APPENDIX C

Site Inspection Checklist

APPENDIX C

Five-Year Review Site Inspection Checklist

TABLE C-1
Site Inspection Team Roster
Site Inspection – April 18, 2006
Second Five-Year Review Report for United Heckathorn, Richmond, California

Name	Title	Affiliation
	Upland Area	
Tony Lester	Operations Supervisor	Levin-Richmond Terminal Corporation
Caroline Ziegler	Senior Project Manager	CH2M HILL – Oakland Office
Diane Sarmiento	Senior Project Manager	CH2M HILL – Oakland Office
Julie Spahn	Project Manager	CH2M HILL – Oakland Office
Sylvia Chan	Project Engineer	CH2M HILL – Oakland Office
	Marine Area	
Lynn Suer	Remedial Project Manager	United States Environmental Protection Agency Region 9
Andy Lincoff	Former Remedial Project Manager	United States Environmental Protection Agency Region 9
Caroline Ziegler	Senior Project Manager	CH2M HILL – Oakland Office
Diane Sarmiento	Senior Project Manager	CH2M HILL – Oakland Office
Julie Spahn	Project Manager	CH2M HILL – Oakland Office
Sylvia Chan	Project Engineer	CH2M HILL – Oakland Office

Five-Year Review Site Inspection Checklist
United Heckathorn Superfund Site

I. SITE INFORMATION	
Site name: United Heckathorn	**Date of inspection:** April 18, 2006
Location and Region: Richmond, Contra Costa County, California	**EPA ID:** CAD981436363
Agency, office, or company leading the five-year review: EPA Region 9	**Weather/temperature:** Sunny / Approximately 68 to 70 °F

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☒ Surface water collection and treatment
- ☒ Other (explain): Dredging Operation along Lauritzen Channel and Parr Canal
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☒ Site map attached [in report]

II. INTERVIEWS ☐ Applicable ☒ N/A

1. **O&M site manager** _____
   Name Title Date

   Interviewed: _____ Phone No: _____
   Problems, suggestions: _____

   NOTE: All referenced attachments can be found in Five-Year Review Report.

2. **O&M staff** _____
   Name Title Date

   Interviewed: _____ Phone No: _____
   Problems, suggestions: _____

   NOTE: All referenced attachments can be found in Five-Year Review Report.

3. **Local regulatory authorities and responsible agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems, suggestions: _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems, suggestions: _____
_____

4. **Other interviews** (optional)

III. ONSITE DOCUMENTS AND RECORDS VERIFIED ☒Applicable ☐N/A

1. **O&M Documents**

O&M manual	☒Readily available	☒Up to date	☐N/A
As-built drawings	☒Readily available	☒Up to date	☐N/A
Maintenance logs	☒Readily available	☒Up to date	☐N/A

Remarks: _____
_____

2. **Site-Specific Health and Safety Plan** ☒Readily available ☒Up to date ☐N/A
Contingency plan/emergency response plan ☒Readily available ☒Up to date ☐N/A

Remarks: Employee Safety Manual and Safety Program are being implemented. Based on personal communication with onsite personnel, each supervisor is responsible for 2 safety meetings per month. Safety aspects are reviewed prior to conducting each task.

3. **O&M and OSHA Training Records** ☒Readily available ☒Up to date ☐N/A

Remarks: Personnel working onsite for daily normal operation are not required to be OSHA 40-hr HAZWOPER-trained. Four employees with HAZWOPER supervisor training are typically on-site during normal operation. Personnel with potential to work with contaminated material are required to be OSHA 40-hr HAZWOPER-trained with a yearly 8-hr refresher course. Qualified personnel are also spill response-trained. O&M sampling and cleaning activities are required to be conducted by OSHA 40-hour HAZWOPER trained personnel/contractors.

4. **Permits and Service Agreements**

Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
Waste disposal, City of Richmond POTW	☒ Readily available	☒ Up to date	☐ N/A
Other permits: Stormwater Permit	☒ Readily available	☒ Up to date	☐ N/A

Remarks: Stormwater Permit refers to General Stormwater Permit for Discharges of Stormwater Associated with Industrial Activities (General Permit No. 97-03-DWQ) administered by the State of California Water Resources Control Board.

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A
Remarks: _____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A
Remarks: _____

7. **Groundwater Monitoring Records** ☐ Readily available ☐ Up to date ☒ N/A
Remarks: _____

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A
Remarks: _____

9. **Discharge Compliance Records**

Air	☐ Readily available	☐ Up to date	☒ N/A
Water (Effluent)	☒ Readily available	☒ Up to date	☐ N/A

Remarks: Annual Reports for Storm Water Discharges Associated with Industrial Activities are readily available and up to date.

10. **Daily Access/Security Logs** ☒ Readily available ☒ Up to date ☐ N/A

Remarks: All visitors entering the facility are required to sign in/out from the security office at the main entrance on Wright Avenue.

IV. O&M COSTS

☒ Applicable ☐ N/A

1. **O&M Organization**

☐ State in-house ☐ Contractor for State
☒ PRP in-house ☒ Contractor for PRP

Remarks: O&M inspection and monitoring of the upland cap have been conducted by PRP-in house personnel during normal operation on a daily basis; Cap inspection, storm water sampling and good housekeeping observation have been conducted by PRP-in house personnel and Contractors on a regular basis.

2. **O&M Cost Records**

☒ Readily available ☒ Up to date
☐ Funding mechanism/agreement in place ☐ NA

Original O&M cost estimate: $5,750 Annual Cost (from Feasibility Study)

Total annual cost by year for review period if available

From	07/01/2001 (Date)	To	06/30/2002 (Date)	$ 7,962.79 (Total cost)
From	07/01/2002 (Date)	To	06/30/2003 (Date)	$ 2,932.78 (Total cost)
From	07/01/2003 (Date)	To	06/30/2004 (Date)	$ 17,845.04 (Total cost)
From	07/01/2004 (Date)	To	06/30/2005 (Date)	$ 17,906.13 (Total cost)
From	07/01/2005 (Date)	To	03/31/2006 (Date)	$ 21,613.99 (Total cost)

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: The actual annual O&M costs are higher than the original O&M cost estimate, however, it does not appear to be an early indicator of remedy problem because of the following reason: [1] the original O&M cost estimate provided in Item IV.2 only includes stormwater sampling, analysis, and reporting of the O&M activities for the 5-acre upland cap, while the actual annual costs include purchases and labor charges for the entire 42-acre marine terminal and all railroad operations. Expenses also include purchases of absorbent materials and inserts, hay, booms, emergency supplies, permits, testing, consultants and disposal; [2] LRTC cannot provide a cost breakdown specifically for the 5-acre former United Heckathorn facility separated from the rest of the 42-acre terminal. It is assumed that the total cost (as listed in Item IV.2) is approximately 25% of the total expense provided by LRTC; [3] It is observed during the site inspection that an ongoing effort has been made to provide the best management practices onsite regarding stormwater pollution and spill prevention, material management, and maintenance of a clean operation onsite. No issue on the upland cap is observed during the site inspection.

V. ACCESS AND INSTITUTIONAL CONTROLS ☒Applicable ☐N/A

A. Fencing ☒Applicable ☐N/A

1. **Fencing** ☐Location shown on site map ☒Gates secured ☐N/A

Remarks: Fences are in-place at the perimeter of the site. Gates are secured. Security guards are on-site 24 hours a day. Based on personal communication with onsite personnel, there is no issue with illegal access to the site.

B. Other Access Restrictions ☒Applicable ☐N/A

1. **Signs and other security measures** ☐Location shown on site map ☐N/A

Remarks: Marine Security (MARSEC) is being adopted at the site. All visitors are required to sign in/out from the security office at the main entrance on Wright Ave. Advisory/warning signs are observed at or near the site indicating pesticides and other chemicals are present. "No Trespassing" and "No Fishing" signs are displayed along the Lauritzen Channel and Richmond Harbor Channel. Pole lights at the site are turned on during night-time.

C. Institutional Controls (ICs) ☒Applicable ☐N/A

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐Yes	☒No	☐N/A
Site conditions imply ICs not being fully enforced	☐Yes	☒No	☐N/A

Type of monitoring (e.g., self-reporting, drive by) _____
Frequency _____
Responsible party/agency _____

Contact _____ _____ _____ _____
Name Title Date Phone No.

Reporting is up-to-date	☐Yes	☐No	☒N/A
Reports are verified by the lead agency	☐Yes	☐No	☒N/A

Specific requirements in deed or decision documents have been met	☒Yes	☐No	☐N/A
Violations have been reported	☐Yes	☒No	☐N/A
Other problems or suggestions:	☐Report attached		☒N/A

2. **Adequacy** ☒ICs are adequate ☐ICs are inadequate ☐N/A

Remarks: As required by the ROD, a deed notice is attached limiting land use of the property to non-residential classification. In addition, long-term operation and maintenance of the cap is required. These ICs are considered adequate to limit the land use of the site from converting to other use without further study and possibly further remediation, and to ensure long-term effectiveness of the remedy.

D. General ☒Applicable ☐N/A

1. **Vandalism/trespassing** ☐Location shown on site map ☒No vandalism evident

Remarks: "No Trespassing" and "No Fishing" signs are displayed at the site.

2. **Land use changes onsite** ☐Location shown on site map ☒N/A

Remarks: Onsite land use remains as industrial use (port priority or related industrial use) with no observed change.

3. **Land use changes offsite** ☐Location shown on site map ☒N/A

Remarks: Offsite land use within the City of Richmond has no significant change. Land use adjacent to the site remains as industrial use, which includes activities operated by Pacific Atlantic Terminal LLC, California Food Oil Company, Unocal, and SIMS metals.

VI. GENERAL SITE CONDITIONS

A. Roads ☒Applicable ☐N/A

1. **Roads damaged** ☐Location shown on site map ☐Roads adequate ☒N/A

Remarks: There is no well-defined pedestrian walkway or vehicles driveway onsite, extra caution or onsite traffic control may be required during period of heavy traffic. The upland cap is used for daily normal operation of the terminal. Minor surface cracks are observed. (See Item VII.A.2 - landfill cover for detail)

B. Other Site Conditions

Remarks: Railroad tracks, crane rail, truck/train scale and fuel station are observed at the site for import/export of material through rail transport. Heavy construction equipment (such as tractors, front loaders, cranes, conveyors) are found onsite at the staging area.

During the site inspection, no erosion is observed on the upland cap; On-site stormwater collection system is in good condition; General housekeeping is well-conducted; A proactive approach is perceived for material management and stormwater pollution prevention. A road sweeper is in operation during the site visit. A dust collector is available to suppress dust emission using fine mist, when necessary. Well-structured security measures are being implemented at the site. Coast Guard Marine Safety Office (MSO) requires that each visiting cargo vessel must have an existing Oil Spill Removal Organization (OSRO) with an emergency response contract, prior to the coast guard allowing entry into the port.

Although stockpiled material (mostly calcite, graphite coke) is surrounded by concrete k-rail barriers, some material is observed to be escaping at the gap in between barriers. Attention should be paid to avoid the possibility of material from migration/release into storm drains. Covering the stockpiled material with a plastic sheet may be considered if needed.

VII. LANDFILL COVERS ☒Applicable ☐N/A

A. Landfill Surface ☒Applicable ☐N/A

1. **Settlement** (Low spots) ☐Location shown on site map ☒Settlement not evident
   Areal extent _____ Depth _____
   Remarks _____

2. **Cracks** ☐Location shown on site map ☐Cracking not evident
   Length _____ Widths _____ Depths _____

   Remarks: Minor surface cracks are observed on the cap. Although it is not a concern at the time of the inspection, attention should be paid to monitor any propagation of the crack; Any further deterioration of the cap would require repair as soon as possible.

3. **Erosion** ☐Location shown on site map ☒Erosion not evident
   Areal extent _____ Depth _____
   Remarks _____

4. **Holes** ☐Location shown on site map ☒Holes not evident
   Areal extent _____ Depth _____
   Remarks _____

5. **Vegetative Cover** ☐Grass ☐Cover properly established ☐No signs of stress
   ☐Trees/Shrubs (indicate size and locations on a diagram) ☒N/A
   Remarks _____

6. **Alternative Cover (armored rock, concrete, etc.)** ☒N/A
   Remarks _____

7. **Bulges** ☐Location shown on site map ☒Bulges not evident
   Areal extent _____ Height _____
   Remarks _____

8. **Wet Area / Water Damage** ☒Wet areas/water damage not evident
   - Wet areas ☐Location shown on site map ☐Areal extent _____
   - Ponding ☐Location shown on site map ☐Areal extent _____
   - Seeps ☐Location shown on site map ☐Areal extent _____
   - Soft subgrade ☐Location shown on site map ☐Areal extent _____

   Remarks _____

9. **Slope Instability** ☐Slides ☐Location shown on site map ☒No evidence of slope instability
Areal extent _____ Depth _____
Remarks _____

B. Benches ☐Applicable ☒N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐Location shown on site map ☐N/A or okay
Remarks _____

2. **Bench Breached** ☐Location shown on site map ☐N/A or okay
Remarks _____

3. **Bench Overtopped** ☐Location shown on site map ☐N/A or okay
Remarks _____

C. Letdown Channels ☐Applicable ☒N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐Location shown on site map ☐No evidence of settlement
Areal extent _____ Depth _____
Remarks _____

2. **Material Degradation** ☐Location shown on site map ☐No evidence of degradation
Material type _____ Areal extent _____
Remarks _____

3. **Erosion** ☐Location shown on site map ☐No evidence of erosion
Areal extent _____ Depth _____
Remarks _____

4. **Undercutting** ☐Location shown on site map ☐No evidence of undercutting
Areal extent _____ Depth _____
Remarks _____

5. **Obstructions** Type _____ ☐Location shown on site map ☐No obstruction
Areal extent _____ Size _____
Remarks _____

6. **Excessive Vegetative Growth** Type _____
- ☐ No evidence of excessive growth
- ☐ Vegetation in channels does not obstruct flow
- ☐ Location shown on site map Areal extent _____

Remarks _____

D. Cover Penetrations ☐ Applicable ☒ N/A

1. **Gas Vents** ☐ Active ☐ Passive
- ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
- ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A

Remarks _____

2. **Gas Monitoring Probes**
- ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
- ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A

Remarks _____

3. **Monitoring Wells** (within surface area of landfill)
- ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
- ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A

Remarks _____

4. **Leachate Extraction Wells**
- ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
- ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A

Remarks _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A

Remarks _____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**
- ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
- ☐ Good condition ☐ Needs Maintenance

Remarks _____

2. **Gas Collection Wells, Manifolds and Piping**
- ☐ Good condition ☐ Needs Maintenance

Remarks _____

3. **Gas Treatment Facilities** (e.g., gas monitoring of adjacent homes or buildings)
☐Good condition ☐Needs Maintenance ☐N/A
Remarks _____

F. Cover Drainage Layer ☐Applicable ☒N/A

1. **Outlet Pipes Inspected** ☐Functioning ☐N/A
Remarks _____

2. **Outlet Rock Inspected** ☐Functioning ☐N/A
Remarks _____

G. Detention/Sedimentation Ponds ☐Applicable ☒N/A

1. **Siltation** Areal extent _____ Depth _____ ☐N/A
☐Siltation not evident
Remarks _____

2. **Erosion** Areal extent _____ Depth _____
☐Erosion not evident
Remarks _____

3. **Outlet Works** ☐Functioning ☐N/A
Remarks _____

4. **Dam** ☐Functioning ☐N/A
Remarks _____

H. Retaining Walls ☐Applicable ☒N/A

1. **Deformations** ☐Location shown on site map ☐Deformation not evident
Horizontal displacement _____ Vertical displacement _____
Rotational displacement _____
Remarks _____

2. **Degradation** ☐Location shown on site map ☐Deformation not evident
Remarks _____

I. Perimeter Ditches/Off-Site Discharge ☒Applicable ☐N/A

1. **Siltation** ☐Location shown on site map ☒Siltation not evident
Areal extent _____ Depth _____
Remarks: _____

2. **Vegetative Growth** ☐Location shown on site map ☐N/A
☒Vegetation does not impede flow
Areal extent _____ Type _____

Remarks: No to little vegetation growth is observed at the grate of the storm drain or other onsite areas. Stormwater flow is not anticipated to be impeded by vegetation.

3. **Erosion** ☐Location shown on site map ☒Erosion not evident
Areal extent _____ Depth _____
Remarks: _____

4. **Discharge Structure** ☐Functioning ☒N/A

Remarks: Direct stormwater discharge from the former United Heckathorn facility to Lauritzen Channel is not allowed (Stormwater outfalls SW-3 to SW-7). These stormwater interceptors are designed to have sufficient capacity to hold all stormwater runoff generated during rainy season for discharge to City of Richmond POTW. (Refer to figure in the 5-Year Review report for locations of the outfall.) A 1-way tidal valve is observed at the outfall pipe of SW-7 to prevent backwater from the Lauritzen channel into the interceptors during high tides. During the site inspection, stormwater is observed in the stormwater interceptors. Based on personal communication with onsite personnel, they are functioning properly during the previous rainy event.

VIII. VERTICAL BARRIER WALLS ☐Not Applicable ☒N/A

1. **Settlement** ☐Location shown on site map ☐Settlement not evident
Areal extent _____ Depth _____
Remarks: _____

2. **Performance Monitoring** Type of monitoring _____
☐Performance not monitored
Frequency _____ Evidence of breaching
Head differential _____
Remarks: _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒Applicable ☐N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐Applicable ☒N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ☐Good condition ☐All required wells located ☐Needs O&M ☐N/A
   Remarks _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐Good condition ☐Needs Maintenance
   Remarks _____

3. **Spare Parts and Equipment**
   ☐Readily available ☐Good condition ☐Requires upgrade ☐Needs to be provided
   Remarks _____

B. Surface Water Collection Structures, Pumps, and Pipelines ☒Applicable ☐N/A

1. **Collection Structures, Pumps, and Electrical**
   ☒Good condition ☐Needs Maintenance

   Remarks: Stormwater from the former United Heckathorn facility is directed into interceptors (SW-3 to SW-7), which is to be sampled, tested and discharged to the city POTW. Interceptors are cleaned once a year and are observed to be in good condition.

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐Good condition ☐Needs Maintenance ☒N/A
   Remarks: _____

3. **Spare Parts and Equipment**
   ☒Readily available ☒Good condition ☐Requires upgrade ☐Needs to be provided

   Remarks: Maintenance and welding shops are located next to the Admin Building for general operation of the shipping terminal. Maintenance equipment is available for use if necessary.

C. Treatment System ☐Applicable ☒N/A

1. **Treatment Train** (Check components that apply)
   - ☐Metals removal ☐Oil/water separation ☐Bioremediation
   - ☐Air stripping ☐Carbon adsorbers
   - ☐Filters _____
   - ☐Additive (e.g., chelation agent, flocculent)_____
   - ☐Others _____
   - ☐Good condition ☐Needs Maintenance
   - ☐Sampling ports properly marked and functional
   - ☐Sampling/maintenance log displayed and up to date
   - ☐Equipment properly identified
   - ☐Quantity of groundwater treated annually _____
   - ☐Quantity of surface water treated annually _____

   Remarks _____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   - ☐N/A ☐Good condition ☐Needs Maintenance

   Remarks _____

3. **Tanks, Vaults, Storage Vessels**
   - ☐N/A ☐Good condition ☐Proper secondary containment ☐Needs Maintenance

   Remarks _____

4. **Discharge Structure and Appurtenances**
   - ☐N/A ☐Good condition ☐Needs Maintenance

   Remarks _____

5. **Treatment Building(s) – support building**
   - ☐N/A ☐Good condition (esp. roof and doorways)
   - ☐Needs repair ☐Chemicals and equipment properly stored

   Remarks _____

6. **Monitoring Wells** (pump and treatment remedy)
   - ☐Properly secured/locked ☐Functioning ☐Routinely sampled ☐Good condition
   - ☐All required wells locations ☐Needs Maintenance ☐N/A

   Remarks _____

D. Monitored Natural Attenuation ☐Applicable ☒N/A

1. **Monitoring Wells** (natural attenuation remedy)
   - ☐Properly secured/locked ☐Functioning ☐Routinely sampled ☐Good condition
   - ☐All required wells locations ☐Needs Maintenance ☐N/A

   Remarks _____

X. OTHER REMEDIES ☒Applicable ☐N/A

If there are remedies applied at the site which are not covered above, describe the physical nature and condition of any facility associated with the remedy.

In addition to upland capping at the former United Heckathorn facility, the implemented remedy also includes [1] dredging of all younger bay mud from the Lauritzen Channel and Parr Canal; [2] off-site disposal of dredged material by rail; [3] placement of clean sediment after dredging; and [4] marine monitoring of surface water and biota for at least five years or until it is demonstrated that the remediation goals have been achieved.

The dredging activities commenced in August 1996 and was completed in April 1997. The post-remediation biomonitoring of pesticides and other contaminants in marine waters near the site have been conducted under an ongoing effort. Results from the monitoring program are summarized in the Five-Year Review report.

A boat tour was conducted at Lauritzen Channel and Parr Canal on the same day prior to conducting the site inspection at the upland area. Birds and seagulls are observed along the waterways. Mussels are observed on the abandoned piles adjacent to the site. Based on personal communication with onsite personnel, sting rays are observed at Lauritzen Channel during summer time in 2005. Signs are displayed along the waterways indicating no fishing is allowed, and pesticides and other contaminants are present in the Channel. Fishing activities along the shore are not observed during the boat tour.

XI. OVERALL OBSERVATIONS ☒Applicable ☐N/A

A. Implementation of the Remedy ☒Applicable ☐N/A

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

According to the ROD, the objective of the remedy is to address remaining hazardous substances at the Site and in the marine environment by implementing engineering and institutional controls.

At the upland area, the objective was to be met by construction of an upland cap at the former Heckathorn facility to prevent erosion of contaminated soil from migrating offsite. In addition, a deed restriction is attached to the site limiting use of the property to non-residential uses. O&M activities of the upland cap are being conducted on a regular basis to ensure long-term effectiveness of the remedy. Based on observation from the site inspection, the integrity of the upland cap is well-maintained and the cap is in good condition with no erosion. The land use of the property remains unchanged under industrial classification. O&M reports are prepared annually to summarize findings from monthly inspection, which are summarized in the 5-year Review report.

For the marine environment, the objective was to be met by [1] dredging of all soft bay mud from the Lauritzen Channel and Parr Canal, with offsite disposal of dredged material, [2] placement of clean material after dredging, and [3] marine monitoring to verify the effectiveness of the remedy. The remedial construction was completed in 1997. Marine biomonitoring has been conducted and documented in annual reports, as summarized in the 5-year Review Report. No issue and observation related to the effectiveness or functioning of the remedy can be determined from the site inspection.

B. Adequacy of O&M ☒Applicable ☐N/A

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Onsite personnel are responsible for daily inspection of the upland cap during normal operation while LRTC's contractor is responsible for cap inspection, storm water sampling and good housekeeping observation in a timely manner. The O&M procedures are combined with regular housekeeping to facilitate normal operation at the terminal.

During the site inspection, stormwater interceptors (SW-3 to SW-7) were observed to be maintained in good condition. Street sweeper was in operation onsite. Hydrocarbon booms were placed upstream of the storm drain drop inlets location near the fuel station. Bales were observed on four sides acting as pre-filter to stormwater flowing into the drop inlet. Ultra-storm guards were installed at the drop inlet to avoid inflow of silt and hydrocarbon. An equipment staging area was designated onsite to facilitate cleanup when potential leakage of equipment occurs.

Based on personal communication with onsite personnel, the interceptors are generally cleaned once a year in which water is to be drawn down to 1-ft and discharged to the City of Richmond POTW. The remaining portion is to be placed in settling pool around June and July to be air-dried through the summer. The remaining settled solids are to be analyzed and disposed to an appropriate disposal location. The ultra-storm guards are to be power-washed prior to disposal during annual cleanout. Sludge removed from the guards is to be analyzed to determine the appropriate disposal location.

More information regarding stormwater discharge to the City of Richmond POTW are discussed in the 5-year Review Report. Biomonitoring of the marine sediments is further discussed in the 5-year Review Report.

C. Early Indicators of Potential Remedy Failure ☒Applicable ☐N/A

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

Based on observation from the site inspection, no major issues exist that could affect the protectiveness of the remedy.

D. Opportunities for Optimization ☒Applicable ☐N/A

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

O&M activities have been continually conducted and optimized at the former United Heckathorn facility. LRTC is taking a proactive approach for maintenance of the integrity of the upland cap, material management, housekeeping, and stormwater pollution prevention. Monitoring and inspection should be continued for evaluation of any potential propagation of the existing surface cracks on the upland cap.

Possible opportunities for optimization in monitoring of the marine sediment are to be discussed in the 5-year Review Report.

APPENDIX D

Site Inspection Photographs

Description: Upland capping area of Levin Richmond Terminal along Lauritzen Channel
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Advisory sign at Lauritzen Channel
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Surface cracks on upland cap
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Stockpiled material on upland cap
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Below the berth at Lauritzen Channel
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: City of Richmond stormwater outlet at northern end of Lauritzen Channel
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Equipment staging area on upland cap
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Other industrial activities adjacent to United Heckathorn site
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

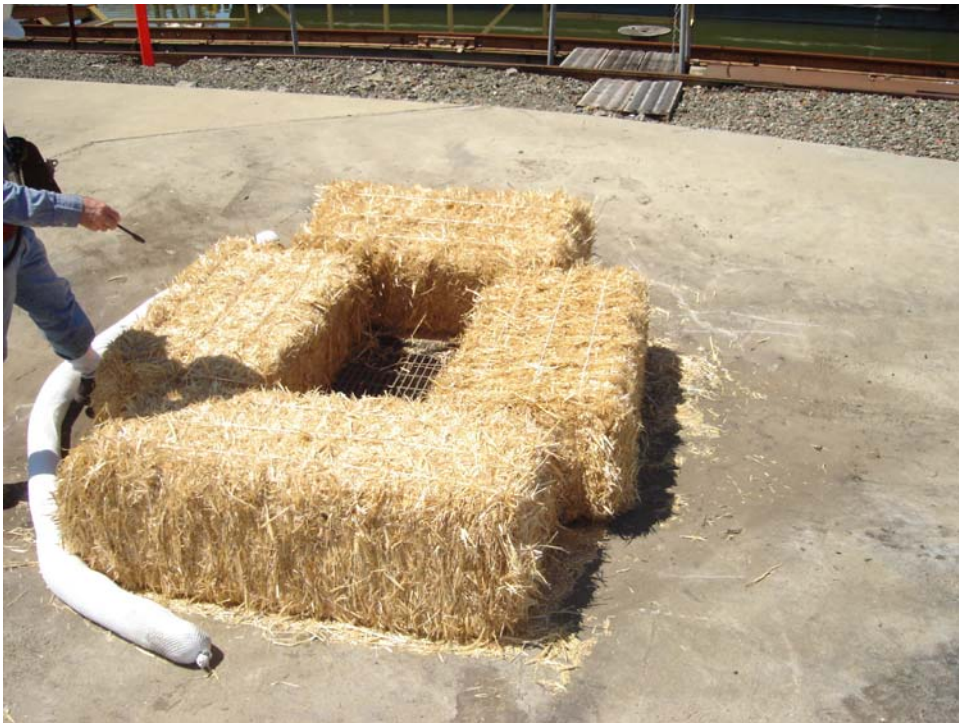
Description: Petroleum sorbent boom along swale at upland area
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Rail fuel station at upland area
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Gravel cover and rail track in adjacent to Lauritzen Channel
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Storm drain equipped with boom and drain guard
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Sampling Location for mussel monitoring
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006



Description: Storm drain with bales and boom
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Stormwater Interceptor (SW-4) at upland area
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: 1-way tidal valve for outlet pipe at SW-7
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Stormwater interceptor outfall and embankment soil along Lauritzen Channel
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Upland area with perimeter fence
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006

Description: Wooden piles and berth along Lauritzen Channel
Photographer: Sylvia Chan/CH2M HILL Date: April 18, 2006