9347 | 122 21.0671 | 222154.4 | 1265962.5 | 222157.4 | 1265971.7 | 3.0 | |
| | 2 | | 1433 | 76.0 | 2.91 | -73.1 | | | 47 35.9336 | 122 21.0687 | 222154.4 | 1265962.5 | 222150.9 | 1265965.0 | 1.3 | 1.3 |
| | 3 | | 1434 | 76.0 | 2.91 | -73.1 | | | 47 35.9323 | 122 21.0699 | 222154.4 | 1265962.5 | 222143.1 | 1265959.9 | 3.5 | |
| EBS18 | 1 | 16-Sep | 1647 | 76.5 | 3.27 | -73.2 | 47 36.1492 | 122 20.9913 | 47 36.1525 | 122 20.9965 | 223454.9 | 1266308.9 | 223475.5 | 1266288.1 | 8.9 | |
| | 2 | | 1648 | 76.5 | 3.26 | -73.2 | | | 47 36.1480 | 122 20.9931 | 223454.9 | 1266308.9 | 223447.9 | 1266301.5 | 3.1 | 1.0 |
| | 3 | | 1649 | 76.5 | 3.26 | -73.2 | | | 47 36.1449 | 122 20.9951 | 223454.9 | 1266308.9 | 223429.2 | 1266292.9 | 9.2 | |
| | 4 | | 1650 | 76.5 | 3.26 | -73.2 | | | 47 36.1475 | 122 20.9997 | 223454.9 | 1266308.9 | 223445.4 | 1266274.3 | 10.9 | |
| | 5 | 17-Sep | 1215 | 74.5 | 1.16 | -73.3 | | | 47 36.1464 | 122 20.9914 | 223454.9 | 1266308.9 | 223438.0 | 1266308.3 | 5.1 | |
| | 6 | | 1215 | 74.5 | 1.17 | -73.3 | | | 47 36.1478 | 122 20.9950 | 223454.9 | 1266308.9 | 223446.8 | 1266293.7 | 5.2 | 1.1 |
| | 7 | | 1216 | 74.5 | 1.18 | -73.3 | | | 47 36.1482 | 122 20.9933 | 223454.9 | 1266308.9 | 223449.1 | 1266300.7 | 3.0 | |
| EBS19 | 1 | 17-Sep | 1151 | 77.5 | 0.87 | -76.6 | 47 36.2952 | 122 21.1363 | 47 36.2973 | 122 21.1388 | 224354.0 | 1265730.3 | 224367.2 | 1265720.5 | 5.0 | |
| | 2 | | 1152 | 77.0 | 0.88 | -76.1 | | | 47 36.2945 | 122 21.1377 | 224354.0 | 1265730.3 | 224350.1 | 1265724.6 | 2.1 | 1.4 |
| | 3 | | 1153 | 77.0 | 0.88 | -76.1 | | | 47 36.2945 | 122 21.1377 | 224354.0 | 1265730.3 | 224350.1 | 1265724.6 | 2.1 | |
| EBS20 | 1 | 17-Sep | 1305 | 88.5 | 1.84 | -86.7 | 47 36.1032 | 122 21.3413 | 47 36.1035 | 122 21.3401 | 223203.7 | 1264864.6 | 223205.6 | 1264869.7 | 1.7 | |
| | 2 | | 1306 | 88.5 | 1.85 | -86.7 | | | 47 36.1035 | 122 21.3407 | 223203.7 | 1264864.6 | 223205.6 | 1264867.2 | 1.0 | 1.2 |
| | 3 | | 1306 | 88.5 | 1.86 | -86.6 | | | 47 36.1055 | 122 21.3442 | 223203.7 | 1264864.6 | 223218.1 | 1264853.0 | 5.6 | |
| EBS21 | 1 | 17-Sep | 1337 | 77.5 | 2.27 | -75.2 | 47 35.9462 | 122 21.6993 | 47 35.9481 | 122 21.6979 | 222278.6 | 1263373.9 | 222290.2 | 1263380.0 | 4.0 | |
| | 2 | | 1338 | 77.5 | 2.28 | -75.2 | | | 47 35.9461 | 122 21.6978 | 222278.6 | 1263373.9 | 222278.0 | 1263380.2 | 1.9 | 0.9 |
| | 3 | | 1338 | 78.0 | 2.28 | -75.7 | | | 47 35.9458 | 122 21.6951 | 222278.6 | 1263373.9 | 222276.0 | 1263391.2 | 5.3 | |
| EBS22 | 1 | 17-Sep | 1329 | 78.5 | 2.17 | -76.3 | 47 36.0582 | 122 21.7553 | 47 36.0583 | 122 21.7514 | 222963.9 | 1263157.2 | 222964.4 | 1263173.4 | 4.9 | |
| | 2 | | 1329 | 78.5 | 2.17 | -76.3 | | | 47 36.0588 | 122 21.7543 | 222963.9 | 1263157.2 | 222967.7 | 1263161.5 | 1.7 | 1.1 |
| | 3 | | 1330 | 78.0 | 2.18 | -75.8 | | | 47 36.0586 | 122 21.7552 | 222963.9 | 1263157.2 | 222966.5 | 1263157.8 | 0.8 | |
| EBS23 | 1 | 16-Sep | 1058 | 110.5 | 0.76 | -109.7 | 47 36.3862 | 122 21.6713 | 47 36.3816 | 122 21.6679 | 224950.7 | 1263542.1 | 224922.7 | 1263555.6 | 9.5 | |
| | 2 | | 1058 | 110.0 | 0.77 | -109.2 | | | 47 36.3826 | 122 21.6718 | 224950.7 | 1263542.1 | 224929.1 | 1263539.7 | 6.6 | 1.0 |
| | 3 | | 1059 | 110.0 | 0.78 | -109.2 | | | 47 36.3900 | 122 21.6725 | 224950.7 | 1263542.1 | 224974.1 | 1263537.8 | 7.3 | |
| EBS24 | 1 | 17-Sep | 1047 | 101.5 | 0.26 | -101.2 | 47 36.3902 | 122 21.8523 | 47 36.3921 | 122 21.8526 | 224989.8 | 1262798.5 | 225001.6 | 1262797.7 | 3.6 | |
| | 2 | | 1048 | 102.0 | 0.26 | -101.7 | | | 47 36.3912 | 122 21.8520 | 224989.8 | 1262798.5 | 224996.1 | 1262800.0 | 2.0 | 1.3 |
| | 3 | | 1048 | 102.0 | 0.26 | -101.7 | | | 47 36.3904 | 122 21.8491 | 224989.8 | 1262798.5 | 224991.0 | 1262811.9 | 4.1 | |
| EBS25 | 1 | 16-Sep | 0925 | 112.5 | 0.04 | -112.5 | 47 36.5402 | 122 21.7663 | 47 36.5354 | 122 21.7694 | 225894.5 | 1263170.2 | 225865.8 | 1263157.0 | 9.6 | |
| | 2 | | 0926 | 112.0 | 0.04 | -112.0 | | | 47 36.5406 | 122 21.7674 | 225894.5 | 1263170.2 | 225897.2 | 1263165.8 | 1.6 | 1.1 |
| | 3 | | 0926 | 111.5 | 0.04 | -111.5 | | | 47 36.5436 | 122 21.7727 | 225894.5 | 1263170.2 | 225915.9 | 1263144.4 | 10.2 | |
| | 4 | | 1015 | 113.0 | 0.35 | -112.7 | | | 47 36.5352 | 122 21.7706 | 225894.5 | 1263170.2 | 225864.7 | 1263152.0 | 10.6 | |
| | 5 | | 1016 | 112.5 | 0.36 | -112.1 | | | 47 36.5386 | 122 21.7665 | 225894.5 | 1263170.2 | 225885.0 | 1263169.3 | 2.9 | 0.9 |
| | 6 | | 1017 | 112.0 | 0.37 | -111.6 | | | 47 36.5406 | 122 21.7655 | 225894.5 | 1263170.2 | 225897.1 | 1263173.7 | 1.3 | |
| EBS27 | 1 | 17-Sep | 1322 | 83.5 | 2.07 | -81.4 | 47 36.1502 | 122 21.8413 | 47 36.1522 | 122 21.8404 | 223530.1 | 1262814.7 | 223542.4 | 1262818.8 | 3.9 | |
| | 2 | | 1323 | 83.5 | 2.09 | -81.4 | | | 47 36.1528 | 122 21.8402 | 223530.1 | 1262814.7 | 223546.0 | 1262819.7 | 5.1 | 1.1 |
| | 3 | | 1323 | 83.5 | 2.10 | -81.4 | | | 47 36.1512 | 122 21.8409 | 223530.1 | 1262814.7 | 223536.4 | 1262816.7 | 2.0 | |
| EBS28 | 1 | 16-Sep | 1555 | 85.0 | 3.37 | -81.6 | 47 36.0422 | 122 21.2263 | 47 36.0384 | 122 21.2283 | 222823.6 | 1265330.0 | 222800.8 | 1265321.5 | 7.4 | |
| | 2 | | 1555 | 85.0 | 3.37 | -81.6 | | | 47 36.0392 | 122 21.2213 | 222823.6 | 1265330.0 | 222805.1 | 1265350.3 | 8.4 | 1.5 |
| | 3 | | 1556 | 85.0 | 3.37 | -81.6 | | | 47 36.0402 | 122 21.2263 | 222823.6 | 1265330.0 | 222811.6 | 1265329.9 | 3.6 | |
| EBS29 | 1 | 17-Sep | 1354 | 67.0 | 2.48 | -64.5 | 47 35.8062 | 122 21.7953 | 47 35.8093 | 122 21.7978 | 221435.5 | 1262962.3 | 221454.7 | 1262952.5 | 6.6 | |
| | 2 | | 1355 | 67.0 | 2.48 | -64.5 | | | 47 35.8075 | 122 21.7966 | 221435.5 | 1262962.3 | 221443.7 | 1262957.2 | 2.9 | 1.1 |
| | 3 | | 1355 | 67.0 | 2.49 | -64.5 | | | 47 35.8055 | 122 21.7965 | 221435.5 | 1262962.3 | 221431.5 | 1262957.4 | 1.9 | |

Charles M. Eaton
Bio-Marine Enterprises
(206) 282-4945
cmeaton@msn.com



## NewFields

;SOFTWARE: Corpscon for Windows 5.11.08

### Elliott Bay DMMP, SPI Stations

### 2013

See file "PSDDA original targets.xy"

**Arranged Alphabetically**

| Station No. | Sample Rep. | Date | GPS Time Start | Meter Block Depth m. | Predicted Nearest Tide m. | Predicted Mudline Depth, m. (MLLW) | Station Target NAD 1983 Degrees Decimal Minutes Latitude | Station Target NAD 1983 Degrees Decimal Minutes Longitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Latitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Longitude | Station Target Wa. State Plane North NAD 83 Northing (y) | Station Target Wa. State Plane North NAD 83 Easting (x) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Northing (y) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Easting (x) | Distance to Target (m.) | GPS Status HDOP good < 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EBS30 | 1 | 17-Sep | 1511 | 62.0 | 3.22 | -58.8 | 47 35.5950 | 122 21.1120 | 47 35.5976 | 122 21.1163 | 220096.3 | 1265746.4 | 220112.4 | 1265729.0 | 7.2 | |
| | 2 | | 1512 | 62.0 | 3.22 | -58.8 | | | 47 35.5962 | 122 21.1147 | 220096.3 | 1265746.4 | 220103.8 | 1265735.4 | 4.0 | 1.0 |
| | 3 | | 1512 | 62.0 | 3.22 | -58.8 | | | 47 35.5936 | 122 21.1138 | 220096.3 | 1265746.4 | 220087.9 | 1265738.8 | 3.4 | |
| | 4 | | 1514 | 62.0 | 3.23 | -58.8 | | | 47 35.5923 | 122 21.1124 | 220096.3 | 1265746.4 | 220079.9 | 1265744.4 | 5.0 | |
| EBS31 | 1 | 17-Sep | 1525 | 64.5 | 3.30 | -61.2 | 47 35.5520 | 122 21.6550 | 47 35.5554 | 122 21.6594 | 219879.1 | 1263508.6 | 219900.1 | 1263490.9 | 8.4 | |
| | 2 | | 1526 | 64.5 | 3.30 | -61.2 | | | 47 35.5557 | 122 21.6583 | 219879.1 | 1263508.6 | 219901.9 | 1263495.4 | 8.0 | 1.0 |
| | 3 | | 1526 | 64.5 | 3.31 | -61.2 | | | 47 35.5543 | 122 21.6514 | 219879.1 | 1263508.6 | 219892.8 | 1263523.6 | 6.2 | |
| EBS32 | 1 | 17-Sep | 1534 | 65.0 | 3.34 | -61.7 | 47 35.8430 | 122 21.9380 | 47 35.8423 | 122 21.9408 | 221671.0 | 1262380.2 | 221667.0 | 1262368.6 | 3.7 | |
| | 2 | | 1534 | 65.0 | 3.35 | -61.7 | | | 47 35.8412 | 122 21.9419 | 221671.0 | 1262380.2 | 221660.4 | 1262363.9 | 5.9 | 1.0 |
| | 3 | | 1535 | 65.0 | 3.35 | -61.7 | | | 47 35.8417 | 122 21.9424 | 221671.0 | 1262380.2 | 221663.5 | 1262361.9 | 6.0 | |
| EBS33 | 1 | 17-Sep | 1541 | 71.5 | 3.38 | -68.1 | 47 36.0580 | 122 21.9410 | 47 36.0580 | 122 21.9393 | 222978.1 | 1262393.9 | 222977.9 | 1262400.9 | 2.1 | |
| | 2 | | 1542 | 71.5 | 3.38 | -68.1 | | | 47 36.0599 | 122 21.9414 | 222978.1 | 1262393.9 | 222989.7 | 1262392.5 | 3.6 | 1.2 |
| | 3 | | 1542 | 71.5 | 3.38 | -68.1 | | | 47 36.0610 | 122 21.9409 | 222978.1 | 1262393.9 | 222996.3 | 1262394.6 | 5.6 | |
| EBS34 | 1 | 17-Sep | 1548 | 76.0 | 3.40 | -72.6 | 47 36.2510 | 122 21.9450 | 47 36.2524 | 122 21.9460 | 224151.5 | 1262400.8 | 224160.1 | 1262396.8 | 2.9 | |
| | 2 | | 1549 | 76.0 | 3.41 | -72.6 | | | 47 36.2501 | 122 21.9478 | 224151.5 | 1262400.8 | 224146.3 | 1262389.2 | 3.9 | 1.5 |
| | 3 | | 1550 | 76.0 | 3.41 | -72.6 | | | 47 36.2487 | 122 21.9471 | 224151.5 | 1262400.8 | 224137.7 | 1262391.9 | 5.0 | |
| EBS35 | 1 | 17-Sep | 1556 | 92.0 | 3.43 | -88.6 | 47 36.2730 | 122 21.8490 | 47 36.2768 | 122 21.8532 | 224277.4 | 1262798.1 | 224300.8 | 1262781.3 | 8.8 | |
| | 2 | | 1557 | 92.0 | 3.43 | -88.6 | | | 47 36.2674 | 122 21.8475 | 224277.4 | 1262798.1 | 224243.2 | 1262803.6 | 10.5 | 2.0 |
| | 3 | | 1557 | 92.5 | 3.43 | -89.1 | | | 47 36.2677 | 122 21.8470 | 224277.4 | 1262798.1 | 224245.0 | 1262805.7 | 10.1 | |
| | 4 | | 1558 | 92.5 | 3.43 | -89.1 | | | 47 36.2688 | 122 21.8476 | 224277.4 | 1262798.1 | 224251.7 | 1262803.3 | 8.0 | |
| EBS36 | 1 | 17-Sep | 1631 | 98.0 | 3.47 | -94.5 | 47 36.4530 | 122 21.9640 | 47 36.4499 | 122 21.9647 | 225380.9 | 1262347.1 | 225362.1 | 1262343.9 | 5.8 | |
| | 2 | | 1632 | 97.0 | 3.47 | -93.5 | | | 47 36.4523 | 122 21.9659 | 225380.9 | 1262347.1 | 225376.8 | 1262339.2 | 2.7 | 1.2 |
| | 3 | | 1632 | 98.0 | 3.47 | -94.5 | | | 47 36.4558 | 122 21.9660 | 225380.9 | 1262347.1 | 225398.0 | 1262339.3 | 5.8 | |
| | 4 | | 1719 | 98.0 | 3.37 | -94.6 | | | 47 36.4532 | 122 21.9653 | 225380.9 | 1262347.1 | 225382.2 | 1262341.8 | 1.7 | |
| | 5 | | 1719 | 98.0 | 3.36 | -94.6 | | | 47 36.4548 | 122 21.9624 | 225380.9 | 1262347.1 | 225391.7 | 1262353.9 | 3.9 | 0.9 |
| | 6 | | 1720 | 99.0 | 3.36 | -95.6 | | | 47 36.4562 | 122 21.9609 | 225380.9 | 1262347.1 | 225400.0 | 1262360.3 | 7.1 | |
| EBS37 | 1 | 17-Sep | 1644 | 96.0 | 3.46 | -92.5 | 47 36.4880 | 122 21.5280 | 47 36.4896 | 122 21.5298 | 225558.0 | 1264143.5 | 225567.8 | 1264136.3 | 3.7 | |
| | 2 | | 1645 | 96.0 | 3.46 | -92.5 | | | 47 36.4894 | 122 21.5295 | 225558.0 | 1264143.5 | 225566.6 | 1264137.5 | 3.2 | 0.9 |
| | 3 | | 1646 | 96.0 | 3.46 | -92.5 | | | 47 36.4878 | 122 21.5280 | 225558.0 | 1264143.5 | 225556.8 | 1264143.5 | 0.4 | |
| | 4 | | 1703 | 96.5 | 3.42 | -93.1 | | | 47 36.4876 | 122 21.5288 | 225558.0 | 1264143.5 | 225555.6 | 1264140.2 | 1.2 | |
| | 5 | | 1704 | 96.5 | 3.42 | -93.1 | | | 47 36.4882 | 122 21.5268 | 225558.0 | 1264143.5 | 225559.1 | 1264148.5 | 1.5 | 0.9 |
| | 6 | | 1704 | 96.0 | 3.42 | -92.6 | | | 47 36.4911 | 122 21.5247 | 225558.0 | 1264143.5 | 225576.5 | 1264157.5 | 7.1 | |
| EBT01 | 1 | 17-Sep | 0945 | 132.5 | 0.03 | -132.5 | 47 36.5692 | 122 22.1077 | 47 36.5708 | 122 22.1128 | 226098.7 | 1261770.7 | 226109.1 | 1261749.8 | 7.1 | |
| | 2 | | 0946 | 132.5 | 0.03 | -132.5 | | | 47 36.5692 | 122 22.1097 | 226098.7 | 1261770.7 | 226099.1 | 1261762.3 | 2.5 | 0.8 |
| | 3 | | 0947 | 132.5 | 0.03 | -132.5 | | | 47 36.5692 | 122 22.1083 | 226098.7 | 1261770.7 | 226099.0 | 1261768.1 | 0.8 | |
| EBT02 | 1 | 17-Sep | 0938 | 133.0 | 0.02 | -133.0 | 47 36.5842 | 122 22.2110 | 47 36.5853 | 122 22.2186 | 226198.4 | 1261347.8 | 226205.9 | 1261316.7 | 9.8 | |
| | 2 | | 0939 | 133.0 | 0.02 | -133.0 | | | 47 36.5860 | 122 22.2155 | 226198.4 | 1261347.8 | 226209.9 | 1261329.5 | 6.6 | 0.8 |
| | 3 | | 0940 | 133.0 | 0.02 | -133.0 | | | 47 36.5854 | 122 22.2132 | 226198.4 | 1261347.8 | 226206.0 | 1261338.9 | 3.6 | |
| EBT03 | 1 | 17-Sep | 0931 | 133.0 | 0.03 | -133.0 | 47 36.5975 | 122 22.3160 | 47 36.5970 | 122 22.3167 | 226288.0 | 1260917.8 | 226285.0 | 1260914.9 | 1.3 | |
| | 2 | | 0932 | 133.0 | 0.03 | -133.0 | | | 47 36.5976 | 122 22.3150 | 226288.0 | 1260917.8 | 226288.6 | 1260921.9 | 1.3 | 0.9 |
| | 3 | | 0933 | 133.5 | 0.03 | -133.5 | | | 47 36.5979 | 122 22.3130 | 226288.0 | 1260917.8 | 226290.2 | 1260930.2 | 3.8 | |
| EBT04 | 1 | 17-Sep | 0924 | 135.0 | 0.04 | -135.0 | 47 36.6092 | 122 22.4243 | 47 36.6101 | 122 22.4266 | 226367.8 | 1260473.9 | 226373.7 | 1260464.7 | 3.3 | |
| | 2 | | 0925 | 134.5 | 0.04 | -134.5 | | | 47 36.6099 | 122 22.4236 | 226367.8 | 1260473.9 | 226372.2 | 1260477.0 | 1.6 | 0.9 |
| | 3 | | 0926 | 134.5 | 0.04 | -134.5 | | | 47 36.6102 | 122 22.4204 | 226367.8 | 1260473.9 | 226373.8 | 1260490.2 | 5.3 | |

Charles M. Eaton
Bio-Marine Enterprises
(206) 282-4945
cmeaton@msn.com



## NewFields

;SOFTWARE: Corpscon for Windows 5.11.08

### Elliott Bay DMMP, SPI Stations

### 2013

See file "PSDDA original targets.xy"

**Arranged Alphabetically**

| Station No. | Sample Rep. | Date | GPS Time Start | Meter Block Depth m. | Predicted Nearest Tide m. | Predicted Mudline Depth, m. (MLLW) | Station Target NAD 1983 Degrees Decimal Minutes Latitude | Station Target NAD 1983 Degrees Decimal Minutes Longitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Latitude | Sample Location DGPS, Trimble NT300D Degrees Decimal Minutes Longitude | Station Target Wa. State Plane North NAD 83 Northing (y) | Station Target Wa. State Plane North NAD 83 Easting (x) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Northing (y) | Sample Location DGPS, Trimble NT300D NAD 1983, Wash. North Easting (x) | Distance to Target (m.) | GPS Status HDOP good < 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EBT05 | 1 | 17-Sep | 0917 | 138.0 | 0.06 | -137.9 | 47 36.6208 | 122 22.5260 | 47 36.6212 | 122 22.5227 | 226447.1 | 1260057.5 | 226449.1 | 1260071.1 | 4.2 | |
| | 2 | | 0917 | 137.5 | 0.06 | -137.4 | | | 47 36.6216 | 122 22.5230 | 226447.1 | 1260057.5 | 226451.5 | 1260069.9 | 4.0 | 1.0 |
| | 3 | | 0918 | 138.0 | 0.06 | -137.9 | | | 47 36.6218 | 122 22.5285 | 226447.1 | 1260057.5 | 226453.2 | 1260047.3 | 3.6 | |
| EBT07 | 1 | 17-Sep | 1032 | 130.0 | 0.16 | -129.8 | 47 36.6275 | 122 22.0510 | 47 36.6260 | 122 22.0523 | 226448.6 | 1262010.7 | 226439.6 | 1262005.1 | 3.2 | |
| | 2 | | 1033 | 130.0 | 0.17 | -129.8 | | | 47 36.6265 | 122 22.0496 | 226448.6 | 1262010.7 | 226442.4 | 1262016.3 | 2.6 | 1.0 |
| | 3 | | 1034 | 130.0 | 0.17 | -129.8 | | | 47 36.6276 | 122 22.0494 | 226448.6 | 1262010.7 | 226449.1 | 1262017.3 | 2.0 | |
| EBT08 | 1 | 17-Sep | 1025 | 124.0 | 0.12 | -123.9 | 47 36.6608 | 122 22.1410 | 47 36.6617 | 122 22.1439 | 226658.6 | 1261644.8 | 226664.1 | 1261633.0 | 4.0 | |
| | 2 | | 1025 | 124.0 | 0.13 | -123.9 | | | 47 36.6618 | 122 22.1432 | 226658.6 | 1261644.8 | 226664.7 | 1261635.9 | 3.3 | 0.9 |
| | 3 | | 1026 | 124.0 | 0.13 | -123.9 | | | 47 36.6608 | 122 22.1389 | 226658.6 | 1261644.8 | 226658.2 | 1261653.4 | 2.6 | |
| EBT09 | 1 | 17-Sep | 1017 | 130.5 | 0.09 | -130.4 | 47 36.6925 | 122 22.2377 | 47 36.6921 | 122 22.2370 | 226859.0 | 1261251.3 | 226856.5 | 1261254.0 | 1.1 | |
| | 2 | | 1018 | 130.5 | 0.09 | -130.4 | | | 47 36.6922 | 122 22.2368 | 226859.0 | 1261251.3 | 226857.1 | 1261254.8 | 1.2 | 1.0 |
| | 3 | | 1018 | 130.5 | 0.09 | -130.4 | | | 47 36.6928 | 122 22.2380 | 226859.0 | 1261251.3 | 226860.9 | 1261250.0 | 0.7 | |
| EBT10 | 1 | 17-Sep | 1009 | 121.0 | 0.06 | -120.9 | 47 36.7275 | 122 22.3327 | 47 36.7280 | 122 22.3363 | 227079.6 | 1260865.1 | 227082.9 | 1260850.2 | 4.6 | |
| | 2 | | 1010 | 121.0 | 0.07 | -120.9 | | | 47 36.7270 | 122 22.3373 | 227079.6 | 1260865.1 | 227076.9 | 1260846.0 | 5.9 | 0.9 |
| | 3 | | 1011 | 121.0 | 0.07 | -120.9 | | | 47 36.7270 | 122 22.3313 | 227079.6 | 1260865.1 | 227076.4 | 1260870.7 | 1.9 | |
| EBT11 | 1 | 17-Sep | 1000 | 114.0 | 0.04 | -114.0 | 47 36.7608 | 122 22.4360 | 47 36.7590 | 122 22.4432 | 227290.7 | 1260444.4 | 227280.1 | 1260414.6 | 9.6 | |
| | 2 | | 1001 | 114.0 | 0.04 | -114.0 | | | 47 36.7610 | 122 22.4401 | 227290.7 | 1260444.4 | 227292.0 | 1260427.6 | 5.1 | 0.9 |
| | 3 | | 1002 | 114.0 | 0.04 | -114.0 | | | 47 36.7599 | 122 22.4367 | 227290.7 | 1260444.4 | 227285.1 | 1260441.4 | 1.9 | |
| | 4 | | 1002 | 114.0 | 0.04 | -114.0 | | | 47 36.7612 | 122 22.4379 | 227290.7 | 1260444.4 | 227293.1 | 1260436.7 | 2.5 | |
| EBZ01 | 1 | 16-Sep | 1507 | 69.0 | 3.30 | -65.7 | 47 35.9100 | 122 21.4500 | 47 35.9078 | 122 21.4469 | 222038.4 | 1264394.6 | 222024.8 | 1264407.0 | 5.6 | |
| | 2 | | 1508 | 69.0 | 3.30 | -65.7 | | | 47 35.9107 | 122 21.4460 | 222038.4 | 1264394.6 | 222042.3 | 1264411.1 | 5.2 | 1.0 |
| | 3 | | 1508 | 69.0 | 3.30 | -65.7 | | | 47 35.9112 | 122 21.4450 | 222038.4 | 1264394.6 | 222045.3 | 1264415.3 | 6.6 | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | CBB-01 | A | 9/13/13 | 13:22 | 288.70 | 18.8 | 20.26 | 1.46 | 19.66 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBB-01 | B | 9/13/13 | 13:23 | 271.27 | 18.12 | 18.99 | 0.87 | 18.48 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBB-01 | C | 9/13/13 | 13:24 | 220.20 | 13.2 | 17.26 | 4.06 | 15.00 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBB-02 | D | 9/14/13 | 11:48 | over pen | over pen | over pen | over pen | over pen | > 4 phi | 4 to 3 phi | > 4 phi | Indet |
| JB | JSN | CBB-02 | E | 9/14/13 | 11:49 | 297.54 | 19.26 | 21.03 | 1.77 | 20.27 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBB-02 | F | 9/14/13 | 11:50 | 282.69 | 18.6 | 20.47 | 1.87 | 19.26 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBB-03 | A | 9/13/13 | 17:24 | 211.42 | 13.79 | 14.88 | 1.09 | 14.40 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBB-03 | B | 9/13/13 | 17:25 | 260.95 | 17.08 | 19.11 | 2.03 | 17.77 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBB-03 | C | 9/13/13 | 17:25 | 244.40 | 15.88 | 17.59 | 1.71 | 16.65 | > 4 phi | 4 to 3 phi | > 4 phi | Physical |
| JB | JSN | CBC-01 | A | 9/13/13 | 14:33 | 265.46 | 17.42 | 18.65 | 1.23 | 18.08 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBC-01 | B | 9/13/13 | 14:34 | 212.05 | 13.75 | 14.88 | 1.13 | 14.44 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBC-01 | C | 9/13/13 | 14:35 | 251.76 | 16.56 | 18.1 | 1.54 | 17.15 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBC-02 | A | 9/13/13 | 14:23 | 240.75 | 16.24 | 16.74 | 0.5 | 16.40 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBC-02 | B | 9/13/13 | 14:24 | 260.58 | 16.45 | 19.08 | 2.63 | 17.75 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBC-02 | C | 9/13/13 | 14:24 | 242.91 | 15.99 | 16.81 | 0.82 | 16.55 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBC-03 | A | 9/13/13 | 14:13 | 249.24 | 16.33 | 17.38 | 1.05 | 16.98 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBC-03 | B | 9/13/13 | 14:13 | 211.93 | 12.43 | 16.04 | 3.61 | 14.44 | > 4 phi | 3 to 2 phi | > 4 phi | Physical |
| JB | JSN | CBC-03 | C | 9/13/13 | 14:14 | 217.79 | 14.13 | 16.09 | 1.96 | 14.83 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBC-04 | A | 9/13/13 | 14:01 | 94.00 | 5.37 | 6.78 | 1.41 | 6.40 | 4 to 3 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBC-04 | B | 9/13/13 | 14:02 | 106.21 | 5.51 | 8 | 2.49 | 7.23 | 4 to 3 phi | 3 to 2 phi | 4 to 3 phi | Physical |
| JB | JSN | CBC-04 | C | 9/13/13 | 14:03 | 89.37 | 5.67 | 6.77 | 1.1 | 6.09 | 4 to 3 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBC-05 | A | 9/13/13 | 15:13 | 32.43 | 1.56 | 2.81 | 1.25 | 2.21 | 4 to 3 phi | 3 to 2 phi | 3 to 2 phi | Physical |
| JB | JSN | CBC-05 | B | 9/13/13 | 15:14 | 29.61 | 1.7 | 2.41 | 0.71 | 2.02 | 4 to 3 phi | 3 to 2 phi | 3 to 2 phi | Physical |
| JB | JSN | CBC-05 | C | 9/13/13 | 15:15 | 69.35 | 3.99 | 5.36 | 1.37 | 4.72 | 4 to 3 phi | 3 to 2 phi | 3 to 2 phi | Physical |
| JB | JSN | CBC-06 | A | 9/13/13 | 15:23 | 131.99 | 7.41 | 11.66 | 4.25 | 8.99 | 4 to 3 phi | 3 to 2 phi | 4 to 3 phi | Physical |
| JB | JSN | CBC-06 | B | 9/13/13 | 15:24 | 110.33 | 8.78 | 10.61 | 1.83 | 7.52 | 4 to 3 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBC-06 | C | 9/13/13 | 15:25 | 152.42 | 9.62 | 11.11 | 1.49 | 10.38 | 4 to 3 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBC-07 | A | 9/13/13 | 11:31 | 234.64 | 15.13 | 16.79 | 1.66 | 15.98 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBC-07 | B | 9/13/13 | 11:31 | 217.94 | 14.04 | 16.17 | 2.13 | 14.85 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | CBC-07 | C | 9/13/13 | 11:32 | 135.33 | 5.47 | 13.34 | 7.87 | 9.22 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBC-08 | A | 9/13/13 | 11:12 | 68.95 | 3.35 | 5.38 | 2.03 | 4.70 | 4 to 3 phi | 3 to 2 phi | 3 to 2 phi | Physical |
| JB | JSN | CBC-08 | B | 9/13/13 | 11:14 | 60.37 | 3.44 | 4.56 | 1.12 | 4.11 | 4 to 3 phi | 3 to 2 phi | 4 to 3 phi | Physical |
| JB | JSN | CBC-08 | C | 9/13/13 | 11:14 | 92.47 | 5.89 | 6.86 | 0.97 | 6.30 | 4 to 3 phi | 3 to 2 phi | 4 to 3 phi | Physical |
| JB | JSN | CBC-09 | A | 9/13/13 | 10:55 | 113.77 | 7.3 | 8.82 | 1.52 | 7.75 | > 4 phi | 3 to 2 phi | 3 to 2 phi | Biogenic |
| JB | JSN | CBC-09 | B | 9/13/13 | 10:56 | 35.59 | 1.61 | 3.58 | 1.97 | 2.42 | 4 to 3 phi | 3 to 2 phi | 3 to 2 phi | Physical |
| JB | JSN | CBC-09 | C | 9/13/13 | 11:05 | 113.90 | 7.35 | 8.1 | 0.75 | 7.76 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBC-10 | A | 9/13/13 | 10:24 | 115.89 | 6.39 | 8.8 | 2.41 | 7.89 | > 4 phi | 2 to 1 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBC-10 | B | 9/13/13 | 10:25 | 45.42 | 2.38 | 4.38 | 2 | 3.09 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBC-10 | C | 9/13/13 | 10:26 | 115.23 | 7.4 | 8.29 | 0.89 | 7.85 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBC-11 | A | 9/13/13 | 10:16 | 131.48 | 8.3 | 9.51 | 1.21 | 8.96 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBC-11 | B | 9/13/13 | 10:17 | 101.07 | 6.06 | 7.47 | 1.41 | 6.88 | 4 to 3 phi | 2 to 1 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBC-11 | C | 9/13/13 | 10:18 | 111.07 | 7.01 | 7.98 | 0.97 | 7.57 | > 4 phi | 2 to 1 phi | 4 to 3 phi | Physical |
| JB | JSN | CBC-12 | A | 9/13/13 | 9:56 | 254.24 | 16.4 | 18.27 | 1.87 | 17.32 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBC-12 | B | 9/13/13 | 9:56 | 198.24 | 12.82 | 13.93 | 1.11 | 13.50 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBC-12 | C | 9/13/13 | 9:57 | 181.91 | 11.73 | 13.52 | 1.79 | 12.39 | > 4 phi | 4 to 3 phi | > 4 phi | Physical |
| JB | JSN | CBF-01 | A | 9/14/13 | 10:29 | 249.59 | 15.11 | 17.59 | 2.48 | 17.00 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-01 | B | 9/14/13 | 10:30 | 233.95 | 15.56 | 16.4 | 0.84 | 15.94 | > 4 phi | 4 to 3 phi | > 4 phi | Physical |
| JB | JSN | CBF-01 | C | 9/14/13 | 10:31 | 262.98 | 17.04 | 18.56 | 1.52 | 17.91 | > 4 phi | 4 to 3 phi | > 4 phi | Physical |
| JB | JSN | CBF-03 | A | 9/14/13 | 11:09 | 248.80 | 15.5 | 18.08 | 2.58 | 16.95 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-03 | B | 9/14/13 | 11:09 | 242.41 | 15.97 | 17.24 | 1.27 | 16.51 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-03 | C | 9/14/13 | 11:10 | 241.67 | 15.92 | 16.75 | 0.83 | 16.46 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-07 | A | 9/14/13 | 10:59 | 220.57 | 13.07 | 17.59 | 4.52 | 15.02 | > 4 phi | 4 to 3 phi | > 4 phi | Physical |
| JB | JSN | CBF-07 | B | 9/14/13 | 11:00 | 238.47 | 15.41 | 17.63 | 2.22 | 16.24 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-07 | C | 9/14/13 | 11:01 | 262.96 | 16.72 | 18.97 | 2.25 | 17.91 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | CBF-09 | A | 9/14/13 | 10:40 | 245.27 | 14.72 | 17.54 | 2.82 | 16.71 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-09 | B | 9/14/13 | 10:40 | 244.37 | 15.27 | 17.72 | 2.45 | 16.65 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-09 | C | 9/14/13 | 10:41 | 250.55 | 16.31 | 17.84 | 1.53 | 17.07 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-10 | A | 9/14/13 | 10:49 | 254.65 | 16.4 | 18.24 | 1.84 | 17.35 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-10 | B | 9/14/13 | 10:50 | 247.81 | 16.13 | 17.63 | 1.5 | 16.88 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-10 | C | 9/14/13 | 10:51 | 225.70 | 15.15 | 15.81 | 0.66 | 15.37 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-13 | A | 9/14/13 | 10:19 | 217.56 | 13.75 | 16.38 | 2.63 | 14.82 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBF-13 | B | 9/14/13 | 10:20 | 192.75 | 12.46 | 14.25 | 1.79 | 13.13 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-13 | C | 9/14/13 | 10:21 | 156.52 | 10.32 | 11.66 | 1.34 | 10.66 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBF-15 | A | 9/14/13 | 10:10 | 237.74 | 15.47 | 16.6 | 1.13 | 16.19 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-15 | B | 9/14/13 | 10:10 | 226.53 | 14.79 | 15.99 | 1.2 | 15.43 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-15 | C | 9/14/13 | 10:11 | 202.97 | 12.47 | 16.43 | 3.96 | 13.83 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-16 | A | 9/14/13 | 9:47 | 219.70 | 14.47 | 15.91 | 1.44 | 14.96 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-16 | B | 9/14/13 | 9:47 | 236.45 | 15.11 | 16.61 | 1.5 | 16.11 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-16 | C | 9/14/13 | 9:49 | 214.62 | 14.39 | 14.83 | 0.44 | 14.62 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-27 | A | 9/14/13 | 9:28 | 233.75 | 15.34 | 16.24 | 0.9 | 15.92 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-27 | B | 9/14/13 | 9:29 | 196.06 | 12.57 | 14.88 | 2.31 | 13.35 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-27 | C | 9/14/13 | 9:30 | 240.92 | 15.67 | 17.04 | 1.37 | 16.41 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-28 | A | 9/14/13 | 9:37 | 234.02 | 14.11 | 17.77 | 3.66 | 15.94 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-28 | B | 9/14/13 | 9:38 | 224.19 | 15.04 | 15.7 | 0.66 | 15.27 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-28 | C | 9/14/13 | 9:39 | 213.71 | 14.22 | 15.09 | 0.87 | 14.56 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-49 | A | 9/14/13 | 11:32 | 246.08 | 15.9 | 17.51 | 1.61 | 16.76 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-49 | B | 9/14/13 | 11:33 | 237.54 | 16.02 | 16.66 | 0.64 | 16.18 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | CBF-49 | C | 9/14/13 | 11:33 | 215.08 | 14 | 14.99 | 0.99 | 14.65 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-57 | A | 9/14/13 | 14:16 | 240.88 | 15.48 | 17.11 | 1.63 | 16.41 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-57 | B | 9/14/13 | 14:16 | 241.39 | 15.77 | 17.41 | 1.64 | 16.44 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-57 | C | 9/14/13 | 14:17 | 261.19 | 17.17 | 18.4 | 1.23 | 17.79 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-58 | A | 9/14/13 | 14:25 | 221.87 | 14.54 | 16.04 | 1.5 | 15.11 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-58 | B | 9/14/13 | 14:25 | 172.99 | 9.78 | 15.32 | 5.54 | 11.78 | > 4 phi | 4 to 3 phi | > 4 phi | Physical |
| JB | JSN | CBF-58 | C | 9/14/13 | 14:26 | 208.55 | 13.18 | 15.27 | 2.09 | 14.21 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-59 | A | 9/14/13 | 14:35 | 183.85 | 10.68 | 15.47 | 4.79 | 12.52 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-59 | B | 9/14/13 | 14:35 | 237.68 | 15.49 | 17.06 | 1.57 | 16.19 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-59 | C | 9/14/13 | 14:36 | 245.39 | 15.84 | 17.42 | 1.58 | 16.71 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-63 | A | 9/14/13 | 11:22 | 224.27 | 14.88 | 15.68 | 0.8 | 15.28 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-63 | B | 9/14/13 | 11:23 | 271.34 | 17.67 | 19.68 | 2.01 | 18.48 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-63 | C | 9/14/13 | 11:24 | 259.39 | 17.31 | 18.13 | 0.82 | 17.67 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-65 | A | 9/14/13 | 15:12 | 236.59 | 13.7 | 17.85 | 4.15 | 16.12 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-65 | B | 9/14/13 | 15:13 | 252.24 | 16.08 | 17.74 | 1.66 | 17.18 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-65 | C | 9/14/13 | 15:14 | 239.23 | 15.91 | 16.88 | 0.97 | 16.30 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-66 | A | 9/14/13 | 15:22 | 256.31 | 15.45 | 19.01 | 3.56 | 17.46 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-66 | B | 9/14/13 | 15:22 | 237.03 | 15.77 | 16.95 | 1.18 | 16.15 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-66 | C | 9/14/13 | 15:23 | 227.71 | 14.81 | 16.07 | 1.26 | 15.51 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-67 | A | 9/14/13 | 15:41 | 245.78 | 15.52 | 18.31 | 2.79 | 16.74 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-67 | B | 9/14/13 | 15:41 | 226.54 | 14.22 | 15.97 | 1.75 | 15.43 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-67 | C | 9/14/13 | 15:42 | 221.13 | 14.16 | 16.47 | 2.31 | 15.06 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-68 | A | 9/14/13 | 15:50 | 249.98 | 16.04 | 17.42 | 1.38 | 17.03 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-68 | B | 9/14/13 | 15:50 | 260.38 | 16.72 | 18.27 | 1.55 | 17.74 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-68 | C | 9/14/13 | 15:51 | 188.20 | 11.44 | 13.43 | 1.99 | 12.82 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-69 | A | 9/14/13 | 16:08 | 268.35 | 17.15 | 19.06 | 1.91 | 18.28 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-69 | B | 9/14/13 | 16:09 | 206.46 | 13 | 15.13 | 2.13 | 14.06 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-69 | C | 9/14/13 | 16:10 | 226.51 | 13.86 | 16.61 | 2.75 | 15.43 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-70 | A | 9/14/13 | 16:19 | 233.64 | 14.95 | 17.34 | 2.39 | 15.91 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-70 | B | 9/14/13 | 16:19 | 247.11 | 16.07 | 18.49 | 2.42 | 16.83 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-70 | C | 9/14/13 | 16:20 | 235.85 | 13.04 | 17.72 | 4.68 | 16.06 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-76 | A | 9/14/13 | 15:31 | 237.76 | 15.18 | 17.04 | 1.86 | 16.20 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | CBF-76 | B | 9/14/13 | 15:32 | 230.22 | 14.28 | 17.43 | 3.15 | 15.68 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-76 | C | 9/14/13 | 15:32 | 226.85 | 14.59 | 15.97 | 1.38 | 15.45 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-77 | A | 9/14/13 | 15:57 | 242.21 | 15.97 | 16.95 | 0.98 | 16.50 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-77 | B | 9/14/13 | 15:58 | 297.02 | 20.1 | 20.78 | 0.68 | 20.23 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBF-77 | C | 9/14/13 | 15:59 | 258.77 | 17.29 | 18.08 | 0.79 | 17.63 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-01 | A | 9/13/13 | 15:47 | 248.72 | 16.6 | 17.2 | 0.6 | 16.94 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-01 | B | 9/13/13 | 15:48 | 259.03 | 16.97 | 18.74 | 1.77 | 17.64 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-01 | C | 9/13/13 | 15:48 | 250.55 | 16.61 | 17.95 | 1.34 | 17.07 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-02 | A | 9/13/13 | 15:57 | 257.80 | 16.33 | 18.4 | 2.07 | 17.56 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-02 | B | 9/13/13 | 15:58 | 239.87 | 14.97 | 17.99 | 3.02 | 16.34 | > 4 phi | 4 to 3 phi | > 4 phi | Physical |
| JB | JSN | CBP-02 | C | 9/13/13 | 15:59 | 249.80 | 16.22 | 17.72 | 1.5 | 17.02 | > 4 phi | 4 to 3 phi | > 4 phi | Physical |
| JB | JSN | CBP-03 | A | 9/13/13 | 16:50 | 263.80 | 15.33 | 20.49 | 5.16 | 17.97 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-03 | B | 9/13/13 | 16:50 | 225.91 | 13.95 | 16.9 | 2.95 | 15.39 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-03 | C | 9/13/13 | 16:51 | 262.74 | 16.4 | 19.26 | 2.86 | 17.90 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-04 | A | 9/13/13 | 16:40 | 219.62 | 13.54 | 16.13 | 2.59 | 14.96 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-04 | B | 9/13/13 | 16:41 | 228.56 | 14.99 | 16.13 | 1.14 | 15.57 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-04 | C | 9/13/13 | 16:42 | 211.37 | 13.13 | 15.84 | 2.71 | 14.40 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-05 | A | 9/13/13 | 11:40 | 184.53 | 12.09 | 13.07 | 0.98 | 12.57 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-05 | B | 9/13/13 | 11:40 | 187.61 | 11.98 | 13.34 | 1.36 | 12.78 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-05 | C | 9/13/13 | 11:41 | 183.70 | 11.27 | 13.39 | 2.12 | 12.51 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-06 | A | 9/13/13 | 11:51 | 184.41 | 7.07 | 19.01 | 11.94 | 12.56 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-06 | B | 9/13/13 | 11:52 | 256.12 | 16.63 | 18.12 | 1.49 | 17.45 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-06 | C | 9/13/13 | 11:52 | 276.32 | 18.19 | 19.21 | 1.02 | 18.82 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-07 | A | 9/13/13 | 12:04 | 236.99 | 15.38 | 17.17 | 1.79 | 16.14 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-07 | B | 9/13/13 | 12:05 | 236.74 | 15.67 | 16.99 | 1.32 | 16.13 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-07 | C | 9/13/13 | 12:05 | 226.91 | 14.54 | 16.61 | 2.07 | 15.46 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-08 | A | 9/13/13 | 14:43 | 254.60 | 14.95 | 19.47 | 4.52 | 17.34 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-08 | B | 9/13/13 | 14:43 | 219.25 | 12.52 | 16.51 | 3.99 | 14.93 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-08 | C | 9/13/13 | 14:44 | 283.92 | 18.35 | 20.14 | 1.79 | 19.34 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | CBP-09 | A | 9/13/13 | 13:35 | 258.88 | 17.11 | 18.68 | 1.57 | 17.63 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-09 | B | 9/13/13 | 13:36 | 229.10 | 14 | 17.72 | 3.72 | 15.61 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-09 | C | 9/13/13 | 13:37 | 249.23 | 15.15 | 19.26 | 4.11 | 16.98 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-10 | A | 9/13/13 | 13:49 | 260.02 | 17.6 | 17.93 | 0.33 | 17.71 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-10 | B | 9/13/13 | 13:50 | 211.68 | 13.52 | 16.47 | 2.95 | 14.42 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-10 | C | 9/13/13 | 13:51 | 230.72 | 15.36 | 17.22 | 1.86 | 15.72 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-11 | A | 9/13/13 | 9:36 | 255.49 | 17.08 | 17.81 | 0.73 | 17.40 | > 4 phi | 4 to 3 phi | 4 to 3 phi | Biogenic |
| JB | JSN | CBP-11 | B | 9/13/13 | 9:37 | 255.78 | 17.04 | 17.72 | 0.68 | 17.42 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-11 | C | 9/13/13 | 9:37 | 198.81 | 12.45 | 15.58 | 3.13 | 13.54 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-12 | A | 9/13/13 | 15:36 | 251.59 | 16.08 | 17.61 | 1.53 | 17.14 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-12 | B | 9/13/13 | 15:37 | 239.01 | 15.77 | 17.15 | 1.38 | 16.28 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBP-12 | C | 9/13/13 | 15:38 | 226.37 | 13.81 | 17.38 | 3.57 | 15.42 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-01 | A | 9/13/13 | 16:16 | 206.35 | 13.45 | 15.22 | 1.77 | 14.06 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-01 | B | 9/13/13 | 16:16 | 202.37 | 13.2 | 14.52 | 1.32 | 13.78 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-01 | C | 9/13/13 | 16:18 | 198.88 | 13.04 | 14.09 | 1.05 | 13.55 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-02 | A | 9/13/13 | 17:10 | 260.09 | 17.59 | 17.98 | 0.39 | 17.72 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-02 | B | 9/13/13 | 17:10 | 230.11 | 14.86 | 16.02 | 1.16 | 15.67 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-02 | C | 9/13/13 | 17:11 | 230.28 | 15.29 | 17.08 | 1.79 | 15.69 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-03 | A | 9/13/13 | 16:06 | 255.10 | 15.54 | 18.92 | 3.38 | 17.38 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-03 | B | 9/13/13 | 16:07 | 264.16 | 16.95 | 18.92 | 1.97 | 17.99 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-03 | C | 9/13/13 | 16:08 | 199.02 | 14.81 | 12.25 | -2.56 | 13.56 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-04 | A | 9/13/13 | 16:59 | 261.66 | 16.04 | 18.58 | 2.54 | 17.82 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-04 | B | 9/13/13 | 16:59 | 263.50 | 17.51 | 18.31 | 0.8 | 17.95 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-04 | C | 9/13/13 | 17:00 | 258.10 | 16.65 | 18.63 | 1.98 | 17.58 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-05 | A | 9/13/13 | 11:22 | 162.57 | 9.73 | 12.78 | 3.05 | 11.07 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-05 | B | 9/13/13 | 11:23 | 162.21 | 10.32 | 11.8 | 1.48 | 11.05 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-05 | C | 9/13/13 | 11:23 | 163.37 | 8.19 | 12.16 | 3.97 | 11.13 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | CBS-06 | A | 9/14/13 | 8:50 | 216.92 | 13.34 | 15.99 | 2.65 | 14.78 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-06 | B | 9/14/13 | 8:51 | 145.20 | 8.87 | 13.16 | 4.29 | 9.89 | > 4 phi | 3 to 2 phi | > 4 phi | Physical |
| JB | JSN | CBS-06 | C | 9/14/13 | 8:51 | 219.65 | 13.17 | 15.82 | 2.65 | 14.96 | > 4 phi | 4 to 3 phi | > 4 phi | Physical |
| JB | JSN | CBS-07 | A | 9/14/13 | 8:38 | 298.87 | 20.05 | 20.51 | 0.46 | 20.36 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-07 | B | 9/14/13 | 8:39 | 265.78 | 17.01 | 18.89 | 1.88 | 18.10 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-07 | C | 9/14/13 | 8:40 | 233.02 | 12.54 | 17.17 | 4.63 | 15.87 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-08 | A | 9/13/13 | 10:04 | 246.84 | 15.58 | 18.15 | 2.57 | 16.81 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-08 | B | 9/13/13 | 10:05 | 163.26 | 9.93 | 11.98 | 2.05 | 11.12 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-08 | C | 9/13/13 | 10:06 | 227.94 | 15.25 | 15.99 | 0.74 | 15.53 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-20 | A | 9/14/13 | 8:59 | 206.26 | 12.27 | 15.59 | 3.32 | 14.05 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-20 | B | 9/14/13 | 8:59 | 201.49 | 12.84 | 14.81 | 1.97 | 13.72 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-20 | C | 9/14/13 | 9:00 | 213.29 | 14.29 | 14.99 | 0.7 | 14.53 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-21 | A | 9/14/13 | 9:10 | 218.16 | 13.77 | 15.95 | 2.18 | 14.86 | > 4 phi | 4 to 3 phi | > 4 phi | Physical |
| JB | JSN | CBS-21 | B | 9/14/13 | 9:10 | 212.57 | 12.32 | 15.63 | 3.31 | 14.48 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBS-21 | C | 9/14/13 | 9:11 | 202.19 | 10.89 | 14.73 | 3.84 | 13.77 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-01 | A | 9/14/13 | 13:54 | 300.13 | 19.51 | 20.97 | 1.46 | 20.44 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-01 | B | 9/14/13 | 13:55 | 227.81 | 15.29 | 15.75 | 0.46 | 15.52 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-01 | C | 9/14/13 | 13:56 | 253.32 | 15.58 | 18.54 | 2.96 | 17.25 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-02 | A | 9/14/13 | 13:46 | 243.86 | 16.06 | 17.74 | 1.68 | 16.61 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-02 | B | 9/14/13 | 13:46 | 237.68 | 14.95 | 17.45 | 2.5 | 16.19 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-02 | C | 9/14/13 | 13:47 | 249.81 | 16.2 | 17.81 | 1.61 | 17.02 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-03 | A | 9/14/13 | 13:38 | 190.93 | 12 | 14.52 | 2.52 | 13.01 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-03 | B | 9/14/13 | 13:39 | 199.41 | 11.82 | 15.25 | 3.43 | 13.58 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-03 | C | 9/14/13 | 13:39 | 231.58 | 13.18 | 16.61 | 3.43 | 15.77 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-07 | A | 9/14/13 | 13:16 | 275.99 | 17.21 | 19.24 | 2.03 | 18.80 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-07 | B | 9/14/13 | 13:17 | 186.83 | 11.43 | 14.4 | 2.97 | 12.73 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-07 | C | 9/14/13 | 13:18 | 262.31 | 16.2 | 18.36 | 2.16 | 17.87 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-08 | A | 9/14/13 | 13:26 | 263.29 | 17.79 | 18.63 | 0.84 | 17.93 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-08 | B | 9/14/13 | 13:27 | 227.84 | 14.7 | 17.19 | 2.49 | 15.52 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-08 | C | 9/14/13 | 13:28 | 242.07 | 16.07 | 17.25 | 1.18 | 16.49 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | CBT-13 | A | 9/14/13 | 12:55 | 263.96 | 16.17 | 19.08 | 2.91 | 17.98 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-13 | B | 9/14/13 | 12:55 | 255.24 | 15.13 | 19.67 | 4.54 | 17.39 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-13 | C | 9/14/13 | 12:56 | 208.56 | 12.95 | 16.47 | 3.52 | 14.21 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-14 | A | 9/14/13 | 13:05 | 225.68 | 14.41 | 17.04 | 2.63 | 15.37 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-14 | B | 9/14/13 | 13:06 | 235.23 | 14.43 | 16.86 | 2.43 | 16.02 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBT-14 | C | 9/14/13 | 13:06 | 255.54 | 17.13 | 18.06 | 0.93 | 17.41 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | CBZ-01 | A | 9/13/13 | 10:32 | 38.85 | 1.81 | 3.3 | 1.49 | 2.65 | > 4 phi | 3 to 2 phi | 3 to 2 phi | Physical |
| JB | JSN | CBZ-01 | B | 9/13/13 | 10:33 | 48.21 | 2.66 | 3.77 | 1.11 | 3.28 | 4 to 3 phi | 3 to 2 phi | 3 to 2 phi | Physical |
| JB | JSN | CBZ-01 | C | 9/13/13 | 10:34 | 14.28 | 0.49 | 1.46 | 0.97 | 0.97 | 4 to 3 phi | 2 to 1 phi | 3 to 2 phi | Indet |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | CBB-01 | A | 9/13/13 | 13:22 | 77.22 | 3.15 | 7.15 | 5.26 | FALSE | FALSE | | | |
| JB | JSN | CBB-01 | B | 9/13/13 | 13:23 | 74 | 4.42 | 8.33 | 5.04 | FALSE | TRUE | 3 | 1.61 | Oxidized |
| JB | JSN | CBB-01 | C | 9/13/13 | 13:24 | 62.52 | 1.97 | 6.45 | 4.26 | FALSE | FALSE | | | |
| JB | JSN | CBB-02 | D | 9/14/13 | 11:48 | indet | indet | indet | indet | FALSE | | | | |
| JB | JSN | CBB-02 | E | 9/14/13 | 11:49 | indet | indet | indet | indet | FALSE | | | | |
| JB | JSN | CBB-02 | F | 9/14/13 | 11:50 | 53.93 | 1.90 | 5.45 | 3.67 | FALSE | FALSE | | | |
| JB | JSN | CBB-03 | A | 9/13/13 | 17:24 | 41.4 | 0.57 | 6.42 | 2.82 | FALSE | TRUE | 2 | 0.56 | Oxidized |
| JB | JSN | CBB-03 | B | 9/13/13 | 17:25 | 62.87 | 1.90 | 7.06 | 4.28 | FALSE | TRUE | 3 | 1.15 | Reduced |
| JB | JSN | CBB-03 | C | 9/13/13 | 17:25 | 63.26 | 3.40 | 6.67 | 4.31 | FALSE | TRUE | 2 | 1.79 | Reduced |
| JB | JSN | CBC-01 | A | 9/13/13 | 14:33 | 68.74 | 0.63 | 7.87 | 4.68 | FALSE | FALSE | | | |
| JB | JSN | CBC-01 | B | 9/13/13 | 14:34 | 38.8 | 0.81 | 4.60 | 2.64 | FALSE | TRUE | 2 | 1.16 | Reduced |
| JB | JSN | CBC-01 | C | 9/13/13 | 14:35 | 47.95 | 1.66 | 4.58 | 3.27 | FALSE | FALSE | | | |
| JB | JSN | CBC-02 | A | 9/13/13 | 14:23 | 85.75 | 3.88 | 8.10 | 5.84 | FALSE | FALSE | | | |
| JB | JSN | CBC-02 | B | 9/13/13 | 14:24 | 46.41 | 0.48 | 6.08 | 3.16 | FALSE | FALSE | | | |
| JB | JSN | CBC-02 | C | 9/13/13 | 14:24 | 57.72 | 1.86 | 5.65 | 3.93 | FALSE | FALSE | | | |
| JB | JSN | CBC-03 | A | 9/13/13 | 14:13 | 59.42 | 2.70 | 6.01 | 4.05 | FALSE | FALSE | | | |
| JB | JSN | CBC-03 | B | 9/13/13 | 14:13 | 41.59 | 1.07 | 4.13 | 2.83 | FALSE | TRUE | 1 | 1.02 | Oxidized |
| JB | JSN | CBC-03 | C | 9/13/13 | 14:14 | 80.44 | 4.24 | 7.19 | 5.48 | FALSE | FALSE | | | |
| JB | JSN | CBC-04 | A | 9/13/13 | 14:01 | 55.26 | 2.83 | 5.17 | 3.76 | FALSE | FALSE | | | |
| JB | JSN | CBC-04 | B | 9/13/13 | 14:02 | 42.11 | 1.43 | 4.87 | 2.87 | FALSE | FALSE | | | |
| JB | JSN | CBC-04 | C | 9/13/13 | 14:03 | 49.64 | 1.95 | 4.74 | 3.38 | FALSE | FALSE | | | |
| JB | JSN | CBC-05 | A | 9/13/13 | 15:13 | indet | >1.56 | >2.81 | >2.21 | FALSE | FALSE | | | |
| JB | JSN | CBC-05 | B | 9/13/13 | 15:14 | indet | >1.7 | >2.41 | >2.02 | FALSE | FALSE | | | |
| JB | JSN | CBC-05 | C | 9/13/13 | 15:15 | 38.43 | 1.83 | 3.93 | 2.62 | FALSE | FALSE | | | |
| JB | JSN | CBC-06 | A | 9/13/13 | 15:23 | 53.14 | 1.29 | 6.10 | 3.62 | FALSE | FALSE | | | |
| JB | JSN | CBC-06 | B | 9/13/13 | 15:24 | 40.11 | 0.00 | 5.13 | 2.73 | FALSE | FALSE | | | |
| JB | JSN | CBC-06 | C | 9/13/13 | 15:25 | 58.54 | 1.74 | 5.58 | 3.99 | FALSE | FALSE | | | |
| JB | JSN | CBC-07 | A | 9/13/13 | 11:31 | 61.42 | 2.13 | 9.91 | 4.18 | FALSE | FALSE | | | |
| JB | JSN | CBC-07 | B | 9/13/13 | 11:31 | 50.68 | 1.47 | 5.40 | 3.45 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | CBC-07 | C | 9/13/13 | 11:32 | 50.82 | 0.68 | 5.88 | 3.46 | FALSE | FALSE | | | |
| JB | JSN | CBC-08 | A | 9/13/13 | 11:12 | 40.35 | 1.04 | 4.99 | 2.75 | FALSE | FALSE | | | |
| JB | JSN | CBC-08 | B | 9/13/13 | 11:14 | 42.72 | 1.58 | 4.11 | 2.91 | FALSE | FALSE | | | |
| JB | JSN | CBC-08 | C | 9/13/13 | 11:14 | 57.96 | 3.06 | 5.08 | 3.95 | FALSE | FALSE | | | |
| JB | JSN | CBC-09 | A | 9/13/13 | 10:55 | 55.49 | 1.61 | 6.87 | 3.78 | FALSE | FALSE | | | |
| JB | JSN | CBC-09 | B | 9/13/13 | 10:56 | 35.59 | >1.61 | >3.58 | >2.42 | FALSE | FALSE | | | |
| JB | JSN | CBC-09 | C | 9/13/13 | 11:05 | 51.66 | 2.15 | 6.96 | 3.52 | FALSE | FALSE | | | |
| JB | JSN | CBC-10 | A | 9/13/13 | 10:24 | 27.11 | 1.04 | 4.22 | 1.85 | FALSE | FALSE | | | |
| JB | JSN | CBC-10 | B | 9/13/13 | 10:25 | 45.42 | >2.38 | >4.38 | >3.09 | FALSE | FALSE | | | |
| JB | JSN | CBC-10 | C | 9/13/13 | 10:26 | 23.8 | 0.25 | 4.04 | 1.62 | FALSE | FALSE | | | |
| JB | JSN | CBC-11 | A | 9/13/13 | 10:16 | 34.37 | 1.06 | 4.45 | 2.34 | FALSE | FALSE | | | |
| JB | JSN | CBC-11 | B | 9/13/13 | 10:17 | 25.19 | 0.38 | 3.88 | 1.72 | FALSE | FALSE | | | |
| JB | JSN | CBC-11 | C | 9/13/13 | 10:18 | 23.84 | 0.86 | 2.13 | 1.62 | FALSE | FALSE | | | |
| JB | JSN | CBC-12 | A | 9/13/13 | 9:56 | 30.31 | 0.15 | 3.76 | 2.06 | FALSE | FALSE | | | |
| JB | JSN | CBC-12 | B | 9/13/13 | 9:56 | 34.45 | 1.40 | 3.54 | 2.35 | FALSE | FALSE | | | |
| JB | JSN | CBC-12 | C | 9/13/13 | 9:57 | 30.98 | 0.25 | 4.26 | 2.11 | FALSE | TRUE | 3 | 0.76 | Oxidized |
| JB | JSN | CBF-01 | A | 9/14/13 | 10:29 | 52.02 | 0.61 | 5.08 | 3.54 | FALSE | TRUE | 1 | 0.46 | Oxidized |
| JB | JSN | CBF-01 | B | 9/14/13 | 10:30 | 56.37 | 1.47 | 5.24 | 3.84 | FALSE | TRUE | 6 | 0.81 | Reduced |
| JB | JSN | CBF-01 | C | 9/14/13 | 10:31 | 61.17 | 1.47 | 6.31 | 4.17 | FALSE | TRUE | 4 | 0.87 | Reduced |
| JB | JSN | CBF-03 | A | 9/14/13 | 11:09 | 55.19 | 1.95 | 6.33 | 3.76 | FALSE | FALSE | | | |
| JB | JSN | CBF-03 | B | 9/14/13 | 11:09 | 53.83 | 0.84 | 7.28 | 3.67 | FALSE | FALSE | | | |
| JB | JSN | CBF-03 | C | 9/14/13 | 11:10 | 65.08 | 2.77 | 7.83 | 4.43 | FALSE | FALSE | | | |
| JB | JSN | CBF-07 | A | 9/14/13 | 10:59 | 70.13 | 2.08 | 9.96 | 4.78 | FALSE | TRUE | 1 | 1.05 | Oxidized |
| JB | JSN | CBF-07 | B | 9/14/13 | 11:00 | 73.95 | 0.79 | 6.35 | 5.04 | FALSE | FALSE | | | |
| JB | JSN | CBF-07 | C | 9/14/13 | 11:01 | 55.58 | 2.17 | 6.01 | 3.79 | FALSE | TRUE | 1 | 0.77 | Reduced |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | CBF-09 | A | 9/14/13 | 10:40 | 59.58 | 0.95 | 6.10 | 4.06 | FALSE | FALSE | | | |
| JB | JSN | CBF-09 | B | 9/14/13 | 10:40 | 73.6 | 3.65 | 7.10 | 5.01 | FALSE | FALSE | | | |
| JB | JSN | CBF-09 | C | 9/14/13 | 10:41 | 66.3 | 2.81 | 8.17 | 4.52 | FALSE | FALSE | | | |
| JB | JSN | CBF-10 | A | 9/14/13 | 10:49 | 68.57 | 4.04 | 6.14 | 4.67 | FALSE | FALSE | | | |
| JB | JSN | CBF-10 | B | 9/14/13 | 10:50 | 81.92 | 4.49 | 7.12 | 5.58 | FALSE | FALSE | | | |
| JB | JSN | CBF-10 | C | 9/14/13 | 10:51 | 52.27 | 1.75 | 5.04 | 3.56 | FALSE | FALSE | | | |
| JB | JSN | CBF-13 | A | 9/14/13 | 10:19 | 56.85 | 3.10 | 6.51 | 3.87 | FALSE | FALSE | | | |
| JB | JSN | CBF-13 | B | 9/14/13 | 10:20 | 53.49 | 1.29 | 5.63 | 3.64 | FALSE | FALSE | | | |
| JB | JSN | CBF-13 | C | 9/14/13 | 10:21 | 54.25 | 1.16 | 4.88 | 3.70 | FALSE | FALSE | | | |
| JB | JSN | CBF-15 | A | 9/14/13 | 10:10 | 47.38 | 1.04 | 5.11 | 3.23 | FALSE | FALSE | | | |
| JB | JSN | CBF-15 | B | 9/14/13 | 10:10 | 58.35 | 1.75 | 5.83 | 3.97 | FALSE | FALSE | | | |
| JB | JSN | CBF-15 | C | 9/14/13 | 10:11 | 54.92 | 0.77 | 5.49 | 3.74 | FALSE | FALSE | | | |
| JB | JSN | CBF-16 | A | 9/14/13 | 9:47 | 59.22 | 2.01 | 5.35 | 4.03 | FALSE | FALSE | | | |
| JB | JSN | CBF-16 | B | 9/14/13 | 9:47 | 60.75 | 2.36 | 9.24 | 4.14 | FALSE | FALSE | | | |
| JB | JSN | CBF-16 | C | 9/14/13 | 9:49 | 64.53 | 2.47 | 6.47 | 4.40 | FALSE | FALSE | | | |
| JB | JSN | CBF-27 | A | 9/14/13 | 9:28 | 67.32 | 3.72 | 6.97 | 4.59 | FALSE | FALSE | | | |
| JB | JSN | CBF-27 | B | 9/14/13 | 9:29 | 60.61 | 2.41 | 5.36 | 4.13 | FALSE | FALSE | | | |
| JB | JSN | CBF-27 | C | 9/14/13 | 9:30 | 70.4 | 2.06 | 7.74 | 4.80 | FALSE | FALSE | | | |
| JB | JSN | CBF-28 | A | 9/14/13 | 9:37 | 60.92 | 2.38 | 6.39 | 4.15 | FALSE | FALSE | | | |
| JB | JSN | CBF-28 | B | 9/14/13 | 9:38 | 65.09 | 2.92 | 8.00 | 4.43 | FALSE | FALSE | | | |
| JB | JSN | CBF-28 | C | 9/14/13 | 9:39 | 63.93 | 2.29 | 5.88 | 4.35 | FALSE | FALSE | | | |
| JB | JSN | CBF-49 | A | 9/14/13 | 11:32 | 51.97 | 2.45 | 5.15 | 3.54 | FALSE | FALSE | | | |
| JB | JSN | CBF-49 | B | 9/14/13 | 11:33 | 50.61 | 2.13 | 6.20 | 3.45 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | CBF-49 | C | 9/14/13 | 11:33 | 61.7 | 3.06 | 6.17 | 4.20 | FALSE | FALSE | | | |
| JB | JSN | CBF-57 | A | 9/14/13 | 14:16 | 54.48 | 2.75 | 5.17 | 3.71 | FALSE | FALSE | | | |
| JB | JSN | CBF-57 | B | 9/14/13 | 14:16 | 63.83 | 3.38 | 6.53 | 4.35 | FALSE | FALSE | | | |
| JB | JSN | CBF-57 | C | 9/14/13 | 14:17 | 61.98 | 2.92 | 8.35 | 4.22 | FALSE | FALSE | | | |
| JB | JSN | CBF-58 | A | 9/14/13 | 14:25 | 49.38 | 1.90 | 4.65 | 3.36 | FALSE | FALSE | | | |
| JB | JSN | CBF-58 | B | 9/14/13 | 14:25 | 20.49 | 0.25 | 3.08 | 1.40 | FALSE | FALSE | | | |
| JB | JSN | CBF-58 | C | 9/14/13 | 14:26 | 53.14 | 1.74 | 5.36 | 3.62 | FALSE | FALSE | | | |
| JB | JSN | CBF-59 | A | 9/14/13 | 14:35 | 68.95 | 2.01 | 7.03 | 4.70 | FALSE | FALSE | | | |
| JB | JSN | CBF-59 | B | 9/14/13 | 14:35 | 62.06 | 2.92 | 5.65 | 4.23 | FALSE | TRUE | 2 | 1.04 | Reduced |
| JB | JSN | CBF-59 | C | 9/14/13 | 14:36 | 70.21 | 0.41 | 10.00 | 4.78 | FALSE | FALSE | | | |
| JB | JSN | CBF-63 | A | 9/14/13 | 11:22 | 68.4 | 2.72 | 5.81 | 4.66 | FALSE | TRUE | 2 | 0.61 | Oxidized |
| JB | JSN | CBF-63 | B | 9/14/13 | 11:23 | 65.84 | 0.95 | 9.00 | 4.48 | FALSE | FALSE | | | |
| JB | JSN | CBF-63 | C | 9/14/13 | 11:24 | 71.67 | 3.44 | 6.81 | 4.88 | FALSE | FALSE | | | |
| JB | JSN | CBF-65 | A | 9/14/13 | 15:12 | 59.08 | 1.60 | 6.45 | 4.02 | FALSE | FALSE | | | |
| JB | JSN | CBF-65 | B | 9/14/13 | 15:13 | 92.74 | 4.53 | 8.58 | 6.32 | FALSE | FALSE | | | |
| JB | JSN | CBF-65 | C | 9/14/13 | 15:14 | 73.21 | 2.84 | 6.71 | 4.99 | FALSE | FALSE | | | |
| JB | JSN | CBF-66 | A | 9/14/13 | 15:22 | 49.42 | 1.04 | 5.90 | 3.37 | FALSE | FALSE | | | |
| JB | JSN | CBF-66 | B | 9/14/13 | 15:22 | 45.3 | 1.79 | 4.81 | 3.09 | FALSE | FALSE | | | |
| JB | JSN | CBF-66 | C | 9/14/13 | 15:23 | 70.69 | 2.68 | 6.79 | 4.82 | FALSE | FALSE | | | |
| JB | JSN | CBF-67 | A | 9/14/13 | 15:41 | 52.71 | 1.83 | 5.36 | 3.59 | FALSE | FALSE | | | |
| JB | JSN | CBF-67 | B | 9/14/13 | 15:41 | 74.28 | 0.84 | 9.39 | 5.06 | FALSE | FALSE | | | |
| JB | JSN | CBF-67 | C | 9/14/13 | 15:42 | 53.89 | 2.24 | 6.39 | 3.67 | FALSE | FALSE | | | |
| JB | JSN | CBF-68 | A | 9/14/13 | 15:50 | 86.92 | 3.88 | 8.41 | 5.92 | FALSE | TRUE | 1 | 0.99 | Reduced |
| JB | JSN | CBF-68 | B | 9/14/13 | 15:50 | 85.59 | 4.40 | 7.26 | 5.83 | FALSE | FALSE | | | |
| JB | JSN | CBF-68 | C | 9/14/13 | 15:51 | 77.78 | 2.38 | 6.95 | 5.30 | FALSE | FALSE | | | |
| JB | JSN | CBF-69 | A | 9/14/13 | 16:08 | 91.63 | 2.95 | 8.12 | 6.24 | FALSE | FALSE | | | |
| JB | JSN | CBF-69 | B | 9/14/13 | 16:09 | 54.23 | 1.24 | 7.40 | 3.69 | FALSE | FALSE | | | |
| JB | JSN | CBF-69 | C | 9/14/13 | 16:10 | 66.21 | 3.81 | 6.22 | 4.51 | FALSE | FALSE | | | |
| JB | JSN | CBF-70 | A | 9/14/13 | 16:19 | 55.97 | 0.95 | 7.60 | 3.81 | FALSE | FALSE | | | |
| JB | JSN | CBF-70 | B | 9/14/13 | 16:19 | 76.46 | 4.06 | 6.74 | 5.21 | FALSE | FALSE | | | |
| JB | JSN | CBF-70 | C | 9/14/13 | 16:20 | 56.82 | 2.47 | 6.63 | 3.87 | FALSE | FALSE | | | |
| JB | JSN | CBF-76 | A | 9/14/13 | 15:31 | 56.75 | 1.66 | 5.65 | 3.87 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | CBF-76 | B | 9/14/13 | 15:32 | 64.57 | 2.51 | 5.76 | 4.40 | FALSE | FALSE | | | |
| JB | JSN | CBF-76 | C | 9/14/13 | 15:32 | 72.84 | 1.77 | 8.65 | 4.96 | FALSE | FALSE | | | |
| JB | JSN | CBF-77 | A | 9/14/13 | 15:57 | 62.98 | 3.54 | 5.44 | 4.29 | FALSE | TRUE | 2 | 1.33 | Reduced |
| JB | JSN | CBF-77 | B | 9/14/13 | 15:58 | 79.23 | 3.59 | 7.53 | 5.40 | FALSE | FALSE | | | |
| JB | JSN | CBF-77 | C | 9/14/13 | 15:59 | 79.49 | 1.61 | 7.78 | 5.41 | FALSE | FALSE | | | |
| JB | JSN | CBP-01 | A | 9/13/13 | 15:47 | 70.41 | 0.45 | 8.08 | 4.80 | FALSE | FALSE | | | |
| JB | JSN | CBP-01 | B | 9/13/13 | 15:48 | 60.62 | 2.38 | 5.38 | 4.13 | FALSE | FALSE | | | |
| JB | JSN | CBP-01 | C | 9/13/13 | 15:48 | 61.27 | 2.91 | 5.65 | 4.17 | FALSE | FALSE | | | |
| JB | JSN | CBP-02 | A | 9/13/13 | 15:57 | 50.33 | 1.00 | 7.42 | 3.43 | FALSE | FALSE | | | |
| JB | JSN | CBP-02 | B | 9/13/13 | 15:58 | 46.04 | 1.29 | 5.94 | 3.14 | FALSE | TRUE | 4 | 0.81 | Oxidized |
| JB | JSN | CBP-02 | C | 9/13/13 | 15:59 | 55.68 | 1.52 | 5.24 | 3.79 | FALSE | TRUE | 10 | 0.43 | Oxidized |
| JB | JSN | CBP-03 | A | 9/13/13 | 16:50 | 36.47 | 0.27 | 5.86 | 2.48 | FALSE | FALSE | | | |
| JB | JSN | CBP-03 | B | 9/13/13 | 16:50 | 23.57 | 0.25 | 4.17 | 1.61 | FALSE | FALSE | | | |
| JB | JSN | CBP-03 | C | 9/13/13 | 16:51 | 42.03 | 0.20 | 6.60 | 2.86 | FALSE | FALSE | | | |
| JB | JSN | CBP-04 | A | 9/13/13 | 16:40 | 48.72 | 0.93 | 5.76 | 3.32 | FALSE | FALSE | | | |
| JB | JSN | CBP-04 | B | 9/13/13 | 16:41 | 43.47 | 0.00 | 5.53 | 2.96 | FALSE | FALSE | | | |
| JB | JSN | CBP-04 | C | 9/13/13 | 16:42 | 46.54 | 0.00 | 7.31 | 3.17 | FALSE | FALSE | | | |
| JB | JSN | CBP-05 | A | 9/13/13 | 11:40 | 42.87 | 0.25 | 6.38 | 2.92 | FALSE | FALSE | | | |
| JB | JSN | CBP-05 | B | 9/13/13 | 11:40 | 31.37 | 0.05 | 4.16 | 2.14 | FALSE | FALSE | | | |
| JB | JSN | CBP-05 | C | 9/13/13 | 11:41 | 52.76 | 1.59 | 5.81 | 3.59 | FALSE | FALSE | | | |
| JB | JSN | CBP-06 | A | 9/13/13 | 11:51 | 57.05 | 0.00 | 8.78 | 3.89 | FALSE | FALSE | | | |
| JB | JSN | CBP-06 | B | 9/13/13 | 11:52 | 58.9 | 1.47 | 6.15 | 4.01 | FALSE | TRUE | 3 | 0.68 | Reduced |
| JB | JSN | CBP-06 | C | 9/13/13 | 11:52 | 64.2 | 2.60 | 5.04 | 4.37 | FALSE | FALSE | | | |
| JB | JSN | CBP-07 | A | 9/13/13 | 12:04 | 32.7 | 0.65 | 4.79 | 2.23 | FALSE | FALSE | | | |
| JB | JSN | CBP-07 | B | 9/13/13 | 12:05 | 70.26 | 2.38 | 7.08 | 4.79 | FALSE | FALSE | | | |
| JB | JSN | CBP-07 | C | 9/13/13 | 12:05 | 66.08 | 2.22 | 6.34 | 4.50 | FALSE | FALSE | | | |
| JB | JSN | CBP-08 | A | 9/13/13 | 14:43 | 52.96 | 0.39 | 5.06 | 3.61 | FALSE | FALSE | | | |
| JB | JSN | CBP-08 | B | 9/13/13 | 14:43 | 63.46 | 2.84 | 5.56 | 4.32 | FALSE | FALSE | | | |
| JB | JSN | CBP-08 | C | 9/13/13 | 14:44 | 57.59 | 1.77 | 5.63 | 3.92 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | CBP-09 | A | 9/13/13 | 13:35 | 67.1 | 2.76 | 6.30 | 4.57 | FALSE | FALSE | | | |
| JB | JSN | CBP-09 | B | 9/13/13 | 13:36 | 54.03 | 2.35 | 5.08 | 3.68 | FALSE | FALSE | | | |
| JB | JSN | CBP-09 | C | 9/13/13 | 13:37 | 54.13 | 1.92 | 5.54 | 3.69 | FALSE | FALSE | | | |
| JB | JSN | CBP-10 | A | 9/13/13 | 13:49 | 51.57 | 2.06 | 4.86 | 3.51 | FALSE | FALSE | | | |
| JB | JSN | CBP-10 | B | 9/13/13 | 13:50 | 58.13 | 0.88 | 7.88 | 3.96 | FALSE | FALSE | | | |
| JB | JSN | CBP-10 | C | 9/13/13 | 13:51 | 53.57 | 0.81 | 6.89 | 3.65 | FALSE | FALSE | | | |
| JB | JSN | CBP-11 | A | 9/13/13 | 9:36 | 52.15 | 2.29 | 6.80 | 3.55 | FALSE | FALSE | | | |
| JB | JSN | CBP-11 | B | 9/13/13 | 9:37 | 54.25 | 2.18 | 6.29 | 3.70 | FALSE | TRUE | 2 | 0.40 | Reduced |
| JB | JSN | CBP-11 | C | 9/13/13 | 9:37 | 48.7 | 1.06 | 4.90 | 3.32 | FALSE | FALSE | | | |
| JB | JSN | CBP-12 | A | 9/13/13 | 15:36 | 72.77 | 3.18 | 9.51 | 4.96 | FALSE | FALSE | | | |
| JB | JSN | CBP-12 | B | 9/13/13 | 15:37 | 65.14 | 3.15 | 6.51 | 4.44 | FALSE | TRUE | 1 | 1.47 | Reduced |
| JB | JSN | CBP-12 | C | 9/13/13 | 15:38 | 63.14 | 1.83 | 7.40 | 4.30 | FALSE | FALSE | | | |
| JB | JSN | CBS-01 | A | 9/13/13 | 16:16 | 55.29 | 2.65 | 5.99 | 3.77 | FALSE | TRUE | 1 | 0.68 | Oxidized |
| JB | JSN | CBS-01 | B | 9/13/13 | 16:16 | 56.04 | 1.72 | 8.10 | 3.82 | FALSE | FALSE | | | |
| JB | JSN | CBS-01 | C | 9/13/13 | 16:18 | 53.4 | 1.72 | 6.90 | 3.64 | FALSE | FALSE | | | |
| JB | JSN | CBS-02 | A | 9/13/13 | 17:10 | 65.68 | 2.13 | 6.56 | 4.47 | FALSE | FALSE | | | |
| JB | JSN | CBS-02 | B | 9/13/13 | 17:10 | 66.64 | 2.06 | 5.63 | 4.54 | FALSE | TRUE | 1 | 1.02 | Oxidized |
| JB | JSN | CBS-02 | C | 9/13/13 | 17:11 | 38.65 | 0.14 | 5.01 | 2.63 | FALSE | FALSE | | | |
| JB | JSN | CBS-03 | A | 9/13/13 | 16:06 | 29.06 | 0.45 | 4.43 | 1.98 | FALSE | FALSE | | | |
| JB | JSN | CBS-03 | B | 9/13/13 | 16:07 | 52.45 | 1.52 | 4.79 | 3.57 | FALSE | FALSE | | | |
| JB | JSN | CBS-03 | C | 9/13/13 | 16:08 | 41.94 | 1.47 | 3.97 | 2.86 | FALSE | TRUE | 5 | 0.77 | Oxidized |
| JB | JSN | CBS-04 | A | 9/13/13 | 16:59 | 70.39 | 3.36 | 7.83 | 4.79 | FALSE | FALSE | | | |
| JB | JSN | CBS-04 | B | 9/13/13 | 16:59 | 56.23 | 2.25 | 4.92 | 3.83 | FALSE | FALSE | | | |
| JB | JSN | CBS-04 | C | 9/13/13 | 17:00 | 64.23 | 2.54 | 4.88 | 4.38 | FALSE | TRUE | 3 | 0.56 | Oxidized |
| JB | JSN | CBS-05 | A | 9/13/13 | 11:22 | 53.47 | 0.59 | 5.67 | 3.64 | FALSE | FALSE | | | |
| JB | JSN | CBS-05 | B | 9/13/13 | 11:23 | 43.41 | 1.27 | 4.79 | 2.96 | FALSE | FALSE | | | |
| JB | JSN | CBS-05 | C | 9/13/13 | 11:23 | 49.75 | 1.74 | 4.72 | 3.39 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | CBS-06 | A | 9/14/13 | 8:50 | 53.06 | 1.18 | 5.63 | 3.61 | FALSE | FALSE | | | |
| JB | JSN | CBS-06 | B | 9/14/13 | 8:51 | 54.15 | 1.81 | 6.33 | 3.69 | FALSE | FALSE | | | |
| JB | JSN | CBS-06 | C | 9/14/13 | 8:51 | 48.22 | 0.91 | 6.65 | 3.28 | FALSE | FALSE | | | |
| JB | JSN | CBS-07 | A | 9/14/13 | 8:38 | 58.22 | 2.13 | 5.92 | 3.97 | FALSE | FALSE | | | |
| JB | JSN | CBS-07 | B | 9/14/13 | 8:39 | 53.13 | 1.45 | 5.13 | 3.62 | FALSE | FALSE | | | |
| JB | JSN | CBS-07 | C | 9/14/13 | 8:40 | 41.48 | 0.00 | 5.63 | 2.83 | FALSE | FALSE | | | |
| JB | JSN | CBS-08 | A | 9/13/13 | 10:04 | 77.68 | 2.22 | 8.96 | 5.29 | FALSE | FALSE | | | |
| JB | JSN | CBS-08 | B | 9/13/13 | 10:05 | 45.26 | 1.29 | 5.06 | 3.08 | FALSE | FALSE | | | |
| JB | JSN | CBS-08 | C | 9/13/13 | 10:06 | 50.65 | 2.41 | 6.33 | 3.45 | FALSE | FALSE | | | |
| JB | JSN | CBS-20 | A | 9/14/13 | 8:59 | 58.28 | 3.04 | 5.83 | 3.97 | FALSE | FALSE | | | |
| JB | JSN | CBS-20 | B | 9/14/13 | 8:59 | 50.01 | 0.00 | 5.49 | 3.41 | FALSE | FALSE | | | |
| JB | JSN | CBS-20 | C | 9/14/13 | 9:00 | 67.27 | 3.10 | 7.19 | 4.58 | FALSE | FALSE | | | |
| JB | JSN | CBS-21 | A | 9/14/13 | 9:10 | 50.81 | 2.04 | 7.12 | 3.46 | FALSE | TRUE | 10 | 0.95 | Oxidized |
| JB | JSN | CBS-21 | B | 9/14/13 | 9:10 | 45.4 | 0.00 | 4.70 | 3.09 | FALSE | TRUE | 1 | 2.55 | Reduced |
| JB | JSN | CBS-21 | C | 9/14/13 | 9:11 | 52.25 | 0.57 | 4.92 | 3.56 | FALSE | FALSE | | | |
| JB | JSN | CBT-01 | A | 9/14/13 | 13:54 | 70.46 | 3.68 | 6.1 | 4.80 | FALSE | | | | |
| JB | JSN | CBT-01 | B | 9/14/13 | 13:55 | 64.75 | 3.94 | 6.62 | 4.41 | FALSE | FALSE | | | |
| JB | JSN | CBT-01 | C | 9/14/13 | 13:56 | 67.13 | 2.50 | 6.63 | 4.57 | FALSE | FALSE | | | |
| JB | JSN | CBT-02 | A | 9/14/13 | 13:46 | 42.18 | 1.77 | 4.63 | 2.87 | FALSE | FALSE | | | |
| JB | JSN | CBT-02 | B | 9/14/13 | 13:46 | 61.75 | 3.06 | 4.37 | 4.21 | FALSE | FALSE | | | |
| JB | JSN | CBT-02 | C | 9/14/13 | 13:47 | 44.15 | 0.65 | 6.08 | 3.01 | FALSE | FALSE | | | |
| JB | JSN | CBT-03 | A | 9/14/13 | 13:38 | 35.15 | 0.70 | 4.54 | 2.39 | FALSE | FALSE | | | |
| JB | JSN | CBT-03 | B | 9/14/13 | 13:39 | 59.14 | 2.17 | 5.29 | 4.03 | FALSE | FALSE | | | |
| JB | JSN | CBT-03 | C | 9/14/13 | 13:39 | 58.22 | 1.48 | 5.42 | 3.97 | FALSE | FALSE | | | |
| JB | JSN | CBT-07 | A | 9/14/13 | 13:16 | 74.01 | 3.04 | 5.99 | 5.04 | FALSE | FALSE | | | |
| JB | JSN | CBT-07 | B | 9/14/13 | 13:17 | 51.84 | 0.00 | 7.10 | 3.53 | FALSE | FALSE | | | |
| JB | JSN | CBT-07 | C | 9/14/13 | 13:18 | 57.76 | 0.90 | 7.92 | 3.93 | FALSE | FALSE | | | |
| JB | JSN | CBT-08 | A | 9/14/13 | 13:26 | 68.27 | 3.72 | 7.19 | 4.65 | FALSE | TRUE | 4 | 0.63 | Reduced |
| JB | JSN | CBT-08 | B | 9/14/13 | 13:27 | 71.13 | 2.86 | 9.46 | 4.85 | FALSE | FALSE | | | |
| JB | JSN | CBT-08 | C | 9/14/13 | 13:28 | 65.17 | 2.95 | 5.42 | 4.44 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | CBT-13 | A | 9/14/13 | 12:55 | 59.52 | 1.45 | 5.70 | 4.05 | FALSE | FALSE | | | |
| JB | JSN | CBT-13 | B | 9/14/13 | 12:55 | 31.77 | 0.00 | 5.31 | 2.16 | FALSE | FALSE | | | |
| JB | JSN | CBT-13 | C | 9/14/13 | 12:56 | 51.99 | 1.22 | 5.22 | 3.54 | FALSE | FALSE | | | |
| JB | JSN | CBT-14 | A | 9/14/13 | 13:05 | 48.23 | 0.38 | 6.40 | 3.29 | FALSE | FALSE | | | |
| JB | JSN | CBT-14 | B | 9/14/13 | 13:06 | 52.55 | 0.00 | 5.74 | 3.58 | FALSE | FALSE | | | |
| JB | JSN | CBT-14 | C | 9/14/13 | 13:06 | 50.96 | 0.36 | 5.94 | 3.47 | FALSE | TRUE | 1 | 1.59 | Reduced |
| JB | JSN | CBZ-01 | A | 9/13/13 | 10:32 | 25.58 | 1.02 | 2.27 | 1.74 | FALSE | FALSE | | | |
| JB | JSN | CBZ-01 | B | 9/13/13 | 10:33 | 36.74 | 1.57 | >3.53 | 2.50 | FALSE | FALSE | | | |
| JB | JSN | CBZ-01 | C | 9/13/13 | 10:34 | 14.28 | >0.49 | >1.46 | >0.97 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | CBB-01 | A | 9/13/13 | 13:22 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBB-01 | B | 9/13/13 | 13:23 | FALSE | | | | UN.SI | Stage I | 7 |
| JB | JSN | CBB-01 | C | 9/13/13 | 13:24 | FALSE | | | | UN.SI | Stage I | 7 |
| JB | JSN | CBB-02 | D | 9/14/13 | 11:48 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBB-02 | E | 9/14/13 | 11:49 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBB-02 | F | 9/14/13 | 11:50 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBB-03 | A | 9/13/13 | 17:24 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | CBB-03 | B | 9/13/13 | 17:25 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBB-03 | C | 9/13/13 | 17:25 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBC-01 | A | 9/13/13 | 14:33 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBC-01 | B | 9/13/13 | 14:34 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | CBC-01 | C | 9/13/13 | 14:35 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBC-02 | A | 9/13/13 | 14:23 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBC-02 | B | 9/13/13 | 14:24 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBC-02 | C | 9/13/13 | 14:24 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBC-03 | A | 9/13/13 | 14:13 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBC-03 | B | 9/13/13 | 14:13 | FALSE | | | | UN.SI | Stage III | 9 |
| JB | JSN | CBC-03 | C | 9/13/13 | 14:14 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBC-04 | A | 9/13/13 | 14:01 | FALSE | | | | UN.SS | Stage I | 7 |
| JB | JSN | CBC-04 | B | 9/13/13 | 14:02 | FALSE | | | | UN.SS | Stage I | 5 |
| JB | JSN | CBC-04 | C | 9/13/13 | 14:03 | FALSE | | | | UN.SS | Stage I | 6 |
| JB | JSN | CBC-05 | A | 9/13/13 | 15:13 | FALSE | | | | SA.F | Stage I | 7 |
| JB | JSN | CBC-05 | B | 9/13/13 | 15:14 | FALSE | | | | SA.F | Stage I | 7 |
| JB | JSN | CBC-05 | C | 9/13/13 | 15:15 | FALSE | | | | SA.F | Stage I | 5 |
| JB | JSN | CBC-06 | A | 9/13/13 | 15:23 | FALSE | | | | UN.SS | Stage I | 6 |
| JB | JSN | CBC-06 | B | 9/13/13 | 15:24 | FALSE | | | | UN.SS | Stage III | 9 |
| JB | JSN | CBC-06 | C | 9/13/13 | 15:25 | FALSE | | | | UN.SS | Stage I | 7 |
| JB | JSN | CBC-07 | A | 9/13/13 | 11:31 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBC-07 | B | 9/13/13 | 11:31 | FALSE | | | | UN.SI | Stage I on III | 10 |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | CBC-07 | C | 9/13/13 | 11:32 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | CBC-08 | A | 9/13/13 | 11:12 | FALSE | | | | SA.F | Stage I | 5 |
| JB | JSN | CBC-08 | B | 9/13/13 | 11:14 | FALSE | | | | SA.F | Stage I | 5 |
| JB | JSN | CBC-08 | C | 9/13/13 | 11:14 | FALSE | | | | SA.F | Stage I | 7 |
| JB | JSN | CBC-09 | A | 9/13/13 | 10:55 | FALSE | | | | UN.SS | Stage I | 7 |
| JB | JSN | CBC-09 | B | 9/13/13 | 10:56 | FALSE | | | | UN.SS | Stage I | 7 |
| JB | JSN | CBC-09 | C | 9/13/13 | 11:05 | FALSE | | | | UN.SS | Stage I on III | 10 |
| JB | JSN | CBC-10 | A | 9/13/13 | 10:24 | FALSE | | | | UN.SS | Stage I on III | 8 |
| JB | JSN | CBC-10 | B | 9/13/13 | 10:25 | FALSE | | | | SA.F | Stage I | 7 |
| JB | JSN | CBC-10 | C | 9/13/13 | 10:26 | FALSE | | | | UN.SS | Stage I on III | 8 |
| JB | JSN | CBC-11 | A | 9/13/13 | 10:16 | FALSE | | | | UN.SS | Stage I on III | 9 |
| JB | JSN | CBC-11 | B | 9/13/13 | 10:17 | FALSE | | | | UN.SS | Stage I on III | 8 |
| JB | JSN | CBC-11 | C | 9/13/13 | 10:18 | FALSE | | | | UN.SS | Stage I | 4 |
| JB | JSN | CBC-12 | A | 9/13/13 | 9:56 | FALSE | | | | UN.SI | Stage I on III | 8 |
| JB | JSN | CBC-12 | B | 9/13/13 | 9:56 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | CBC-12 | C | 9/13/13 | 9:57 | FALSE | | | | UN.SI | Stage I | 4 |
| JB | JSN | CBF-01 | A | 9/14/13 | 10:29 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-01 | B | 9/14/13 | 10:30 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-01 | C | 9/14/13 | 10:31 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-03 | A | 9/14/13 | 11:09 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-03 | B | 9/14/13 | 11:09 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-03 | C | 9/14/13 | 11:10 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-07 | A | 9/14/13 | 10:59 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-07 | B | 9/14/13 | 11:00 | FALSE | | | | UN.SI | Stage II | 9 |
| JB | JSN | CBF-07 | C | 9/14/13 | 11:01 | FALSE | | | | UN.SI | Stage II on III | 11 |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | CBF-09 | A | 9/14/13 | 10:40 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-09 | B | 9/14/13 | 10:40 | FALSE | | | | UN.SI | Stage I | 7 |
| JB | JSN | CBF-09 | C | 9/14/13 | 10:41 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-10 | A | 9/14/13 | 10:49 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-10 | B | 9/14/13 | 10:50 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-10 | C | 9/14/13 | 10:51 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-13 | A | 9/14/13 | 10:19 | FALSE | | | | UN.SS | Stage I on III | 11 |
| JB | JSN | CBF-13 | B | 9/14/13 | 10:20 | FALSE | | | | UN.SS | Stage I on III | 10 |
| JB | JSN | CBF-13 | C | 9/14/13 | 10:21 | FALSE | | | | UN.SS | Stage I on III | 10 |
| JB | JSN | CBF-15 | A | 9/14/13 | 10:10 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-15 | B | 9/14/13 | 10:10 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-15 | C | 9/14/13 | 10:11 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-16 | A | 9/14/13 | 9:47 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-16 | B | 9/14/13 | 9:47 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-16 | C | 9/14/13 | 9:49 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-27 | A | 9/14/13 | 9:28 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-27 | B | 9/14/13 | 9:29 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-27 | C | 9/14/13 | 9:30 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-28 | A | 9/14/13 | 9:37 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-28 | B | 9/14/13 | 9:38 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-28 | C | 9/14/13 | 9:39 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-49 | A | 9/14/13 | 11:32 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-49 | B | 9/14/13 | 11:33 | FALSE | | | | UN.SI | Stage I on III | 10 |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | CBF-49 | C | 9/14/13 | 11:33 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-57 | A | 9/14/13 | 14:16 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-57 | B | 9/14/13 | 14:16 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-57 | C | 9/14/13 | 14:17 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-58 | A | 9/14/13 | 14:25 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-58 | B | 9/14/13 | 14:25 | FALSE | | | | UN.SI | Stage III | 7 |
| JB | JSN | CBF-58 | C | 9/14/13 | 14:26 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-59 | A | 9/14/13 | 14:35 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-59 | B | 9/14/13 | 14:35 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-59 | C | 9/14/13 | 14:36 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-63 | A | 9/14/13 | 11:22 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-63 | B | 9/14/13 | 11:23 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-63 | C | 9/14/13 | 11:24 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-65 | A | 9/14/13 | 15:12 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-65 | B | 9/14/13 | 15:13 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-65 | C | 9/14/13 | 15:14 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-66 | A | 9/14/13 | 15:22 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-66 | B | 9/14/13 | 15:22 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-66 | C | 9/14/13 | 15:23 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-67 | A | 9/14/13 | 15:41 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-67 | B | 9/14/13 | 15:41 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-67 | C | 9/14/13 | 15:42 | FALSE | | | | UN.SI | Stage III | 10 |
| JB | JSN | CBF-68 | A | 9/14/13 | 15:50 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-68 | B | 9/14/13 | 15:50 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-68 | C | 9/14/13 | 15:51 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-69 | A | 9/14/13 | 16:08 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-69 | B | 9/14/13 | 16:09 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBF-69 | C | 9/14/13 | 16:10 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-70 | A | 9/14/13 | 16:19 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-70 | B | 9/14/13 | 16:19 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-70 | C | 9/14/13 | 16:20 | FALSE | | | | UN.SI | Stage I | 7 |
| JB | JSN | CBF-76 | A | 9/14/13 | 15:31 | FALSE | | | | UN.SI | Stage I on III | 11 |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | CBF-76 | B | 9/14/13 | 15:32 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBF-76 | C | 9/14/13 | 15:32 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-77 | A | 9/14/13 | 15:57 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-77 | B | 9/14/13 | 15:58 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBF-77 | C | 9/14/13 | 15:59 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBP-01 | A | 9/13/13 | 15:47 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBP-01 | B | 9/13/13 | 15:48 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBP-01 | C | 9/13/13 | 15:48 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBP-02 | A | 9/13/13 | 15:57 | FALSE | | | | UN.SI | Stage III | 10 |
| JB | JSN | CBP-02 | B | 9/13/13 | 15:58 | FALSE | | | | UN.SI | Stage III | 10 |
| JB | JSN | CBP-02 | C | 9/13/13 | 15:59 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBP-03 | A | 9/13/13 | 16:50 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | CBP-03 | B | 9/13/13 | 16:50 | FALSE | | | | UN.SI | Stage I on III | 8 |
| JB | JSN | CBP-03 | C | 9/13/13 | 16:51 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | CBP-04 | A | 9/13/13 | 16:40 | FALSE | | | | UN.SI | Stage III | 10 |
| JB | JSN | CBP-04 | B | 9/13/13 | 16:41 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | CBP-04 | C | 9/13/13 | 16:42 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBP-05 | A | 9/13/13 | 11:40 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | CBP-05 | B | 9/13/13 | 11:40 | FALSE | | | | UN.SI | Stage I on III | 8 |
| JB | JSN | CBP-05 | C | 9/13/13 | 11:41 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBP-06 | A | 9/13/13 | 11:51 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBP-06 | B | 9/13/13 | 11:52 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBP-06 | C | 9/13/13 | 11:52 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBP-07 | A | 9/13/13 | 12:04 | FALSE | | | | UN.SI | Stage I | 4 |
| JB | JSN | CBP-07 | B | 9/13/13 | 12:05 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBP-07 | C | 9/13/13 | 12:05 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBP-08 | A | 9/13/13 | 14:43 | FALSE | | | | UN.SI | Stage III | 10 |
| JB | JSN | CBP-08 | B | 9/13/13 | 14:43 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBP-08 | C | 9/13/13 | 14:44 | FALSE | | | | UN.SI | Stage I on III | 11 |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | CBP-09 | A | 9/13/13 | 13:35 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBP-09 | B | 9/13/13 | 13:36 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBP-09 | C | 9/13/13 | 13:37 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBP-10 | A | 9/13/13 | 13:49 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBP-10 | B | 9/13/13 | 13:50 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBP-10 | C | 9/13/13 | 13:51 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBP-11 | A | 9/13/13 | 9:36 | FALSE | | | | UN.SS | Stage I on III | 10 |
| JB | JSN | CBP-11 | B | 9/13/13 | 9:37 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | CBP-11 | C | 9/13/13 | 9:37 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBP-12 | A | 9/13/13 | 15:36 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBP-12 | B | 9/13/13 | 15:37 | FALSE | | | | UN.SI | Stage I | 7 |
| JB | JSN | CBP-12 | C | 9/13/13 | 15:38 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBS-01 | A | 9/13/13 | 16:16 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBS-01 | B | 9/13/13 | 16:16 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBS-01 | C | 9/13/13 | 16:18 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBS-02 | A | 9/13/13 | 17:10 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBS-02 | B | 9/13/13 | 17:10 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBS-02 | C | 9/13/13 | 17:11 | FALSE | | | | UN.SI | Stage III | 9 |
| JB | JSN | CBS-03 | A | 9/13/13 | 16:06 | FALSE | | | | UN.SI | Stage I on III | 8 |
| JB | JSN | CBS-03 | B | 9/13/13 | 16:07 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBS-03 | C | 9/13/13 | 16:08 | FALSE | | | | UN.SI | Stage III | 9 |
| JB | JSN | CBS-04 | A | 9/13/13 | 16:59 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBS-04 | B | 9/13/13 | 16:59 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBS-04 | C | 9/13/13 | 17:00 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBS-05 | A | 9/13/13 | 11:22 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBS-05 | B | 9/13/13 | 11:23 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | CBS-05 | C | 9/13/13 | 11:23 | FALSE | | | | UN.SI | Stage I on III | 10 |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | CBS-06 | A | 9/14/13 | 8:50 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | CBS-06 | B | 9/14/13 | 8:51 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | CBS-06 | C | 9/14/13 | 8:51 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | CBS-07 | A | 9/14/13 | 8:38 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBS-07 | B | 9/14/13 | 8:39 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBS-07 | C | 9/14/13 | 8:40 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | CBS-08 | A | 9/13/13 | 10:04 | FALSE | | | | UN.SI | Stage I on III | 7 |
| JB | JSN | CBS-08 | B | 9/13/13 | 10:05 | FALSE | | | | UN.SI | Stage I on III | 7 |
| JB | JSN | CBS-08 | C | 9/13/13 | 10:06 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBS-20 | A | 9/14/13 | 8:59 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBS-20 | B | 9/14/13 | 8:59 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBS-20 | C | 9/14/13 | 9:00 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBS-21 | A | 9/14/13 | 9:10 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBS-21 | B | 9/14/13 | 9:10 | FALSE | | | | UN.SI | Stage III | 10 |
| JB | JSN | CBS-21 | C | 9/14/13 | 9:11 | FALSE | | | | UN.SI | Stage II on III | 10 |
| JB | JSN | CBT-01 | A | 9/14/13 | 13:54 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBT-01 | B | 9/14/13 | 13:55 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBT-01 | C | 9/14/13 | 13:56 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBT-02 | A | 9/14/13 | 13:46 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | CBT-02 | B | 9/14/13 | 13:46 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBT-02 | C | 9/14/13 | 13:47 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | CBT-03 | A | 9/14/13 | 13:38 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | CBT-03 | B | 9/14/13 | 13:39 | FALSE | | | | UN.SI | Stage I | 7 |
| JB | JSN | CBT-03 | C | 9/14/13 | 13:39 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBT-07 | A | 9/14/13 | 13:16 | FALSE | | | | UN.SI | Stage I | 7 |
| JB | JSN | CBT-07 | B | 9/14/13 | 13:17 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBT-07 | C | 9/14/13 | 13:18 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBT-08 | A | 9/14/13 | 13:26 | FALSE | | | | UN.SI | Stage I | 7 |
| JB | JSN | CBT-08 | B | 9/14/13 | 13:27 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | CBT-08 | C | 9/14/13 | 13:28 | FALSE | | | | UN.SI | Stage I on III | 11 |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | CBT-13 | A | 9/14/13 | 12:55 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | CBT-13 | B | 9/14/13 | 12:55 | FALSE | | | | UN.SI | Stage I on III | 8 |
| JB | JSN | CBT-13 | C | 9/14/13 | 12:56 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBT-14 | A | 9/14/13 | 13:05 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBT-14 | B | 9/14/13 | 13:06 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBT-14 | C | 9/14/13 | 13:06 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | CBZ-01 | A | 9/13/13 | 10:32 | FALSE | | | | SA.F | Stage I | 4 |
| JB | JSN | CBZ-01 | B | 9/13/13 | 10:33 | FALSE | | | | SA.F | Stage I | 5 |
| JB | JSN | CBZ-01 | C | 9/13/13 | 10:34 | FALSE | | | | SA.F | Stage I | 7 |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | CBB-01 | A | 9/13/13 | 13:22 | brown silts grading to tan silts grading to dark grey silts; polychaetes on surface and at depth = Stage 1 on 3 indicator |
| JB | JSN | CBB-01 | B | 9/13/13 | 13:23 | brown silts grading to tan silts grading to dark grey silts; wiper clasts |
| JB | JSN | CBB-01 | C | 9/13/13 | 13:24 | brown silts grading to tan silts grading to dark grey silts;no biological indicators |
| JB | JSN | CBB-02 | D | 9/14/13 | 11:48 | OVERPENETRATION; tan silts grading to grey silts grading to dark grey silts; oxic void at depth |
| JB | JSN | CBB-02 | E | 9/14/13 | 11:49 | Partial OVERPENETRATION; tan silts grading to grey silts grading to dark grey silts; oxic void at depth; possible burrow surface |
| JB | JSN | CBB-02 | F | 9/14/13 | 11:50 | thin brown surface layer of silts grading to tan silts grading to grey silts; small surface tubes = Stage 1; sed filled void structure at depth = Stage 3 |
| JB | JSN | CBB-03 | A | 9/13/13 | 17:24 | tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; molpadia at depth = Stage 3 indicator |
| JB | JSN | CBB-03 | B | 9/13/13 | 17:25 | thin brown surface layer silts grading to tan silts grading to grey silts; small burrow on surface center = stage 1 indicator; oxic void at depth = Stage 3 indicator; discontinuous trace layer of f. sand at ~3 cm depth |
| JB | JSN | CBB-03 | C | 9/13/13 | 17:25 | tan silts grading to grey silts grading to dark grey silts; several oxic voids at depth = Stage 3 indicator; surface disturbed, trace f. sand layer ~1.5 cm depth |
| JB | JSN | CBC-01 | A | 9/13/13 | 14:33 | tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; 2 oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBC-01 | B | 9/13/13 | 14:34 | brown silts grading to tan silts grading to grey silts; mud clasts on surface likely from previous drop; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator; runeven surface |
| JB | JSN | CBC-01 | C | 9/13/13 | 14:35 | brown silts grading to tan silts grading to grey silts; polychaetes on surface and at depth = Stage 1 on 3 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBC-02 | A | 9/13/13 | 14:23 | thin brown silt layer on surface grading to tan silts grading to grey silts; several large oxic voids at depth = Stage 3 indicator; enrichment of f sand upper 10 cm = historic DM |
| JB | JSN | CBC-02 | B | 9/13/13 | 14:24 | thin brown silt layer on surface grading to tan silts grading to grey silts; several large oxic voids at depth = Stage 3 indicator; polychaete tubes on surface = Stage 1 indicator |
| JB | JSN | CBC-02 | C | 9/13/13 | 14:24 | thin brown very fine sands and silt layer on surface grading to tan silts grading to grey silts; oxic void at depth = Stage 3 indicator; some vary sparse 3 to 2 phi sands intermixed into surface sediments, possible DM; lrge mound in farfield left, possble mudclast or feeding mound |
| JB | JSN | CBC-03 | A | 9/13/13 | 14:13 | thin brown very fine sands and silts on surface grading to tan silts grading to light grey silts; polychaetes at surface and at depth = Stage 1 on 3 indicator; possible burrow right of center |
| JB | JSN | CBC-03 | B | 9/13/13 | 14:13 | thin brown very fine sands and silts on surface grading to tan silts grading to light grey silts; polychaetes and oxic voids at depth = Stage 3 indicator; some vary sparse 3 to 2 phi sands intermixed into surface sediments, possible DM; uneven disturbed? surface |
| JB | JSN | CBC-03 | C | 9/13/13 | 14:14 | thin brown very fine sands and silts on surface grading to tan silts grading to light grey silts; polychaetes at depth = Stage 3 indicator; some vary sparse 3 to 2 phi sands intermixed into surface sediments, possible DM |
| JB | JSN | CBC-04 | A | 9/13/13 | 14:01 | dark grey medium fine sands grading to tan very fine sands and silts grading to grey very fine sands and silts; DM present on surface and intermixed at depth; no biological indicators |
| JB | JSN | CBC-04 | B | 9/13/13 | 14:02 | dark grey medium fine sands grading to tan very fine sands and silts grading to grey very fine sands and silts; DM present on surface and intermixed at depth; no biological indicators; uneven surface |
| JB | JSN | CBC-04 | C | 9/13/13 | 14:03 | dark grey medium fine sands grading to tan very fine sands and silts grading to grey very fine sands and silts; DM present on surface and intermixed at depth; polychaete tubes on surface = Stage 1 indicator; ripples on surface |
| JB | JSN | CBC-05 | A | 9/13/13 | 15:13 | minimal penetration; dark grey medium sands (DM) overlying grey/tan fine sands; polychaete tubes on surface = Stage 1 indicator; uneven/mounded surface |
| JB | JSN | CBC-05 | B | 9/13/13 | 15:14 | minimal penetration; dark grey medium sands (DM) overlying grey/tan fine sands; polychaete tubes on surface = Stage 1 indicator |
| JB | JSN | CBC-05 | C | 9/13/13 | 15:15 | minimal penetration; dark grey medium sands (DM) overlying grey/tan fine sands; polychaete tubes on surface = Stage 1 indicator |
| JB | JSN | CBC-06 | A | 9/13/13 | 15:23 | brown very fine sands mixed with dark grey medium sands (DM); grading to tan very fine sands grading to grey fine sands and silts; DM present intermixed into surface sediments; no biological indicators |
| JB | JSN | CBC-06 | B | 9/13/13 | 15:24 | brown fine sands mixed with dark grey medium sands grading to tan very fine sands and silts grading to grey silts; Large burrow = Stage 3 indicator; DM present intermixed into surface sediments |
| JB | JSN | CBC-06 | C | 9/13/13 | 15:25 | brown fine sands intermixed with dark grey medium sands (DM) grading to tan very fine sands and silts grading to grey very fine sands and silts; DM present intermixed into surface sediments; polychaete tubes on surface = Stage 1 indicator |
| JB | JSN | CBC-07 | A | 9/13/13 | 11:31 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; polychaetes and oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBC-07 | B | 9/13/13 | 11:31 | thin brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; small burrow/void structures = Stage 3 indicator |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | CBC-07 | C | 9/13/13 | 11:32 | tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; possible large burrow entrance far field center of image; disturbed surface |
| JB | JSN | CBC-08 | A | 9/13/13 | 11:12 | dark grey/brown medium sands grading to light grey very fine sands and silts; DM present on surface in form of medim sands; no biological indicators; historic DM at depth |
| JB | JSN | CBC-08 | B | 9/13/13 | 11:14 | dark grey/brown medium sands grading to light grey very fine sands and silts; DM present on surface in form of medim sands; polychaete tubes on surface = Stage 1 indicator |
| JB | JSN | CBC-08 | C | 9/13/13 | 11:14 | dark grey/brown medium sands grading to light grey very fine sands and silts; DM present on surface in form of medim sands; polychaete tubes on surface = Stage 1 indicator |
| JB | JSN | CBC-09 | A | 9/13/13 | 10:55 | brown fine sands grading to tan fine sands grading to grey fine sands and silts; DM present on surface and intermixed at depth polychate tubes on surface = Stage 1 indicator |
| JB | JSN | CBC-09 | B | 9/13/13 | 10:56 | brown fine sands grading to tan fine sands grading to grey fine sands and silts; DM present on surface and intermixed at depth polychate tubes on surface = Stage 1 indicator; RPD>pen |
| JB | JSN | CBC-09 | C | 9/13/13 | 11:05 | dark grey medium sands (DM) grading to tan/grey very fine sands and silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; DM present on surface (medium sands) |
| JB | JSN | CBC-10 | A | 9/13/13 | 10:24 | brown very fine sands grading to tan silty fine sands grading to grey silts and very fine sands; DM present on surface as well as intermixed at depth in form of medium sands; polychaete tubes on surface = Stage 1 indicator; polychaetes at depth and small void/burrow left = Stage 3 indicator |
| JB | JSN | CBC-10 | B | 9/13/13 | 10:25 | minimal penetration; medium sands intermixed with very fine tan fine sands; polychaete tubes on surface = Stage 1 indicator; RPD>pen |
| JB | JSN | CBC-10 | C | 9/13/13 | 10:26 | brown fine sands grading to tan very fine sands and silts grading to dark grey silts and fine sands; DM (medium sands)present on surface and intermixed into surface sediments; DM in patch/layer @ 5.5cm depth; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBC-11 | A | 9/13/13 | 10:16 | brown fine sands grading to tan very fine sands and silts grading to dark grey silts and very fine sands; DM present intermixed into surface sediments; polychaete tubes on surface = Stage 1 indicator; small void upper left, possible burrow center = Stage 3 indicator; large organism at base of image left side |
| JB | JSN | CBC-11 | B | 9/13/13 | 10:17 | brown fine sands intermixed with medium grey sands on surface grading to tan very fine sands and silts grading to grey silts; DM present on surface and intermixed into sediments (medium grey sands); oxic void at depth and polychaete at depth = Stage 3 indicator; small surface tube left and right = Stage I indicator |
| JB | JSN | CBC-11 | C | 9/13/13 | 10:18 | brown fine/medium sands grading to tan very fine sands and silts grading to grey silts; fecal pellets on surface; DM present on surface and intermixed at depth (medium sands); no biological indicators; uneven surface |
| JB | JSN | CBC-12 | A | 9/13/13 | 9:56 | brown very fine sands and silts grading to tan silts grading to grey silts; surface layer of DM over historical DM; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBC-12 | B | 9/13/13 | 9:56 | brown very fine sands and silts grading to tan silts grading to dark grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator; likley historic DM at depth |
| JB | JSN | CBC-12 | C | 9/13/13 | 9:57 | tan silts grading to grey silts; disturbed surface w/ oxidized mud clasts; small surface tubes = Stage 1 indicator; possible woody particles at depth; possible historic DM at depth |
| JB | JSN | CBF-01 | A | 9/14/13 | 10:29 | thin brown surface layer of very fine sands and silts grading to tan silts grading to grey silts; polychaetes on surface = Stage 1 indicator; polychaete and oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-01 | B | 9/14/13 | 10:30 | thin brown surface layer of very fine sands and silts grading to tan silts grading to grey/dark grey silts; polychaetes at surface and at depth = Stage 1 on 3 indicator; oxic void at depth; discontinuous reduced layers at depth possible historic DM? |
| JB | JSN | CBF-01 | C | 9/14/13 | 10:31 | brown surface layer of very fine sands and silts grading to tan silts grading to grey silts; polychaetes in surface sediments = Stage 1 indicator; molpadia at depth = Stage 3 indicator; mud clasts on surface likely artifact from previous drop; discontinuous reduced layers at depth possible historic DM? |
| JB | JSN | CBF-03 | A | 9/14/13 | 11:09 | brown surface layer of very fine sands and silts grading to tan silts grading to dark grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; fine woody debris scattered throughout upper half of profile (DM origins?) |
| JB | JSN | CBF-03 | B | 9/14/13 | 11:09 | brown surface layer of very fine sands and silts grading to tan silts grading to dark grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator; fine woody debris scattered throughout upper half of profile (DM origins?) |
| JB | JSN | CBF-03 | C | 9/14/13 | 11:10 | brown very fine sands and silts grading to tan very fine sands and asilts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator; scattered very small woody debris throughout profile (DM origins?) |
| JB | JSN | CBF-07 | A | 9/14/13 | 10:59 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; oxic void at depth = Stage 3 indicator; disturbed surface; discontinous f sand (trace) layer in surface recent DM?; gray discontinous sed layers at depth = historic DM deposits? |
| JB | JSN | CBF-07 | B | 9/14/13 | 11:00 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; stick amphipods on surface = Stage 2 indicator; very small bits of woody debris in upper half of profile (DM origins?) |
| JB | JSN | CBF-07 | C | 9/14/13 | 11:01 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; stick amphipods on surface = Stage 2 indicator; oxic void at depth = Stage 3 indicator |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | CBF-09 | A | 9/14/13 | 10:40 | thin brown very fine sands and silts layer grading to tan very fine sands and silts grading to grey silts; trace possible DM (dark grey medium sands intermixed into surface sediments; polychaetes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator; discontinuous reduced sed layers at depth possible historic DM |
| JB | JSN | CBF-09 | B | 9/14/13 | 10:40 | brown very fine sands and silts grading to tan silts grading to grey silts; no biological indicators; woody debris on surface; trace f sand in upper ~3 cm possible DM |
| JB | JSN | CBF-09 | C | 9/14/13 | 10:41 | brown very fine sands and silts grading to tan silts grading to grey silts; small void structures lower right = Stage 3 |
| JB | JSN | CBF-10 | A | 9/14/13 | 10:49 | brown very fine sands and silts grading to tan silts grading to dark grey silts; oxic voids at depth = Stage 3 indicator; possible historic DM with depth due to discontinuous reduced layers, although very well mixed |
| JB | JSN | CBF-10 | B | 9/14/13 | 10:50 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; trace f. sand well mixed in upper 3-4 cm likely DM |
| JB | JSN | CBF-10 | C | 9/14/13 | 10:51 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaetes on surface and at depth = Stage 1 on 3 indicator; trace f. sand well mixed in upper 3 cm likely DM |
| JB | JSN | CBF-13 | A | 9/14/13 | 10:19 | brown very fine sands intermixed with dark grey medium sands grading to tan very fine sands and silts grading to grey very fine sands and silts; ambient sands present based on NW location (dark grey medium sands);polychaete tubes on surface = Stage 1 indicator; oxic voids and organisms at depth = Stage 3 indicator |
| JB | JSN | CBF-13 | B | 9/14/13 | 10:20 | brown very fine sands intermixed with dark grey medium sands grading to tan very fine sands and silts grading to grey very fine sands and silts; ambient sands present based on NW location (dark grey medium sands);polychaete tubes on surface = Stage 1 indicator; oxic voids and organisms at depth = Stage 3 indicator |
| JB | JSN | CBF-13 | C | 9/14/13 | 10:21 | brown very fine sands intermixed with dark grey medium sands grading to tan very fine sands and silts grading to grey very fine sands and silts; ambient sands present based on NW location (dark grey medium sands);polychaete tubes on surface = Stage 1 indicator; oxic voids and organisms at depth = Stage 3 indicator |
| JB | JSN | CBF-15 | A | 9/14/13 | 10:10 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBF-15 | B | 9/14/13 | 10:10 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; molpadia at depth = Stage 3 indicator; trace f sand well mixed in upper 3 cm likely DM |
| JB | JSN | CBF-15 | C | 9/14/13 | 10:11 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; disturbed surface; possible small void center bottom |
| JB | JSN | CBF-16 | A | 9/14/13 | 9:47 | brown very fine sands and silts intermixed with dark grey medium sands grading to tan very fine sands and silts grading to grey silts; polychaetes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; Ambient sands present (dark grey medium sands) intermixed into surface sediments |
| JB | JSN | CBF-16 | B | 9/14/13 | 9:47 | brown very fine sands and silts intermixed with dark grey medium snads grading to tan very fine sands and silts grading to grey silts; polychaetes on surface = Stage 1 indicator; organism at depth = Stage 3 indicator; ambient sands present intermixed into surface sediments (dark grey medium sands) top ~3.5 cm |
| JB | JSN | CBF-16 | C | 9/14/13 | 9:49 | brown very fine sands mixed with dark grey medium sands grading to tan very fine sands and silts grading to grey silts; ambient sands present on surface in large patches of dark grey medium sands; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-27 | A | 9/14/13 | 9:28 | brown very fine sands and silts grading to tan silts grading to grey silts; oxic voids at depth = Stage 3 indicator; ambient sands likely in form of dark grey medium sands in trace amount intermixed into surface sediments |
| JB | JSN | CBF-27 | B | 9/14/13 | 9:29 | brown surface layer very fine sands grading to tan silts and very fine sands grading to grey silts; trace sand present intermixed into surface sediments (dark grey medium sands); polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBF-27 | C | 9/14/13 | 9:30 | brown surface layer very fine sands grading to tan silts and very fine sands grading to grey silts; polychaete tube on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBF-28 | A | 9/14/13 | 9:37 | tan very fine sands and silts grading to light grey silts; oxic void at depth = Stage 3 indicator; slight concentrated sand layer near surface likely ambient given location |
| JB | JSN | CBF-28 | B | 9/14/13 | 9:38 | brown very fine sands grading to tan very fine sands and silts grading to light grey silts; polychaetes on surface = Stage 1 indicator; oxic voids and large polychaetes at depth = Stage 3 indicator; ambient sands in form of dark grey medium sands intermixed into surface sediments |
| JB | JSN | CBF-28 | C | 9/14/13 | 9:39 | brown very fine sands grading to tan very fine sands and silts grading to light grey silts; oxic void at depth = Stage 3 indicator; ambient sands in form of dark grey medium sands intermixed into surface sediments |
| JB | JSN | CBF-49 | A | 9/14/13 | 11:32 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids and polychaetes at depth = Stage 3 indicator; trace f. sand in surface layer possible DM |
| JB | JSN | CBF-49 | B | 9/14/13 | 11:33 | brown very fine sands intermixed with possible DM (dark grey medium sands) grading to tan very fine sands and silts grading to grey silts; polychaetes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; possible DM intermixed into surface sediments |

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| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | CBF-49 | C | 9/14/13 | 11:33 | brown very fine sands grading to tan very fine sands and silts grading to grey silts; oxic void at depth = Stage 3 indicator; trace f sand in surface sediments possible DM |
| JB | JSN | CBF-57 | A | 9/14/13 | 14:16 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; molpadia? And polychaetes at depth = Stage 3 indicator |
| JB | JSN | CBF-57 | B | 9/14/13 | 14:16 | brown very fine sands and silts grading to tan silts grading to grey silts; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBF-57 | C | 9/14/13 | 14:17 | brown very fine sands and silts grading to tan silts grading to grey silts; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBF-58 | A | 9/14/13 | 14:25 | brown very fine sands grading to tan very fine sands and silts grading to dark grey silts; oxic void at depth = Stage 3 indicator; polychaete tubes on surface = Stage 1 indicator |
| JB | JSN | CBF-58 | B | 9/14/13 | 14:25 | tan very fine sands and silts grading to dark grey silts; disturbed surface possibly from previous drop; molpadia at depth = Stage 3 indicator |
| JB | JSN | CBF-58 | C | 9/14/13 | 14:26 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; polycahete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-59 | A | 9/14/13 | 14:35 | brown very fine sands grading to tan silts grading to grey silts; large burrow center of image = Stage 3 indicator; polychaetes on surface = Stage 1 indicator; f. sands on surface likely ambient |
| JB | JSN | CBF-59 | B | 9/14/13 | 14:35 | brown very fine sadns and silts grading to tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-59 | C | 9/14/13 | 14:36 | tan very fine sands grading to grey very fine sands and silts; polychaetes on surface and at depth = Stage 1 on 3 indicator |
| JB | JSN | CBF-63 | A | 9/14/13 | 11:22 | brown very fine sands grading to tan very fine sands and silts grading to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-63 | B | 9/14/13 | 11:23 | brown and tan very fine sands and silts grading to tan silts grading to dark grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-63 | C | 9/14/13 | 11:24 | brown and tan very fine sands and silts grading to tan silts grading to dark grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-65 | A | 9/14/13 | 15:12 | brown very fine sands and silts gradinf to tan very fine sands and silts grading to grey silts; large burrow at surface left side = Stage 3 indicator; polychaete tube on surface = Stage 1 indicator |
| JB | JSN | CBF-65 | B | 9/14/13 | 15:13 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-65 | C | 9/14/13 | 15:14 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; burrow left side = Stage 3 indicator |
| JB | JSN | CBF-66 | A | 9/14/13 | 15:22 | tan very fine sands and silts grading to grey very fine sands and silts; polychaetes on surface = Stage 1 inidcator; molpadia at depth = Stage 3 indicator |
| JB | JSN | CBF-66 | B | 9/14/13 | 15:22 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaetes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-66 | C | 9/14/13 | 15:23 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaetes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-67 | A | 9/14/13 | 15:41 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaetes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-67 | B | 9/14/13 | 15:41 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaetes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-67 | C | 9/14/13 | 15:42 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; surface burrow structure; possible organism at depth |
| JB | JSN | CBF-68 | A | 9/14/13 | 15:50 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaetes on surface and at depth = Stage 1 on 3 indicator |
| JB | JSN | CBF-68 | B | 9/14/13 | 15:50 | brown very fine sands and silts grading to tan silts grading to grey silts; burrow and oxic void at depth with molpadia = Stage 3 indicator |
| JB | JSN | CBF-68 | C | 9/14/13 | 15:51 | tan very fine sands and silts grading to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-69 | A | 9/14/13 | 16:08 | tan very fine sands and silts grading to grey silts; oxic void at depth = Stage 3 indicator; burrow center of images |
| JB | JSN | CBF-69 | B | 9/14/13 | 16:09 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaetes at surface and at depth = Stage 1 on 3 indicator |
| JB | JSN | CBF-69 | C | 9/14/13 | 16:10 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaetes at surface and at depth = Stage 1 on 3 indicator |
| JB | JSN | CBF-70 | A | 9/14/13 | 16:19 | brown very fine sands and silts grading to tan silts grading to grey silts;oxic void w/ organism at depth (molpadia?) = Stage 3 indicator |
| JB | JSN | CBF-70 | B | 9/14/13 | 16:19 | brown very fine sands and silts grading to tan silts grading to grey silts;oxic void at depth = Stage 3 indicator |
| JB | JSN | CBF-70 | C | 9/14/13 | 16:20 | brown very fine sands and silts grading to tan silts grading to grey silts; no biological indicators |
| JB | JSN | CBF-76 | A | 9/14/13 | 15:31 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; organism at depth = Stage 3 indicator |

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| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | CBF-76 | B | 9/14/13 | 15:32 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; organism at depth = Stage 3 indicator |
| JB | JSN | CBF-76 | C | 9/14/13 | 15:32 | tan very fine sands and silts grading to grey very fine sands and silts; oxic voids at depth = Stage 3 indicator; surface enriched in f sand |
| JB | JSN | CBF-77 | A | 9/14/13 | 15:57 | brown very fine sands and silts grading to tan silts grading to grey silts; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBF-77 | B | 9/14/13 | 15:58 | brown very fine sands and silts grading to tan silts grading to grey silts; oxic voids at depth = Stage 3 indicator; Deep RPD |
| JB | JSN | CBF-77 | C | 9/14/13 | 15:59 | brown very fine sands and silts grading to tan silts grading to grey silts; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBP-01 | A | 9/13/13 | 15:47 | thin brown silty surface layer grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBP-01 | B | 9/13/13 | 15:48 | thin brown silty surface layer grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; polychaetes at depth = Stage 3 indicator; trace f sand in the upper 4 cm well mixed interpreted as historic DM |
| JB | JSN | CBP-01 | C | 9/13/13 | 15:48 | thin brown silty surface layer grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBP-02 | A | 9/13/13 | 15:57 | thin brown silty surface layer grading to tan silts grading to grey silts; oxic void at depth = Stage 3 indicator; some reduced sed near surface related to DM? |
| JB | JSN | CBP-02 | B | 9/13/13 | 15:58 | tan silts grading to grey silts; several oxic voids at depth = Stage 3 indicator; organism at base of image right side |
| JB | JSN | CBP-02 | C | 9/13/13 | 15:59 | thin brown surface layer silts grading to tan silts grading to grey silts; possible oxic void at base of image = Stage 3 indicator |
| JB | JSN | CBP-03 | A | 9/13/13 | 16:50 | thin brown surface layer silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; organism at depth = Stage 3 indicator; near surface grey seds with trace wood parrticles possible historic DM? |
| JB | JSN | CBP-03 | B | 9/13/13 | 16:50 | thin brown surface layer silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; polychaetes and oxic voids at depth = Stage 3 indicator; darker reduced material at depth possible historic DM? |
| JB | JSN | CBP-03 | C | 9/13/13 | 16:51 | thin brown surface layer silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; polychaetes and oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBP-04 | A | 9/13/13 | 16:40 | thin brown surface layer silts grading to tan silts grading to grey silts; polychaetes and oxic voids at depth = Stage 3 indicator; reduced sed at depth possible historic DM |
| JB | JSN | CBP-04 | B | 9/13/13 | 16:41 | thin brown surface layer silts grading to tan silts grading to grey silts; polychaetes and oxic voids at depth = Stage 3 indicator; polychaete tubes on surface = Stage 1 indicator; reduced sediments at depth shows discontinuous layers, possible historic DM |
| JB | JSN | CBP-04 | C | 9/13/13 | 16:42 | thin brown surface layer silts grading to tan silts grading to grey silts; polychaetes and oxic voids at depth = Stage 3 indicator; polychaete tubes on surface = Stage 1 indicator; reduced sediments at depth shows discontinuous layers, possible historic DM |
| JB | JSN | CBP-05 | A | 9/13/13 | 11:40 | brown very fine sand and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; 4 oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBP-05 | B | 9/13/13 | 11:40 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; jellyfish tentacles at sediment-water interface pushed down into sediment by camera prism |
| JB | JSN | CBP-05 | C | 9/13/13 | 11:41 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator; ripples on surface |
| JB | JSN | CBP-06 | A | 9/13/13 | 11:51 | tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; large surface burrow = Stage 3 indicator |
| JB | JSN | CBP-06 | B | 9/13/13 | 11:52 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; possible voids at depth = Stage 3 indicator |
| JB | JSN | CBP-06 | C | 9/13/13 | 11:52 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; 3voids at depth = Stage 3 indicator; trace of sand mixed in upper 5 cm = historic DM |
| JB | JSN | CBP-07 | A | 9/13/13 | 12:04 | brown very fine sands and silts grding to tan silts grading to grey silts; surface tubes = Stage I indicator |
| JB | JSN | CBP-07 | B | 9/13/13 | 12:05 | brown very fine sands and silts grading to tan silts grading to grey silts; two large oxic voids at depth = Stage 3 indicator; polychaete tubes on surface = Stage 1 indicator; thin layer of fine sand on surface likely DM |
| JB | JSN | CBP-07 | C | 9/13/13 | 12:05 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBP-08 | A | 9/13/13 | 14:43 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; 2 large oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBP-08 | B | 9/13/13 | 14:43 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBP-08 | C | 9/13/13 | 14:44 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; oxic voids at depth = Stage 3 indicator |

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|---|---|---|---|---|---|---|
| JB | JSN | CBP-09 | A | 9/13/13 | 13:35 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; surface tubes; small void/burrow structure right |
| JB | JSN | CBP-09 | B | 9/13/13 | 13:36 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; polychaetes and oxic voids at depth = Stage 3 indicator; disturbed surface or burrow |
| JB | JSN | CBP-09 | C | 9/13/13 | 13:37 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; polychaete at depth left, surface burrow and filled void at depth = Stage 3 indicator |
| JB | JSN | CBP-10 | A | 9/13/13 | 13:49 | thin brown very fine sands surface layer grading to tan silts and very fine sands grading to grey silts; large oxic void at depth = Stage 3 indicator; polychaete tubes on surface= Stage 1 indicator; fine sand enrichment from slope material |
| JB | JSN | CBP-10 | B | 9/13/13 | 13:50 | thin brown very fine sands surface layer grading to tan silts and very fine sands grading to grey silts; sediment filled void/burrow left; disturbed surface; f. sand on surface from slope material. |
| JB | JSN | CBP-10 | C | 9/13/13 | 13:51 | thin brown very fine sands surface layer grading to tan silts grading to grey silts; polychaetes in surface sediments and oxic voids at depth = Stage 1 on 3 indicator; sand enrichment in surface from slope material |
| JB | JSN | CBP-11 | A | 9/13/13 | 9:36 | thin unconsolidated brown surface layer grading to tan silts and very fine sands grading to grey silts; polychaete tubes on surface = Stage 1 indicator; polychaetes at depth = Stage 3 indicator; some very small woody debris at depth (trace) |
| JB | JSN | CBP-11 | B | 9/13/13 | 9:37 | thin unconsolidated brown surface layer grading to tan silts grading to dark grey silts; polychaete tubes on surface = Stage 1 indicator; 2 reduced mud clasts on surface likely from previous drop; very small slivers of woody debrs intermixed into surface sediments; possible sand layer at depth, reduced sed just above? |
| JB | JSN | CBP-11 | C | 9/13/13 | 9:37 | thin unconsolidated brown surface layer (fecal pellets) grading to tan silts and very fine sands grading to dark grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth right side = Stage 3 indicator;burrow on surface ~2cm; reduced sed layer at base of image |
| JB | JSN | CBP-12 | A | 9/13/13 | 15:36 | tan silts grading to grey silts grading to dark grey silts; burrow and oxic void = Stage 3 indicator; polychaete tubes on surface = Stage 1 indicator |
| JB | JSN | CBP-12 | B | 9/13/13 | 15:37 | tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; mud clasts artifact from previous drop |
| JB | JSN | CBP-12 | C | 9/13/13 | 15:38 | thin brown surface layers silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator; reduced layer at depth possible historic DM |
| JB | JSN | CBS-01 | A | 9/13/13 | 16:16 | thin brown surface layers silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBS-01 | B | 9/13/13 | 16:16 | thin brown surface layers silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator; trace of fine sand mixed in upper 2-3 cm |
| JB | JSN | CBS-01 | C | 9/13/13 | 16:18 | thin brown surface layers silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator; f sand (trace) well mixed in upper 2-3cm |
| JB | JSN | CBS-02 | A | 9/13/13 | 17:10 | thin brown surface layer of silts mixed with medium grey sands (DM) grading to tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; trace DM present intermixed into surface sediments |
| JB | JSN | CBS-02 | B | 9/13/13 | 17:10 | thin brown surface layer of silts mixed with medium grey sands (DM) grading to tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; trace DM present intermixed into surface sediments |
| JB | JSN | CBS-02 | C | 9/13/13 | 17:11 | tan very fine sands and silts mixed with medium grey sands (DM) grading to tan silts grading to grey silts; oxic void at depth = Stage 3 indicator; trace DM presend in form of medium sands intermixed into surface sediments |
| JB | JSN | CBS-03 | A | 9/13/13 | 16:06 | tan silts grading to grey silts grading to dark grey silts; polychaete tubes on surface = Stage 1 indicator; large void at depth = Stage 3 indicator; slight enrichment in f sand in upper 5-8 cm historic DM? |
| JB | JSN | CBS-03 | B | 9/13/13 | 16:07 | tan silts grading to grey silts grading to dark grey silts; polychaete tubes on surface = Stage 1 indicator; several oxic voids at depth = Stage 3 indicator; enrichment of f gray sand in upper 10 cm = historic DM? |
| JB | JSN | CBS-03 | C | 9/13/13 | 16:08 | thin brown surface layer silts; grading to tan silts grading to grey silts; likely sed filled void structures at depth = Stage 3 |
| JB | JSN | CBS-04 | A | 9/13/13 | 16:59 | thin brown surface layer silts grading to tan silts grading to grey silts; polychaetes and oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBS-04 | B | 9/13/13 | 16:59 | thin brown surface layer silts grading to tan silts grading to grey silts; polychaetes at surface = Stage 1 indicator; small burrow structure left bottom = Stage 3 indicator |
| JB | JSN | CBS-04 | C | 9/13/13 | 17:00 | thin brown surface layer silts grading to tan silts grading to grey silts; polychaetes at surface = Stage 1 indicator; sed filled voids at depth = Stage 3 indicator |
| JB | JSN | CBS-05 | A | 9/13/13 | 11:22 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBS-05 | B | 9/13/13 | 11:23 | brown very fine sands intermixed with medium grey sands (DM) grading to tan very fine sands and silts grading to green/grey silts; polychaete tubes on surface = Stage 1 indicator; small fraction of DM intermixed into surface sediments |
| JB | JSN | CBS-05 | C | 9/13/13 | 11:23 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaetes on surface and at depth = Stage 1 on 3 indicator |

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| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | CBS-06 | A | 9/14/13 | 8:50 | thin brown surface layer silts grading to tan silts grading to grey silts; small polychaete at depth left, no obvious voids present |
| JB | JSN | CBS-06 | B | 9/14/13 | 8:51 | tan silts intermixed with trace amount of grey medium sands (DM) grading to grey silts; disturbed surface, possible artifact of previous drop; trace DM present in surface sediments |
| JB | JSN | CBS-06 | C | 9/14/13 | 8:51 | tan very fine sands and silts grading to tan silts grading to grey silts; trace amounto of DM (mudium dark grey sands) intermixed into surface sediments; polychaete tubes on surface = Stage 1 indicator |
| JB | JSN | CBS-07 | A | 9/14/13 | 8:38 | brown silts gradinf to tan silts grading to dark grey silts; polychaetes on surface = Stage 1 indicator; polychaetes at depth = Stage 3 indicator |
| JB | JSN | CBS-07 | B | 9/14/13 | 8:39 | tan very fine sands and silts grading to grey very fine sands and silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBS-07 | C | 9/14/13 | 8:40 | tan very fine sands and silts grading to grey silts; diturbed surface possibly from previous drop; polychaete tubes on surface = Stage 1 indicator |
| JB | JSN | CBS-08 | A | 9/13/13 | 10:04 | tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; white organism at depth left side = Stage 3 indicator; disturbed surface; f. sand and small patch of medium sands @ ~14cm depth possible historical DM |
| JB | JSN | CBS-08 | B | 9/13/13 | 10:05 | thin brown unconsilidated surface layer grading to tan very fine sands and silts grading to grey silts; polychaetes on surface = Stage 1 indicator; polychaetes and oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBS-08 | C | 9/13/13 | 10:06 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaetes on surface and at depth = Stage 1 on 3 indicator |
| JB | JSN | CBS-20 | A | 9/14/13 | 8:59 | brown very fine sands and silts intermixed with dark grey medium sands (DM) grading to tan very fine sands and silts grading to grey silts; polychaetes on surface and at depth = Stage 1 on 3 indicator; trace DM present intermixed into surface sediments |
| JB | JSN | CBS-20 | B | 9/14/13 | 8:59 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator; large piece of wood on surface; trace DM (medium dark grey sands) intermixed into surface sediments |
| JB | JSN | CBS-20 | C | 9/14/13 | 9:00 | thin surface layer brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBS-21 | A | 9/14/13 | 9:10 | brown silts and very fine sands grading to tan silts grading to grey silts; disturbed surface; large burrow at surface and large oxic void at depth = Stage 1 on 3 indicator; trace DM present intermixed into surface sediments (dark grey medium sands); discontinuous reduced layers at depth possible historic DM |
| JB | JSN | CBS-21 | B | 9/14/13 | 9:10 | thin brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; oxic voids and molpadia at depth = Stage 3 indicator; |
| JB | JSN | CBS-21 | C | 9/14/13 | 9:11 | tan very fine sands intermixed with tan silts grading to grey silts; polychaetes on surface = Stage 1 indicator; oxic void with organism at depth = Stage 3 indicator; stick amphipod on surface = Stage 2 indicator |
| JB | JSN | CBT-01 | A | 9/14/13 | 13:54 | partial OVERPENETRATION; tan silts grading to grey silts grading to dark grey silts; oxic void at depth |
| JB | JSN | CBT-01 | B | 9/14/13 | 13:55 | brown very fine sands and silts grading to tan silts grading to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBT-01 | C | 9/14/13 | 13:56 | brown very fine sands and silts grading to tan silts grading to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBT-02 | A | 9/14/13 | 13:46 | tan very fine sands and silts grading to grey very fine sands and silts grading to dark grey silts; polychaete tube on surface = Stage 1 indicator |
| JB | JSN | CBT-02 | B | 9/14/13 | 13:46 | tan very fine sands and silts grading to grey very fine sands and silts grading to dark grey silts;oxic void at depth = Stage 3 indicator |
| JB | JSN | CBT-02 | C | 9/14/13 | 13:47 | tan very fine sands and silts grading to grey very fine sands and silts grading to dark grey silts; no biological indicators; trace f. sand possible historical DM |
| JB | JSN | CBT-03 | A | 9/14/13 | 13:38 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tube on surface = Stage 1 indicator |
| JB | JSN | CBT-03 | B | 9/14/13 | 13:39 | brown very fine sands and silts grading to tan silts grading to grey silts; polychaete tube on surface = Stage 1 indicator; jellyfish tentacle pushed down by camera prism right side |
| JB | JSN | CBT-03 | C | 9/14/13 | 13:39 | tans very fine sands and silts grading to grey silts grading to dark grey silts; polychaetes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBT-07 | A | 9/14/13 | 13:16 | tan very fine sands and silts grading to grey silts grading to dark grey silts; polychaete tubes on surface = Stage 1 indicator |
| JB | JSN | CBT-07 | B | 9/14/13 | 13:17 | brown very fine sands and silts grading to tan silts grading to grey silts; large burrow center = Stage 3 indicator; polychaete tube on surface = Stage 1 indicator |
| JB | JSN | CBT-07 | C | 9/14/13 | 13:18 | tan very fine sands and silts grading to grey silts gradiung to dark grey silts; polychaete tubes on surface = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | CBT-08 | A | 9/14/13 | 13:26 | brown very fine sands and silts grading to tan silts grading to dark grey silts; polychaetes in surface sediments = Stage 1 indicator |
| JB | JSN | CBT-08 | B | 9/14/13 | 13:27 | brown very fine sandfs and silts grading to tan silts grading to dark grey silts; large burrow center of image = Stage 3 indicator |
| JB | JSN | CBT-08 | C | 9/14/13 | 13:28 | brown very fine sands and silts grading to tan silts grading to dark grey silts; polychaetes in surface sediments = Stage 1 indicator; sed filled void at depth = Stage 3 indicator |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | CBT-13 | A | 9/14/13 | 12:55 | brown very fine sands and silts grading to tan silts gradng to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBT-13 | B | 9/14/13 | 12:55 | brown very fine sands grading to grey very fine sands and silts; molpadia at depth = Stage 3 indicator; polychaete tube on surface = Stage 1 indicator |
| JB | JSN | CBT-13 | C | 9/14/13 | 12:56 | tan very fine sands and silts grading to grey very fine sands and silts; oxic void at depth = Stage 3 indicator; polychaete tubes on surface = Stage 1 indicator |
| JB | JSN | CBT-14 | A | 9/14/13 | 13:05 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; burrow on right side |
| JB | JSN | CBT-14 | B | 9/14/13 | 13:06 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator |
| JB | JSN | CBT-14 | C | 9/14/13 | 13:06 | brown very fine sands and silts grading to tan very fine sands and silts grading to grey silts; polychaete tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; mud clast artifact of previous drop |
| JB | JSN | CBZ-01 | A | 9/13/13 | 10:32 | minimal penetration; medium sands mixed with very fine sands grading to tan very fine sands; DM (medium sands) present on surface and in surface sediments |
| JB | JSN | CBZ-01 | B | 9/13/13 | 10:33 | minimal penetration; medium sands mixed with very fine sands grading to tan very fine sands; DM (medium sands) present on surface and in surface sediments |
| JB | JSN | CBZ-01 | C | 9/13/13 | 10:34 | Only slight penetration; dark grey medium sands DM; scattered surface rbues in farfield = Stage 1 indicator |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | CBB-01 | A | 9/13/13 | 13:22 | | |
| JB | JSN | CBB-01 | B | 9/13/13 | 13:23 | | |
| JB | JSN | CBB-01 | C | 9/13/13 | 13:24 | | |
| JB | JSN | CBB-02 | D | 9/14/13 | 11:48 | | |
| JB | JSN | CBB-02 | E | 9/14/13 | 11:49 | | |
| JB | JSN | CBB-02 | F | 9/14/13 | 11:50 | | |
| JB | JSN | CBB-03 | A | 9/13/13 | 17:24 | | |
| JB | JSN | CBB-03 | B | 9/13/13 | 17:25 | | |
| JB | JSN | CBB-03 | C | 9/13/13 | 17:25 | | |
| JB | JSN | CBC-01 | A | 9/13/13 | 14:33 | | 1.91 |
| JB | JSN | CBC-01 | B | 9/13/13 | 14:34 | | |
| JB | JSN | CBC-01 | C | 9/13/13 | 14:35 | | |
| JB | JSN | CBC-02 | A | 9/13/13 | 14:23 | | 6.78 |
| JB | JSN | CBC-02 | B | 9/13/13 | 14:24 | | |
| JB | JSN | CBC-02 | C | 9/13/13 | 14:24 | | |
| JB | JSN | CBC-03 | A | 9/13/13 | 14:13 | | |
| JB | JSN | CBC-03 | B | 9/13/13 | 14:13 | 0.99 | |
| JB | JSN | CBC-03 | C | 9/13/13 | 14:14 | 1.27 | |
| JB | JSN | CBC-04 | A | 9/13/13 | 14:01 | >6.40 | |
| JB | JSN | CBC-04 | B | 9/13/13 | 14:02 | >7.23 | |
| JB | JSN | CBC-04 | C | 9/13/13 | 14:03 | >6.09 | |
| JB | JSN | CBC-05 | A | 9/13/13 | 15:13 | >2.21 | |
| JB | JSN | CBC-05 | B | 9/13/13 | 15:14 | >2.02 | |
| JB | JSN | CBC-05 | C | 9/13/13 | 15:15 | >4.72 | |
| JB | JSN | CBC-06 | A | 9/13/13 | 15:23 | >8.99 | |
| JB | JSN | CBC-06 | B | 9/13/13 | 15:24 | 5.15 | |
| JB | JSN | CBC-06 | C | 9/13/13 | 15:25 | 3.68 | >6.7 |
| JB | JSN | CBC-07 | A | 9/13/13 | 11:31 | | |
| JB | JSN | CBC-07 | B | 9/13/13 | 11:31 | | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | CBC-07 | C | 9/13/13 | 11:32 | | |
| JB | JSN | CBC-08 | A | 9/13/13 | 11:12 | 2.28 | >2.4 |
| JB | JSN | CBC-08 | B | 9/13/13 | 11:14 | 2.16 | >1.95 |
| JB | JSN | CBC-08 | C | 9/13/13 | 11:14 | 2.43 | >3.9 |
| JB | JSN | CBC-09 | A | 9/13/13 | 10:55 | >7.75 | |
| JB | JSN | CBC-09 | B | 9/13/13 | 10:56 | >2.42 | |
| JB | JSN | CBC-09 | C | 9/13/13 | 11:05 | 1.69 | >5.43 |
| JB | JSN | CBC-10 | A | 9/13/13 | 10:24 | >7.89 | |
| JB | JSN | CBC-10 | B | 9/13/13 | 10:25 | >3.09 | |
| JB | JSN | CBC-10 | C | 9/13/13 | 10:26 | >7.85 | |
| JB | JSN | CBC-11 | A | 9/13/13 | 10:16 | >8.96 | |
| JB | JSN | CBC-11 | B | 9/13/13 | 10:17 | >6.88 | |
| JB | JSN | CBC-11 | C | 9/13/13 | 10:18 | >7.57 | |
| JB | JSN | CBC-12 | A | 9/13/13 | 9:56 | 1.77 | >11.39 |
| JB | JSN | CBC-12 | B | 9/13/13 | 9:56 | | >8.5 |
| JB | JSN | CBC-12 | C | 9/13/13 | 9:57 | | >9.7 |
| JB | JSN | CBF-01 | A | 9/14/13 | 10:29 | | |
| JB | JSN | CBF-01 | B | 9/14/13 | 10:30 | | 4.49 |
| JB | JSN | CBF-01 | C | 9/14/13 | 10:31 | | 3.88 |
| JB | JSN | CBF-03 | A | 9/14/13 | 11:09 | | |
| JB | JSN | CBF-03 | B | 9/14/13 | 11:09 | | |
| JB | JSN | CBF-03 | C | 9/14/13 | 11:10 | | |
| JB | JSN | CBF-07 | A | 9/14/13 | 10:59 | 0.68 | 4.22 |
| JB | JSN | CBF-07 | B | 9/14/13 | 11:00 | | |
| JB | JSN | CBF-07 | C | 9/14/13 | 11:01 | | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | CBF-09 | A | 9/14/13 | 10:40 | TR | |
| JB | JSN | CBF-09 | B | 9/14/13 | 10:40 | TR | |
| JB | JSN | CBF-09 | C | 9/14/13 | 10:41 | TR | |
| JB | JSN | CBF-10 | A | 9/14/13 | 10:49 | | |
| JB | JSN | CBF-10 | B | 9/14/13 | 10:50 | TR | |
| JB | JSN | CBF-10 | C | 9/14/13 | 10:51 | TR | |
| JB | JSN | CBF-13 | A | 9/14/13 | 10:19 | | |
| JB | JSN | CBF-13 | B | 9/14/13 | 10:20 | | |
| JB | JSN | CBF-13 | C | 9/14/13 | 10:21 | | |
| JB | JSN | CBF-15 | A | 9/14/13 | 10:10 | | |
| JB | JSN | CBF-15 | B | 9/14/13 | 10:10 | TR | |
| JB | JSN | CBF-15 | C | 9/14/13 | 10:11 | | |
| JB | JSN | CBF-16 | A | 9/14/13 | 9:47 | | |
| JB | JSN | CBF-16 | B | 9/14/13 | 9:47 | | |
| JB | JSN | CBF-16 | C | 9/14/13 | 9:49 | | |
| JB | JSN | CBF-27 | A | 9/14/13 | 9:28 | | |
| JB | JSN | CBF-27 | B | 9/14/13 | 9:29 | | |
| JB | JSN | CBF-27 | C | 9/14/13 | 9:30 | | |
| JB | JSN | CBF-28 | A | 9/14/13 | 9:37 | | |
| JB | JSN | CBF-28 | B | 9/14/13 | 9:38 | | |
| JB | JSN | CBF-28 | C | 9/14/13 | 9:39 | | |
| JB | JSN | CBF-49 | A | 9/14/13 | 11:32 | TR | |
| JB | JSN | CBF-49 | B | 9/14/13 | 11:33 | 0.75 | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | CBF-49 | C | 9/14/13 | 11:33 | TR | |
| JB | JSN | CBF-57 | A | 9/14/13 | 14:16 | | |
| JB | JSN | CBF-57 | B | 9/14/13 | 14:16 | | |
| JB | JSN | CBF-57 | C | 9/14/13 | 14:17 | | |
| JB | JSN | CBF-58 | A | 9/14/13 | 14:25 | | |
| JB | JSN | CBF-58 | B | 9/14/13 | 14:25 | | |
| JB | JSN | CBF-58 | C | 9/14/13 | 14:26 | | |
| JB | JSN | CBF-59 | A | 9/14/13 | 14:35 | | |
| JB | JSN | CBF-59 | B | 9/14/13 | 14:35 | | |
| JB | JSN | CBF-59 | C | 9/14/13 | 14:36 | | |
| JB | JSN | CBF-63 | A | 9/14/13 | 11:22 | | |
| JB | JSN | CBF-63 | B | 9/14/13 | 11:23 | | >11.4 |
| JB | JSN | CBF-63 | C | 9/14/13 | 11:24 | | |
| JB | JSN | CBF-65 | A | 9/14/13 | 15:12 | | |
| JB | JSN | CBF-65 | B | 9/14/13 | 15:13 | | |
| JB | JSN | CBF-65 | C | 9/14/13 | 15:14 | | |
| JB | JSN | CBF-66 | A | 9/14/13 | 15:22 | | |
| JB | JSN | CBF-66 | B | 9/14/13 | 15:22 | | |
| JB | JSN | CBF-66 | C | 9/14/13 | 15:23 | | |
| JB | JSN | CBF-67 | A | 9/14/13 | 15:41 | | |
| JB | JSN | CBF-67 | B | 9/14/13 | 15:41 | | |
| JB | JSN | CBF-67 | C | 9/14/13 | 15:42 | | |
| JB | JSN | CBF-68 | A | 9/14/13 | 15:50 | | |
| JB | JSN | CBF-68 | B | 9/14/13 | 15:50 | | |
| JB | JSN | CBF-68 | C | 9/14/13 | 15:51 | | |
| JB | JSN | CBF-69 | A | 9/14/13 | 16:08 | | |
| JB | JSN | CBF-69 | B | 9/14/13 | 16:09 | | |
| JB | JSN | CBF-69 | C | 9/14/13 | 16:10 | | |
| JB | JSN | CBF-70 | A | 9/14/13 | 16:19 | | |
| JB | JSN | CBF-70 | B | 9/14/13 | 16:19 | | |
| JB | JSN | CBF-70 | C | 9/14/13 | 16:20 | | |
| JB | JSN | CBF-76 | A | 9/14/13 | 15:31 | | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | CBF-76 | B | 9/14/13 | 15:32 | | |
| JB | JSN | CBF-76 | C | 9/14/13 | 15:32 | | |
| JB | JSN | CBF-77 | A | 9/14/13 | 15:57 | | |
| JB | JSN | CBF-77 | B | 9/14/13 | 15:58 | | |
| JB | JSN | CBF-77 | C | 9/14/13 | 15:59 | | |
| JB | JSN | CBP-01 | A | 9/13/13 | 15:47 | | |
| JB | JSN | CBP-01 | B | 9/13/13 | 15:48 | | TR |
| JB | JSN | CBP-01 | C | 9/13/13 | 15:48 | | |
| JB | JSN | CBP-02 | A | 9/13/13 | 15:57 | | |
| JB | JSN | CBP-02 | B | 9/13/13 | 15:58 | | |
| JB | JSN | CBP-02 | C | 9/13/13 | 15:59 | | |
| JB | JSN | CBP-03 | A | 9/13/13 | 16:50 | | |
| JB | JSN | CBP-03 | B | 9/13/13 | 16:50 | | |
| JB | JSN | CBP-03 | C | 9/13/13 | 16:51 | | |
| JB | JSN | CBP-04 | A | 9/13/13 | 16:40 | | >8.57 |
| JB | JSN | CBP-04 | B | 9/13/13 | 16:41 | | >12.7 |
| JB | JSN | CBP-04 | C | 9/13/13 | 16:42 | | >11.1 |
| JB | JSN | CBP-05 | A | 9/13/13 | 11:40 | | |
| JB | JSN | CBP-05 | B | 9/13/13 | 11:40 | TR | |
| JB | JSN | CBP-05 | C | 9/13/13 | 11:41 | | |
| JB | JSN | CBP-06 | A | 9/13/13 | 11:51 | | |
| JB | JSN | CBP-06 | B | 9/13/13 | 11:52 | | |
| JB | JSN | CBP-06 | C | 9/13/13 | 11:52 | | TR |
| JB | JSN | CBP-07 | A | 9/13/13 | 12:04 | | |
| JB | JSN | CBP-07 | B | 9/13/13 | 12:05 | 0.28 | |
| JB | JSN | CBP-07 | C | 9/13/13 | 12:05 | | |
| JB | JSN | CBP-08 | A | 9/13/13 | 14:43 | | |
| JB | JSN | CBP-08 | B | 9/13/13 | 14:43 | | |
| JB | JSN | CBP-08 | C | 9/13/13 | 14:44 | | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | CBP-09 | A | 9/13/13 | 13:35 | | |
| JB | JSN | CBP-09 | B | 9/13/13 | 13:36 | | |
| JB | JSN | CBP-09 | C | 9/13/13 | 13:37 | | |
| JB | JSN | CBP-10 | A | 9/13/13 | 13:49 | | |
| JB | JSN | CBP-10 | B | 9/13/13 | 13:50 | | |
| JB | JSN | CBP-10 | C | 9/13/13 | 13:51 | | |
| JB | JSN | CBP-11 | A | 9/13/13 | 9:36 | | |
| JB | JSN | CBP-11 | B | 9/13/13 | 9:37 | | |
| JB | JSN | CBP-11 | C | 9/13/13 | 9:37 | | |
| JB | JSN | CBP-12 | A | 9/13/13 | 15:36 | | |
| JB | JSN | CBP-12 | B | 9/13/13 | 15:37 | | |
| JB | JSN | CBP-12 | C | 9/13/13 | 15:38 | | >3.06 |
| JB | JSN | CBS-01 | A | 9/13/13 | 16:16 | 1.55 | |
| JB | JSN | CBS-01 | B | 9/13/13 | 16:16 | TR | |
| JB | JSN | CBS-01 | C | 9/13/13 | 16:18 | TR | |
| JB | JSN | CBS-02 | A | 9/13/13 | 17:10 | 1.33 | >11.25 |
| JB | JSN | CBS-02 | B | 9/13/13 | 17:10 | 0.65 | >10.46 |
| JB | JSN | CBS-02 | C | 9/13/13 | 17:11 | 1.10 | >14.59 |
| JB | JSN | CBS-03 | A | 9/13/13 | 16:06 | | 5.30 |
| JB | JSN | CBS-03 | B | 9/13/13 | 16:07 | | 6.24 |
| JB | JSN | CBS-03 | C | 9/13/13 | 16:08 | | |
| JB | JSN | CBS-04 | A | 9/13/13 | 16:59 | | >14.63 |
| JB | JSN | CBS-04 | B | 9/13/13 | 16:59 | | >12.73 |
| JB | JSN | CBS-04 | C | 9/13/13 | 17:00 | | >13.5 |
| JB | JSN | CBS-05 | A | 9/13/13 | 11:22 | 0.66 | >6.79 |
| JB | JSN | CBS-05 | B | 9/13/13 | 11:23 | 1.44 | >7.17 |
| JB | JSN | CBS-05 | C | 9/13/13 | 11:23 | 0.40 | >10.9 |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | CBS-06 | A | 9/14/13 | 8:50 | | >13.21 |
| JB | JSN | CBS-06 | B | 9/14/13 | 8:51 | 1.89 | >8.0 |
| JB | JSN | CBS-06 | C | 9/14/13 | 8:51 | TR | >13.0 |
| JB | JSN | CBS-07 | A | 9/14/13 | 8:38 | | >14.7 |
| JB | JSN | CBS-07 | B | 9/14/13 | 8:39 | | 13.45 |
| JB | JSN | CBS-07 | C | 9/14/13 | 8:40 | | >14.0 |
| JB | JSN | CBS-08 | A | 9/13/13 | 10:04 | 1.35 | >10.5 |
| JB | JSN | CBS-08 | B | 9/13/13 | 10:05 | TR | >11.12 |
| JB | JSN | CBS-08 | C | 9/13/13 | 10:06 | 2.02 | >9.3 |
| JB | JSN | CBS-20 | A | 9/14/13 | 8:59 | 0.55 | >12.6 |
| JB | JSN | CBS-20 | B | 9/14/13 | 8:59 | 0.74 | |
| JB | JSN | CBS-20 | C | 9/14/13 | 9:00 | TR | >10.5 |
| JB | JSN | CBS-21 | A | 9/14/13 | 9:10 | 0.34 | >8.15 |
| JB | JSN | CBS-21 | B | 9/14/13 | 9:10 | TR | >10.8 |
| JB | JSN | CBS-21 | C | 9/14/13 | 9:11 | | >10.0 |
| JB | JSN | CBT-01 | A | 9/14/13 | 13:54 | | |
| JB | JSN | CBT-01 | B | 9/14/13 | 13:55 | | |
| JB | JSN | CBT-01 | C | 9/14/13 | 13:56 | | |
| JB | JSN | CBT-02 | A | 9/14/13 | 13:46 | | |
| JB | JSN | CBT-02 | B | 9/14/13 | 13:46 | | |
| JB | JSN | CBT-02 | C | 9/14/13 | 13:47 | | |
| JB | JSN | CBT-03 | A | 9/14/13 | 13:38 | | |
| JB | JSN | CBT-03 | B | 9/14/13 | 13:39 | | |
| JB | JSN | CBT-03 | C | 9/14/13 | 13:39 | | |
| JB | JSN | CBT-07 | A | 9/14/13 | 13:16 | | |
| JB | JSN | CBT-07 | B | 9/14/13 | 13:17 | | |
| JB | JSN | CBT-07 | C | 9/14/13 | 13:18 | | |
| JB | JSN | CBT-08 | A | 9/14/13 | 13:26 | | |
| JB | JSN | CBT-08 | B | 9/14/13 | 13:27 | | |
| JB | JSN | CBT-08 | C | 9/14/13 | 13:28 | | |

**NewFields Sediment Profile Image Analysis**
**Project: COMMENCEMENT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | CBT-13 | A | 9/14/13 | 12:55 | | |
| JB | JSN | CBT-13 | B | 9/14/13 | 12:55 | | |
| JB | JSN | CBT-13 | C | 9/14/13 | 12:56 | | |
| JB | JSN | CBT-14 | A | 9/14/13 | 13:05 | | |
| JB | JSN | CBT-14 | B | 9/14/13 | 13:06 | | |
| JB | JSN | CBT-14 | C | 9/14/13 | 13:06 | | |
| JB | JSN | CBZ-01 | A | 9/13/13 | 10:32 | >2.65 | |
| JB | JSN | CBZ-01 | B | 9/13/13 | 10:33 | >3.28 | |
| JB | JSN | CBZ-01 | C | 9/13/13 | 10:34 | >0.97 | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | EBB01 | A | 9/16/13 | 13:04 | 99.54 | 5.87 | 7.3 | 1.43 | 6.78 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBB01 | B | 9/16/13 | 13:05 | 123.18 | 7.86 | 8.68 | 0.82 | 8.39 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBB01 | C | 9/16/13 | 13:06 | 106.36 | 6.28 | 7.98 | 1.7 | 7.24 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBB02 | A | 9/16/13 | 16:26 | 189.18 | 12.82 | 13.02 | 0.2 | 12.89 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBB02 | B | 9/16/13 | 16:27 | 235.37 | 15.72 | 16.75 | 1.03 | 16.03 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBB02 | C | 9/16/13 | 16:27 | 174.45 | 11.18 | 12.48 | 1.3 | 11.88 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JSN | JSN | EBB03 | A | 9/16/13 | 8:47 | 255.54 | 16.88 | 18.04 | 1.16 | 17.41 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JSN | JSN | EBB03 | B | 9/16/13 | 8:47 | 274.36 | 18.22 | 18.95 | 0.73 | 18.69 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JSN | JSN | EBB03 | C | 9/16/13 | 8:48 | 259.94 | 16.9 | 18.88 | 1.98 | 17.71 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBB04 | A | 9/17/13 | 8:55 | 227.73 | 15.27 | 16.18 | 0.91 | 15.51 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBB04 | B | 9/17/13 | 8:56 | 232.75 | 15.54 | 16.49 | 0.95 | 15.85 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBB04 | C | 9/17/13 | 8:57 | 209.33 | 13.27 | 16.45 | 3.18 | 14.26 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBC06 | A | 9/16/13 | 11:55 | 22.31 | 1.34 | 2.01 | 0.67 | 1.52 | 4 to 3 phi | 3 to 2 phi | 4 to 3 phi | Physical |
| JB | JSN | EBC06 | B | 9/16/13 | 11:55 | 54.93 | 3.59 | 3.94 | 0.35 | 3.74 | 4 to 3 phi | 3 to 2 phi | 4 to 3 phi | Physical |
| JB | JSN | EBC06 | C | 9/16/13 | 11:56 | 100.67 | 6.67 | 7.19 | 0.52 | 6.86 | 4 to 3 phi | 3 to 2 phi | 4 to 3 phi | Physical |
| JB | JSN | EBC07 | A | 9/16/13 | 15:19 | 143.09 | 8.89 | 10.39 | 1.5 | 9.75 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBC07 | B | 9/16/13 | 15:20 | 178.89 | 11.19 | 12.82 | 1.63 | 12.19 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBC07 | C | 9/16/13 | 15:21 | 190.97 | 12.87 | 13.39 | 0.52 | 13.01 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBC08 | A | 9/16/13 | 15:26 | 32.77 | 14.64 | 17.74 | 3.1 | 2.23 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBC08 | B | 9/16/13 | 15:27 | 271.73 | 18.47 | 18.92 | 0.45 | 18.51 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBC08 | C | 9/16/13 | 15:28 | 271.49 | 17.72 | 18.92 | 1.2 | 18.49 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBC09 | A | 9/16/13 | 10:50 | 289.75 | 18.61 | 20.01 | 1.4 | 19.74 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBC09 | B | 9/16/13 | 10:51 | 188.78 | 9.96 | 15.88 | 5.92 | 12.86 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBC09 | C | 9/16/13 | 10:52 | 251.73 | 16.58 | 17.86 | 1.28 | 17.15 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBC10 | A | 9/16/13 | 10:42 | 282.69 | 18.01 | 20.3 | 2.29 | 19.26 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBC10 | B | 9/16/13 | 10:43 | 218.99 | 14.43 | 15.38 | 0.95 | 14.92 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBC10 | C | 9/16/13 | 10:43 | 232.73 | 15.32 | 16.59 | 1.27 | 15.85 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBC11 | A | 9/16/13 | 15:35 | 241.89 | 16.29 | 17.04 | 0.75 | 16.48 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBC11 | B | 9/16/13 | 15:36 | 236.62 | 16.07 | 16.38 | 0.31 | 16.12 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | EBC11 | C | 9/16/13 | 15:36 | 240.25 | 15.75 | 17.11 | 1.36 | 16.36 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBC12 | A | 9/16/13 | 15:01 | 166.09 | 10.71 | 11.78 | 1.07 | 11.31 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBC12 | B | 9/16/13 | 15:01 | 145.87 | 9.1 | 10.59 | 1.49 | 9.94 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBC12 | C | 9/16/13 | 15:02 | 158.30 | 10.41 | 11.1 | 0.69 | 10.78 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBC13 | A | 9/16/13 | 13:55 | 241.18 | 15.06 | 17.38 | 2.32 | 16.43 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBC13 | B | 9/16/13 | 13:56 | 240.61 | 15.88 | 16.88 | 1 | 16.39 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBC13 | C | 9/16/13 | 13:57 | 240.33 | 16.04 | 16.95 | 0.91 | 16.37 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JSN | JSN | EBP01 | A | 9/16/13 | 9:14 | 235.63 | 12.75 | 18.33 | 5.58 | 16.05 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JSN | JSN | EBP01 | B | 9/16/13 | 9:15 | 246.41 | 16.16 | 17.4 | 1.24 | 16.78 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JSN | JSN | EBP01 | C | 9/16/13 | 9:16 | 303.71 | 18.74 | 21.07 | 2.33 | 20.69 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JSN | JSN | EBP03 | A | 9/16/13 | 9:33 | 64.20 | 3.69 | 4.81 | 1.12 | 4.37 | > 4 phi | < -1 phi | 4 to 3 phi | Biogenic |
| JSN | JSN | EBP03 | B | 9/16/13 | 9:34 | 51.28 | 2.77 | 4.22 | 1.45 | 3.49 | > 4 phi | < -1 phi | 4 to 3 phi | Biogenic |
| JSN | JSN | EBP03 | C | 9/16/13 | 9:34 | 87.30 | 4.88 | 6.76 | 1.88 | 5.95 | > 4 phi | < -1 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBP04 | B | 9/16/13 | 17:08 | 270.00 | 16.86 | 19.65 | 2.79 | 18.39 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP04 | C | 9/16/13 | 17:08 | 280.74 | 18.9 | 19.74 | 0.84 | 19.12 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP04 | E | 9/17/13 | 11:45 | 200.59 | 13.34 | 14.23 | 0.89 | 13.66 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP05 | A | 9/16/13 | 16:56 | 266.71 | 17.36 | 19.02 | 1.66 | 18.17 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP05 | B | 9/16/13 | 16:56 | 284.04 | 19.06 | 19.69 | 0.63 | 19.35 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP05 | C | 9/16/13 | 16:57 | 238.86 | 14.61 | 17.74 | 3.13 | 16.27 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP06 | A | 9/16/13 | 16:19 | 265.47 | 17.78 | 18.42 | 0.64 | 18.08 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP06 | B | 9/16/13 | 16:20 | 239.99 | 15.54 | 16.88 | 1.34 | 16.35 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP06 | C | 9/16/13 | 16:20 | 243.19 | 15.02 | 17.7 | 2.68 | 16.56 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP07 | A | 9/16/13 | 13:27 | 185.89 | 10.78 | 13.82 | 3.04 | 12.66 | > 4 phi | 4 to 3 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBP07 | B | 9/16/13 | 13:27 | 209.52 | 13.75 | 15.06 | 1.31 | 14.27 | > 4 phi | 4 to 3 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBP07 | C | 9/16/13 | 13:28 | 145.61 | 9.44 | 11.93 | 2.49 | 9.92 | > 4 phi | 4 to 3 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBP08 | A | 9/16/13 | 13:19 | 189.64 | 12.27 | 13.54 | 1.27 | 12.92 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBP08 | B | 9/16/13 | 13:19 | 148.42 | 9.21 | 11.23 | 2.02 | 10.11 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBP08 | C | 9/16/13 | 13:20 | 166.80 | 11.23 | 11.64 | 0.41 | 11.36 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBP09 | A | 9/16/13 | 13:12 | 194.83 | 12.28 | 13.8 | 1.52 | 13.27 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | EBP09 | B | 9/16/13 | 13:12 | 187.59 | 12.5 | 13.21 | 0.71 | 12.78 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBP09 | C | 9/16/13 | 13:13 | 155.24 | 10.51 | 10.76 | 0.25 | 10.57 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBP10 | A | 9/16/13 | 14:10 | 173.74 | 11.05 | 12.27 | 1.22 | 11.83 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBP10 | B | 9/16/13 | 14:11 | 193.20 | 12.45 | 13.64 | 1.19 | 13.16 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBP10 | C | 9/16/13 | 14:11 | 221.32 | 14.11 | 16.23 | 2.12 | 15.08 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBP11 | A | 9/16/13 | 11:38 | 168.36 | 11.18 | 11.75 | 0.57 | 11.47 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBP11 | B | 9/16/13 | 11:38 | 159.42 | 10.57 | 12.05 | 1.48 | 10.86 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBP11 | C | 9/16/13 | 11:39 | 195.67 | 12.75 | 14.18 | 1.43 | 13.33 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP12 | A | 9/16/13 | 11:16 | 165.87 | 10.23 | 12.41 | 2.18 | 11.30 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP12 | B | 9/16/13 | 11:17 | 171.05 | 11.07 | 12.43 | 1.36 | 11.65 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP12 | C | 9/16/13 | 11:18 | 223.98 | 14.22 | 16.84 | 2.62 | 15.26 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP13 | A | 9/16/13 | 11:26 | 41.57 | 0 | 7.39 | 7.39 | 2.83 | > 4 phi | 4 to 3 phi | 4 to 3 phi | Physical |
| JB | JSN | EBP13 | B | 9/16/13 | 11:27 | 120.67 | 7.41 | 9.55 | 2.14 | 8.22 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBP13 | C | 9/16/13 | 11:27 | 76.32 | 4.83 | 5.95 | 1.12 | 5.20 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JSN | JSN | EBP14 | B | 9/16/13 | 8:59 | 274.32 | 17.65 | 19.33 | 1.68 | 18.69 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JSN | JSN | EBP14 | C | 9/16/13 | 8:59 | 260.12 | 17.43 | 18.08 | 0.65 | 17.72 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JSN | JSN | EBP14 | E | 9/16/13 | 9:58 | 265.51 | 17.24 | 19.24 | 2 | 18.09 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP15 | E | 9/16/13 | 10:06 | 292.84 | 19.06 | 21.03 | 1.97 | 19.95 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP15 | G | 9/16/13 | 10:31 | 260.08 | 17.04 | 18.03 | 0.99 | 17.72 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBP15 | I | 9/16/13 | 10:32 | 197.00 | 12 | 15.82 | 3.82 | 13.42 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR01 | A | 9/16/13 | 15:13 | 239.15 | 14.61 | 17.2 | 2.59 | 16.29 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBR01 | B | 9/16/13 | 15:14 | 214.88 | 14.34 | 15.11 | 0.77 | 14.64 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBR01 | C | 9/16/13 | 15:15 | 233.88 | 15.72 | 16.47 | 0.75 | 15.93 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBR02 | B | 9/17/13 | 16:13 | 169.17 | 8.51 | 14.91 | 6.4 | 11.52 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR02 | C | 9/17/13 | 16:21 | 222.65 | 14.65 | 15.97 | 1.32 | 15.17 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR02 | D | 9/17/13 | 16:22 | 239.86 | 15.41 | 17.24 | 1.83 | 16.34 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR03 | A | 9/16/13 | 16:36 | 232.99 | 15.09 | 16.75 | 1.66 | 15.87 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR03 | B | 9/16/13 | 16:36 | 218.93 | 14.07 | 15.75 | 1.68 | 14.91 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | EBR03 | D | 9/17/13 | 14:15 | 155.74 | 10.27 | 10.91 | 0.64 | 10.61 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR03 | D | 9/17/13 | 14:15 | 155.35 | 10.32 | 10.93 | 0.61 | 10.58 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR03 | E | 9/17/13 | 14:16 | 162.58 | 10.6 | 11.82 | 1.22 | 11.07 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR03 | F | 9/17/13 | 14:17 | 34.64 | 1.74 | 3.09 | 1.35 | 2.36 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR04 | A | 9/16/13 | 15:45 | 260.24 | 16.86 | 17.35 | 0.49 | 17.73 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR04 | B | 9/16/13 | 15:45 | 267.91 | 17.63 | 18.95 | 1.32 | 18.25 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR04 | C | 9/16/13 | 15:46 | 249.23 | 16.68 | 17.88 | 1.2 | 16.98 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR05 | A | 9/17/13 | 11:37 | 257.30 | 16.97 | 18.29 | 1.32 | 17.53 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR05 | B | 9/17/13 | 11:38 | 206.58 | 13.48 | 16.27 | 2.79 | 14.07 | > 4 phi | 4 to 3 phi | > 4 phi | Physical |
| JB | JSN | EBR05 | C | 9/17/13 | 11:38 | 275.08 | 18.08 | 19.04 | 0.96 | 18.74 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR06 | A | 9/16/13 | 14:53 | 245.52 | 16.56 | 17.15 | 0.59 | 16.72 | > 4 phi | 3 to 2 phi | > 4 phi | Biogenic |
| JB | JSN | EBR06 | B | 9/16/13 | 14:54 | 204.73 | 13.43 | 14.7 | 1.27 | 13.95 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR06 | C | 9/16/13 | 14:55 | 243.71 | 15.56 | 17.85 | 2.29 | 16.60 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR07 | A | 9/17/13 | 10:56 | 232.49 | 14.59 | 17.95 | 3.36 | 15.84 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR07 | B | 9/17/13 | 10:56 | 243.40 | 16.09 | 16.97 | 0.88 | 16.58 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBR07 | C | 9/17/13 | 10:57 | 239.71 | 15.82 | 16.88 | 1.06 | 16.33 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS02 | A | 9/16/13 | 13:49 | 243.10 | 16.35 | 17.04 | 0.69 | 16.56 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS02 | B | 9/16/13 | 13:50 | 228.87 | 14.91 | 16.52 | 1.61 | 15.59 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS02 | C | 9/16/13 | 13:50 | 290.58 | 19.13 | 20.33 | 1.2 | 19.79 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS03 | A | 9/17/13 | 11:03 | 290.69 | 19.58 | 20.35 | 0.77 | 19.80 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS03 | C | 9/17/13 | 11:27 | 261.39 | 17.31 | 18.95 | 1.64 | 17.80 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS03 | E | 9/17/13 | 11:28 | 230.57 | 14.7 | 16.72 | 2.02 | 15.71 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS04 | D | 9/17/13 | 12:58 | 253.74 | 16.54 | 18.04 | 1.5 | 17.28 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS04 | E | 9/17/13 | 12:58 | 267.83 | 16.9 | 19.83 | 2.93 | 18.24 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS04 | F | 9/17/13 | 12:59 | 187.48 | 12.48 | 14.34 | 1.86 | 12.77 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS05 | A | 9/17/13 | 14:25 | 209.75 | 13.91 | 15.2 | 1.29 | 14.29 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS05 | B | 9/17/13 | 14:26 | 213.19 | 13.95 | 15.99 | 2.04 | 14.52 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS05 | C | 9/17/13 | 14:26 | 172.90 | 11.32 | 12.45 | 1.13 | 11.78 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS06 | A | 9/16/13 | 13:37 | 259.51 | 15.52 | 18.77 | 3.25 | 17.68 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS06 | B | 9/16/13 | 13:37 | 239.17 | 15.38 | 17.47 | 2.09 | 16.29 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS06 | C | 9/16/13 | 13:38 | 254.81 | 16.99 | 18.02 | 1.03 | 17.36 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | EBS07 | A | 9/16/13 | 14:46 | 244.96 | 16.29 | 16.95 | 0.66 | 16.69 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS07 | B | 9/16/13 | 14:47 | 184.81 | 12.05 | 13.81 | 1.76 | 12.59 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS07 | C | 9/16/13 | 14:47 | 252.19 | 17.01 | 17.56 | 0.55 | 17.18 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS08 | A | 9/17/13 | 13:48 | 184.00 | 10.94 | 13.93 | 2.99 | 12.53 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS08 | B | 9/17/13 | 13:48 | 77.38 | 4.74 | 5.99 | 1.25 | 5.27 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS08 | C | 9/17/13 | 13:49 | 121.58 | 7.96 | 8.67 | 0.71 | 8.28 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS09 | A | 9/16/13 | 11:04 | 219.15 | 13.2 | 15.95 | 2.75 | 14.93 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS09 | B | 9/16/13 | 11:05 | 202.71 | 13.38 | 14.47 | 1.09 | 13.81 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS09 | C | 9/16/13 | 11:06 | 236.84 | 15.08 | 17.15 | 2.07 | 16.13 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS10 | A | 9/17/13 | 13:12 | 196.32 | 12.52 | 14.79 | 2.27 | 13.37 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS10 | B | 9/17/13 | 13:13 | 220.61 | 14.46 | 16.04 | 1.58 | 15.03 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS10 | C | 9/17/13 | 13:14 | 246.88 | 16.63 | 17.22 | 0.59 | 16.82 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS11 | A | 9/17/13 | 14:09 | 204.15 | 13.48 | 14.57 | 1.09 | 13.91 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS11 | B | 9/17/13 | 14:10 | 141.40 | 7.13 | 10.71 | 3.58 | 9.63 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS11 | C | 9/17/13 | 14:11 | 171.78 | 10.73 | 12.75 | 2.02 | 11.70 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS12 | B | 9/17/13 | 12:05 | 257.58 | 16.9 | 18.4 | 1.5 | 17.55 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS12 | C | 9/17/13 | 12:05 | 189.57 | 10.94 | 14.36 | 3.42 | 12.91 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS12 | D | 9/17/13 | 12:06 | 190.27 | 11.54 | 14.11 | 2.57 | 12.96 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS13 | A | 9/16/13 | 14:04 | 246.75 | 15.99 | 17.5 | 1.51 | 16.81 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS13 | B | 9/16/13 | 14:05 | 214.97 | 13.11 | 15.45 | 2.34 | 14.64 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS13 | C | 9/16/13 | 14:05 | 219.65 | 14.66 | 15.89 | 1.23 | 14.96 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS14 | A | 9/16/13 | 13:43 | 233.72 | 14.77 | 16.43 | 1.66 | 15.92 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS14 | B | 9/16/13 | 13:44 | 250.94 | 16.72 | 17.65 | 0.93 | 17.09 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS14 | C | 9/16/13 | 13:45 | 231.88 | 15.52 | 16.43 | 0.91 | 15.79 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS15 | A | 9/16/13 | 11:48 | 159.71 | 9.89 | 12.14 | 2.25 | 10.88 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS15 | B | 9/16/13 | 11:48 | 137.65 | 8.65 | 10.37 | 1.72 | 9.38 | > 4 phi | 4 to 3 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS15 | C | 9/16/13 | 11:49 | 172.69 | 11.07 | 12.3 | 1.23 | 11.76 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS16 | A | 9/17/13 | 14:03 | 163.51 | 10.46 | 12.27 | 1.81 | 11.14 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS16 | B | 9/17/13 | 14:03 | 190.89 | 12.75 | 13.64 | 0.89 | 13.00 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS16 | C | 9/17/13 | 14:04 | 82.49 | 5.34 | 6.1 | 0.76 | 5.62 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | EBS17 | A | 9/17/13 | 14:32 | 258.87 | 16.45 | 19.56 | 3.11 | 17.63 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS17 | B | 9/17/13 | 14:32 | 218.40 | 14.48 | 15.27 | 0.79 | 14.88 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS17 | C | 9/17/13 | 14:33 | 213.75 | 13.53 | 15.43 | 1.9 | 14.56 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS18 | E | 9/17/13 | 12:14 | 210.21 | 11.2 | 16.16 | 4.96 | 14.32 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS18 | F | 9/17/13 | 12:15 | 243.79 | 12.84 | 19.11 | 6.27 | 16.61 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS18 | G | 9/17/13 | 12:16 | 246.83 | 16.11 | 18.11 | 2 | 16.81 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS19 | A | 9/17/13 | 11:51 | 233.99 | 15.3 | 16.93 | 1.63 | 15.94 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS19 | B | 9/17/13 | 11:52 | 220.35 | 14.43 | 16.27 | 1.84 | 15.01 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS19 | C | 9/17/13 | 11:52 | 239.53 | 15.48 | 17.56 | 2.08 | 16.32 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS20 | A | 9/17/13 | 13:05 | 185.34 | 11.94 | 13 | 1.06 | 12.62 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS20 | B | 9/17/13 | 13:05 | 171.61 | 10.48 | 13.29 | 2.81 | 11.69 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS20 | C | 9/17/13 | 13:06 | 157.27 | 9.91 | 11.39 | 1.48 | 10.71 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS21 | A | 9/17/13 | 13:37 | 132.73 | 7.87 | 9.73 | 1.86 | 9.04 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS21 | B | 9/17/13 | 13:37 | 140.98 | 8.78 | 10.21 | 1.43 | 9.60 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS21 | C | 9/17/13 | 13:38 | 149.19 | 9.6 | 10.98 | 1.38 | 10.16 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS22 | A | 9/17/13 | 13:28 | 173.70 | 10.55 | 12.75 | 2.2 | 11.83 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS22 | B | 9/17/13 | 13:29 | 139.39 | 6.12 | 12.75 | 6.63 | 9.49 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS22 | C | 9/17/13 | 13:30 | 146.43 | 8.82 | 10.91 | 2.09 | 9.97 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS23 | A | 9/16/13 | 10:57 | 222.76 | 11.14 | 16.72 | 5.58 | 15.17 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS23 | B | 9/16/13 | 10:58 | 125.18 | 7.24 | 9.98 | 2.74 | 8.53 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS23 | C | 9/16/13 | 10:59 | 192.35 | 10.14 | 17.51 | 7.37 | 13.10 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS24 | A | 9/17/13 | 10:47 | 165.52 | 10.46 | 11.82 | 1.36 | 11.27 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS24 | B | 9/17/13 | 10:47 | 254.55 | 16.43 | 18.29 | 1.86 | 17.34 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS24 | C | 9/17/13 | 10:48 | 232.51 | 15.24 | 16.45 | 1.21 | 15.84 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS25 | D | 9/16/13 | 10:15 | 295.92 | 19.31 | 20.71 | 1.4 | 20.16 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS25 | E | 9/16/13 | 10:16 | 228.30 | 14.11 | 18.33 | 4.22 | 15.55 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS25 | F | 9/16/13 | 10:16 | 299.52 | 19.26 | 21.01 | 1.75 | 20.40 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS27 | A | 9/17/13 | 13:22 | 209.60 | 13.95 | 14.8 | 0.85 | 14.28 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS27 | B | 9/17/13 | 13:22 | 130.22 | 7.53 | 10.37 | 2.84 | 8.87 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS27 | C | 9/17/13 | 13:23 | 211.61 | 12.96 | 15.52 | 2.56 | 14.41 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS28 | A | 9/16/13 | 15:54 | 237.88 | 14.25 | 17.04 | 2.79 | 16.20 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | EBS28 | B | 9/16/13 | 15:55 | 247.37 | 16.49 | 17.29 | 0.8 | 16.85 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS28 | C | 9/16/13 | 15:56 | 257.47 | 17.04 | 18.79 | 1.75 | 17.54 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS29 | A | 9/17/13 | 13:54 | 72.49 | 3.15 | 6.19 | 3.04 | 4.94 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS29 | B | 9/17/13 | 13:54 | 40.48 | 2.02 | 3.25 | 1.23 | 2.76 | > 4 phi | < -1 phi | > 4 phi | Biogenic |
| JB | JSN | EBS29 | C | 9/17/13 | 13:55 | 70.45 | 4.19 | 5.51 | 1.32 | 4.80 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS30 | A | 9/17/13 | 15:11 | 198.71 | 13.09 | 14.34 | 1.25 | 13.54 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS30 | B | 9/17/13 | 15:11 | 174.58 | 11.61 | 12.14 | 0.53 | 11.89 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS30 | C | 9/17/13 | 15:12 | 183.19 | 11.07 | 14.22 | 3.15 | 12.48 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS31 | A | 9/17/13 | 15:25 | 151.62 | 10.21 | 10.8 | 0.59 | 10.33 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS31 | B | 9/17/13 | 15:25 | 187.05 | 12 | 13.18 | 1.18 | 12.74 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS31 | C | 9/17/13 | 15:26 | 173.78 | 11.32 | 12.07 | 0.75 | 11.84 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS32 | A | 9/17/13 | 15:33 | 170.95 | 11.05 | 12.18 | 1.13 | 11.64 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS32 | B | 9/17/13 | 15:34 | 76.46 | 4.67 | 6.33 | 1.66 | 5.21 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS32 | C | 9/17/13 | 15:35 | 80.24 | 4.15 | 6.19 | 2.04 | 5.47 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS33 | A | 9/17/13 | 15:41 | 182.11 | 11.57 | 13.81 | 2.24 | 12.40 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS33 | B | 9/17/13 | 15:41 | 129.70 | 8.64 | 9.51 | 0.87 | 8.83 | > 4 phi | 4 to 3 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS33 | C | 9/17/13 | 15:42 | 146.10 | 9.62 | 10.39 | 0.77 | 9.95 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS34 | A | 9/17/13 | 15:48 | 165.77 | 10.62 | 11.82 | 1.2 | 11.29 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS34 | B | 9/17/13 | 15:49 | 196.15 | 12.66 | 14 | 1.34 | 13.36 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS34 | C | 9/17/13 | 15:49 | 167.82 | 10.98 | 12.41 | 1.43 | 11.43 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS35 | B | 9/17/13 | 15:56 | 254.65 | 16.06 | 17.88 | 1.82 | 17.35 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS35 | C | 9/17/13 | 15:57 | 259.16 | 16.68 | 19.33 | 2.65 | 17.65 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS35 | D | 9/17/13 | 15:57 | 288.47 | 18.69 | 20.62 | 1.93 | 19.65 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS36 | D | 9/17/13 | 17:18 | 138.82 | 8.96 | 9.62 | 0.66 | 9.46 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS36 | E | 9/17/13 | 17:19 | 122.17 | 7.94 | 8.71 | 0.77 | 8.32 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS36 | F | 9/17/13 | 17:20 | 174.58 | 11.41 | 12.75 | 1.34 | 11.89 | > 4 phi | 3 to 2 phi | 4 to 3 phi | Biogenic |
| JB | JSN | EBS37 | D | 9/17/13 | 17:03 | 282.36 | 18.63 | 20.42 | 1.79 | 19.23 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS37 | E | 9/17/13 | 17:03 | 201.28 | 13.28 | 14.59 | 1.31 | 13.71 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBS37 | F | 9/17/13 | 17:04 | 267.45 | 17.27 | 18.67 | 1.4 | 18.22 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT01 | A | 9/17/13 | 9:45 | 199.93 | 12.07 | 15.47 | 3.4 | 13.62 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT01 | B | 9/17/13 | 9:46 | 248.38 | 16.51 | 17.56 | 1.05 | 16.92 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Camera Penetration (cm) | | | | | Grain Size (phi) | | | Surface Roughness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Range | Mean | Min | Max | Maj Mode | |
| JB | JSN | EBT01 | C | 9/17/13 | 9:47 | 158.42 | 8.12 | 12.48 | 4.36 | 10.79 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT02 | A | 9/17/13 | 9:38 | 256.08 | 16.79 | 18.24 | 1.45 | 17.44 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT02 | B | 9/17/13 | 9:39 | 222.58 | 13.13 | 16.89 | 3.76 | 15.16 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT02 | C | 9/17/13 | 9:39 | 243.23 | 15.36 | 18.44 | 3.08 | 16.57 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT03 | A | 9/17/13 | 9:31 | 238.36 | 15.22 | 16.89 | 1.67 | 16.24 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT03 | B | 9/17/13 | 9:32 | 235.90 | 16.02 | 16.99 | 0.97 | 16.07 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT03 | C | 9/17/13 | 9:32 | 201.67 | 12.32 | 15.92 | 3.6 | 13.74 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT04 | A | 9/17/13 | 9:24 | 246.20 | 15.45 | 17.8 | 2.35 | 16.77 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT04 | B | 9/17/13 | 9:25 | 251.18 | 16.86 | 17.67 | 0.81 | 17.11 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT04 | C | 9/17/13 | 9:26 | 241.92 | 15.89 | 17.51 | 1.62 | 16.48 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT05 | A | 9/17/13 | 9:16 | 250.00 | 16.7 | 17.77 | 1.07 | 17.03 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT05 | B | 9/17/13 | 9:17 | 253.67 | 14.36 | 18.22 | 3.86 | 17.28 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT05 | C | 9/17/13 | 9:18 | 273.00 | 18.1 | 19.38 | 1.28 | 18.60 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT07 | A | 9/17/13 | 10:32 | 277.87 | 18.09 | 20.26 | 2.17 | 18.93 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT07 | B | 9/17/13 | 10:33 | 244.98 | 16.24 | 17.15 | 0.91 | 16.69 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT07 | C | 9/17/13 | 10:33 | 268.90 | 16.74 | 19.56 | 2.82 | 18.32 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT08 | A | 9/17/13 | 10:24 | 246.49 | 14.68 | 18.06 | 3.38 | 16.79 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT08 | B | 9/17/13 | 10:25 | 215.16 | 13.5 | 15.95 | 2.45 | 14.66 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT08 | C | 9/17/13 | 10:26 | 259.51 | 17.22 | 18.24 | 1.02 | 17.68 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT09 | A | 9/17/13 | 10:17 | 268.80 | 17.49 | 19.33 | 1.84 | 18.31 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT09 | B | 9/17/13 | 10:17 | 281.12 | 17.9 | 20.44 | 2.54 | 19.15 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT09 | C | 9/17/13 | 10:18 | 256.01 | 17.29 | 17.77 | 0.48 | 17.44 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT10 | A | 9/17/13 | 10:09 | 243.78 | 15.82 | 17.72 | 1.9 | 16.61 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT10 | B | 9/17/13 | 10:10 | 261.54 | 17.36 | 18.27 | 0.91 | 17.81 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT10 | C | 9/17/13 | 10:10 | 243.01 | 14.9 | 17.42 | 2.52 | 16.55 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT11 | A | 9/17/13 | 9:59 | 253.50 | 15.79 | 17.79 | 2 | 17.27 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT11 | B | 9/17/13 | 10:00 | 237.84 | 15.06 | 17.97 | 2.91 | 16.20 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBT11 | C | 9/17/13 | 10:01 | 278.12 | 18.56 | 19.88 | 1.32 | 18.94 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBZ01 | A | 9/16/13 | 15:07 | 181.20 | 11.71 | 12.8 | 1.09 | 12.34 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBZ01 | B | 9/16/13 | 15:07 | 197.24 | 12.5 | 14.79 | 2.29 | 13.44 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |
| JB | JSN | EBZ01 | C | 9/16/13 | 15:08 | 168.46 | 10.26 | 13 | 2.74 | 11.47 | > 4 phi | 4 to 3 phi | > 4 phi | Biogenic |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | EBB01 | A | 9/16/13 | 13:04 | 32.4 | 1.42 | 4.49 | 2.21 | FALSE | FALSE | | | |
| JB | JSN | EBB01 | B | 9/16/13 | 13:05 | 37.12 | 1.21 | 5.36 | 2.53 | FALSE | FALSE | | | |
| JB | JSN | EBB01 | C | 9/16/13 | 13:06 | 31.77 | 0.97 | 3.72 | 2.16 | FALSE | FALSE | | | |
| JB | JSN | EBB02 | A | 9/16/13 | 16:26 | 37.78 | 0.75 | 4.35 | 2.57 | FALSE | TRUE | 3 | 0.99 | Reduced |
| JB | JSN | EBB02 | B | 9/16/13 | 16:27 | 64.32 | 2.15 | 5.44 | 4.38 | FALSE | TRUE | 2 | 1.80 | Reduced |
| JB | JSN | EBB02 | C | 9/16/13 | 16:27 | 47.33 | 1.95 | 4.54 | 3.22 | FALSE | FALSE | | | |
| JSN | JSN | EBB03 | A | 9/16/13 | 8:47 | 53.95 | 1.33 | 5.92 | 3.67 | FALSE | FALSE | | | |
| JSN | JSN | EBB03 | B | 9/16/13 | 8:47 | 41.82 | 1.24 | 6.08 | 2.85 | FALSE | FALSE | | | |
| JSN | JSN | EBB03 | C | 9/16/13 | 8:48 | 43.54 | 0.07 | 5.73 | 2.97 | FALSE | FALSE | | | |
| JB | JSN | EBB04 | A | 9/17/13 | 8:55 | 40.71 | 1.43 | 4.99 | 2.77 | FALSE | FALSE | | | |
| JB | JSN | EBB04 | B | 9/17/13 | 8:56 | 27.14 | 0.86 | 3.61 | 1.85 | FALSE | FALSE | | | |
| JB | JSN | EBB04 | C | 9/17/13 | 8:57 | 40.58 | 0.00 | 8.46 | 2.76 | FALSE | FALSE | | | |
| JB | JSN | EBC06 | A | 9/16/13 | 11:55 | indet | >1.34 | >2.01 | >1.52 | FALSE | FALSE | | | |
| JB | JSN | EBC06 | B | 9/16/13 | 11:55 | 34.07 | 1.07 | 3.33 | 2.32 | FALSE | FALSE | | | |
| JB | JSN | EBC06 | C | 9/16/13 | 11:56 | 37.27 | 1.25 | 5.04 | 2.54 | FALSE | TRUE | 3 | 0.99 | Reduced |
| JB | JSN | EBC07 | A | 9/16/13 | 15:19 | 25.64 | 0.86 | 3.09 | 1.75 | FALSE | FALSE | | | |
| JB | JSN | EBC07 | B | 9/16/13 | 15:20 | 50.99 | 2.29 | 5.24 | 3.47 | FALSE | FALSE | | | |
| JB | JSN | EBC07 | C | 9/16/13 | 15:21 | 53.67 | 3.09 | 4.54 | 3.66 | FALSE | FALSE | | | |
| JB | JSN | EBC08 | A | 9/16/13 | 15:26 | 30.67 | 0.00 | 4.56 | 2.09 | FALSE | FALSE | | | |
| JB | JSN | EBC08 | B | 9/16/13 | 15:27 | 31.63 | 0.00 | 3.83 | 2.15 | FALSE | FALSE | | | |
| JB | JSN | EBC08 | C | 9/16/13 | 15:28 | 33.66 | 0.00 | 5.51 | 2.29 | FALSE | FALSE | | | |
| JB | JSN | EBC09 | A | 9/16/13 | 10:50 | 79.98 | 2.58 | 6.53 | 5.45 | FALSE | FALSE | | | |
| JB | JSN | EBC09 | B | 9/16/13 | 10:51 | 57.47 | 2.63 | 7.4 | 3.91 | FALSE | FALSE | | | |
| JB | JSN | EBC09 | C | 9/16/13 | 10:52 | 61.94 | 3.95 | 7.28 | 4.22 | FALSE | FALSE | | | |
| JB | JSN | EBC10 | A | 9/16/13 | 10:42 | 33.56 | 0.88 | 6.35 | 2.29 | FALSE | FALSE | | | |
| JB | JSN | EBC10 | B | 9/16/13 | 10:43 | 47.13 | 1.02 | 4.77 | 3.21 | FALSE | FALSE | | | |
| JB | JSN | EBC10 | C | 9/16/13 | 10:43 | 47.26 | 1.43 | 5.58 | 3.22 | FALSE | FALSE | | | |
| JB | JSN | EBC11 | A | 9/16/13 | 15:35 | 58.2 | 2.11 | 5.60 | 3.96 | FALSE | FALSE | | | |
| JB | JSN | EBC11 | B | 9/16/13 | 15:36 | 47.19 | 1.13 | 4.29 | 3.21 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | EBC11 | C | 9/16/13 | 15:36 | 55.89 | 2.59 | 4.72 | 3.81 | FALSE | FALSE | | | |
| JB | JSN | EBC12 | A | 9/16/13 | 15:01 | 34.77 | 0.61 | 5.04 | 2.37 | FALSE | FALSE | | | |
| JB | JSN | EBC12 | B | 9/16/13 | 15:01 | 35.64 | 0.96 | 3.31 | 2.43 | FALSE | FALSE | | | |
| JB | JSN | EBC12 | C | 9/16/13 | 15:02 | 31.05 | 0.66 | 3.59 | 2.11 | FALSE | FALSE | | | |
| JB | JSN | EBC13 | A | 9/16/13 | 13:55 | 47.45 | 1.92 | 5.64 | 3.23 | FALSE | FALSE | | | |
| JB | JSN | EBC13 | B | 9/16/13 | 13:56 | 29.9 | 0.84 | 2.75 | 2.04 | FALSE | FALSE | | | |
| JB | JSN | EBC13 | C | 9/16/13 | 13:57 | 47.17 | 0.34 | 5.42 | 3.21 | FALSE | FALSE | | | |
| JSN | JSN | EBP01 | A | 9/16/13 | 9:14 | 21.57 | 0.36 | 5.95 | 1.47 | FALSE | FALSE | | | |
| JSN | JSN | EBP01 | B | 9/16/13 | 9:15 | 41.99 | 1.70 | 4.38 | 2.86 | FALSE | FALSE | | | |
| JSN | JSN | EBP01 | C | 9/16/13 | 9:16 | 51.12 | 1.75 | 5.85 | 3.48 | FALSE | FALSE | | | |
| JSN | JSN | EBP03 | A | 9/16/13 | 9:33 | 28.33 | 0.37 | 3.51 | 1.93 | FALSE | FALSE | | | |
| JSN | JSN | EBP03 | B | 9/16/13 | 9:34 | 37.67 | 0.92 | 3.88 | 2.57 | FALSE | FALSE | | | |
| JSN | JSN | EBP03 | C | 9/16/13 | 9:34 | 56.09 | 2.89 | 5.64 | 3.82 | FALSE | FALSE | | | |
| JB | JSN | EBP04 | B | 9/16/13 | 17:08 | 41.99 | 0.27 | 6.06 | 2.86 | FALSE | FALSE | | | |
| JB | JSN | EBP04 | C | 9/16/13 | 17:08 | 44.42 | 1.31 | 7.80 | 3.03 | FALSE | FALSE | | | |
| JB | JSN | EBP04 | E | 9/17/13 | 11:45 | 47.41 | 2.51 | 4.06 | 3.23 | FALSE | FALSE | | | |
| JB | JSN | EBP05 | A | 9/16/13 | 16:56 | 62.33 | 2.76 | 8.50 | 4.25 | FALSE | FALSE | | | |
| JB | JSN | EBP05 | B | 9/16/13 | 16:56 | 68.91 | 2.99 | 6.33 | 4.69 | FALSE | FALSE | | | |
| JB | JSN | EBP05 | C | 9/16/13 | 16:57 | 63.82 | 1.72 | 7.33 | 4.35 | FALSE | FALSE | | | |
| JB | JSN | EBP06 | A | 9/16/13 | 16:19 | 44.28 | 1.29 | 4.24 | 3.02 | FALSE | FALSE | | | |
| JB | JSN | EBP06 | B | 9/16/13 | 16:20 | 50.67 | 1.31 | 5.31 | 3.45 | FALSE | FALSE | | | |
| JB | JSN | EBP06 | C | 9/16/13 | 16:20 | 48.62 | 1.59 | 6.35 | 3.31 | FALSE | FALSE | | | |
| JB | JSN | EBP07 | A | 9/16/13 | 13:27 | 39.3 | 1.97 | 3.75 | 2.68 | FALSE | FALSE | | | |
| JB | JSN | EBP07 | B | 9/16/13 | 13:27 | 44.14 | 2.16 | 4.42 | 3.01 | FALSE | FALSE | | | |
| JB | JSN | EBP07 | C | 9/16/13 | 13:28 | 42.8 | 2.11 | 4.13 | 2.92 | FALSE | FALSE | | | |
| JB | JSN | EBP08 | A | 9/16/13 | 13:19 | 36.88 | 1.70 | 3.81 | 2.51 | FALSE | FALSE | | | |
| JB | JSN | EBP08 | B | 9/16/13 | 13:19 | 33.12 | 1.36 | 3.25 | 2.26 | FALSE | FALSE | | | |
| JB | JSN | EBP08 | C | 9/16/13 | 13:20 | 42.29 | 1.72 | 3.40 | 2.88 | FALSE | FALSE | | | |
| JB | JSN | EBP09 | A | 9/16/13 | 13:12 | 43.21 | 1.98 | 4.15 | 2.94 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | EBP09 | B | 9/16/13 | 13:12 | 37.17 | 1.11 | 3.09 | 2.53 | FALSE | FALSE | | | |
| JB | JSN | EBP09 | C | 9/16/13 | 13:13 | 44.44 | 2.22 | 4.18 | 3.03 | FALSE | FALSE | | | |
| JB | JSN | EBP10 | A | 9/16/13 | 14:10 | 44.26 | 0.68 | 4.19 | 3.01 | FALSE | FALSE | | | |
| JB | JSN | EBP10 | B | 9/16/13 | 14:11 | 43.62 | 0.43 | 5.79 | 2.97 | FALSE | FALSE | | | |
| JB | JSN | EBP10 | C | 9/16/13 | 14:11 | 38.51 | 0.00 | 5.51 | 2.62 | FALSE | FALSE | | | |
| JB | JSN | EBP11 | A | 9/16/13 | 11:38 | 44.08 | 1.54 | 3.79 | 3.00 | FALSE | FALSE | | | |
| JB | JSN | EBP11 | B | 9/16/13 | 11:38 | 41.84 | 2.06 | 3.72 | 2.85 | FALSE | FALSE | | | |
| JB | JSN | EBP11 | C | 9/16/13 | 11:39 | 37.07 | 1.40 | 3.67 | 2.53 | FALSE | TRUE | 1 | 1.36 | Reduced |
| JB | JSN | EBP12 | A | 9/16/13 | 11:16 | 44.56 | 1.74 | 4.27 | 3.04 | FALSE | FALSE | | | |
| JB | JSN | EBP12 | B | 9/16/13 | 11:17 | 44.51 | 1.72 | 5.49 | 3.03 | FALSE | FALSE | | | |
| JB | JSN | EBP12 | C | 9/16/13 | 11:18 | 47.4 | 1.54 | 5.26 | 3.23 | FALSE | FALSE | | | |
| JB | JSN | EBP13 | A | 9/16/13 | 11:26 | 21.35 | 0.75 | 3.90 | 1.45 | FALSE | FALSE | | | |
| JB | JSN | EBP13 | B | 9/16/13 | 11:27 | 42.89 | 2.13 | 4.77 | 2.92 | FALSE | FALSE | | | |
| JB | JSN | EBP13 | C | 9/16/13 | 11:27 | 38.25 | 1.40 | 4.58 | 2.61 | FALSE | FALSE | | | |
| JSN | JSN | EBP14 | B | 9/16/13 | 8:59 | 29.54 | 0.22 | 4.98 | 2.01 | FALSE | FALSE | | | |
| JSN | JSN | EBP14 | C | 9/16/13 | 8:59 | 55.15 | 1.97 | 5.83 | 3.76 | FALSE | FALSE | | | |
| JSN | JSN | EBP14 | E | 9/16/13 | 9:58 | 42.14 | 0.57 | 4.24 | 2.87 | FALSE | FALSE | | | |
| JB | JSN | EBP15 | E | 9/16/13 | 10:06 | 65.11 | 1.88 | 5.60 | 4.43 | FALSE | TRUE | 3.00 | 0.50 | Oxidized |
| JB | JSN | EBP15 | G | 9/16/13 | 10:31 | 40.79 | 1.29 | 4.90 | 2.78 | FALSE | FALSE | | | |
| JB | JSN | EBP15 | I | 9/16/13 | 10:32 | 55.06 | 2.97 | 5.72 | 3.75 | FALSE | FALSE | | | |
| JB | JSN | EBR01 | A | 9/16/13 | 15:13 | 64.36 | 1.72 | 6.94 | 4.38 | FALSE | FALSE | | | |
| JB | JSN | EBR01 | B | 9/16/13 | 15:14 | 55.95 | 2.72 | 5.90 | 3.81 | FALSE | FALSE | | | |
| JB | JSN | EBR01 | C | 9/16/13 | 15:15 | 46.86 | 2.13 | 3.99 | 3.19 | FALSE | FALSE | | | |
| JB | JSN | EBR02 | B | 9/17/13 | 16:13 | 43.28 | 1.36 | 5.35 | 2.95 | FALSE | FALSE | | | |
| JB | JSN | EBR02 | C | 9/17/13 | 16:21 | 59.45 | 2.79 | 5.60 | 4.05 | FALSE | FALSE | | | |
| JB | JSN | EBR02 | D | 9/17/13 | 16:22 | 47.64 | 2.11 | 4.45 | 3.25 | FALSE | FALSE | | | |
| JB | JSN | EBR03 | A | 9/16/13 | 16:36 | 43.34 | 1.22 | 4.26 | 2.95 | FALSE | FALSE | | | |
| JB | JSN | EBR03 | B | 9/16/13 | 16:36 | 48.26 | 1.72 | 4.48 | 3.29 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | EBR03 | D | 9/17/13 | 14:15 | 47.37 | 2.36 | 4.83 | 3.23 | FALSE | FALSE | | | |
| JB | JSN | EBR03 | D | 9/17/13 | 14:15 | 41.47 | 1.75 | 4.92 | 2.82 | FALSE | FALSE | | | |
| JB | JSN | EBR03 | E | 9/17/13 | 14:16 | 47.72 | 2.13 | 3.79 | 3.25 | FALSE | FALSE | | | |
| JB | JSN | EBR03 | F | 9/17/13 | 14:17 | indet | >1.74 | >3.09 | >2.36 | FALSE | FALSE | | | |
| JB | JSN | EBR04 | A | 9/16/13 | 15:45 | 44.11 | 0.95 | 4.44 | 3.00 | FALSE | FALSE | | | |
| JB | JSN | EBR04 | B | 9/16/13 | 15:45 | 59.31 | 1.36 | 5.38 | 4.04 | FALSE | FALSE | | | |
| JB | JSN | EBR04 | C | 9/16/13 | 15:46 | 56.49 | 1.04 | 5.88 | 3.85 | FALSE | FALSE | | | |
| JB | JSN | EBR05 | A | 9/17/13 | 11:37 | 55.17 | 2.22 | 5.30 | 3.76 | FALSE | FALSE | | | |
| JB | JSN | EBR05 | B | 9/17/13 | 11:38 | 35.18 | 0.25 | 4.33 | 2.40 | FALSE | TRUE | 2 | 1.61 | Reduced |
| JB | JSN | EBR05 | C | 9/17/13 | 11:38 | 61.87 | 2.20 | 6.94 | 4.21 | FALSE | FALSE | | | |
| JB | JSN | EBR06 | A | 9/16/13 | 14:53 | 24.67 | 0.68 | 2.66 | 1.68 | FALSE | FALSE | | | |
| JB | JSN | EBR06 | B | 9/16/13 | 14:54 | 50.07 | 1.90 | 4.35 | 3.41 | FALSE | FALSE | | | |
| JB | JSN | EBR06 | C | 9/16/13 | 14:55 | 38.64 | 0.29 | 4.70 | 2.63 | FALSE | FALSE | | | |
| JB | JSN | EBR07 | A | 9/17/13 | 10:56 | 60.45 | 2.83 | 5.29 | 4.12 | FALSE | FALSE | | | |
| JB | JSN | EBR07 | B | 9/17/13 | 10:56 | 50 | 2.49 | 4.92 | 3.41 | FALSE | FALSE | | | |
| JB | JSN | EBR07 | C | 9/17/13 | 10:57 | 48.96 | 2.35 | 5.63 | 3.33 | FALSE | FALSE | | | |
| JB | JSN | EBS02 | A | 9/16/13 | 13:49 | 38.26 | 1.20 | 3.99 | 2.61 | FALSE | FALSE | | | |
| JB | JSN | EBS02 | B | 9/16/13 | 13:50 | 47.99 | 0.93 | 4.94 | 3.27 | FALSE | FALSE | | | |
| JB | JSN | EBS02 | C | 9/16/13 | 13:50 | 13.68 | 0.16 | 2.20 | 0.93 | FALSE | FALSE | | | |
| JB | JSN | EBS03 | A | 9/17/13 | 11:03 | 65.76 | 3.56 | 6.94 | 4.48 | FALSE | FALSE | | | |
| JB | JSN | EBS03 | C | 9/17/13 | 11:27 | 58.88 | 2.92 | 5.71 | 4.01 | FALSE | FALSE | | | |
| JB | JSN | EBS03 | E | 9/17/13 | 11:28 | 51 | 0.99 | 6.17 | 3.47 | FALSE | FALSE | | | |
| JB | JSN | EBS04 | D | 9/17/13 | 12:58 | 55.34 | 1.32 | 5.76 | 3.77 | FALSE | FALSE | | | |
| JB | JSN | EBS04 | E | 9/17/13 | 12:58 | 48.44 | 1.75 | 5.13 | 3.30 | FALSE | FALSE | | | |
| JB | JSN | EBS04 | F | 9/17/13 | 12:59 | 50.07 | 2.17 | 4.49 | 3.41 | FALSE | FALSE | | | |
| JB | JSN | EBS05 | A | 9/17/13 | 14:25 | 33.36 | 0.59 | 3.61 | 2.27 | FALSE | FALSE | | | |
| JB | JSN | EBS05 | B | 9/17/13 | 14:26 | 42.91 | 1.16 | 4.40 | 2.92 | FALSE | TRUE | 2 | 6.25 | Reduced |
| JB | JSN | EBS05 | C | 9/17/13 | 14:26 | 38.77 | 0.68 | 3.59 | 2.64 | FALSE | TRUE | 1 | 3.23 | Reduced |
| JB | JSN | EBS06 | A | 9/16/13 | 13:37 | 56.38 | 0.45 | 6.20 | 3.84 | FALSE | FALSE | | | |
| JB | JSN | EBS06 | B | 9/16/13 | 13:37 | 62.95 | 1.99 | 5.47 | 4.29 | FALSE | FALSE | | | |
| JB | JSN | EBS06 | C | 9/16/13 | 13:38 | 34.96 | 0.83 | 5.33 | 2.38 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | EBS07 | A | 9/16/13 | 14:46 | 54.39 | 2.29 | 4.65 | 3.70 | FALSE | FALSE | | | |
| JB | JSN | EBS07 | B | 9/16/13 | 14:47 | 47.12 | 1.99 | 5.06 | 3.21 | FALSE | FALSE | | | |
| JB | JSN | EBS07 | C | 9/16/13 | 14:47 | 45.44 | 1.59 | 4.17 | 3.10 | FALSE | FALSE | | | |
| JB | JSN | EBS08 | A | 9/17/13 | 13:48 | 56.29 | 2.84 | 4.81 | 3.83 | FALSE | FALSE | | | |
| JB | JSN | EBS08 | B | 9/17/13 | 13:48 | 41.66 | 1.88 | 4.04 | 2.84 | FALSE | FALSE | | | |
| JB | JSN | EBS08 | C | 9/17/13 | 13:49 | 45.31 | 2.20 | 3.72 | 3.09 | FALSE | FALSE | | | |
| JB | JSN | EBS09 | A | 9/16/13 | 11:04 | 61.75 | 3.29 | 5.53 | 4.21 | FALSE | FALSE | | | |
| JB | JSN | EBS09 | B | 9/16/13 | 11:05 | 46.4 | 1.38 | 4.61 | 3.16 | FALSE | FALSE | | | |
| JB | JSN | EBS09 | C | 9/16/13 | 11:06 | 57.84 | 2.42 | 8.5 | 3.94 | FALSE | FALSE | | | |
| JB | JSN | EBS10 | A | 9/17/13 | 13:12 | 45.65 | 2.11 | 4.65 | 3.11 | FALSE | TRUE | 1 | 1.90 | Reduced |
| JB | JSN | EBS10 | B | 9/17/13 | 13:13 | 50.26 | 2.63 | 3.68 | 3.42 | FALSE | FALSE | | | |
| JB | JSN | EBS10 | C | 9/17/13 | 13:14 | 46.96 | 1.92 | 4.20 | 3.20 | FALSE | FALSE | | | |
| JB | JSN | EBS11 | A | 9/17/13 | 14:09 | 38.66 | 1.56 | 3.74 | 2.63 | FALSE | FALSE | | | |
| JB | JSN | EBS11 | B | 9/17/13 | 14:10 | 24.26 | 0.00 | 4.12 | 1.65 | FALSE | TRUE | 2.00 | 1.29 | Reduced |
| JB | JSN | EBS11 | C | 9/17/13 | 14:11 | 24.37 | 0.54 | 3.29 | 1.66 | FALSE | FALSE | | | |
| JB | JSN | EBS12 | B | 9/17/13 | 12:05 | 78.33 | 4.19 | 6.51 | 5.34 | FALSE | FALSE | | | |
| JB | JSN | EBS12 | C | 9/17/13 | 12:05 | 48.54 | 2.63 | 4.06 | 3.31 | FALSE | TRUE | 1 | 1.08 | Reduced |
| JB | JSN | EBS12 | D | 9/17/13 | 12:06 | 50.05 | 1.81 | 4.35 | 3.41 | FALSE | FALSE | | | |
| JB | JSN | EBS13 | A | 9/16/13 | 14:04 | 40.04 | 1.54 | 3.59 | 2.73 | FALSE | FALSE | | | |
| JB | JSN | EBS13 | B | 9/16/13 | 14:05 | 57.69 | 1.61 | 6.67 | 3.93 | FALSE | FALSE | | | |
| JB | JSN | EBS13 | C | 9/16/13 | 14:05 | 61.01 | 2.45 | 6.15 | 4.16 | FALSE | FALSE | | | |
| JB | JSN | EBS14 | A | 9/16/13 | 13:43 | 52.13 | 1.49 | 5.35 | 3.55 | FALSE | FALSE | | | |
| JB | JSN | EBS14 | B | 9/16/13 | 13:44 | 77.9 | 3.01 | 7.06 | 5.31 | FALSE | FALSE | | | |
| JB | JSN | EBS14 | C | 9/16/13 | 13:45 | 59.75 | 2.42 | 5.60 | 4.07 | FALSE | FALSE | | | |
| JB | JSN | EBS15 | A | 9/16/13 | 11:48 | 30.36 | 0.00 | 4.29 | 2.07 | FALSE | FALSE | | | |
| JB | JSN | EBS15 | B | 9/16/13 | 11:48 | 37.08 | 1.15 | 3.99 | 2.53 | FALSE | FALSE | | | |
| JB | JSN | EBS15 | C | 9/16/13 | 11:49 | 35.51 | 0.52 | 5.70 | 2.42 | FALSE | FALSE | | | |
| JB | JSN | EBS16 | A | 9/17/13 | 14:03 | 43.49 | 2.24 | 3.77 | 2.96 | FALSE | FALSE | | | |
| JB | JSN | EBS16 | B | 9/17/13 | 14:03 | 21.02 | 0.00 | 4.92 | 1.43 | FALSE | FALSE | | | |
| JB | JSN | EBS16 | C | 9/17/13 | 14:04 | 23.07 | 0.72 | 2.36 | 1.57 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | EBS17 | A | 9/17/13 | 14:32 | 49.68 | 1.49 | 4.41 | 3.38 | FALSE | FALSE | | | |
| JB | JSN | EBS17 | B | 9/17/13 | 14:32 | 43.97 | 1.86 | 3.99 | 3.00 | FALSE | FALSE | | | |
| JB | JSN | EBS17 | C | 9/17/13 | 14:33 | 43.43 | 1.54 | 3.74 | 2.96 | FALSE | FALSE | | | |
| JB | JSN | EBS18 | E | 9/17/13 | 12:14 | 68.7 | 2.65 | 6.08 | 4.68 | FALSE | TRUE | 2 | 0.80 | Reduced |
| JB | JSN | EBS18 | F | 9/17/13 | 12:15 | 75.73 | 3.85 | 7.39 | 5.16 | FALSE | FALSE | | | |
| JB | JSN | EBS18 | G | 9/17/13 | 12:16 | 48.42 | 1.38 | 4.33 | 3.30 | FALSE | FALSE | | | |
| JB | JSN | EBS19 | A | 9/17/13 | 11:51 | 46.93 | 2.51 | 4.52 | 3.20 | FALSE | FALSE | | | |
| JB | JSN | EBS19 | B | 9/17/13 | 11:52 | 45.82 | 1.69 | 6.12 | 3.12 | FALSE | FALSE | | | |
| JB | JSN | EBS19 | C | 9/17/13 | 11:52 | 45.5 | 1.20 | 5.12 | 3.10 | FALSE | FALSE | | | |
| JB | JSN | EBS20 | A | 9/17/13 | 13:05 | 26.19 | 0.00 | 3.91 | 1.78 | FALSE | FALSE | | | |
| JB | JSN | EBS20 | B | 9/17/13 | 13:05 | 28.63 | 0.00 | 3.60 | 1.95 | FALSE | TRUE | 4.00 | 0.80 | Reduced |
| JB | JSN | EBS20 | C | 9/17/13 | 13:06 | 40.18 | 1.06 | 3.74 | 2.74 | FALSE | FALSE | | | |
| JB | JSN | EBS21 | A | 9/17/13 | 13:37 | 34.21 | 1.31 | 3.49 | 2.33 | FALSE | FALSE | | | |
| JB | JSN | EBS21 | B | 9/17/13 | 13:37 | 14.06 | 0.00 | 2.58 | 0.96 | FALSE | FALSE | | | |
| JB | JSN | EBS21 | C | 9/17/13 | 13:38 | 10.9 | 0.00 | 3.06 | 0.74 | FALSE | FALSE | | | |
| JB | JSN | EBS22 | A | 9/17/13 | 13:28 | 58.62 | 2.04 | 5.47 | 3.99 | FALSE | FALSE | | | |
| JB | JSN | EBS22 | B | 9/17/13 | 13:29 | 76.89 | 4.19 | 9.08 | 5.24 | FALSE | FALSE | | | |
| JB | JSN | EBS22 | C | 9/17/13 | 13:30 | 54.59 | 3.08 | 4.97 | 3.72 | FALSE | FALSE | | | |
| JB | JSN | EBS23 | A | 9/16/13 | 10:57 | 52.44 | 0.29 | 6.15 | 3.57 | FALSE | FALSE | | | |
| JB | JSN | EBS23 | B | 9/16/13 | 10:58 | 40.59 | 0.00 | 4.61 | 2.76 | FALSE | FALSE | | | |
| JB | JSN | EBS23 | C | 9/16/13 | 10:59 | 68.56 | 0.52 | 7.12 | 4.67 | FALSE | FALSE | | | |
| JB | JSN | EBS24 | A | 9/17/13 | 10:47 | 33.01 | 1.36 | 4.32 | 2.25 | FALSE | FALSE | | | |
| JB | JSN | EBS24 | B | 9/17/13 | 10:47 | 48.6 | 1.59 | 4.81 | 3.31 | FALSE | FALSE | | | |
| JB | JSN | EBS24 | C | 9/17/13 | 10:48 | 47.68 | 1.93 | 4.92 | 3.25 | FALSE | FALSE | | | |
| JB | JSN | EBS25 | D | 9/16/13 | 10:15 | 76.32 | 2.90 | 10.37 | 5.20 | FALSE | FALSE | | | |
| JB | JSN | EBS25 | E | 9/16/13 | 10:16 | 51.21 | 2.29 | 6.29 | 3.49 | FALSE | TRUE | 2 | 0.81 | Reduced |
| JB | JSN | EBS25 | F | 9/16/13 | 10:16 | 77.96 | 5.08 | 9.87 | 5.31 | FALSE | FALSE | | | |
| JB | JSN | EBS27 | A | 9/17/13 | 13:22 | 58.01 | 3.10 | 5.32 | 3.95 | FALSE | FALSE | | | |
| JB | JSN | EBS27 | B | 9/17/13 | 13:22 | 69.81 | 2.81 | 5.54 | 4.76 | FALSE | FALSE | | | |
| JB | JSN | EBS27 | C | 9/17/13 | 13:23 | 66.47 | 2.81 | 6.26 | 4.53 | FALSE | FALSE | | | |
| JB | JSN | EBS28 | A | 9/16/13 | 15:54 | 38.23 | 0.38 | 6.01 | 2.60 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | EBS28 | B | 9/16/13 | 15:55 | 45 | 1.65 | 4.65 | 3.07 | FALSE | FALSE | | | |
| JB | JSN | EBS28 | C | 9/16/13 | 15:56 | 54.56 | 0.00 | 6.51 | 3.72 | FALSE | FALSE | | | |
| JB | JSN | EBS29 | A | 9/17/13 | 13:54 | 39.05 | 1.35 | 5.21 | 2.66 | FALSE | FALSE | | | |
| JB | JSN | EBS29 | B | 9/17/13 | 13:54 | 32.53 | 1.65 | 2.75 | 2.22 | FALSE | FALSE | | | |
| JB | JSN | EBS29 | C | 9/17/13 | 13:55 | 38.57 | 1.45 | 3.88 | 2.63 | FALSE | FALSE | | | |
| JB | JSN | EBS30 | A | 9/17/13 | 15:11 | 57.7 | 2.17 | 6.26 | 3.93 | FALSE | FALSE | | | |
| JB | JSN | EBS30 | B | 9/17/13 | 15:11 | 59.94 | 3.04 | 4.74 | 4.08 | FALSE | FALSE | | | |
| JB | JSN | EBS30 | C | 9/17/13 | 15:12 | 63.55 | 2.99 | 7.44 | 4.33 | FALSE | FALSE | | | |
| JB | JSN | EBS31 | A | 9/17/13 | 15:25 | 45.54 | 1.99 | 4.36 | 3.10 | FALSE | FALSE | | | |
| JB | JSN | EBS31 | B | 9/17/13 | 15:25 | 50.1 | 2.36 | 4.27 | 3.41 | FALSE | FALSE | | | |
| JB | JSN | EBS31 | C | 9/17/13 | 15:26 | 53.42 | 1.81 | 4.65 | 3.64 | FALSE | FALSE | | | |
| JB | JSN | EBS32 | A | 9/17/13 | 15:33 | 33.72 | 1.27 | 3.38 | 2.30 | FALSE | FALSE | | | |
| JB | JSN | EBS32 | B | 9/17/13 | 15:34 | 21.62 | 0.00 | 3.42 | 1.47 | FALSE | FALSE | | | |
| JB | JSN | EBS32 | C | 9/17/13 | 15:35 | 36.21 | 0.70 | 3.93 | 2.47 | FALSE | FALSE | | | |
| JB | JSN | EBS33 | A | 9/17/13 | 15:41 | 47.27 | 1.29 | 4.27 | 3.22 | FALSE | FALSE | | | |
| JB | JSN | EBS33 | B | 9/17/13 | 15:41 | 41.82 | 1.79 | 4.74 | 2.85 | FALSE | FALSE | | | |
| JB | JSN | EBS33 | C | 9/17/13 | 15:42 | 43.45 | 2.13 | 4.12 | 2.96 | FALSE | FALSE | | | |
| JB | JSN | EBS34 | A | 9/17/13 | 15:48 | 43.29 | 1.36 | 4.15 | 2.95 | FALSE | FALSE | | | |
| JB | JSN | EBS34 | B | 9/17/13 | 15:49 | 45.73 | 1.50 | 4.27 | 3.11 | FALSE | FALSE | | | |
| JB | JSN | EBS34 | C | 9/17/13 | 15:49 | 41.09 | 1.52 | 5.13 | 2.80 | FALSE | FALSE | | | |
| JB | JSN | EBS35 | B | 9/17/13 | 15:56 | 69.35 | 3.47 | 5.15 | 4.72 | FALSE | FALSE | | | |
| JB | JSN | EBS35 | C | 9/17/13 | 15:57 | 63.2 | 3.26 | 5.47 | 4.30 | FALSE | TRUE | 2.00 | 1.88 | Reduced |
| JB | JSN | EBS35 | D | 9/17/13 | 15:57 | 71.9 | 3.13 | 6.94 | 4.90 | FALSE | FALSE | | | |
| JB | JSN | EBS36 | D | 9/17/13 | 17:18 | 46.41 | 2.38 | 4.45 | 3.16 | FALSE | FALSE | | | |
| JB | JSN | EBS36 | E | 9/17/13 | 17:19 | 44.38 | 1.97 | 4.47 | 3.02 | FALSE | FALSE | | | |
| JB | JSN | EBS36 | F | 9/17/13 | 17:20 | 54.55 | 2.01 | 5.88 | 3.72 | FALSE | FALSE | | | |
| JB | JSN | EBS37 | D | 9/17/13 | 17:03 | 71.94 | 3.06 | 6.14 | 4.90 | FALSE | FALSE | | | |
| JB | JSN | EBS37 | E | 9/17/13 | 17:03 | 64.05 | 3.59 | 5.63 | 4.36 | FALSE | FALSE | | | |
| JB | JSN | EBS37 | F | 9/17/13 | 17:04 | 52.15 | 1.99 | 4.43 | 3.55 | FALSE | FALSE | | | |
| JB | JSN | EBT01 | A | 9/17/13 | 9:45 | 55.2 | 2.31 | 6.62 | 3.76 | FALSE | FALSE | | | |
| JB | JSN | EBT01 | B | 9/17/13 | 9:46 | 33.15 | 0.48 | 4.94 | 2.26 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Apparent RPD Thickness (cm) | | | | Low DO | Mud Clasts | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | area | Min | Max | Mean | | Present | Count | Avg. Diam. | Oxidation |
| JB | JSN | EBT01 | C | 9/17/13 | 9:47 | 25.37 | 0.81 | 4.92 | 1.73 | FALSE | FALSE | 3.00 | 0.51 | Oxidized |
| JB | JSN | EBT02 | A | 9/17/13 | 9:38 | 41.65 | 1.95 | 6.49 | 2.84 | FALSE | FALSE | | | |
| JB | JSN | EBT02 | B | 9/17/13 | 9:39 | 42.04 | 0.84 | 4.51 | 2.86 | FALSE | FALSE | | | |
| JB | JSN | EBT02 | C | 9/17/13 | 9:39 | 43.3 | 0.43 | 4.27 | 2.95 | FALSE | FALSE | | | |
| JB | JSN | EBT03 | A | 9/17/13 | 9:31 | 31.23 | 0.93 | 4.22 | 2.13 | FALSE | FALSE | | | |
| JB | JSN | EBT03 | B | 9/17/13 | 9:32 | 53.11 | 0.65 | 3.90 | 3.62 | FALSE | FALSE | | | |
| JB | JSN | EBT03 | C | 9/17/13 | 9:32 | 24.07 | 0.34 | 3.34 | 1.64 | FALSE | FALSE | | | |
| JB | JSN | EBT04 | A | 9/17/13 | 9:24 | 50.19 | 0.98 | 3.75 | 3.42 | FALSE | FALSE | | | |
| JB | JSN | EBT04 | B | 9/17/13 | 9:25 | 49.44 | 2.01 | 5.15 | 3.37 | FALSE | FALSE | | | |
| JB | JSN | EBT04 | C | 9/17/13 | 9:26 | 72.25 | 1.36 | 8.24 | 4.92 | FALSE | FALSE | | | |
| JB | JSN | EBT05 | A | 9/17/13 | 9:16 | 39.52 | 1.29 | 4.74 | 2.69 | FALSE | FALSE | | | |
| JB | JSN | EBT05 | B | 9/17/13 | 9:17 | 53.15 | 0.77 | 5.97 | 3.62 | FALSE | TRUE | 2 | 1.16 | Oxidized |
| JB | JSN | EBT05 | C | 9/17/13 | 9:18 | 35.98 | 1.04 | 3.81 | 2.45 | FALSE | FALSE | | | |
| JB | JSN | EBT07 | A | 9/17/13 | 10:32 | 47.41 | 1.95 | 5.04 | 3.23 | FALSE | FALSE | | | |
| JB | JSN | EBT07 | B | 9/17/13 | 10:33 | 44.63 | 2.18 | 5.79 | 3.04 | FALSE | TRUE | 2 | 1.05 | Reduced |
| JB | JSN | EBT07 | C | 9/17/13 | 10:33 | 56.87 | 1.29 | 5.45 | 3.87 | FALSE | FALSE | | | |
| JB | JSN | EBT08 | A | 9/17/13 | 10:24 | 39.4 | 0.00 | 3.31 | 2.68 | FALSE | FALSE | | | |
| JB | JSN | EBT08 | B | 9/17/13 | 10:25 | 45.27 | 1.54 | 4.70 | 3.08 | FALSE | FALSE | | | |
| JB | JSN | EBT08 | C | 9/17/13 | 10:26 | 40.78 | 1.09 | 5.01 | 2.78 | FALSE | FALSE | | | |
| JB | JSN | EBT09 | A | 9/17/13 | 10:17 | 47.31 | 1.63 | 4.24 | 3.22 | FALSE | FALSE | | | |
| JB | JSN | EBT09 | B | 9/17/13 | 10:17 | 40.05 | 1.36 | 3.13 | 2.73 | FALSE | FALSE | | | |
| JB | JSN | EBT09 | C | 9/17/13 | 10:18 | 44.77 | 2.47 | 4.22 | 3.05 | FALSE | FALSE | | | |
| JB | JSN | EBT10 | A | 9/17/13 | 10:09 | 35.88 | 0.66 | 2.83 | 2.44 | FALSE | FALSE | | | |
| JB | JSN | EBT10 | B | 9/17/13 | 10:10 | 63.67 | 3.06 | 7.10 | 4.34 | FALSE | FALSE | | | |
| JB | JSN | EBT10 | C | 9/17/13 | 10:10 | 40.42 | 0.00 | 5.74 | 2.75 | FALSE | FALSE | | | |
| JB | JSN | EBT11 | A | 9/17/13 | 9:59 | 54.02 | 2.15 | 6.04 | 3.68 | FALSE | TRUE | 2 | 1.15 | Reduced |
| JB | JSN | EBT11 | B | 9/17/13 | 10:00 | 46.35 | 1.45 | 4.88 | 3.16 | FALSE | FALSE | | | |
| JB | JSN | EBT11 | C | 9/17/13 | 10:01 | 58.26 | 2.61 | 4.58 | 3.97 | FALSE | FALSE | | | |
| JB | JSN | EBZ01 | A | 9/16/13 | 15:07 | 20.4 | 0.45 | 4.96 | 1.39 | FALSE | FALSE | | | |
| JB | JSN | EBZ01 | B | 9/16/13 | 15:07 | 52.73 | 1.68 | 6.68 | 3.59 | FALSE | FALSE | | | |
| JB | JSN | EBZ01 | C | 9/16/13 | 15:08 | 33.83 | 0.29 | 5.60 | 2.30 | FALSE | FALSE | | | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | EBB01 | A | 9/16/13 | 13:04 | FALSE | | | | SA.F | Stage I | 4 |
| JB | JSN | EBB01 | B | 9/16/13 | 13:05 | FALSE | | | | SA.F | Stage I on III | 9 |
| JB | JSN | EBB01 | C | 9/16/13 | 13:06 | FALSE | | | | SA.F | Stage I on III | 8 |
| JB | JSN | EBB02 | A | 9/16/13 | 16:26 | FALSE | | | | UN.SF | Stage I | 5 |
| JB | JSN | EBB02 | B | 9/16/13 | 16:27 | FALSE | | | | UN.SF | Stage I | 7 |
| JB | JSN | EBB02 | C | 9/16/13 | 16:27 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JSN | JSN | EBB03 | A | 9/16/13 | 8:47 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JSN | JSN | EBB03 | B | 9/16/13 | 8:47 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JSN | JSN | EBB03 | C | 9/16/13 | 8:48 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBB04 | A | 9/17/13 | 8:55 | FALSE | | | | UN.SF | Stage III | 9 |
| JB | JSN | EBB04 | B | 9/17/13 | 8:56 | FALSE | | | | UN.SF | Stage I on III | 8 |
| JB | JSN | EBB04 | C | 9/17/13 | 8:57 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBC06 | A | 9/16/13 | 11:55 | FALSE | | | | SA.F | Stage I | 7 |
| JB | JSN | EBC06 | B | 9/16/13 | 11:55 | FALSE | | | | SA.F | Stage I | 5 |
| JB | JSN | EBC06 | C | 9/16/13 | 11:56 | FALSE | | | | SA.F | Stage I | 5 |
| JB | JSN | EBC07 | A | 9/16/13 | 15:19 | FALSE | | | | UN.SI | Stage I on III | 8 |
| JB | JSN | EBC07 | B | 9/16/13 | 15:20 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | EBC07 | C | 9/16/13 | 15:21 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBC08 | A | 9/16/13 | 15:26 | FALSE | | | | UN.SI | Stage I on III | 8 |
| JB | JSN | EBC08 | B | 9/16/13 | 15:27 | FALSE | | | | UN.SI | Stage I | 4 |
| JB | JSN | EBC08 | C | 9/16/13 | 15:28 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBC09 | A | 9/16/13 | 10:50 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBC09 | B | 9/16/13 | 10:51 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBC09 | C | 9/16/13 | 10:52 | FALSE | | | | UN.SF | Stage I | 7 |
| JB | JSN | EBC10 | A | 9/16/13 | 10:42 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBC10 | B | 9/16/13 | 10:43 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBC10 | C | 9/16/13 | 10:43 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBC11 | A | 9/16/13 | 15:35 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | EBC11 | B | 9/16/13 | 15:36 | FALSE | | | | UN.SI | Stage I on III | 10 |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | EBC11 | C | 9/16/13 | 15:36 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | EBC12 | A | 9/16/13 | 15:01 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | EBC12 | B | 9/16/13 | 15:01 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | EBC12 | C | 9/16/13 | 15:02 | FALSE | | | | UN.SI | Stage I on III | 8 |
| JB | JSN | EBC13 | A | 9/16/13 | 13:55 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBC13 | B | 9/16/13 | 13:56 | FALSE | | | | UN.SF | Stage I on III | 8 |
| JB | JSN | EBC13 | C | 9/16/13 | 13:57 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JSN | JSN | EBP01 | A | 9/16/13 | 9:14 | FALSE | | | | UN.SF | Stage III | 7 |
| JSN | JSN | EBP01 | B | 9/16/13 | 9:15 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JSN | JSN | EBP01 | C | 9/16/13 | 9:16 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JSN | JSN | EBP03 | A | 9/16/13 | 9:33 | FALSE | | | | HR | Stage I | 4 |
| JSN | JSN | EBP03 | B | 9/16/13 | 9:34 | FALSE | | | | HR | Stage I | 5 |
| JSN | JSN | EBP03 | C | 9/16/13 | 9:34 | FALSE | | | | SA.F | Stage I | 7 |
| JB | JSN | EBP04 | B | 9/16/13 | 17:08 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBP04 | C | 9/16/13 | 17:08 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBP04 | E | 9/17/13 | 11:45 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBP05 | A | 9/16/13 | 16:56 | FALSE | | | | UN.SF | Stage I | 7 |
| JB | JSN | EBP05 | B | 9/16/13 | 16:56 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBP05 | C | 9/16/13 | 16:57 | FALSE | | | | UN.SF | Stage I | 7 |
| JB | JSN | EBP06 | A | 9/16/13 | 16:19 | FALSE | | | | UN.SF | Stage I | 6 |
| JB | JSN | EBP06 | B | 9/16/13 | 16:20 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBP06 | C | 9/16/13 | 16:20 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBP07 | A | 9/16/13 | 13:27 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBP07 | B | 9/16/13 | 13:27 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBP07 | C | 9/16/13 | 13:28 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBP08 | A | 9/16/13 | 13:19 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | EBP08 | B | 9/16/13 | 13:19 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | EBP08 | C | 9/16/13 | 13:20 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | EBP09 | A | 9/16/13 | 13:12 | FALSE | | | | UN.SI | Stage I | 5 |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | EBP09 | B | 9/16/13 | 13:12 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBP09 | C | 9/16/13 | 13:13 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBP10 | A | 9/16/13 | 14:10 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBP10 | B | 9/16/13 | 14:11 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBP10 | C | 9/16/13 | 14:11 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBP11 | A | 9/16/13 | 11:38 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBP11 | B | 9/16/13 | 11:38 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBP11 | C | 9/16/13 | 11:39 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBP12 | A | 9/16/13 | 11:16 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBP12 | B | 9/16/13 | 11:17 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBP12 | C | 9/16/13 | 11:18 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBP13 | A | 9/16/13 | 11:26 | FALSE | | | | UN.SI | Stage I | 3 |
| JB | JSN | EBP13 | B | 9/16/13 | 11:27 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBP13 | C | 9/16/13 | 11:27 | FALSE | | | | UN.SI | Stage I | 5 |
| JSN | JSN | EBP14 | B | 9/16/13 | 8:59 | FALSE | | | | UN.SF | Stage I on III | 8 |
| JSN | JSN | EBP14 | C | 9/16/13 | 8:59 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JSN | JSN | EBP14 | E | 9/16/13 | 9:58 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBP15 | E | 9/16/13 | 10:06 | FALSE | | | | UN.SF | Stage III | 11 |
| JB | JSN | EBP15 | G | 9/16/13 | 10:31 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBP15 | I | 9/16/13 | 10:32 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBR01 | A | 9/16/13 | 15:13 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | EBR01 | B | 9/16/13 | 15:14 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | EBR01 | C | 9/16/13 | 15:15 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBR02 | B | 9/17/13 | 16:13 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBR02 | C | 9/17/13 | 16:21 | FALSE | | | | UN.SF | Stage III | 11 |
| JB | JSN | EBR02 | D | 9/17/13 | 16:22 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBR03 | A | 9/16/13 | 16:36 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | EBR03 | B | 9/16/13 | 16:36 | FALSE | | | | UN.SI | Stage I on III | 10 |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | EBR03 | D | 9/17/13 | 14:15 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | EBR03 | D | 9/17/13 | 14:15 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | EBR03 | E | 9/17/13 | 14:16 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBR03 | F | 9/17/13 | 14:17 | FALSE | | | | UN.SI | Stage I | 7 |
| JB | JSN | EBR04 | A | 9/16/13 | 15:45 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBR04 | B | 9/16/13 | 15:45 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBR04 | C | 9/16/13 | 15:46 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBR05 | A | 9/17/13 | 11:37 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBR05 | B | 9/17/13 | 11:38 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBR05 | C | 9/17/13 | 11:38 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBR06 | A | 9/16/13 | 14:53 | FALSE | | | | UN.SF | Stage III | 8 |
| JB | JSN | EBR06 | B | 9/16/13 | 14:54 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBR06 | C | 9/16/13 | 14:55 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBR07 | A | 9/17/13 | 10:56 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBR07 | B | 9/17/13 | 10:56 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBR07 | C | 9/17/13 | 10:57 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBS02 | A | 9/16/13 | 13:49 | FALSE | | | | UN.SF | Stage I | 5 |
| JB | JSN | EBS02 | B | 9/16/13 | 13:50 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBS02 | C | 9/16/13 | 13:50 | FALSE | | | | UN.SF | Stage I on III | 7 |
| JB | JSN | EBS03 | A | 9/17/13 | 11:03 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBS03 | C | 9/17/13 | 11:27 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBS03 | E | 9/17/13 | 11:28 | FALSE | | | | UN.SF | Stage III | 10 |
| JB | JSN | EBS04 | D | 9/17/13 | 12:58 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBS04 | E | 9/17/13 | 12:58 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBS04 | F | 9/17/13 | 12:59 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBS05 | A | 9/17/13 | 14:25 | FALSE | | | | UN.SF | Stage I | 5 |
| JB | JSN | EBS05 | B | 9/17/13 | 14:26 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBS05 | C | 9/17/13 | 14:26 | FALSE | | | | UN.SF | Stage III | 9 |
| JB | JSN | EBS06 | A | 9/16/13 | 13:37 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBS06 | B | 9/16/13 | 13:37 | FALSE | | | | UN.SF | Stage III | 11 |
| JB | JSN | EBS06 | C | 9/16/13 | 13:38 | FALSE | | | | UN.SF | Stage III | 9 |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | EBS07 | A | 9/16/13 | 14:46 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS07 | B | 9/16/13 | 14:47 | FALSE | | | | UN.SI | Stage III | 10 |
| JB | JSN | EBS07 | C | 9/16/13 | 14:47 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS08 | A | 9/17/13 | 13:48 | FALSE | | | | UN.SS | Stage I on III | 11 |
| JB | JSN | EBS08 | B | 9/17/13 | 13:48 | FALSE | | | | UN.SS | Stage I on III | 9 |
| JB | JSN | EBS08 | C | 9/17/13 | 13:49 | FALSE | | | | UN.SS | Stage I | 6 |
| JB | JSN | EBS09 | A | 9/16/13 | 11:04 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | EBS09 | B | 9/16/13 | 11:05 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS09 | C | 9/16/13 | 11:06 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | EBS10 | A | 9/17/13 | 13:12 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS10 | B | 9/17/13 | 13:13 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | EBS10 | C | 9/17/13 | 13:14 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS11 | A | 9/17/13 | 14:09 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBS11 | B | 9/17/13 | 14:10 | FALSE | | | | UN.SF | Stage I | 4 |
| JB | JSN | EBS11 | C | 9/17/13 | 14:11 | FALSE | | | | UN.SF | Stage I on III | 8 |
| JB | JSN | EBS12 | B | 9/17/13 | 12:05 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBS12 | C | 9/17/13 | 12:05 | FALSE | | | | UN.SF | Stage III | 10 |
| JB | JSN | EBS12 | D | 9/17/13 | 12:06 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBS13 | A | 9/16/13 | 14:04 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBS13 | B | 9/16/13 | 14:05 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | EBS13 | C | 9/16/13 | 14:05 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | EBS14 | A | 9/16/13 | 13:43 | FALSE | | | | UN.SF | Stage III | 10 |
| JB | JSN | EBS14 | B | 9/16/13 | 13:44 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBS14 | C | 9/16/13 | 13:45 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBS15 | A | 9/16/13 | 11:48 | FALSE | | | | UN.SI | Stage I on III | 8 |
| JB | JSN | EBS15 | B | 9/16/13 | 11:48 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBS15 | C | 9/16/13 | 11:49 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBS16 | A | 9/17/13 | 14:03 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBS16 | B | 9/17/13 | 14:03 | FALSE | | | | UN.SF | Stage I | 3 |
| JB | JSN | EBS16 | C | 9/17/13 | 14:04 | FALSE | | | | UN.SF | Stage I | 4 |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | EBS17 | A | 9/17/13 | 14:32 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBS17 | B | 9/17/13 | 14:32 | FALSE | | | | UN.SF | Stage I | 5 |
| JB | JSN | EBS17 | C | 9/17/13 | 14:33 | FALSE | | | | UN.SF | Stage III | 9 |
| JB | JSN | EBS18 | E | 9/17/13 | 12:14 | FALSE | | | | UN.SF | Stage III | 11 |
| JB | JSN | EBS18 | F | 9/17/13 | 12:15 | FALSE | | | | UN.SF | Stage III | 11 |
| JB | JSN | EBS18 | G | 9/17/13 | 12:16 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBS19 | A | 9/17/13 | 11:51 | FALSE | | | | UN.SF | Stage III | 10 |
| JB | JSN | EBS19 | B | 9/17/13 | 11:52 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBS19 | C | 9/17/13 | 11:52 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBS20 | A | 9/17/13 | 13:05 | FALSE | | | | UN.SI | Stage I on III | 8 |
| JB | JSN | EBS20 | B | 9/17/13 | 13:05 | FALSE | | | | UN.SI | Stage I on III | 8 |
| JB | JSN | EBS20 | C | 9/17/13 | 13:06 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBS21 | A | 9/17/13 | 13:37 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBS21 | B | 9/17/13 | 13:37 | FALSE | | | | UN.SI | Stage I | 3 |
| JB | JSN | EBS21 | C | 9/17/13 | 13:38 | FALSE | | | | UN.SI | Stage I | 2 |
| JB | JSN | EBS22 | A | 9/17/13 | 13:28 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | EBS22 | B | 9/17/13 | 13:29 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | EBS22 | C | 9/17/13 | 13:30 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | EBS23 | A | 9/16/13 | 10:57 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS23 | B | 9/16/13 | 10:58 | FALSE | | | | UN.SI | Stage III | 9 |
| JB | JSN | EBS23 | C | 9/16/13 | 10:59 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | EBS24 | A | 9/17/13 | 10:47 | FALSE | | | | UN.SI | Stage I on III | 8 |
| JB | JSN | EBS24 | B | 9/17/13 | 10:47 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS24 | C | 9/17/13 | 10:48 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS25 | D | 9/16/13 | 10:15 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBS25 | E | 9/16/13 | 10:16 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBS25 | F | 9/16/13 | 10:16 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBS27 | A | 9/17/13 | 13:22 | FALSE | | | | UN.SF | Stage III | 11 |
| JB | JSN | EBS27 | B | 9/17/13 | 13:22 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | EBS27 | C | 9/17/13 | 13:23 | FALSE | | | | UN.SI | Stage I | 7 |
| JB | JSN | EBS28 | A | 9/16/13 | 15:54 | FALSE | | | | UN.SI | Stage I | 5 |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | EBS28 | B | 9/16/13 | 15:55 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | EBS28 | C | 9/16/13 | 15:56 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS29 | A | 9/17/13 | 13:54 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | EBS29 | B | 9/17/13 | 13:54 | FALSE | | | | UN.SI | Stage I | 4 |
| JB | JSN | EBS29 | C | 9/17/13 | 13:55 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | EBS30 | A | 9/17/13 | 15:11 | FALSE | | | | UN.SI | Stage III | 11 |
| JB | JSN | EBS30 | B | 9/17/13 | 15:11 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | EBS30 | C | 9/17/13 | 15:12 | FALSE | | | | UN.SI | Stage I on III | 11 |
| JB | JSN | EBS31 | A | 9/17/13 | 15:25 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS31 | B | 9/17/13 | 15:25 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS31 | C | 9/17/13 | 15:26 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS32 | A | 9/17/13 | 15:33 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | EBS32 | B | 9/17/13 | 15:34 | FALSE | | | | UN.SI | Stage I | 3 |
| JB | JSN | EBS32 | C | 9/17/13 | 15:35 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBS33 | A | 9/17/13 | 15:41 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS33 | B | 9/17/13 | 15:41 | FALSE | | | | UN.SI | Stage I | 5 |
| JB | JSN | EBS33 | C | 9/17/13 | 15:42 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBS34 | A | 9/17/13 | 15:48 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBS34 | B | 9/17/13 | 15:49 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | EBS34 | C | 9/17/13 | 15:49 | FALSE | | | | UN.SI | Stage I on III | 9 |
| JB | JSN | EBS35 | B | 9/17/13 | 15:56 | FALSE | | | | UN.SF | Stage III | 11 |
| JB | JSN | EBS35 | C | 9/17/13 | 15:57 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBS35 | D | 9/17/13 | 15:57 | FALSE | | | | UN.SF | Stage I | 7 |
| JB | JSN | EBS36 | D | 9/17/13 | 17:18 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS36 | E | 9/17/13 | 17:19 | FALSE | | | | UN.SI | Stage I on III | 10 |
| JB | JSN | EBS36 | F | 9/17/13 | 17:20 | FALSE | | | | UN.SI | Stage I | 6 |
| JB | JSN | EBS37 | D | 9/17/13 | 17:03 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBS37 | E | 9/17/13 | 17:03 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBS37 | F | 9/17/13 | 17:04 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBT01 | A | 9/17/13 | 9:45 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBT01 | B | 9/17/13 | 9:46 | FALSE | | | | UN.SF | Stage I on III | 9 |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Methane | | | | Benthic Habitat | Successional Stage | OSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Present | Count | Mean Depth | Diameter | | | |
| JB | JSN | EBT01 | C | 9/17/13 | 9:47 | FALSE | | | | UN.SF | Stage I | 4 |
| JB | JSN | EBT02 | A | 9/17/13 | 9:38 | FALSE | | | | UN.SF | Stage I | 5 |
| JB | JSN | EBT02 | B | 9/17/13 | 9:39 | FALSE | | | | UN.SF | Stage I | 5 |
| JB | JSN | EBT02 | C | 9/17/13 | 9:39 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBT03 | A | 9/17/13 | 9:31 | FALSE | | | | UN.SF | Stage I on III | 8 |
| JB | JSN | EBT03 | B | 9/17/13 | 9:32 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBT03 | C | 9/17/13 | 9:32 | FALSE | | | | UN.SF | Stage I on III | 8 |
| JB | JSN | EBT04 | A | 9/17/13 | 9:24 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBT04 | B | 9/17/13 | 9:25 | FALSE | | | | UN.SF | Stage I | 6 |
| JB | JSN | EBT04 | C | 9/17/13 | 9:26 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBT05 | A | 9/17/13 | 9:16 | FALSE | | | | UN.SF | Stage I | 5 |
| JB | JSN | EBT05 | B | 9/17/13 | 9:17 | FALSE | | | | UN.SF | Stage I | 6 |
| JB | JSN | EBT05 | C | 9/17/13 | 9:18 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBT07 | A | 9/17/13 | 10:32 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBT07 | B | 9/17/13 | 10:33 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBT07 | C | 9/17/13 | 10:33 | FALSE | | | | UN.SF | Stage I on III | 11 |
| JB | JSN | EBT08 | A | 9/17/13 | 10:24 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBT08 | B | 9/17/13 | 10:25 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBT08 | C | 9/17/13 | 10:26 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBT09 | A | 9/17/13 | 10:17 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBT09 | B | 9/17/13 | 10:17 | FALSE | | | | UN.SF | Stage I | 5 |
| JB | JSN | EBT09 | C | 9/17/13 | 10:18 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBT10 | A | 9/17/13 | 10:09 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBT10 | B | 9/17/13 | 10:10 | FALSE | | | | UN.SF | Stage I | 7 |
| JB | JSN | EBT10 | C | 9/17/13 | 10:10 | FALSE | | | | UN.SF | Stage I on III | 9 |
| JB | JSN | EBT11 | A | 9/17/13 | 9:59 | FALSE | | | | UN.SF | Stage I | 6 |
| JB | JSN | EBT11 | B | 9/17/13 | 10:00 | FALSE | | | | UN.SF | Stage III | 10 |
| JB | JSN | EBT11 | C | 9/17/13 | 10:01 | FALSE | | | | UN.SF | Stage I | 7 |
| JB | JSN | EBZ01 | A | 9/16/13 | 15:07 | FALSE | | | | UN.SF | Stage I | 3 |
| JB | JSN | EBZ01 | B | 9/16/13 | 15:07 | FALSE | | | | UN.SF | Stage I on III | 10 |
| JB | JSN | EBZ01 | C | 9/16/13 | 15:08 | FALSE | | | | UN.SF | Stage I on III | 9 |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | EBB01 | A | 9/16/13 | 13:04 | brown to tan to grey fine sands; surface tubes = Stage 1 indicator; minimal shell fragments; high sand content likely from Duwamish west waterway input |
| JB | JSN | EBB01 | B | 9/16/13 | 13:05 | tan to gray fine sands and silts; surface tubes = Stage 1 indicator (nice big tubes god example); small oxic void w/ organsism = Stage 3 indicator;; high sand content likely from Duwamish west waterway input |
| JB | JSN | EBB01 | C | 9/16/13 | 13:06 | tan to grey fine sands and silts; surface tubes = Stage 1 indicator; small oxic void = Stage 3 indicator; sand content likely due to Duwamish west waterway input |
| JB | JSN | EBB02 | A | 9/16/13 | 16:26 | brown to tan to grey silts; surface tubes = Stage 1 indicator |
| JB | JSN | EBB02 | B | 9/16/13 | 16:27 | brown to tan to grey silts; surface tubes = Stage 1 indicator |
| JB | JSN | EBB02 | C | 9/16/13 | 16:27 | brown to tan to grey silts; surface tubes = Stage 1 indicator; sed filled voids at depth = Stage 3 indicator |
| JSN | JSN | EBB03 | A | 9/16/13 | 8:47 | soft, tan to gray silt; trace f sand in the upper sed column, small void left = Stage III indicator, small surface tubes = Stage I indicator; fecal pellets |
| JSN | JSN | EBB03 | B | 9/16/13 | 8:47 | soft, tan to gray silt; trace f sand in the upper sed column, small worm & burrow center = Stage III indicator, small surface tube right = Stage I indicator; fecal pellets; shell particle near surface right |
| JSN | JSN | EBB03 | C | 9/16/13 | 8:48 | soft, tan to gray silt; f sand in the upper ~4 cm sed column, large void bottom, small burrow structures right = Stage III indicator, small surface tube right = Stage I indicator; small woody particles near surface, trace shell particles |
| JB | JSN | EBB04 | A | 9/17/13 | 8:55 | brown to tan to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBB04 | B | 9/17/13 | 8:56 | brown to tan to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBB04 | C | 9/17/13 | 8:57 | brown to tan to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBC06 | A | 9/16/13 | 11:55 | tan fine sands throughout (DM>p); minimal penetration; piece of wood on surface as well as shell fragment; no biological indicators |
| JB | JSN | EBC06 | B | 9/16/13 | 11:55 | tan fine sands throughout (DM>p); minimal penetration; surface tubes = Stage 1 indicator; fine woody debris on surface |
| JB | JSN | EBC06 | C | 9/16/13 | 11:56 | tan to grey to dark grey fine sands (DM>p); reduced mud calsts on surface; no biological indicators |
| JB | JSN | EBC07 | A | 9/16/13 | 15:19 | tan to grey to dark grey silts; reduced silts at depth indicative of most recent dredged material placement - however well developed RPD indicates it has been in place for more than a few months; surface tubes = Stage 1 indicator; small void at interface left = Stage 3 indicator (PRINT FOR REPORT - good example of DM sitting a long time, stage 3 organisms utilizing DM |
| JB | JSN | EBC07 | B | 9/16/13 | 15:20 | tan to grey to dark grey silts; reduced silts at depth indicative of most recent dredged material placement; surface tubes = Stage 1 indicator |
| JB | JSN | EBC07 | C | 9/16/13 | 15:21 | tan to grey to dark grey silts; reduced sands and silts at depth indicative of most recent dredged material placement; surface tubes = Stage 1 indicator; small void at interface right = Stage 3 indicator |
| JB | JSN | EBC08 | A | 9/16/13 | 15:26 | tan to gray to dark grey silts; reduced sands and silts at depth with discontiinuous layers = historical dredged material; surface tubes = Stage 1 indicator; void at depth = Stage 3 indicator |
| JB | JSN | EBC08 | B | 9/16/13 | 15:27 | tan to gray to dark grey silts; reduced sands and silts at depth hisorical dredged material; surface tubes = Stage 1 indicator; f. sand in upper ~3 cm likely related to recent DM |
| JB | JSN | EBC08 | C | 9/16/13 | 15:28 | tan to gray to dark grey silts; smeared, mostly continuous layers of reduced sands and silts at depth = possible more recent dredged material; surface tubes = Stage 1 indicator; void at depth = Stage 3 indicator |
| JB | JSN | EBC09 | A | 9/16/13 | 10:50 | unconsolidated, tan to gray silts; tubes on surface = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; faint trace f sand well mixed in the upper 4-5 cm possible historic DM |
| JB | JSN | EBC09 | B | 9/16/13 | 10:51 | unconsolidated, tan to gray silts; tubes on surface = Stage 1 indicator; well developed oxic void at depth = Stage 3 indicator; surface = significant slope; faint trace f sand well mixed in the upper 4-5 cm possible historic DM |
| JB | JSN | EBC09 | C | 9/16/13 | 10:52 | unconsolidated, brown to tan to gray silts; small tubes on surface = Stage 1 indicator; surface fecal pellets; no obvious voids |
| JB | JSN | EBC10 | A | 9/16/13 | 10:42 | unconsolidated; tan to grey silts w/ trace sands intermixed in surface sediments (possible DM); tubes on surface = Stage 1 indicator; well developed oxic void at depth = Stage 3 indicator; reduced patches at depth possible related to older DM? |
| JB | JSN | EBC10 | B | 9/16/13 | 10:43 | brown very fine sands and silts to tan to grey silts; oxic void at depth = Stage 3 indicator; small surface tube = Stage 1 indicator; discontinuous reduced layer at depth possible DM origins |
| JB | JSN | EBC10 | C | 9/16/13 | 10:43 | tan to grey silt; surface tubes = Stage 1 indicator; two well developed oxic voids = Stage 3 indicator; discontinuous reduced layer at depth possible DM origins |
| JB | JSN | EBC11 | A | 9/16/13 | 15:35 | tan to gray to dark grey silts; reduced sands and silts at depth indicative of more recent dredged material; polychaetes at depth = Stage 3 indicator; DM layering evident, although near surface layering has been obscured due to bioturbation (PRINT FOR REPORT) |
| JB | JSN | EBC11 | B | 9/16/13 | 15:36 | brown to tan to grey to dark grey silts; surface tubes = Stage 1 indicator; organism inside oxic void at depth = Stage 3 indicator; reduced silts and sands at depth = more recent DM, although has been in place more than a few months |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | EBC11 | C | 9/16/13 | 15:36 | brown to tan to grey to dark grey silts; polychaetes at depth = Stage 3 indicator; reduced silts and sands at depth = more recent DM, although has been in place for a while |
| JB | JSN | EBC12 | A | 9/16/13 | 15:01 | brown to tan to dark grey silts; surface tubes = Stage 1 indicator; reduced silts and sands at depth = more recent DM, although has been in place more than a few months |
| JB | JSN | EBC12 | B | 9/16/13 | 15:01 | brown to tan to dark grey silts; surface tubes = Stage 1 indicator; reduced silts and sands at depth = more recent DM, although has been in place more than a few months |
| JB | JSN | EBC12 | C | 9/16/13 | 15:02 | brown to tan to dark grey silts; surface tubes = Stage 1 indicator; reduced silts and sands at depth = more recent DM, although has been in place more than a few months; well developed oxic void at depth at DM layer interface = Stage 3 indicator; interesting variety of organisms - hydroids, polyps, surface tubes) (PRINT FOR REPORT) |
| JB | JSN | EBC13 | A | 9/16/13 | 13:55 | tan to grey to dark grey silts; surface tubes = Stage 1 indicator; 2 small oxic voids at depth = Stage 3 indicator; reduced silts at depth indicative of historic dredged material placement |
| JB | JSN | EBC13 | B | 9/16/13 | 13:56 | tan to grey to dark grey silts; surface tubes = Stage 1 indicator; small oxic voids at depth = Stage 3 indicator; reduced silts at depth indicative of historic dredged material placement;sea pen or polyp on surface (PRINT FOR REPORT) |
| JB | JSN | EBC13 | C | 9/16/13 | 13:57 | tan to grey to dark grey silts; surface tubes = Stage 1 indicator; large polychaete at depth = Stage 3 indicator; reduced silts at depth indicative of historic dredged material placement; small clam shell on surface |
| JSN | JSN | EBP01 | A | 9/16/13 | 9:14 | 2.5 cm layer of gray silt and f sand over relict aRPD, gray surface silt/sand layer may be DM or surface disturbance/deposition from sed sampling program??; small polychaetes at depth (Capitella?), burrow structure right = Stage III indicator (PRINT FOR REPORT) |
| JSN | JSN | EBP01 | B | 9/16/13 | 9:15 | soft tan to gray silt, sand enriched in the upper ~2.5 cm = sands from western slope?; surface tubes = Stage I indicator, numerous well developed voids = Stage III (PRINT FOR REPORT with Rep A) |
| JSN | JSN | EBP01 | C | 9/16/13 | 9:16 | soft tan to gray silt, slight sand enriched in the upper sediment column, Stage I surface tubes, large feeding void left, right slide of image partially overpenetrated |
| JSN | JSN | EBP03 | A | 9/16/13 | 9:33 | low pen; tan to gray silts and f sand, thin surface layer of med sand (from sediment sampling disturbance or sand from nearby slope?), rocks on surface with bryozoans, surface tubes, scattered shell debris. |
| JSN | JSN | EBP03 | B | 9/16/13 | 9:34 | low pen; tan to gray silts and f sand, thin surface layer of med sand (from sediment sampling disturbance or sand from nearby slope?), rocks on surface with bryozoans, surface tubes, scattered shell debris on surface |
| JSN | JSN | EBP03 | C | 9/16/13 | 9:34 | low pen; tan to gray silts and f sand, surface tubes = Stage I; rocks on surface with bryozoans, possible brick debris right |
| JB | JSN | EBP04 | B | 9/16/13 | 17:08 | tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBP04 | C | 9/16/13 | 17:08 | tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBP04 | E | 9/17/13 | 11:45 | tan to grey silts; surface tubes = Stage 1 indicator; small oxic void at burrow at depth = Stage 3 indicator |
| JB | JSN | EBP05 | A | 9/16/13 | 16:56 | tan to grey to dark grey silts; surface tubes = Stage 1 indicator |
| JB | JSN | EBP05 | B | 9/16/13 | 16:56 | tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBP05 | C | 9/16/13 | 16:57 | tan to grey silts; no biological indicators; distrubed irregular surface; fecal pellets |
| JB | JSN | EBP06 | A | 9/16/13 | 16:19 | tan to grey silts; surface tubes = Stage 1 indicator |
| JB | JSN | EBP06 | B | 9/16/13 | 16:20 | tan to grey silts; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBP06 | C | 9/16/13 | 16:20 | tan to grey silts; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 indicator; possible burrow structure left |
| JB | JSN | EBP07 | A | 9/16/13 | 13:27 | tan to grey fine sands and silts; surface tubes = Stage 1 indicator; polychaetes and very small oxic voids at depth = Stage 3 indicator; shell hash on surface; sand content likely from Duwamigh east waterway input |
| JB | JSN | EBP07 | B | 9/16/13 | 13:27 | brown to tan to grey fine sands and silts; surface tubes = Stage 1 indicator; small oxic voids at depth = Stage 3 indicator; shell on surface; sand content in surface sediments likely from Duwamish east waterway input |
| JB | JSN | EBP07 | C | 9/16/13 | 13:28 | brown to tan to grey fine sands and silts; dark grey medium sands thin layer on surface; large burrow center = Stage 3 indicator (great example image); surface tubes = Stage 1 indicator (PRINT FOR REPORT) |
| JB | JSN | EBP08 | A | 9/16/13 | 13:19 | tan to grey fine sands and silts; surface tubes = Stage 1 indicator; shell on surface; thin dark grey medium sands on surface (riverine input likely) |
| JB | JSN | EBP08 | B | 9/16/13 | 13:19 | tan to grey fine sands and silts; surface tubes = Stage 1 indicator; thin dark grey medium sands on surface (riverine input likely) |
| JB | JSN | EBP08 | C | 9/16/13 | 13:20 | tan to grey fine sands and silts; surface tubes = Stage 1 indicator; thin dark grey medium sands on surface (riverine input likely) |
| JB | JSN | EBP09 | A | 9/16/13 | 13:12 | tan to grey fine sands and silts; surface tubes = Stage 1 indicator; thin dark grey medium sands on surface (riverine input likely) |

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|---|---|---|---|---|---|---|
| JB | JSN | EBP09 | B | 9/16/13 | 13:12 | tan to grey fine sands and silts; surface tubes = Stage 1 indicator; void at depth = Stage 3 indicator; thin layer dark grey medium sands on surface = riverine input |
| JB | JSN | EBP09 | C | 9/16/13 | 13:13 | tan to grey fine sands and silts; surface tubes = Stage 1 indicator; polychaetes at depth = Stage 3 indicator; thin layer dark grey medium sands on surface = riverine input |
| JB | JSN | EBP10 | A | 9/16/13 | 14:10 | dark grey medium sands grading to tan fine sands and silts grading to grey silts; mudium sands on surface = riverine input likely; surface tubes = Stage 1 indicator; polychaete at depth = Stage 3 indicator |
| JB | JSN | EBP10 | B | 9/16/13 | 14:11 | dark grey medium sand mixed with brown fine sands and silts grading to tan silts grading to grey silts; surface tubes = Stage 1 indicator; large well developed oxic void/burrow at depth = Stage 3 indicator; sand content in upper cm riverine input or DM? (PRINT FOR REPORT) |
| JB | JSN | EBP10 | C | 9/16/13 | 14:11 | dark grey medium sands on surface; tan to grey silts below; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 indicator; enriched f. sands in surface seds likely attributed to Duwamish R. |
| JB | JSN | EBP11 | A | 9/16/13 | 11:38 | brown to tan to grey silts; f. sand in surface recent DM or sand from Duwamish; patch of medium sands @ 2.95cm depth (historical DM?); surface tubes = Stage 1 indicator; oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBP11 | B | 9/16/13 | 11:38 | brown to tan to grey silts; trace sand in surface sediments (recent DM or sand from Duwamish); surface tubes= Stage 1 indicator; oxic voids at depth = Stage 3 indicator; floccs on surface; possible hydroid on surface right |
| JB | JSN | EBP11 | C | 9/16/13 | 11:39 | brown to tan to grey silts; trace medium sands in surface sediments (recent DM or sand from Duwamish) ; surface tubes = Stage 1 indicator; organism at depth = Stage 3 inidcator; mud clast |
| JB | JSN | EBP12 | A | 9/16/13 | 11:16 | brown to tan to grey silts; trace sand in upper 1-2 cm either recent DM or sand from Duwamish; surface tubes in high density= Stage 1 indicator; oxic void at depth = Stage 3 indicator; sand enriched with depth |
| JB | JSN | EBP12 | B | 9/16/13 | 11:17 | brown to tan to gray silts; trace sands in top 1 cm either recent DM or sand from Duwamish; surface tubes in relative high density = Stage 1 indicator; well developed oxic void at depth = Stage 3 indicator; large polychaete at depth; sand enriched with depth |
| JB | JSN | EBP12 | C | 9/16/13 | 11:18 | brown to tan to grey silts; burrow center = stage 3 indicator; surface tubes = stage 1 indicator; trace sands in top 1.5 cm either recent DM or sand from Duwamish; |
| JB | JSN | EBP13 | A | 9/16/13 | 11:26 | tan to grey very fine sands and silts; rock in farfield with brotezoans; surface tubes = Stage 1 indicator; irregular surface, partially underpenetrated left side; shell fragments on surface |
| JB | JSN | EBP13 | B | 9/16/13 | 11:27 | brown to tan to gray silts; trace medium sands in surface sediments (DM or Duwamish sands); surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 incdicator; unknown white/grey object on surface farfield, organism? |
| JB | JSN | EBP13 | C | 9/16/13 | 11:27 | brown to tan to grey silts and fine sands (likely related to Duwamish hydrodynamics); unconsolidated surface with trace medium sands; surface tubes = Stage 1 indicator |
| JSN | JSN | EBP14 | B | 9/16/13 | 8:59 | tan to gray homogeneous silt, trace f sand in the surface sediments; small surface tubes = Stage I indicator; feeding voids = Stage III |
| JSN | JSN | EBP14 | C | 9/16/13 | 8:59 | unconsolidated, tan to gray homogeneous silt, abundant surface tubes = Stage I indicator; burrow/void structure left = Stage III indicator |
| JSN | JSN | EBP14 | E | 9/16/13 | 9:58 | unconsolidated, tan to gray homogeneous silt, surface tubes = Stage I indicator; burrow structure center and Molpadia sea cucumber right = Stage III indicator |
| JB | JSN | EBP15 | E | 9/16/13 | 10:06 | unconsolidated, tan to gray homogeneous silt; oxic voids at depth = Stage 3 indicator; thin layer of fecal pellets on surface, small oxid voids |
| JB | JSN | EBP15 | G | 9/16/13 | 10:31 | unconsolidated, tan to gray homogeneous silt; well developed oxic void at depth = Stage 3 indicator; surface tubes = Stage 1; trace f sand in small surface burrow right |
| JB | JSN | EBP15 | I | 9/16/13 | 10:32 | unconsolidated, tan to gray homogeneous silt; well developed oxic void at depth = Stage 3 indicator; surface tubes = Stage 1; trace f sand in surface seds |
| JB | JSN | EBR01 | A | 9/16/13 | 15:13 | brown to tan to dark grey silts; surface tubes = Stage 1 indicator; reduced silts and sands at depth = more recent DM, although has been in place more than a few months; ; well developed oxic void at depth = Stage 3 indicator |
| JB | JSN | EBR01 | B | 9/16/13 | 15:14 | brown to tan to dark grey silts; reduced silts and sands at depth = more recent DM, although has been in place more than a few months; ; well developed oxic void at depth near interface = Stage 3 indicator (PRINT FOR REPORT) |
| JB | JSN | EBR01 | C | 9/16/13 | 15:15 | tan to grey silts; surface tubes = Stage 1 indicator; reduced silts and sands at depth = more recent DM, although has been in place more than a few months; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBR02 | B | 9/17/13 | 16:13 | tan to grey silts; surface tubes = Stage 1 indicator; disturbed surface likely related to burrow = Stage 3 indicator |
| JB | JSN | EBR02 | C | 9/17/13 | 16:21 | tan to grey silts; oxic void at depth = Stage 3 indicator; patches reduced sed at depth may be related to historic DM, but well mixed |
| JB | JSN | EBR02 | D | 9/17/13 | 16:22 | tan to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBR03 | A | 9/16/13 | 16:36 | tan to grey silts; surface tubes = Stage 1 indicator; |
| JB | JSN | EBR03 | B | 9/16/13 | 16:36 | tan to grey silts; organism at depth = Stage 3 indicator; trace f. sand near surface; small surface tube center = Stage 1 indicator |

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| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | EBR03 | D | 9/17/13 | 14:15 | tan to grey silts; surface tubes = Stage 1 indicator; |
| JB | JSN | EBR03 | D | 9/17/13 | 14:15 | tan to grey silts and very fine sands;surface tubes = Stage 1 indicator; increased sand content from Duwamish R |
| JB | JSN | EBR03 | E | 9/17/13 | 14:16 | tan to grey silts and very fine sands; surface tubes = Stage 1 indicator; small oxic voids at depth = Stage 3 indicator; increased sand from Duwamish R |
| JB | JSN | EBR03 | F | 9/17/13 | 14:17 | minimal penetration; RPD>pen; tan silts; surface tubes = Stage 1 indicator |
| JB | JSN | EBR04 | A | 9/16/13 | 15:45 | tan to grey silts; surface tubes = Stage 1 indicator; 2 well developed oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBR04 | B | 9/16/13 | 15:45 | tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic void at depth = Stage 3 indicator; f. sand enriched in upper ~3 cm in sed column likely related to recent DM |
| JB | JSN | EBR04 | C | 9/16/13 | 15:46 | tan to grey silts; no biological indicators; small void right = stage 3 indicator; f. sand enriched in upper ~2 cm in sed column likely related to recent DM |
| JB | JSN | EBR05 | A | 9/17/13 | 11:37 | tan to grey silts; oxic voids at depth = Stage 3 indicator; small surface tube right = Stage 1 indicator |
| JB | JSN | EBR05 | B | 9/17/13 | 11:38 | tan to grey silts; surface tubes and polychaetes at depth = Stage 1 on 3 indicator; disturbed surface |
| JB | JSN | EBR05 | C | 9/17/13 | 11:38 | tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic voids with organism at depth = Stage 3 indicator |
| JB | JSN | EBR06 | A | 9/16/13 | 14:53 | tan to dark grey fine sands and silts; reduced sands and silts at depth = more recent DM, although has been in place more than a few months; oxic void and organism at depth = Stage 3 indicator |
| JB | JSN | EBR06 | B | 9/16/13 | 14:54 | tan to dark grey silts;surface tubes = Stage 1 indicator; large polychaete at depth and void at interface = Stage 3 indicator; reduced silts at depth = more recent DM, although has been in place more than a few months (PRINT FOR REPORT) |
| JB | JSN | EBR06 | C | 9/16/13 | 14:55 | tan to dark grey silts; surface tubes = Stage 1 indicator; small oxic voids at depth = Stage 3 indicator; reduced silts and sands at depth = more recent DM, although has been in place more than a few months |
| JB | JSN | EBR07 | A | 9/17/13 | 10:56 | brown to tan to grey silts; surface tubes = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; trace f. sand related to slope? |
| JB | JSN | EBR07 | B | 9/17/13 | 10:56 | brown to tan to grey silts; surface tubes = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; burrow structure surface; trace f. sand related to slope? |
| JB | JSN | EBR07 | C | 9/17/13 | 10:57 | brown to tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic voids at depth = Stage 3 indicator; trace f sand in upper 2-3 cm possibly related to slope?; PRINT FOR REPORT |
| JB | JSN | EBS02 | A | 9/16/13 | 13:49 | tan to grey homogeneous silts; surface tubes = Stage 1 indicator; trace f. sand in upper 3 cm = recent DM; possible historical DM present at depth based on discontinuous reduced sed layer |
| JB | JSN | EBS02 | B | 9/16/13 | 13:50 | tan to grey homogeneous silts; surface tubes = Stage 1 indicator; small oxic void at depth = Stage 3 indicator; f sand enriched surface (~1.5cm) likely recent DM |
| JB | JSN | EBS02 | C | 9/16/13 | 13:50 | tan to grey homogeneous silts; surface tubes = Stage 1 indicator; small oxic void at depth = Stage 3 indicator; recent DM (enriched in sands) over possible historical DM |
| JB | JSN | EBS03 | A | 9/17/13 | 11:03 | brown to tan to grey silts; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS03 | C | 9/17/13 | 11:27 | brown to tan to grey silts; surface tubes = Stage 1 indicator; small oxic sed filled void at depth = Stage 3 indicator |
| JB | JSN | EBS03 | E | 9/17/13 | 11:28 | brown to tan to grey silts; oxic void at depth = Stage 3 indicator; small fish in water column |
| JB | JSN | EBS04 | D | 9/17/13 | 12:58 | brown to tan to grey silts; well developed oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS04 | E | 9/17/13 | 12:58 | brown to tan to grey silts; well developed oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS04 | F | 9/17/13 | 12:59 | brown to tan to grey silts; well developed oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS05 | A | 9/17/13 | 14:25 | brown to tan to grey silts; surface tubes = Stage 1 indicator |
| JB | JSN | EBS05 | B | 9/17/13 | 14:26 | tan to grey silts; large mud clasts on surface likely artifact from previous drop; surface tubes = Stage 1 indicator; small void structure center = Stage 3 indicator |
| JB | JSN | EBS05 | C | 9/17/13 | 14:26 | tan to grey silts; mud clast on surface likely from previous drop; small oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS06 | A | 9/16/13 | 13:37 | tan to grey homogeneous silts; surface tubes = Stage 1 indicator; small oxic void at depth = Stage 3 indicator; possible burrow right side; f. sand enriched in surface 2 cm likely recent DM |
| JB | JSN | EBS06 | B | 9/16/13 | 13:37 | tan to grey homogeneous silts; small oxic void at depth = Stage 3 indicator; enriched f. sand in upper 2 cm = recent DM; discontinuous reduced sed layers at depth likely historic DM |
| JB | JSN | EBS06 | C | 9/16/13 | 13:38 | tan to grey homogeneous silts; burrow center; 2 oxic voids at depth = Stage 3 indicator; recent DM (f. sand enriched) in top ~1.5 cm; possible historic DM at depth |

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| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | EBS07 | A | 9/16/13 | 14:46 | tan to grey fine sands and silts; oxic void at depth = Stage 3 indicator; enriched sand likely from Duwamish R |
| JB | JSN | EBS07 | B | 9/16/13 | 14:47 | tan to grey fine sands and silts; polychaetes at depth = Stage 3 indicator; enriched sand in top ~2 cm likley from Duwamish R |
| JB | JSN | EBS07 | C | 9/16/13 | 14:47 | tan to grey fine sands and silts; large burrow right side and small oxic void center = Stage 3 indicator; possible large burrow right; enriched f sand in surface likely from Duwamish R |
| JB | JSN | EBS08 | A | 9/17/13 | 13:48 | tan to grey very fine sands and silts; trace medium sands in upper half of profile (possible DM); surface tubes = Stage 1 indicator; organisms at depth = Stage 3 indicator |
| JB | JSN | EBS08 | B | 9/17/13 | 13:48 | tan to grey very fine sands and silts; trace medium sands in upper half of profile (possible DM); surface tubes = Stage 1 indicator; organisms at depth = Stage 3 indicator |
| JB | JSN | EBS08 | C | 9/17/13 | 13:49 | tan to grey very fine sands and silts; surface tubes = Stage 1 indicator |
| JB | JSN | EBS09 | A | 9/16/13 | 11:04 | tan to grey silts w/ trace medium sands in surface sediments (possible slope material); surface tubes = Stage 1 indicator; well developed oxic void at depth = Stage 3 indicator; |
| JB | JSN | EBS09 | B | 9/16/13 | 11:05 | tan to grey silts; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3; polychaete at depth; f. sand well mixed throughout possibly from slope |
| JB | JSN | EBS09 | C | 9/16/13 | 11:06 | tan to grey silts; trace medium sands intermixed into surface sediments (possible slope material); surface tubes = Stage 1 indicator; oxic void at depth = Stage 3; burrow center |
| JB | JSN | EBS10 | A | 9/17/13 | 13:12 | tan to grey silts; surface tubes and polychaetes at depth = Stage 1 on 3 indicator; distrubed surface |
| JB | JSN | EBS10 | B | 9/17/13 | 13:13 | tan to grey silts; surface tubes = Stage 1 indicator |
| JB | JSN | EBS10 | C | 9/17/13 | 13:14 | tan to grey silts; surface tubes = Stage 1 indicator;l small oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBS11 | A | 9/17/13 | 14:09 | tan to grey silts; marbled reduced sediments at depth possible signiture of historic DM; surface tubes = Stage 1 indicator; small oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS11 | B | 9/17/13 | 14:10 | tan to grey silts; marbled reduced sediments at depth possible signiture of historic DM; surface tubes = Stage 1 indicator; disturbed sirface likely from previous drop |
| JB | JSN | EBS11 | C | 9/17/13 | 14:11 | tan to grey silts; marbled reduced sediments at depth possible signiture of historic DM; surface tubes = Stage 1 indicator; well developed oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS12 | B | 9/17/13 | 12:05 | tan to grey silts; polychaetes at depth = Stage 3 indicator |
| JB | JSN | EBS12 | C | 9/17/13 | 12:05 | tan to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS12 | D | 9/17/13 | 12:06 | tan to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS13 | A | 9/16/13 | 14:04 | brown to tan to grey fine sands and silts; medium sands in upper cm likely riverine sources; surface tubes = Stage 1 indicator; small oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS13 | B | 9/16/13 | 14:05 | brown to tan to grey silty fine sands; surface tubes = Stage 1 indicator; well developed oxic void = Stage 3 indicator; f sand likely from Duwamish R |
| JB | JSN | EBS13 | C | 9/16/13 | 14:05 | brown to tan to grey silty fine sands; surface tubes = Stage 1 indicator; large polychaete and oxic void at depth = Stage 3 indicator; f sand likely from Duwamish R |
| JB | JSN | EBS14 | A | 9/16/13 | 13:43 | tan to grey homogeneous f sandy silts; two well defined oxic voids at depth = Stage 3 indicator; trace f sand & reduced sed in surface possible recent DM; discontinous reduced layers at depth possible historic DM |
| JB | JSN | EBS14 | B | 9/16/13 | 13:44 | tan to grey homogeneous silts; well defined oxic void at depth = Stage 3 indicator; surface tubes = Stage 1 indicator; trace f sand & reduced sed in surface possible recent DM; discontinous reduced layers at depth possible historic DM |
| JB | JSN | EBS14 | C | 9/16/13 | 13:45 | tan to grey homogeneous silts; reduced patches at depth possible historic DM remnants; possble sed filled void bottom right |
| JB | JSN | EBS15 | A | 9/16/13 | 11:48 | tan to grey vfine sands and silts; medium sands intermixed into surface sediments possible DM; surface tubes = Stage 1 indicator; oxic voids = Stage 3 indicator; low rpd suggest recent disturbance/DM placement; historic DM present at depth |
| JB | JSN | EBS15 | B | 9/16/13 | 11:48 | tan to dark gray fine sands and silts; surface tubes = Stage 1 indicator; oxic void = Stage 3 indicator; reduced sediments at depth historic DM |
| JB | JSN | EBS15 | C | 9/16/13 | 11:49 | tan to dark grey fine sands and silts; surface tubes = Stage 1 indicator; polychaetes at depth = Stage 3 indicator; reduced silts at depth indicative of historic dredged materila placement |
| JB | JSN | EBS16 | A | 9/17/13 | 14:03 | tan to grey to dark gray silts; surface tubes = Stage 1 indicator; polychaetes at depth = Stage 3 indicator; very reduced silts at depth = DM |
| JB | JSN | EBS16 | B | 9/17/13 | 14:03 | tan to grey silts and very fine sands; marbled reduced sediments at depth possible historic DM?; surface tubes = Stage 1 indicator |
| JB | JSN | EBS16 | C | 9/17/13 | 14:04 | low penetration; tan to grey silts and very fine sands; marbled reduced sediments at depth possible historic DM?; surface tubes = Stage 1 indicator |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | EBS17 | A | 9/17/13 | 14:32 | tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic void at depth = Stage 3 indicator; reduced sed at depth discontinuous layer = 1.25 cm |
| JB | JSN | EBS17 | B | 9/17/13 | 14:32 | tan to grey silts; no biological indicators; reduced patchy sed at depth = DM |
| JB | JSN | EBS17 | C | 9/17/13 | 14:33 | tan to grey silts; well developed oxic voids at depth = Stage 3 indictator; depression in surface possible footprint from previous drop |
| JB | JSN | EBS18 | E | 9/17/13 | 12:14 | tan to grey silts; large burrow center; oxic void at depth = Stage 3 indicator; shrimp on surface (POSSIBLE PRINT FOR REPORT - site station East with no DM) |
| JB | JSN | EBS18 | F | 9/17/13 | 12:15 | tan to grey silts; large burrow center; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS18 | G | 9/17/13 | 12:16 | tan to grey silts; oxic void at depth = Stage 3 indicator; small surface tubes = Stage 1 indicator |
| JB | JSN | EBS19 | A | 9/17/13 | 11:51 | tan to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS19 | B | 9/17/13 | 11:52 | tan to grey silts; oxic void at depth = Stage 3 indicator; surface tubes = Stage 1 indicator |
| JB | JSN | EBS19 | C | 9/17/13 | 11:52 | tan to grey silts; oxic void at depth = Stage 3 indicator; surface tubes = Stage 1 indicator |
| JB | JSN | EBS20 | A | 9/17/13 | 13:05 | tan to dark grey silts and very fne sands; reduced sediments likely related to more recent DM; surface tubes = Stage 1 indicator; burrow/oxic void right side images = Stage 3 indicator |
| JB | JSN | EBS20 | B | 9/17/13 | 13:05 | tan to dark grey silts; surface tubes = Stage 1 indicator; small void structure at depth = Stage 3 indicator; reduced silts and sands at depth = historic DM? |
| JB | JSN | EBS20 | C | 9/17/13 | 13:06 | tan to dark grey silts; surface tubes = Stage 1 indicator; oxic void and polychaete at depth = Stage 3 indicator; reduced silts and sands at depth = more recent DM? |
| JB | JSN | EBS21 | A | 9/17/13 | 13:37 | tan to dark grey silts; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 indicator; reduced silts and sands at depth = likely related to most recent DM |
| JB | JSN | EBS21 | B | 9/17/13 | 13:37 | disturbed surface possibly from burrow accessing DM at depth; tan to dark grey silts; surface tubes = Stage 1 indicator; reduced silts at depth = DM (POSSIBLE PRINT FOR REPORT) |
| JB | JSN | EBS21 | C | 9/17/13 | 13:38 | tan to grey to dark grey silts and finee sands (related to recent DM?); surface tubes = Stage 1 indicator; low RPD suggests more recent DM |
| JB | JSN | EBS22 | A | 9/17/13 | 13:28 | tan to grey silts and very fine sands; well developed oxic void at depth = Stage 3 indicator, reduced discontinuous layer at depth may be related to historic DM |
| JB | JSN | EBS22 | B | 9/17/13 | 13:29 | tan to grey silts; surface tubes = Stage 1 indicatorl large burrow center = Stage 3 indicator; PRINT FOR REPORT, with Rep A for comparison - ONSITE STATION WITH HISTORIC DM AND LARGE BURROWS |
| JB | JSN | EBS22 | C | 9/17/13 | 13:30 | tan to grey silts; surface tubes = Stage 1 indicator; reduced discontinuous layer at depth may be related to historic DM |
| JB | JSN | EBS23 | A | 9/16/13 | 10:57 | brown to tan to grey silts; uneven surface - (possible burrow left); surface tubes = Stage 1; oxic void = Stage 3 |
| JB | JSN | EBS23 | B | 9/16/13 | 10:58 | tan to grey silts; oxic void at depth = Stage 3; gray reduced sediment on surface right and in burrow left from organism transport |
| JB | JSN | EBS23 | C | 9/16/13 | 10:59 | brown to tan to grey silts; well developed oxic void at depth = Stage 3; sloped surface/possible surface burrow |
| JB | JSN | EBS24 | A | 9/17/13 | 10:47 | brown to tan to grey silts; oxic void at depth = Stage 3 indicator; surface tubes = Stage 1 indicator; polychaete at depth; trace f. sand in upper 2 cm of sed column either DM or Duwamish R seds |
| JB | JSN | EBS24 | B | 9/17/13 | 10:47 | brown to tan to grey silts; polychaetes at depth = Stage 3 indicator; surface tubes = Stage 1 indicator; f. sand in upper 4 cm either Duwamish R seds or DM |
| JB | JSN | EBS24 | C | 9/17/13 | 10:48 | brown to tan to grey silts; polychaetes at depth = Stage 3 indicator; surface tubes = Stage 1 indicator; f. sand in upper sed column either Duwamish R seds or DM |
| JB | JSN | EBS25 | D | 9/16/13 | 10:15 | partially overpenetrated left side; unconsolidated, tan to gray silts; well developed oxic void at depth left = Stage 3 indicator; small surface tubes right = stage 1 indicator; trace f sand in upper 1.5 cm from western slope? |
| JB | JSN | EBS25 | E | 9/16/13 | 10:16 | unconsolidated, tan to grey silts; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 indicator; mud clasts on surface artifact of previous drop; trace f sand in upper 0.5 cm possible sands from western slope? |
| JB | JSN | EBS25 | F | 9/16/13 | 10:16 | unconsolidated, tan to grey silts; oxic void at depth = Stage 3 indicator; partially over penetrated right side; small surface left = Stage 1 indicator; trace f. sand in surface sediments from western slope? |
| JB | JSN | EBS27 | A | 9/17/13 | 13:22 | tan to grey silts; oxic void at depths = Stage 3 indicator; |
| JB | JSN | EBS27 | B | 9/17/13 | 13:22 | tan to grey silts; surface tubes = Stage 1 indicator; large burrow at surface center and oxic void at depths = Stage 3 indicator; |
| JB | JSN | EBS27 | C | 9/17/13 | 13:23 | tan to grey silts and very fine sands; surface tubes = Stage 1 indicator |
| JB | JSN | EBS28 | A | 9/16/13 | 15:54 | tan to dark grey fine sands and silts; reduced sands and silts at dept = historic DM; small burrow just below surface = Stage 1 indicator |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | EBS28 | B | 9/16/13 | 15:55 | tan to dark grey fine sands and silts; reduced sands and silts at dept = more recent DM, although has been in place more than a few months; no biological indicators |
| JB | JSN | EBS28 | C | 9/16/13 | 15:56 | tan to dark grey fine sands and silts; reduced sands and silts at dept = more recent DM, although has been in place more than a few months; surface tubes = Stage 1 indicator; several small oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBS29 | A | 9/17/13 | 13:54 | minimal penetration; tan to grey silts and fine sands; trace medium sands throughout profile, riverine or DM?; surface tubes = Stage 1 indicator |
| JB | JSN | EBS29 | B | 9/17/13 | 13:54 | minimal penetration; tan homgeneous silts and fine sands; surface tubes = Stage 1 indicator; trace medium sand content throughout profile |
| JB | JSN | EBS29 | C | 9/17/13 | 13:55 | minimal penetration; tan homgeneous silts and fine sands; surface tubes = Stage 1 indicator; trace medium sand content throughout profile |
| JB | JSN | EBS30 | A | 9/17/13 | 15:11 | tan to grey very fine sands and silts; large polychaete at depth = Stage 3 indicator; trace f sand in upper 2 cm likely riverine input |
| JB | JSN | EBS30 | B | 9/17/13 | 15:11 | tan to grey very fine sands and silts;small oxic void at depth = Stage 3 indicator; surface tubes = Stage 1 indicator; trace f sand in upper 2 cm likely riverine input |
| JB | JSN | EBS30 | C | 9/17/13 | 15:12 | tan to grey very fine sands and silts;small oxic void at depth = Stage 3 indicator; surface tubes = Stage 1 indicator; trace f sand in upper 2 cm likely riverine input |
| JB | JSN | EBS31 | A | 9/17/13 | 15:25 | tan to grey very fine sands and silts;small oxic void at depth = Stage 3 indicator; surface tubes = Stage 1 indicator; trace medium sands throughout = riverine input or DM? |
| JB | JSN | EBS31 | B | 9/17/13 | 15:25 | tan to grey very fine sands and silts; small oxic voids at depth = Stage 3 indicator; surface tubes = Stage 1 indicator; trace medium sands throughout upper 3cm = riverine input or DM? |
| JB | JSN | EBS31 | C | 9/17/13 | 15:26 | tan to grey very fine sands and silts; small oxic void at depth = Stage 3 indicator; surface tubes = Stage 1 indicator; trace medium sands throughout upper 3cm= riverine input or DM? |
| JB | JSN | EBS32 | A | 9/17/13 | 15:33 | tan to grey fine sands and silts; trace medium sands on surface as well as in layer ~10cm depth, likely riverine input; surface tubes = Stage 1 indicator; structure on surface (hard) with tube and hydroids attached; small sea fan on surface? |
| JB | JSN | EBS32 | B | 9/17/13 | 15:34 | tan to grey fine sands and silts; trace medium sands throughout profile, possible historic DM or likely riverine input; surface tubes = Stage 1 indicator |
| JB | JSN | EBS32 | C | 9/17/13 | 15:35 | tan to grey fine sands and silts; trace medium sands throughout profile, possible historic DM or likely riverine input; surface tubes = Stage 1 indicator; small void structures at depth center = Stage 3 indicator |
| JB | JSN | EBS33 | A | 9/17/13 | 15:41 | tan to grey very fine sands and silts; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 indicator; f. sand likley related to riverine input |
| JB | JSN | EBS33 | B | 9/17/13 | 15:41 | tan to grey very fine sands and silts; surface tubes = Stage 1 indicator; trace medium sands in surface sediments; f. sand likely related to riverine input |
| JB | JSN | EBS33 | C | 9/17/13 | 15:42 | tan to grey very fine sands and silts; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 indicator; trace medium sands in surface sediments likel related to riverine input |
| JB | JSN | EBS34 | A | 9/17/13 | 15:48 | tan to grey very fione sands and silts; surface tubes = Stage 1 indicator; small oxic void at depth = Stage 3 indicator; trace medium sands throughout possible DM or likely related to riverine input |
| JB | JSN | EBS34 | B | 9/17/13 | 15:49 | tan to grey very fine sands and silts; surface tubes = Stage 1 indicator; trace medium sands throughout likely related to riverine input |
| JB | JSN | EBS34 | C | 9/17/13 | 15:49 | tan to grey very fine sands and silts; surface tubes = Stage 1 indicator; trace medium sands throughout likely related to riverine input; burrow and small void structure right = Stage 3 indicator |
| JB | JSN | EBS35 | B | 9/17/13 | 15:56 | tan to grey silts; oxic void at depth = Stage 3 indicator; thin surface layer with trace f. sand likely related to riverine sources |
| JB | JSN | EBS35 | C | 9/17/13 | 15:57 | tan to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS35 | D | 9/17/13 | 15:57 | tan to grey silts; no biological indicators; partially overpenetrated left side; thin surface layer with trace f. sand likely related to riverine sources |
| JB | JSN | EBS36 | D | 9/17/13 | 17:18 | tan to grey fine sands and silts; trace medium sands in surface sediments = likely riverine input; surface tubes = Stage 1 indicator; polychaetes at depth = Stage 3 indicator |
| JB | JSN | EBS36 | E | 9/17/13 | 17:19 | tan to grey fine sands and silts; trace medium sands in surface sediments = likely riverine input; surface tubes = Stage 1 indicator; small oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBS36 | F | 9/17/13 | 17:20 | tan to grey fine sands and silts; trace medium sands in surface sediments = likely riverine input; surface tubes = Stage 1 indicator |
| JB | JSN | EBS37 | D | 9/17/13 | 17:03 | tan to grey silts; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBS37 | E | 9/17/13 | 17:03 | tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic void at depth = Stage 3 indicator; polychaete at depth |
| JB | JSN | EBS37 | F | 9/17/13 | 17:04 | tan to grey silts; surface tubes = Stage 1 indicator; polychaete at depth = Stage 3 indicator |
| JB | JSN | EBT01 | A | 9/17/13 | 9:45 | brown to tan to grey silts; surface tubes = Stage 1 indicator; burrow and small sed filled voids left = stage 3 indicator |
| JB | JSN | EBT01 | B | 9/17/13 | 9:46 | brown to tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic void at depth = Stage 3 indicator; large polychaete at depth |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Comments |
|---|---|---|---|---|---|---|
| JB | JSN | EBT01 | C | 9/17/13 | 9:47 | brown to tan to grey silts; surface tubes = Stage 1 indicator; shrimp and amphipods on surface and on algae; red or brown algae on surface; trace f. sand on surface |
| JB | JSN | EBT02 | A | 9/17/13 | 9:38 | brown to tan to grey silts; surface tubes = Stage 1 indicator |
| JB | JSN | EBT02 | B | 9/17/13 | 9:39 | brown to tan to grey silts; no biological indicators |
| JB | JSN | EBT02 | C | 9/17/13 | 9:39 | brown to tan to grey silts; surface tubes = Stage 1 indicator; small oxic void at depth = Stage 3 indicator |
| JB | JSN | EBT03 | A | 9/17/13 | 9:31 | brown to tan to grey silts; surface tubes = Stage 1 indicator; small oxic void at depth = Stage 3 indicator |
| JB | JSN | EBT03 | B | 9/17/13 | 9:32 | brown to tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic void at depth = Stage 3 indicator; polychaetes at depth |
| JB | JSN | EBT03 | C | 9/17/13 | 9:32 | brown to tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic void at depth = Stage 3 indicator |
| JB | JSN | EBT04 | A | 9/17/13 | 9:24 | brown to tan to grey silts; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBT04 | B | 9/17/13 | 9:25 | brown to tan to grey silts; surface tubes = Stage 1 indicator |
| JB | JSN | EBT04 | C | 9/17/13 | 9:26 | brown to tan to grey silts; surface tubes = Stage 1 indicator; oxic void at base of image = Stage 3 indicator |
| JB | JSN | EBT05 | A | 9/17/13 | 9:16 | brown to tan to grey silts; no biological indicators |
| JB | JSN | EBT05 | B | 9/17/13 | 9:17 | brown to tan to grey silts; no biological indicators |
| JB | JSN | EBT05 | C | 9/17/13 | 9:18 | brown to tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBT07 | A | 9/17/13 | 10:32 | brown to tan to grey silts; surface tubes = Stage 1 indicator; small oxic void at depth = Stage 3 indicator; polychaete at depth |
| JB | JSN | EBT07 | B | 9/17/13 | 10:33 | brown to tan to grey silts; surface tubes = Stage 1 indicator; oxic voids at depth = Stage 3 indicator; polychaetes at depth; mud clasts on surface from previous drop |
| JB | JSN | EBT07 | C | 9/17/13 | 10:33 | brown to tan to grey silts; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 indicator; polychaetes at depth |
| JB | JSN | EBT08 | A | 9/17/13 | 10:24 | brown to tan to grey silts; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBT08 | B | 9/17/13 | 10:25 | brown to tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic void at depth = Stage 3 indicator |
| JB | JSN | EBT08 | C | 9/17/13 | 10:26 | brown to tan to grey silts; surface tubes = Stage 1 indicator; oxic void at depth = Stage 3 indicator |
| JB | JSN | EBT09 | A | 9/17/13 | 10:17 | brown to tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBT09 | B | 9/17/13 | 10:17 | brown to tan to grey silts;no biological indicators |
| JB | JSN | EBT09 | C | 9/17/13 | 10:18 | brown to tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBT10 | A | 9/17/13 | 10:09 | brown to tan to grey silts; surface tubes = Stage 1 indicator; well developed oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBT10 | B | 9/17/13 | 10:10 | brown to tan to grey silts; surface tubes = Stage 1 indicator |
| JB | JSN | EBT10 | C | 9/17/13 | 10:10 | brown to tan to grey silts; surface tubes = Stage 1 indicator; oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBT11 | A | 9/17/13 | 9:59 | brown to tan to grey silts; surface tubes = Stage 1 indicator |
| JB | JSN | EBT11 | B | 9/17/13 | 10:00 | brown to tan to grey silts; oxic voids at depth = Stage 3 indicator |
| JB | JSN | EBT11 | C | 9/17/13 | 10:01 | brown to tan to grey silts; no biological indicators |
| JB | JSN | EBZ01 | A | 9/16/13 | 15:07 | brown very fine sands and silts overlying light grey silty DM; several layers of recent DM light grey overylying dark grey DM; surface tubes = Stage 1 indicator |
| JB | JSN | EBZ01 | B | 9/16/13 | 15:07 | brown very fine sands and silts overlying light grey silty DM; small void left = Stage 3 indicator; several layers of recent DM light grey overylying dark grey DM; surface tubes = Stage 1 indicator; woody debris near surface |
| JB | JSN | EBZ01 | C | 9/16/13 | 15:08 | brown very fine sands and silts overlying light grey silty DM; several layers of recent DM light grey overylying dark grey DM; surface tubes = Stage 1 indicator; possible near surface voids center = Stage 3 indicator |

**NewFields Sediment Profile Image Analysis**
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| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | EBB01 | A | 9/16/13 | 13:04 | | |
| JB | JSN | EBB01 | B | 9/16/13 | 13:05 | | |
| JB | JSN | EBB01 | C | 9/16/13 | 13:06 | | |
| JB | JSN | EBB02 | A | 9/16/13 | 16:26 | | |
| JB | JSN | EBB02 | B | 9/16/13 | 16:27 | | |
| JB | JSN | EBB02 | C | 9/16/13 | 16:27 | | |
| JSN | JSN | EBB03 | A | 9/16/13 | 8:47 | | |
| JSN | JSN | EBB03 | B | 9/16/13 | 8:47 | | |
| JSN | JSN | EBB03 | C | 9/16/13 | 8:48 | | |
| JB | JSN | EBB04 | A | 9/17/13 | 8:55 | | |
| JB | JSN | EBB04 | B | 9/17/13 | 8:56 | | |
| JB | JSN | EBB04 | C | 9/17/13 | 8:57 | | |
| JB | JSN | EBC06 | A | 9/16/13 | 11:55 | >1.52 | |
| JB | JSN | EBC06 | B | 9/16/13 | 11:55 | >3.74 | |
| JB | JSN | EBC06 | C | 9/16/13 | 11:56 | >6.86 | |
| JB | JSN | EBC07 | A | 9/16/13 | 15:19 | >9.75 | |
| JB | JSN | EBC07 | B | 9/16/13 | 15:20 | >12.19 | |
| JB | JSN | EBC07 | C | 9/16/13 | 15:21 | >13.01 | |
| JB | JSN | EBC08 | A | 9/16/13 | 15:26 | | >12.80 |
| JB | JSN | EBC08 | B | 9/16/13 | 15:27 | 3.20 | >12.34 |
| JB | JSN | EBC08 | C | 9/16/13 | 15:28 | >14.32 | |
| JB | JSN | EBC09 | A | 9/16/13 | 10:50 | | |
| JB | JSN | EBC09 | B | 9/16/13 | 10:51 | | |
| JB | JSN | EBC09 | C | 9/16/13 | 10:52 | | |
| JB | JSN | EBC10 | A | 9/16/13 | 10:42 | | >7.3 |
| JB | JSN | EBC10 | B | 9/16/13 | 10:43 | | >9.0 |
| JB | JSN | EBC10 | C | 9/16/13 | 10:43 | | >7.3 |
| JB | JSN | EBC11 | A | 9/16/13 | 15:35 | >16.48 | |
| JB | JSN | EBC11 | B | 9/16/13 | 15:36 | >16.12 | |

**NewFields Sediment Profile Image Analysis**
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| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | EBC11 | C | 9/16/13 | 15:36 | >16.36 | |
| JB | JSN | EBC12 | A | 9/16/13 | 15:01 | >11.31 | |
| JB | JSN | EBC12 | B | 9/16/13 | 15:01 | >9.94 | |
| JB | JSN | EBC12 | C | 9/16/13 | 15:02 | >10.78 | |
| JB | JSN | EBC13 | A | 9/16/13 | 13:55 | | >12.19 |
| JB | JSN | EBC13 | B | 9/16/13 | 13:56 | | >9.73 |
| JB | JSN | EBC13 | C | 9/16/13 | 13:57 | | >11.53 |
| JSN | JSN | EBP01 | A | 9/16/13 | 9:14 | | |
| JSN | JSN | EBP01 | B | 9/16/13 | 9:15 | | |
| JSN | JSN | EBP01 | C | 9/16/13 | 9:16 | | |
| JSN | JSN | EBP03 | A | 9/16/13 | 9:33 | | |
| JSN | JSN | EBP03 | B | 9/16/13 | 9:34 | | |
| JSN | JSN | EBP03 | C | 9/16/13 | 9:34 | | |
| JB | JSN | EBP04 | B | 9/16/13 | 17:08 | | |
| JB | JSN | EBP04 | C | 9/16/13 | 17:08 | | |
| JB | JSN | EBP04 | E | 9/17/13 | 11:45 | | |
| JB | JSN | EBP05 | A | 9/16/13 | 16:56 | | |
| JB | JSN | EBP05 | B | 9/16/13 | 16:56 | | |
| JB | JSN | EBP05 | C | 9/16/13 | 16:57 | | |
| JB | JSN | EBP06 | A | 9/16/13 | 16:19 | | |
| JB | JSN | EBP06 | B | 9/16/13 | 16:20 | | |
| JB | JSN | EBP06 | C | 9/16/13 | 16:20 | | |
| JB | JSN | EBP07 | A | 9/16/13 | 13:27 | | |
| JB | JSN | EBP07 | B | 9/16/13 | 13:27 | | |
| JB | JSN | EBP07 | C | 9/16/13 | 13:28 | | |
| JB | JSN | EBP08 | A | 9/16/13 | 13:19 | | |
| JB | JSN | EBP08 | B | 9/16/13 | 13:19 | | |
| JB | JSN | EBP08 | C | 9/16/13 | 13:20 | | |
| JB | JSN | EBP09 | A | 9/16/13 | 13:12 | | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | EBP09 | B | 9/16/13 | 13:12 | | |
| JB | JSN | EBP09 | C | 9/16/13 | 13:13 | | |
| JB | JSN | EBP10 | A | 9/16/13 | 14:10 | | |
| JB | JSN | EBP10 | B | 9/16/13 | 14:11 | | |
| JB | JSN | EBP10 | C | 9/16/13 | 14:11 | | |
| JB | JSN | EBP11 | A | 9/16/13 | 11:38 | | |
| JB | JSN | EBP11 | B | 9/16/13 | 11:38 | | |
| JB | JSN | EBP11 | C | 9/16/13 | 11:39 | | |
| JB | JSN | EBP12 | A | 9/16/13 | 11:16 | | |
| JB | JSN | EBP12 | B | 9/16/13 | 11:17 | | |
| JB | JSN | EBP12 | C | 9/16/13 | 11:18 | | |
| JB | JSN | EBP13 | A | 9/16/13 | 11:26 | | |
| JB | JSN | EBP13 | B | 9/16/13 | 11:27 | | |
| JB | JSN | EBP13 | C | 9/16/13 | 11:27 | | |
| JSN | JSN | EBP14 | B | 9/16/13 | 8:59 | | |
| JSN | JSN | EBP14 | C | 9/16/13 | 8:59 | | |
| JSN | JSN | EBP14 | E | 9/16/13 | 9:58 | | |
| JB | JSN | EBP15 | E | 9/16/13 | 10:06 | | |
| JB | JSN | EBP15 | G | 9/16/13 | 10:31 | | |
| JB | JSN | EBP15 | I | 9/16/13 | 10:32 | | |
| JB | JSN | EBR01 | A | 9/16/13 | 15:13 | >16.29 | |
| JB | JSN | EBR01 | B | 9/16/13 | 15:14 | >14.64 | |
| JB | JSN | EBR01 | C | 9/16/13 | 15:15 | >15.93 | |
| JB | JSN | EBR02 | B | 9/17/13 | 16:13 | | |
| JB | JSN | EBR02 | C | 9/17/13 | 16:21 | | |
| JB | JSN | EBR02 | D | 9/17/13 | 16:22 | | |
| JB | JSN | EBR03 | A | 9/16/13 | 16:36 | | |
| JB | JSN | EBR03 | B | 9/16/13 | 16:36 | | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | EBR03 | D | 9/17/13 | 14:15 | | |
| JB | JSN | EBR03 | D | 9/17/13 | 14:15 | | |
| JB | JSN | EBR03 | E | 9/17/13 | 14:16 | | |
| JB | JSN | EBR03 | F | 9/17/13 | 14:17 | | |
| JB | JSN | EBR04 | A | 9/16/13 | 15:45 | | |
| JB | JSN | EBR04 | B | 9/16/13 | 15:45 | 2.77 | |
| JB | JSN | EBR04 | C | 9/16/13 | 15:46 | 1.71 | |
| JB | JSN | EBR05 | A | 9/17/13 | 11:37 | | |
| JB | JSN | EBR05 | B | 9/17/13 | 11:38 | | |
| JB | JSN | EBR05 | C | 9/17/13 | 11:38 | | |
| JB | JSN | EBR06 | A | 9/16/13 | 14:53 | >16.72 | |
| JB | JSN | EBR06 | B | 9/16/13 | 14:54 | >13.95 | |
| JB | JSN | EBR06 | C | 9/16/13 | 14:55 | >16.60 | |
| JB | JSN | EBR07 | A | 9/17/13 | 10:56 | | |
| JB | JSN | EBR07 | B | 9/17/13 | 10:56 | | |
| JB | JSN | EBR07 | C | 9/17/13 | 10:57 | | |
| JB | JSN | EBS02 | A | 9/16/13 | 13:49 | TR | 8.03 |
| JB | JSN | EBS02 | B | 9/16/13 | 13:50 | 1.54 | |
| JB | JSN | EBS02 | C | 9/16/13 | 13:50 | 2.54 | >12.11 |
| JB | JSN | EBS03 | A | 9/17/13 | 11:03 | | |
| JB | JSN | EBS03 | C | 9/17/13 | 11:27 | | |
| JB | JSN | EBS03 | E | 9/17/13 | 11:28 | | |
| JB | JSN | EBS04 | D | 9/17/13 | 12:58 | | |
| JB | JSN | EBS04 | E | 9/17/13 | 12:58 | | |
| JB | JSN | EBS04 | F | 9/17/13 | 12:59 | | |
| JB | JSN | EBS05 | A | 9/17/13 | 14:25 | | |
| JB | JSN | EBS05 | B | 9/17/13 | 14:26 | | |
| JB | JSN | EBS05 | C | 9/17/13 | 14:26 | | |
| JB | JSN | EBS06 | A | 9/16/13 | 13:37 | 2.00 | |
| JB | JSN | EBS06 | B | 9/16/13 | 13:37 | 2.07 | 7.99 |
| JB | JSN | EBS06 | C | 9/16/13 | 13:38 | 1.45 | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | EBS07 | A | 9/16/13 | 14:46 | | |
| JB | JSN | EBS07 | B | 9/16/13 | 14:47 | | |
| JB | JSN | EBS07 | C | 9/16/13 | 14:47 | | |
| JB | JSN | EBS08 | A | 9/17/13 | 13:48 | | 5.36 |
| JB | JSN | EBS08 | B | 9/17/13 | 13:48 | | |
| JB | JSN | EBS08 | C | 9/17/13 | 13:49 | 1.36 | |
| JB | JSN | EBS09 | A | 9/16/13 | 11:04 | | |
| JB | JSN | EBS09 | B | 9/16/13 | 11:05 | | |
| JB | JSN | EBS09 | C | 9/16/13 | 11:06 | | |
| JB | JSN | EBS10 | A | 9/17/13 | 13:12 | | |
| JB | JSN | EBS10 | B | 9/17/13 | 13:13 | | |
| JB | JSN | EBS10 | C | 9/17/13 | 13:14 | | |
| JB | JSN | EBS11 | A | 9/17/13 | 14:09 | | >11.0 |
| JB | JSN | EBS11 | B | 9/17/13 | 14:10 | | >8.0 |
| JB | JSN | EBS11 | C | 9/17/13 | 14:11 | | 6.50 |
| JB | JSN | EBS12 | B | 9/17/13 | 12:05 | | |
| JB | JSN | EBS12 | C | 9/17/13 | 12:05 | | |
| JB | JSN | EBS12 | D | 9/17/13 | 12:06 | | |
| JB | JSN | EBS13 | A | 9/16/13 | 14:04 | | |
| JB | JSN | EBS13 | B | 9/16/13 | 14:05 | | |
| JB | JSN | EBS13 | C | 9/16/13 | 14:05 | | |
| JB | JSN | EBS14 | A | 9/16/13 | 13:43 | TR | 5.00 |
| JB | JSN | EBS14 | B | 9/16/13 | 13:44 | TR | |
| JB | JSN | EBS14 | C | 9/16/13 | 13:45 | | 2.50 |
| JB | JSN | EBS15 | A | 9/16/13 | 11:48 | 2.13 | >7.17 |
| JB | JSN | EBS15 | B | 9/16/13 | 11:48 | 1.68 | >7.47 |
| JB | JSN | EBS15 | C | 9/16/13 | 11:49 | 1.84 | >9.48 |
| JB | JSN | EBS16 | A | 9/17/13 | 14:03 | >10.9 | |
| JB | JSN | EBS16 | B | 9/17/13 | 14:03 | | >10.1 |
| JB | JSN | EBS16 | C | 9/17/13 | 14:04 | | >3.63 |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | EBS17 | A | 9/17/13 | 14:32 | | 1.25 |
| JB | JSN | EBS17 | B | 9/17/13 | 14:32 | | 5.68 |
| JB | JSN | EBS17 | C | 9/17/13 | 14:33 | | 5.27 |
| JB | JSN | EBS18 | E | 9/17/13 | 12:14 | | |
| JB | JSN | EBS18 | F | 9/17/13 | 12:15 | | |
| JB | JSN | EBS18 | G | 9/17/13 | 12:16 | | |
| JB | JSN | EBS19 | A | 9/17/13 | 11:51 | | |
| JB | JSN | EBS19 | B | 9/17/13 | 11:52 | | |
| JB | JSN | EBS19 | C | 9/17/13 | 11:52 | | |
| JB | JSN | EBS20 | A | 9/17/13 | 13:05 | >12.62 | |
| JB | JSN | EBS20 | B | 9/17/13 | 13:05 | | >10.4 |
| JB | JSN | EBS20 | C | 9/17/13 | 13:06 | >10.71 | |
| JB | JSN | EBS21 | A | 9/17/13 | 13:37 | >9.04 | |
| JB | JSN | EBS21 | B | 9/17/13 | 13:37 | >9.60 | |
| JB | JSN | EBS21 | C | 9/17/13 | 13:38 | >10.16 | |
| JB | JSN | EBS22 | A | 9/17/13 | 13:28 | | 4.36 |
| JB | JSN | EBS22 | B | 9/17/13 | 13:29 | | |
| JB | JSN | EBS22 | C | 9/17/13 | 13:30 | | 4.42 |
| JB | JSN | EBS23 | A | 9/16/13 | 10:57 | | |
| JB | JSN | EBS23 | B | 9/16/13 | 10:58 | | |
| JB | JSN | EBS23 | C | 9/16/13 | 10:59 | | |
| JB | JSN | EBS24 | A | 9/17/13 | 10:47 | | |
| JB | JSN | EBS24 | B | 9/17/13 | 10:47 | | |
| JB | JSN | EBS24 | C | 9/17/13 | 10:48 | | |
| JB | JSN | EBS25 | D | 9/16/13 | 10:15 | | |
| JB | JSN | EBS25 | E | 9/16/13 | 10:16 | | |
| JB | JSN | EBS25 | F | 9/16/13 | 10:16 | | |
| JB | JSN | EBS27 | A | 9/17/13 | 13:22 | | |
| JB | JSN | EBS27 | B | 9/17/13 | 13:22 | | |
| JB | JSN | EBS27 | C | 9/17/13 | 13:23 | | |
| JB | JSN | EBS28 | A | 9/16/13 | 15:54 | | >13.82 |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | EBS28 | B | 9/16/13 | 15:55 | >16.85 | |
| JB | JSN | EBS28 | C | 9/16/13 | 15:56 | >17.54 | |
| JB | JSN | EBS29 | A | 9/17/13 | 13:54 | | |
| JB | JSN | EBS29 | B | 9/17/13 | 13:54 | | |
| JB | JSN | EBS29 | C | 9/17/13 | 13:55 | | |
| JB | JSN | EBS30 | A | 9/17/13 | 15:11 | | |
| JB | JSN | EBS30 | B | 9/17/13 | 15:11 | | |
| JB | JSN | EBS30 | C | 9/17/13 | 15:12 | | |
| JB | JSN | EBS31 | A | 9/17/13 | 15:25 | | |
| JB | JSN | EBS31 | B | 9/17/13 | 15:25 | | |
| JB | JSN | EBS31 | C | 9/17/13 | 15:26 | | |
| JB | JSN | EBS32 | A | 9/17/13 | 15:33 | | |
| JB | JSN | EBS32 | B | 9/17/13 | 15:34 | | |
| JB | JSN | EBS32 | C | 9/17/13 | 15:35 | | |
| JB | JSN | EBS33 | A | 9/17/13 | 15:41 | | |
| JB | JSN | EBS33 | B | 9/17/13 | 15:41 | | |
| JB | JSN | EBS33 | C | 9/17/13 | 15:42 | | |
| JB | JSN | EBS34 | A | 9/17/13 | 15:48 | | |
| JB | JSN | EBS34 | B | 9/17/13 | 15:49 | | |
| JB | JSN | EBS34 | C | 9/17/13 | 15:49 | | |
| JB | JSN | EBS35 | B | 9/17/13 | 15:56 | | |
| JB | JSN | EBS35 | C | 9/17/13 | 15:57 | | |
| JB | JSN | EBS35 | D | 9/17/13 | 15:57 | | |
| JB | JSN | EBS36 | D | 9/17/13 | 17:18 | | |
| JB | JSN | EBS36 | E | 9/17/13 | 17:19 | | |
| JB | JSN | EBS36 | F | 9/17/13 | 17:20 | | |
| JB | JSN | EBS37 | D | 9/17/13 | 17:03 | | |
| JB | JSN | EBS37 | E | 9/17/13 | 17:03 | | |
| JB | JSN | EBS37 | F | 9/17/13 | 17:04 | | |
| JB | JSN | EBT01 | A | 9/17/13 | 9:45 | | |
| JB | JSN | EBT01 | B | 9/17/13 | 9:46 | | |

**NewFields Sediment Profile Image Analysis**
**Project: ELLIOTT BAY 2013**

| Analyst (Initials) | QA (Initials) | Station | Replicate | Date | Time | Recent DM (cm) | Historic DM (cm) |
|---|---|---|---|---|---|---|---|
| | | | | | | Mean | Mean |
| JB | JSN | EBT01 | C | 9/17/13 | 9:47 | | |
| JB | JSN | EBT02 | A | 9/17/13 | 9:38 | | |
| JB | JSN | EBT02 | B | 9/17/13 | 9:39 | | |
| JB | JSN | EBT02 | C | 9/17/13 | 9:39 | | |
| JB | JSN | EBT03 | A | 9/17/13 | 9:31 | | |
| JB | JSN | EBT03 | B | 9/17/13 | 9:32 | | |
| JB | JSN | EBT03 | C | 9/17/13 | 9:32 | | |
| JB | JSN | EBT04 | A | 9/17/13 | 9:24 | | |
| JB | JSN | EBT04 | B | 9/17/13 | 9:25 | | |
| JB | JSN | EBT04 | C | 9/17/13 | 9:26 | | |
| JB | JSN | EBT05 | A | 9/17/13 | 9:16 | | |
| JB | JSN | EBT05 | B | 9/17/13 | 9:17 | | |
| JB | JSN | EBT05 | C | 9/17/13 | 9:18 | | |
| JB | JSN | EBT07 | A | 9/17/13 | 10:32 | | |
| JB | JSN | EBT07 | B | 9/17/13 | 10:33 | | |
| JB | JSN | EBT07 | C | 9/17/13 | 10:33 | | |
| JB | JSN | EBT08 | A | 9/17/13 | 10:24 | | |
| JB | JSN | EBT08 | B | 9/17/13 | 10:25 | | |
| JB | JSN | EBT08 | C | 9/17/13 | 10:26 | | |
| JB | JSN | EBT09 | A | 9/17/13 | 10:17 | | |
| JB | JSN | EBT09 | B | 9/17/13 | 10:17 | | |
| JB | JSN | EBT09 | C | 9/17/13 | 10:18 | | |
| JB | JSN | EBT10 | A | 9/17/13 | 10:09 | | |
| JB | JSN | EBT10 | B | 9/17/13 | 10:10 | | |
| JB | JSN | EBT10 | C | 9/17/13 | 10:10 | | |
| JB | JSN | EBT11 | A | 9/17/13 | 9:59 | | |
| JB | JSN | EBT11 | B | 9/17/13 | 10:00 | | |
| JB | JSN | EBT11 | C | 9/17/13 | 10:01 | | |
| JB | JSN | EBZ01 | A | 9/16/13 | 15:07 | >12.34 | |
| JB | JSN | EBZ01 | B | 9/16/13 | 15:07 | >13.44 | |
| JB | JSN | EBZ01 | C | 9/16/13 | 15:08 | >11.47 | |