

## **Operations and Maintenance Plan**

East Stege Marsh  
Campus Bay, Richmond, California

December 2013



A handwritten signature in blue ink that reads "Jenifer Beatty".

---

Jenifer Beatty, PG 6650 (CA)  
Principal Hydrogeologist

A handwritten signature in blue ink that reads "Lucas W. Paz".

---

Lucas W. Paz, Ph. D.  
Principle Hydrologist

**Operations and Maintenance  
Plan**

East Stege Marsh  
Campus Bay, Richmond,  
California

Prepared for:  
Zeneca Inc.

Prepared by:  
ARCADIS U.S., Inc.  
2000 Powell Street  
Suite 700  
Emeryville  
California 94608  
Tel 510 652 4500  
Fax 510 652 4906

Our Ref.:  
EM009358.0035.0008

Date:  
December 2013

*This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.*

<b>1. Introduction</b>	<b>1</b>
1.1 O&M Plan Goals and Objectives	1
1.2 Site Description	2
1.3 Responsible Parties	2
<b>2. Summary of Remedial Actions and Wetland Restoration</b>	<b>3</b>
2.1 Post-Remediation Site Monitoring	4
2.2 Post-Remediation Monitoring Results	5
2.3 DTSC Approval	5
2.4 USACE Permit Closure	5
<b>3. Long-Term O&amp;M Activities</b>	<b>6</b>
3.1 Fence and Signage Inspections and Maintenance	6
3.2 Vegetation Management and Maintenance	7
3.3 Five-Year Report	8
3.4 O&M Schedule of Activities	8
<b>4. Reporting and Record Keeping</b>	<b>9</b>
4.1 Annual Inspection Summary Reports	9
4.2 DTSC Notification Requirements	9
<b>5. Site Access</b>	<b>9</b>
<b>6. References and Related Documents</b>	<b>10</b>

**Tables**

Table 1	Routine O&M Activities ( <i>in text</i> )
---------	---

**Figures**

Figure 1	Site Vicinity Map
Figure 2	Site Plan
Figure 3	Fence and Signage Map

**Appendices**

- Appendix A Interim Long-Term Vegetation Management and Monitoring Plan for the Habitat Enhancement Area
- Appendix B USACE Release of Liability Letter
- Appendix C O&M Inspection Checklist

## 1. Introduction

ARCADIS U.S., Inc. (ARCADIS) has prepared this Operation and Maintenance (O&M) Plan, on behalf of Zeneca Inc. (Zeneca), for Habitat Area 1 located at the former Zeneca property, now known as the Campus Bay site in Richmond, California (Figure 1; Site). The Site is subject to Department of Toxic Substances Control (DTSC) Site Investigation and Remediation Order Docket No. IS/E-RAO 06/07-005 (the 2006 DTSC Order) issued in September 2006. The 2006 DTSC Order divides the Habitat Enhancement Area (HEA), located in the southern portion of the Site, into two areas: Habitat Area 1, which includes East Stege Marsh (ESM) and immediately adjacent upland areas, and Habitat Area 2, which includes two lagoons and surrounding uplands (Figure 2).

The results of several previous investigations at ESM indicated that sediments contained elevated concentrations of arsenic, cadmium, copper, mercury, lead, zinc, and selenium. The implementation of remedial actions within Habitat Area 1 was completed in 2006. DTSC approved the final implementation of remedial measures on June 4, 2007 in a letter approving the March 5, 2007 Final HEA Implementation Report (LFR 2007a). Restoration of ESM habitat as a component of the remedial action has been considered a success and the ecological performance criteria presented in the Conceptual Remediation, and Risk Management Plan (CRRMP) and associated Habitat Enhancement Plan (HEP; LFR 2002b), as modified based on discussions with the U.S. Army Corps of Engineers (USACE; LFR 2004), have been largely achieved (Section 2.4). In a letter dated November 21, 2013, the USACE formally states that “the mitigation requirements have been met and that long term monitoring of the project may cease.” A copy of the USACE letter is provided in Appendix B.

This O&M Plan has been prepared in accordance with the 2006 DTSC Order to present the program and procedures for long-term operation, maintenance, monitoring of ESM and ongoing vegetation management actions within the HEA under the DTSC oversight. This O&M Plan addresses review comments provided by the DTSC, in a letter dated November 12, 2013, on a draft version of the O&M Plan. Response actions and long-term O&M activities will continue to be conducted under DTSC oversight, as required by Health and Safety Code Division 20, Chapter 6.8, commencing with §25300 et seq. The O&M Plan will be implemented under DTSC oversight.

### 1.1 O&M Plan Goals and Objectives

The primary goal of this O&M Plan is to continue to facilitate habitat restoration while protecting human and ecological health. In order to accomplish this goal, the O&M Plan will address the following objectives:

- Establish an annual inspection, monitoring, reporting program to evaluate and document engineering controls and habitat restoration;
- Implement ongoing vegetation management activities as prescribed by the Interim Long-Term Vegetation Management and Maintenance Plan for the HEA (Appendix A);
- Provide for timely repairs or replacement of damaged fencing or signage;
- Minimize disturbances to the habitat; and
- Provide for record keeping of inspections and repairs and reporting to DTSC.

## 1.2 Site Description

ESM is an approximately 10-acre tidal salt marsh located in the southern portion of the Site and partly on East Bay Regional Park District (EBRPD) property, north of the San Francisco Bay shoreline (Figures 1 and 2). ESM/Habitat Area 1 is located within the southern portions of Assessor's Parcel Number (APNs) 560-050-022 and 560-010-046, and the western portion of APN 560-010-047 not included within Habitat Area -2 or the Southeast Parcel. The University of California (UC) owns the adjacent West Stege Marsh and the UC Richmond Field Station is located west of the Site. Baxter Creek is located east of ESM and discharges to San Francisco Bay through the eastern portion of ESM.

The overall HEA footprint is a 22.1-acre oblong open space area comprised of salt marsh, two lagoons, and upland habitat fronting the Campus Bay property. Zeneca granted a conservation easement within a portion of the HEA to the EBRPD (Figure 2). The EBRPD conservation easement comprises approximately 13.2 acres along the bay frontage (Figure 2). In accordance with the agreement with EBRPD development activities within the conservation easement boundary are prohibited.

## 1.3 Responsible Parties

Zeneca, Cherokee Simeon Venture I, LLC (CSV), Bayer Cropscience, and The Regents of the University of California are responsible parties under the 2006 DTSC Order. CSV is the owner of the Site, including the HEA; the project proponent is Zeneca. The Responsible Parties named in the 2006 DTSC Order are responsible for implementing the O&M Plan as part of site remediation. One or more Responsible Parties will be responsible for implementation and compliance with the provisions of this O&M Plan.

## 2. Summary of Remedial Actions and Wetland Restoration

Site remediation and restoration activities were conducted under the 2001 Regional Water Quality Control Board (RWQCB) issued Order No. 01-101, 2005 Site Investigation and Remediation Order Docket No. IS/E-RAO 04/05-006 (2005 DTSC Order), the 2006 DTSC Order, the USACE Clean Water Act Section 404 Permit Number 28252S<sup>1</sup>, Bay Area Coastal Development Commission (BCDC) permit number M01-52(a), City of Richmond Grading Permit Number 04-21, EBRPD Encroachment Permit Number 048E-03-423, California Department of Fish and Game Lake or Streambed Alteration Agreement Number 1600-2003-0613-3, and U.S. Fish and Wildlife Service Biological Opinion File Number 1-1-04-F-0076.

The remedial action objectives (RAOs) and potential remedial alternatives for ESM were developed and presented in the CRRMP (LFR 2002b) based on characterization data, the conceptual site model, and results of the Human Health Risk and Ecological Risk Assessment for East Stege Marsh (LFR 2002a). The CRRMP, prepared for the HEA in accordance with RWQCB Order No 01-101, discussed proposed remedial activities and risk management practices to eliminate or significantly reduce the potential for the exposure of human and ecological receptors to chemicals present in sediment in ESM while maintaining and improving existing functional habitat quality. The recommended and subsequently approved remedial measure to meet RAOs (Remedial Alternative-4a Modified) included removal of affected sediments to significantly reduce contaminant mass and reduce the potential exposure to human and ecological receptors while maintaining and enhancing the habitat within ESM (LFR 2002b). Clean, imported fill was placed in the excavated areas and the marsh was graded to support implementation of the HEA HEP and monitoring plan. In ESM excavation areas, 3 feet of clean soil cover was deemed acceptable to reduce the potential for human and ecological exposure in ESM due to the potential for erosion due to tidal action.

The Final Implementation Report for Remediation of the Habitat Enhancement Area (LFR 2007a) documents the remediation and restoration activities completed in Habitat Area 1 and Habitat Area 2 from 2004 through 2006.

---

<sup>1</sup> Department of Army Nationwide Permit 38 (Cleanup of Hazardous and Toxic Waste; 67 Fed. Reg. 2020, January 15, 2002), pursuant to Section 404 of the Clean Water Act (33 U.S.C. Section 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. Section 403).

## **2.1 Post-Remediation Site Monitoring**

Habitat Area 1 post-remediation monitoring activities began in the summer of 2006 and continued through 2013. Post-remediation monitoring has been performed in accordance with the following documents:

- Comprehensive Monitoring Plan (LFR 2002c)
- Remedial Design Details (LFR 2003)
- USACE Clean Water Act Section 404 Permit (#28252S)
- Removal Action Work Plan (LFR 2005)
- Pore Water and Sediment Sampling Work Plan, East Stege Marsh (LFR 2007b)
- 5-Year Remedial Action Review Work Plan, Habitat Area 1 – East Stege Marsh (ARCADIS, 2013)

The elements of the post-remediation monitoring program have included the following:

- Sediment sampling and analysis
- Pore water extraction and analysis
- Sediment accretion measurements
- Surface water sampling and analysis
- Ecological restoration monitoring

Post-Remediation Reporting has included the following:

- Annual Monitoring Reports Submitted to USACE and DTSC (2007a, 2007b, 2008, 2009, 2010, 2011, and 2012)
- Letter Report transmitted to the DTSC: Evaluation of Year 1 Sediment Monitoring Results from East Stege Marsh (2006)
- Pore Water and Sediment Sampling Results Submitted to the DTSC (2007b, 2007c and 2008)



## 2.2 Post-Remediation Monitoring Results

Data from post-remediation monitoring of the hydrology, vegetation, sediment, and surface water of the ESM conducted since 2006 have shown that the ESM is stable, well vegetated with diverse speciation, and on a strong trajectory to becoming a fully functioning coastal salt marsh with adjacent upland habitat (ARCADIS 2011). These monitoring results also have indicated that the concentrations of constituents of concern in sediments have decreased relative to concentrations detected in samples collected prior to conducting the remedial action.

It is expected that native vegetation cover in the transitional and coastal scrub zones within Habitat Area 1 will continue to increase in the near future as the existing shrubs in these zones, close canopy and existing native grasses and forbs (herbaceous flowering plants), as well as newly planted ones, become more firmly established in the transitional zone. In general, the restored native shrubs have been successfully established within the coastal scrub zone; most of the grassland, particularly in central portions of the north end and under the restored shrubs, supports a stable community of established native species.

Consistent with the Comprehensive Monitoring Plan and USACE requirements, post-remediation monitoring reports were prepared and submitted annually for USACE in accordance with the USACE Clean Water Act Section 404 Permit (#28252S) and the BCDC Permit (#M01-52[a]).

## 2.3 DTSC Approval

The DTSC provided review comments on the ESM Sixth Annual Monitoring Report (ARCADIS 2011). The report was revised to address DTSC comments and a revised version of the Sixth Annual Monitoring Report, dated January 13, 2012, was submitted to DTSC. In a letter dated February 27, 2012, the DTSC noted that the annual monitoring of ESM was implemented and reported under the terms and conditions of the USACE permit number 2852S and the BCDC permit number M01-52(a), and that DTSC's Ecological Risk Assessment Section required no further revisions.

## 2.4 USACE Permit Closure

Restoration of ESM habitat as a component of the remedial action has been considered a success and the ecological performance criteria presented in the CRRMP and associated HEP (LFR 2002b) as modified based on discussions with the USACE (LFR 2004), have been achieved to date. On September 13, 2011, representatives from USACE, the DTSC, EBRPD, ARCADIS, Pacific Open Space, and representatives from Zeneca met at ESM to conduct an inspection and review the final monitoring results presented in the Sixth Annual Monitoring Report. The field meeting

included an inspection of restoration areas and discussion of ongoing site maintenance required to support a "Section 404 Permit Release of Liability Letter" from USACE stating that ESM has been restored in accordance with the Section 404 Permit mitigation requirements and that a long-term vegetation management plan be developed and implemented as an ongoing requirement. ESM conditions observed during the September 13, 2011 field inspection were deemed very favorable by the relevant resource agencies. As a result of this meeting the USACE required that the following final remaining actions be conducted:

- Development of a long-term vegetation management/maintenance plan including a provision for brief annual status reports.
- Following approval by the USACE, revise the HEA Operation and Maintenance Agreement with DTSC to incorporate ongoing implementation of the long-term vegetation management/maintenance plan.
- Provide a final updated Jurisdictional Delineation report to the USACE documenting the current expanded extent of ESM for confirmation by USACE.
- Participate in a subsequent follow-up meeting at the Site with USACE and USFWS (Ryan Olah) on October 13, 2011 to address any remaining questions or concerns.
- Provide USACE with a copy of the previously established Conservation Easement covering the ESM for reference.

The above actions have been completed as required. An Interim Long-term Vegetation Management and Maintenance Plan for the HEA (Vegetation Management Plan; Appendix A) was developed to facilitate the continued improvement in habitat restoration and vegetation management efforts and proposes an adaptive management approach for the upland transition and upland habitat areas within the HEA to meet performance objectives. The USACE and DTSC approved the Vegetation Management Plan and the USACE issued a final letter stating that mitigation requirements have been met (Appendix B).

### **3. Long-Term O&M Activities**

#### **3.1 Fence and Signage Inspections and Maintenance**

Per the 2006 DTSC Order, the Site is currently fenced and includes signs that meet the EBRPD requirements. Based on review of the Draft O&M Plan, the DTSC requested that two additional signs be added along the fence separating Lot 3 from ESM. A total of four new signs were added (including the two that were requested by the DTSC) as illustrated on Figure 3. This O&M Plan provides for the maintenance of the existing

fence and signage to:

- reduce potential intrusion of recreators and domesticated animals;
- reduce potential exposures to residual contaminants in sediment; and
- protect sensitive habitats

The perimeter fence will be inspected on a semi-annual basis (twice a year) to identify any damage to be repaired or need to replace signs. The inspections will be conducted by an O&M Professional. The O&M Professional for this project will be an individual that is familiar with the marsh restoration along with the scope and objectives of this plan.

### **3.2 Vegetation Management and Maintenance**

Vegetation management and maintenance is ongoing and will continue to support and build upon the positive trajectory of native plant coverage established to date within ESM and the Upland Transition Zone. Ongoing vegetation management activities including exotic vegetation removal will continue to improve transitional and upland habitat conditions generally on the Site in accordance with the USACE and DTSC approved Vegetation Management Plan (ARCADIS 2012; Appendix A). The Vegetation Management Plan will be implemented for a period of three years, at which time strategies set forth in the plan will be reevaluated. Current strategies include targeted mowing and mechanical removal of non-native plant species, follow-up herbicide application, water-conserving soil amendments and/or mulching, associated weed control, and as-needed corrective actions.

Equipment used for routine maintenance activities include hand tools and handheld gasoline powered mowers and weed whips. Gasoline powered tools are used to remove non-native vegetation and maintain the upland and upland transition areas located upgradient of California clapper rail (CCR) salt marsh habitat in ESM. Active vegetation management activities are not planned or anticipated to take place within the ESM salt marsh zone (low, middle or high marsh) or within tidal channels where CCR have the potential to be present. Maintenance in the upland and upland transition areas using the handheld gas powered tools is generally completed in 1 to 3 work days per quarter as needed. To mitigate any impacts that this work may have on the CCR in ESM, the gasoline powered equipment will only be used during the period from approximately 1.5 hours after sunrise to 1.5 hours before sunset and gasoline powered equipment will not be used during the CCR nesting period (March through May). In addition, hand tools will be used to clear non-native vegetation in the flat salt marsh portions of ESM near the tidal channels. Thus this work is not anticipated to result in disturbance to the CCR.

### 3.3 Five-Year Report

The 2006 DTSC Order also requires that a 5-year review and evaluation of the completed remedy for ESM be conducted pursuant to Section 121 (c) of the Comprehensive Environmental Response Compensation and Liability Act, 42 U.S.C. 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499. The purpose of the 5-Year review is to evaluate the performance (i.e., the adequacy and effectiveness) of the previously implemented remedy in protecting public health, safety, and the environment, including an evaluation of the institutional controls (i.e., Land Use Covenant, O&M Plan). The 5-year review and evaluation is currently being performed in accordance with the DTSC-approved work plan (ARCADIS 2013) and will be submitted to the DTSC for review and approval.

### 3.4 O&M Schedule of Activities

Table 1 provides the overall O&M Schedule. Inspection documentation and reporting is summarized in Section 4. During the CCR nesting period (March through May) gasoline powered equipment will not be used during routine O&M activities.

**Table 1  
Routine O&M Activities**

<b>Visit</b>	<b>Activities</b>
Late Winter	<ul style="list-style-type: none"> <li>• Trash and Debris Removal</li> <li>• Weed Control (as needed)</li> <li>• Mowing (as needed)</li> <li>• Herbicide Application (as needed)</li> </ul>
Spring	<ul style="list-style-type: none"> <li>• Fence and Signage Inspection</li> <li>• Weed Control (as needed)</li> <li>• Mowing (as needed)</li> <li>• Herbicide Application (as needed)</li> </ul>
Summer	<ul style="list-style-type: none"> <li>• Trash and Debris Removal</li> <li>• Weed Control (as needed)</li> <li>• Mowing (as needed)</li> <li>• Herbicide Application (as needed)</li> </ul>
Fall	<ul style="list-style-type: none"> <li>• Fence and Signage Inspection</li> <li>• Weed Control (as needed)</li> <li>• Mowing (as needed)</li> <li>• Herbicide Application (as needed)</li> </ul>

## **4. Reporting and Record Keeping**

### **4.1 Annual Inspection Summary Reports**

The findings of inspections performed in accordance with Table 1 will be documented on an O&M Inspection Checklist form (Appendix C) that will be included in Annual Summary Reports. The Annual Summary Report will be submitted to the DTSC by the end of each calendar year.

Annual Inspection Summary Reports will summarize the findings of routine inspections, and will document completions, delays, or failures to repair any items identified as needing repairs.

Annual Inspection Summary Reports will include:

- Results of the visual inspections and any supporting data;
- A description of actions taken during the reporting period or changed in site conditions;
- Description of actions planned or expected to be undertaken in the next year;
- Conclusion regarding the effectiveness of O&M measures in meeting project objectives;
- Copies of inspection checklists and photo logs; and
- A summary of vegetation management and maintenance work performed during the year and a status of vegetative conditions and management in accordance with the Vegetation Management Plan.

### **4.2 DTSC Notification Requirements**

The DTSC will be notified of planned work associated with routine inspections and repairs or other activities requiring site access three weeks in advance of planned activities, if practical, or within 72 hours following unplanned activities, such as repairs.

## **5. Site Access**

Upon request, site access for DTSC representatives and O&M personnel will be arranged and provided by CSV and the Project Proponent upon request.

**6. References and Related Documents**

- ARCADIS. 2007. First Annual Monitoring Report East Stege Marsh Monitoring Plan Implementation Campus Bay - Richmond, California Permit Authorization #28252S. March 30.
- ARCADIS. 2007. Second Annual Monitoring Report East Stege Marsh Monitoring Plan Implementation Campus Bay - Richmond, California Permit Authorization #28252S. August 31.
- ARCADIS. 2008. Third Annual Monitoring Report East Stege Marsh Monitoring Plan Implementation Campus Bay - Richmond, California Permit Authorization #28252S. August 31.
- ARCADIS. 2009. Fourth Annual Monitoring Report East Stege Marsh Monitoring Plan Implementation Campus Bay - Richmond, California Permit Authorization #28252S. August 31.
- ARCADIS. 2010. Fifth Annual Monitoring Report East Stege Marsh Monitoring Plan Implementation Campus Bay - Richmond, California Permit Authorization #28252S. September 30.
- ARCADIS. 2011. Sixth Annual Monitoring Report East Stege Marsh Monitoring Plan Implementation Campus Bay - Richmond, California Permit Authorization #28252S. August 31.
- ARCADIS. 2012. Interim Long Term Vegetation Management and Maintenance Plan for the Habitat Enhancement Area (Habitat Area 1 and Habitat Area 2), Campus Bay Site, Richmond, California. November 12.
- ARCADIS. 2013. 5-Year Remedial Action Review Work Plan, Habitat Area 1 – East Stege Marsh, Campus Bay, Richmond, California. April 15.
- LFR. 2002a. Human Health and Ecological Risk Assessment East Stege Marsh. March 31.
- LFR. 2002b. Conceptual Remediation and Risk Management Plan for the Habitat Enhancement Area, Subunit 1, Meade Street Operable Unit, Richmond, California. October 4.
- LFR. 2002c. Comprehensive Monitoring Plan Subunit 1 of the Meade Street Operable Unit, Former Zeneca Inc. Richmond Facility, Richmond, California. November 7.



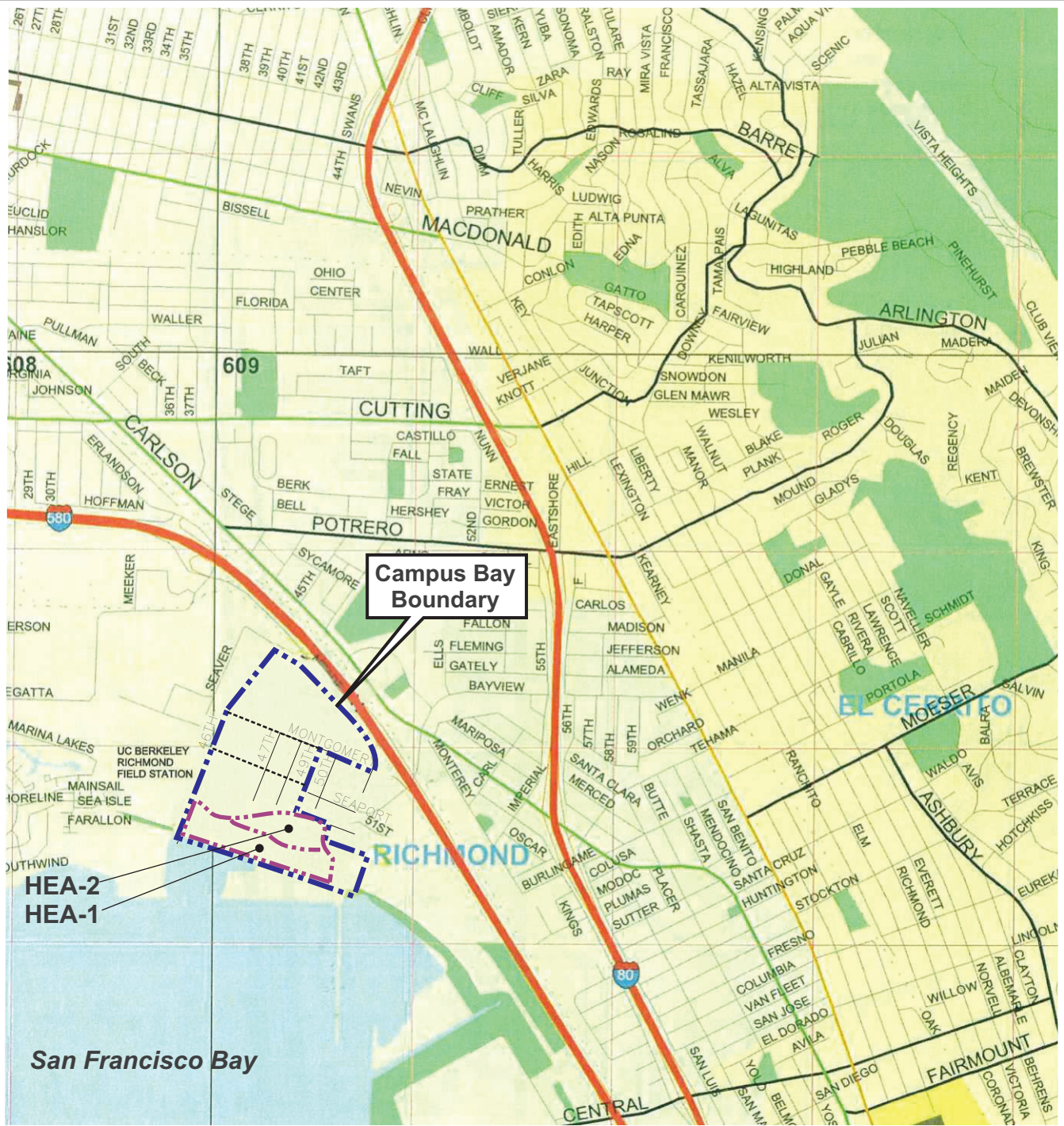
## **Operations and Maintenance Plan**

East Stege Marsh  
Campus Bay, Richmond,  
California



- LFR. 2003. Remedial Design Details for Habitat Enhancement Area, Subunit 1, Meade Street Operable Unit, Richmond, California. August 1.
- LFR. 2005. Removal Action Work Plan, Remaining Portions of ESM to Be Remediated, Campus Bay, Richmond, California. July 25.
- LFR. 2004. Letter transmitted to USACE Re: Revised Table 8 – Suggested Monitoring Performance Criteria, Meade Street Operable Unit, Richmond, California. June 15.
- LFR. 2006. Letter Report transmitted to the DTSC: Evaluation of Year 1 Sediment Monitoring Results from East Stege Marsh Removal Action Work Plan, Remaining Portions of ESM to Be Remediated, Campus Bay, Richmond, California. July 25.
- LFR. 2007a. Final Implementation Report for Remediation of Habitat Enhancement Area. March 5.
- LFR. 2007b. Pore Water and Sediment Sampling Work Plan, East Stege Marsh, Former Zeneca Facility, Campus Bay Project, Richmond, California. April 6.
- LFR. 2007c. Results of Pore Water and Sediment Sampling and Analysis. October 10.
- LFR. 2008. Results of 2008 Pore Water and Sediment Sampling, Campus Bay, Richmond, CA. September 19.

## Figures





SOURCE: THOMAS BROS MAP - Bay Area 2001

-  Approximate Campus Bay Property Boundary
-  Approximate Habitat Enhancement Area (HEA) Boundaries

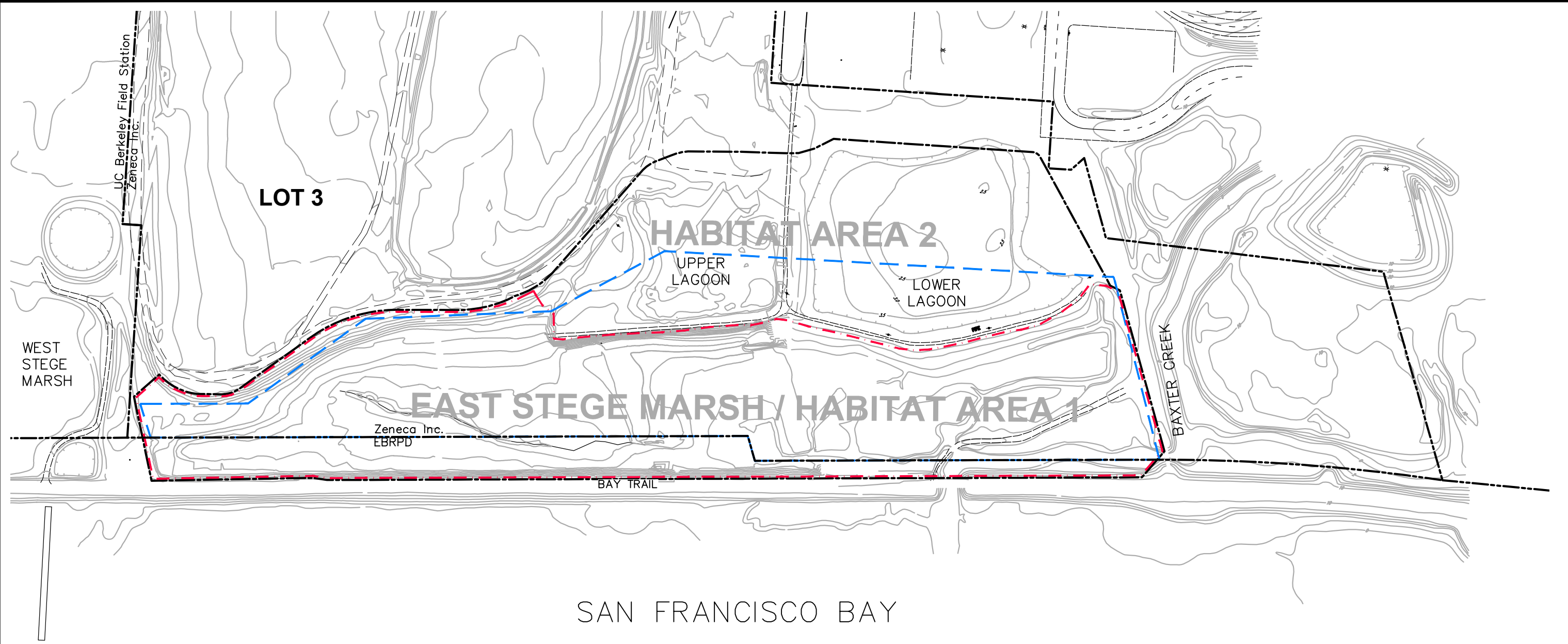
CAMPUS BAY SITE  
RICHMOND, CALIFORNIA

**SITE VICINITY MAP**

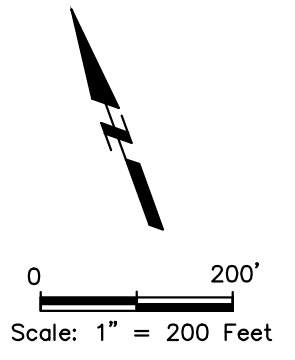


FIGURE  
**1**

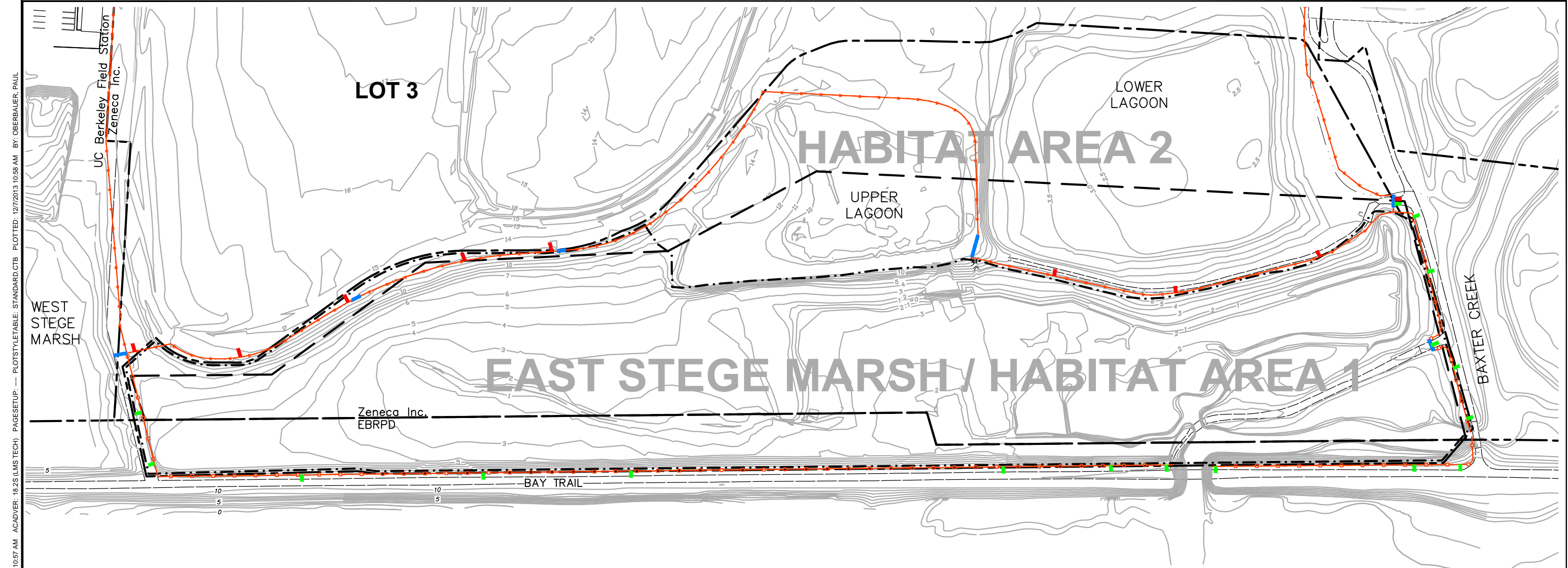
CITY:(Read) DIV:(GROUP:Read) DB:(Read) LD:(Opt) PIC:(Opt) PM:(Read) TM:(Opt) LVR:(Opt) ON="OFF" REF="G:\Workgroups\Design\00109359\2812011 Wetland Delineation\Zeneca Veg Mgmt Plan 01162012.dwg LAYOUT: 2 SAVED: 10/16/2013 5:11 PM ACADVER: 18.25 (LMS TECH) PAGESETUP: PLOTSTYLETABLE: LFR STANDARD.CTB PLOTTED: 10/16/2013 5:15 PM BY: OBERBAUER, PAUL XREFS: IMAGES: PROJECTNAME: 07545 Site update 12/2/2013-marsh-aerial-for-BA.TIF



- EXPLANATION:
- Site topography (NGVD29)
  - HEA boundary - 22.1 acres
  - Property boundary
  - Conservation Easement from Zeneca to EBRPD - 13.2 acres
  - HEA 1 - East Stege Marsh Boundary












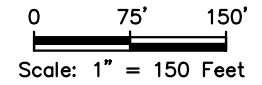
CAMPUS BAY, RICHMOND, CALIFORNIA	
<b>SITE PLAN</b>	
<b>ARCADIS</b>	FIGURE <b>2</b>




SAN FRANCISCO BAY

**LEGEND**

-  6' CHAIN LINK FENCE
-  4' NO CLIMB FENCE
-  GATE
  
-  RESOURCE PROTECTION SIGNAGE THAT STATES:  
"RESOURCE PROTECTION AREA, KEEP OUT"
  
-  HAZARDOUS SUBSTANCE SIGNAGE THAT STATES:  
"CAUTION: HAZARDOUS SUBSTANCE AREA,  
UNAUTHORIZED PERSONS KEEP OUT"
  
-  PROPERTY LINE
-  HEA BOUNDARY - 22.1 ACRES
-  HEA 1 - EAST STEGE MARSH BOUNDARY
-  CONSERVATION EASEMENT BOUNDARY - 13.2 ACRES



CAMPUS BAY, RICHMOND, CALIFORNIA	
<b>FENCE AND SIGNAGE MAP</b>	
	FIGURE <b>3</b>

CITY:\Reed\DIV\GROUP\Reed\ DB\Reed\ LD\Opt\ PIC\Opt\ PM\Reed\ T\T\Opt\ LVR\Opt\ON+\"OFF\"-REF\"  
 G:\Workgroups\Design\001\0935928\2011\Wetland\Delimitation\Figure 4\Monitoring\Locations1.dwg LAYOUT: OM3 SAVED: 12/7/2013 10:57 AM ACADVER: 18.2S (LMS TECH) PAGESSETUP: --- PLOTSTYLETABLE: STANDARD.CTB PLOTTED: 12/7/2013 10:58 AM BY: OBERBAUER, PAUL  
 XREFS: IMAGES: PROJECTNAME: 0010912001001  
 Wetland-FINAL\_GRADE-ADDITION-Rev1  
 Zeneca as build site topo  
 Wetland-UTILITY-R1



## **Appendix A**

Interim Long-Term Vegetation  
Management and Monitoring Plan for  
the Habitat Enhancement Area

**Interim Long-term Vegetation Management and  
Maintenance Plan for the Habitat Enhancement  
Area (Habitat Area 1 and Habitat Area 2)  
Campus Bay Site  
Richmond, California**

**May 1, 2012  
Revised: November 5, 2012**

Prepared for  
U.S. Army Corps of Engineers

**TABLE OF CONTENTS**

1.0 INTRODUCTION ..... 1

    1.1 RESPONSIBLE PARTIES ..... 1

    1.2 LOCATION OF PROJECT SITE ..... 1

    1.3 SCOPE AND SCHEDULE ..... 2

2.0 PROJECT AREA DESCRIPTION AND BACKGROUND ..... 2

3.0 VEGETATION MANAGEMENT/MAINTENANCE PLAN IMPLEMENTATION ..... 4

    3.1 SITE PREPARATION ..... 4

        3.1.1 WEED CONTROL ..... 4

    3.2 PRESERVATION OF EXISTING NATIVE SPECIES ..... 7

4.0 MANAGEMENT AND MAINTENANCE ACTIVITIES ..... 7

    4.1 WEED CONTROL ..... 8

    4.2 HERBICIDE APPLICATION REQUIREMENTS ..... 8

    4.3 TRASH REMOVAL ..... 9

    4.4 MAINTENANCE SCHEDULE ..... 10

5.0 MONITORING ..... 10

    5.1 PERFORMANCE OBJECTIVES ..... 11

6.0 ADAPTIVE MANAGEMENT APPROACH ..... 11

7.0 CONTINGENCY SEEDING AND NATIVE PLANTING ..... 11

    7.1 CONTINGENCY IRRIGATION ..... 12

    7.2 CONTINGENCY SOIL AMENDMENT IN SEEDING AREAS ..... 13

    7.3 CONTINGENCY UPLAND/WETLAND SEEDING ..... 13

8.0 REFERENCES ..... 14

**FIGURES**

Figure 1: Focus Area for Vegetation Management Activities

## 1.0 INTRODUCTION

ARCADIS-US (ARCADIS) has prepared this Interim Long-term Vegetation Management and Maintenance Plan (the Plan) for the Habitat Enhancement Area (HEA) [Habitat Area 1 and Habitat Area 2] located on the Campus Bay Site in Richmond, California (the "Site") as required by the U.S. Army Corps of Engineers (USACE). This Plan was developed to facilitate the continued improvement in habitat restoration and vegetation management efforts and proposes an adaptive management approach for the upland transition and upland habitat areas within the HEA to meet performance objectives. Accordingly, this Plan provides a work plan and proposed schedule to conduct follow-up maintenance activities and prepare annual status summaries within a designated portion of the HEA (see Figure 1). This Plan also provides for the development of an ongoing HEA vegetation stewardship program to assist in supporting the original restoration project and habitat enhancement objectives.

Habitat revegetation performance criteria and vegetation management objectives were previously developed as part of the HEA Habitat Enhancement Plan (HEP) in coordination with the USACE and other resource agencies. ARCADIS has gained essential experience during and following the implementation of the East Stege Marsh (ESM) and HEA habitat restoration and enhancement efforts that have informed the development of this Plan, including the identification of functional methods associated with debris and vegetation removal, specific non-native plant species of concern, targeted herbicide application, upland planting, and ongoing maintenance requirements.

### 1.1 RESPONSIBLE PARTIES

Cherokee Simeon Venture I, LLC is the current owner of the HEA; the project proponent is Zeneca, Inc. The Responsible Parties named in the 2005 Site Investigation Order (Order) are responsible for implementing the Operation and Maintenance Plan as part of site remediation. One or more Responsible Parties will be responsible for implementation and compliance with the provisions of this Plan. Annual status updates will be provided to the California Department of Toxic Substances Control (DTSC) as the primary agency currently overseeing remedial activities being conducted in accordance with conditions stipulated in the final adopted HEA Operation and Maintenance Agreement.

### 1.2 LOCATION OF PROJECT SITE

The HEA is a tidal wetland and upland habitat enhancement area. Figure 1 depicts the location of the HEA and ESM, located in the southern portion of the Campus Bay property located west of Interstate 580 (I-580), west of Bayview Avenue, and south of Meade Street in Richmond, California.

The overall HEA footprint is a 22.1 acre oblong open space area comprised of salt marsh, freshwater ponds/lagoons and upland habitat fronting the Campus Bay property. The previous owner, Zeneca, granted a conservation easement within the HEA to the East Bay Regional Parks District (EBRPD), which is incorporated as part of the Eastshore State Park (ESP) system. The EBRPD conservation easement comprises approximately 13.2 acres along the bay frontage (Figure 1). Development activities within the conservation easement boundary are prohibited.

### 1.3 SCOPE AND SCHEDULE

The Plan proposes an adaptive management approach that includes monitoring of the maintenance elements comprising of four appropriately-scheduled vegetation maintenance events per year. The vegetation management and maintenance activities incorporate relevant milestones, such as targeted seasonal clearing and weed suppression, seasonal considerations, and plant development phases, etc. This Plan also includes requirements for regularly scheduled (quarterly) site inspections to document the current vegetative conditions, status and summary of vegetation maintenance activities, aerial extent of enhanced habitat areas, and limited photo documentation. Annual HEA restoration status updates will be prepared for DTSC review. Contingencies for additional invasive weed control and new planting are incorporated in the Plan for implementation, if deemed necessary based on summaries provided in the annual HEA status update reports.

This Plan will be implemented for a period of three years, at which time strategies set forth in the Plan will be reevaluated. Strategies include targeted mowing and mechanical removal of non-native plant species, follow-up herbicide application, water-conserving soil amendments and/or mulching, associated weed control, and as-needed corrective actions.

## 2.0 PROJECT AREA DESCRIPTION AND BACKGROUND

The areas where ongoing vegetation management and maintenance activities associated with this Plan will be implemented are the transitional and upland habitat areas within the portion of the HEA referred to in the attached Figure 1 as the "Focus Area for Vegetation Management Activities" (Focus Area). This Focus Area includes a total area of approximately 3.9 acres.

The Site, of which the HEA is a part, was a former industrial and agricultural chemical manufacturing and formulating facility where various entities had performed manufacturing for over 100 years until approximately 1997. The Site consists of 86 acres of former manufacturing and research areas, including two former storm water/process water retention lagoons and the ESM. The adjacent West Stege Marsh is located on property primarily owned by the University of California. Zeneca voluntarily initiated a Phase I Environmental Site Assessment and a Phase II Investigation to characterize environmental conditions at the Site. Results of the Phase II Investigation and previous environmental investigations indicated that soil and groundwater beneath the Site had been affected by chemicals. An ongoing remediation program at the Site previously under the oversight of the San Francisco Regional Water Quality Control Board and currently under the oversight of the California Department of Toxic Substances Control is ongoing. Numerous evaluations of the HEA have been performed over the past decade to assess its hydrology, soils, and environmental conditions. Previous studies have evaluated the general conditions in the HEA and have documented previous sampling and activities related to completion of remediation and environmental restoration conducted to date. The activities completed in the HEA are documented in the "Final Implementation Report for Remediation of Habitat Enhancement Area, Campus Bay, Richmond, California," dated January 11, 2007. A summary of these activities is provided below.

In 2002, a Site Remediation and Habitat Enhancement Plan was developed for the HEA (LFR, 2002a) and a Conceptual Remediation and Risk Management Plan (CRRMP; LFR, 2002b) was prepared to reduce mass contaminants in the HEA, minimize potential off-site migration, minimize impact to habitat, and to expand and enhance wetland habitats. Alternative RA-4a (modified) of the CRRMP was approved by the Regional Water Quality Control Board in June 2003 and it was deemed to most



effectively accomplish the goals of the CRRMP with minimal impact to the existing marsh habitat. Alternative RA-4a also included a small expansion of the salt marsh at its western extent. Remediation and vegetation maintenance activities in the HEA were permitted by USACE 404 Permit #282525 and San Francisco Bay Conservation and Development Commission (BCDC) Improvement Permit #MO1-52.

Since 2006, Site preparation, planting, and vegetation maintenance activities have been conducted in conjunction with the Site's remediation and grading activities. Initial phases of vegetation management included exotic vegetation removal to clear the HEA of large non-native woody and herbaceous perennial plants. Large woody debris and dead shrubs, and exotic shrubs such as French broom (*Genista monspessulana*) and pampas grass (*Cortaderia selloana*) were removed in addition to accumulated foliage from perennial exotic weeds, such as fennel and hemlock followed by subsequent targeted herbicide applications. Repeated targeted removal of pepperweed (*Lepidium latifolium*) was also conducted throughout 2009, 2010 and 2011. Pepperweed has been less prevalent during 2011 but aggressive efforts have been implemented throughout 2011 to control new growth.

The HEA is bordered on the northern side by upland fill areas and is bordered on the southern side by an embankment that fronts San Francisco Bay. The top of the embankment is at an elevation of between 10 and 13 feet NGVD. The EBRPD's Eastshore State Park Bay Trail (formerly a railroad line) runs along the southern side of ESM. The embankment of the Bay Trail rises abruptly from the marsh, and the trail surface is at an elevation of approximately 10.5 feet NGVD. An area of historic fill material separates the HEA and West Stege Marsh and Carlson Creek runs along the eastern side of the HEA. The HEA surface elevation ranges from approximately 1 foot NGVD to approximately 14 feet NGVD. The high tide line is at approximately 5.0 feet NGVD.

The HEA has an overall gradient toward the south, but topography is complex at smaller scales. Much of the HEA is tidal marsh, while upland areas are typified by broad berms that separate ESM and the lagoons. The berms, lagoons, and marsh can be distinguished on aerial photographs as well as bare areas without vegetation.

The ESM is a tidally influenced jurisdictional wetland and the largest feature of the HEA. The marsh is influenced by tidal fluctuations from San Francisco Bay and is dominated by tidal salt marsh habitat.

The EBRPD portion of the HEA is currently undeveloped and is part of the ESP. The ESP includes approximately 2,262 acres of tidelands and upland property along 8.5 miles of shoreline of the San Francisco Bay. The ESP extends from the City of Richmond in the north through the Cities of Berkeley, Emeryville and Oakland in the south.

The HEA upland transition and upland areas include a mixture of both native and non-native vegetation, including non-native grasses, forbs and shrubs such as pampas grass (*Cortaderia selloana*), brome (*Bromus* spp.), pepperweed (*Lepidium latifolium*), wild oat (*Avena fatua*), leafy spurge (*Euphorbia esula*), and wild radish (*Raphanus sativus*). The HEA also supports areas with localized concentrations (often monotypic) of fennel (*Foeniculum vulgare*), Himalayan blackberry (*Rubus discolor*), French broom (*Genista monspessulana*), leafy spurge (*Euphorbia esula*), and the native coyote bush (*Baccharis pilularis*); some concentrations of coyote bush are large enough to be considered a coyote-bush dominated scrub community. The coyote brush stands are of varying sizes and plant density. Trees in the HEA are represented by widely scattered and in some instances

dense patches of arroyo willow (*Salix lasiolepis*) in the low areas and, less commonly, acacia trees (*Acacia longifolia*).

### 3.0 VEGETATION MANAGEMENT/MAINTENANCE PLAN IMPLEMENTATION

A description of ongoing vegetation management and maintenance tasks is provided below, including accepted methods for removal and control of exotic/non-native invasive plant species.

#### 3.1 SITE PREPARATION

##### 3.1.1 WEED CONTROL

This section describes general invasive weed eradication activities that will be implemented at the HEA. Invasive weed/brush species management will begin with the cutting and removal of above ground growth. The targeted invasive species will be aggressively removed and chipped on-site and consolidated in chip piles to support decomposition. Weed eradication will occur via grubbing, mechanical clearing, and mowing within the vegetation management focus area. Existing native wetland vegetative cover will be preserved during the grubbing and clearing process. Where feasible, native shrubs and trees will also be saved; non-native trees and shrubs will be targeted. This invasive species control program will specifically target: pepperweed (*Lepidium latifolium*), pampas grass (*Cortaderia selloana*), Mustard (*Brassica nigra*), Fennel (*Foeniculum vulgare*), Himalayan blackberry (*Rubus armeniacus*), Bristly ox tongue (*Picris echioides*), Russian thistle (*Salsola soda*), French broom (*Genista monspessulana*). The following non-native grasses will be targeted: Annual ryegrass (*Lolium multiflorum*), Rabbitsfoot grass (*Polypogon monspeliensis*), Bermuda grass (*Cynodon dactylon*), Wild oats (*Avena* sp.), and Ripgut brome (*Bromus diandrus*). A qualified restoration ecologist, landscape architect, or other professional familiar with native plant restoration will guide the work, inspect progress, and assist in the annual documentation of ongoing weed removal efforts.

Options for weed removal methods for Himalayan blackberry (*Rubus armeniacus*), broom (French broom [*Genista monspessulana*], Scotch broom [*Cytisus scoparius*], and Spanish broom [*Spartium junceum*]), fennel (*Foeniculum vulgare*), acacia (*Acacia longifolia*), pampas grass (*Cortaderia selloana*), and non-native annual grasses are described below. Methods for removing Himalayan blackberry, broom, fennel, acacia, and pampas grass are adapted from the Weed Workers' Handbook (TWP & CIPC 2004).

##### PEPPERWEED

- Target all observed Pepperweed (*Lepidium latifolium*) and remove plants using hand or mechanical removal techniques (including roots) and dispose with care not to re-distribute seed or plant material on the HEA in a manner that could lead to re-emergence or re-sprouting.
- Apply/spray Aquamaster® (Glyphosate) in early September. Glyphosate is considered effective against *Lepidium* if applied in the fall.

---

## HIMALAYAN BLACKBERRY

- Cut stems with loppers close to the ground. Where feasible, dig out the root ball with a pulaski or shovel and remove as much of the root as possible. Interconnecting roots reaching over 30-foot-long and 2 to 3-foot-deep make pulling up all the roots difficult. Therefore, aim to remove the main root ball and the large lateral roots.
- Brush cut the canes and use rakes and hoes to clear the vegetation when flowers are in bloom but before the fruit sets. Cutting encourages new growth but may be effective if repeated over a number of years.
- Cut stems to about 1 foot above ground level and treat stumps with a 25-50 percent concentration of Glyphosate (as approved by the Environmental Protection Agency [EPA] for an aquatic setting) immediately after cutting.

---

## BROOM

- Pull shrubs by hand or with a weed wrench, or dig with a pulaski, pick, or shovel between January and May, when the moist ground makes it easier to remove the roots and before another generation of seeds has developed. Repeated pulling of successive generations is currently thought to be the single most effective method of removing broom.
- Cut shrubs to just above ground level using a pruning saw, loppers, or brush cutter, ideally during the dry season so that the stumps become more stressed. Cutting, rather than pulling, has the advantage of minimizing soil disturbance. Untreated cut stumps will re-sprout and must be cut repeatedly. Alternatively, cut the stems about 2 inches above ground level, then girdle the stump by peeling the bark off the stems down to ground level. This method reduces re-sprouting and works best on medium to large broom plants.
- Cut stems, using loppers, to about 2 inches above ground level and grub out the roots.
- Cut and treat/spray the stumps with herbicide approved by EPA for an aquatic setting.
- Girdle the trunk of large broom plants with a small hand tools such as a paint scraper. (Warning: while girdling minimizes soil disturbance, standing dead broom will increase, not reduce, fire hazards. In addition, broom left standing will interfere with future weed removal activities.)
- Scrape/remove seedlings with a hoe.
- Emerging seedlings will likely have to be removed for the next 3 years or perhaps longer. In the first year after removing mature plants, the next generation will be too small to pull, but this dense flush of seedlings is effectively controlled by flaming with a propane torch. A single pass with the torch will wilt and kill seedlings. Controlling broom plants when they are seedlings will reduce a great deal of work in pulling plants the second year after removing mature broom. Remove the broom before the seed pods mature. Broom re-sprouts from the base when cut; therefore, all broom except seedlings and old, senescent plants can re-sprout after cutting if not treated with herbicide. Re-sprouting stump shoots can be cut or weed-whipped the following year, either in late spring or in the dry season. Repeat this treatment annually until the plants' energy resources are depleted.

- Remove any ripe seeds by brush cutting and bagging the flower heads. This method is also a useful stop-gap measure to contain the spread of fennel on sites where elimination is not possible. Check for seedling growth twice a year, particularly in late winter/early spring, and follow up on re-sprouts to exhaust energy stored in the roots.

---

## FENNEL

- Pull small seedlings by hand when soil is soft and moist. Hand tools, such as a soil knife or trowel, can also be used to uproot seedlings. A thick taproot frequently makes pulling mature fennel impracticable.
- Dig out individual plants with shovels, hand picks, and pulaskis, preferably when the soil is still moist. If the entire root mass cannot be removed, remove at least the upper portion of the root crown (generally the top 3-6 inches). Cutting into the root just before the plant sets seed reduces the number of re-sprouts. If following up with herbicides is not planned, dig only in light infestations, because the soil disturbance will expose seeds and increase germination. The deep taproot and bulb store the plant's energy and will regenerate quickly if cut. Cutting alone will not kill fennel, so follow up on re-sprouts frequently to exhaust the roots.
- Mow fennel 4 times per year, about every 3 months, beginning in March-April. Some seed heads lie prostrate and are therefore easier to miss. Mowing during seed set encourages seed spread and should therefore not be conducted. Mowing too soon before seed set appears to increase vegetative growth. Reports suggest that this repeated mowing technique can eradicate fennel within 4 years.
- Mow and wait for re-sprouts to appear, then apply Glyphosate (foliar spray approved by EPA for an aquatic setting) to the bushy re-sprouts.
- Foliar spray a 2 percent solution of Glyphosate (approved by EPA for an aquatic setting) on the leaves of green seedlings emerging after dormancy (March-May). Spray before the plant bolts (around June). Repeat application may be needed.

---

## ACACIA

- Pull seedlings and small saplings by hand or with a weed wrench, preferably when the soil is moist.
- Cut larger saplings and mature trees and treat with herbicide approved by EPA for an aquatic setting.
- Cut to 1 foot above ground level and cover stump with black plastic or fabric shade cloth.
- Cut to 1 foot above ground level and macerate stump.
- Girdle or frill.
- Drill and inject with herbicide (approved by EPA for an aquatic setting).

## PAMPAS GRASS

- Where possible, pull seedlings by hand or with the help of a pick, pulaski, or shovel.
- Cut larger plants and remove the root mass. First, carefully cut and dispose of all seed plumes, including immature ones that have yet to emerge from their sheath because they may be able to mature. Next, cut stems and leaf blades to near ground level with a pulaski, Swedish brush ax, or chainsaw. Some practitioners prefer to use a chainsaw to remove the mass of leaves, while others caution that this method is dangerous (the chainsaw user must kneel and cannot see the blade) and slow (the grass quickly clogs the chainsaw guard). An expertly sharpened machete is also effective, but like a chainsaw, is an appropriate tool only for experienced professionals. Finally, remove the root mass. If it is very large, use the ax side of the pulaski to chop it into 4- or 5-inch squares, then use the flat side of the pulaski to hoe out the pieces.
- Pull very large plants with a truck hitch. This method is possible if the pampas grass is near a road and a strong truck is available. Place a choker cable around the plant, digging it into the ground a little behind the plant so it won't slip off. Secure the cable to the truck hitch and pull the plant out easily.
- Cut the plumes of plants that are unable to be removed as a temporary containment measure. Cut the plumes while they are still pink or purple (prior to producing seeds), typically in August to October. However, cut plumes can produce another seed plume from the same stalk in as little as 1-2 weeks.
- Foliar spray 2 percent Glyphosate (approved by EPA for an aquatic setting) on all green growth during the active growth period (November–July). Spraying minimizes soil disturbance, but the herbicide must contact the entire leaf surface which is a difficult task for large plants. An additional caution: plants that appear dead soon after spraying may survive and re-grow the following year.
- Cut away the stems and leaves and then apply herbicide to the cut stems near the root mass.

## NON-NATIVE TREES

- Cut the trunk of larger brush stems and trees at approximately 1 foot above ground level and paint the stump with herbicide (approved by EPA for an aquatic setting).
- Spray or hand-pull seedlings.

### 3.2 PRESERVATION OF EXISTING NATIVE SPECIES

Care will be taken when conducting weed control activities so that existing native plant coverage is not disturbed. Extra caution will be taken when removing non-native plants and trees that are within the drip line of preserved trees or shrubs.

## 4.0 MANAGEMENT AND MAINTENANCE ACTIVITIES

The activities described below will be implemented within the upland habitat restoration areas (Focus Area for Vegetation Management Activities, Figure 1) to ensure appropriate long-term management and maintenance. Management and maintenance activities will occur in the Focus

Area on both an as-needed and routine basis for three years (2012-2014). In general, management and maintenance activities will be conducted by the applicants or designated subcontractors and will consist of activities that are conducted according to an established schedule including a minimum of 4 vegetation management/ maintenance events per year. Management activities within the restoration areas may consist of the following: weed control/removal, mowing, spraying, native planting maintenance, browse protection, irrigation system maintenance, and trash removal.

#### 4.1 WEED CONTROL

Maintenance and management activities within the buffer areas may consist of the following: weed control, native seeding maintenance, and irrigation system maintenance.

Remove targeted non-native plants and noxious weeds (as listed in Section 3.1.1) that may become established within the Focus Area. Where possible, the entire plant will be removed, including the roots. In other cases, plants will be removed to the soil line and sprayed as they re-sprout.

Weeding shall be performed at four (4) intervals during the one year maintenance period: two (2) in early spring, one (1) the week prior to the 4th of July, and one (1) in the fall. Weeding shall be completed to the satisfaction of the qualified restoration ecologist and in accordance with the established performance criteria. Weed control will be implemented using hand removal techniques and augmented with herbicide applications. Weed control activities will be timed to occur just prior to the flowering period of the target species to prevent seed development and dispersal.

The native upland and wetland seeding areas and wetland plugs will be inspected a minimum of four times per year and properly maintained.

#### 4.2 HERBICIDE APPLICATION REQUIREMENTS

Weed control will be implemented around the installed native plants; such control will consist of weeding inside the watering basins and weeding immediately around the plants (outside of the weed fabric). Weed control will be performed in early spring, late spring, and mid-summer.

Hand removal techniques will be used for implementing weed control unless the weed infestation is so severe that herbicide application is necessary. Weed control activities will be timed to occur just prior to the flowering period of the target species to prevent seed development and dispersal. If herbicide application is necessary, it will be accomplished in accordance with the following standards:

- Only the use of EPA-approved herbicides suitable for aquatic settings (e.g., Rodeo, or other herbicide(s) approved for use in aquatic settings) will be permitted.
- Herbicide will be applied by a licensed applicator.
- No spraying will be permitted if wind speed exceeds 5 miles per hour.
- Application equipment will be limited to hand-held sprayers, backpack sprayers, and/or wick applicators.

- Once non-native species are determined to be under control, hand-removal techniques will be the primary method of control.

Blue spray pattern indicator shall be added to the mix tank after herbicide. Application rate of colorant shall be 1 ounce per gallon.

Do not overspray as to cause runoff of herbicide. Do not spray when winds and/or gusts are above 5 miles per hour. Contractor may use "IN-PLACE" (Deposition Aid and Drift Management Agent) at Contractor's option, when applying Roundup Pro to prevent off-site drift.

Apply herbicide per manufacturer's label directions and in conformance with state and local codes.

It shall be the responsibility of the Contractor to arrange for their QAL/QAC to report all contract herbicide usage to the County Agricultural Commissioner, with a copy to the District.

Dispose of all empty herbicide containers off-site in a legal manner.

The contractor shall notify the designated property manager at least 48 hours before spraying. Target non-native plants will be periodically sprayed with herbicide per manufacturer's instructions (Aquamaster®, a re-labeling of Rodeo®) to eradicate them. A surfactant is typically added to Aquamaster® which is registered for aquatic use and used on days when there is no rain forecast for at least 24 hours and when the wind speeds were at or below 5 miles per hour in order to minimize spray drift.

The final chemical mixing rate for the following (for each 4-gallon backpack sprayer) will be determined based on confirmed guidance provided by a Certified Pest Control Advisor:

- Roundup Pro® or Aquamaster® (for aquatic areas)
- No Foam A or Competitor Surfactant
- Milestone VM Plus (broadleaf selective herbicide for uplands and seasonally dry wetlands)
- Ammonium sulfate
- Coloring agent

Apply pre-emergent herbicide (Surflan A.S. Specialty Herbicide) to areas to be seeded/planted before mulching.

Apply post-emergent herbicide (Roundup Pro) to seeded/planted areas after seeding/planting. At Contractor's option, "IN-PLACE" drift management agent may be used. Strip turf and weeds as soon as all plant material is dead.

Apply Aquamaster® (Glyphosate) in early September to any observed Lepidium.

#### 4.3 TRASH REMOVAL

Trash will be removed from the enhancement area on a semi-annual basis. Undesirable litter that can smother establishing plants and/or injure wildlife will be targeted (e.g., plastic, styrofoam, etc.). All trash removed from the HEA will be disposed of at an appropriate off-site location.

## 4.4 MAINTENANCE SCHEDULE

Maintenance of the revegetated areas at the HEA will be timed on a seasonal and daily basis, if necessary, to avoid impacts to nesting raptors and to minimize impacts to other wildlife species that utilize the HEA. Maintenance includes weed control activities (e.g., mowing, use of a weed whacker, pulling or digging plants out by hand or with tools, use of a weed torch, and/or use of herbicides), trash removal, and other similar activities. Weed maintenance efforts will occur on a regular basis to minimize competition to native plants from encroaching weed species. Maintenance of fencing and other structures will occur as needed to protect resources within the HEA. Weeding shall be performed at four (4) intervals during each annual maintenance period: two (2) in early spring, one (1) the week prior to the 4th of July, and one (1) in the fall (see Table 1).

**Table 1. Routine Maintenance Activities**

Visit	Activities
Spring (March)	<ul style="list-style-type: none"> <li>• Trash and Debris Removal</li> <li>• Weed Control (as needed)</li> <li>• Mowing (as needed)</li> <li>• Herbicide Application (as needed)</li> </ul>
Spring (Early May)	<ul style="list-style-type: none"> <li>• Weed Control (as needed)</li> <li>• Mowing (as needed)</li> <li>• Herbicide Application (as needed)</li> </ul>
Summer (Early July)	<ul style="list-style-type: none"> <li>• Trash and Debris Removal</li> <li>• Weed Control (as needed)</li> <li>• Mowing (as needed)</li> <li>• Herbicide Application (as needed)</li> </ul>
Fall (September/October)	<ul style="list-style-type: none"> <li>• Weed Control (as needed)</li> <li>• Mowing (as needed)</li> <li>• Herbicide Application (as needed)</li> </ul>
Annual HEA Status Summary Report	<ul style="list-style-type: none"> <li>• Submitted to DTSC prior to December 31 each year</li> </ul>

## 5.0 MONITORING

The HEA will be monitored on an annual basis. The HEA will be inspected at a minimum of four times per year and properly maintained. Previously installed plantings in the HEA will be inspected during the minimum quarterly visits by the project restoration specialist, who will determine if contingency activities are necessary. Annual reports will include a summary of work performed



during the year and a status of vegetative conditions and status of the various HEA vegetation management areas regarding vegetation extent, composition and condition. The reports will be used to support subsequent maintenance activities for the following year. Representative photographs will be taken on an annual basis for three years. At the end of three years, a report will be prepared that includes summaries of the monitoring data and representative photographs. Previously installed plantings in the HEA will be regularly inspected by the project restoration specialist.

## 5.1 PERFORMANCE OBJECTIVES

The overall performance goal will be to support the previously established upland transition native vegetation cover objective of 50% aerial coverage in the "Focus Area" as a whole with the understanding that this objective is a general guideline, but may not be met in all areas due to the site-specific constraints. This Plan will be implemented to control the target non-native species of concern as described in the Plan.

If it is determined that the overall performance goal is not being met, the contractor shall implement reseeding and weed control or other suitable corrective actions.

## 6.0 ADAPTIVE MANAGEMENT APPROACH

If the performance/success criteria are not met, adaptive management strategies will be triggered. Adaptive management strategies may include, but are not limited to: modifications to the clearing schedule and specific areas targeted for treatment, consideration of targeted reseeding and/or replanting native plant species if areas are encountered where significant mortality has occurred; modifying weed-management strategies; targeted temporary irrigation; improving browse-protection methods (measures to reduce damage to tender young plants by browsing animals such as rabbits); increasing fertilizing; improving erosion control, and improving protection of the overall site.

## 7.0 CONTINGENCY SEEDING AND NATIVE PLANTING

The HEA upland transition and upland habitat restoration areas have been previously seeded and/or planted with native grasses, native herbaceous species and native shrubs that are known to occur in the vicinity as listed below:

### Summary Listing of Key Native Plant Species Located in the Vegetation Management Focus Area:

Upland transition and upland coastal scrub zones - *Baccharis pilularis*, *Artemisia californica*, *Mimulus aurantiacus*, *Heteromeles arbutifolia*, *Eriophyllum staechadifolium*, *Lupinus arboreus*, *Lupinus chamissonis*, and *Salvia mellifera*

Freshwater lagoons - *Salix laevigata*, *S. lasiolepis*

*Bromus carinatus* - Primarily on the slopes amongst the brush, but also seen throughout the HEA, especially on the moist soil above the wetland.

*Nassella pulchra* - Found on the slopes amongst the brush, the northern grassland near the willows and the upland transition zone that was recently planted.

*Hordeum brachyantherum* - Dense stand in the moist soil between the tidal marsh and the recently planted upland transition zone. Occasional plants found throughout the HEA.

*Elymus glaucus* - Primarily on the slopes amongst the brush and found throughout the HEA.

*Distichlis spicata* - Primarily at upper elevations within the tidal marsh and on the border between the tidal marsh and the upland transition zone.

*Salicornia virginica* – Located in low lying areas adjacent to the tidal salt marsh zone.

*Leymus triticoides*, *Leymus vancouverensis* - Part of the recent plant installation.

Additional plant or seed installation will only be conducted as a contingency action, if deemed necessary, and is generally outside the scope of this Plan. The guidelines presented below will be employed during contingency plant installation, as necessary, and during maintenance periods to promote successful plant establishment. These guidelines may be modified and refined based on input from the project restoration specialist.

- Plants will be placed with the roots untangled and laid out in the planting hole to promote good root growth and prevent the plant from becoming root bound.
- Roots will be adequately protected at all times from sun and/or drying winds.
- After excavation and before planting, the planting hole will be filled approximately half full with water, backfilled with 70 percent thoroughly broken-up native topsoil and 30 percent organic mulch, and then completely filled with water to minimize soil settling after installation.
- Plants will be set in the planting hole so that the crown of the root ball is just above finished grade. The crown of the plant will not be depressed.
- Each plant will be individually watered sufficiently to reach the lower roots (12 inches) at the time of planting.
- Biodegradable moisture barrier/wood chips or bark mulch (4 feet by 4 feet) will be installed around each plant.

## 7.1 CONTINGENCY IRRIGATION

If deemed necessary, contingency seeding/planting may require irrigation directly after seeding/planting. Additional temporary irrigation for plugs and container plantings will be considered as necessary to support ongoing vegetation management needs. Supplemental irrigation can be supported with either temporary drip emitters or micro-spray irrigation systems.

Irrigation can be applied during dry winters to supplement any deficiency in rainfall that may occur. The need for supplemental irrigation during subsequent years will be determined by the project restoration specialist.

If watering is deemed to be necessary it would typically occur during the summer months (and during other times if there is below average rainfall). Summer watering (April- October) will be infrequent and deep to encourage deep rooting by the native species and to discourage abundant growth of weed species. Because the majority of the species that will be planted are drought tolerant, it is anticipated that limited irrigation will be required. In addition, root diseases may develop if too much water is applied.

The exact quantity and frequency of irrigation during the plant establishment period will be determined in the field by the landscape contractor with input from a qualified restoration ecologist. The quantity and frequency of irrigation will be greatest immediately following initial plant installation and will be reduced to an as-needed basis in subsequent years.

Irrigation will not be necessary for the previously seeded vegetation or plantings since natural precipitation typically supplies sufficient water for the establishment of the grass, forb, and shrub species in the native seed mix. In addition, irrigation may wash seeds off the slopes or cause the seeded vegetation to fail if supplemental watering is insufficient. Furthermore, non-native weed species may be given a competitive advantage over native species by the application of additional irrigation water.

The amount and frequency of irrigation, if necessary, will be determined by conducting a test application in the late spring prior to each dry season. The test irrigation will entail monitoring the percolation rate and level of saturation of the soil. After the soil has reached its saturation point, the soil around the root zone will be augered to determine if the water has percolated below the root zone. If not, the process will be repeated until the desired results are achieved. The time required to achieve the goal will determine the duration of each application. The frequency of application will be determined by monitoring the soil moisture content. After the first irrigation application, the project restoration specialist will auger the root zone of several plants every three to four days to determine the amount of moisture. When the soil is relatively dry, the irrigation application will be repeated.

The irrigation system will be inspected on a regular basis during the dry season. Irrigation equipment will be properly maintained to ensure the appropriate amount of water is being delivered to the restoration areas.

## 7.2 CONTINGENCY SOIL AMENDMENT IN SEEDING AREAS

If areas are exhibiting poor soil conditions targeted soil amendment treatments will be considered. After restoration areas have been grubbed, an amendment can be lightly tilled into the soil. The amendment will be composed of nitrolized organic woodchips or ash with medium pH or other suitable equivalent and covered with organic mulch.

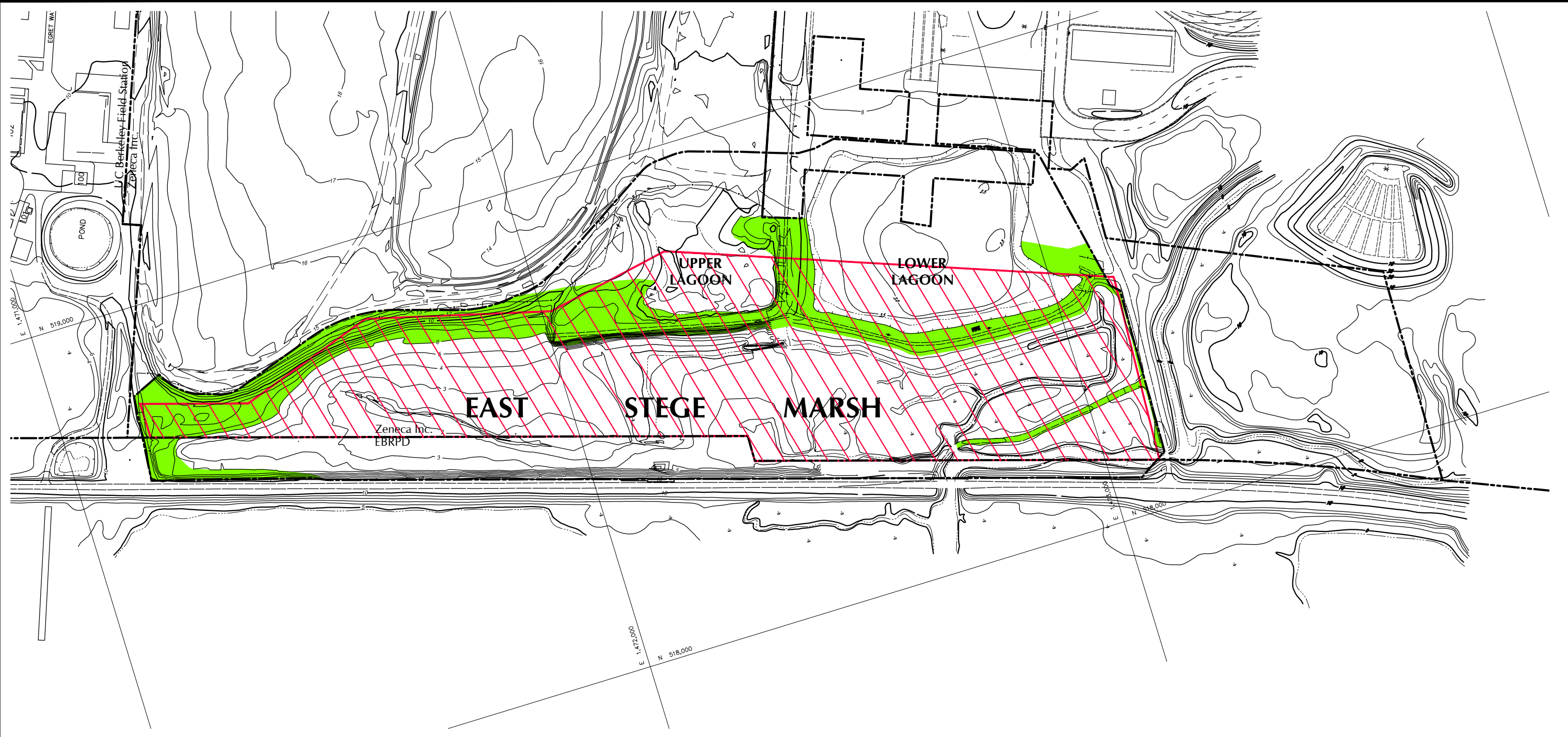
## 7.3 CONTINGENCY UPLAND/WETLAND SEEDING

If deemed necessary, upland and wetland seed mixes will be broadcast evenly in areas of the restoration areas that are disturbed by activities and exotic plant removal. The application procedure will involve scarifying the surface soil in the areas to be seeded. The seedbed area will be weed- and clod-free and raked smooth. The seed will be broadcast in specified areas and thoroughly raked into the soil. The seed will be distributed by hand. All installed plants will be protected from over-seeding. A light application of rice straw will be placed on top of the seeded areas. The seeded area will then be watered in thoroughly to soak the soil, improve seed to soil contact, and eliminate air pockets.

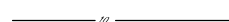




## 8.0 REFERENCES

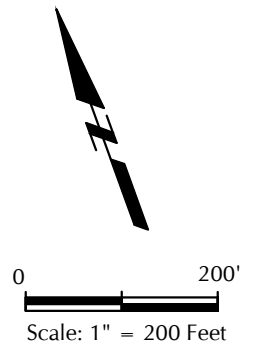
- ARCADIS. 2002a. Habitat Enhancement Plan for Marshland Portion of the Meade Street Operable unit, Subunits 1 and 2a, Richmond, California. July 26.
- . 2002b. Conceptual Remediation and Risk Management Plan for the Habitat Enhancement Area, Subunit 1, Meade Street. October 4.
- . 2007. Final Implementation Report for Remediation of Habitat Enhancement Area, Campus Bay, Richmond, California. January 11.
- The Watershed Project and California Invasive Plant Council (TWP & CIPC). 2004. The Weed Workers' Handbook, A Guide to Techniques for Removing Bay Area Invasive Plants. Prepared by The Watershed Project, Richmond, CA and California Invasive Plant Council, Berkeley, CA.


CITY:(Read) DIV:(GROUP:Read) DB:(Read) LD:(Opt) PIC:(Opt) PM:(Read) TMR:(Opt) LVR:(Opt)ON="OFF"REF"  
 I:\Design\001\0935928\2011 Wetland Delineation\Zeneca Veg Mgmt Plan 01162012.dwg LAYOUT: 1 (2) SAVED: 1/24/2012 3:24 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ... PLOTSTYLETABLE: LFR STANDARD.CTB PLOTTED: 1/24/2012 5:08 PM BY: OBERBAUER, PAUL  
 XREFS: IMAGES: PROJECTNAME: 07545  
 Site update 12/28/10-marsh-aerial-for BA.TIF



**EXPLANATION:**

-  Site topography (NGVD)
-  HEA boundary - 22.1 acres
-  Property boundary
-  Focus Area for Vegetation Management Activities - 3.9 acres
-  Conservation Easement from Zeneca to EBRPD - 13.2 acres



ZENECA INC. CAMPUS BAY SITE, RICHMOND, CALIFORNIA	
<b>FOCUS AREA FOR VEGETATION MANAGEMENT ACTIVITIES</b>	
	FIGURE <b>1</b>



## **Appendix B**

USACE Release of Liability Letter



DEPARTMENT OF THE ARMY  
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS  
1455 MARKET STREET  
SAN FRANCISCO, CALIFORNIA 94103-1398

NOV 21 2013

Regulatory Division (1145b)

SUBJECT: File Number 2003-282520S

Mr. William D. Marsh  
Edgcomb Law Group  
115 Sansome Street, Suite 700  
San Francisco, California 94104

Dear Mr. Marsh:

This letter is written in regards to the East Stege Restoration Enhancement Project, Corps file # 2003-282520S. The project is located on the Campus Bay property at 4677 Meade Street, in the City of Richmond, Contra Costa, California.

After review of the Fifth Year Monitoring Report dated September 30, 2010 and a site visit conducted by our staff on November 7, 2012, the Corps has determined that the project has achieved the success criteria outlined in the Restoration Enhancement Monitoring Plan. Consequently, the Corps concurs with your determination that the mitigation requirements have been met and long term monitoring of the project may cease.

Should you have any questions regarding this matter, please call Nina Cavett-Cox of our Regulatory Division at 415-503-6765. Please address all correspondence to the Regulatory Division and refer to the File Number at the head of this letter.

Sincerely,

ORIGINAL SIGNED  
BY Brian Matsumoto  
ACTING CHIEF, REG. DIV., SOUTH BR.  
FOR

Jane M. Hicks  
Chief, Regulatory Division

Copy Furnished:

Lucas Paz  
ARCADIS U.S., Inc.  
2999 Oak Road, Suite 300  
Walnut Creek, California 94597

CA RWQCB, Oakland, CA

Lynn Nakashima  
Department of Toxic substance Control  
700 Heinz Avenue  
Berkeley, Ca 94710

CF:

CESPN-OR-R (Rdg File)  
CESPN-OR-RS (CAVETT-COX)

CAVETT-COX Cox  
CESPN-R-S  
-6765 11/21/13  
November 20, 2013

MATSUMOTO  
CESPN-R-S  
HICKS  
CESPN-R





## **Appendix C**

O&M Inspection Checklist

**O&M INSPECTION CHECKLIST  
HABITAT AREA 1 – EAST STEGE MARSH  
CAMPUS BAY, RICHMOND, CALIFORNIA**

Inspector: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Climatic Conditions: \_\_\_\_\_

---

**Landscaping, Fencing, and Drainage Inspection**

Please observe and document the following:

- Inspect fencing
- Inspect signage
- Overall vegetation coverage and health
- Presence of exotic species; need for weed control
- Need for trash removal
- Need for mowing
- Areas recommended for herbicide application
- Tidal inundation
- Areas recommended for planting

**LOCATION OF OBSERVATION** (show on map, photo document):

---

---

---

---

---

**OBSERVATION TYPE AND DETAILED DESCRIPTION** (show on map, photo document):

---

---

---

---

---

**ACTION(s) TO BE TAKEN** (if necessary)\*:

---

---

---

---

---

---

**REMARKS:**

---

---

---

---

---

---

---

**Signature:**

Site Inspector: \_\_\_\_\_ Date: \_\_\_\_\_

**REPAIR RECORD**

Inspector: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Climatic Conditions: \_\_\_\_\_

---

**DEFICIENCY TYPE AND DETAILED DESCRIPTION:**

---

---

---

---

---

---

---

---

**LOCATION OF REPAIR ACTIVITY (show on map):**

---

---

---

**REPAIR ACTION TAKEN:**

---

---

---

---

---

---

---

**REMARKS:**

---

---

---

---

---

---

---

**Signature:**

Site Inspector: \_\_\_\_\_ Date: \_\_\_\_\_