Appendix C
2012 and 2013 Field Summary Technical Memoranda

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Summary of Field Activities to Support Phase 4 Source Identification Study United Heckathorn Superfund Site, Richmond, California

PREPARED FOR: United States Environmental Protection Agency Region 9

PREPARED BY: CH2M HILL

DATE: January 03, 2012

PROJECT NUMBER: USEPA CONTRACT NO. EP-S9-08-04
USEPA WORK ASSIGNMENT NO. 025-RIFS-09R3
CH2M HILL PROJECT NO. 385441

Background

Previous Phase I and Phase II source investigations (Kohn and Evans, 2002 and 2004) were performed at the United Heckathorn Superfund Site in Richmond, California to locate potential point sources of contamination along the eastern bank of the Lauritzen Channel. Table 1, which is discussed further below, summarizes the potential point sources associated with outfalls that were identified in the previous studies. The locations of these outfalls and other major structures have been incorporated into the project's geographic information system (GIS); however, field verification of the features was necessary to generate a current site features map in accordance with the *Preliminary Draft Focused Feasibility Study Data Gaps Sampling and Analysis Plan Addendum #2 Source Identification Study* (SAP) (CH2M HILL, 2012). This technical memorandum summarizes the results of the site survey performed in late 2012 to support the Phase 4 source identification study.

Site Survey Activities

Site survey activities were performed during the spring low tide (approximately -0.6 feet mean lower low water) on November 29 and December 10, 2012. The site survey activities consisted of touring the eastern side of the Lauritzen Channel by boat and foot to locate potential point sources of contamination including outfall pipes, breaks in the sheet pile walls, and other features that could potentially act as preferential pathways for contaminant transport into the channel.

On November 29, 2012, the eastern side of the Lauritzen Channel (between bent numbers -1 and -45) and the head of the channel (between SW-7 and SW-6) were surveyed by foot (Figure 1). On December 10, 2012, the eastern side of the Lauritzen

Channel (underneath the Levin Pier, between bent numbers +1 and +73), the head of the channel (between SW-7 and SW-6), and a portion of the western side of the Lauritzen Channel (west of bent numbers -1 through -19) were surveyed by boat. A representative from the Richmond Levin Terminal escorted CH2M HILL on the Levin boat. A map with the locations of previously documented outfall pipes/structures, as well as a hand-held global positioning system (GPS) unit with pre-loaded GIS information for these features, were used to verify the locations of previously-documented structures. Labels for the previously-documented structures contain a prefix of P1 indicating they were documented during the Phase 1 source investigation. The prefix P4 indicates pipes that were identified on a storm drain figure from the City of Richmond obtained after the Phase 1 source investigation, one structure (P4-3) that was discussed in the Phase 1 source investigation but not located in the field, and all new structures identified during the current field activities on November 29 and December 10, 2012. Locations of new features that were not previously documented were recorded using the GPS unit. Observed features were also photographed and/or videotaped.

Findings

The key findings of the Phase 4 source identification study are listed below. Table 1 summarizes the potential point sources documented during previous investigations and new information obtained during this Phase 4 source identification study. Figure 1 presents the location of the outfall pipes and other shoreline features. Attachment 1 contains photographs of the observed features.

- All previously documented pipes were located with the exception of PC1-1, P4-1, P4-3, and P1-4. Outfall PC1-1 is located in the Parr Canal, which was not surveyed as part of the Phase 4 source investigation study. Pipe P4-1, located on the western side of the channel, was not accessible by boat due to a barge stationed in the channel. Pipes P1-4 and P4-3 were not located by boat or by foot and are assumed to no longer be present.

- Additional outfall pipes identified in this survey include five storm water interceptor pipes (SW-3 through SW-7) installed during the final remedy for the upland portion of the former United Heckathorn site completed in 1998 (PES, 1998) on the eastern side and head of the channel, four pipes along the western side of the channel (P4-4 through P4-7), and eight new pipes (P4-8 through P4-15) along the eastern side of the channel underneath the Levin Pier. Additionally, two electrical conduits were observed on the eastern side of the channel beneath the Levin Pier.

- The eastern shoreline material consists of sheet pile (steel plates supported by railroad ties), concrete, rip rap, and/or shotcrete, as shown in Figure 1. The majority of the western side of the channel (west of bent numbers -1 through -19) consisted of rock/rip rap.

- Erosion under the sheet pile wall (~1-2 foot voids) was observed at the northern end of the eastern side of the channel, beginning around outfall pipe location P4-3 and extending north to the head of the channel (see Photograph 12 in Attachment 1).

- Sink holes and exposed cap material were observed on the Levin property in the vicinity of P1-4 and P1-3 (see Photographs 25 and 26 in Attachment 1).

In addition to the site surveys described above, observations of the eastern and western shoreline of the Lauritzen Channel were recorded during bathymetric survey activities on December 4, 2012. Noticeable outfall pipes, culverts, and other features that appeared to drain into the channel were photographed from the survey vessel. These photographs will be further evaluated and geo-referenced as part of the Source Identification Study Technical Memorandum to be submitted separately.

References

CH2M HILL. 2012. *Preliminary Draft. Focused Feasibility Study Data Gaps Sampling and Analysis Plan Addendum #2, Source Identification, Study United Heckathorn Superfund Site, Richmond, California.* November.

Kohn and Evans. 2002. *Phase I Source Investigation at the United Heckathorn Superfund Site, Richmond, California*. PNNL-14088. December.

Kohn and Evans. 2004. *Year 6 Post-Remediation Biomonitoring and Phase II Source Investigation at the United Heckathorn Superfund Site, Richmond, California*. PNNL-14596. March.

PES Environmental, Inc. 1998. *Pre-Final/Final Design and Remedial Action Work Plan Upland Capping Project, Richmond, California*. April.

Figure 1

LEGEND

- Outfall Locations
- Outfall Locations not verified in field.
- Pier
- 10 Pier Pilings
- -10 Former Pier Pilings
- Bent Number

Shoreline Material

- Concrete
- Rock/Rip Rap
- Rock/Rip Rap and Concrete
- Shotcrete
- Sheet Pile
- Sheet Pile and Concrete

- Former United Heckathorn Buildings
- Property Line

N

0 62.5 125 250 Feet

Note:
Positive bent numbers are associated with existing rows of pier pilings.
Negative bent numbers are associated with historical pier pilings.

FIGURE 1
SUMMARY OF FIELD ACTIVITIES TO SUPPORT PHASE 4 SOURCE IDENTIFICATION STUDY

UNITED HECKATHORN SUPERFUND SITE
RICHMOND, CALIFORNIA

CH2MHILL

Document Path: D:\Projects\EPA_UnitedHeckathorn\MapFiles\2012\Field\SiteFeatures_FieldMapV2.mxd Date Saved: 1/3/2013 5:12:39 PM

Table 1

TABLE 1
Potential Point Sources of Contamination to the Lauritzen Channel
United Heckathorn Superfund Site Source Identification Technical Memorandum

Point Source Identifier[1]	Description [2]	Phase 1 Identifier Transect [3]	Phase 1 Comments	Phase 4 Identifier Bent Number[4]	Phase 4 Comments
Pipes Documented Prior to the Phase I Source Investigation					
LCI-1	Concrete municipal outfall at north end of Lauritzen Channel Flap gate installed on outfall in October 2012.	-47	Some water flow observed	Head of channel	Lauritzen Outfall was located and flap gate observed. See Photograph 15 in Attachment 1.
PCI-1	Concrete municipal outfall at north end of Parr Canal. Flap gate installed on outfall prior to site visit on January 25, 2011.		N/A		Pipe was not verified because Parr Canal was not inspected as part of the site survey.
P1-1	8-in. metal outfall through retaining wall about 2 ft above sediment	-27.5	Some water dripping observed (pipe is submerged at high tide).		Pipe was located. Tidal drainage was observed dripping from pipe.
P1-2	5.5-in. metal pipe through retaining wall about 5 ft above present sediment surface, same location as 8-in. pipe above	-27.5	No sediment in pipe, no water flow, not sampled.		Pipe was located.
P1-3	L-shaped pipe	-24.5	Valve closed; not sampled.		Angled metal pipe was located. Appears to be an abandoned fire main. See Photograph 21 in Attachment 1.
P4-3	Described in Phase I as a screened pipe end in riprap near north end of sheetpile wall		Not found during Phase I field survey		Pipe was not located.

TABLE 1
Potential Point Sources of Contamination to the Lauritzen Channel
United Heckathorn Superfund Site Source Identification Technical Memorandum

Point Source Identifier[1]	Description [2]	Phase 1 Identifier Transect [3]	Phase 1 Comments	Phase 4 Identifier Bent Number[4]	Phase 4 Comments
P4-1	Pipe discharging to west side of channel, identified on City of Richmond drainage map.		Not found during Phase I field survey		Pipe was not verified because this portion of the Lauritzen Channel was inaccessible by boat due to barge stationed in the channel.
P4-2	21-inch pipe discharging beneath Levin Pier, identified on City of Richmond drainage map.		Pipe this size not found at expected location during Phase I field survey, but several smaller previously undocumented pipes were found beneath pier.	+9.5	2-inch diameter corroded metal pipe was located. See Photograph 3 in Attachment 1.
Pipes identified in Phase I Source Investigation					
P1-4	Concrete pipe at bottom of riprap. Described as the "seep" in Phase 2. Grouted on July 18, 2003 by EPA.	-8.5	Some flow observed. Pipe is difficult to see as it blends in with cobbles and rip rap.		Pipe was not located.
P1-5	Corroded metal pipe identified during February 6, 2002 deployment, under Levin Pier.	+20	Appears valved off, end very corroded.	+20.5	10-inch diameter corroded metal pipe located. See Photograph 5 in Attachment 1.
P1-6	6-inch diameter pipe, under Levin Pier.	+31.5	Appears to discharge occasionally.	+31.5	Corroded metal pipe was located. See Photograph 8 in Attachment 1.
P1-7	8-inch diameter pipe, under Levin Pier.	+59.5	Appears valved off, old, unused; not sampled or photographed.	+59.5	12-inch diameter pipe located. Appears to be an abandoned fire main. See Photograph 11 in Attachment 1.
Pipes identified in Phase 4 Source Investigation					
SW-3	NA	NA	NA	+27	18-inch diameter HDPE storm water interceptor pipe. Filter cloth is loosely hanging from pipe.

TABLE 1
Potential Point Sources of Contamination to the Lauritzen Channel
United Heckathorn Superfund Site Source Identification Technical Memorandum

Point Source Identifier[1]	Description [2]	Phase 1 Identifier Transect [3]	Phase 1 Comments	Phase 4 Identifier Bent Number[4]	Phase 4 Comments
					See Photograph 6 in Attachment 1.
SW-4	NA	NA	NA	0	18-inch diameter HDPE storm water interceptor pipe. Contains 8 inch diameter valve and filter cloth intact. Water was flowing from pipe.
SW-5	NA	NA	NA	-17	18-inch diameter HDPE storm water interceptor pipe. Contains 8 inch diameter valve and filter cloth intact. See Photograph 20 in Attachment 1.
SW-6	NA	NA	NA	Head of channel, east of LC1-1	18-inch diameter HDPE storm water interceptor pipe. Contains 8 inch diameter valve and filter cloth intact. See Photograph 14 in Attachment 1.
SW-7	NA	NA	NA	Head of channel, west of LC1-1	15-inch diameter HDPE storm water interceptor pipe. Appears to be valved closed. See Photograph 16 in Attachment 1.
P4-4	NA	NA	NA	Head of channel, west of SW-7	10-inch diameter metal pipe. See Photo See Photograph 17 in Attachment 1.
P4-5	NA	NA	NA	western side channel across from -33	4-inch diameter metal pipe. See Photograph 18 in Attachment 1.
P4-6	NA	NA	NA	western side channel	2 to4-inch diameter metal pipe.

TABLE 1
Potential Point Sources of Contamination to the Lauritzen Channel
United Heckathorn Superfund Site Source Identification Technical Memorandum

Point Source Identifier[1]	Description [2]	Phase 1 Identifier Transect [3]	Phase 1 Comments	Phase 4 Identifier Bent Number[4]	Phase 4 Comments
				across from -26	
P4-7	NA	NA	NA	western side channel across from -24	4-inch diameter metal pipe.
P4-8	NA	NA	NA	0	8-inch diameter corroded metal pipe located at bottom of rip rap. See Photograph 19 in Attachment 1.
P4-9	NA	NA	NA	+20.5	9-inch diameter corroded metal U-shaped pipe. Appears to be abandoned fire main. See Photograph 4 in Attachment 1.
P4-10	NA	NA	NA	+26.5	4-inch diameter corroded metal pipe. See Photograph 7 in Attachment 1.
P4-11	NA	NA	NA	+70.5	18-inch diameter metal pipe cemented shut.
P4-12	NA	NA	NA	+72	6-inch diameter metal pipe.
P4-13	NA	NA	NA	-14	2-inch diameter corroded metal pipe. See Photograph 22 in Attachment 1.
P4-14	NA	NA	NA	-11.5	2-inch diameter corroded metal pipe. See Photograph 23 in Attachment 1.
P4-15	NA	NA	NA	-10.5	2-inch diameter long metal pipe. See Photograph 24 in Attachment 1.
Conduits 1 and 2	NA	NA	NA	+30.5	2 metal conduits. See Photograph 9 in Attachment 1.

NOTES:

NA=Not applicable

[1] Point source identifiers have been assigned for this study. Labels containing a prefix of P1 refer to pipes that were identified in the field during the Phase I Source Investigation (Kohn and Evans, 2002). The prefix P4 refers to pipes that were identified on a storm drain figure from the City of Richmond obtained after the Phase I Source Investigation, one structure P4-3 that was discussed in the Phase I Source Investigation but was not located in the field, and all new structures identified during field activities on 11/29/12 and 12/10/12.

[2] Descriptions from Table 3.1 of the Phase I Source Investigation (Kohn and Evans, 2002).

[3] A transect naming system and navigational baseline were established using the numbers assigned to rows of pier pilings (also known as bent numbers) supporting the Levin pier. Each row of pilings was assigned a whole number starting with +1 at the north end of the pier. The transect numbering system for the rows of pier pilings is presented as Attachment B of the SAP (CH2M HILL, 2012). Transect numbers fall between whole number pier pilings (e.g., +17.5 falls between +17 and +18).

[4]Positive bent numbers are associated with existing rows of pier pilings. Negative bent numbers are associated with historical pier pilings. Bent numbers are spaced approximately 15 feet apart.

Attachment 1
Photograph Log

Photograph 1: View of rock/rip rap under Levin Pier.

Photograph 2: View of sheet pile (steel plates supported by railroad ties) and rock/rip rap under Levin pier

Photograph 3: View of 2-inch diameter corroded metal pipe at Bent +9.5. Apppears to be pipe P4-2.

Photograph 4: View of 9-inch diameter corroded metal U-shaped pipe at Bent +20.5 (pipe P4-9). Appears to be abandoned fire main.

Photograph 5: View of 10-inch diameter corroded metal pipe at Bent +20.5. Appears to be pipe P1-5.

Photograph 6: View of 18-inch diameter HDPE pipe SW-3 at Bent +27. Filter cloth loosely hanging.

Photograph 7: 4-inch diameter corroded metal pipe at Bent +26.5 (Pipe P4-10).

Photograph 8: 6-inch diameter corroded metal pipe (P1-6) and Shotcrete at Bent +31.5.

Photograph 9: Two 2-inch diameter metal conduits at Bent +30.5.

Photograph 10: Shotcrete between Bents +28 and +48.

Photograph 11: 12-inch diameter pipe (P1-7) at Bent +59.5. Appears to be an abandoned fire main.

Photograph 12: Erosion under sheet pile at abandoned pier near Bent -40 (~1-2 foot voids).

Photograph 13: Abandoned pier northern end/eastern side of Lauritzen Channel

Photograph 14: 18-inch diameter storm water interceptor pipe SW-6 with 8-inch valve and filter cloth at head/eastern side of Lauritzen Channel.

Photograph 15: Lauritzen Channel Outfall (LCI-1) at head of Lauritzen Channel.

Photograph 16: 15-inch diameter storm water interceptor pipe SW-7 at head/western side of Lauritzen Channel.

Photograph 17: 10-inch diameter metal pipe (P4-4) at head/western side of Lauritzen Channel.

Photograph 18: 2 to 4-inch diameter metal pipe (P4-5), western side of Lauritzen Channel across from Bent -33.

Photograph 19: 8-inch diameter corroded metal pipe (P4-8) beneath storm water interceptor pipe SW-4 at Bent 0.

Photograph 20: 18-inch diameter storm water interceptor pipe (SW-5) with 8-inch diameter valve and filter cloth at Bent -17.

Photograph 21: Angled metal pipe located at Bent -24.5. Appears to be pipe P1-3, an abandoned fire main.

Photograph 22: 2-inch diameter corroded metal pipe (P4-13) located at Bent -14.

Photograph 23: 2-inch diameter corroded metal pipe (P4-14) located at Bent -11.5.

Photograph 24: 2-inch diameter corroded metal pipe (P4-15) located at Bent -10.5

Photograph 25: Sink hole showing exposed cap material.

Photograph 26: Exposed cap material.

Summary of Field Activities to Support the Source Identification Study, Sediment Grab Sampling and Bent Number 37 Seep Water Sampling United Heckathorn Superfund Site, Richmond, California

PREPARED FOR:	United States Environmental Protection Agency Region 9
PREPARED BY:	CH2M HILL
DATE:	August 14, 2013
PROJECT NUMBER:	USEPA CONTRACT NO. EP-S9-08-04 USEPA WORK ASSIGNMENT NO. 025-RIFS-09R3 CH2M HILL PROJECT NO. 385441

Background

Surface sediment grab samples were collected as part of the sediment sampling activities described in the Final Focused Feasibility Study Data Gaps Sampling and Analysis Plan Addendum #2, Source Identification Study, United Heckathorn Superfund Site (SAP) (CH2M HILL, 2013). Sediment sampling activities included collection of sediment grab samples from 14 locations (discussed in this technical memorandum) and core samples from 27 locations (discussed in the vibracoring field summary technical memorandum). Sediment samples were analyzed to identify the source(s) of dichlorodiphenyl-trichloroethane (DDT)[1] This technical memorandum summarizes the grab sediment sampling activities performed on March 13 and April 29, 2013. Additionally, a new seep at bent number 37[2] was identified during surface sediment sampling. The collection of one water sample from this location is summarized at the end of this technical memorandum. The analytical results for the sediment grab samples and seep water sample will be presented and evaluated in the Source Identification Study report.

Nine unbiased sediment grab samples (with locations identified using a modified grid system) were collected along the northern and eastern sides of the Lauritzen Channel (Figure 1). Three biased grab samples were collected near the 8-inch pipe at bent number -27.5, the former seep pipe at bent number -8.5, and the hot spot identified under the north end of the Levin pier in the Phase I Source Identification Study (Kohn and Evans, 2002).

[1] DDT is defined as the sum of 2,4'- and 4,4'-dichlorodiphenyltrichloroethane (DDT); 2,4'- and 4,4'-dichlorodiphenyldichloroethane (DDD); and 2,4'- and 4,4'-dichlorodiphenyldichloroethene (DDE)

[2] Bent numbers are the numbers assigned to rows of pier pilings supporting the Levin pier. Each row of pilings was assigned a whole number starting with +1 at the north end of the pier. Positive bent numbers are associated with existing rows of pier pilings. Negative bent numbers are associated with historical pier pilings.

The locations chosen for sediment grab samples were in water that was too shallow for or otherwise inaccessible (between pilings and under the piers) to the larger vessel used during the sediment vibracore sampling activities in April 2013. A small vessel and a hand-deployed Ekman sampler were used to collect sediment grab samples at many of these locations; however, a few locations were accessed by foot.

Sediment Grab Sample Collection Activities

On March 13, 2013, sediment grab samples were collected at locations SD13-01, SD13-02, SD13-03, SD13-06, SD13-07, SD13-11, SD13-16, SD13-17, and SD13-21 (nine of the fourteen proposed grab sediment sample locations) along the northern and eastern side of the Lauritzen Channel. A small vessel (13-foot Boston Whaler), an Ekman sampler, and boat operator were provided by the United States Environmental Protection Agency (EPA) Region 9 Laboratory. The tides ranged from 1.03 feet Mean Lower Low Water (MLLW) at 0900 hours, to a high tide of 5.67 feet MLLW at 1400 hours, and 4.48 feet MLLW at 1600 hours on March 13, 2013.

On April 29, 2013, during an exceptionally low tide, grab samples were collected from the remaining four locations (SD13-22, SD13-26, SD-30, and SD13-34), which were located under the pier and at the previously identified hotspot near the north end of the pier. Grab samples were collected by hand from locations under the pier in the morning. The final grab sample was collected at the hot spot using the Ekman dredge. A small vessel (16-foot flat-bottomed work boat), and operator were provided by the Levin Richmond Terminal. The tides ranged from 0.03 feet MLLW at 0800 hours, to a low tide of -1.09 feet MLLW at 0948 hours, and 0.38 feet MLLW at 1145 hours on April 29, 2013.

The sediment grab sample locations were determined in the field using a handheld global positioning system (GPS) unit (Trimble) that was preloaded with the proposed sample location coordinates. The vessel was anchored at each location using either bow or stern anchors, or by tying the vessel to a pier, piling or other fixed point. On March 13, 2013, the geographic information system (GIS) coordinates were collected at six of the nine sediment grab sample locations (SD13-01, SD13-02, SD13-03, SD13-06, SD13-07, and SD13-11). The GPS battery failed at approximately 1330 hours; therefore, the GIS coordinates for the remaining three sediment grab sample locations (SD13-16, SD13-17, and SD13-21) were downloaded from an onsite mobile phone and the location was identified based on site features and landmarks such as the pier bent numbers. The sediment grab samples collected on April 29, 2013 were located under the pier where there is no GPS coverage; therefore, these locations were also identified using landmarks including the associated pier bent numbers. Figure 1 presents the locations of the sediment grab samples collected in March and April 2013. The sample collection forms are presented in Attachment 1 and the laboratory chains of custody are presented in Attachment 2. Attachment 3 presents a photographic log of the sediment grab sampling activities.

Sediment Grab Sample Processing Activities

March 13, 2013

At each sediment grab sample location, the water depth was measured using a hand-held sonar device and recorded on the sample collection form (Attachment 1). The channel water was very clear at most locations, which allowed the operator to see the Ekman sampler on the channel bottom. The majority of the sediment grab sample locations were very rocky and contained debris (e.g., shell fragments, rocks, leaf litter) which interfered with sediment sample recovery. For this reason, multiple drops of the Eckman sampler were necessary at the same location to collect the volume of sediment required for laboratory analyses. Materials collected from multiple drops of the Eckman sampler were placed into disposable commercial food-grade aluminum pans. Rocks and other debris were discarded. The sediment sample color, contents, and lithology were recorded (Attachment 1) and photos of the samples were taken (Attachment 3).

The sediment was homogenized using prepackaged disposable scoops and transferred to pre-labeled sample containers. The time and date of sample collection were recorded (Attachment 1). Samples were collected at each location for pesticide analysis (EPA Method 8081A), total organic carbon (TOC; Walkley-Black method), and grain size (American Society for Testing and Materials [ASTM] Method D4464). Samples were stored on ice inside a cooler during the sampling activities. Samples collected for pesticide analysis were submitted to the Contract Laboratory Program (CLP) lab (one 4 ounce (oz) jar for KAP) and split samples were submitted to the EPA Region 9 Laboratory (one 4 oz jar). Samples for analysis of physical parameters (grain size and TOC) were submitted to PTS Laboratories (one gallon zip lock bag). One field duplicate was collected for pesticide analysis. Laboratory chains of custody are presented in Attachment 2. The Eckman sampler was cleaned of sediment between each station by scrubbing with an Alconox solution and rinsing with site water.

April 29, 2013

At each sediment grab sample location, the location was carefully documented by noting the adjacent pier bent numbers because the GPS could not be used under the pier. The only location underwater at the time of sampling was SD13-22. The water depth at location SD13-22 was determined by measuring the length of line for the Ekman Dredge, which was recorded on the sample collection form (Attachment 1). The embankment under the pier is covered in either rip-rap or concrete, although enough sediment was available at each location to collect sufficient sample volume for analysis. The sediment was generally silty sand with gravel, although some clay balls were observed. Sediment was removed from the embankment using disposable scoops and mixed thoroughly in commercial food-grade aluminum pans. Rocks and other debris were discarded. Location SD13-22 was very rocky, which interfered with sediment sample recovery. Ten drops of the Eckman sampler were necessary at this location to collect the volume of sediment required for laboratory analyses. Materials collected from multiple drops of the Eckman sampler were placed into a disposable plastic bag and thoroughly mixed. Rocks and other debris were discarded. The sediment sample color, contents, and lithology were recorded (Attachment 1) and photos of the samples were taken (Attachment 3).

The sediment was homogenized using prepackaged disposable scoops and transferred to pre-labeled sample containers. The time and date of sample collection was recorded (Attachment 1). Samples were collected at each location for pesticide analysis (EPA Method 8081A), TOC (Walkley-Black method), and grain size (ASTM Method D4464). Samples were stored on ice inside a cooler during the sampling activities. Samples collected for pesticides analysis were submitted to the CLP lab (one 4 oz jar for KAP) and split samples were submitted to the EPA Region 9 Laboratory (one 4 oz jar). Sample for the analysis of physical parameters (grain size and TOC) were submitted to PTS Laboratories (one gallon zip lock bag). Laboratory chains of custody are presented in Attachment 2. The Ekman sampler was cleaned of any sediment by scrubbing with an Alconox solution and rinsing with site water before it was returned.

Water was observed seeping out of the lower embankment between bent numbers 24 and 25; however, the flow was diffuse and occurred below the riprap in unarmored sediment below the tide line. A seep was observed flowing out of the embankment at bent number 37 as shown on Photographs 22 and 23 of Attachment 3. This seep was sampled as described later in this memorandum.

Sediment Grab Sample Descriptions

The sample collection forms (Attachment 1) present the information recorded for each sediment sample collected. The information recorded includes the date, time, and type of sample collected, the water depth at each location, the surface sediment sample collection depth (0 to 0.5 feet below sediment surface), tide height, GIS coordinates for each location, and description of sediment encountered (color, contents, and lithology). A summary of the sediment sample descriptions is presented below.

SD13-01

The unbiased sediment sample (SD13-01-0005) is located at the head of the Lauritzen Channel. The Eckman sampler was deployed multiple times (approximately 12). The deployments failed due to debris caught in the jaws of the Eckman sampler, shells and/or gravel caught in the spring mechanism, or the sampler not tripping due to the shallow depth. The clear visibility of the channel bottom allowed the operator to see a steep slope of the near shore location and the rocks and debris on the bottom of the channel. The vessel was relocated approximately 20 feet southeast of the original proposed location, to a slightly deeper, flatter location with less debris. The water depth was measured at 7.8 feet deep at this location. Two partially filled grab samples were homogenized for sample processing. Sediment was dark grey-green with a dark brown and black layer at the surface. The material was silty clay with gravel, sand, shells, and debris (wood, plastic, and leaves). Photographs 1 and 2 in Attachment 3 show the sediment.

SD13-02

The unbiased sediment sample (SD13-02-0005) is located at the head of the Lauritzen Channel. The first drop of the Ekman sampler was successful at this location. The channel bottom was visible and appeared rocky. The water depth was measured at 11 feet. The material was black silty clay with sand, shells, plastic, and woody debris. Large sticks and

shells were removed prior to homogenization and sample processing. Photograph 3 in Attachment 3 shows the sediment.

SD13-03

The unbiased sediment sample (SD13-03-0005) is located at the head of the Lauritzen Channel and south of the municipal storm drain outfall. Multiple attempts were made until a successful sample was collected. The failed attempts were due to the presence of debris on the bottom of the channel. The water depth was measured at 6.5 feet. An oily sheen was observed on the water in the Ekman sampler. A large fraction of the sample consisted of leaf litter, branches, and shells. Sediment was black with green and brown layers. The material was silty clay with sand, gravel, woody debris, and shells. There was a slight organic odor observed. Multiple worms and amphipods were also observed in the material. Photographs 4 and 5 in Attachment 3 show the sediment.

SD13-07

The unbiased sediment sample (SD13-07-0005) is located along the eastern side of the Lauritzen Channel. The sample vessel was tied up to the "Do not eat fish" sign located at bent number -5. The water depth was measured at 10.8 feet. Five deployments of the Eckman sampler were made and rocks were obtained. The sixth deployment of the Ekman sampler was successful. The sediment was black with a surface layer of brown and green organic material and it had a slight organic odor. The material was silty clay with sand, rocks, shells, sticks and leaves. Photographs 6 and 7 in Attachment 3 show the sediment.

SD13-11

The unbiased sediment sample (SD13-11-0005) is located along the eastern side of the Lauritzen Channel near bent number -30. The water depth was measured at 15 feet. One attempt yielded a successful Ekman grab sample. Sediment was brown and black with a green layer. Uniform black specks were observed throughout the material. Worms and amphipods were also observed in the sediment. The sediment was silty clay with sand, shell debris, leaves, and rocks. Photographs 8 through 10 in Attachment 3 show the sediment.

SD13-12

The biased sediment sample (SD13-12-0005) is located along the eastern side of the Lauritzen Channel at bent number -27.5, adjacent to the 8-inch pipe documented in the Phase I Source Investigation (Kohn and Evans, 2002). The water depth was measured at 10.6 feet. Rocks were obtained in two unsuccessful deployments of the Ekman. Sediments obtained from 3 deployments of the Eckman (Attempts 3 through 5) were combined into one sample. Sediment was black with brown layers. Uniform black specks were observed throughout the material. Worms and amphipods were also observed in the sediment. The sediment was silty clay with sand, shell debris, leaves, and rocks. Photograph 11 in Attachment 3 shows the sediment.

SD13-16

The unbiased sediment sample (SD13-16-0005) is located along the eastern side of the Lauritzen Channel, south of the stormwater interceptor SW-5 outfall near bent number -16.5. The GPS unit's battery failed so the location coordinates were downloaded from an

onsite mobile phone (Attachment 1). The water depth was measured at 9 feet. The channel bottom was very rocky. Multiple attempts were conducted and the sample was collected from a combination of partially filled Ekman samples. An oily sheen was observed on the water in the pan. Sediment was black with yellow-brown clay clumps (appears to be Older Bay Mud [OBM] material). The sediment was silty clay with clay clumps, gravel, shells and rocks. Material resembling bauxite (reddish nodules) was observed in the sample (bauxite is typically transported from the terminal). Photograph 12 in Attachment 3 shows the sediment.

SD13-17

The biased sediment sample (SD13-17-0005) is located along the eastern side of the Lauritzen Channel, at bent number -8.5, adjacent to the former seep pipe (P1-4) that was identified in the Phase I Source Investigation (Kohn and Evans, 2002) and sealed in 2003. The GPS unit was not operational. The location coordinates were downloaded from an onsite mobile phone (Attachment 1). The water depth was measured at 9 feet. Sediment was greyish-brown with small black specs uniformly distributed throughout the material. The sediment was silty clay with some rocks and sand. Algae was observed on the surface sediment. An oily sheen was observed on the water surface in the pan. Photograph 13 in Attachment 3 shows the sediment.

SD13-21

The unbiased sediment sample (SD13-21-0005) is located along the eastern side of the Lauritzen Channel, on the north side of the floating dock at bent number -3.5. The GPS unit was not operational. The location coordinates were downloaded from an onsite mobile phone (Attachment 1). The water depth was measured at 11 feet. Two partially filled Ekman samples were combined to collect sufficient sample volume to submit field duplicates. The first Ekman sample contained silty clay with sand, rocks and clay clump. The second drop contained a large clay clump containing roots (appears to be OBM). Because the Ekman sampler will not penetrate OBM, it appears that the clump of OBM obtained in the Ekman sampler was disturbed during an earlier event. The material was homogenized for primary, split, and field duplicate samples. Photograph 14 in Attachment 3 shows the sediment material and Photograph 15 shows a clump of clay that is presumed to be OBM.

SD13-22

The biased sediment sample (SD13-22-0005) is located along the eastern side of the Lauritzen Channel, on the south side of the floating dock between bent numbers 2 and 3. The GPS unit was not useful due to the overhanging pier structure. The location coordinates were estimated on the figure based on landmarks recorded in field notes. The water depth was measured at 30 feet. Ten Ekman samples were attempted but only one drop provided sufficient sediment to submit for analysis. The first Ekman sample contained silty sand with gravel, clay and shell hash. The next nine Ekman drops were retrieved either with rocks in the jaws or hinges, empty, or untripped. The material was homogenized for primary samples. Photograph 16 in Attachment 3 shows the sediment.

SD13-26

The unbiased sediment sample (SD13-26-0005) is located along the eastern side of the Lauritzen Channel, on the south side of the floating dock between bent numbers 10 and 11. The GPS unit was not useful due to the overhanging pier structure. The location coordinates were estimated on the figure based on landmarks recorded in field notes. The embankment at this location consists of approximately 3 feet of conglomerate concrete along the top of the embankment, above approximately 6-7 feet of angular rock (from 6-inch in diameter to riprap). The lower 1-2 feet of embankment at this tide level consists of OBM with a very thin veneer of soft sediment. Pockets of an orange, organic material (possibly algae) was observed on rocks in the area. The sample was collected at 0930 at a tide of -1.02 feet MLLW just below the riprap, from the clay sediment. The material was homogenized for primary samples. Photographs 17 and 18 in Attachment 3 show the embankment and sediment.

SD13-30

The unbiased sediment sample (SD13-30-0005) is located along the eastern side of the Lauritzen Channel, on the south side of the floating dock between bent numbers 23 and 24. The GPS unit was not useful due to the overhanging pier structure. The location coordinates were estimated on the figure based on landmarks recorded in field notes. The embankment at this location consists of a partial sheet pile wall along the top of the embankment, above approximately 4 to 5 feet of angular rock (from 6-inch in diameter to riprap). The sample was collected at 0905 at a tide of -0.84 feet MLLW approximately 1 foot above the water. Riprap was removed to expose the silty clay with sand and gravel. The sediment was grayish black and had a slight sulfurous odor. The material was homogenized for primary samples. Photographs 19 and 20 in Attachment 3 show the embankment and sediment.

SD13-34

The unbiased sediment sample (SD13-34-0005) is located along the eastern side of the Lauritzen Channel, on the south side of the floating dock between bent numbers 36 and 37, approximately 1 foot north of the bent number 37 piling. The GPS unit was not useful due to the overhanging pier structure. The location coordinates were estimated on the figure based on landmarks recorded in field notes. The embankment at this location consists of shotcrete concrete along the top of the embankment, above approximately 4-5 feet of angular rock (from 6-inch diameter to riprap). The sample was collected at 0840 at a tide of -0.58 feet MLLW approximately 1 foot above the water. Riprap was removed to expose the greyish brown, silty sand with gravel and shells. The material was homogenized for primary samples. Photographs 21, 22, and 24 in Attachment 3 show the embankment and sediment. Photograph 23 shows the seep at bent number 37 just a few feet to the south of this location.

SD13-38

The unbiased sediment sample (SD13-38-0005) is located along the eastern side of the Lauritzen Channel, on the south side of the floating dock between bent numbers 50 and 51. The GPS unit was not useful due to the overhanging pier structure. The location coordinates were estimated on the figure based on landmarks recorded in field notes. The embankment at this location consists of steel rails driven into the sediment to support the embankment which consists of ballast and riprap along top of the embankment, above approximately 4-5 feet of angular rock (from 6-inch diameter to riprap) and debris (including a plastic

gasoline jug). The sample was collected at 0800 at a tide of 0.03 feet MLLW approximately 3 foot above the water. Riprap was removed to expose the dark brown, silty sand with gravel and shells. A small amount of clay was observed. The material was homogenized for primary samples. Photographs 25 in Attachment 3 show the embankment and sediment.

Bent Number 37 Seep Water Sampling Activities

A seep was located at bent number 37 during the sediment grab sampling activities on April 29, 2013 (Photographs 22 and 23 in Attachment 3). The seep was found in an area that was shotcreted by Levin Richmond Terminal Corporation (LRTC) during a low tide in June 2012. The seep water was flowing out of a circular void in the shotcrete approximately 2 feet above the water line at 0840 (tide at -0.58 feet MLLW), which suggests that the seep would be below the water line most of the time. No sediment was exposed below this seep, but sediment sample SD13-34 was taken approximately 3 feet north of the seep where sediment was present.

A sample of the flowing water was collected from the seep to determine conductivity of the water. Rich Bauer (Region 9 Environmental Protection Agency Laboratory Chemistry Lead) determined the water was approximately 2,400 ppm total dissolved solids (TDS), which is slightly brackish (typical seawater is 35,000 ppm TDS), and suggests a possible groundwater source. The location of the seep was documented and added to the GIS database for the United Heckathorn Project as point source P4-16 to conform with the naming convention used for the site survey conducted in 2012 to locate any point sources along the embankment. The project team recommended a water sample be collected from the seep location at bent number 37 during an extreme low tide when the area could be accessed safely.

On July 24, 2013, the low tide for the Inner Richmond Harbor was -1.0 feet MLLW at 0743 hours. The width of the seep was estimated to be about 2 inches the flow was estimated to be about 20 gallons per minute. Field parameters including pH (7.01), temperature (20.3 degrees Celsius), electrical conductivity (5.534 milliseimens per centimeter), and total dissolved solids (0.0034 kilograms per Liter) were measured and recorded in the field notes (Attachment 4). The amount of time it took to fill each 1 Liter glass amber bottle was also recorded (ranged from 12 to 14 seconds with only 30 to 50 percent of the flow being captured).

The water sample was collected from the seep during the extreme low tide using a new flexible food-grade cutting board to channel the water into the sample containers. Prior to using this method, the Project Manager contacted a Senior Chemist with Vista Analytical Laboratories (Vista), to ensure that chemicals in the cutting board such as phthalates or other plasticizers would not cause interference with the pesticide analyses. Vista's Senior Chemist confirmed that their high-resolution analytical method would not be affected by any plastics that might leach from the cutting board; however, he noted that standard analytical methods may be affected. The sample was sent to Vista for analysis of total and dissolved dichlorodiphenyl-trichloroethanes (DDTs[3]) and Dieldrin (four 1-Liter amber glass

[3] 2,4'- and 4,4'-dichlorodiphenyltrichloroethane (DDT); 2,4'- and 4,4'-dichlorodiphenyldichloroethane (DDD); and 2,4'- and 4,4'-dichlorodiphenyldichloroethene (DDE)

bottles) and a sample was also provided to EPA Region 9 laboratory for analysis of total suspended solids (three 250-milliliter poly bottles). The field observations and chains of custody for the water sample are provided in Attachment 4.

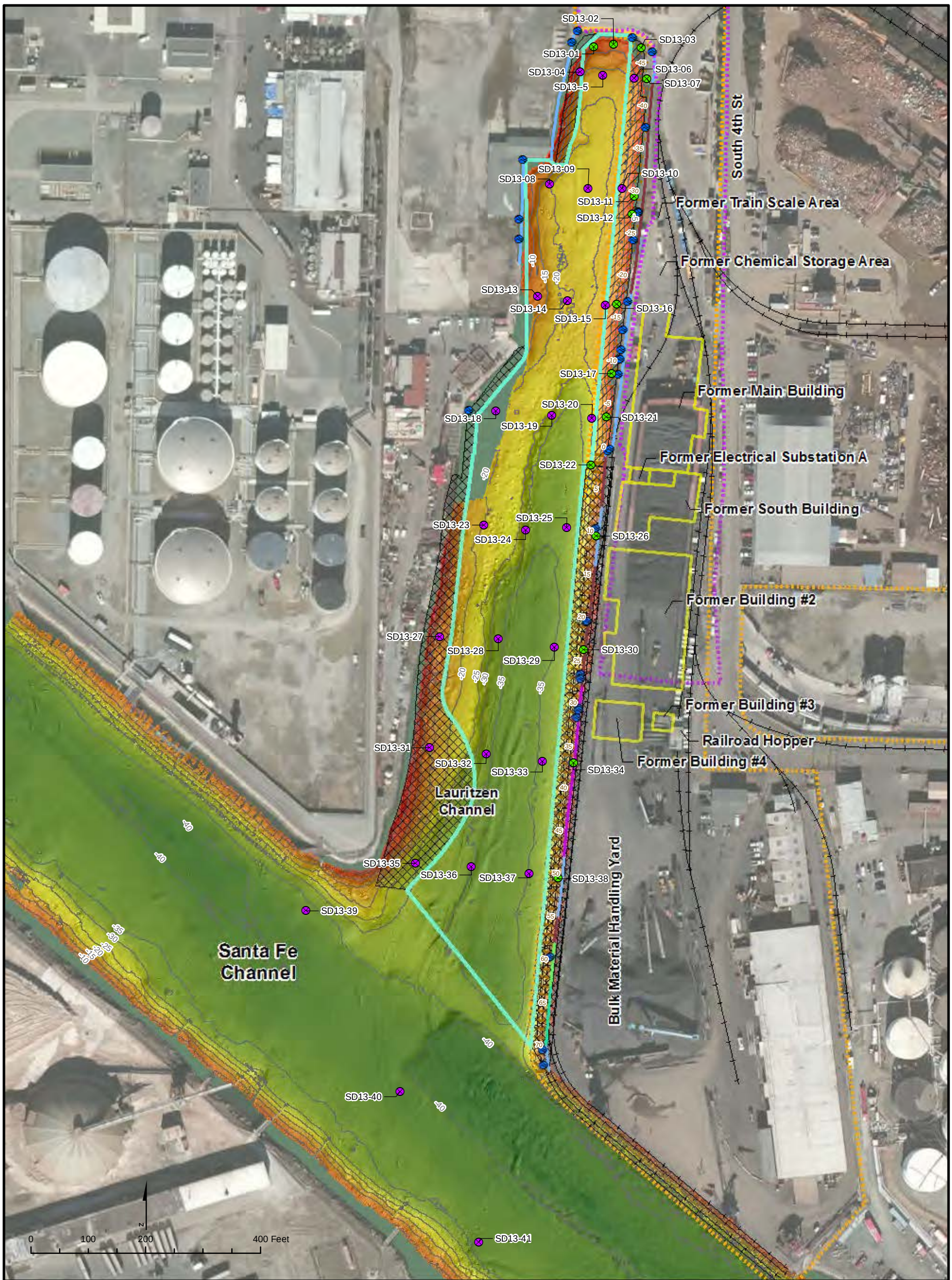
References

CH2M HILL. 2013. Final *Focused Feasibility Study Data Gaps Sampling and Analysis Plan Addendum #2 Source Identification Study United Heckathorn Superfund Site*. February.

Kohn, N. and N. Evans. 2002. *Phase I Source Investigation at the United Heckathorn Superfund Site, Richmond, California*. PNNL-14088. December.

Kohn, N. and N. Evans. 2004. *Year 6 Post-Remediation Biomonitoring and Phase II Source Investigation at the United Heckathorn Superfund Site, Richmond, California*. PNNL-14596. March.

Figure 1
Grab Sediment Sampling Locations



LEGEND

- Sediment Grab Sample Location
- Vibracore Sample Location

Bathymetry

1 ft — 44 ft

Bathymetric Contour (5 foot Interval)

- Outfall Location
- Former Pier Pilings
- Pier Pilings
- Railroad
- Former Buildings
- Dredged Area
- Partially Dredged Area
- Un-Dredged Area
- Concrete
- Rock/Rip Rap
- Rock/Rip Rap and Concrete
- Shotcrete
- Sheet Pile
- Sheet Pile and Concrete

FIGURE 1
2013 Sediment Sampling Locations
United Heckathorn Superfund Site
Richmond, California

CH2MHILL

Document Path: D:\Projects\EPA_UnitedHeckathorn\MapFiles\2013\July\SedimentSampleLocations.mxd

Attachment 1
Sample Collection Forms

Sample ID on chain of custody: SD13-01-0005

SAMPLE COLLECTION FORM

(complete one form per sample)

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 3/13/13 Time: 1040

Sample Type: [x] Primary [ ] Field Duplicate [ ] Rinse blank [ ] Trip Blank [ ] Field/Ambient Blank

If FD, please list Primary sample _____

Matrix: Sediment

Depth (ft bgs): 0 (beginning depth) - 0.5' (ending depth) Water Depth 7.8'

Sample Method: Ponar Grab (dedicated equipment being used?) Y

Weather: Clear/Sunny Temperature: 55.9°F

Sample Location ID: SD13-01 GPS (Northing/Easting): 6023257.96435 / 2164485.3143

CLP ID: SD13-01-0005 GPS Datum: NAD 1983 CA State Plane Zone 3 feet

EPA split sample ID: Y8RL5 Tide cycle/Datum: ~2.5 ft/MLLW

Sediment Descriptions

Color: Dark grey-greenish with dark brown + black

Moisture: Dry Sl. Moist Moist V.Moist (Wet)

Major Description: Clay (Silty Clay) Silt Clayey Sand Sandy Clay Sand Gravelly Sand Gravel Grvly Clay

Minor Description: (Organic) Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded

Well / (poorly) mod - sorted well / (poorly) / mod - cemented (loose)

Other Descriptors:

Sticks, vegetative debris, shell fragments, plastic, piece of wood piling, glass shards, sediment is silty clay with gravel, sand, and debris. Sediment is loose, no plasticity.

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-01-0005-1	3/13/13	Tamara's iphone	Sediment in Ponar
SD13-01-0005-2	3/13/13	"	" "
SD13-01-0005-3	3/13/13	"	Sediment in pan
SD13-01-0005-4	3/13/13	"	" "

Sample Parameters

Parameters	Sample Containers
[x] Pesticides (EPA Method 8081A)	2 x 4oz jars
[x] TOC (Walkley-Black)	
[ ] Percent solids (ASTM Method D2216)	½ gal ziplock
[ ] percent moisture (ASTM Method D2216)	
[x] grain size ((ASTM Method D4464))	
[ ] specific gravity (ASTM Method D854)	
[ ] Atterberg limits ((ASTM Method D4318)	

Sampling Notes: Channel bottom visible through clear water. Mooring lines, tire, + debris observed. Very rocky bottom. Took 12 attempts w/ Ponar grab. Sample was homogenized from 2 successful ponar grabs. Due to very rocky bottom, had to move the location west from original.

Sampler Name: Tamara Frank

Sample ID on chain of custody: SD13-02-0005

SAMPLE COLLECTION FORM

(complete one form per sample)

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 3/13/13 Time: 11:10am

Sample Type: ☑ Primary ☐ Field Duplicate ☐ Rinse blank ☐ Trip Blank ☐ Field/Ambient Blank

If FD, please list Primary sample _____

Matrix: Sediment

Depth (ft bgs): 0 - 0.5 (beginning depth - ending depth) Water Depth 11 ft

Sample Method: Ponar Grab (dedicated equipment being used?) Y

Weather: Sunny, Clear Temperature: 71.6°F

Sample Location ID: SD13-02 GPS (Northing/Easting): 6023292.8112 / 2164488.6969

CLP ID: SD13-02-0005 GPS Datum: NAD 1983 CA Plane Zone 3 Feet

EPA split sample ID: Y8RL6 Tide ~~cycle~~ datum: ~3.0ft /MLLW

Sediment Descriptions

Color: Black

Moisture: Dry Sl. Moist Moist V.Moist (Wet)

Major Description: Clay (Silty Clay) Silt Clayey Sand Sandy Clay Sand Gravelly Sand Gravel Grvly Clay

Minor Description: (Organic) Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded

Well / (poorly) / mod - sorted well / (poorly) / mod - cemented (Loose)

Other Descriptors:

Shells, sticks, plastic debris, woody material.

silty/clay, somewhat consolidated, noplasticity, organic material with sticks and shells

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-02-0005-1	3/13/13	Tamara's	Sediment in ponar
SD13-02-0005-2	3/13/13	Iphone	" "

Sample Parameters

Parameters	Sample Containers
☑ Pesticides (EPA Method 8081A)	1x 4oz jar
☑ TOC (Walkley-Black)	1x Yzgal Ziplock
☐ Percent solids (ASTM Method D2216)	
☐ percent moisture (ASTM Method D2216)	
☑ grain size ((ASTM Method D4464))	1x Yzgal Ziplock
☐ specific gravity (ASTM Method D854)	
☐ Atterberg limits ((ASTM Method D4318)	

Sampling Notes: Channel bottom visible. Rocky bottom.

Sampler Name: Tamara Frank

Sample ID on chain of custody: SD13-03-0005

SAMPLE COLLECTION FORM

(complete one form per sample)

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 3/13/13 Time: 1140

Sample Type: ☑ Primary ☐ Field Duplicate ☐ Rinse blank ☐ Trip Blank ☐ Field/Ambient Blank

If FD, please list Primary sample _____

Matrix: Sediment

Depth (ft bgs): 0 - 0.5' (beginning depth - ending depth) Water Depth 6.5'

Sample Method: Ponar grab (dedicated equipment being used?) Y

Weather: Sunny/Clear Temperature: 76°F

Sample Location ID: SD13-03 GPS (Northing/Easting): 6002334.9885 / 2164483.0340

CLP ID: SD13-03-0005 GPS Datum: NAD 1983 CA State Plane Zone 3 feet

EPA split sample ID: Y8RL7 Tide ~~Cycle~~ LL / Datum: ~3.8 ft / MLLW

Sediment Descriptions

Color: Black w/ green + brown

Moisture: Dry Sl. Moist Moist V.Moist Wet

Major Description: Clay Silty Clay Silt Clayey Sand Sandy Clay Sand Gravelly Sand Gravel Grvly Clay

Minor Description: Organic Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded

Well / poorly / mod - sorted well / poorly / mod - cemented Loose

Other Descriptors:

Organic odor. Oily sheen on water inside ponar.
Silty clay w/ sand and gravel, woody debris, beer caps, leaf litter, shell debris, gravel, sticks, and moderate amount of worms, tunicates, copepods. Large fraction of volume is leaves, branches, and shells.

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-03-0005-1	3/13/13	Tamara's	Sediment in ponar
" " -2	"	Iphone	Sediment in pan
" " -3	"		" "

Sample Parameters

Parameters	Sample Containers
☑ Pesticides (EPA Method 8081A)	2x 4oz jar
☑ TOC (Walkley-Black)	
☐ Percent solids (ASTM Method D2216)	> 1/2 gal ziplock
☐ percent moisture (ASTM Method D2216)	
☑ grain size ((ASTM Method D4464))	
☐ specific gravity (ASTM Method D854)	
☐ Atterberg limits ((ASTM Method D4318)	

Sampling Notes: grab material appears to be composed of some storm drain material based on the amount of leaves and branches observed at this location.

Sampler Name: Tamara Frank

Sample ID on chain of custody: SD13-07-0005

SAMPLE COLLECTION FORM

(complete one form per sample)

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 3/13/13 Time: 1220

Sample Type: [x] Primary [ ] Field Duplicate [ ] Rinse blank [ ] Trip Blank [ ] Field/Ambient Blank

If FD, please list Primary sample _____

Matrix: Sediment

Depth (ft bgs): 0 - 0.5' (beginning depth - ending depth) Water Depth 10.8'

Sample Method: Ponar Grab (dedicated equipment being used?) Y

Weather: Sunny/Clear Temperature: 81°F

Sample Location ID: SD13-07 GPS (Northing/Easting): 6023351.2709/2164429.3453

CLP ID: SD13-07-0005 GPS Datum: NAD 1983 CA State Plane Zone 3 ft

EPA split sample ID: Y8RL8 Tide ~~cycle~~ / Datum: ~4.3 ft / MLLW

Sediment Descriptions

Color: Black w/ brown and green

Moisture: Dry Sl. Moist Moist V.Moist Wet

Major Description: Clay Silty Clay Silt Clayey Sand Sandy Clay Sand Gravelly Sand Gravel Grvly Clay

Minor Description: Organic Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded Well / poorly / mod - sorted well / poorly / mod - cemented Loose

Other Descriptors:

Slight organic odor.

Silty clay w/ sand + rocks, shell debris, sticks, and leaves.

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-07-0005-1	3/13/13	Tamara's Iphone	Pier piling location
" " -2	"		" "
" " -3	"		Rocky/riprap bottom
" " -4	"		"
" " -5	"		Sediment in pan
" " -6	"		"

Sample Parameters

Parameters	Sample Containers
[x] Pesticides (EPA Method 8081A)	2X 4oz jars
[x] TOC (Walkley-Black)	
[ ] Percent solids (ASTM Method D2216)	
[ ] percent moisture (ASTM Method D2216)	> 1/2 gal Ziplock
[x] grain size ((ASTM Method D4464))	
[ ] specific gravity (ASTM Method D854)	
[ ] Atterberg limits ((ASTM Method D4318)	

Sampling Notes: Rocky/riprap bottom. Sample collected @ 6th attempt. Sample location is next to Fish prohibition sign at Bent - 5.

Sampler Name: Tamara Frank

Sample ID on chain of custody: SD13-11-0005

SAMPLE COLLECTION FORM

(complete one form per sample)

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 3/13/13 Time: 1250

Sample Type: [✓] Primary [ ] Field Duplicate [ ] Rinse blank [ ] Trip Blank [ ] Field/Ambient Blank

If FD, please list Primary sample _____

Matrix: Sediment

Depth (ft bgs): 0 - 0.5' (beginning depth - ending depth) Water Depth 15'

Sample Method: Ponar Grab (dedicated equipment being used?) Y

Weather: Sunny/Clear Temperature: 79.9°F

Sample Location ID: SD13-11 GPS (Northing/Easting): 6023329.2936 / 2164224.6048

CLP ID: SD13-11-0005 GPS Datum: NAD 1983 CA State Plane Zone 3 feet

EPA split sample ID: Y8RL9 tide ~~Datum~~/Datum: ~5ft/MLLW

Sediment Descriptions

Color: Brown w/ green and some black, uniform black specs in material.

Moisture: Dry Sl. Moist Moist V.Moist (Wet)

Major Description: Clay (Silty Clay) Silt Clayey Sand Sandy Clay Sand Gravelly Sand Gravel Grvly Clay

Minor Description: (Organic) Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded

Well / (poorly) / mod - sorted well / (poorly) / mod - cemented (Loose)

Other Descriptors:

Black specs uniformally distributed throughout material.

Silty clay with sand, shell debris, leaves, rocks, and worms.

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-11-0005-1	3/13/13	Tamara's	Sediment in Ponar
" -2	"	Iphone	"
" -3	"		"
" -4	"		"
" -5	"		Sediment in pan
" -6	"		"

Sample Parameters

Parameters	Sample Containers
[✓] Pesticides (EPA Method 8081A)	2 x 4oz jar
[✓] TOC (Walkley-Black)	
[ ] Percent solids (ASTM Method D2216)	½ gal ziplock
[ ] percent moisture (ASTM Method D2216)	
[✓] grain size ((ASTM Method D4464))	
[ ] specific gravity (ASTM Method D854)	
[ ] Atterberg limits ((ASTM Method D4318)	

Sampling Notes: _____

Sampler Name: Tamara Frank

Sample ID on chain of custody: SD13-12-0005

SAMPLE COLLECTION FORM

(complete one form per sample)

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 3/13/13 Time: 1320

Sample Type: [✓] Primary [ ] Field Duplicate [ ] Rinse blank [ ] Trip Blank [ ] Field/Ambient Blank

If FD, please list Primary sample _____

Matrix: Sediment

Depth (ft bgs): 0 (beginning depth) - 0.5' (ending depth) Water Depth 10.56'

Sample Method: Ponar Grab (dedicated equipment being used?) y

Weather: Sunny/Clear Temperature: 72.5°F

Sample Location ID: SD13-12 GPS (Northing/Easting): 1022325.0980/2164192.9685

CLP ID: SD13-12-0005 GPS Datum: NAD 1983 CA State Plane Zone 3 feet

EPA split sample ID: Y8RH0 tide ~~cycle~~/Datum: ~5.1 ft /mllw

Sediment Descriptions

Color: Black w/brown layers. Small black specs uniformally distributed throughout material

Moisture: Dry Sl. Moist Moist V.Moist (Wet)

Major Description: Clay (Silty Clay) Silt Clayey Sand Sandy Clay Sand Gravelly Sand Gravel Grvly Clay

Minor Description: (Organic) Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded

Well / (poorly) / mod - sorted well / (poorly) / mod - cemented (Loose)

Other Descriptors:

Silty clay w/sand, rocks, shells, leaf litter, and worms. A lot of biological activity observed (worms, copepods, tunicates, sand fleas). Small black specks uniformally distributed throughout material.

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-12-0005-1	3/13/13	Tamara's Iphone	Sediment in pan
-2	"		"
-3	"		"
-4	"		"
-5	"		"
-6	"		"

Sample Parameters

Parameters	Sample Containers
[✓] Pesticides (EPA Method 8081A)	2 x 4oz jar
[✓] TOC (Walkley-Black)	
[ ] Percent solids (ASTM Method D2216)	½ gal ziplock
[ ] percent moisture (ASTM Method D2216)	
[✓] grain size ((ASTM Method D4464))	
[ ] specific gravity (ASTM Method D854)	
[ ] Atterberg limits ((ASTM Method D4318)	

Sampling Notes: Very rocky bottom. Multiple attempts to collect sample. Sample was homogenized from 3 partially filled ponar grabs.

Location @ bent -27.5 (8" pipe from PH I)

Sampler Name: Tamara Frank

Sample ID on chain of custody: SD13-16-0005

SAMPLE COLLECTION FORM

(complete one form per sample)

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 3/13/13 Time: 1400

Sample Type: [x] Primary [ ] Field Duplicate [ ] Rinse blank [ ] Trip Blank [ ] Field/Ambient Blank

If FD, please list Primary sample _____

Matrix: Sediment

Depth (ft bgs): 0 - 0.5' (beginning depth - ending depth) Water Depth 9'

Sample Method: Ponar Grab (dedicated equipment being used?) Y

Weather: Sunny / Clear Temperature: 85°F

Sample Location ID: SD13-16 GPS (Northing/Easting): GPS unit died (battery)

CLP ID: SD13-16-0005 GPS Datum: _____

EPA split sample ID: Y8RH1 Tide/Datum: -5.4 ft / MLLW

Sediment Descriptions

Color: Black w/ yellow-brown clumps

Moisture: Dry Sl. Moist Moist V.Moist Wet

Major Description: Clay Silty Clay Silt Clayey Sand Sandy Clay Sand Gravelly Sand Gravel Grvly Clay

Minor Description: Organic Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded Well / poorly / mod - sorted well / poorly / mod - cemented Loose

Other Descriptors:

Oily sheen observed on water in pan.

Silty clay w/ yellow brown clay clumps. Small fraction of shells, rocks, and gravel.

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-16-0005-1	3/10/13	Tamara's	Sediment in pan w/ clay clumps
" " -2	"	Iphone	" "
" " -3	"		" "

Sample Parameters

Parameters	Sample Containers
[x] Pesticides (EPA Method 8081A)	2x 4oz jar
[x] TOC (Walkley-Black)	
[ ] Percent solids (ASTM Method D2216)	> 1/2 gal ziplock
[ ] percent moisture (ASTM Method D2216)	
[x] grain size ((ASTM Method D4464))	
[ ] specific gravity (ASTM Method D854)	
[ ] Atterberg limits ((ASTM Method D4318)	

Sampling Notes: Sample location e Bent -16.5 near SW-5 pipe (South of SW-5).
Iphone GIS coordinates 37.923 N / 22.367 W

Sampler Name: Tamara Frank

SAMPLE COLLECTION FORM

(complete one form per sample)

Sample ID on chain of custody: SD13-17-0005

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 3/13/13 Time: 1430

Sample Type: ☑ Primary ☐ Field Duplicate ☐ Rinse blank ☐ Trip Blank ☐ Field/Ambient Blank

If FD, please list Primary sample _____

Matrix Sediment

Depth (ft bgs): 0 - 0.5' (beginning depth - ending depth) Water Depth 9 ft

Sample Method: Ponar Grab (dedicated equipment being used?) y

Weather: Sunny/clear Temperature: 84.5°F

Sample Location ID: SD13-17 GPS (Northing/Easting): GPS unit died (battery)

CLP ID: SD13-17-0005 GPS Datum: " "

EPA split sample ID: Y8ZH2 Tide cycle/Datum: ~5.3 ft / MLLW

Sediment Descriptions

Color: Greyish/Brown w/small black specks uniformaly distributed throughout material

Moisture: Dry Sl. Moist Moist V.Moist (Wet)

Major Description: Clay (Silty Clay) Silt Clayey Sand Sandy Clay Sand Gravelly Sand Gravel Grvly Clay

Minor Description: (Organic) Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded Well / (poorly) / mod - sorted well / (poorly) / mod - cemented (Loose)

Other Descriptors:

algae observed on surface sediment.

Silty clay w/ some rocks and sand. Black specks uniformaly distributed throughout material.

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-17-0005-1	3/13/13	Tamara's	Sediment in Ponar
" -2	"		" "
" -3	"	Iphone	" "
" -4	"		Sediment in pan
" -5	"		Piling location
" -6	"		"
" -7	"		"

Sample Parameters

Parameters	Sample Containers
☑ Pesticides (EPA Method 8081A)	2x 4oz jar
☑ TOC (Walkley-Black)	
☐ Percent solids (ASTM Method D2216)	1/2 gal ziplock
☐ percent moisture (ASTM Method D2216)	
☑ grain size ((ASTM Method D4464))	
☐ specific gravity (ASTM Method D854)	
☐ Atterberg limits ((ASTM Method D4318)	

Sampling Notes: Oily sheen observed on H_2O in pan. Sample location at Bent - 8.5, Pipe P1-4 (from PHI) was not observed/located. Iphone 6's coordinates 37.923 N / 22.367 W

Sampler Name: Tamara Frank

SAMPLE COLLECTION FORM
(complete one form per sample)

Sample ID on chain of custody: SD13-21-0005

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 3/13/13 Time: 1500

Sample Type: [✓] Primary [✓] Field Duplicate [ ] Rinse blank [ ] Trip Blank [ ] Field/Ambient Blank

If FD, please list Primary sample SD13-21-0005 (primary); SD13-79-0005 (FD)

Matrix: Sediment

Depth (ft bgs): 0 - 0.5' (beginning depth - ending depth) Water Depth 11 ft

Sample Method: Ponar grab (dedicated equipment being used?)

Weather: Sunny/clear Temperature: 79°F

Sample Location ID: SD13-21 GPS (Northing/Easting): GPS unit died (battery)

CLP ID: SD13-21-0005/SD13-79-0005 GPS Datum: " "

EPA split sample ID: Y8RH3 (primary) Tide ~~cycle~~ L.L./Datum: ~5.1 ft/MLW

Y8RH5 (FD)

Sediment Descriptions

Color: Grey w/ dark grey/black clumps

Moisture: Dry Sl. Moist Moist V.Moist Wet

Major Description: Clay Silty Clay Silt Clayey Sand Sandy Clay Sand Gravelly Sand Gravel Grvly Clay

Minor Description: Organic Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded

Well / poorly / mod - sorted well / poorly / mod - cemented Loose

Other Descriptors:

Silty clay w/ rocks, Sand, clay clumps. Clay clumps contain roots.

~~Not much vegetation or~~ L.L. No vegetation or bio activity observed.

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-21-0005-1	3/13/13	Tamara's	Sediment in ponar
" -2	"	Iphone	Sediment in Dpn
" -3	"		" w/ clay clumps
" -4	"		" "

Sample Parameters

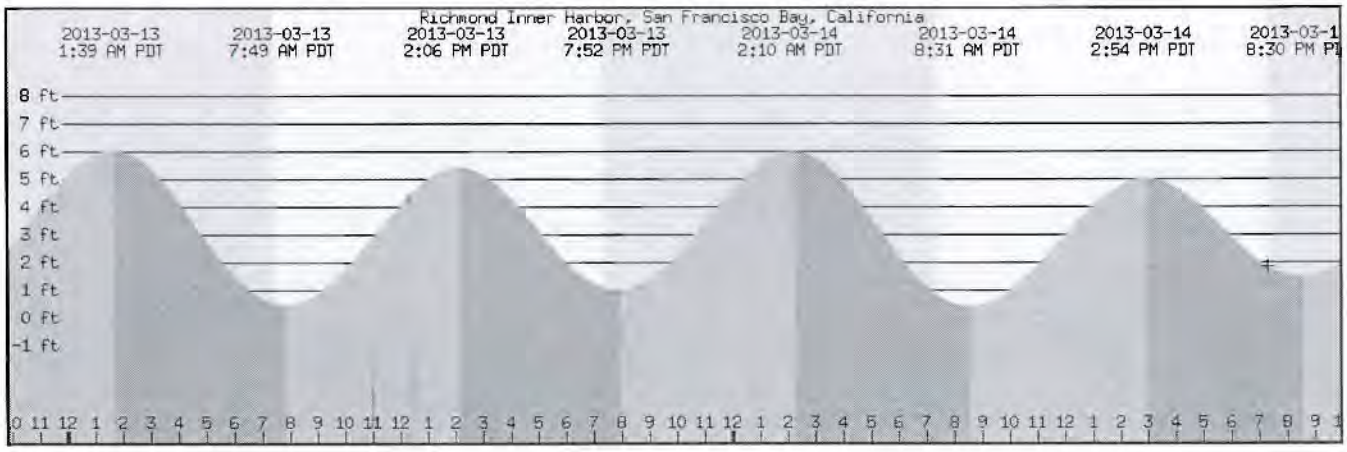
Parameters	Sample Containers
[✓] Pesticides (EPA Method 8081A)	2 x 4oz jar
[✓] TOC (Walkley-Black)	
[ ] Percent solids (ASTM Method D2216)	
[ ] percent moisture (ASTM Method D2216)	
[✓] grain size ((ASTM Method D4464))	> 1/2 gal ziplock
[ ] specific gravity (ASTM Method D854)	
[ ] Atterberg limits ((ASTM Method D4318)	

Sampling Notes: Sample located @ Bent-3.5. Sample homogenized from 2 ponar grabs. N Sample (CLP) SD13-21-0005; FD - SD13-79-0005
N Sample (EPA) Y8RH3; FD - Y8RH5
Iphone GPS Coordinates 37.923 N 122.367 W

Sampler Name: Tamara Frank

Mobile Geographics Tides for iPhone

Richmond Inner Harbor, San Francisco Bay, California
Requested time: 2013-03-13 12:00 AM PDT



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▶ High Tide Chart

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Richmond Inner Harbor, San Francisco Bay, California
37.9100° N, 122.3583° W

2013-03-13	1:39 AM PDT	6.06 feet	High Tide
2013-03-13	7:23 AM PDT	Sunrise	
2013-03-13	7:49 AM PDT	0.48 feet	Low Tide
2013-03-13	2:06 PM PDT	5.43 feet	High Tide
2013-03-13	7:15 PM PDT	Sunset	
2013-03-13	7:52 PM PDT	1.00 feet	Low Tide
2013-03-14	2:10 AM PDT	6.01 feet	High Tide
2013-03-14	7:21 AM PDT	Sunrise	
2013-03-14	8:31 AM PDT	0.42 feet	Low Tide
2013-03-14	2:54 PM PDT	5.03 feet	High Tide
2013-03-14	7:16 PM PDT	Sunset	
2013-03-14	8:30 PM PDT	1.46 feet	Low Tide
2013-03-15	2:42 AM PDT	5.89 feet	High Tide
2013-03-15	7:20 AM PDT	Sunrise	
2013-03-15	9:15 AM PDT	0.46 feet	Low Tide
2013-03-15	3:45 PM PDT	4.64 feet	High Tide
2013-03-15	7:16 PM PDT	Sunset	
2013-03-15	9:10 PM PDT	1.91 feet	Low Tide
2013-03-16	3:16 AM PDT	5.71 feet	High Tide
2013-03-16	7:18 AM PDT	Sunrise	
2013-03-16	10:02 AM PDT	0.57 feet	Low Tide
2013-03-16	4:43 PM PDT	4.29 feet	High Tide
2013-03-16	7:17 PM PDT	Sunset	
2013-03-16	9:54 PM PDT	2.33 feet	Low Tide
2013-03-17	3:55 AM PDT	5.51 feet	High Tide

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Time Control

Year: 2013 Month: 3 Day: 13 Go

Note: predictions for some locations do not cover the full span of years. If your browser returns a blank page or a "no data" error, then the predictions

Sample ID on chain of custody

SD13-22-0005

SAMPLE COLLECTION FORM

(complete one form per sample)

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 4/29/13 Time: 1145

Sample Type: [✓] Primary [ ] Field Duplicate [ ] Rinse blank [ ] Trip Blank [ ] Field/Ambient Blank

If FD, please list Primary sample _____

Matrix: Sediment

Depth (ft bgs): 0 - 0.5' (beginning depth - ending depth) Water Depth 30 ft

Sample Method: Ponar Grab Sediment Sample (dedicated equipment being used?) Y

Weather: Sunny Temperature: ~75°F

Sample Location ID: SD13-22 GPS (Northing/Easting): No signal under pier

CLP ID: Y8RH4 GPS Datum: Pilings. Sample placed between Bents +2 and +3.

EPA split sample ID: NA

Sediment Descriptions

Color: Gray

Moisture: Dry Sl. Moist Moist V.Moist (Wet)

Major Description: Clay Silty Clay (Silt) Clayey Sand Sandy Clay (Sand) Gravelly Sand (Gravel) Grvly Clay

Minor Description: Organic Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded Well / poorly / mod - sorted well / poorly / mod - cemented (Loose)

Other Descriptors:

Silty sand with some gravel and clay. Some shell hash.

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-22-1	4/29/13	L.L.	T.F. collecting sample w/ Ponar
SD13-22-2	4/29/13	L.L.	Sediment sample from ponar

Sample Parameters

Parameters	Sample Containers
[✓] Pesticides (EPA Method 8081A)	1 x 4oz jar
[✓] TOC (Walkley-Black)	
[ ] Percent solids (ASTM Method D2216)	1 gal ziplock bag
[ ] percent moisture (ASTM Method D2216)	
[✓] grain size ((ASTM Method D4464))	
[ ] specific gravity (ASTM Method D854)	
[ ] Atterberg limits ((ASTM Method D4318)	

Sampling Notes: 16 Ponar attempts at this location due to very rocky bottom. Sample was collected from 1st attempt. ~~[illegible]~~ Sample collected between Bents +2 and +3 in Hotspot Area.

Sampler Name: Tamara Frank

Sample ID on chain of custody: SD13-26-0005

SAMPLE COLLECTION FORM

(complete one form per sample)

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 4/29/13 Time: 0930

Sample Type: [x] Primary [ ] Field Duplicate [ ] Rinse blank [ ] Trip Blank [ ] Field/Ambient Blank

If FD, please list Primary sample _____

Matrix: Sediment

Depth (ft bgs): 0 - 0.5' (beginning depth - ending depth) Water Depth NA / embankment sample

Sample Method: Grab w/disposable scoops (dedicated equipment being used?) Y

Weather: Sunny Temperature: ~ 65

Sample Location ID: SD13-26 GPS (Northing/Easting): NA / no signal under pier.

CLP ID: YBRM6 GPS Datum: Sample collected between Bents + 10 and + 11

EPA split sample ID: NA

Sediment Descriptions

Color: grayish black

Moisture: Dry Sl. Moist Moist V.Moist (Wet)

Major Description: (Clay) Silty Clay (Silt) Clayey Sand Sandy Clay Sand Gravelly Sand (Gravel) Grvly Clay

Minor Description: Organic Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded Well / poorly / mod - sorted well / poorly / mod - cemented (Loose)

Other Descriptors:

Clay clumps with some rocks. Presumed OBM. Roots are visible.

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-26-1	4/29/13	L.L.	T.F. Collecting sample @ embankment
SD13-26-2	4/29/13	L.L.	location of embankment Shotcrete
SD13-26-3	4/29/13	L.L.	L.L. ~~[illegible]~~ Sediment Sample in pan
SD13-26-4	4/29/13	L.L.	Closeup presumed OBM w/roots

Sample Parameters

Parameters	Sample Containers
[x] Pesticides (EPA Method 8081A)	1 x 4oz jar
[x] TOC (Walkley-Black)	1 gal ziplock
[ ] Percent solids (ASTM Method D2216)	
[ ] percent moisture (ASTM Method D2216)	
[x] grain size ((ASTM Method D4464))	
[ ] specific gravity (ASTM Method D854)	
[ ] Atterberg limits ((ASTM Method D4318)	

Sampling Notes: _____

Sampler Name: Tamara Frank

Sample ID on chain of custody: SD13-30-0005

SAMPLE COLLECTION FORM

(complete one form per sample)

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 4/29/13 Time: 0905

Sample Type: [x] Primary [ ] Field Duplicate [ ] Rinse blank [ ] Trip Blank [ ] Field/Ambient Blank

If FD, please list Primary sample _____

Matrix: Sediment

Depth (ft bgs): 0 - 0.5' (beginning depth - ending depth) Water Depth NA / embankment

Sample Method: Grab w/disposable scoops (dedicated equipment being used?) y

Weather: Sunny Temperature: ~65

Sample Location ID: SD13-30 GPS (Northing/Easting): NA / No signal under pier.

CLP ID: V8RM7 GPS Datum: Sampled Between Bents +23 and +24

EPA split sample ID: SD13-30-0005

Sediment Descriptions

Color: tray ish-black

Moisture: Dry Sl. Moist Moist V.Moist Wet

Major Description: Clay Silty Clay Silt Clayey Sand Sandy Clay Sand Gravelly Sand Gravel Grvly Clay

Minor Description: Organic Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded Well / poorly / mod - sorted well / poorly / mod - cemented Loose

Other Descriptors:

Silty clay with sand and gravel and clumps of clay. Some shell hash. Slight sulfurous odor.

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-30-1	4/29/13	L.L.	T.F. collecting sample
SD13-30-2	4/29/13	L.L.	Sample in pan

Sample Parameters

Parameters	Sample Containers
[x] Pesticides (EPA Method 8081A)	1 x 4 oz jar
[x] TOC (Walkley-Black)	
[ ] Percent solids (ASTM Method D2216)	1 gal ziplock
[ ] percent moisture (ASTM Method D2216)	
[x] grain size ((ASTM Method D4464))	
[ ] specific gravity (ASTM Method D854)	
[ ] Atterberg limits ((ASTM Method D4318)	

Sampling Notes: _____

Sampler Name: Tamara Frank

Sample ID on chain of custody: SD13-34-0005

SAMPLE COLLECTION FORM

(complete one form per sample)

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 4/29/13 Time: 0840

Sample Type: [x] Primary [ ] Field Duplicate [ ] Rinse blank [ ] Trip Blank [ ] Field/Ambient Blank

If FD, please list Primary sample _____

Matrix: Sediment

Depth (ft bgs): 0 (beginning depth) - 0.5 (ending depth) Water Depth NA / embankment

Sample Method: Grab with disposable scoops (dedicated equipment being used?) Y

Weather: Clear Temperature: ~ 60 °F

Sample Location ID: SD13-34 GPS (Northing/Easting): No signal under piers

CLP ID: Y8LH8 GPS Datum: ~~Sampled between Bents~~ +36 and +37.

EPA split sample ID: ~~SD13~~ L.L. NA L.L.

Sediment Descriptions

Color: grayish-brown

Moisture: Dry Sl. Moist Moist V.Moist Wet

Major Description: Clay Silty Clay Silt Clayey Sand Sandy Clay Sand Gravelly Sand Gravel Grvly Clay

Minor Description: Organic Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded Well / poorly / mod - sorted well / poorly / mod - cemented Loose

Other Descriptors:

Silty Sand with gravel and some shells.

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-34-1	4/29/13	L.L.	T.F. collecting sample
SD13-34-2	4/29/13	L.L.	" "
SD13-34-3	4/29/13	L.L.	Outfall with H_2O flowing @ Bent +37
SD13-34-4	4/29/13	L.L.	Sediment sample in pan

Sample Parameters

Parameters	Sample Containers
[x] Pesticides (EPA Method 8081A)	1 x 4oz jar
[x] TOC (Walkley-Black)	
[ ] Percent solids (ASTM Method D2216)	> 1 gal Ziplock
[ ] percent moisture (ASTM Method D2216)	
[x] grain size ((ASTM Method D4464))	
[ ] specific gravity (ASTM Method D854)	
[ ] Atterberg limits ((ASTM Method D4318)	

Sampling Notes: Sample collected at Bent +37 beneath observed outfall (~ 3 yd from N of outfall). ~~Outfall~~ water observed flowing through shot crete. Water sample was collected for ~~Conductivity~~ L.L. & TOS analysis @ EPA lab. TOS ≤ 2400 ppm based on EPA analysis which is brackish water.

Sampler Name: Tamara Frank

Sample ID on chain of custody: SD13-38-0005

SAMPLE COLLECTION FORM

(complete one form per sample)

Event Name: United Heckathorn Source ID

Sample Collection Information

Date: 4/29/13 Time: 0800

Sample Type: [✓] Primary [ ] Field Duplicate [ ] Rinse blank [ ] Trip Blank [ ] Field/Ambient Blank

If FD, please list Primary sample _____

Matrix: Sediment

Depth (ft bgs): 0 (beginning depth) - 0.5 (ending depth) Water Depth NA / embankment

Sample Method: Grab w/disposable scoops (dedicated equipment being used?) Y

Weather: clear Temperature: ~60°F

Sample Location ID: SD13-38 GPS (Northing/Easting): No signal under pier

CLP ID: Y8RM9 GPS Datum: Sample collected between Bents +50 and +51

EPA split sample ID: SD13-38-0005

Sediment Descriptions

Color: dark brown

Moisture: Dry Sl. Moist Moist V.Moist (Wet)

Major Description: (Clay) Silty Clay (Silt) Clayey Sand Sandy Clay (Sand) Gravelly Sand (Gravel) Grvly Clay

Minor Description: Organic Mottled Plastic M.Plastic Nodules vf f coarse-grained Ang / SA / SR / Rounded Well / poorly / mod - sorted well / poorly / mod - cemented (Loose)

Other Descriptors:

Rocks/gravel with some clay, sand, and silt. Some biological activity observed

Photographic Log:

Photo file name	Date	Initials	Subject of Photo
SD13-38-1	4/29/13	L.L.	T.F. collecting grab @ embankment
SD13-38-2	4/29/13	L.L.	" "
SD13-38-3	4/29/13	L.L.	Sediment in pan
SD13-38-4	4/29/13	L.L.	" "

Sample Parameters

Parameters	Sample Containers
[✓] Pesticides (EPA Method 8081A)	1 x 4oz jar
[✓] TOC (Walkley-Black)	
[ ] Percent solids (ASTM Method D2216)	> 1 gal ziplock
[ ] percent moisture (ASTM Method D2216)	
[✓] grain size ((ASTM Method D4464))	
[ ] specific gravity (ASTM Method D854)	
[ ] Atterberg limits ((ASTM Method D4318)	

Sampling Notes: _____

Sampler Name: Tamara Frank

Station Home Page

Station Information

Tide / Water Level Data

Tide Predictions

Current Data

Meteorological Observations

Conductivity

PORTS

Operational Forecast System

Bench Mark Sheets

Datums

Harmonic Constituents

Sea Level Trends

Measurement Specifications

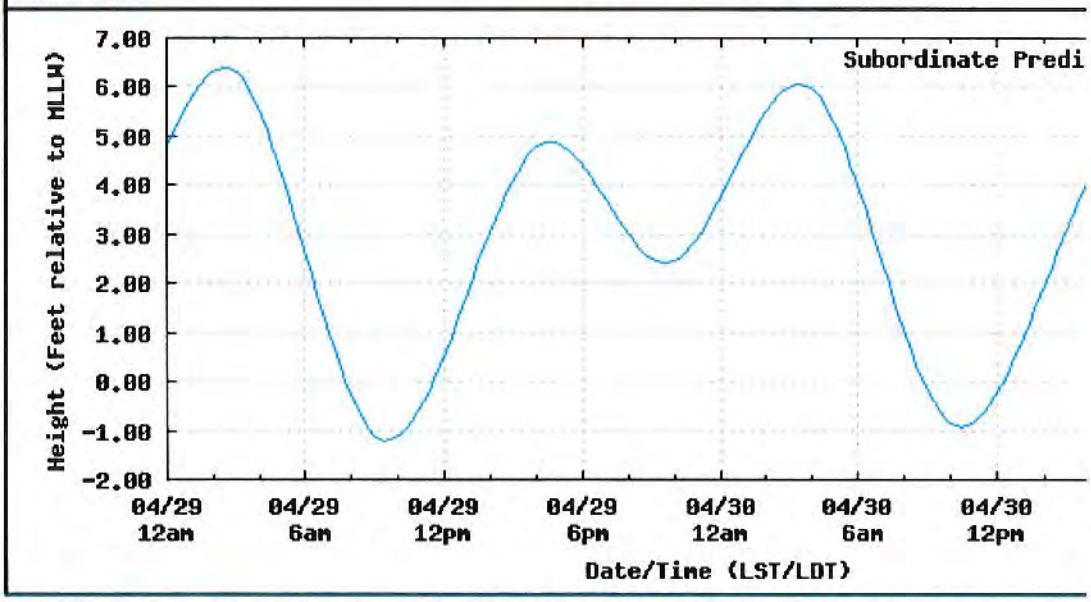
Richmond Inner Harbor, CA StationId: 9414849

Referenced to Station: SAN FRANCISCO (Golden Gate) (9414290)
Height offset in feet (low:*0.98 high: * 1.04) Time offset in mins (low:30 high: 16)

Daily Tide Prediction in **Feet**
Time Zone: **LST/LDT**
Datum: **MLLW**

2013/04/29 - 2013/04/30

Bacl



Disclaimer: These data are based upon the latest information available as of the date of your request, published tide tables.
Note: For predictions of Subordinate stations, the solid blue line depicts a curve fit between the high approximates the segments between.

Begin Date: Apr 29 2013 | **Time Range:** Daily | **Time Zone:** LST/LDT | **Data Units:** Feet | Show Advanced Opt

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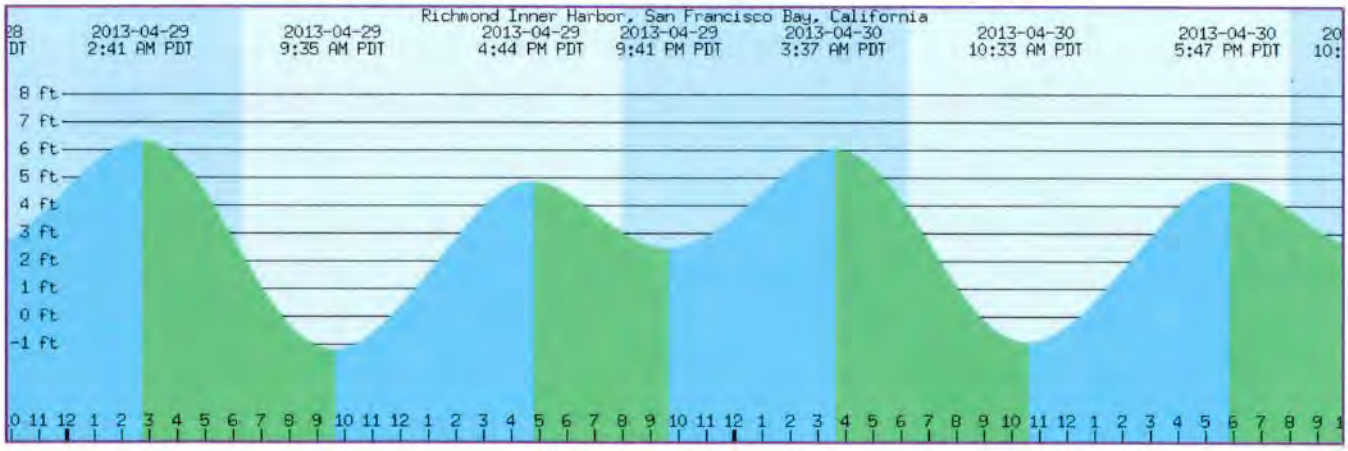
Mobile Geographics Tides for iPhone

Richmond Inner Harbor, San Francisco Bay, California
Requested time: 2013-04-29 12:00 AM PDT



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Richmond Inner Harbor, San Francisco Bay, California
37.9100° N, 122.3583° W

2013-04-29	2:41 AM PDT	6.35 feet	High Tide
2013-04-29	6:15 AM PDT	Sunrise	
2013-04-29	9:35 AM PDT	-1.20 feet	Low Tide
2013-04-29	4:44 PM PDT	4.84 feet	High Tide
2013-04-29	7:58 PM PDT	Sunset	
2013-04-29	9:41 PM PDT	2.42 feet	Low Tide
2013-04-30	3:37 AM PDT	6.01 feet	High Tide
2013-04-30	6:14 AM PDT	Sunrise	
2013-04-30	10:33 AM PDT	-0.92 feet	Low Tide
2013-04-30	5:47 PM PDT	4.87 feet	High Tide
2013-04-30	7:59 PM PDT	Sunset	
2013-04-30	10:56 PM PDT	2.47 feet	Low Tide
2013-05-01	4:40 AM PDT	5.58 feet	High Tide
2013-05-01	6:13 AM PDT	Sunrise	
2013-05-01	11:35 AM PDT	-0.56 feet	Low Tide
2013-05-01	6:50 PM PDT	5.01 feet	High Tide
2013-05-01	8:00 PM PDT	Sunset	
2013-05-02	12:19 AM PDT	2.31 feet	Low Tide
2013-05-02	4:16 AM PDT	Last Quarter	
2013-05-02	5:52 AM PDT	5.15 feet	High Tide
2013-05-02	6:11 AM PDT	Sunrise	
2013-05-02	12:38 PM PDT	-0.20 feet	Low Tide
2013-05-02	7:48 PM PDT	5.22 feet	High Tide
2013-05-02	8:01 PM PDT	Sunset	
2013-05-03	1:39 AM PDT	1.93 feet	Low Tide

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Note: predictions for some locations do not cover the full span of years. If your browser returns a blank page or a "no data" error, then the predictions

Station Home Page
Station Information
Tide / Water Level Data
Tide Predictions
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Meteorological Observations
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Sea Level Trends
Measurement Specifications

Richmond Inner Harbor, CA StationId: 9414849

Referenced to Station: SAN FRANCISCO (Golden Gate) (9414290)
Height offset in feet (low:*0.98 high: * 1.04) Time offset in mins (low:30 high: 16)

Daily Tide Prediction in **Feet**
Time Zone: **LST/LDT**
Datum: **MLLW**

2013/03/13 - 2013/03/14

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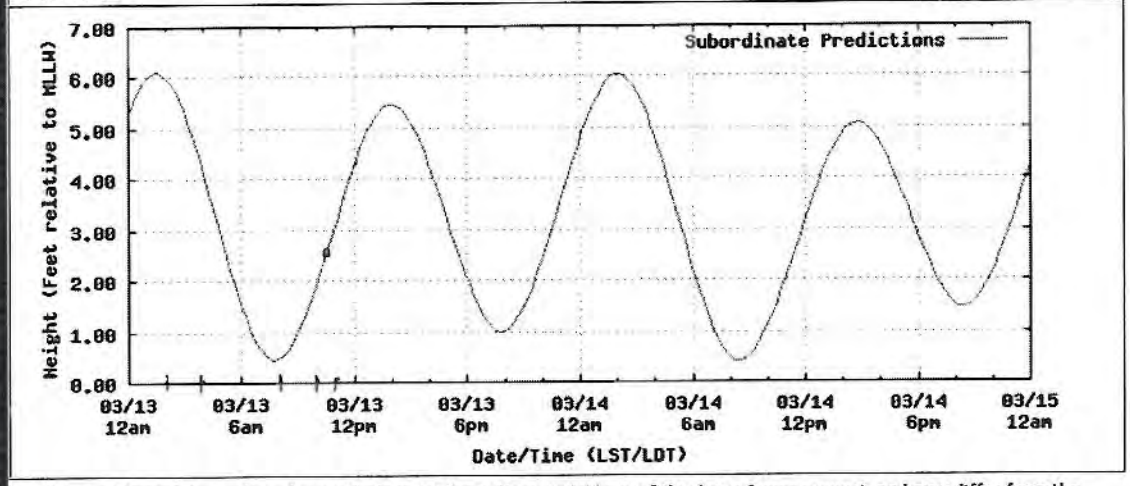

Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.

Published Tide Tables Formats
Annual PDF | Annual TXT | Annual XML

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High/Low Tide Predictions in Feet from 2013/03/13 - 2013/03/14

Download: TXT XML

Date	Day	Time	Hgt
03/13	Wed	01:31 AM	6.1 H
03/13	Wed	07:43 AM	0.46 L
03/13	Wed	01:58 PM	5.48 H
03/13	Wed	07:47 PM	0.99 L
03/14	Thu	02:02 AM	6.05 H
03/14	Thu	08:25 AM	0.41 L
03/14	Thu	02:46 PM	5.08 H
03/14	Thu	08:24 PM	1.45 L

Attachment 2
Laboratory Chains of Custody

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_R9001

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number: R13S55
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Container: 4 oz glass jar
Preservatives: 4C (+-2C)
Filtered: n
Holding Time: 14 Days

Ship To:
USEPA Region 9 Laboratory
1337 South 46th Street, Building 201
Richmond, CA 94804
510-412-2389
Sample Receiving

SAMPLE ID	DATE	TIME	Matrix	Pesticides (SW8081A)	Number of Containers	COMMENTS
SD13-01-0005	3/13/13	1040	Sed	X	1	
SD13-02-0005	3/13/13	1110	Sed	X	1	
SD13-03-0005	3/13/13	1140	Sed	X	1	
SD13-07-0005	3/13/13	1220	Sed	X	1	
SD13-11-0005	3/13/13	1250	Sed	X	1	
SD13-12-0005	3/13/13	1320	Sed	X	1	
SD13-16-0005	3/13/13	1400	Sed	X	1	
SD13-17-0005	3/13/13	1430	Sed	X	1	
SD13-21-0005	3/13/13	1500	Sed	X	1	
SD13-22-0005			Sed	X	1	
~~SD13-78-0005~~ SD13-79-0005	3/13/13	1500	Sed	X	1	SD13-79-0005
SD13-26-0005			Sed	X	1	
				TOTAL NUMBER OF CONTAINERS	16	

Signatures		Date/Time
Sampled by	Tamara Frank	3/13/13 1655
Relinquished by	[illegible]	3/13/13 1655
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment: hand delivery
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_R90429

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number: R13S55
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Container: 4 oz glass jar
Preservatives: 4C (+-2C)
Filtered: n
Holding Time Days

Ship To:
USEPA Region 9 Laboratory
1337 South 46th Street, Building 201
Richmond, CA 94804
510-412-2389
Sample Receiving

SAMPLE ID	DATE	TIME	Matrix	Pesticides (SW8081A)		Number of Containers	COMMENTS
SD13-30-0005	4/29/13	0905	Sed	X		1	
SD13-38-0005	4/29/13	0800	Sed	X		1	
					TOTAL NUMBER OF CONTAINERS	2	

Signatures		Date/Time
Sampled by	Tamara Frank	4/29/13
Relinquished by	Tamara Frank	4/29/13
Received by	[illegible]	
Relinquished by	[illegible]	
Received by	[illegible]	4/29/13 1050

Shipping Details

Method of shipment: Hand delivered
Shipping Company:
On ice: yes / no:
Airbill No.: N/A
Shipping Date:

19°C

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032813-140841-0005
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RM4	Sediment/	Grab Ponar	CLP PEST	1010 (4C (+-2C)) (1)	SD13-22-0005	4/29/13@1145		
Y8RM6	Sediment/	Grab	CLP PEST	1011 (4C (+-2C)) (1)	SD13-26-0005	4/29/13@0930		
Y8RM7	Sediment/	Grab	CLP PEST	1012 (4C (+-2C)) (1)	SD13-30-0005	4/29/13@0905		
Y8RM8	Sediment/	Grab	CLP PEST	1013 (4C (+-2C)) (1)	SD13-34-0005	4/29/13@0840		
Y8RM9	Sediment/	Grab	CLP PEST	1014 (4C (+-2C)) (1)	SD13-38-0005	4/29/13@0800	~~SD13-38~~	

Special Instructions:

Shipment for Case Complete? N

Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	[illegible]	4/29/13									

USEPA CLP Organics COC (LAB COPY)

DateShipped: 3/14/13
CarrierName: FedEx
AirbillNo: 8635 7985 7667

CHAIN OF CUSTODY RECORD

Case #: 43379
Cooler #:

No: 9-031213-143450-0003
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab Use Only
Y8RL5	Sed/	Grab	CLP PEST	1000 (4C (+-2C)) (1)	SD13-01-0005	3/13/13 1040		
Y8RL6	Sed/	Grab	CLP PEST	1001 (4C (+-2C)) (1)	SD13-02-0005	3/13/13 1110		
Y8RL7	Sed/	Grab	CLP PEST	1002 (4C (+-2C)) (1)	SD13-03-0005	3/13/13 1140		
Y8RL8	Sed/	Grab	CLP PEST	1003 (4C (+-2C)) (1)	SD13-07-0005	3/13/13 1220		
Y8RL9	Sed/	Grab	CLP PEST	1004 (4C (+-2C)) (1)	SD13-11-0005	3/13/13 1250		
Y8RM0	Sed/	Grab	CLP PEST	1005 (4C (+-2C)) (1)	SD13-12-0005	3/13/13 1320		
Y8RM1	Sed/	Grab	CLP PEST	1006 (4C (+-2C)) (1)	SD13-16-0005	3/13/13 1400		
Y8RM2	Sed/	Grab	CLP PEST	1007 (4C (+-2C)) (1)	SD13-17-0005	3/13/13 1430		
Y8RM3	Sed/	Grab	CLP PEST	1008 (4C (+-2C)) (1)	SD13-21-0005	3/13/13 1500		
~~Y8RM4~~	~~Sed/~~	~~Grab~~	~~CLP PEST~~	~~1009 (4C (+-2C)) (1)~~	~~SD13-22-0005~~			
Y8RM5	Sed/	Grab	CLP PEST	1010 (4C (+-2C)) (1)	SD13-~~78~~ 79-0005	3/13/13 1515		
~~Y8RM6~~	~~Sed/~~	~~Grab~~	~~CLP PEST~~	~~1011 (4C (+-2C)) (1)~~	~~SD13-26-0005~~			
~~Y8RM7~~	~~Sed/~~	~~Grab~~	~~CLP PEST~~	~~1012 (4C (+-2C)) (2)~~	~~SD13-30-0005~~			
~~Y8RM8~~	~~Sed/~~	~~Grab~~	~~CLP PEST~~	~~1013 (4C (+-2C)) (1)~~	~~SD13-34-0005~~			
~~Y8RM9~~	~~Sed/~~	~~Grab~~	~~CLP PEST~~	~~1014 (4C (+-2C)) (1)~~	SD13-38-0005			

3/13/13

Sample(s) to be used for Lab QC: ~~Y8RM7~~ Y8RM3

Shipment for Case Complete? N

Samples Transferred From Chain of Custody #

Analysis Key: CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
To Lab	Jamara Jack	3/14/13									

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS001

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None			
			Filtered:	n	n			
			Holding Time	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-01-0005	3/13/13	1040	Sed	X	X		1	
SD13-02-0005	3/13/13	1110	Sed	X	X		1	
SD13-03-0005	3/13/13	1140	Sed	X	X		1	
SD13-07-0005	3/13/13	1220	Sed	X	X		1	
SD13-11-0005	3/13/13	1250	Sed	X	X		1	
SD13-12-0005	3/13/13	1320	Sed	X	X		1	
SD13-16-0005	3/13/13	1400	Sed	X	X		1	
SD13-17-0005	3/13/13	1430	Sed	X	X		1	
SD13-21-0005	3/13/13	1500	Sed	X	X		1	MS/MSD on TOC
~~SD13-22-0005~~			Sed	X	X		~~1~~	
~~SD13-26-0005~~			Sed	X	X		~~1~~	
~~SD13-30-0005~~			Sed	X	X		~~1~~	~~MS/MSD on TOC~~ TF 3/13/13
						TOTAL NUMBER OF CONTAINERS	~~14~~ 9	

TF 3/13/13

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

	Signatures	Date/Time
Sampled by	Tamara Franck	3/14/13 1200
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment: fedex overnight
Shipping Company:
On ice: (yes) no:
Airbill No.: 8635 7985 7656
Shipping Date: 3/14/13

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS0429

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Container:				Ziplock Bag	Ziplock Bag			
Preservatives:				None	None			
Filtered:				n	n			
Holding Time				180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-22-0005	4/29/13	1145	Sed	X	X		1	
SD13-26-0005	4/29/13	0930	Sed	X	X		1	
SD13-30-0005	4/29/13	0905	Sed	X	X		1	
SD13-34-0005	4/29/13	0840	Sed	X	X		1	
SD13-38-0005	4/29/13	0820	Sed	X	X		1	
							TOTAL NUMBER OF CONTAINERS	5

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

	Signatures	Date/Time
Sampled by	[illegible]	4/29/13 1[illegible]
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details
Method of shipment: Fed Ex 1st Overnight
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

Attachment 3
Photograph Log

Photograph 1: SD13-01-0005 in the Ekman sampler

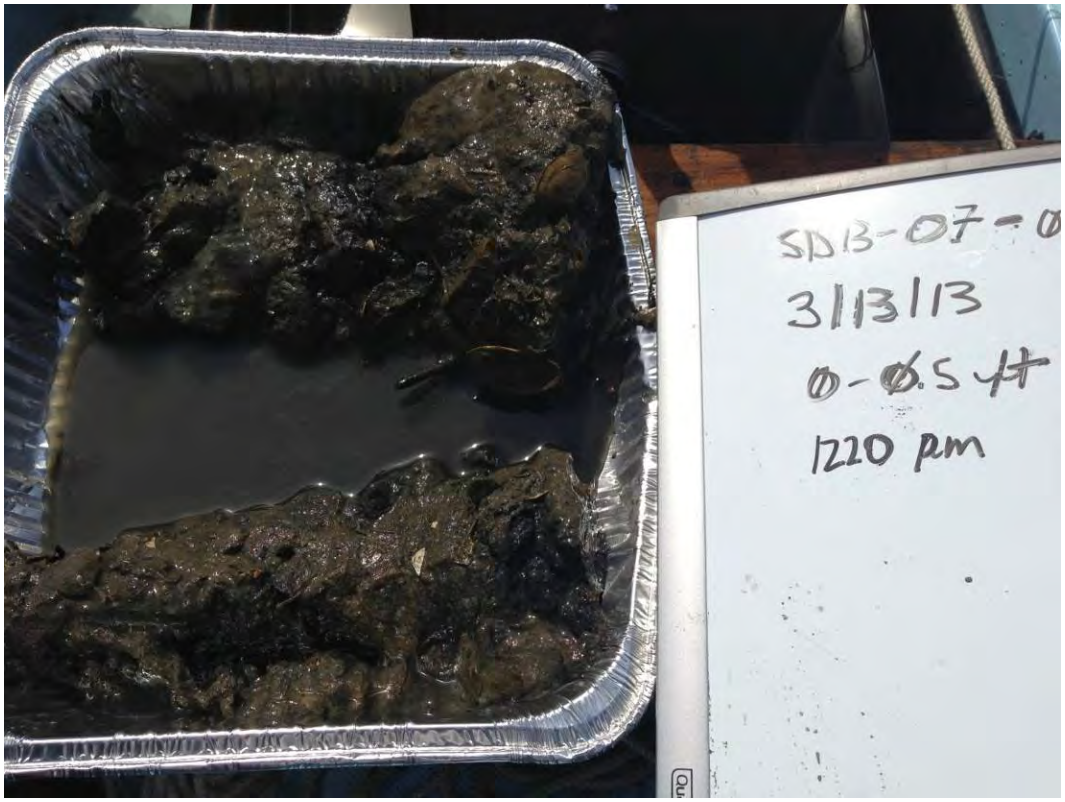
Photograph 2: SD13-01-0005 combined sample from two partially filled Ekman samples

Photograph 3: SD13-02-0005 in the Ekman sampler

Photograph 4: SD13-03-0005 in the Ekman sampler

Photograph 5: SD13-03-0005 combined material from Ekman samples

Photograph 6: SD13-07-0005 in the Ekman sampler



Photograph 7: SD13-07-0005 sample from successful deployment of Ekman sampler

Photograph 8: SD13-11-0005 in the Ekman sampler

Photograph 9: SD13-11-0005 sample from successful deployment of Ekman sampler

Photograph 10: SD13-11-0005 closeup showing small black specs uniformally distributed

Photograph 11: SD13-12-0005 combined sample from three partially filled Ekman samples

Photograph 12: SD13-16-0005 combined sample from partially filled Ekman samples. Clay clumps were present in the sample.

Photograph 13: SD13-17-0005 in Ekman sampler.

Photograph 14: SD13-21-0005 in Ekman sampler.

Photograph 15: SD13-21-0005 showing closeup of clay clump assumed to be Older Bay Mud.

Photograph 16: SD13-22-0005 showing composited samples from Ekman Sampler.

Photograph 17: SD13-26 showing embankment. Red arrow shows location of sample.

Photograph 18: SD13-26-0005 showing composited samples from Ekman Sampler.

Photograph 19: SD13-30 showing embankment and sampling location.

Photograph 20: SD13-30-0005 showing composited sample.

Photograph 21: SD13-34 showing embankment looking north.

Photograph 22: SD13-34 showing embankment looking south during sampling. Red arrow shows seep.

Photograph 23: SD13-34 showing seep at bent number 37.

Photograph 24: SD13-34-005 showing composited sample.

Photograph 25: SD13-38 showing embankment.

Photograph 26: SD13-38-005 showing composited sample.

Attachment 4
Bent Number 37 Seep Sampling Photograph, Field Notes, and Laboratory Chains of Custody

Photograph 1: Closeup of seep at bent number 37 as sampled on July 24, 2013.

7/24/13 United Heckathorn- Seep Sample
0 Arrive, meet Tony
0 In boat
at 37 blocked by barge
er at bent 39, walk over to seep

: Collect sample
2x 1L Amber for Pest unfiltered
2x 1L Amber for Pest filtered
3x 250mL for TSS

pH = 7.01
Temp = 20.3°C
EC = 5.534 mS/cm
"TDS" = 0.0034 kg/L

Bottle fill time 1L (about 30% to 50% of flow captured
12 sec
13 sec
12 sec
14 sec

ENVIRONMENTAL PROTECTION AGENCY
Region 9 Laboratory

CHAIN OF CUSTODY RECORD

1337 S. 46th St., Bldg. 201
Richmond, CA 94804-4698

PROJ. NO.:

PROJECT NAME: United Heckathorn

SAMPLERS: (Signature) [signature] William Frohlich

DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	755	REMARKS
7-24-13	0745	SW		✓	SW13-P4-16	3	X	

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	7-24-13 0905				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Received for Laboratory by: (Signature)	Date / Time	Temp.	Seals Intact (Y/N)	Conditions / Remarks
R9 Lab [signature]	7/24/13 0905	20°C	hand delivered	Hand delivered

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

9-4033

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSW_V001

2013 Seep Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager: Bill Frohlich
Cell Number: 925 209.0881
Fax/Email: bill.frohlich@ch2m.com

Container:	1 L Amber Glass
Preservatives:	4C (+-2C)
Filtered:	n
Holding Time	7 Days

Ship To:
Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
916-673-1520
Sample Receiving

SAMPLE ID	DATE	TIME	Matrix	Pesticides (E1699)	Number of Containers	COMMENTS
SW13-P4-16	7.24.13	0745	SW	X	2 ~~1~~	Filter on Receipt, ~~Additional volume for MS/MSD~~ 2
SW-P4-16	7.24.13	0745	SW	X	2	No Filter
				TOTAL NUMBER OF CONTAINERS	1	

Signatures		Date/Time
Sampled by	Will Fell	7.24.13 0745
Relinquished by	Will Fell	7.24.13 1115
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment: Fed Ex
Shipping Company:
On ice: yes / no:
Airbill No.: 7963 0645 4779
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruth.siegmund@e2.com

Chain of Custody Anomaly/Sample Acceptance Form

Vista Analytical Laboratory

CH2M Hill
Brenda McConathy
brenda.mcconathy@ch2m.com
(415) 294-0446

Workorder Number: 1300533
Date Received: 25-Jul-13 08:41
Documented by/date: AEW 7/25/13

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

Thank you,

Martha Maier
mmaier@vista-analytical.com
916-673-1520

[X] Sample IDs on Chain of Custody do not match Sample Container Labels

Chain of Custody ID	Container Label ID
SW-P4-16	SW13-P4-16

Client Authorization

Proceed with Analysis: (YES) NO Signature and Date Brenda McConathy

Client Comments/Instructions Please assign SW13-P4-16F to filtered result

Summary of Field Activities to Support the Source Identification Study United Heckathorn Superfund Site, Richmond, California

PREPARED FOR:	United States Environmental Protection Agency Region 9
PREPARED BY:	CH2M HILL
DATE:	July 25, 2013
PROJECT NUMBER:	USEPA CONTRACT NO. EP-S9-08-04 USEPA WORK ASSIGNMENT NO. 025-RIFS-09R3 CH2M HILL PROJECT NO. 385441

Background

Sediment core samples were collected as part of the sediment sampling activities described in the Final Focused Feasibility Study Data Gaps Sampling and Analysis Plan Addendum #2 Source Identification Study United Heckathorn Superfund Site (SAP) (CH2M HILL, 2013). A total of twenty-four sediment cores were collected from locations positioned on a sampling grid in the Lauritzen Channel, and three sediment cores were collected in the Santa Fe Channel. The cores were advanced to collect intact samples of Younger Bay Mud (YBM), down to the contact with the Older Bay Mud (OBM). The target depth of penetration was the effective length of the core barrel (7.5 feet) or refusal, which was defined as the depth where the rate of core penetration approached zero.

This technical memorandum summarizes the vibracore sediment sampling activities on April 1 – 5, 2013. The results will be used to support the Source Identification Study and Tier 2 Sediment Transport Study for the site.

Sample Collection Activities

The sampling platform, provided by Dixon Marine Services, was mobilized on April 1, 2013. Sediment cores were collected at all 27 of the proposed sample locations in the Lauritzen and Santa Fe Channels on April 2 and 3, 2013.

Target coordinates for the sampling locations were loaded into the on-board navigation system. The platform was anchored at each location by tying off to above water anchor points (e.g., pier supports or anchored barges) on the port and starboard sides of the bow and maintaining position using the boat engine to tension the lines. The water depth was recorded using a weighted disk attached to the end of a spooled measuring tape (lead line) and the as-sampled location was recorded using differential global positioning system (GPS). Sampling information including the time, date, water depth,

tide height, core penetration, and recovery was recorded in the log book and on the core log sheets. The cores were labeled with indelible marker showing the core identification number and orientation.

The cores were collected using a Rossfelder P-5 electric vibracore head equipped with a metal 4-inch core barrel fitted with a 3.75-inch interior diameter, clear polycarbonate liner. A stainless steel driller's basket (core catcher) and nose cone were installed in the end of the core barrel to retain the core during penetration and recovery. The vibracore was mounted on *M/V Walter Marie*, a 32-foot work vessel equipped with a bow-mounted A-frame used to deploy and retrieve the vibracore. The vibracore was positioned on the bottom of the canal within 9 feet of the proposed location. The vibracore was advanced to 7.5 feet (the effective length of the core barrel) or refusal. The vibracore was retrieved, and the core liner was removed from the core barrel. If recovery was less than 70 percent of penetration, or if no plug of OBM was observed in the core catcher at locations with less than 7.5 feet of penetration, a second core was attempted. The core barrel was cleaned with an Alconox solution, rinsed with site water, loaded with a new, clean liner and prepared for the next location. Figure 1 presents the locations of the 27 sediment core samples collected (Figure 1 is located at the end of this technical memorandum).

At locations SD13-05 and SD13-09, where cores were collected for fine-interval sampling, the cores were maintained upright during the entire collection process. During retrieval, a cap was placed over the core catcher at the bottom of the liner, the connection between the catcher and the barrel was loosened, and the exterior core barrel was mechanically lifted while a worker held the capped liner upright. This procedure ensured that the liner remained vertical during collection, minimizing the disturbance of the soft upper sediment/water interface.

The cores were transported to the U.S. Environmental Protection Agency (EPA) Region 9 Laboratory on April 2 and 3, 2013 where they were placed in a walk-in refrigerator and allowed to settle overnight before processing.

Sample Processing Activities

The sediment cores were processed from April 3 through April 5, 2013 in the shipping bay of the Region 9 Laboratory. An area of the bay was covered with heavy plastic to contain any spilled mud and debris. A table was covered in plastic and aluminum foil strips to help contain any flowable mud that was present in the top of the core. Whole cores were allowed to settle and consolidate overnight in a refrigerator maintained at 4°C, and were removed from the refrigerator immediately before processing. The core was held upright in a tub within the plastic-lined processing area and a small cut was made in the liner approximately ½ inch above the sediment-water interface to allow the overlying water to slowly drain out. When the top of the core was free of water, the cut was completed through the core liner and the core cap was reinstalled on the cut end of the liner.

The intact core was then carefully placed on the table. Two parallel cuts were made in the core liner, each starting at the bottom of the core and moving toward the top,

allowing a section of the liner to be removed exposing the complete core or allowing the core to be split in half longitudinally, allowing for the interior sediment structure to be observed. Any material that had smeared along the outer edge of the core or along the surface where the core was sliced in half was scraped away using disposable scoops to minimize cross-contamination and allow photographic documentation of the core. Photos were taken at 2-foot intervals along the entire core; each photo included a measuring tape and white board with sample information to allow identification of photos. The core were visually characterized for sediment type, color, moisture content, texture, grain size and shape, consistency, visible evidence of contamination, odor, and any other observations. The colors were designated using a Munsell color chart. Odors were categorized as no odor, unclassified odor, sulfur-like odor and/or petroleum hydrocarbon-like odor.

A summary of key field data and observations is provided in Table 1 (all tables are located at the end of this technical memorandum). OBM was observed in 15 cores and evidence of the sand layer placed in the channel in 1997 was observed in 9 cores. At one location (SD13-20), the core barrel was advanced to 7.5 feet without exhibiting refusal or penetrating OBM. Generally, the YBM was observed to be wet to very wet, black or dark gray, silts and clays. Where observed, the sand layer was typically dark gray, medium sand that was firm to hard and generally dry to slightly moist.

After the photos were taken and the cores were characterized, the cores were sub-sampled for chemical and physical analyses. Sediments from the targeted sample interval were removed using clean, disposable scoops and transferred to a disposable aluminum pan, where they were thoroughly mixed and transferred to pre-labeled sample containers. The samples collected for chemical and physical analyses are summarized in Table 2.

Sample containers were labeled with the date and time that the core was sub-sampled. Labels were covered with clear tape. The containers to be submitted for chemical analyses were placed in a freezer and the containers to be submitted for physical analyses were placed in a refrigerator until shipment.

All sediment that remained in the core liners and all used sampling equipment and personal protective equipment (PPE) were transferred to buckets which were then transferred to appropriately-labeled investigation-derived waste (IDW) drums storied at the Levin Richmond Terminal Corporation in a designated IDW storage area.

Samples were collected at each location for pesticides analysis (EPA Method 8081A) and total organic carbon (TOC) (Walkley-Black method). Samples were submitted from selected locations for Atterberg limits (ASTM Method D4318), specific gravity (ASTM Method D854), percent solids (ASTM Method D2216), and grain size (ASTM Method D4464). Samples were stored on ice inside a cooler until the completion of the sampling activities. Samples submitted to the EPA Contract Laboratory Program (CLP) laboratory, KAP Technologies, Inc., included 111 normal samples collected for pesticides analysis and 11 samples submitted as field duplicates. Split samples from 14 locations were submitted to the EPA Region 9 Laboratory. Physical parameters included 66 grain size, 9 Atterberg Limits, 27 specific gravity, percent solids,

and 109 TOC submitted to PTS Laboratories, Inc. Samples for pesticide analyses were shipped to KAP laboratory and samples for physical parameters were shipped to PTS Laboratories via FedEx Priority Overnight for Saturday delivery on April 5. All samples were shipped on ice. Split samples for pesticide analyses by the Region 9 Laboratory were hand delivered on April 5. Laboratory Chains-of-Custody are included in Attachment 1.

The sediment sample collection forms are presented in Attachment 2 and the photograph log for this sampling event is presented in Attachment 3. Selected photos of the sample collection are provided within this document; however, the complete photograph log will provided electronically to the EPA.

References

CH2M HILL. 2013. Final *Focused Feasibility Study Data Gaps Sampling and Analysis Plan Addendum #2 Source Identification Study United Heckathorn Superfund Site.* February.

Tables

TABLE 1
Summary of Vibracore Observations - 2013 Source Identification Investigation
United Heckathorn Superfund Site, Richmond, California

Location	Field Longitude (X)	Field Latitude (Y)	Measured Water Depth (ft)	Observed/Verified Tide (ft MLLW)[1]	Penetration (ft)	Recovery (ft)	Refusal (Y/N)	Core Barrel Advanced to Full Length (Y/N)	OBM in core (Y/N)	Thickness of YBM (Corrected) (ft)[2]	Elevation of YBM Surface (ft MLLW)	Elevation of OBM[3] (ft MLLW)	Evidence of 1997 Benthic Sand Layer (Y/N)	Additional Comments
SD13-4	6023234.68	2164441.03	14.6	0.74	7.17	1.50	Y	N	N	7.17	-13.86	*-21.0*	N	Rocks and riprap were observed along the seafloor on west side of channel. Three attempts at this location all resulted sufficient penetration but minimal recovery. The vibracore head continued to slip downslope due to unfavorable bottom conditions. Attempt 3, located approximately 9.8' east of the target location was retained for sampling. Core was black silt and sand over gravel; petroleum hydrocarbon odor noted, stronger in gravel. The core catcher contained OBM.
SD13-5	6023274.05	2164435.49	17.7	0.36	5.50	4.10	Y	N	N	4.75	-17.34	*-22.1*	N	Fine interval core. Entire core dominantly sticky black clay/silt with trace to minor sand. Increased sand and gravel at bottom of core. Strong hydrocarbon-type odor at 3.3' below TOC.
SD13-6	6023328.85	2164430.36	13.5	2.41	5.33	5.00	Y	N	N	5.33	-11.09	*-16.4*	Y	The first attempt at this location hit a rocky bottom. The boat was moved into deeper water slightly to the west of the proposed location. When the core liner was removed from the core barrel, it was noted that the core catcher contained rocks, not OBM. Since no OBM was observed a third attempt was made to collect a core including the YBM/OBM interface. The third attempt had approximately 4' penetration which was stopped by rock. The senior field staff confirmed that 2 attempts at the offset location were sufficient and the third attempt was discarded. Below 2 feet, core is dominantly sand, increasing gravel and decreasing silt/clay content with depth to 4.2 feet. Below 4.2 feet to BOC no gravel and less clay/silt.
SD13-8	6023181.39	2164245.71	19.6	-0.21	7.17	5.60	N	Y	Y	5.57	-19.81	-25.4	N	Transition zone to OBM from 4 to 4.3 feet from TOC.
SD13-9	6023248.50	2164238.21	20.7	-0.37	6.00	5.50	N	N	Y	3.75	-21.07	-24.8	Y	This location was identified as the fine interval sample. The first core retrieved was allowed to rest horizontally for a brief period of time, during barge movement. Since this location is designated as a fine interval sample, a second core was collected. Nose cone was cut off during processing and not included in processed length. Sand layer observed above 0.6 feet of consolidated, black, clay/silt YBM. Due to OBM observation in first core, second core was stopped once a depth of 6 feet had been reached to minimize consolidation of YBM.
SD13-10	6023307.69	2164238.02	12.4	-0.12	6.67	6.60	Y	N	Y	1.87	-12.52	-14.4	N	Minor sand was observed from 0.9 to 1.8 feet below TOC.
SD13-13	6023160.53	2164049.90	14.1	1.06	7.00	2.50	Y	N	Y	5.60	-13.04	-18.6	N	Sandy silt/clay observed in top 0.6 feet. Penetration was 7' and the operator felt the vibracore tilt when OBM was encountered. OBM was encountered, so despite a low recovery, no additional attempts were required. Since vibracore head tipped over the penetration is overestimated.
SD13-14	6023212.77	2164041.92	20.2	0.63	6.67	6.40	Y	N	Y	1.17	-19.57	-20.7	N	Top 0.4 feet of core included coarse, dark gray to black sand with clay and silt, approximately 80% sand.
SD13-15	6023278.51	2164034.84	14.3	0.1	6.25	4.90	Y	N	Y	3.35	-14.20	-17.6	Y	Dark gray to black medium sand (drier than interval above) observed from 1.6 to 2 feet from TOC.
SD13-18	6023087.22	2163850.25	21.6	2.05	6.42	6.50	Y	N	Y	1.00	-19.55	-20.6	Y	Observed approximately 1 inch of dark gray, medium sand right above OBM.
SD13-19	6023185.28	2163842.50	31.5	2.26	6.00	6.10	Y	N	Y	4.00	-29.24	-33.2	Y	From 1.8 to 2.7 feet below TOC transition from black clay/silt to medium, dark gray firm, slightly moist sand - decreasing fines with depth noted. From 2.7 to 4 feet below TOC observed dark gray, fine to medium sand, dry and hard. Minor shell hash from 2.7 to 3 feet. Transition to OBM at 4 feet below TOC.
SD13-20	6023255.11	2163837.51	25.1	1.7	7.25	5.17	N	Y	N	7.25	-23.40	NA	N	YBM included black silt/clay with pockets of gravel or gravel with fine sand throughout.
SD13-23	6023066.85	2163651.19	21.4	1.21	4.33	3.70	Y	N	Y	4.33	-20.19	-24.5	Y	Sand observed from 0.9 to 1.5 feet from TOC - medium, dark gray, trace to minor fines and trace shell hash. Below 1.5 feet black silt/clay was observed interspersed with hard, fat gray-brown clay. No clear transition observed and there appeared to be fingers of silt/clay that comprises YBM into the firmer, drier OBM. From 3 to 3.7 feet, there was less of the black silt/clay. Slight petroleum hydrocarbon odor (observed as diesel-like odor) was noted at bottom of core.
SD13-24	6023139.40	2163642.13	32.5	0.78	6.92	6.00	Y	N	Y	0.92	-31.72	-32.6	N	Top 0.7 feet of core was soft, black clay/silt (clearly YBM) and from 0.7 to 4.1 feet below TOC, sediment appeared to be OBM; however from 4.1 to 5.2 feet below the TOC, material became wet again and gravel observed at bottom of this interval. From 5.2 to 6.0 the sediment was soft clay/silt with gravel and pockets of black silt/clay (presumed to be YBM sediment).
SD13-25	6023211.18	2163646.43	33.9	1.59	6.83	5.90	Y	N	N	6.83	-32.31	*-39.1*	Y	Sand observed in bottom interval of core (5.3 to BOC at 5.9 feet). Transition from YBM to sand was abrupt, material below sand interval not observed.
SD13-27	6022989.83	2163456.36	13.2	-0.2	5.00	3.10	Y	N	N	5.00	-13.40	*-18.4*	N	Core appeared to be highly disturbed and contained multiple, relatively thin, layers of sediment ranging from black clay/silt and poorly sorted sand and coarse gravel to very hard, dry clay with gravel.
SD13-28	6023091.65	2163452.79	34.3	0.22	6.50	6.00	Y	N	N	6.50	-34.08	*-40.6*	N	At 3 feet from TOC, an abrupt transition in moisture content and firmness observed. Pockets of dark olive-brown to dark gray silt/clay were observed between 4 and 6 feet.
SD13-29	6023189.47	2163438.66	34.2	0.06	6.67	6.20	Y	N	N	6.67	-34.14	*-40.8*	N	Entire core silt/clay with trace fine sand (YBM). PHC odor noted throughout, but was notably stronger near bottom of core. At 5.7 feet from TOC, increased gravel and sand content observed, but there was not a distinct "sand" layer.
SD13-31	6022972.31	2163263.24	14.6	-0.27	4.83	5.00	Y	N	Y	0.00	N/A	-15.5	N	Entire core was OBM; the top 2 feet contained areas of mottled dark gray clay/silt and appeared disturbed compared to the sediment below 2 feet.
SD13-32	6023070.70	2163251.79	33.5	-0.3	6.75	6.10	Y	N	N	6.75	-33.79	*-40.5*	N	Entire core silt/clay with trace fine sand (YBM). PHC odor noted throughout. Notable transition at 3 feet; sediment above is very cohesive, wet, and sticky; below material is still silt/clay but less wet. At 4.4 feet from TOC observed a clast of black, organic rich material.
SD13-33	6023168.50	2163239.19	33.7	-0.2	6.92	6.20	Y	N	N	6.92	-33.90	*-40.8*	N	Entire core is black silt/clay (YBM) with pockets of firmer gray-brown clay observed below 2 feet.
SD13-35	6022947.27	2163061.12	30.7	0.62	6.58	5.80	Y	N	Y	6.58	-30.08	-36.7	Y	Medium, dark gray sand observed from 2.6 to 2.9 feet from TOC and from 3.4 to 4.6 feet from TOC; trace shell hash observed in lower interval. From 4.6 feet to BOC soft, wet, black silt clay. Plug of OBM observed at very bottom of core.
SD13-36	6023044.53	2163055.96	36.5	1.71	6.58	6.50	Y	N	N	6.58	-34.79	*-41.4*	Y	Sand layer observed from 4.3 to 4.5 feet and 5.2 to 5.4 feet below TOC. Remainder of core clay/silt with varying degrees of firmness and moisture (all YBM).
SD13-37	6023145.91	2163043.31	35.3	-0.19	6.58	6.00	Y	N	N	6.58	-35.49	*-42.1*	N	Gravel and rocks noted at bottom of core during processing.

TABLE 1
Summary of Vibracore Observations - 2013 Source Identification Investigation
United Heckathorn Superfund Site, Richmond, California

Location	Field Longitude (X)	Field Latitude (Y)	Measured Water Depth (ft)	Observed/Verified Tide (ft MLLW)[1]	Penetration (ft)	Recovery (ft)	Refusal (Y/N)	Core Barrel Advanced to Full Length (Y/N)	OBM in core (Y/N)	Thickness of YBM (Corrected) (ft)[2]	Elevation of YBM Surface (ft MLLW)	Elevation of OBM[3] (ft MLLW)	Evidence of 1997 Benthic Sand Layer (Y/N)	Additional Comments
SD13-39	6022756.43	2162979.33	40	4.06	5.58	4.90	Y	N	Y	4.08	-35.94	-40.0	N	From 4.8 to 5.2 feet below TOC a layer of coarse, angular gravel with sand and silt observed; YBM present below this layer. At 5.6 feet below TOC there is a layer of black, organic rich material, approximately 3/8" thick that had a strong, chemical-type odor.
SD13-40	6022921.50	2162662.19	41.5	3.07	4.92	4.00	Y	N	Y	2.92	-38.43	-41.4	N	Penetration likely overestimated due to the very soft nature of the surface sediment. From 3 to 3.4 feet the OBM contained what appeared to be black inclusions of YBM.
SD13-41	6023057.92	2162400.50	39.1	2.25	6.42	6.50	Y	N	Y	3.92	-36.85	-40.8	N	Transition from YBM to OBM observed at 4 feet below TOC. From 4 to 5 feet the clay was broken into angular, gravel-sized clumps, from 4.9 to 5 feet this transitioned into a hard, dark gray clay.

Notes:
1. Verified tide data from National Oceanographic and Atmospheric Adminstration Station 9414863, Richmond, California. Accessed May 6, 2013.
2. Thickness of the YBM has been corrected to account for less than 100 percent core recovery.
3. Where OBM was not directly observed in cores that met refusal, the inferred elevation of the OBM surface was calculated by subtracting the corrected thickness of YBM from the YBM surface elevation. The inferred values are italicized.
BOC - bottom of core
ft - feet
MLLW - mean lower low water
N/A - not applicable
OBM - Old Bay Mud
TOC - top of core
YBM - Young Bay Mud

TABLE 2
Summary of Samples Collected from Sediment Cores - 2013 Source Identification Investigation
United Heckathorn Superfund Site, Richmond, California

Location	Field Longitude (X)	Field Latitude (Y)	Sample ID	CLP Sample Number	Duplicate Sample ID or MS/MSD	Type of Sample (OBM or YBM)	Top Depth (ft) (from TOC)	Bottom Depth (ft) (from TOC)
SD13-4	6023234.68	2164441.03	SD13-04-0005	Y8RN1		YBM	0.0	0.5
			SD13-04-0515	Y8RN2		YBM	0.5	1.5
SD13-5	6023274.05	2164435.49	SD13-05-0002	Y8RN6		YBM	0.0	0.2
			SD13-05-0203	Y8RN7		YBM	0.2	0.3
			SD13-05-0305	Y8RN8		YBM	0.3	0.5
			SD13-05-0507	Y8RN9		YBM	0.5	0.7
			SD13-05-0708	Y8RO0		YBM	0.7	0.8
			SD13-05-0810	Y8RO1		YBM	0.8	1.0
			SD13-05-1020	Y8RO2		YBM	1.0	2.0
			SD13-05-2040	Y8RO3		YBM	2.0	4.0
SD13-6	6023328.85	2164430.36	SD13-06-0005	Y8RO5		YBM	0.0	0.5
			SD13-06-0520	Y8RO6		YBM	0.5	2.0
			SD13-06-2040	Y8RO7		YBM	2.0	4.0
			SD13-06-4059	Y8RO8		YBM	4.0	4.9
SD13-8	6023181.39	2164245.71	SD13-08-0005	Y8RO9		YBM	0.0	0.5
			SD13-08-0520	Y8RP0	Y8RP1	YBM	0.5	2.0
			SD13-08-2040	Y8RP2		YBM	2.0	4.0
			Non-sampled Interval			OBM	4.0	4.6
			SD13-08-4055	Y8RP3		OBM	4.6	5.5
SD13-9	6023248.50	2164238.21	SD13-09-0002	Y8RP4		YBM	0.0	0.2
			SD13-09-0203	Y8RP5		YBM	0.2	0.3
			SD13-09-0305	Y8RP6		YBM	0.3	0.5
			SD13-09-0507	Y8RP7		YBM	0.5	0.7
			SD13-09-0708	Y8RP8		YBM	0.7	0.8
			SD13-09-0810	Y8RP9		YBM	0.8	1.0
			SD13-09-1020	Y8RQ0		YBM	1.0	2.0
			SD13-09-2040	Y8RQ1		YBM	2.0	4.0
			SD13-09-4055	Y8RQ2		OBM	4.0	5.5
SD13-10	6023307.69	2164238.02	SD13-10-0005	Y8RQ3		YBM	0.0	0.5
			SD13-10-0520	Y8RQ4		YBM/OBM	0.5	2.0
			SD13-10-2040	Y8RQ5	MS/MSD	YBM/OBM	2.0	4.0
			SD13-10-4060	Y8RQ6		OBM	4.0	6.0
			SD13-10-6066	Y8RR2		OBM	6.0	6.6
SD13-13	6023160.53	2164049.90	SD13-13-0005	Y8RQ7	Y8RQ8	YBM	0.0	0.5
			SD13-13-0520	Y8RQ9		YBM/OBM	0.5	2.0
			SD13-13-2025	Y8RR0	Y8RR1	OBM	2.0	2.5
SD13-14	6023212.77	2164041.92	SD13-14-0005	Y8RR3		YBM	0.0	0.5
			SD13-14-0509	Y8RR4		YBM	0.5	0.9
			Non-sampled Interval			OBM	0.9	1.0
			SD13-14-1020	Y8RR5		OBM	1.0	2.0
			SD13-14-2040	Y8RR6		OBM	2.0	4.0
SD13-15	6023278.51	2164034.84	SD13-15-0005	Y8RR7		YBM	0.0	0.5
			SD13-15-0520	Y8RR8		YBM	0.5	2.0
			SD13-15-2040	Y8RR9		OBM	2.0	4.0
			SD13-15-4049	Y8RS0		OBM	4.0	4.9
SD13-18	6023087.22	2163850.25	SD13-18-0005	Y8RS1		YBM	0.0	0.5
			SD13-18-0510	Y8RS2		YBM	0.5	1.0
			Non-sampled Interval				1.0	1.5
			SD13-18-1030	Y8RS3	Y8RS5	OBM	1.5	3.0
SD13-19	6023185.28	2163842.50	SD13-19-0005	Y8RS6		YBM	0.0	0.5
			SD13-19-0520	Y8RS7		YBM	0.5	2.0
			SD13-19-2040	Y8RS8		YBM	2.0	4.0
			Non-sampled Interval			--	4.0	4.5
			SD13-19-4560	Y8RS9		OBM	4.5	6.0

TABLE 2
Summary of Samples Collected from Sediment Cores - 2013 Source Identification Investigation
United Heckathorn Superfund Site, Richmond, California

Location	Field Longitude (X)	Field Latitude (Y)	Sample ID	CLP Sample Number	Duplicate Sample ID or MS/MSD	Type of Sample (OBM or YBM)	Top Depth (ft) (from TOC)	Bottom Depth (ft) (from TOC)
SD13-20	6023255.11	2163837.51	SD13-20-0005	Y8RT0		YBM	0.0	0.5
			SD13-20-0520	Y8RT1		YBM	0.5	2.0
			SD13-20-2040	Y8RT2	MS/MSD	YBM	2.0	4.0
			SD13-20-4052	Y8RT3		YBM	4.0	5.2
SD13-23	6023066.85	2163651.19	SD13-23-0005	Y8RT4		YBM	0.0	0.5
			SD13-23-0520	Y8RT5	Y8RT6	YBM	0.5	2.0
			SD13-23-2037	Y8RT7		YBM/OBM	2.0	3.7
SD13-24	6023139.40	2163642.13	SD13-24-0005	Y8RT9		YBM	0.0	0.5
			SD13-24-0520	Y8RU0		YBM/OBM	0.5	2.0
			SD13-24-2040	Y8RU1		YBM/OBM	2.0	4.0
			SD13-24-4060	Y8RU2		YBM/OBM	4.0	6.0
SD13-25	6023211.18	2163646.43	SD13-25-0005	Y8RU3		YBM	0.0	0.5
			SD13-25-0520	Y8RU4		YBM	0.5	2.0
			SD13-25-2040	Y8RU5	Y8RU6	YBM	2.0	4.0
			SD13-25-4059	Y8RU7		YBM	4.0	5.9
SD13-27	6022989.83	2163456.36	SD13-27-0005	Y8RU8	MS/MSD	YBM	0.0	0.5
			SD13-27-0520	Y8RU9		YBM	0.5	2.0
			SD13-27-2031	Y8RV0		YBM	2.0	3.1
SD13-28	6023091.65	2163452.79	SD13-28-0005	Y8RV2		YBM	0.0	0.5
			SD13-28-0520	Y8RV3		YBM	0.5	2.0
			SD13-28-2040	Y8RV4		YBM	2.0	4.0
			SD13-28-4060	Y8RV5		YBM	4.0	6.0
SD13-29	6023189.47	2163438.66	SD13-29-0005	Y8RV6		YBM	0.0	0.5
			SD13-29-0520	Y8RV7	Y8RV8	YBM	0.5	2.0
			SD13-29-2040	Y8RV9		YBM	2.0	4.0
			SD13-29-4060	Y8RW0		YBM	4.0	6.0
SD13-31	6022972.31	2163263.24	SD13-31-0005	Y8RW1		OBM	0.0	0.5
			SD13-31-0520	Y8RW2		OBM	0.5	2.0
			SD13-31-2040	Y8RW3	Y8RW5	OBM	2.0	4.0
SD13-32	6023070.70	2163251.79	SD13-32-0005	Y8RW6		YBM	0.0	0.5
			SD13-32-0520	Y8RW7		YBM	0.5	2.0
			SD13-32-2040	Y8RW8		YBM	2.0	4.0
			SD13-32-4060	Y8RW9		YBM	4.0	6.0
SD13-33	6023168.50	2163239.19	SD13-33-0005	Y8RX0		YBM	0.0	0.5
			SD13-33-0520	Y8RX1	MS/MSD	YBM	0.5	2.0
			SD13-33-2040	Y8RX2		YBM	2.0	4.0
			SD13-33-4060	Y8RX3		YBM	4.0	6.0
SD13-35	6022947.27	2163061.12	SD13-35-0005	Y8RX4	Y8RX5	YBM	0.0	0.5
			SD13-35-0520	Y8RX6		YBM	0.5	2.0
			SD13-35-2040	Y8RX7		YBM	2.0	4.0
			SD13-35-4058	Y8RX8		YBM	4.0	5.8
SD13-36	6023044.53	2163055.96	SD13-36-0005	Y8RX9		YBM	0.0	0.5
			SD13-36-0520	Y8RY0		YBM	0.5	2.0
			SD13-36-2040	Y8RY1		YBM	2.0	4.0
			SD13-36-4065	Y8RY2		YBM	4.0	6.5
SD13-37	6023145.91	2163043.31	SD13-37-0005	Y8RY3	Y8RY4	YBM	0.0	0.5
			SD13-37-0520	Y8RY5		YBM	0.5	2.0
			SD13-37-2040	Y8RY6		YBM	2.0	4.0
			SD13-37-4060	Y8RY7		YBM	4.0	6.0
SD13-39	6022756.43	2162979.33	SD13-39-0005	Y8RY8		YBM	0.0	0.5
			SD13-39-0520	Y8RY9		YBM	0.5	2.0
			SD13-39-2040	Y8RZ0		YBM	2.0	3.4
			Non-sampled Interval	--		YBM	3.4	4.0
			SD13-39-4049	Y8RZ1		OBM	4.0	4.9

TABLE 2
Summary of Samples Collected from Sediment Cores - 2013 Source Identification Investigation
United Heckathorn Superfund Site, Richmond, California

Location	Field Longitude (X)	Field Latitude (Y)	Sample ID	CLP Sample Number	Duplicate Sample ID or MS/MSD	Type of Sample (OBM or YBM)	Top Depth (ft) (from TOC)	Bottom Depth (ft) (from TOC)
SD13-40	6022921.50	2162662.19	SD13-40-0005	Y8RZ2		YBM	0.0	0.5
			SD13-40-0520	Y8RZ3		YBM	0.5	2.0
			SD13-40-2040	Y8RZ4		OBM	2.0	4.0
SD13-41	6023057.92	2162400.50	SD13-41-0005	Y8RZ6		YBM	0.0	0.5
			SD13-41-0520	Y8RZ7		YBM	0.5	2.0
			SD13-41-2040	Y8RZ8		YBM	2.0	4.0
			SD13-41-4049	Y8RZ9	Y8RA0	YBM/OBM	4.0	4.9
			Non-sampled Interval			OBM	4.9	5.5
			SD13-41-5565	Y8RW4		OBM	5.5	6.5

Notes:
-- = Not Available
CLP - Contract Laboratory Program
ft = feet
MS/MSD - matrix spike/matrix spike duplicate
OBM = Old Bay Mud
TOC = Top of Core
YBM = Young Bay Mud
The coordinate system is : NAD 1983 California State Plane Zone 3 (feet)

Figure

LEGEND

- Sediment Grab Sample Location
- Vibracore Sample Location

Bathymetry

1 ft — 44 ft

Bathymetric Contour (5 foot Interval)

- Outfall Location
- Former Pier Pilings
- Pier Pilings
- Railroad
- Former Buildings
- Dredged Area
- Partially Dredged Area
- Un-Dredged Area
- Concrete
- Rock/Rip Rap
- Rock/Rip Rap and Concrete
- Shotcrete
- Sheet Pile
- Sheet Pile and Concrete

FIGURE 1
2013 Sediment Sampling Locations
United Heckathorn Superfund Site
Richmond, California

CH2MHILL

Document Path: D:\Projects\EPA_UnitedHeckathorn\MapFiles\2013\July\SedimentSampleLocations.mxd

Attachment 1
Laboratory Chains of Custody

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-100145-0009
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RN1	Sediment/		CLP PEST	1000 (4C (+-2C)) (1)	SD13-04-0005	4/3/13 0905		
Y8RN2	Sediment/		CLP PEST	1001 (4C (+-2C)) (1)	SD13-04-0520	4/3/13 0905		
~~Y8RN3~~	~~Sediment/~~		~~CLP PEST~~	~~1002 (4C (+-2C)) (1)~~	~~SD13-04-20~~			
~~Y8RN4~~	~~Sediment/~~		~~CLP PEST~~	~~1003 (4C (+-2C)) (1)~~	~~SD13-06-20~~			
~~Y8RN5~~	~~Sediment/~~		~~CLP PEST~~	~~1004 (4C (+-2C)) (1)~~	~~SD13-04-40~~			
Y8RO5	Sediment/		CLP PEST	1014 (4C (+-2C)) (1)	SD13-06-0005	4/5/13 0830		
Y8RO6	Sediment/		CLP PEST	1015 (4C (+-2C)) (1)	SD13-06-0520	4/5/13 0830		
Y8RO7	Sediment/		CLP PEST	1016 (4C (+-2C)) (1)	SD13-06-2040	4/5/13 0830		
Y8RO8	Sediment/		CLP PEST	1017 (4C (+-2C)) (1)	SD13-06-4050	4/5/13 0830		

Special Instructions:

Shipment for Case Complete? N

Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	Jamara Jack	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-095753-0007
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RN6	Sediment/		CLP PEST	1005 (4C (+-2C)) (1)	SD13-05-0002	4/3/13 1320		
Y8RN7	Sediment/		CLP PEST	1006 (4C (+-2C)) (1)	SD13-05-0203	4/3/13 1320		
Y8RN8	Sediment/		CLP PEST	1007 (4C (+-2C)) (1)	SD13-05-0305	4/3/13 1320		
Y8RN9	Sediment/		CLP PEST	1008 (4C (+-2C)) (1)	SD13-05-0507	4/3/13 1320		
Y8RO0	Sediment/		CLP PEST	1009 (4C (+-2C)) (1)	SD13-05-0708	4/3/13 1320		
Y8RO1	Sediment/		CLP PEST	1010 (4C (+-2C)) (1)	SD13-05-0810	4/3/13 1320		
Y8RO2	Sediment/		CLP PEST	1011 (4C (+-2C)) (1)	SD13-05-1020	4/3/13 1320		
Y8RO3	Sediment/		CLP PEST	1012 (4C (+-2C)) (1)	SD13-05-2040	4/3/13 1320		
~~Y8RO4~~	~~Sediment/~~	TS 4/3/13	~~CLP PEST~~	~~1013 (4C (+-2C)) (1)~~	~~SD13-05-40~~			

Special Instructions:

Shipment for Case Complete? N

Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	Jamera Jack	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-102240-0010
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RO9	Sediment/		CLP PEST	1018 (4C (+-2C)) (1)	SD13-08-0005	4/5/13 1300		
Y8RP0	Sediment/		CLP PEST	1019 (4C (+-2C)) (1)	SD13-08-0520	4/5/13 1300		
Y8RP1	Sediment/		CLP PEST	1020 (4C (+-2C)) (1)	SD13-92-0520	4/5/13 1300		
Y8RP2	Sediment/		CLP PEST	1021 (4C (+-2C)) (1)	SD13-08-2040	4/5/13 1300		
Y8RP3	Sediment/		CLP PEST	1022 (4C (+-2C)) (1)	SD13-08-4060	4/5/13 1300		
Y8RQ3	Sediment/		CLP PEST	1032 (4C (+-2C)) (1)	SD13-10-0005	4/4/13 1550		
Y8RQ4	Sediment/		CLP PEST	1033 (4C (+-2C)) (1)	SD13-10-0520	4/4/13 1550		
Y8RQ5	Sediment/		CLP PEST	1034 (4C (+-2C)) (2)	SD13-10-2040	4/4/13 1550		
Y8RQ6	Sediment/		CLP PEST	1035 (4C (+-2C)) (1)	SD13-10-4060	4/4/13 1550		
Y8RR2	Sediment		CLP PEST	"	SD13-~~1066~~	4/4/13 1550		
					~~10-6066~~	~~4/4/13 1550~~		

Special Instructions: Extra volume Y8RQ5 for MS/MSD

Shipment for Case Complete? N
Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	Ginnera Jones	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-095847-0008
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RP4	Sediment/		CLP PEST	1023 (4C (+-2C)) (1)	SD13-09-0002	4/3/13 1120		
Y8RP5	Sediment/		CLP PEST	1024 (4C (+-2C)) (1)	SD13-09-0203	4/3/13 1120		
Y8RP6	Sediment/		CLP PEST	1025 (4C (+-2C)) (1)	SD13-09-0305	4/3/13 1120		
Y8RP7	Sediment/		CLP PEST	1026 (4C (+-2C)) (1)	SD13-09-0507	4/3/13 1120		
Y8RP8	Sediment/		CLP PEST	1027 (4C (+-2C)) (1)	SD13-09-0708	4/3/13 1120		
Y8RP9	Sediment/		CLP PEST	1028 (4C (+-2C)) (1)	SD13-09-0810	4/3/13 1120		
Y8RQ0	Sediment/		CLP PEST	1029 (4C (+-2C)) (1)	SD13-09-1020	4/3/13 1120		
Y8RQ1	Sediment/		CLP PEST	1030 (4C (+-2C)) (1)	SD13-09-2040	4/3/13 1120		
Y8RQ2	Sediment/		CLP PEST	1031 (4C (+-2C)) (1)	SD13-09-4055	4/3/13 1120		

Special Instructions:

Shipment for Case Complete? N
Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	Jamaia Jones	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-102317-0011
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RQ7	Sediment/		CLP PEST	1036 (4C (+-2C)) (1)	SD13-13-0005	4/3/13 0950		
Y8RQ8	Sediment/		CLP PEST	1037 (4C (+-2C)) (1)	SD13-87-0005	4/3/13 0950		
Y8RQ9	Sediment/		CLP PEST	1038 (4C (+-2C)) (1)	SD13-13-0520	4/3/13 0950		
Y8RR0	Sediment/		CLP PEST	1039 (4C (+-2C)) (1)	SD13-13-2025	4/3/13 0950		
Y8RR1	Sediment/		CLP PEST	1040 (4C (+-2C)) (1)	SD13-87-2025	4/3/13 0950		
~~Y8RR2~~	~~Sediment/~~		~~CLP PEST~~	~~1041 (4C (+-2C)) (1)~~	~~SD13-13-40~~	~~4/5/13~~		
Y8RR3	Sediment/		CLP PEST	1042 (4C (+-2C)) (1)	SD13-14-0005	4/5/13 1145		
Y8RR4	Sediment/		CLP PEST	1043 (4C (+-2C)) (1)	SD13-14-0520 09	4/5/13 1145		
Y8RR5	Sediment/		CLP PEST	1044 (4C (+-2C)) (1)	SD13-14-20 10	4/5/13 1145		
Y8RR6	Sediment/		CLP PEST	1045 (4C (+-2C)) (2)	SD13-14-40 20 40	4/5/13 1145		

Special Instructions: extra volume Y8RR6 -MS/MSD

Shipment for Case Complete? N
Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	[signature]	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-102350-0012
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RR7	Sediment/		CLP PEST	1046 (4C (+-2C)) (1)	SD13-15-0005	4/3/13 1540		
Y8RR8	Sediment/		CLP PEST	1047 (4C (+-2C)) (1)	SD13-15-0520	4/3/13 1540		
Y8RR9	Sediment/		CLP PEST	1048 (4C (+-2C)) (1)	SD13-15-2040	4/3/13 1540		
Y8RS0	Sediment/		CLP PEST	1049 (4C (+-2C)) (1)	SD13-15-4049	4/3/13 1540		
Y8RS1	Sediment/		CLP PEST	1050 (4C (+-2C)) (1)	SD13-18-0005	4/4/13 1220		
Y8RS2	Sediment/		CLP PEST	1051 (4C (+-2C)) (1)	SD13-18-~~0520~~ 0540	4/4/13 1220		
Y8RS3	Sediment/		CLP PEST	1052 (4C (+-2C)) (1)	SD13-18-~~20~~ 1520	4/4/13 1220		
~~Y8RS4~~	~~Sediment/~~		~~CLP PEST~~	~~1053 (4C (+-2C)) (1)~~	~~SD13-18-40~~	~~4/4/13 1220~~		
Y8RS5	Sediment/		CLP PEST	1054 (4C (+-2C)) (1)	SD13-82-~~40~~ 1530	4/4/13 1220		

Special Instructions:

Shipment for Case Complete? N
Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	[signature]	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-102415-0013
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RS6	Sediment/		CLP PEST	1055 (4C (+-2C)) (1)	SD13-19-0005	4/5/13 1225		
Y8RS7	Sediment/		CLP PEST	1056 (4C (+-2C)) (1)	SD13-19-0520	4/5/13 1225		
Y8RS8	Sediment/		CLP PEST	1057 (4C (+-2C)) (1)	SD13-19-2040	4/5/13 1225		
Y8RS9	Sediment/		CLP PEST	1058 (4C (+-2C)) (1)	SD13-19-4060	4/5/13 1225		
Y8RT0	Sediment/		CLP PEST	1059 (4C (+-2C)) (1)	SD13-20-0005	4/3/13 1440		
Y8RT1	Sediment/		CLP PEST	1060 (4C (+-2C)) (1)	SD13-20-0520	4/3/13 1440		
Y8RT2	Sediment/		CLP PEST	1061 (4C (+-2C)) (2)	SD13-20-2040	4/3/13 1440		
Y8RT3	Sediment/		CLP PEST	1062 (4C (+-2C)) (1)	SD13-20-4052	4/3/13 1440		

Special Instructions: Extra volume for Y8RT2 MS/MSD

Shipment for Case Complete? N

Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	[signature]	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-102441-0014
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected		Inorganic Sample #	For Lab use Only
Y8RT4	Sediment/		CLP PEST	1063 (4C (+-2C)) (1)	SD13-23-0005	4/4/13	1135		
Y8RT5	Sediment/		CLP PEST	1064 (4C (+-2C)) (1)	SD13-23-0520	4/4/13	1135		
Y8RT6	Sediment/		CLP PEST	1065 (4C (+-2C)) (1)	SD13-77-0520	4/4/13	1135		
Y8RT7	Sediment/		CLP PEST	1066 (4C (+-2C)) (1)	SD13-23-2037	4/4/13	1135		
~~Y8RT8~~	~~Sediment/~~		~~CLP PEST~~	~~1067 (4C (+-2C)) (1)~~	~~SD13-23-40~~				
Y8RT9	Sediment/		CLP PEST	1068 (4C (+-2C)) (1)	SD13-24-0005	4/4/13	1015		
Y8RU0	Sediment/		CLP PEST	1069 (4C (+-2C)) (1)	SD13-24-0520	4/4/13	1015		
Y8RU1	Sediment/		CLP PEST	1070 (4C (+-2C)) (1)	SD13-24-2040	4/4/13	1015		
Y8RU2	Sediment/		CLP PEST	1071 (4C (+-2C)) (1)	SD13-24-4060	4/4/13	1015		

Special Instructions:

Shipment for Case Complete? N
Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	Jamaica Jank	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-102823-0015
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RU3	Sediment/		CLP PEST	1072 (4C (+-2C)) (1)	SD13-25-0005	4/5/13 0745		
Y8RU4	Sediment/		CLP PEST	1073 (4C (+-2C)) (1)	SD13-25-0520	4/5/13 0745		
Y8RU5	Sediment/		CLP PEST	1074 (4C (+-2C)) (1)	SD13-25-2040	4/5/13 0745		
Y8RU6	Sediment/		CLP PEST	1075 (4C (+-2C)) (1)	SD13-75-2040	4/5/13 0745		
Y8RU7	Sediment/		CLP PEST	1076 (4C (+-2C)) (1)	SD13-25-4059	4/5/13 0745		
Y8RU8	Sediment/		CLP PEST	1077 (4C (+-2C)) (2)	SD13-27-0005	4/4/13 0930		
Y8RU9	Sediment/		CLP PEST	1078 (4C (+-2C)) (1)	SD13-27-0520	4/4/13 0930		
Y8RV0	Sediment/		CLP PEST	1079 (4C (+-2C)) (1)	SD13-27-2031	4/4/13 0930		
~~Y8RV1~~	~~Sediment/~~	~~&~~	~~CLP PEST~~	~~1080 (4C (+-2C)) (1)~~	~~SD13-27-40~~			

Special Instructions: MS/MSD extra volume on Y8RU8

Shipment for Case Complete? N
Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	J Frank	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-102849-0016
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected		Inorganic Sample #	For Lab use Only
Y8RV2	Sediment/		CLP PEST	1081 (4C (+-2C)) (1)	SD13-28-0005	4/4/13	0840		
Y8RV3	Sediment/		CLP PEST	1082 (4C (+-2C)) (1)	SD13-28-0520	4/4/13	0840		
Y8RV4	Sediment/		CLP PEST	1083 (4C (+-2C)) (1)	SD13-28-2040	4/4/13	0840		
Y8RV5	Sediment/		CLP PEST	1084 (4C (+-2C)) (1)	SD13-28-4060	4/4/13	0840		
Y8RV6	Sediment/		CLP PEST	1085 (4C (+-2C)) (1)	SD13-29-0005	4/5/13	950		
Y8RV7	Sediment/		CLP PEST	1086 (4C (+-2C)) (1)	SD13-29-0520	4/5/13	950		
Y8RV8	Sediment/		CLP PEST	1087 (4C (+-2C)) (1)	SD13-71-0520	4/5/13	950		
Y8RV9	Sediment/		CLP PEST	1088 (4C (+-2C)) (1)	SD13-29-2040	4/5/13	950		
Y8RW0	Sediment/		CLP PEST	1089 (4C (+-2C)) (1)	SD13-29-4060	4/5/13	950		

Special Instructions:

Shipment for Case Complete? N
Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	Jemera Jack	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-102917-0017
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RW1	Sediment/		CLP PEST	1090 (4C (+-2C)) (1)	SD13-31-0005	4/4/13 1500		
Y8RW2	Sediment/		CLP PEST	1091 (4C (+-2C)) (1)	SD13-31-0520	4/4/13 1500		
Y8RW3	Sediment/		CLP PEST	1092 (4C (+-2C)) (1)	SD13-31-2040	4/4/13 1500		
~~Y8RW4~~	~~Sediment/~~		~~CLP PEST~~	~~1093 (4C (+-2C)) (1)~~	~~SD13-31-40~~			
Y8RW5	Sediment/		CLP PEST	1094 (4C (+-2C)) (1)	SD13-69~~50~~2040	4/4/13 1500		
Y8RW6	Sediment/		CLP PEST	1095 (4C (+-2C)) (1)	SD13-32-0005	4/5/13 0910		
Y8RW7	Sediment/		CLP PEST	1096 (4C (+-2C)) (1)	SD13-32-0520	4/5/13 0910		
Y8RW8	Sediment/		CLP PEST	1097 (4C (+-2C)) (1)	SD13-32-2040	4/5/13 0910		
Y8RW9	Sediment/		CLP PEST	1098 (4C (+-2C)) (1)	SD13-32-4060	4/5/13 0910		

Special Instructions:

Shipment for Case Complete? N
Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	[illegible]	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-102950-0018
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RX0	Sediment/		CLP PEST	1099 (4C (+-2C)) (1)	SD13-33-0005	4/4/13 1100		
Y8RX1	Sediment/		CLP PEST	1100 (4C (+-2C)) (2)	SD13-33-0520	4/4/13 1100		
Y8RX2	Sediment/		CLP PEST	1101 (4C (+-2C)) (1)	SD13-33-2040	4/4/13 1100		
Y8RX3	Sediment/		CLP PEST	1102 (4C (+-2C)) (1)	SD13-33-4060	4/4/13 1100		
Y8RX4	Sediment/		CLP PEST	1103 (4C (+-2C)) (1)	SD13-35-0005	4/4/13 1420		
Y8RX5	Sediment/		CLP PEST	1104 (4C (+-2C)) (1)	SD13-65-0005	4/4/13 1420		
Y8RX6	Sediment/		CLP PEST	1105 (4C (+-2C)) (1)	SD13-35-0520	4/4/13 1420		
Y8RX7	Sediment/		CLP PEST	1106 (4C (+-2C)) (1)	SD13-35-2040	4/4/13 1420		
Y8RX8	Sediment/		CLP PEST	1107 (4C (+-2C)) (1)	SD13-35-4058	4/4/13 1420		

Special Instructions: Extra volume on Y8RX1 for MS/MSD

Shipment for Case Complete? N
Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	J Franklin	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-103020-0019
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RX9	Sediment/		CLP PEST	1108 (4C (+-2C)) (1)	SD13-36-0005	4/4/13 1300		
Y8RY0	Sediment/		CLP PEST	1109 (4C (+-2C)) (1)	SD13-36-0520	4/4/13 1300		
Y8RY1	Sediment/		CLP PEST	1110 (4C (+-2C)) (1)	SD13-36-2040	4/4/13 1300		
Y8RY2	Sediment/		CLP PEST	1111 (4C (+-2C)) (1)	SD13-36-4060	4/4/13 1300		
Y8RY3	Sediment/		CLP PEST	1112 (4C (+-2C)) (1)	SD13-37-0005	4/5/13 1030		
Y8RY4	Sediment/		CLP PEST	1113 (4C (+-2C)) (1)	SD13-63-0005	4/5/13 1030		
Y8RY5	Sediment/		CLP PEST	1114 (4C (+-2C)) (1)	SD13-37-0520	4/5/13 1030		
Y8RY6	Sediment/		CLP PEST	1115 (4C (+-2C)) (1)	SD13-37-2040	4/5/13 1030		
Y8RY7	Sediment/		CLP PEST	1116 (4C (+-2C)) (1)	SD13-37-4060	4/5/13 1030		

Special Instructions:

Shipment for Case Complete? N
Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	James Jaude	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped: 4/5/13
CarrierName: fedex
AirbillNo: 801554311030

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-103046-0020
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected		Inorganic Sample #	For Lab use Only
Y8RY8	Sediment/		CLP PEST	1117 (4C (+-2C)) (1)	SD13-39-0005	4/4/13	1345		
Y8RY9	Sediment/		CLP PEST	1118 (4C (+-2C)) (1)	SD13-39-0520	4/4/13	1345		
Y8RZ0	Sediment/		CLP PEST	1119 (4C (+-2C)) (1)	SD13-39-2040	4/4/13	1345		
Y8RZ1	Sediment/		CLP PEST	1120 (4C (+-2C)) (1)	SD13-39-4049	4/4/13	1345		
Y8RZ2	Sediment/		CLP PEST	1121 (4C (+-2C)) (1)	SD13-40-0005	4/4/13	1540		
Y8RZ3	Sediment/		CLP PEST	1122 (4C (+-2C)) (1)	SD13-40-0520	4/4/13	1540		
Y8RZ4	Sediment/		CLP PEST	1123 (4C (+-2C)) (1)	SD13-40-2040	4/4/13	1540		
~~Y8RZ5~~	~~Sediment/~~		~~CLP PEST~~	~~1124 (4C (+-2C)) (2)~~	~~SD13-40-40~~	~~4/4/13~~	~~1540~~		

Special Instructions: Y8RZ4 extra volume for MS/MSD

Shipment for Case Complete? N

Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	J Frank	4/5/13									

USEPA CLP Organics COC (LAB COPY)
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: CAD981436363
Case #: 43379
Cooler #:

No: 9-032913-103115-0021
Lab: KAP Technologies Inc.
Lab Contact: Rao Alsakani
Lab Phone: 281-367-0065

Organic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Inorganic Sample #	For Lab use Only
Y8RZ6	Sediment/		CLP PEST	1125 (4C (+-2C)) (1)	SD13-41-0005	4/5/13 1100		
Y8RZ7	Sediment/		CLP PEST	1126 (4C (+-2C)) (1)	SD13-41-0520	4/5/13 1100		
Y8RZ8	Sediment/		CLP PEST	1127 (4C (+-2C)) (1)	SD13-41-2040	4/5/13 1100		
Y8RZ9	Sediment/		CLP PEST	1128 (4C (+-2C)) (1)	SD13-41-4049	4/5/13 1100		
Y8SA0	Sediment/		CLP PEST	1129 (4C (+-2C)) (1)	SD13-59-4049	4/5/13 1100		
Y8RW4	"		"	"	SDB-41 5565	4/5/13 1100		

Special Instructions:

Shipment for Case Complete? N
Samples Transferred from Chain of Custody #

Analysis Key CLP PEST=CLP TCL Pesticides

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
	Jessica Jones	4/5/13									

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS0406

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag		
			Preservatives:	None	None	None	None	None		
			Filtered:	n	n	n	n	n		
			Holding Time	180 Days	180 Days	180 Days	180 Days	180 Days		
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Atterberg Limits (D4318)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)	Number of Containers	COMMENTS
SD13-04-00 15	4/3/13	0905	Sed	X	X	X			1	
SD13-04-0005	4/3/13	0905	Sed				X	X	1	
SD13-04-~~0520~~ 0515	4/3/13	0905	Sed					X	1	
~~SD13-04-20~~ TF			~~Sed~~				~~X~~	~~X~~	~~1~~	
~~SD13-04-40~~ TF			~~Sed~~					~~X~~	~~1~~	
SD13-06-00 50	4/5/13	0830	Sed	X	X	X			1	
SD13-06-0005	4/5/13	0830	Sed				X	X	1	
SD13-06-0520	4/5/13	0830	Sed					X	1	
SD13-06-2040	4/5/13	0830	Sed				X	X	1	
SD13-06-4050	4/5/13	0830	Sed					X	1	
								TOTAL NUMBER OF CONTAINERS	10	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS05

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None	None	None	None			
			Filtered:	n	n	n	n	n			
			Holding Time	180 Days	180 Days	180 Days	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Atterberg Limits (D4318)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-05-0040	4/3/13	1320	Sed	X	X	X				1	
SD13-05-0002	4/3/13	1320	Sed				X	X		1	
SD13-05-0203	4/3/13	1320	Sed				X	X		1	
SD13-05-0305	4/3/13	1320	Sed				X	X		1	
SD13-05-0507	4/3/13	1320	Sed				X	X		1	
SD13-05-0708	4/3/13	1320	Sed				X	X		1	
SD13-05-0810	4/3/13	1320	Sed				X	X		1	
SD13-05-1020	4/3/13	1320	Sed				X	X		1	
SD13-05-2040	4/3/13	1320	Sed				X	X		1	
~~SD13-05-40~~			~~Sed~~				X	X		1	
									TOTAL NUMBER OF CONTAINERS	~~15~~ 16	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS0810

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None	None	None	None			
			Filtered:	n	n	n	n	n			
			Holding Time	180 Days	180 Days	180 Days	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Atterberg Limits (D4318)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-08-0040	4/5/13	1300	Sed	X	X	X				1	
SD13-08-0005	4/5/13	1300	Sed				X	X		1	
SD13-08-0520	4/5/13	1300	Sed					X		1	
SD13-08-2040	4/5/13	1300	Sed				X	X		1	
SD13-08-~~40~~ 4655	4/5/13	1300	Sed					X		1	
SD13-10-0066	4/4/13	1550	Sed	X	X	X				1	
SD13-10-0005	4/4/13	1550	Sed				X	X		1	
SD13-10-0520	4/4/13	1550	Sed					X		1	
SD13-10-2040	4/4/13	1550	Sed				X	X		1	MS/MSD on TOC
SD13-10-4066	4/4/13	1550	Sed					X		1	
									TOTAL NUMBER OF CONTAINERS	10	

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On Ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS09

2013 Sediment Sampling

Project Name: United Heckathorn

Project Number:

Project Manager:

Sample Manager:

Cell Number:

Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None	None	None	None			
			Filtered:	n	n	n	n	n			
			Holding Time	180 Days	180 Days	180 Days	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Atterberg Limits (D4318)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-09-0055	4/3/13	1120	Sed	X	X	X				1	
SD13-09-0002	4/3/13	1120	Sed				X	X		1	
SD13-09-0203	4/3/13	1120	Sed				X	X		1	
SD13-09-0305	4/3/13	1120	Sed				X	X		1	
SD13-09-0507	4/3/13	1120	Sed				X	X		1	
SD13-09-0708	4/3/13	1120	Sed				X	X		1	
SD13-09-0810	4/3/13	1120	Sed				X	X		1	
SD13-09-1020	4/3/13	1120	Sed				X	X		1	
SD13-09-2040	4/3/13	1120	Sed				X	X		1	
SD13-09-4055	4/3/13	1120	Sed				X	X		1	
									TOTAL NUMBER OF CONTAINERS	10	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS1314

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None	None	None	None			
			Filtered:	n	n	n	n	n			
			Holding Time	180 Days	180 Days	180 Days	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Atterberg Limits (D4318)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-13-0025	4/3/13	0950	Sed	X	X	X				1	
SD13-13-0005	4/3/13	0950	Sed				X	X		1	
SD13-13-0520	4/3/13	0950	Sed					X		1	
SD13-13-2025	4/3/13	0950	Sed				X	X		1	
~~SD13-13-40~~			~~Sed~~					~~X~~	TE 4/3/13	~~1~~	
SD13-14-0009	4/5/13	1145	Sed	X	X	X				1	
SD13-14-0005	4/5/13	1145	Sed				X	X		1	
SD13-14-0520 09	4/5/13	1145	Sed					X		1	
SD13-14-20 10 20	4/5/13	1145	Sed				X	X		1	
SD13-14-40 20 40	4/5/13	1145	Sed					X		1	MS/MSD on TOC
									TOTAL NUMBER OF CONTAINERS	10	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS1518

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None	None	None	None			
			Filtered:	n	n	n	n	n			
			Holding Time	180 Days	180 Days	180 Days	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Atterberg Limits (D4318)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-15-0049	4/3/13	1540	Sed	X	X	X				1	
SD13-15-0005	4/3/13	1540	Sed				X	X		1	
SD13-15-0520	4/3/13	1540	Sed					X		1	
SD13-15-2040	4/3/13	1540	Sed				X	X		1	
SD13-15-4049	4/3/13	1540	Sed					X		1	
SD13-18-0010	4/4/13	1220	Sed	X		X				1	
SD13-18-0005	4/4/13	1220	Sed				X	X		1	
SD13-18-~~0520~~ 0510	4/4/13	1220	Sed					X		1	
SD13-18-~~20~~ 1530	4/4/13	1220	Sed				X	X		1	
~~SD13-18-40~~	~~4/4/13~~	~~1220~~	~~Sed~~					~~X~~	~~X~~	~~1~~	
									TOTAL NUMBER OF CONTAINERS	16 9	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS1920

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None	None	None			
			Filtered:	n	n	n	n			
			Holding Time	180 Days	180 Days	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-19-00 40	4/5/13	1225	Sed	X	X				1	
SD13-19-0005	4/5/13	1225	Sed			X	X		1	
SD13-19-0520	4/5/13	1225	Sed				X		1	
SD13-19-2040	4/5/13	1225	Sed			X	X		1	
SD13-19-4045 60	4/5/13	1225	Sed				X		1	
SD13-20-0052	4/3/13	1440	Sed	X	X				1	
SD13-20-0005	4/3/13	1440	Sed			X	X		1	
SD13-20-0520	4/3/13	1440	Sed				X		1	
SD13-20-2040	4/3/13	1440	Sed			X	X		1	MS/MSD on TOC
SD13-20-4052	4/3/13	1440	Sed				X		1	
								TOTAL NUMBER OF CONTAINERS	10	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS2324

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None	None	None			
			Filtered:	n	n	n	n			
			Holding Time	180 Days	180 Days	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-23-00 37	4/4/13	1135	Sed	X	X				1	
SD13-23-0005	4/4/13	1135	Sed			X	X		1	
SD13-23-0520	4/4/13	1135	Sed				X		1	
SD13-23-20 37	4/4/13	1135	Sed			X	X		1	
~~SD13-23-40~~			Sed				X		~~1~~	
SD13-24-00 60	4/4/13	1015	Sed	X	X				1	
SD13-24-0005	4/4/13	1015	Sed			X	X		1	
SD13-24-0520	4/4/13	1015	Sed				X		1	
SD13-24-20 40	4/4/13	1015	Sed			X	X		1	
SD13-24-40 60	4/4/13	1015	Sed				X		1	
								TOTAL NUMBER OF CONTAINERS	~~10~~ 9	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS2527

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None	None	None			
			Filtered:	n	n	n	n			
			Holding Time	180 Days	180 Days	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-25-0059	4/5/13	0745	Sed	X	X				1	
SD13-25-0005	4/5/13	0745	Sed			X	X		1	
SD13-25-0520	4/5/13	0745	Sed				X		1	
SD13-25-2020	4/5/13	0745	Sed			X	X		1	
SD13-25-4059	4/5/13	0745	Sed				X		1	
SD13-27-0031	4/4/13	0930	Sed	X	X				1	
SD13-27-0005	4/4/13	0930	Sed			X	X		1	MS/MSD on TOC
SD13-27-0520	4/4/13	0930	Sed				X		1	
SD13-27-2031	4/4/13	0930	Sed			X	X		1	
~~SD13-27-40~~			~~Sed~~				~~X~~		~~1~~	
								TOTAL NUMBER OF CONTAINERS	10	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On Ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS2829

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag		
			Preservatives:	None	None	None	None		
			Filtered:	n	n	n	n		
			Holding Time	180 Days	180 Days	180 Days	180 Days		
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)	Number of Containers	COMMENTS
SD13-28-0000	4/4/13	0840	Sed	X	X			1	
SD13-28-0005	4/4/13	0840	Sed			X	X	1	
SD13-28-0520	4/4/13	0840	Sed				X	1	
SD13-28-2040	4/4/13	0840	Sed			X	X	1	
SD13-28-4060	4/4/13	0840	Sed				X	1	
SD13-29-0000	4/5/13	950	Sed	X	X			1	
SD13-29-0005	4/5/13	950	Sed			X	X	1	
SD13-29-0520	4/5/13	950	Sed				X	1	
SD13-29-2040	4/5/13	950	Sed			X	X	1	
SD13-29-4060	4/5/13	950	Sed				X	1	
							TOTAL NUMBER OF CONTAINERS	10	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS3132

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None	None	None			
			Filtered:	n	n	n	n			
			Holding Time	180 Days	180 Days	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-31-00 20	4/4/13	1500	Sed	X	X				1	
SD13-31-0005	4/4/13	1500	Sed			X	X		1	
SD13-31-0520	4/4/13	1500	Sed				X		1	
SD13-31-20 40	4/4/13	1500	Sed			X	X		1	
~~SD13-31-40~~			~~Sed~~				~~X~~		~~1~~	
SD13-32-00 60	4/5/13	0910	Sed	X	X				1	
SD13-32-0005	4/5/13	0910	Sed			X	X		1	
SD13-32-0520	4/5/13	0910	Sed				X		1	
SD13-32-20 40	4/5/13	0910	Sed			X	X		1	
SD13-32-40 60	4/5/13	0910	Sed				X		1	
								TOTAL NUMBER OF CONTAINERS	10	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On Ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc. CHAIN OF CUSTODY RECORD: UHSed_PTS3335 2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None	None	None			
			Filtered:	n	n	n	n			
			Holding Time	180 Days	180 Days	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-33-0060	4/4/13	1100	Sed	X	X				1	
SD13-33-0005	4/4/13	1100	Sed			X	X		1	
SD13-33-0520	4/4/13	1100	Sed				X		1	MS/MSD on TOC
SD13-33-2040	4/4/13	1100	Sed			X	X		1	
SD13-33-4060	4/4/13	1100	Sed				X		1	
SD13-35-0058	4/4/13	1420	Sed	X	X				1	
SD13-35-0005	4/4/13	1420	Sed			X	X		1	
SD13-35-0520	4/4/13	1420	Sed				X		1	
SD13-35-2040	4/4/13	1420	Sed			X	X		1	
SD13-35-4058	4/4/13	1420	Sed				X		1	
								TOTAL NUMBER OF CONTAINERS	10	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details
Method of shipment:
Shipping Company:
On Ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS3637

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None	None	None			
			Filtered:	n	n	n	n			
			Holding Time	180 Days	180 Days	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-36-00 ~~00~~ 65	4/4/13	1300	Sed	X	X				1	
SD13-36-0005	4/4/13	1300	Sed			X	X		1	
SD13-36-0520	4/4/13	1300	Sed				X		1	
SD13-36-2040	4/4/13	1300	Sed			X	X		1	
SD13-36-40 65	4/4/13	1300	Sed				X		1	
SD13-37-00 00	4/5/13	1030	Sed	X	X				1	
SD13-37-0005	4/5/13	1030	Sed			X	X		1	
SD13-37-0520	4/5/13	1030	Sed				X		1	
SD13-37-2040	4/5/13	1030	Sed			X	X		1	
SD13-37-40 60	4/5/13	1030	Sed				X		1	
								TOTAL NUMBER OF CONTAINERS	10	

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS3940

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

			Container:	Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
			Preservatives:	None	None	None	None			
			Filtered:	n	n	n	n			
			Holding Time	180 Days	180 Days	180 Days	180 Days			
SAMPLE ID	DATE	TIME	Matrix	Percent Solids (D2216)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-39-~~0049~~ 0034	4/4/13	1345	Sed	X	X				1	
SD13-39-0005	4/4/13	1345	Sed			X	X		1	
SD13-39-0520	4/4/13	1345	Sed				X		1	
SD13-39-20~~[illegible]~~ 34	4/4/13	1345	Sed			X	X		1	
SD13-39-4049	4/4/13	1345	Sed				X		1	
SD13-40-0040	4/4/13	1540	Sed	X	X				1	
SD13-40-0005	4/4/13	1540	Sed			X	X		1	
SD13-40-0520	4/4/13	1540	Sed				X		1	
SD13-40-2040	4/4/13	1540	Sed			X	X		1	MS/MSD on TOC
~~SD13-40-40~~	~~4/4/13~~	~~1540~~	~~Sed~~				~~X~~		~~1~~	~~MS/MSD on TOC~~
								TOTAL NUMBER OF CONTAINERS	10	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On Ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_PTS41

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number:
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Container:					Ziplock Bag	Ziplock Bag	Ziplock Bag	Ziplock Bag			
Preservatives:					None	None	None	None			
Filtered:					n	n	n	n			
Holding Time					180 Days	180 Days	180 Days	180 Days			
SAMPLE ID		DATE	TIME	Matrix	Percent Solids (D2216)	Specific Gravity (D854)	Grain Size (D4464)	TOC (Walkley-Black)		Number of Containers	COMMENTS
SD13-41-0049	1100	4/5/13	1100	Sed	X	X				1	
SD13-41-0005	1100	4/5/13	1100	Sed			X	X		1	
SD13-41-0520	1100	4/5/13	1100	Sed				X		1	
SD13-41-2040	1100	4/5/13	1100	Sed			X	X		1	
SD13-41-4049	1100	4/5/13	1100	Sed				X		1	
									TOTAL NUMBER OF CONTAINERS	5	

Ship To:
PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
562-347-2504
Sample Receiving

Signatures		Date/Time
Sampled by		
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_R90406

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number: R13S55
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Container: 4 oz glass jar
Preservatives: 4C (+-2C)
Filtered: n
Holding Time: Days

Ship To:
USEPA Region 9 Laboratory
1337 South 46th Street, Building 201
Richmond, CA 94804
510-412-2389
Sample Receiving

SAMPLE ID	DATE	TIME	Matrix	Pesticides (SW8081A)		Number of Containers	COMMENTS
SD13-04-~~0520~~ 0515	4/3/13	0905	Sed	X		1	
~~SD13-00-40~~			~~Sed~~	~~X~~	~~MF~~	~~1~~	
SD13-00-4050	4/5/13	0830	Sed	X		1	
					TOTAL NUMBER OF CONTAINERS	~~2~~ 1 2	MF

Signatures		Date/Time
Sampled by	[signature]	4/5/13
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_R90813

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number: R13S55
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Container:	4 oz glass jar
Preservatives:	4C (+-2C)
Filtered:	n
Holding Time	Days

Ship To:
USEPA Region 9 Laboratory
1337 South 46th Street, Building 201
Richmond, CA 94804
510-412-2389
Sample Receiving

SAMPLE ID	DATE	TIME	Matrix	Pesticides (SW8081A)	Number of Containers	COMMENTS
SD13-08-2040	4/5/13	1300	Sed	X	1	
SD13-13-0520	4/3/13	0450	Sed	X	1	
				TOTAL NUMBER OF CONTAINERS	2	

	Signatures	Date/Time
Sampled by	James Jones	4/4/13
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_R91518

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number: R13S55
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Container:	4 oz glass jar
Preservatives:	4C (+-2C)
Filtered:	n
Holding Time	Days

Ship To:
USEPA Region 9 Laboratory
1337 South 46th Street, Building 201
Richmond, CA 94804
510-412-2389
Sample Receiving

SAMPLE ID	DATE	TIME	Matrix	Pesticides (SW8081A)	Number of Containers	COMMENTS
SD13-15-2000	4/3/13	1540	Sed	X	1	
SD13-18-~~0500~~ 0510	4/4/13	1220	Sed	X	1	
				TOTAL NUMBER OF CONTAINERS	2	

	Signatures	Date/Time
Sampled by		
Relinquished by	[signature]	4/4/13
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_R91923

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number: R13S55
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Container: 4 oz glass jar
Preservatives: 4C (+-2C)
Filtered: n
Holding Time: Days

Ship To:
USEPA Region 9 Laboratory
1337 South 46th Street, Building 201
Richmond, CA 94804
510-412-2389
Sample Receiving

SAMPLE ID	DATE	TIME	Matrix	Pesticides (SW8081A)	Number of Containers	COMMENTS
SD13-19-2040	4/5/13	1225	Sed	X	1	
SD13-23-0005	4/4/13	1135	Sed	X	1	
				TOTAL NUMBER OF CONTAINERS	2	

	Signatures	Date/Time
Sampled by		
Relinquished by	[illegible]	4/5/13
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_R92527

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number: R13S55
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Container:	4 oz glass jar
Preservatives:	4C (+-2C)
Filtered:	n
Holding Time	Days

Ship To:
USEPA Region 9 Laboratory
1337 South 46th Street, Building 201
Richmond, CA 94804
510-412-2389
Sample Receiving

SAMPLE ID	DATE	TIME	Matrix	Pesticides (SW8081A)		Number of Containers	COMMENTS
SD13-25-20 40	4/5/13	0745	Sed	X		1	
SD13-27-~~40~~ 0520	4/4/13	0930	Sed	X		1	
					TOTAL NUMBER OF CONTAINERS	2	

	Signatures	Date/Time
Sampled by	Jamara Jank	4/5/13
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_R92832

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number: R13S55
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Container:	4 oz glass jar
Preservatives:	4C (+-2C)
Filtered:	n
Holding Time	Days

Ship To:
USEPA Region 9 Laboratory
1337 South 46th Street, Building 201
Richmond, CA 94804
510-412-2389
Sample Receiving

SAMPLE ID	DATE	TIME	Matrix	Pesticides (SW8081A)	Number of Containers	COMMENTS
SD13-28-0520	4/4/13	0840	Sed	X	1	
SD13-32-0005	4/5/13	0910	Sed	X	1	
				TOTAL NUMBER OF CONTAINERS	2	

	Signatures	Date/Time
Sampled by	Jamara Jack	4/5/13
Relinquished by		
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

E2 Consulting Engineers, Inc.

CHAIN OF CUSTODY RECORD: UHSed_R93540

2013 Sediment Sampling

Project Name: United Heckathorn
Project Number: R13S55
Project Manager:
Sample Manager:
Cell Number:
Fax/Email:

Container:	4 oz glass jar
Preservatives:	4C (+-2C)
Filtered:	n
Holding Time	Days

SAMPLE ID	DATE	TIME	Matrix	Pesticides (SW8081A)	Number of Containers
SD13-35-4059	4/4/13	1420	Sed	X	1
SD13-40-2040	4/4/13	1540	Sed	X	1
				TOTAL NUMBER OF CONTAINERS	2

Ship To:
USEPA Region 9 Laboratory
1337 South 46th Street, Building 201
Richmond, CA 94804
510-412-2389
Sample Receiving

COMMENTS

	Signatures	Date/Time
Sampled by		
Relinquished by	[illegible]	4/5/13
Received by		
Relinquished by		
Received by		

Shipping Details

Method of shipment:
Shipping Company:
On ice: yes / no:
Airbill No.:
Shipping Date:

Special Instructions:

Report Copy to:
Ruth Siegmund
ruthsiegmund@e2.com

Attachment 2
Sample Collection Forms

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID: ~~SD-04~~ cc SD13-04 Northing: 2164441.03
Sampling: C.Cisneros/CH2M HILL Easting: 6023234.68
Crew/Company: Dixon Marine Datum: NAD83 CA State Plane Zn III
Depth (ft): 11.1' (Attempt 2: 14.9 | Attempt 3: 14.6)
Pred Tide (ft): 1.54 ft MLLW (1.22 | 0.87)
St. Arrival: 918
Vessel: Walter Marie St.Depart 1010
Collection: vibracore Logged by: T.Himmer/CH2M; T.Frank/E2
Contact Information: Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086

Attempt 1 Refusal? Y/N O
Penetration (ft): 5.9 inches - Discarded
Recovery (ft)
Date/Time: 4/2/2013 918

Attempt 2 Refusal? Y/N O
Penetration cc ~~ft, in~~: 105.5
cc ~~21 inches~~
Recovery (ft)
Date/Time: 4/2/13 0940

Attempt 3
7 ft, 2 in
21 inches
4/2/13 1000

1.5' measured during processing

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
YBM-gravel	0.5		MH/OH	BLK	VS	N	H	W	F-MSN	FAINT	0	50	50	A	Made 3rd attempt further from shore - away from slope. 3rd Att. Retained
	1			10YR 2/1	S					PHC		25	75	B	
1.5'			GM-GC		F				G	*	75	15	10	C	
	2														
	3														
	4														
	5														
	6														
	7														
	8														
	9														
	10														

ODOR STRONGER IN GRAVEL 1.3 - 1.5'

0-0.4' loose f-m sand w/ fines. gravel @ bottom of interval,

0.5 - 1.3' f-m sand w/ fines, firmer, wet, trace gravel

1.3-1.5' gravel w/ sand and fines strong odor.

* RG splite for pest.

Sample Summary (check boxes for analysis):

	Sample ID	Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	GS+ Atterberg
A	YBRN1 SD13-04-0005		4/3/2013 9:05	0-0.5	✓	✓	✓	
B	YBRN2 SD13-04-0515	* RG *	↓	0.5-1.5	✓		✓	
C	SD13-04-0015			0-1.5				✓
D								
E								
F								

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.F1.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

FINE INTERVAL CORE

Station ID:	~~SD05~~ SD13-05 cc	Northing:	2164435.49	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023274.05	Penetration (ft):	5.5
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	4ft, 8 inches
		Depth (ft)	17.7	Date/Time:	4/2/13 1020
		Pred Tide (ft):	0.48 ft MLLW		
		St. Arrival:	1012	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1034	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M, T.Frank/E2	Recovery (ft)	NA
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

4.1 @ processing had to cut core catcher off. Material in catcher not included in sample

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter-corresponds to below)	Comments
YBM	0.5	~~OH~~ TM	~~OH~~ OH	10YR 2/1 Blk	S. - - to t.	N	H	v. wet to wet	f.s	slight PHC	trace to 5%	~10	85-90	A-F	only top ~1/2 1/4 to 1/2 men v-soft. Rest of sediment core quite cohesive & stichey
	1														
	2		OH OH						MD sand			2.5' 25 to 30%	70-75%	G	
	3									Strong PHC 3.3				H see below	entire core domenantly stichy black clay/silt w/ trace to minor sand. See increasing sand + gravel ~2.5' Strong hydro-carbon odor @ 3.3' (diesel/ oil-type odor)
4.1	4							wet to moist							
	5														
	6														
	7														
	8														
	9														
	10														

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	AH, Sgr, % moist.					
A	Y8RN6	SD13-05-0002	4/3/13 13:20	0 - .2	✓	✓	✓						
B	Y8RN7	SD13-05-0203		0.2-0.3	✓	✓	✓						
C	Y8RN8	SD13-05-0305		0.3-0.5	✓	✓	✓						
D	Y8RN9	SD13-05-0507		0.5-0.7	✓	✓	✓						
E	Y8RQ0	SD13-05-0708		0.7-0.8	✓	✓	✓						
F	Y8RQ1	SD13-05-0810		0.8-1.0	✓	✓	✓						
G	Y8RQ2	SD-05-1020		1.0-2.0	✓	✓	✓						
H	Y8RQ3	SD-05-2040		2.0-4.0	✓	✓	✓	✓					
I		SD-05-0040		0.0-4.0									

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.F1.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-03	Northing:	2164429.97	Penetration (in)	Attempt 1 / Refusal? Y/N: 64 in / 0
Sampling	C.Cisneros/CH2M HILL	Easting:	6023327.06	Recovery (ft)	66 in
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Date/Time:	4/2/2013 0830
		Depth (ft)	13.5 / 2nd 13.10		
		Pred Tide (ft):	2.78 ft MLLW / 2.22		
		St. Arrival:	815		Attempt 2 / Refusal? Y/N
Vessel:	RV Walter Marie	St.Depart	~855	Penetration (ft):	4 ft
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	~1 ft - Discarded
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	4/2/13 0852

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
4BM	0.5		OL/OH	2.5 YR 2.5/1	V.S	N	H	wet	m. sand/PHC	strong	D	5-10	90-95	A	0-2' v.soft. black silt/clay, v. stick w/ minor med. to fine sand. small cobble @ 1.7'
	1													B	
SAND gravel + clay/silt	2		SP-SM	4/1 + 2.5/1	F			moist	M. sand		0	80-85	15-20		
	3								M. GR.		10-20	65-70	15	C	2' Dk gray to black sand. f. med, trace shell hash, pockets of wet, black silt clay.
	4													D	
5.0'	5														
	6			mussel shell @ 4' plastic @ 3'											3-4' SAA w/ more gravel + more clay 4.2 to BOC - Dk gray to black sand, as above, w/ no gravel + less clay/silt.
	7														
	8														
	9														
	10														

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	EPA	ATT. SPOC, 20 Sel (W)				
A 48R05	SD13-06-0005		4/5/13	0-0.5	✓	✓	✓						
B 48R06	SD13-06-0520		0830	0.5-2.0	✓		✓						
C 48R07	SD13-06-2040			2.0-4.0	✓	✓	✓						
D 48R08	SD13-06-4059			4.0-5.9	✓		✓	✓					
E	SD13-06-0059			0.0-5.9					✓				
F													

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.F1.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-08	Northing:	2164245.71	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023181.39	Penetration (ft):	7ft 2:n
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	5ft 10:n
		Depth (ft)	19.6	Date/Time:	4/2/13 1308
		Pred Tide (ft):	0.06 ft MLLW		
		St. Arrival:	1305	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1320	Penetration (ft):	NA
Collection:	vibracore	Logged by:	T.Hemmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
OBM	0.5		OH/OL	2.5 YR 2/1 + 4/1	VS ↓ S	N	H	v. wet	~~slight~~ ts	slight PHC	0	tr	100	A	0-4 very soft to soft black to dk gray silt + clay, v. wet to wet. slightly increasing firmness w/depth.
	1													B	
	2														
	3							WET		MOD PHC				C	
	4														
Transition OBM		4.6	CH CL	10YR 5/1 + 6/6	H	slight N	H	~~dry~~ moist	Z CS	MOD PHC (*)	–	90	100 10	X D	
	5.6														
	6														
	7														
	8														
	9														
	10														

@ 3' - organic material (grass/ to brown)
(*) moderate diesel like odor
@ 4.3'

4.6 to BOC - clay/silt, ~~dry~~, moist hard, orange/brown w/ gray mottles or possibly burrows - lense of ~~to~~ dk brown. cs. sand from 5.2 to 5.5

4 to 4.3 transition to OBM - w/ olive brown - gray; slightly plastic, dry clay.

4.6 to BOC

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	PCB	TOC	EPA pesticides	Spgr/% Solids				
A YSRP0	SD13-08-0005		4/5/13	0-0.5	✓	✓	✓						
B ~~YS~~RP0	SD13-08-0520	FD	1300	0.5-2.0	✓		✓		FD=YSRP1				
C YSRP2	SD13-08-2040			2.0-4.0	✓	✓	✓						
D YSRP3	SD13-08-4655			4.6-5.5	✓	X	✓	✓					
E	SD13-08-0040			0-4.0					✓				
F													

Reviewed by: Date

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.F1.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

SD13-09 FINE INTERVAL CORE

Station ID:	~~SD-09~~ CC	Northing:	2164238.21	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023248.50	Penetration (ft):	78 inches
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	rain down
		Depth (ft)	20.6' #2 20.7	Date/Time:	4/2/13 1135
		Pred Tide (ft):	-0.21' ft MLLW -0.27		
		St. Arrival:	11:24	Attempt 2	Refusal? Y/N
Vessel:	WALTER MARIE	St.Depart	1211	Penetration (ft):	6ft (deliberately)
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	6.ft, 4: n recovery (incl nose cone)
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	4/2/13 1200

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter-corresponds to below)	Comments
	0.5	YBM	OL/MH	10YR 2/1	V.S S	N	Mo	v.moist	Z to vfs	slight organic	trace	0-5	95-100	A to F ~~B~~ G	Had to cut nose cone off of core when processing, final processed core length doesn't include material in cone.
	1				MOD F.										
	2			2.7	F. to VH										
		SAND	SP-SM	10YR 3/1				Moist	M.S	PHC mod	trace	85	15	H ~~C~~	
	3			3.4 10YR 2/1	F.			Moist to wet	vfs	slight org.	0	5	95		
			OL/MH												
	4	OBM	CH	10YR 5/4		Plastic	H	Moist to slight moist	Z	None	none	100	0	I ~~D~~	top to 2.7 - clay/silt/black varying moisture + firmness.
	5														5.5' firmness increases w/depth
	6														
	7														
	8														
	9														
	10														

Top 1 ft of core ≠ cohesive except for top ~ 1/2 inch.

consolidated YBM from to ~ 4.1 to 4.2'
w/ OBM.
- slight diesel odor

2.7-3.4 - Dark gray sand, f-med. trace shell hash, w/ fines Dk gray to black.
3.4-4 → cons. black clay/silt. moist, trace vfs.

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	Archive Bioassay
A	Y8RP4	SD13-09-0002	4/3/2013	0-0.02'	✓	✓	✓	
B	Y8RP5	SD13-09-0203	11:20	0.2-0.3	✓	✓	✓	
C	Y8RP6	SD13-09-0305		0.3-0.5	✓	✓	✓	
D	Y8RP7	SD13-09-0507		0.5-0.7	✓	✓	✓	
E	Y8RP8	SD13-09-0708		0.7-0.8	✓	✓	✓	
F	Y8RP9	SD13-09-0810		0.8-1.0	✓	✓	✓	

Reviewed by: Date:

G	Y8RQ0	SD13-09-1020	1-2	✓	✓	✓
H	Y8RQ1	SD13-09-2040	2-4	✓	✓	✓
I	Y8RQ2	SD13-09-4055	4-5.5	✓	✓	✓
J	Y8	SD13-09-0055	0-5.5			✓

Site Name: United Heckathorn
Project Number: 385441.FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13 -10	Northing:	2164238.02		Attempt 1 / Refusal? Y/N
Sampling	C Cisneros/CH2M HILL	Easting:	6023307.69	Penetration (ft):	6'8" Y
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	6'7"
		Depth (ft)	12.4 ft	Date/Time:	4/2/13
		Pred Tide (ft):	0.02 ft MLLW		
		St. Arrival:	1050		Attempt 2 / Refusal? Y/N
Vessel:	Walter Marie	St.Depart	11:10	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	NA
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter-corresponds to below)	Comments
YBM	0.5		OH/OL	10YR 2/1	V.S	N	H	wet	MS	HS+ PHC mod to strong	~~S~~	10-15	85-90	A	strong sulfur odor when opened.
	1			10YR 3/1										B	
trans. to OBM	2														0-0.9 organic silt trace shell hash black, wet, soft, minor sand
	2.6		CH	10YR 5/1	V.Firm ~~H~~	plastic		moist	Z	None	—	—	100	C	
	3														
	4														0.9-1.8 Dk gray silt soft, wet
OBM	4.2 ~~4.5~~		CH-CL	10YR 5/2	MOD F. to firm	N			CS.		~~tr.~~	10-15	85-90	D	
	6														1.8-2.5 transition to v. firm light gray, slightly moist clay.
OBM	6.6													E	
	7		no distinct sand layer observed												2.5-4.2 - clay
	8		v. strong sulfur odor @ 2' noted during sampling												4.2-6.5 mod to firm, dk gray clay w/sand (f-med) decreasing sand @ bottom of interval
	9														
	10														

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	PCBs	TOC	Attr, %Solids, Spgr
A 48RQ3	SD13-10-0005		4/4/13	0-0.5	✓	✓	✓	
B 48RQ4	SD13-10-0520		1550	0.5-2.0	✓		✓	
C 48RQ5	SD13-10-2040	MS/MSD		2.0-4.0	✓	✓	✓	
D 48RQ6	SD13-10-4060			4.0-6.0	✓		✓	
E 48RR2	SD13-10-6066			6.0-6.6	✓			
F	SD13-10-0066							✓

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.F1.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-13	Northing:	2164049.90	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023160.53	Penetration (ft):	7 ft
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	31 in
		Depth (ft)	14.1	Date/Time:	4/2/13 1428
		Pred Tide (ft):	1.12 ft MLLW		
		St. Arrival:	1425	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1450	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M, T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

2.5' @ processing

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
SP-SM	0.5	←	sandy 4BM silty clay	10YR 4/1 Dk. gray	v.s. ↓	N	H	v.m. to wet	ms. gr.	faint organic	5 10	20	75	A	Lost small amt of v.wet material from top interval during opening - captured on foil + added to sample
	1	--- 1.1 CL			v.f.	plastic	↓	moist	≈FS		0	5	95	B	
CH	2	← OBM		10YR 5/4 lgt. olive brown	↓									C	
	3														
	4														
	5														
	6														
	7														
	8														
	9														
	10														

observed pockets of OBM @ .6 to 1.1' - interspersed w/ pockets of YBM.

0-0.6' wet / to v.moist sandy silt. clay w/ gravel
0.6-1.1 - decreasing sand + increasing gravel w/ depth, dk. gray
1.1 start of OBM - firm to hard, fat clay/ silt, w/ trace sand, olive brown

* head tipped penetration overestimated

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	AA, Op solid SP grab		
A YBRQ7	SD13-13-0003	FD	4/3/13	0-0.5	✓	✓	✓			YBRQ8 = FD
B YBRQ4	SD13-13-0520		9:50	0.5-2	✓		✓			
C YBRR0	SD13-13-2025	FD		2-2.5	✓	✓	✓	✓		YBRR1 = FD
D	SD13-13-0025		↓							
E										
F										

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.F1.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-14	Northing:	2164041.92	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023212.77	Penetration (ft):	6 ft 8:n
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	6 ft 6:n
		Depth (ft)	20.2 ft	Date/Time:	4/2/13 1405
		Pred Tide (ft):	0.74 ft MLLW		
		St. Arrival:	1400	Attempt 2	Refusal? Y/N
Vessel:	Water-Marie	St.Depart	1415	Penetration (ft):	∞
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

	Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter-corresponds to below)	Comments
YBM	0.5			10YR 2/1	OH/ OL w/ sp	S.	N	H	wet	C.S.	MOD PHC	—	80	~~60~~ 20	A	0-0.4'
	1			—	—	—	—	—	—			—	10	90	B	Dk gray to
OBM					CL	F	N	S	Dry	f.s.	None				C	black sand m w/ clay &
	2			10YR 6/4								f				silt, wet.
	3			5Y 6/2 & 4/1	CH	S	slight plastic	slight moist				—	—	100	D	0.4 - 0.9 black clay/ silt, wet.
	4				CL	F	N		Dry	f.s.		—	—	100		1 - BOC - OBM
	5															1-2' slightly moist clayey sand olive w/ pockets of orange.
	6			10YR 6/6	CL	H			Dry	fs		—	15	85		
	6.4'															
	7			4.3 - 5.4 orange brown clay, slight moist. (f),												2-3 orange-brown dry, sandy clay
	8			5.4 to BOC - v. sandy hard, clay (CL)												3-4.3 soft to slight firm gray clay (CL) ~~w/ slight odor~~ ~~to~~ large mottles - dk. gray & olive gray
	9			possible burrows @ 5 - 5.3												
	10															

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	Alt Cp gr, Sp Sol					
A Y3RR3	SD13-14-0005		4/5/13	0-0.5	✓	✓	✓						
B Y3RR4	SD13-14-0509		1100	0.5-0.9	✓		✓						
C Y3RR5	SD13-14-1020			1.0-2.0	✓	✓	✓						
D Y3RR6	SD13-14-2040	MS/MSD		2.0-4.0	✓		✓						
E	SD13-14-0009		0	0-0.9				✓					
F													

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

→ N: 2164034.84
E: 6023278.51

Station ID:	SD 13-15	Northing:	~~2164430.36~~ cc	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	~~6023328.85~~ cc	Penetration (ft):	6ft 3in
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	60 inches
		Depth (ft)	14.3	Date/Time:	4/2/13 1332
		Pred Tide (ft):	0.34 ft MLLW		
		St. Arrival:	1330	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1350	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
	0.5	OBM w/ gravel	GM-GC	10YR 2/1	stiff	clay is plastic	H	WET-MOIST	MED Gravel	SLIGHT PHC	30-55	15	30	A	flowable mud layer observed through liner @ sed/water interface
	1													B	
	2	SAND 2' OBM	SP-SM CH	10YR 4/2	v. stiff	plastic		DRY	2	None	0	0	100%	C	0-1.6' Black v. stiff clayey gravel w/ small cobbles
	3			10YR 4/4	hard			v. DRY						D see below	1.6-2 - dk gray to black med. sand. v. hard. drier than material above
	4														
	4.9									MOD Diesel like odor @ 4-4.9					2-3.2 - v. stiff fat, olive or gray-brown gray clay - OBM, very distinct transition @ 3.2'
	5														3.2-4.9 - very stiff plastic light brown-yellow clay
	6														
	7														
	8														
	9														
	10														

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	% solids Atterberg Sp. grav					
A 48RR7	SD13-15-0005	N	4/3/13	0-0.5	✓	✓	✓						
B 48RR8	SD13-15-0520	↓	15:40	0.5-2	✓		✓		RG splits				
C 48RR9	SD13-15-2040			2-4	✓	✓	✓						
D 48RS0	SD13-15-4049			4-4.9	✓		✓						
E	SD13-15-0049			0-4.9	✓		✗ NA TMW	✓					
F													

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD 13-1B	Northing:	2163850.25		Attempt 1 Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023087.22	Penetration (ft):	6' 5"
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	6' 5"
		Depth (ft)	21.6	Date/Time:	4/3/13 1616
		Pred Tide (ft):	1.85 ft MLLW		
		St. Arrival:	1610		Attempt 2 Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1620	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Hammer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com; 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter-corresponds to below)	Comments
YBM	0.5		OL/ OH	10 YR 2/1	V.S	N	H	wet	Z	~~none~~ MOD	0	0	100	A	0-1' wet, black clay/silt w/ trace sand. @ base of layer @ 1" of dark gray med sand. Very sharp change to stiff, fat clay w/ mottled iron oxide staining, light yellowish brown. massive.
SAND	1		SP-SM	2.5 YR 4/1	F. H.	plastic		moist dry	MS. Z vfs	PHC NONE		90 ~5	10 ~~100~~ 95	B NS	
OBM	2		CH	2.5 YR 6/4 to 6/6										C	
	3														
	4														
	5														
	6														
6.5															
	7														
	8														
	9														
	10														

0-1 - noted moderate PHC odor (diesel - like) after the samples were homogenized.

Sampled 1.5. 3' of OBM over transition sharp, but sampled from slightly lower int. to ~~avoid pate~~ assure we avoided cross-contamination

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	RG	% Solid, Sp gr.				
A YBRS1	SD13-1B-0005			0-0.5	✓	✓	✓						
B YBRS2	SD13-1B-0510			.5-1	✓	✓	✓	✓					
C YBRS3	SD13-1B-1530 FD			1.5-3.	✓	✓	✓		FD=YBRS5				
D	SD13-1B-0010								✓				
E													
F													

Review: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441 FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-19	Northing:	~~2164042.90~~ 2163842.50	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	~~6023160.63~~ 6023185.08	Penetration (ft):	6 ft
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	6 ft 6 in
		Depth (ft)	31.5	Date/Time:	4/2/13 1528
		Pred Tide (ft):	0.25 ft MLLW		
		St. Arrival:	1525	Attempt 2	Refusal? Y/N
Vessel:		St.Depart	1545	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M, T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2066			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample ID/S (letter corresponds to below)	Comments
40M	0.5		OL OH	2.5 YR 2.5/1	VS	N	H	wet	~~MS~~ MS.	MOD PHC	0	3.5	95-97	A	0-1.8 black-dk gray clay/silt, v.soft wet, trace med. sand.
	1				S									B	
	2		ol sand		F			slight MS moist							
Transition	3		SP-SM	2.5Y 4/2	H					None		90	10	C	1.8-2.7 transition to med dark gray, firm, slightly moist sand.
SAND	4														
0BM			CL	5Y 5/2	H	slight plastic	H	Dry	Z		—	—	100	X	decreasing fines w/ depth.
	5													D	2.7 to 4' dk gray f-med sand, dry, hard. minor small shell hash 2.7 to 3'
	6														
	6.1														
	7														
	8														
	9														piece of coke or charcoal @ 3.1'
	10														

Sample Summary (check boxes for analysis):

Sample ID	Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	EPA	SP gr/2 sieve				
A 48RS6 SD13-19-0005		4/5/13	0-0.5	✓	✓	✓						
B 48RS7 SD13-19-0520		1235	0.5-2.0	✓		✓						
C 48RS8 SD13-19-2040			2.0-4.0	✓	✓	✓	✓					
D 48RS9 SD13-19-4560			4.5-6.0	✓		✓						
E SD13-19-0040			0.0-4.0					✓				
F												

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.F1.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-20	Northing:	2163837.61	Attempt 1	Refusal? Y/N 0
Sampling	C.Cisneros/CH2M HILL	Easting:	6023265.11	Penetration (ft):	7 ft 3 in
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	5 ft 2 in @ processing. settled over night
		Depth (ft)	28.1	Date/Time:	4/2/13 1502
		Pred Tide (ft):	1.73 ft MLLW		
		St. Arrival:	1500	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1525	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
	0.5	~~OB~~ YBM	Silty sandy gravel OH OH	10YR 2/1	MOD F. F.	N	H	WET	ES Gr.	MOD PHC	80-90	5-10	5-10	A	Top 1/2 - 3/4" very watery clay/silt.
	1													B	ontop of black gravel w/ silt fines + sand - observed
	2									FAINT TO MOD PHC				C	pockets w/ less gravel
	3		Some (CH) Pockets	10YR 2/1 and 5/4											but grail
	4													See below	pervasive throughout
	5													D	the core.
	6														Gravel is ranges from
	7														Subrounded to v. angular
	8														3.3-4.0 pockets of olive grey clay
	9														5.0-5.5 med sand trace to minor fines
	10														

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	% Solid/Sp.gr.
A 48RT0	SD13-20-0005		4/3/13	0-0.5	✓	✓	✓	
B 48RT1	SD13-20-0520			0.5-2.0	✓		✓	
C 48RT2	SD13-20-2040	MS/MSD		2.0-4.0	✓	✓	✓	
D 48RT3	SD13-20-4052			4.0-5.2	✓		✓	
E	SD13-20-0052			0-5.2				✓
F								

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.F1.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-23	Northing:	2163651.19	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023066.85	Penetration (ft):	4ft 4in
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	3.7 ft
		Depth (ft)	21.4 ft	Date/Time:	4/3/13 1535
		Pred Tide (ft):	1.1 ft ft MLLW		
		St. Arrival:	1526	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1540	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781 378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter-corresponds to below)	Comments
YBM	0.5		SH / OL	10YR 2/1	V.S	N	H	wet	Z	o NONE	-	10	90	A	0-0.9 v. ~~slot~~ soft silt/clay, black wet, some med sand
SAND	1		SP-SM	BLK 10YR 4/1	F	N	H	slight moist	CS SD		-	90	10		0.9-1.5 sand, med, trace shell hash, dk gray
	2		↓ CH	~~2.5~~ 10YR 2/1					f-m SD.	slight PHC		5	95	B	trace to minor fines.
OBM mixed w/ YBM see right	3		CH	2.5 YR 5/2	F.	FAT/ PLASTIC		moist	MD-GR Z	↓	5	5	90	C	
	3.7'														
	5														1.5 to boc → black silt/ clay inter mixed w/ hard fat. grey-brown clay, no clear transition - appears to be ~~inter th~~ fingers of the ~~clay~~ silt/ clay into the firmer/ ~~dry~~ drier clay
	6		(TN)	Slightly	3' to 3.7 predominantly firm ~~hard dry~~ moist, clay, w/ some traces of the black silt/clay										
	7				some rounded med gravel @ top of 3-3.7. slight PHC odor @ BOC (diesel-like)										
	8														
	9														
	10														

the black clay/ silt is moist & mod. firm

Sample Summary (check boxes for analysis):

	Sample ID	Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC			
A	YBRT4 SD13-23-C005		4/4/13		✓	✓	✓	✓		
B	YBRT5 SD13-23-C520	FD	11:35		✓	✓	✓		YBRT6 = FD	
C	YBRT7 SD13-23-2037				✓	✓	✓			
D	SD13-23-2037							✓		
E										
F										

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-24	Northing:	2163642.13	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023139.40	Penetration (ft):	6ft 11:n
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	6 ft
		Depth (ft)	32.5ft	Date/Time:	4/3/13 1515
		Pred Tide (ft):	0.86 ft MLLW		
		St. Arrival:	1511	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1518	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378 2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum Particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
YBM	0.5		OL/OH	10YR 2/1	V.S	N	H	V. wet	vfg	none	tr.	5	95	A	0-0.7 v.wet, soft black silt/clay, loose
	1		CH	2.5 ~~10YR~~ 5/2	H	plastic		DRY	Z	slight PHC	0	0	100	B	
clast OBM	2				v. firm	plast		moist							0.7-2.0' dry, hard fat dark olive clay
	3									slight PHC				C	2-3.6 v.firm, ~~slightly~~ moist
	4		CH-CL		HARD MOD FIRM										dark olive or grayish brown clay
	5								cs. grav.						3.6-4.1 - SAA. but hard.
YBM	6		OL/OH	10YR 2/1 and	S	N		wet			5	tr.	95	D	4.1-5.2 SAA, but wet, mod. firm w/ gravel @ bottom of interval
	7			2.5 YR 5/2											5.2-6.0' soft clay-silt w/ gravel, wet see pockets of black material very sticky/ cohesive - difficult to mix/homogenize during sampling
	8														
	9														
	10														

silt/clay below clasts of OBM?

Sample Summary (check boxes for analysis):

	Sample ID	Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GSS	TOC	%solid, Sp grav					
A	Y8RT9 SD13-24-0005		4/4/2013	0-0.5	✓	✓	✓						
B	Y8RU0 SD13-24-0520		~~10:11~~	0.5-2	✓		✓						
C	Y8RU1 SD13-24-2040		10:15	2-4	✓	✓	✓						
D	Y8RU2 SD13-24-4060			4-6	✓		✓						
E	SD13-24-0000							✓					
F													

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-25	Northing:	2163646.43		Attempt 1 Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023211.18	Penetration (ft):	6ft 10:n
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	5ft 9:n
		Depth (ft)	33.9	Date/Time:	4/3/13 1556
		Pred Tide (ft):	1.55 ft MLLW		
		St. Arrival:	1552		Attempt 2 Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1600	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2098			Date/Time:	

	Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
YBM	0.5			ON/OL	2.5 YR 2.5/1 w/ some 4/1	vs.	N	H	wet	fs	MOD PHC throughout	0	tr	100	A	0-5.3 v. soft wet, clay/silt dk gray + black, thin skin of light brown/oxidized layer @ top
	1			↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	B	
	2															*
	3					S.									C	trace fine sand, increases firmness to "soft" @ 3'
	4					↓										
	5															*
SAND 5.9	5.3			SP-SM	2.5 YR 4/1	H			slight moist	MS		–	90	60	D	5.3 to BOC - Dk gray f-med sand, dense, hard, trace to minor fines Abrupt transition to sand.
	6															
	7															
	8															
	9															
	10															

* mussel shell @ 2' & @ 4.5'

Sample Summary (check boxes for analysis):

	Sample ID	Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	EPA pest	Rejected spgr				
A	Y3RU3 SD13-25-0005		4/5/13	0-0.5	✓	✓	✓						
B	Y3RU4 SD13-25-0520		0745	0.5-2.0	✓		✓						
C	Y3RU5 SD13-25-2040	FD		2.0-4.0	✓	✓	✓	✓			FD=Y3RU6		
D	Y3RU7 SD13-25-4059			4.0-5.9	✓		✓						
E	SD13-25-0059			0.0-5.9					✓				
F													

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441 FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-~~2927~~ CC	Northing:	2163456.36	Attempt 1 Refusal Y/N	N
Sampling	C.Cisneros/CH2M HILL	Easting:	6022989.83	Penetration (ft):	5 ft
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	~~77 in~~ 40 in 3.1' processed
		Depth (ft)	13.2 ft	Date/Time:	4/3/13 1406
		Pred Tide (ft):	0.05 ft MLLW		
		St. Arrival:	1400	Attempt 2 Refusal Y/N	
Vessel:	Walter Marie	St.Depart	1411	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
~~HBB~~ HBM + sand + gravel	0.5		loose SM	10YR 5/1	Hard	N	H	Moist	~~es~~ C.Gr.	N	5 10 ~75	80 ~~20~~ 15	5 10 15	A	0-0.5 ~~loose~~, black silty/clayey poorly sorted sand md to cs grained.
	1		GM GC	10YR 4/1 10YR 6/4				Dry Moist					10	B	
	2		CH SW-SC		very Hard		H	slight moist			20	10 30	70 56	C	
	3		CH SW-SC	10YR 5/4				Dry				10 50	~~85~~ 70 30		0.5-0.9 SAA but drier, lighter
	3.1														
	4														
	5														0.9-1.8 poorly sorted gravel w/ sand + clay. gravel sub rounded to sub angular
	6														1.8-2.0 - v. hard dry, clay w/ gravel.
	7														2-2.7 - hard, clayey ~~sandy~~ sand, med to cs. w/ some gravel
	8														
	9														
	10														

TH
~~3.0~~ 2.9
2.7 - ~~BOC~~ - v. hard, v. dry clay light brown
2.9-3.1 v. hard, ~~sandy clay w/~~ TH ~~gravel~~ clayey sand w/ gravel

Coarse gravel obs. throughout core

no ~~clear~~ or abrupt transitions in upper part of core, lithologic layers had gradual transition zones.

Transitions in lower part of core (below 2') more abrupt

Sample Summary (check boxes for analysis):

	Sample ID	Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	TSS	TOC	EPA 9056	% solids	% gravel				
A	08RU8 SD13-27-0015	MS/MSD	4/4/13	0-.5	X	X	X							
B	08RU9 SD13-27-0520		9:30	.5-2	X		X	X						
C	08RV0 SD13-27-2031			2-3.1	X	X	X							
D	SD13-27-0031			0-3.1					X					
E														
F														

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.F1.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-28	Northing:	2163452.79	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023091.65	Penetration (ft):	6.5ft
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	69in
		Depth (ft)	34.3	Date/Time:	4/3/13 1445
		Pred Tide (ft):	0.39ft ft MLLW		
		St. Arrival:	1436	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1455	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781 378 2086			Date/Time:	

6' processed

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
4Bm	0.5		MU-OL/OM	10YR 2/1 mottled w/ 10YR 4/1	VS.	N	H	wet	Z	NONE	0	0	100	A	0-3' black, sticky clay silt, v. soft to soft
	1													B	increasing firmness & decreasing moisture @ 3' - abrupt transition observed
	2														
	3				S.			most	FAINT PHC					C	
	4														
	5													D	pockets of dark olive-brown to dk gray silt/clay bet. 4½-6'
	6														
	7														
	8														
	9														
	10														

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	TGS	TOC	EPA pest spread, % solids					
A	48RV2 SD13-28-0005		4/4/2013	0-.5'	✓	✓	✓						
B	48RV3 SD13-28-0520		8:40	.5-2	✓		✓	✓					
C	48RV4 SD13-28-2040			2-4	✓	✓	✓						
D	48RV5 SD13-28-4060			4-6	✓		✓						
E	48 SD13-28-0060			0-6					✓				
F													

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-29	Northing:	2163438.66	Attempt 1	Refusal? Y/N (O)
Sampling	C.Cisneros/CH2M HILL	Easting:	6023189.47	Penetration (ft):	6ft 8in
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	77in
		Depth (ft)	34.2ft	Date/Time:	4/3/13 1422
		Pred Tide (ft):	0.22 ft MLLW		
		St. Arrival:	1420	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1430	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
4BM	0.5		OH/ OL	2.5 YR 2.5/1 + 3/1	v.s. s.	N	H	v. wet wet	f.s	mod to strong PHC	0	0-2 tr.	98-100	A	Entire core is ~~vv~~ wet to v.wet black to dk gray clay/silt w/ trace fine sand, organic PHC odor noted throughout - mod to strong. Notably stronger near the B.O.C.
	1													B	
	2														
	3													C	
	4														
	5								cobble		5	10	85	D	
6.2	6														@5.7 ft → SAA but w/ gravel + more sand content.
	7														
	8														
	9														
	10														

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/ MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	Spgr	No gravel				
A	y3RV6 SD13-29-0005		4/5/13	0-0.5	✓	✓	✓						
B	y3RV7 SD13-29-0520	(MS)	950	0.5-2.0	✓		✓			FD=y3RV8			
C	y3RV9 SD13-29-2040			2.0-4.0	✓	✓	✓						
D	y3RV10 SD13-29-4060			4.0-6.0	✓		✓						
E	SD13-29-0000			0.0-6.0				✓					
F													

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-31	Northing:	2163263.24		Attempt 1 Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6022972.31	Penetration (ft):	1ft
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Z2	Recovery (ft)	1 inch
		Depth (ft)	14.6 Attempt 2 15.2	Date/Time:	4/3/13 1325
		Pred Tide (ft):	-0.14 ft MLLW -0.11		
		St. Arrival:	1320		Attempt 2 Refusal? Y/N
Vessel:	Walter Mare	St.Depart	1355	Penetration (ft):	4ft 10:n
Collection:	vibracore	Logged by:	T.Hammer/CH2M; T.Frank/E2	Recovery (ft)	64in
Contact Information:	Theresa Hammer/CH2M HILL, theresa.hammer@ch2m.com, 781.378.2086			Date/Time:	4/3/13 1345

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
Disturb OBM	0.5		CH w/ OH OH	2.5 YR 5/6 and 5.1	H	Plastic	H	wet	CS	None	0	5	95	A	~~0-2'~~ Entire core dominantly dry, hard, fat. light brownish yellow clay 0-2' has areas of mottled dark gray clay/ silt. upper ~~or~~ 2' of core appears disturbed compared to ~~lower~~ below 2' clay is massive Below 4' not sampled b/c 2-4 is OBM
	1													B	
OBM	2		CH	2.5 YR 5/6	H			DRY	CS	None	0	0	~~2~~ 100	C (OBM)	
	3														
	4													NS	
	5														
	6														
	7														
	8														
	9														
	10														

Sample Summary (check boxes for analysis):

	Sample ID	Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	sp.gr, % solids					
A	~~U3~~ RW1 SD13-31-0005		4/4/13	0-0.5	✓	✓	✓						
B	~~U3~~ RW2 SD13-31-0520		1500	0.5-2.0	✓		✓						
C	~~U3~~ RW3 SD13-31-2040	FD		2.0-4.0	✓	✓	✓	✓		FD-U8RW5			
D	SD13-31-0020			0.0-2.0				✓					
E													
F													

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-32	Northing:	2163251.79		Attempt 1 Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023070.70	Penetration (ft):	6ft 9:n
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	74:n
		Depth (ft)	33.5	Date/Time:	4/3/13 1251
		Pred Tide (ft):	-0.12 ft MLLW		
		St. Arrival:	1245		Attempt 2 Refusal? Y/N
Vessel:	Walter Mart	St.Depart	1300	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M, T.Frank/E2	Recovery (ft)	
Contact information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
4BM	0.5		MH/OL	2.5 YR 2.5/1 → 4.1	V.S ↓ S	N	H	V. wet → wet	Ps	st. PHC	0	tr. 0-32	92-100	A	0-BOC. Silt/clay w/ trace f. sand.
	1													B	
	2														0-1' v. soft + v. wet.
	3			w/ 2.5 YR 5.2				v. moist						C	2-3' wet + soft.
	4														0-3' very cohesive, sticky material below 3' material is
	5													D	
6.1	6														stiff silt/clay + soft but, slightly less wet.
	7			PHC odor noted throughout core.											
	8			@4.4 - clast of black, organic rich material											@5.7 ~1/2" thin layer of black organic rich material
	9			0-3 - core had to be sliced in half. below 3' sediment broke apart.											
	10														

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth interval (ft)	Pesticides	GS	TOC	EPA	SPG/90 Silica				
A YBRW6	SD13-32-0005		4/5/13	0-0.5	✓	✓	✓	✓					
B YBRW7	SD13-32-0520		0910	0.5-2.0	✓		✓						
C YBRW8	SD13-32-2040			2.0-4.00	✓	✓	✓						
D YBRW9	SD13-32-4060			4.0-6.0	✓		✓						
E	SD13-32 0000			0.0-0.0					✓				
F													

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-33	Northing:	2163239.19	Attempt 1	Refusal? Y/N (Y)
Sampling	C Cisneros/CH2M HILL	Easting:	6023168.50	Penetration (ft):	6ft 11:00
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	7.5 ft
		Depth (ft)	33.7	Date/Time:	4/3/13 1233
		Pred Tide (ft):	-0.06 ft MLLW		
		St. Arrival:	1230	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1240	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

6.2' processed

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
YBM ↓	0.5	~~OL/ OH~~	OL/ OH	10YR 2/1 Blk.	VS	N	H	wet	Z	slight PHC	0	tr 0	100	A	Entire core is black silt clay w/ pockets of gray-brown firmer clay
	1													B	
	2		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
	3			w/ 2.5YR 4/2 pockets below 2'										C	All YBM
	4														
	5													D	
	6														
	6.2'														
	7														
	8														
	9														
	10														

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	% solids, sp grav					
A	~~YBRX0~~ SD13-33-0005		4/4/13	0-0.5	✓	✓	✓						
B	~~YBRX1~~ SD13-33 0520	MS/MSD	1100	0.5-2.0	✓		✓						
C	~~YBRX2~~ SD13-33 2040			2.0-4.0	✓	✓	✓						
D	~~YBRX3~~ SD13-33-0400		↓	4.0-6.0	✓		✓						
E	SD13-33-0060			0.0-6.0				✓					
F													

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.F1.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-35	Northing:	2163061.12		Attempt 1 Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6022947.27	Penetration (ft):	6ft 7in
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	5ft 10in
		Depth (ft)	30.7	Date/Time:	4/3/13 1115
		Pred Tide (ft):	0.82 ft MLLW		
		St. Arrival:	1110		Attempt 2 Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1125	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
YBM	0.5		OH/OL	5Y 2.5/1 to 3/2	V.S.	N	H	wet	SC CS. SAND	None	tr.	10	90	A	0-3.4 black to dark gray clay/silt
	1													B	w/angular cs. sand @ 1.2' (~1/2" thick.
	2														
	-2.6			5Y 4/1	F					slight PHC		80	20		
	3				S							10	90	C	med, dk gray sand from 2.6 to 2.9' and from 3.4 to 4.6' (TH)
SAND	3.4	S	SP-SM		F		H	moist	CS	None		90	10		
	4				~~S~~										
	4.6														
YBM	5		OH/OL	5Y 2.5/1 to 3/2	~~V.S~~			wet	MS			10	90	D	~~3.6'~~ trace shell hash in lower interval
plug of OBM	5.8		CH		F. ~~FAT~~	FAT PLASTIC		DRY	2	None		0	100		
	6														4.6 to BOC soft, wet black to dk gray clay/silt, wet, small plug at 5.8 firm, drier plastic clay @ boc, olive brown
	7														
	8														
	9														
	10														

Sample Summary (check boxes for analysis):

	Sample ID	Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	8260B, SPLP EPA Test		
A	YBRX4 SD13-35-0005	FD	4/4/13 1420	0-0.5	✓	✓	✓		FD: YBRX5	
B	YBRX6 SD13-35-0520			0.5-2.0	✓		✓			
C	YBRX7 SD13-35-2040			2.0-4.0	✓	✓	✓			
D	YBRX8 SD13-35-4058			4.0-5.8	✓		✓		✓	
E	SD13-35-0058			0-5.8				✓	~~PAH~~	
F										

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.F1.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-36	Northing:	2163055.96	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023044.53	Penetration (ft):	6ft 7:n
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	6ft 4:n
		Depth (ft)	36.5ft	Date/Time:	4/3/13 1035
		Pred Tide (ft):	1.53 ft MLLW		
		St. Arrival:	1020	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1040	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
YBM	0.5		OH/OL	2.5 10YR 5/4	US	N	H	WET	Z	Faint PHC	tr.	tr	100	A	Core almost entirely clay silt w/varying degrees of firmness + moisture. Sand @ 4.3 to 4.5' and 5.2 - 5.4'
	1			~~10YR~~ 2.5	S										
	2			4R 2.5/1 10YR 5/2 olive										B	
	3	2.8												C	
	4			2.5YR											
SAND			SP-SM	4/1	F			moist	MS			90	10		Silt/clay v. sticky, v. difficult to split cores & mixing samples is difficult.
YBM			OH/OL	to	S			wet				10	90		
	5							-							
SAND			SP-SM	2.5/1	F			moist				90	10	D	
YBM			OH/OL		S			wet.	Z			5	95		
6.5'	6														
	7														2 to 5' more olive gray 10YR 5/2
	8														
	9														
	10														

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	PCS	TOC	Sp gr., % Solids					
A	Y8RX9	SD13-36-0005	4/4/13 1300	0.0-0.5	✓	✓	✓						
B	Y8RY0	SD13-36-0520		0.5-2.0	✓		✓						
C	Y8RY1	SD13-36-2040		2.0-4.0	✓	✓	✓						
D	Y8RY2	SD13-36-4065		4.0-6.5	✓		✓						
E		SD13-36-0006.5		0.0-6.5				✓					
F													

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.F1.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-37	Northing:	2163043.31	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023145.91	Penetration (ft):	6ft 7:n
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	5ft 11:n
		Depth (ft)	35.3	Date/Time:	4/2/13 1011
		Pred Tide (ft):	2.02 ft MLLW		
		St. Arrival:	1005	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	1015	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter-corresponds to below)	Comments
4BM ↓	0.5		OK/ OL	2.5 YR 2.5/1 + 4/1	V.S	N	H	V. wet	Z	Faint PHC	0	0	100	A	0-4.8 Black-dark gray clay/silt.
	1													B	soft to v.soft. v. wet.; shell (mussel @ 2.5)
	2														
	3													C	4.8 to 5.2 - coarse, angular gravel w/ sand + silt
	4														
Gravel sand 4BM 6'	5			2.5YR 4/1	F. S			wet ↓	cs. ~~GR~~ Z	MOD ~~50~~ PHC (*)	SD ~~15~~	15	35	D	~~5.2~~ 5.2 to BOC wet, soft, dk gray clay
	6														
	7		2-4' interval - mainly dk gray w/ small inclusions 1/4 - 3/8" of darker, wetter clay/silt												Silt @ 5.4' there is layer ~3/8" thick - black, w/ (*) strong chemical-type odor
	8														
	9														
	10														

Sample Summary (check boxes for analysis):

	Sample ID	Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth interval (ft)	Pesticides	TSS	TOC	% solids, SPGV				
A	U8RY3 SD13-37-0005	FD	4/5/13	0-0.5	✓	✓	✓			FD	U8RY4	
B	U8RY5 SD13-37-0520		1030	0.5-2.0	✓		✓					
C	U8RY6 SD13-37-2040			2.0-4.0	✓	✓	✓					
D	U8RY7 SD13-37-4060			4.0-6.0	✓		✓					
E	SD13-37-0060			0.0-6.0				✓				
F												

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-39	Northing:	2162979.33		Attempt 1 Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6022756.43	Penetration (ft):	5ft 7in
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	5ft 3in
		Depth (ft)	40	Date/Time:	4/3/13 0821
		Pred Tide (ft):	4.49 ft MLLW		
		St. Arrival:	0808		Attempt 2 Refusal? Y/N
Vessel:	Walter Marie	St.Depart	0825	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
YBM	0.5		OL/ OH	5YR 2/1 and 5Y 4/1	VS	N	H	wet	NS	None	0 5 0	5-10	90-95	A	0-3.4 dark gray to black silt/clay stick, trace fine sand
	1				S									B	
	2													C	thin @ 0.4' layer of sand + gravel
	3														
3.4 OBM	4		CH	5Y 4/1	H	plastic		Dry to slight moist	Z	Faint PHC	0	0	Z 100	NS D	3.4 to BOC hard, dry to slightly moist dk gray, fat clay. Did not sample 3.4 to 4 to avoid potential cross contam. some black flecks noted.
4.9	5														
	6														
	7														
	8														
	9														
	10														

Sample Summary (check boxes for analysis):

	Sample ID	Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	Sp gravity/% solids					
	A ~~YBRX9~~	SD13-~~39~~-0005	4/4/13 1345	0-0.5	✓	✓	✓						
	B ~~YBRX9~~	SD13-~~39~~-0520		0.5-2	✓		✓						
	C ~~YBRY1~~	SD13-~~39~~-~~2040~~ 2034		2-3.9	✓	✓	✓						
	D ~~YBRY2~~	SD13-~~39~~-~~4045~~ 4049		4-4.9	✓		✓						
	E	SD13-39-0034		0-3.4				✓					
	F												

YBRY8
YBRY9
YBRZ0
YBRZ1

Reviewed by: Date:

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441 FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-40	Northing:	2162662.19	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6022921.50	Penetration (ft):	4ft 11in
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	~~5ft 8in*~~ a 5'
		Depth (ft)	41.5	Date/Time:	4/3/13 0906
		Pred Tide (ft):	3.54 ft MLLW		
		St. Arrival:	0857	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	0912	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Himmer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter-corresponds to below)	Comments
48m	0.5		OH/ OL	10YR 2/1 to 4/1	VS	N	H	wet	MS	~~NAC~~	—	0-5	95-100	A	0-3 m at very fine clay, light tan, suspended in water **
	1				S									B	
	2							moist	FS		—	1-3%	97-99		0-2' dk gray to black clay/silk, v. sticky, wet, trace fine sand 2-3.5
0.8m	3		CL	10YR 3/1	H									C	
3.5 4.0	4							wet	CS. GR		~5	~0	95		2-4' dry, dark gray clay. non plastic. 3.5-4 wet clay and some gravel - clay appears "fractured": eg - gravel sized chunks of clay w/in watery silt/clay.
	5														
	6														
	7														
	8														
	9														
	10														

ODOR -
0 - ~1.5 - None
1.5 - 2 moderate PHC
2 - 4 - none.

** 0.1' - 0.2' fine sand layer

Sample Summary (check boxes for analysis):

Sample ID	Sample Type (N/FD/MS/MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	EPA	SPP/% Sol				
A Y3R22 SD13-40-0005		4/4/13	0-0.5	✓	✓	✓						
B Y3R23 SD13-40-0520		1540	0.5-2.0	✓		✓						
C Y3R24 SD13-40 ~~2040~~			2.0-4.0	✓		✓	✓					
D SD13-40-0040			0.0-4.0					✓				
E												
F												

Reviewed by: Date:

* Note that from ~4ft 11in to 5ft 8in, sediment is very soft, and might not have been felt by driller taking water depth measurement. Penetration likely more than indicated, close to 5ft, 8in, sediment has continued to settle to 5ft.

CH2MHILL

Site Name: United Heckathorn
Project Number: 385441.FI.01
Project Location: Richmond, California
Survey Duration: April 1 - April 4, 2013

Station ID:	SD13-41	Northing:	2162400.50	Attempt 1	Refusal? Y/N
Sampling	C.Cisneros/CH2M HILL	Easting:	6023057.92	Penetration (ft):	6ft, 5:1
Crew/Company	Dixon Marine	Datum:	NAD83 CA State Plane Zn III	Recovery (ft)	
		Depth (ft)	39.1	Date/Time:	4/3/13 0945
		Pred Tide (ft):	2.73 ft MLLW		
		St. Arrival:	0932	Attempt 2	Refusal? Y/N
Vessel:	Walter Marie	St.Depart	0948	Penetration (ft):	
Collection:	vibracore	Logged by:	T.Hammer/CH2M; T.Frank/E2	Recovery (ft)	
Contact Information:	Theresa Himmer/CH2M HILL, theresa.himmer@ch2m.com, 781.378.2086			Date/Time:	

Depth below water surface (ft)	Depth below mudline (ft)	Lithology	Type	Color (Munsell)	Consistency/ Density	Cementation/ Plasticity	Structure	Moisture Content	Maximum particle size	Odor	% gravel	% sand	% fines	Sample IDs (letter corresponds to below)	Comments
YBM	0.5		~~OH~~ OL ML MH	2.5 YR 3/2	V.S	N	H	v. wet	Z		0	0	100	A	V. Soft to soft clay/ silt to 4'
	1								cs. GR Z	slight ~~PH~~ ODM	tr. 0			B	Grayish brown w/ ~~sh~~ some black streaks.
	2														
	3													C	
appears to be ~~fractured~~ ~~broken~~ clasts of OBM.	4				MSD Firm										4-5' wet, ~~angular~~ angular chunks of clay (CH)
5- OBM	5		CL	2.5YR 5/2	H.	slight ~~Dry~~ plastic	Dry		Z	none ~~Z~~	0	0	100 ~~Z~~	D	
	6													X	
6.5														E	gravel-sized pieces.
	7														4.9-5 transition to hard clay dk gray
	8														
	9														
	10														

Angular ~~debris~~ rock @ 1' cube
@ 1" ~~m~~ square /gravel

Sample Summary (check boxes for analysis):

Sample ID		Sample Type (N/FD/MS/ MSD)	Sample Date/Time	Depth Interval (ft)	Pesticides	GS	TOC	9 gr/% solids					
A	Y8R26 SD13-41-0005		4/5/13	0.0-0.5	✓	✓	✓						
B	Y8R27 SD13-41-0520		1100	0.5-2.0	✓		✓						
C	Y8R28 SD13-41-0040			2.0-4.0	✓	✓	✓						
D	Y8R29 SD13-41-4049	FD		4.0-4.9	✓		✓				FD	Y8RA0	
E	SD13-41-0049			0.0-4.9				✓					
F													

Reviewed by: Date:

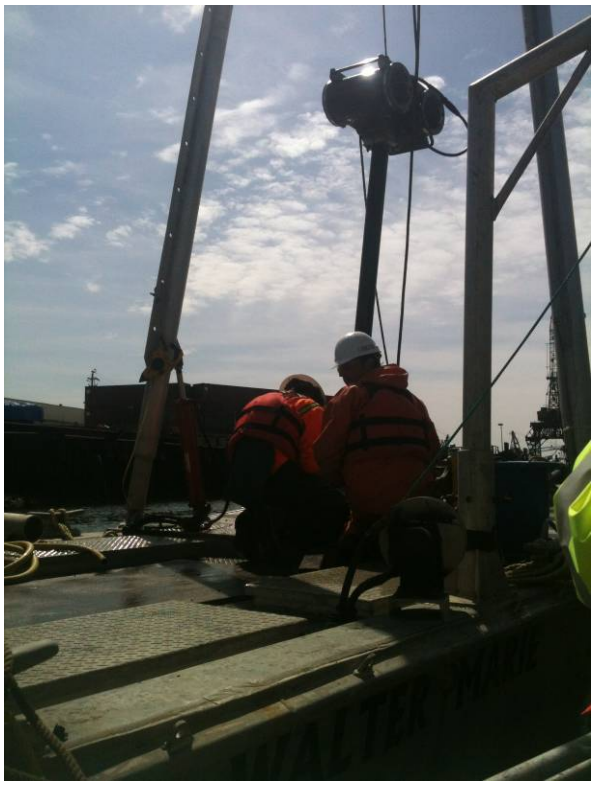
Attachment 3
Photograph Log

Photograph 1: Vibracore drilling team member holding the cable as the vibracore head was lowered in order to feel when the barrel hits the bottom.

Photograph 2: Rocky area surrounding SD13-06 and vessel tie off locations.

Photograph 3: Vibracore team members removing core catcher from barrel and capping bottom.

Photograph 4: Vibracore drill team members capping the fine-interval core from SD13-5.

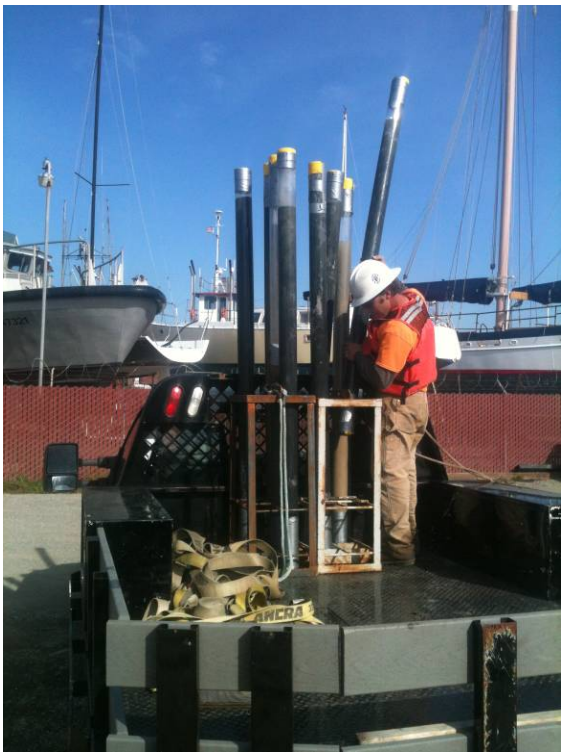


Photograph 5: Vibracore sampling team members capping the fine-interval core from SD13-9.

Photograph 6: Vibracore team members coiling up hose on boat deck after rinsing off vibracore head.

Photograph 7: Vibracore team member decontaminating the core catcher.

Photograph 8: Completed cores and empty liners in the rack on the vessel.



Photograph 9: Vibracore team member loading completed cores into core rack on truck for transport to the laboratory.