

March 11, 2011

EM009358.0017.00001

Ms. Barbara Cook, P.E.
Acting Assistant Deputy Director, Cleanup Program
Site Mitigation Branch
c/o Lynn Nakashima
Department of Toxic Substances Control
700 Heinz Avenue, Suite 200
Berkeley, California 94710

Subject: Transmittal of Groundwater Data Collected in Select Areas at the University of California Richmond Field Station, Richmond, California

Dear Ms. Cook:

ARCADIS U.S., Inc. (ARCADIS) is submitting this letter on behalf of Zeneca Inc. (Zeneca), a respondent to the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) Site Investigation Order, Docket No. 06/07-004 (“DTSC Order”)¹. This letter report summarizes monitoring well installation and groundwater sampling activities and transmits the analytical results of groundwater samples collected in select areas at the University of California Richmond Field Station (UCRFS) located in Richmond, California (“the Site”; Figure 1). The well installation and sampling activities were required by the DTSC in its September 16, 2010 letter to Zeneca. The activities discussed in this letter were conducted in accordance with the procedures set forth in the following ARCADIS documents previously approved by the DTSC:

- “Revised Work Plan to Evaluate Groundwater in Select Areas at the University of California Richmond Field Station, Richmond, California,” dated November 24, 2010 (“the Work Plan”)
- “Lot 3 Field Sampling and Analysis Plan, Campus Bay Site, Former Zeneca, Inc., Richmond Facility, Richmond, California,” dated November 2, 2005 (“the Lot 3 FSAP”)
- “Revised Health and Safety Plan, Environmental and Associated Activities, Campus Bay Site, Former Zeneca, Inc., Richmond Facility, Richmond, California,” dated January 7, 2008
- “Revised Quality Assurance Project Plan Approval, Former Zeneca Property, Campus Bay Site,” dated July 18, 2005

In accordance with the Work Plan, five upper-horizon groundwater monitoring wells were installed in and around the biologically active permeable barrier (BAPB) on the UCRFS to evaluate the groundwater quality in the vicinity BAPB (Figure 2). The upper horizon has been defined as the shallow water-bearing sediments present from the ground surface to approximately

¹ The Regents of the University of California (UC) is also a respondent to the DTSC Order.

20 feet below ground surface (bgs). The newly installed groundwater monitoring wells are labeled MW-34 through MW-38.

In addition, a grab groundwater sample was collected from a direct-push boring west of the slurry wall on the UCRFS property (Figure 2). The grab groundwater sample, labeled UCB-SL-GGW, was collected from the first water-bearing sediments located below the slurry wall. The purpose of this data was to assess the potential presence of volatile organic compound (VOC) concentrations in groundwater beneath the slurry wall located on the UCRFS.

The approximate locations of the monitoring wells and the grab groundwater sample are illustrated on Figure 2. The construction details for the monitoring wells and grab groundwater sample are provided in Table 1. A discussion of the monitoring well installation and groundwater sample collection procedures is provided below.

INSTALLATION AND SAMPLING ACTIVITIES

Pre-Fieldwork Activities

Prior to implementing field activities, Underground Service Alert (USA) was notified 48 hours in advance of mobilization to the field. A private utility locator was contracted to identify underground utilities at each monitoring well and grab groundwater location. Ground penetrating radar (GPR) was also used in an attempt to assess the exact location of the BAPB prior to initiating subsurface drilling and sampling activities. In addition, ARCADIS obtained the applicable drilling and well permits required for the work from the Contra Costa County Environmental Health Division (CCCEHD).

Monitoring Well Installation

On December 15 through 17, 2010, five groundwater monitoring wells were installed within the BAPB and the upper-horizon sediments at the approximate locations illustrated on Figure 2. The purpose of these wells is to provide data regarding the groundwater quality in the vicinity of the BAPB and assess the effectiveness of the BAPB in reducing dissolved metals (and to a lesser extent VOCs) in upper-horizon groundwater as it migrates towards the marsh on the UCRFS.

Three groundwater monitoring wells (MW-34, MW-35, and MW-36) were installed in a line perpendicular to the BAPB, one each at a location upgradient from, within, and downgradient from the BAPB, respectively (see Figure 2). The upgradient and downgradient wells were installed approximately 10 feet from the well located within the BAPB. The two additional wells (MW-37 and MW-38) were installed within the BAPB to the east and west of the well cluster at the approximate locations indicated on Figure 2. The approximate location of the BAPB was determined in the field prior to installation of the monitoring wells using a global positioning system (GPS), historical site maps and documents, and GPR. The location of the BAPB near the ground surface at wells MW35, MW37, and MW38 was verified by observing BAPB material that was removed from the subsurface using a hand auger prior to drilling.

At each well location a pilot soil boring was advanced using the direct-push drilling method for the purpose of determining the subsurface lithology and desired well screen interval. Soil samples were collected continuously for the total depth of the boring. The lithology was recorded onto soil boring logs in general accordance with the Unified Soil Classification System (USCS) by an ARCADIS field geologist. Soil samples were screened in the field using a portable photoionization detector (PID). The PID measurements were also recorded onto the soil boring logs. The soil boring logs have been provided in Attachment 1.

The monitoring well borings were then drilled over the pilot borings using a drilling rig equipped with 8-inch hollow-stem augers in accordance with the procedure outlined in the Work Plan. At each location, the monitoring wells were constructed using flush threaded 2-inch-diameter schedule 40 polyvinyl chloride (PVC) well casing with 10 feet of PVC 0.010-inch slotted well screen installed at various depths depending on observed lithology in the soil cores. For wells MW-35, MW-37, and MW-38, installed within the BAPB, the bottom of the well screen was set at the base of the BAPB. As the augers were removed, the annular space between the well and the formation was filled with No. 2/12 sand to a depth of approximately 1 foot above the screened interval. An approximately 2-foot-thick layer of bentonite chips was then placed above the sand pack and hydrated to form a coherent seal. The remaining annular space above the bentonite was filled with cement grout. A locking well cap was then placed on top of the well casing. The monitoring wells were completed with a riser pipe extending approximately 3 feet above grade. A metal casing was then installed to protect the PVC riser pipe. The monitoring well construction details are included on the soil boring logs provided in Attachment 1. A summary of the well construction details are provided in Table 1.

In accordance with county permits, the monitoring wells were completed under the oversight of a representative of the CCCEHD. All five monitoring wells were developed on January 4, 2010 in accordance with the procedures provided in the Lot 3 FSAP. The well development logs are provided in Attachment 2. The elevation, northing, and easting of each newly installed monitoring well were then surveyed by a California-licensed surveyor.

Grab Groundwater Sample

A single grab groundwater sample was collected from the first groundwater-bearing sediments located beneath the slurry wall from a location approximately 25 feet to the west of the slurry wall (UCB-GW-SL; Figure 2). The purpose of this sample was to provide data to assess for the potential presence of VOCs in groundwater below the slurry wall on the UCRFS. The grab groundwater sample was collected from approximately 25 and 30 feet bgs. The sample interval is approximately 5 to 10 feet below the base of the slurry wall and approximately 3 to 8 feet below the upper-horizon water-bearing sediments (see the soil boring in Attachment 1).

The grab groundwater sample was collected using a limited-access direct-push rig. The drilling contractor used a hand auger to advance the first 5 feet to verify that no utilities would be affected. During the advancement of the boring, soil samples were collected continuously to a total depth 30

feet bgs to identify the first water-bearing zone beneath the slurry wall. The slurry wall is completed to approximately 20 feet bgs.

The lithology was recorded onto soil boring logs in general accordance with the USCS. The soil boring log has been provided in Attachment 1.

To prevent cross-contamination from the shallow groundwater zone, a separate hydropunch boring was advanced approximately 3 feet to the south of the original soil boring to 30 feet bgs. The hydropunch tooling was then pulled up approximately 5 feet exposing a screened sample interval of 25 to 30 feet bgs. The groundwater sample was collected by lowering a small-diameter (0.75-inch) stainless steel bailer down into the hydropunch sampler. The groundwater was then transferred from the bailer into clean laboratory-provided sample containers, stored in an ice-chilled cooler, and transported under chain-of-custody protocol to the laboratory for analysis.

The grab groundwater sample was submitted to Curtis & Tompkins, Ltd. (C&T), a state-certified laboratory. In accordance with the Work Plan, the sample was analyzed for VOCs by U.S. Environmental Protection Agency (EPA) Method 8260B. VOCs detected in the grab groundwater sample are presented in Table 2.

After the groundwater sample was collected, the hydropunch sampler was removed and the soil borings were abandoned using the procedures described in the Lot 3 FSAP under the oversight of the CCCEHD.

Monitoring Well Sampling

Groundwater samples were collected from the newly installed monitoring wells on January 7, 2011 using low-flow purging techniques in accordance with the procedures described in the Lot 3 FSAP.

Groundwater samples were collected in sample containers provided by the analytical laboratory and temporarily stored in an ice-chilled cooler for transport to the laboratory. Sample containers were labeled with the collector's initials, sample identification number (well identification), time of sample collection, date, location, sample type, analytical method, and preservative used. Complete chain-of-custody (COC) forms accompanied the samples to C&T.

During low-flow purging from groundwater monitoring wells, the following field parameters are measured and recorded on water quality field sheets prior to sample collection using a YSI 556 Multiparameter Water Quality Meter equipped with a flow-through cell:

- Dissolved oxygen (DO)
- oxidation-reduction potential (ORP)
- pH
- specific conductance

- temperature
- turbidity

In accordance with the Work Plan, groundwater samples were collected in laboratory-supplied containers and submitted to C&T for the following chemical analyses:

- Title 22 Metals using EPA Method 6010 (EPA Method 7470 for mercury)
- VOCs using EPA Method 8260B
- Zeneca proprietary pesticides (OPPs) using EPA Method 8270SIM
- Ferrous iron using Standard Method 3500 FeB
- Dissolved sulfide using Standard Method 4500S2-D
- Alkalinity using Standard Method 2320B
- Chloride using EPA Method 300.0
- Sulfate using EPA Method 300.0
- Total dissolved solids (TDS) using Standard Method 2540C

Analytical results and field measurements for groundwater samples collected on January 7, 2011 are presented in Tables 2 through 5. Table 6 presents a summary of key parameters in analyzing the effectiveness of the BAPB.

Additional Groundwater Quality Data

In accordance with the Work Plan “relevant data from UC sampling at the UCRFS” is to be included in this transmittal. As such, the analytical results for samples collected from piezometers RFS-GW-ETA and RFS-GW-B163 located on the UCRFS are included in Tables 2 through 5 and the locations of piezometers RFS-GW-ETA and RFS-GW-B163 are illustrated on Figure 3. This data represents upper-horizon groundwater quality at locations in the upgradient direction relative to the groundwater samples collected on January 7, 2011 from the wells installed in the vicinity of the BAPB. Piezometers RFS-GW-ETA and RFS-GW-B163 are reported to be screened from 3.5 to 13.5 feet bgs and 7 to 17 feet bgs, respectively (Table 1). UCRFS provided this data in the technical memorandum prepared by Tetra Tech Inc. entitled: “Draft Phase I Groundwater Sampling Results, Technical Memorandum, University of California, Berkeley, Richmond Field Station, Richmond, California,” dated January 12, 2011.

In addition, ARCADIS has included the analytical results for grab groundwater samples collected in the vicinity of the BAPB in 2001. This data is presented on a figure included as Attachment 3 to this letter. The figure was included in the report prepared by URS Corporation on behalf of UCRFS entitled: “Final Report, Results of Additional Soil and Groundwater Investigations and Surface Water Monitoring Plan, Marsh Portion of Subunit 2A, Richmond Field Station, Richmond, California (Tasks 3A & 3B, Regional Water Quality Control Board (RWQCB) Order No. 01-102),” dated November 21, 2001. As indicated, this figure presents historical metals

concentrations collected just upgradient of the marsh on the UCRFS prior to the installation of the BAPB.

If you have any questions regarding the information provided above, please do not hesitate to call the undersigned at (510) 652-4500.

Sincerely,

ARCADIS U.S., Inc.



Ronald Goloubow, P.G. (8655)
Principal Geologist



Daren Roth
Senior Geologist

cc: Ms. Lynn Nakashima, DTSC
Mr. Doug Mosteller
Mr. Bill Marsh, Esq.
Mr. Anthony Garvin, University Counsel for UC
Mr. Nicholas Targ, Esq.
Mr. Karl Hans, UC

Attachments:

Table 1: UC BAPB Well Construction Details
Table 2: UC BAPB Sampling Analytical Results, Volatile Organic Compounds in Groundwater
Table 3: UC BAPB Sampling Analytical Results, Metals in Groundwater
Table 4: UC BAPB Sampling Analytical Results, Proprietary Pesticides
Table 5: UC BAPB Sampling Analytical Results, General Minerals and Field Parameters
Table 6: Summary of UC BAPB Cluster Wells Indicator Parameters

Figure 1: Site Vicinity Map

Figure 2: Approximate Monitoring Well and Grab Groundwater Locations at the Richmond Field Station

Attachment 1: Soil Boring Logs with Well Construction Details

Attachment 2: Monitoring Well Development Logs

Attachment 3: Figure 6 of 2001 URS Report

**Table 1
UC BAPB Well Construction Details
UC Richmond Field Station
Campus Bay, Richmond, CA**

| Area | Well Name | Installation Date | Approximate Total Depth (feet bgs) | Casing Diameter (inches) | Approximate Screen Interval (feet bgs) | TOC Elevation | Ground Surface Elevation | Approximate Screen Elevation | Screen Size and Material | Surface Mount |
|---|---------------|-------------------|------------------------------------|--------------------------|--|---------------|--------------------------|------------------------------|--------------------------|---------------|
| ARCADIS Monitoring Wells | | | | | | | | | | |
| Near BAPB | MW-34 | 12/17/10 | 19.0 | 2.0 PVC | 9.0 - 19.0 | 7.18 | 4.74 | -4.26 to -14.26 | 0.010 PVC | Monument |
| | MW-35 | 12/16/10 | 16.0 | 2.0 PVC | 6.0 - 16.0 | 6.98 | 4.24 | -1.76 to -11.76 | 0.010 PVC | Monument |
| | MW-36 | 12/16/10 | 17.0 | 2.0 PVC | 7.0 - 17.0 | 6.78 | 4.07 | -2.93 to -12.93 | 0.010 PVC | Monument |
| | MW-37 | 12/17/10 | 15.0 | 2.0 PVC | 5.0 - 15.0 | 7.92 | 4.92 | -0.08 to -10.08 | 0.010 PVC | Monument |
| | MW-38 | 12/15/10 | 18.0 | 2.0 PVC | 8.0 - 18.0 | 8.23 | 6.00 | -2.0 to -12.0 | 0.010 PVC | Monument |
| Grab Groundwater Sample Near Slurry Wall | | | | | | | | | | |
| West of Slurry Wall | UCB-SL-GGW-30 | 12/17/10 | 30.0 | NA | 25.0 - 30.0 | NA | 9.84 | NA | NA | NA |
| Tetra Tech Monitoring Wells | | | | | | | | | | |
| Upgradient of BAPB | RFS-GW-B163* | 7/26/10 | 17.5 | 2.0 | 7.0 - 17.0 | 7.68 | 7.91 | 0.91 to -9.09 | NA | Flush |
| | RFS-GW-ETA* | 7/28/10 | 14.0 | 2.0 | 3.5 - 13.5 | 4.85 | 5.03 | 1.53 to -8.47 | NA | Flush |

Notes:

BAPB = Biologically Active Permeable Barrier

feet bgs = feet below ground surface

NA = Information not applicable or available

PVC = Polyvinyl chloride

TOC = Top of Casing Elevation (based on the National Geodetic Vertical Datum 29 Standard)

* = Well installed by Tetra Tech on behalf of the University of California (UC), Berkeley.

Table 2
UC BAPB Sampling Analytical Results
Volatile Organic Compounds in Groundwater
UC Richmond Field Station
Campus Bay, Richmond, CA

*All results in micrograms per liter (µg/l)**

| Sample ID | Sample Type | Sample Date | 1,1,2,2-Tetrachloroethane | 1,1-Dichloroethene | 1,2-Dichloroethane | Acetone | Benzene | Chlorobenzene | Chloroform | cis-1,2-Dichloroethene | Tetrachloroethene | trans-1,2-Dichloroethene | Trichloroethene | Vinyl Chloride |
|-----------------|-------------|-------------|---------------------------|--------------------|--------------------|-------------|-------------|---------------|-------------|------------------------|-------------------|--------------------------|-----------------|----------------|
| MW-34 | Primary | 1/7/2011 | <0.5 | <0.5 | 3.1 | <10 | 0.3J | 92 | 2.0 | 1.8 | 13 | <0.5 | 20 | <0.5 |
| MW-35 | Primary | 1/7/2011 | <0.5 | <0.5 | 0.6 | 7.7J | 0.7 | 26 | <0.5 | 4.5 | <0.5 | 0.5 | 0.7 | 0.4J |
| MW-36 | Primary | 1/7/2011 | <1.3 | <1.3 | 3 | <25 | 1.1J | 160 | 2.6 | 1.1J | 11 | <1.3 | 9.3 | <1.3 |
| MW-37 | Primary | 1/7/2011 | <0.5 | 0.5J | 3.9 | <10 | 0.4J | 29 | <0.5 | 24 | 87 | 1.9 | 32 | <0.5 |
| MW-38 | Primary | 1/7/2011 | <1 | <1 | 13 | <20 | 1.6 | 300 | 1.7 | 41 | 190 | 0.8J | 86 | 3.3 |
| | Duplicate | 1/7/2011 | <2.5 | <2.5 | 12 | <50 | 1.5J | 280 | 1.5J | 38 | 180 | <2.5 | 82 | 3.4 |
| UCB-SL-GGW-30 | Primary | 12/17/2010 | 8.9 | <8.3 | 47 | <170 | 11 | 3600 | 62 | 11 | 1200 | <8.3 | 260 | <8.3 |
| RFS-GW-B163* | Primary | 9/2/2010 | <0.5 | 0.3J | 8.5 | 2.7J | 0.2J | 6.5 | 2.1 | 3 | 8.4 | 0.3J | 100 | 0.7 |
| RFS-GW-ETA* | Primary | 9/24/2010 | <0.5 | <0.5 | <0.5 | <4.0 | <0.5 | <0.5 | <0.5 | 0.9 | <0.5 | <0.5 | 12 | <0.5 |
| | Duplicate | 9/24/2010 | <0.5 | <0.5 | <0.5 | <4.0 | <0.5 | <0.5 | <0.5 | 0.9 | <0.5 | <0.5 | 14 | <0.5 |
| Equipment Blank | Primary | 1/7/2011 | <0.5 | <0.5 | <0.5 | <10 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Trip Blank | Primary | 1/7/2011 | <0.5 | <0.5 | <0.5 | <10 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |

Notes:

<0.5 = Concentration not detected at or above indicated laboratory reporting limit

BAPB = Biologically Active Permeable Barrier

J = estimated value

MW = monitoring well

* = Sample Collected by Tetra Tech on behalf of the University of California (UC), Berkeley.

Bold values indicate concentrations above laboratory detection limits. Only chemicals with at least one detection in the current sampling event are shown in this table.

Table 3
UC BAPB Sampling Analytical Results
Metals in Groundwater
UC Richmond Field Station
Campus Bay, Richmond, CA

*All results in micrograms per liter (µg/l)**

| Sample ID | Sample Type | Sample Date | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Copper | Lead | Mercury | Molybdenum | Nickel | Selenium | Silver | Thallium | Vanadium | Zinc |
|--------------|-------------|-------------|----------|------------|------------|-----------|--------------|------------|------------|------------|------------|--------------|-------------|------------|-----------|------------|----------|------------|---------------|
| MW-34 | Primary | 1/7/2011 | <10 | <5 | 19 | <2 | <5 | 6.9 | <5 | <5 | <5 | <0.2 | <5 | 30 | 13 | 7.1 | <10 | <5 | <20 |
| MW-35 | Primary | 1/7/2011 | <10 | <5 | 75 | <2 | <5 | 7.7 | 6.2 | <5 | <5 | <0.2 | 5.2 | 11 | 65 | 6.3 | <10 | <5 | <20 |
| MW-36 | Primary | 1/7/2011 | <10 | <5 | 31 | <2 | <5 | 12 | 160 | <5 | <5 | <0.2 | <5 | 460 | 43 | 7.6 | <10 | <5 | 310 |
| MW-37 | Primary | 1/7/2011 | <10 | <5 | 53 | <2 | <5 | 7.9 | 320 | <5 | <5 | <0.2 | <5 | 360 | 25 | <5 | <10 | <5 | 23,000 |
| MW-38 | Primary | 1/7/2011 | <10 | 63 | 100 | <2 | <5 | 11 | 19 | <5 | <5 | <0.2 | 6.4 | 90 | 47 | 7.1 | <10 | <5 | 590 |
| | Duplicate | 1/7/2011 | <10 | 61 | 100 | <2 | <5 | 11 | 19 | <5 | <5 | <0.2 | 6.4 | 91 | 41 | 7.2 | <10 | <5 | 590 |
| RFS-GW-B163* | Primary | 9/2/2010 | <1.0 | 1.6 | 17 | <0.5 | 5.2 | <5.0 | 6 | 2.5 | <2.0 | 0.083 | 0.95 | 170 | <2.0 | <0.5 | <2.0 | <4.0 | 9.2 |
| RFS-GW-ETA* | Primary | 9/24/2010 | <1.0 | 22 | 39 | <0.5 | 0.93J | 5.8 | 3.8 | 22 | 9.8 | 2.3 | 2.7 | 10 | <2.0 | <0.5 | <2.0 | 5.4 | 110 |
| | Duplicate | 9/24/2010 | <1.0 | 13 | 28 | <0.5 | <1.0 | 2.6 | 2.4 | 8 | 3.2 | 1.3 | 2.9 | 4.9 | <2.0 | <0.5 | <2.0 | <4.0 | 50 |
| Equipment | Primary | 1/7/2011 | <10 | <5 | <5 | <2 | <5 | <5 | <5 | <5 | <5 | <0.2 | <5 | <5 | <10 | <5 | <10 | <5 | <20 |

Notes:

<0.2 = Concentration not detected at or above indicated laboratory reporting limit

BAPB = Biologically Active Permeable Barrier

J = Estimated Value

MW = monitoring well

* = Sample Collected by Tetra Tech on behalf of the University of California (UC), Berkeley.

Bold values indicate concentrations above laboratory detection limits.

Table 4
UC BAPB Sampling Analytical Results
Proprietary Pesticides
UC Richmond Field Station
Campus Bay, Richmond, CA

*All results in micrograms per liter (µg/l)**

| Well ID | Sample Type | Sample Date | Butylate | Cycloate | EPTC | Molinate | Napropamide | Pebulate | Vernolate |
|-----------------|-------------|-------------|----------|----------|------|----------|-------------|----------|-----------|
| MW-34 | Primary | 1/7/2011 | <2.5 | <2.5 | <5 | <2.5 | <2.5 | <2.5 | <2.5 |
| MW-35 | Primary | 1/7/2011 | <2.5 | <2.5 | <5 | <2.5 | <2.5 | <2.5 | <2.5 |
| MW-36 | Primary | 1/7/2011 | <2.5 | <2.5 | <5 | <2.5 | <2.5 | <2.5 | <2.5 |
| MW-37 | Primary | 1/7/2011 | <2.5 | <2.5 | <5 | <2.5 | <2.5 | <2.5 | <2.5 |
| MW-38 | Primary | 1/7/2011 | <2.5 | <2.5 | <5 | <2.5 | <2.5 | <2.5 | <2.5 |
| | Duplicate | 1/7/2011 | <2.5 | <2.5 | <5 | <2.5 | <2.5 | <2.5 | <2.5 |
| Equipment Blank | Primary | 1/7/2011 | <2.5 | <2.5 | <5 | <2.5 | <2.5 | <2.5 | <2.5 |

Notes:

<0.5 = Concentration not detected at or above indicated laboratory reporting limit

BAPB = Biologically Active Permeable Barrier

MW = monitoring well

EPTC = S-ethyl dipropylthiocarbamate

UC = University of California

Table 5
UC BAPB Sampling Analytical Results
General Minerals and Field Parameters
UC Richmond Field Station
Campus Bay, Richmond, CA

| Sample ID | Sample Type | Sample Date | Alkalinity, Bicarbonate (mg/l) | Alkalinity, Carbonate (mg/l) | Alkalinity, Hydroxide (mg/l) | Alkalinity, Total as CaCO ₃ (mg/l) | Chloride (mg/l) | Conductivity (µS/cm) | Dissolved Oxygen (mg/l) | Dissolved Sulfide (mg/l) | Sulfate (mg/l) | Total Dissolved Solids (mg/l) | Oxidation Reduction Potential (mV) | pH (SU) | Temperature (C°) | Turbidity (NTU) |
|--------------|-------------|-------------|--------------------------------|------------------------------|------------------------------|---|-----------------|----------------------|-------------------------|--------------------------|----------------|-------------------------------|------------------------------------|-------------|------------------|-----------------|
| MW-34 | Primary | 1/7/2011 | 380 | <6.7 | <6.7 | 380 | 1800 | 9360 | 3.92 | <0.04 | 3300 | 7540 | 11.1 | 6.54 | 14.8 | 10 |
| MW-35 | Primary | 1/7/2011 | 1700 | <6.7 | <6.7 | 1700 | 2800 | 10852 | 3.04 | <0.04 | 970 | 7450 | -42.8 | 6.65 | 13.2 | 25 |
| MW-36 | Primary | 1/7/2011 | 310 | <6.7 | <6.7 | 310 | 2900 | 12896 | 5.18 | <0.04 | 3400 | 9560 | 35.5 | 5.97 | 13.6 | 8 |
| MW-37 | Primary | 1/7/2011 | 340 | <6.7 | <6.7 | 340 | 2200 | 9001 | 5.12 | <0.04 | 2200 | 6470 | -29.3 | 5.97 | 13.3 | 11 |
| MW-38 | Primary | 1/7/2011 | 830 | <6.7 | <6.7 | 830 | 2400 | 9767 | 3.93 | <0.04 | 1700 | 7040 | -16 | 6.25 | 15.9 | 7 |
| | Duplicate | 1/7/2011 | 820 | <6.7 | <6.7 | 820 | 2400 | - | - | <0.04 | 1700 | 7010 | - | - | - | - |
| RFS-GW-B163* | Primary | 9/2/2010 | - | - | - | - | - | - | - | - | - | 2900 | - | - | - | - |
| RFS-GW-ETA* | Primary | 9/24/2010 | - | - | - | - | - | - | - | - | - | 1300 | - | - | - | - |
| | Duplicate | 9/24/2010 | - | - | - | - | - | - | - | - | - | 1300 | - | - | - | - |
| FIELD BLANK | Primary | 1/7/2011 | <1 | <1 | <1 | <1 | <0.2 | - | - | <0.04 | <0.5 | <10 | - | - | - | - |

Notes:

<0.04 = Concentration not detected at or above indicated laboratory reporting limit.

BAPB = Biologically Active Permeable Barrier

mV = millivolts

mg/L = Milligrams per liter

MW = Monitoring well

NTU = Nephelometric Turbidity Units

SU = Standard units

µg/L = Micrograms per liter

µS/cm = Microsiemens per centimeter

- = result not available or not applicable

* = Sample Collected by Tetra Tech on behalf of the University of California (UC), Berkeley.

Bold values indicate concentrations above laboratory detection limits.

Dissolved oxygen, oxidation reduction potential, pH, specific conductance, temperature and turbidity were measured in the field.

Table 6
Summary of UC BAPB Cluster Wells Indicator Parameters
UC Richmond Field Station
Campus Bay, Richmond, CA

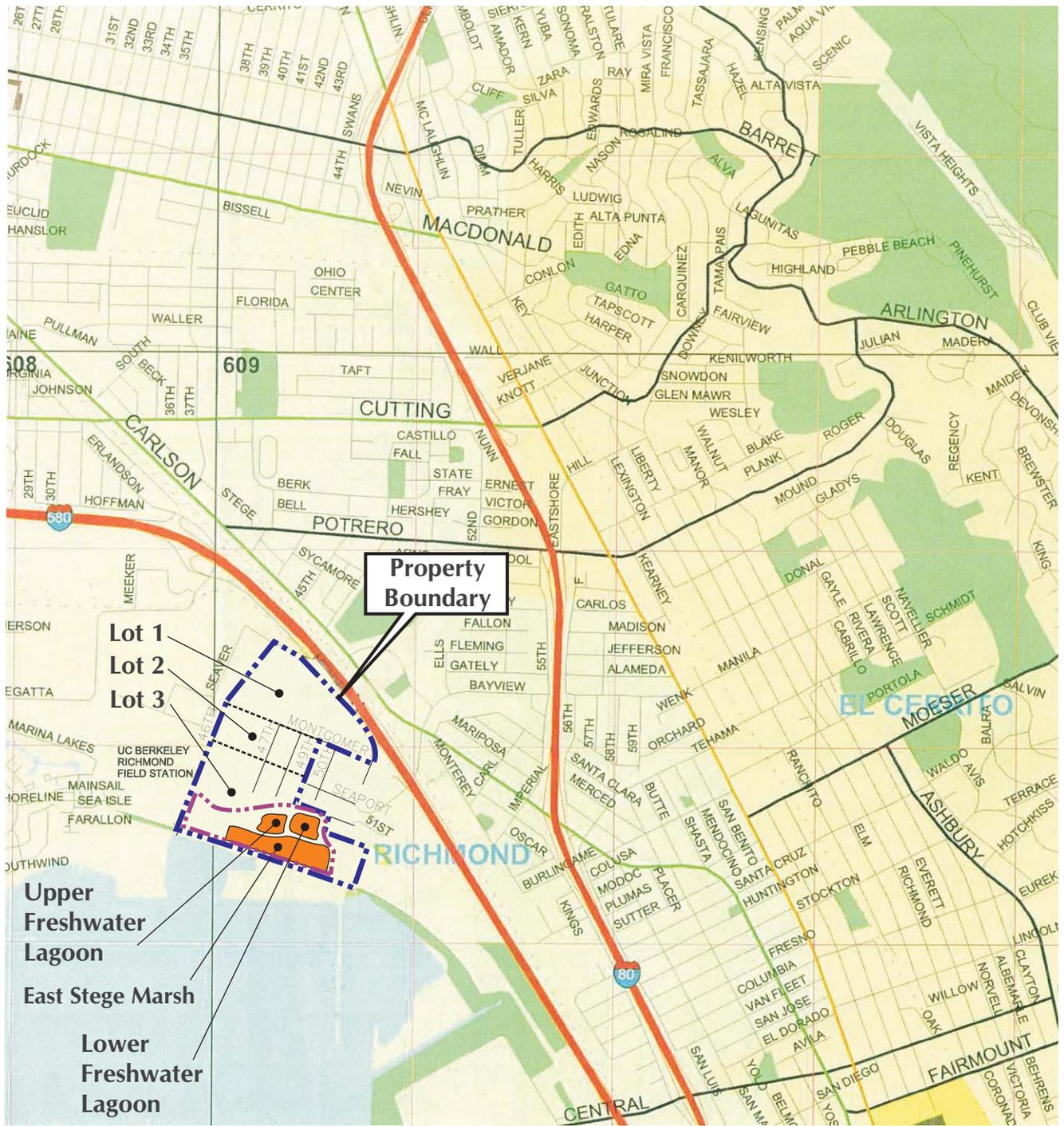
| Sample ID | Sample Type | Location | Sample Date | Alkalinity, Bicarbonate (mg/L) | Ferrous Iron (Fe ²⁺) (mg/L) | Oxidation Reduction Potential (mV) | pH (SU) | Sulfate (mg/L) | Dissolved Sulfide (mg/L) | Arsenic (µg/L) | Copper (µg/L) | Nickel (µg/L) | Zinc (µg/L) |
|-----------|-------------|--------------|-------------|--------------------------------|---|------------------------------------|---------|----------------|--------------------------|----------------|---------------|---------------|-------------|
| MW-34 | Primary | Upgradient | 1/7/2011 | 380 | <0.1 | 11.1 | 6.54 | 3,300 | <0.04 | <5 | <5 | 30 | <20 |
| MW-35 | Primary | In BAPB | 1/7/2011 | 1,700 | 21 | -42.8 | 6.65 | 970 | <0.04 | <5 | <5 | 11 | <20 |
| MW-36 | Primary | Downgradient | 1/7/2011 | 310 | 5.0 | 35.5 | 5.97 | 3,400 | <0.04 | <5 | <5 | 460 | 310 |
| MW-37 | Primary | In BAPB | 1/7/2011 | 340 | 140 | -29.3 | 5.97 | 2,200 | <0.04 | <5 | <5 | 360 | 23,000 |
| MW-38 | Primary | In BAPB | 1/7/2011 | 830 | 4.7 | -16.0 | 6.25 | 1,700 | <0.04 | 63 | <5 | 90 | 590 |
| | Duplicate | | 1/7/2011 | 820 | 4.7 | -16.0 | 6.25 | 1,700 | <0.04 | 61 | <5 | 91 | 590 |

Abbreviations:

<0.1 = Concentration not detected at or above indicated laboratory reporting limit.
 BAPB = Biologically Active Permeable Barrier
 mV = millivolts
 mg/L = Milligrams per liter
 MW = Monitoring well
 SU = Standard units
 µg/L = Micrograms per liter
 UC = University of California

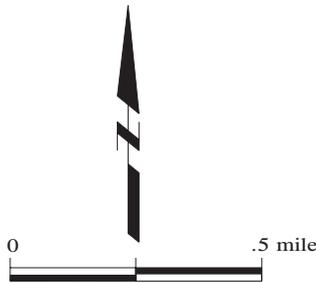
Note:

This table summarizes data presented in Tables 2 through 5 for cluster wells upgradient, within, and downgradient of the BAPB. The indicator parameters presented in this table are measured in the BAPB cluster wells to evaluate the effectiveness of the BAPB in buffering the groundwater and creating reducing conditions necessary for the precipitation of dissolved metals in groundwater.



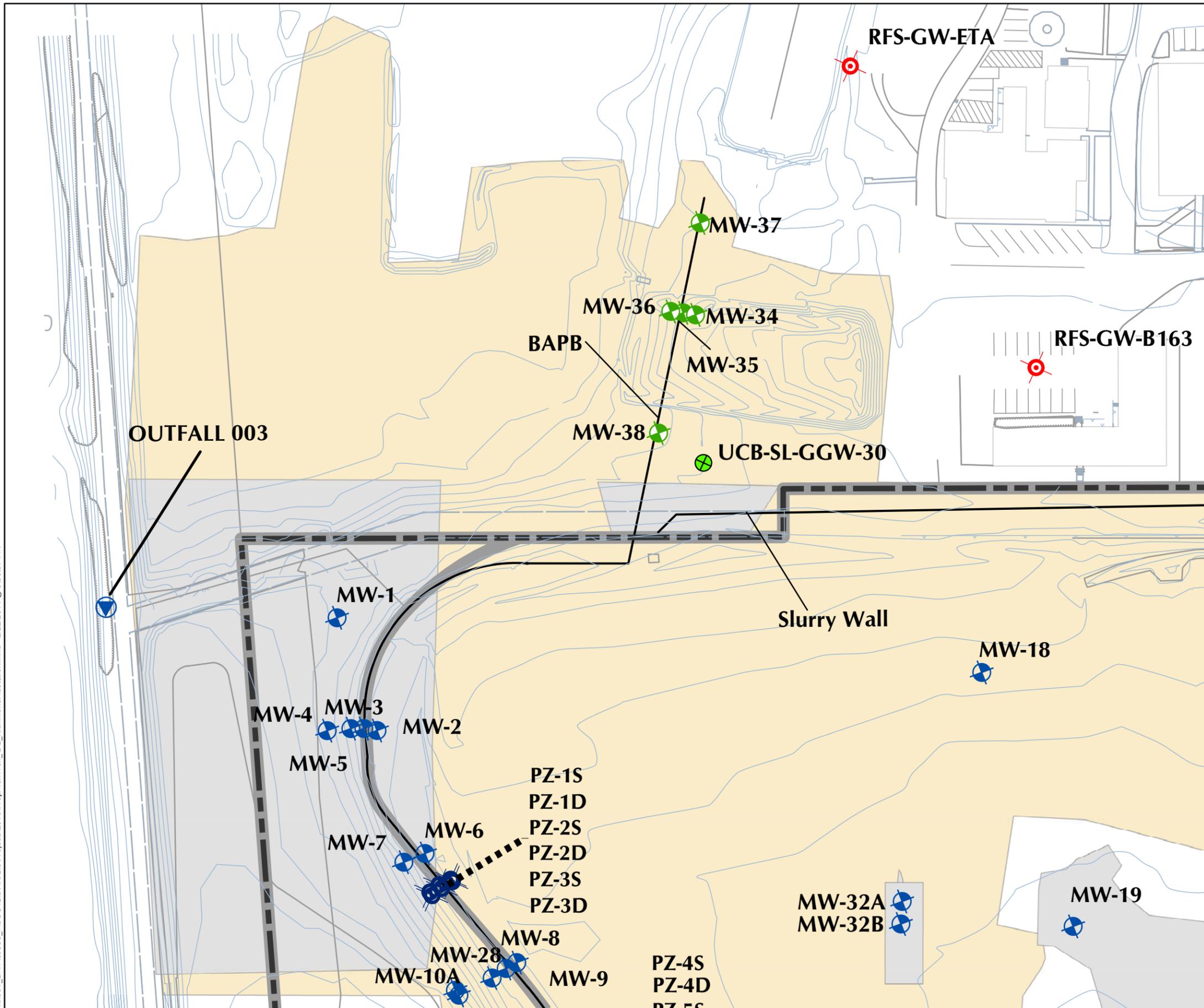
SOURCE: THOMAS BROS MAP - Bay Area 2001

-  Approximate Campus Bay Property Boundary
-  Approximate HEA Boundary



| | |
|--|---------------------------|
| CAMPUS BAY, RICHMOND, CALIFORNIA | |
| SITE VICINITY MAP | |
|  | FIGURE 1 |

K:\001_EMV\09358_MSOU\GIS\Projects\2010\PropMonWell_GG_RichmondFieldStation.mxd - 2/22/2011 @ 3:38:37 PM



LEGEND

- APPROXIMATE MONITORING WELL LOCATION
- APPROXIMATE GRAB GROUNDWATER LOCATION
- MW-16B APPROXIMATE LOCATION OF EXISTING MONITORING WELL
- PZ-8 APPROXIMATE LOCATION OF EXISTING PIEZOMETER
- RFS-GW-B163 APPROXIMATE LOCATION OF EXISTING TETRA TECH PIEZOMETER
- Outfall 003 SURFACE-WATER MONITORING LOCATION
- HABITAT ENHANCEMENT AREA BOUNDARY
- PROPERTY BOUNDARY
- SUBAREA BOUNDARY
- PREVIOUS CINDER EXCAVATION AREA
- 2-FOOT CONTOUR INTERVAL

AREA ILLUSTRATED

0 80 160 Feet
GRAPHIC SCALE

CAMPUS BAY, RICHMOND, CALIFORNIA

APPROXIMATE MONITORING WELL AND GRAB GROUNDWATER LOCATIONS AT THE RICHMOND FIELD STATION

ARCADIS

FIGURE 2

ATTACHMENT 1

Soil Boring Logs with Well Construction Details

PROJECT NAME Zeneca: UCRFS Groundwater Monitoring

WELL NUMBER MW-34

CLIENT Zeneca

PAGE 1 OF 1

PROJECT LOCATION Campus Bay

DRILLING CONTRACTOR Gregg Drilling

PROJECT NUMBER EM009358.0017.00001

DRILLING METHOD Direct Push / Hollow Stem Auger

LOCATION Richmond, CA

STAMP (IF APPLICABLE) AND/OR NOTES

OVA EQUIPMENT Photoionization Meter

Hand augered to 5 Feet Below Ground Surface
No PID due to rain

GROUND ELEVATION _____ HOLE DIAMETER .8 Inches

TOP OF CASING ELEVATION _____ HOLE DEPTH 20.0 feet

▽ FIRST ENCOUNTERED WATER 9.5 feet

STABILIZED WATER ---

LOGGED BY Thomas R. Collins, IV DATE 12/17/10

| DEPTH (feet) | SAMPLE TYPE NUMBER | SAMPLE RECOVERY | U.S.C.S. | GRAPHIC LOG | DEPTHS | LITHOLOGIC DESCRIPTION | WELL DIAGRAM | DEPTH (feet) |
|--------------|----------------------|-----------------|----------|-------------|--------|---|---|--------------|
| 5 | Hand Auger to 5 Feet | | CL | | | CLAY (CL); Dark Grayish Brown (10YR 4/2) | <p>8-inch-dia. borehole 2-inch-dia. Sch. 40 PVC blank casing Grout Bentonite Seal Sand Pack #2/12 2-inch-dia. Factory Slotted PVC Screen Fitted End Cap</p> | 5 |
| | | | SW | | 6.0 | SAND (SW); Very Dark Greenish Gray (GLEY 2 3/5BG) | | 10 |
| | | | CL | | 7.5 | CLAY (CL); Dark Yellowish Brown (10YR 4/6) | | 15 |
| 10 | | | SC | | 9.5 ▽ | SAND with Clay (SC); Wet; with some Cinder | | 20 |
| | | | CL | | 11.0 | CLAY (CL); Dark Yellowish Brown (10YR 4/6) | | |
| 15 | | | SC | | 16.0 | CLAYEY SAND (SC) above CLAY bottom; Dark Yellowish Brown (10YR 4/6) | | |
| | | | CL | | 19.0 | CLAY (CL); Dark Yellowish Brown (10YR 4/6) | | |
| 20 | | | CL | | 20.0 | CLAY (CL); Dark Yellowish Brown (10YR 4/6) | | |
| | | | | | | Bottom of Boring at Approximately 20 Feet Below Ground Surface | | |

BORING+WELL 2006 EM009358.0017 DEC2010.GPJ LFR SEPT 2006.GDT 02/16/11

APPROVED BY: _____ DATE: _____



PROJECT NAME Zeneca: UCRFS Groundwater Monitoring

CLIENT Zeneca

WELL NUMBER MW-35

PAGE 1 OF 1

PROJECT LOCATION Campus Bay

DRILLING CONTRACTOR Gregg Drilling

PROJECT NUMBER EM009358.0017.00001

DRILLING METHOD Direct Push / Hollow Stem Auger

LOCATION UCB Marsh, Richmond, CA

STAMP (IF APPLICABLE) AND/OR NOTES

Hand augered to 5 Feet Below Ground Surface

OVA EQUIPMENT Photoionization Meter

GROUND ELEVATION _____ HOLE DIAMETER .8 Inches

TOP OF CASING ELEVATION _____ HOLE DEPTH 18.0 feet

▽ FIRST ENCOUNTERED WATER 3.0 feet

STABILIZED WATER ---

LOGGED BY Thomas R. Collins, IV DATE 12/16/10

| DEPTH (feet) | SAMPLE TYPE NUMBER | SAMPLE RECOVERY | U.S.C.S. | GRAPHIC LOG | DEPTHS | LITHOLOGIC DESCRIPTION | PID (ppm) | WELL DIAGRAM | DEPTH (feet) |
|--------------|-------------------------------------|-----------------|----------|-------------|--------|--|-----------|--------------|--------------|
| 5 | Hand Auger to 5 Feet | SC | | | 5.0 | SAND w/ Some Clay (SC); GLEY2 3/5B | 0.0 | | 5 |
| 10 | No Recovery from 5 feet to 16 feet. | | | | | BAPB possible here but recovery is poor and sluff from above results in about 1 foot of Sand recovery each time. Black organic gravel with mulch. | 0.0 | | 10 |
| 15 | | | | | | Bottom of BAPB at Approximately 16 Feet | 0.0 | | 15 |
| 16.0 | | | CL | | 16.0 | CLAY (CL); 10YR 4/6; low plastic | 0.0 | | 16.0 |
| 18.0 | | | | | 18.0 | Bottom of Boring at Approximately 18 Feet Below Ground Surface | 0.0 | 18.0 | |

BORING+WELL 2006 EM009358.0017_DEC2010.GPJ LFR SEPT 2006.GDT 02/16/11

APPROVED BY: _____ DATE: _____



PROJECT NAME Zeneca: UCRFS Groundwater Monitoring

CLIENT Zeneca

WELL NUMBER MW-36

PAGE 1 OF 1

PROJECT LOCATION Campus Bay

DRILLING CONTRACTOR Gregg Drilling

PROJECT NUMBER EM009358.0017.00001

DRILLING METHOD Direct Push / Hollow Stem Auger

LOCATION UCB Marsh, Richmond, CA

STAMP (IF APPLICABLE) AND/OR NOTES

Hand augered to 5 Feet Below Ground Surface

OVA EQUIPMENT Photoionization Meter

GROUND ELEVATION _____ HOLE DIAMETER .8 Inches

TOP OF CASING ELEVATION _____ HOLE DEPTH 20.0 feet

▽ FIRST ENCOUNTERED WATER 7.5 feet

STABILIZED WATER ---

LOGGED BY Thomas R. Collins, IV DATE 12/16/10

| DEPTH (feet) | SAMPLE TYPE NUMBER | SAMPLE RECOVERY | U.S.C.S. | GRAPHIC LOG | DEPTHS | LITHOLOGIC DESCRIPTION | PID (ppm) | WELL DIAGRAM | DEPTH (feet) |
|--------------|----------------------|-----------------|----------|-------------|--------|---|-----------|--|--------------|
| 5 | Hand Auger to 5 Feet | SP | | | 5.0 | SAND (SP); Very Dark Greenish Gray (GLEY 1 3/10Y) | 0.0 | <p>8-inch-dia. borehole 2-inch-dia. Sch. 40 PVC blank casing Grout Bentonite Seal Sand Pack #2/12 2-inch-dia. Factory Slotted PVC Screen 8-inch-dia. borehole Fitted End Cap</p> | 5 |
| | | CL | | | 7.0 | CLAY (CL); Yellowish Brown (10YR 5/4); Low Plastic | 0.0 | | 10 |
| | | SP | | | ▽ 7.5 | SAND (SP); Very Dark Bluish Gray (GLEY 2 3/5B); Wet; with some purple cinder staining on the edges | 0.0 | | 15 |
| | | CL | | | 11.0 | CLAY (CL) with Very Fine Sand; Dark Yellowish Brown (10YR 4/4); Moist; Low Plastic | 0.0 | | 20 |
| | | SP | | | 13.0 | SAND (SP); as above; 6-inch sections of Clay like above throughout, sluff likely mixed with clay, native sand is wet, clay is not | 0.0 | | |
| | | No Recovery | | | 16.0 | | 0.0 | | |
| 20 | | | | | 20.0 | Bottom of Boring at Approximately 20 Feet Below Ground Surface | 0.0 | | 20 |

BORING+WELL 2006 EM009358.0017 DEC2010.GPJ LFR SEPT 2006.GDT 02/16/11

APPROVED BY: _____ DATE: _____



PROJECT NAME Zeneca: UCRFS Groundwater Monitoring

CLIENT Zeneca

WELL NUMBER MW-37

PAGE 1 OF 1

PROJECT LOCATION Campus Bay

DRILLING CONTRACTOR Gregg Drilling

PROJECT NUMBER EM009358.0017.00001

DRILLING METHOD Direct Push / Hollow Stem Auger

LOCATION Richmond, CA

STAMP (IF APPLICABLE) AND/OR NOTES

OVA EQUIPMENT Photoionization Meter

Hand augered to 5 Feet Below Ground Surface
No PID due to rain

GROUND ELEVATION _____ HOLE DIAMETER .8 Inches

TOP OF CASING ELEVATION _____ HOLE DEPTH 16.0 feet

▽ FIRST ENCOUNTERED WATER 9.0 feet

STABILIZED WATER ---

LOGGED BY Thomas R. Collins, IV DATE 12/17/10

| DEPTH (feet) | SAMPLE TYPE NUMBER | SAMPLE RECOVERY | U.S.C.S. | GRAPHIC LOG | DEPTHS | LITHOLOGIC DESCRIPTION | WELL DIAGRAM | DEPTH (feet) |
|--------------|----------------------|-----------------|----------|-------------|--------|--|---|--------------|
| | | | CL | | 2.0 | CLAY (CL); Dark Yellowish Brown (10YR 4/6); Low to Medium Plastic | <ul style="list-style-type: none"> 8-inch-dia. borehole Grout 2-inch-dia. Sch. 40 PVC blank casing Bentonite Seal Sand Pack #2/12 2-inch-dia. Factory Slotted PVC Screen 8-inch-dia. borehole Sand Pack #2/12 Fitted End Cap | |
| | Hand Auger to 5 Feet | | | | | BAPB Black Mulchy Organic; Sandy and rocky with some mud BAPB is moist/wet, groundwater location is difficult because of rain from surface makes everything wet | | |
| 5 | | | | | | | | 5 |
| | | | SW | | 10.0 | SAND (SW); Very Dark Bluish Gray (GLEY 2 3/5B) | | 10 |
| 10 | | | CL | | 11.0 | CLAY (CL); Dark Yellowish Brown (10YR 4/6); Low to Medium Plastic | | 15 |
| 15 | | | | | 16.0 | | | |
| | | | | | | Bottom of Boring at Approximately 16 Feet Below Ground Surface | | |

BORING+WELL 2006 EM009358.0017_DEC2010.GPJ LFR SEPT 2006.GDT 02/16/11

APPROVED BY: _____ DATE: _____



PROJECT NAME Zeneca: UCRFS Groundwater Monitoring

WELL NUMBER MW-38

CLIENT Zeneca

PAGE 1 OF 1

PROJECT LOCATION Campus Bay

DRILLING CONTRACTOR Gregg Drilling

PROJECT NUMBER EM009358.0017.00001

DRILLING METHOD Direct Push / Hollow Stem Auger

LOCATION Richmond, CA

STAMP (IF APPLICABLE) AND/OR NOTES

OVA EQUIPMENT Photoionization Meter

Hand augered to 5 Feet Below Ground Surface

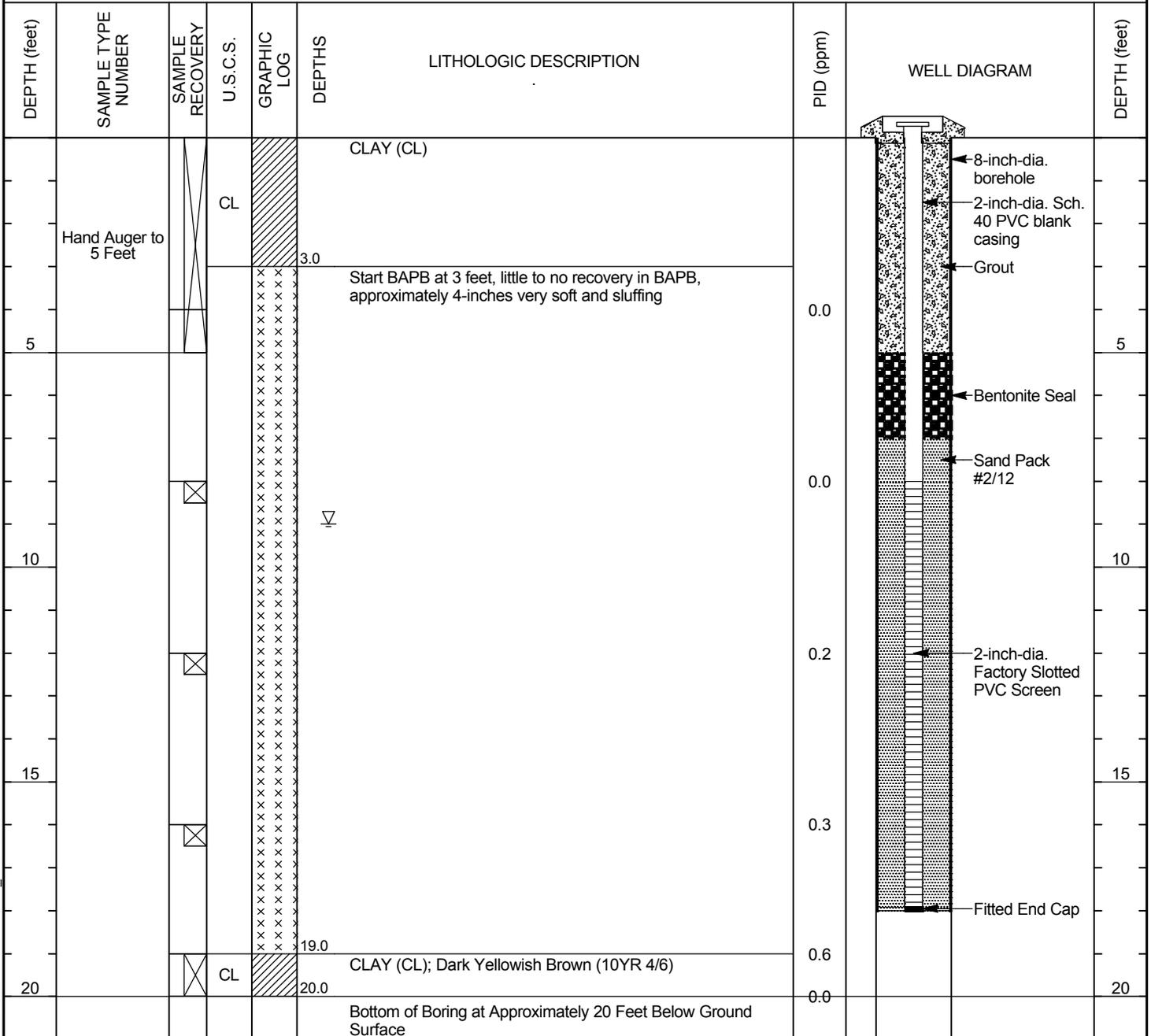
GROUND ELEVATION _____ HOLE DIAMETER .8 Inches

TOP OF CASING ELEVATION _____ HOLE DEPTH 20.0 feet

▽ FIRST ENCOUNTERED WATER 9.0 feet

STABILIZED WATER ---

LOGGED BY Thomas R. Collins, IV DATE 12/15/10



BORING+WELL 2006 EM009358.0017 DEC2010.GPJ LFR SEPT 2006.GDT 02/16/11

APPROVED BY: _____ DATE: _____



| DEPTH (feet) | SAMPLE TYPE NUMBER | SAMPLE RECOVERY | U.S.C.S. | GRAPHIC LOG | DEPTHS | LITHOLOGIC DESCRIPTION | DEPTH (feet) |
|--------------|--------------------|-----------------|----------|---|--------|--|--------------|
| | | | SP |  | 23.0 | SAND (SP); Very Dark Grayish Brown (10YR 3/2); Coarse Grained; Well Sorted; with some multi-color gravel / pebbles (continued) | |
| | | | CL |  | 24.0 | CLAY (CL); Low Plastic; with some Sand | |
| 25 | | | | | | | 25 |
| | | | SW |  | | 4-inches coarse gravel, poorly graded sand (SP), coarsens with depth, wet 4-inches well graded sand (SW), with fines, Dark Yellowish Brown (10YR 4/6) | |
| 30 | | | | | | | 30 |
| | | | | | | Gravelly Sand with Clay, not very wet | |
| | | | | | 32.0 | | |
| | | | | | | Bottom of Boring at Approximately 32 Feet Below Ground Surface | |

BORING+WELL 2006 EM009358.0017 DEC2010.GPJ LFR SEPT 2006.GDT 02/16/11

APPROVED BY: _____ DATE: _____



ATTACHMENT 2

Monitoring Well Development Logs

Development Data Sheet

| | | |
|--|---|--|
| Job#: B1-110104 | Developer: J Kerns B Myers | Client: Arcadis |
| Well ID: <i>Hw34</i> | Date: 1/4/11 | Site: Campus Bay |
| Well diam: 1/4" 1" <u>(2")</u> 3" 4" 6" Other: | DTW: <i>2.77</i> | TD Before: <i>21.84</i> TD After: <i>21.84</i> |
| Purge equip: ES - diam: Bladder Peri Waterra Positive Air Displacement Ext. System disp bailer <u>(teflon bailer)</u> other: | | |
| Surge block used: <u>(Y)</u> N | | |
| Length of time surged prior to development: <i>10 mins</i> | | |
| Pump depth/ intake: | Multipliers: 1"= 0.04 2"= 0.16 3"= 0.37 4"= 0.65 5"= 1.02 6"= 1.47 Radius ² X 0.163 | |
| (TD - DTW X Multiplier = 1 Volume) | | 80% Recovery (TD - DTW X 0.20 + DTW) |

1 Volume = 3.0 X 10 = 30 (Total Purge)

Meter(s): *ultrasonometer, Hoch*

| Time | Temp (°C / °F) | pH | Cond (mS / <u>(S)</u>) | Turbidity (NTU) | Purge Rate (gal or mL / min) | Volume Removed (gal / L) | DTW | Notes |
|-------------|-------------------|------------|----------------------------|--------------------|------------------------------------|--------------------------------|--------------|-----------------------------------|
| <i>1055</i> | <i>14.4</i> | <i>7.0</i> | <i>8299</i> | <i>71000</i> | — | <i>3</i> | — | <i>Hard bottom, turbid, sandy</i> |
| <i>1058</i> | <i>15.3</i> | <i>7.0</i> | <i>8313</i> | <i>71000</i> | — | <i>6</i> | — | <i>Turbid</i> |
| <i>1103</i> | <i>15.6</i> | <i>6.7</i> | <i>8547</i> | <i>71000</i> | — | <i>9</i> | — | <i>"</i> |
| <i>1107</i> | <i>15.7</i> | <i>6.7</i> | <i>8817</i> | <i>71000</i> | — | <i>12</i> | — | <i>"</i> |
| <i>1112</i> | <i>16.1</i> | <i>6.9</i> | <i>8459</i> | <i>71000</i> | — | <i>15</i> | <i>10.50</i> | <i>"</i> |
| <i>1116</i> | <i>15.7</i> | <i>6.6</i> | <i>9247</i> | <i>71000</i> | — | <i>18</i> | — | <i>"</i> |
| <i>1120</i> | <i>15.8</i> | <i>6.6</i> | <i>9437</i> | <i>71000</i> | — | <i>21</i> | — | <i>"</i> |
| <i>1125</i> | <i>15.9</i> | <i>6.6</i> | <i>9506</i> | <i>71000</i> | — | <i>24</i> | — | <i>"</i> |
| <i>1130</i> | <i>16.0</i> | <i>6.6</i> | <i>9660</i> | <i>71000</i> | — | <i>27</i> | — | <i>"</i> |
| <i>1134</i> | <i>16.0</i> | <i>6.6</i> | <i>9670</i> | <i>71000</i> | — | <i>30</i> | — | <i>"</i> |
| | | | | | | | | <i>DTW = 2.67</i> |

| | |
|---|---|
| Did well dewater? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | Total volume removed: <i>30</i> (gal / L) |
| Sample method (if applicable): Disp Bailer <input type="checkbox"/> Ded. Tubing <input type="checkbox"/> New Tubing <input type="checkbox"/> Ext. Port <input type="checkbox"/> Other: <input type="checkbox"/> | |
| Sample date: <i>/</i> | Sample time: <i>/</i> DTW at sample: <i>/</i> |
| Sample ID: <i>/</i> | Lab: <i>/</i> Number of bottles: <i>/</i> |
| Analysis: <i>/</i> | |

Development Data Sheet

| | | |
|---|---|--|
| Job#: B1-110104 | Developer: J Kerns B Myers | Client: Arcadis |
| Well ID: MW-35 | Date: 1/4/11 | Site: Campus Bay |
| Well diam: 1/4" 1" <u>2"</u> 3" 4" 6" Other: | DTW: 2.50 | TD Before: 18.20 TD After: 18.23 |
| Purge equip: ES - diam: Bladder Peri Waterra Positive Air Displacement Ext. System | | |
| disp bailer <u>teflon bailer</u> other: Surge block used: <u>Y</u> N | | |
| Length of time surged prior to development: 10 mins | | |
| Pump depth/ intake: | Multipliers: 1"= 0.04 2"= 0.16 3"= 0.37 4"= 0.65 5"= 1.02 6"= 1.47 Radius ² X 0.163 | |
| (TD - DTW X Multiplier = 1 Volume) | | 80% Recovery (TD - DTW X 0.20 + DTW) |

1 Volume = 2.5 X 10 = 25 (Total Purge)

Meter(s): Ultrameter, Haeh

| Time | Temp (°C/°F) | pH | Cond (mS/μS) | Turbidity (NTU) | Purge Rate (gal or mL/min) | Volume Removed (gal/L) | DTW | Notes |
|-----------------------------|-----------------|-----|-----------------|--------------------|----------------------------------|------------------------------|-----|---------------------|
| 1034 | 14.1 | 6.4 | 10.08 | 71000 | — | 2.5 | — | Hard bottom, Turbid |
| 1038 | 14.6 | 6.5 | 10.37 | 71000 | — | 5 | — | Turbid |
| 1042 | 15.2 | 6.5 | 10.33 | 71000 | — | 7.5 | — | " |
| 1046 | 14.9 | 6.6 | 10.20 | 71000 | — | 10 | — | " |
| Well dewatered @ 10 gallons | | | | | DTW = 17.81 | | | |
| 1139 | 14.7 | 6.5 | 10.45 | >1000 | — | 12.5 | — | clearing slowly |
| 1143 | 14.8 | 6.6 | 10.54 | >1000 | — | 15.0 | — | |
| 1147 | 15.1 | 6.7 | 10.30 | >1000 | — | 17.5 | — | |
| Dewatered @ 17.5 gallons | | | | | DTW = 17.86 | | | |
| 1244 | 15.1 | 6.9 | 10.30 | >1000 | — | 20.0 | — | |
| 1247 | 15.2 | 6.7 | 10.27 | >1000 | — | 22.5 | — | |
| 1250 | 15.2 | 6.8 | 10.28 | >1000 | — | 25.0 | — | DTW = 3.52 |
| Dewatered @ | | | | | 250 gallons | | | |

| | |
|--|---|
| Did well dewater? <u>YES</u> NO | Total volume removed: <u>25.0</u> (gal/L) |
| Sample method (if applicable): <input checked="" type="checkbox"/> Disp Bailer <input type="checkbox"/> Ded. Tubing <input type="checkbox"/> New Tubing <input type="checkbox"/> Ext. Port <input type="checkbox"/> Other: | |
| Sample date: / / | Sample time: : : DTW at sample: / / |
| Sample ID: / / | Lab: / / Number of bottles: / |
| Analysis: / / / / / / | |

Development Data Sheet

| | | |
|---|---|--|
| Job#: B1-110104 | Developer: J Kerns B Myers | Client: Arcadis |
| Well ID: <i>HW36</i> | Date: 1/4/11 | Site: Campus Bay |
| Well diam: 1/4" 1" <u>2"</u> 3" 4" 6" Other: | DTW: <i>2.54</i> | TD Before: <i>19.67</i> TD After: <i>19.67</i> |
| Purge equip: ES - diam: Bladder Peri Waterra Positive Air Displacement Ext. System | | |
| disp bailer <u>teflon bailer</u> other: Surge block used: <u>Y</u> N | | |
| Length of time surged prior to development: <i>10 mins</i> | | |
| Pump depth/ intake: | Multipliers: 1"= 0.04 2"= 0.16 3"= 0.37 4"= 0.65 5"= 1.02 6"= 1.47 Radius ² X 0.163 | |
| (TD - DTW X Multiplier = 1 Volume) | | 80% Recovery (TD - DTW X 0.20 + DTW) |

1 Volume = 2.7 X 10 = 27 (Total Purge) Meter(s):

| Time | Temp (°C/°F) | pH | Cond (mS / µS) | Turbidity (NTU) | Purge Rate (gal or mL / min) | Volume Removed (gal / L) | DTW | Notes |
|----------------------------|--------------|-----|----------------|-----------------|------------------------------|--------------------------|------|----------------------------|
| 1000 | 14.6 | 6.6 | 12.61 | 71000 | — | 2.7 | — | Hard bottom, turbid, silty |
| 1004 | 14.6 | 6.7 | 12.42 | 71000 | — | 5.4 | — | Turbid, silty |
| 1008 | 14.7 | 6.2 | 12.34 | 71000 | — | 8.1 | 9.11 | Turbid |
| 1012 | 14.8 | 6.1 | 12.21 | 71000 | — | 10.8 | — | " |
| 1015 | 14.8 | 6.0 | 12.17 | 71000 | — | 11.5 13.5 | — | " |
| 1018 | 14.9 | 6.3 | 12.14 | 71000 | — | 16.2 16.2 | — | " |
| 1021 | 14.6 | 6.3 | 12.15 | 71000 | — | 19 19 | — | " |
| 1025 | 14.8 | 6.1 | 12.07 | 71000 | — | 20.7 21.7 | — | " |
| 1027 | 14.7 | 6.1 | 12.01 | 71000 | — | 24.4 | — | " |
| 1030 | 14.6 | 6.1 | 11.96 | 71000 | — | 27 | — | " |
| | | | | | | | 2.66 | |
| * Well bottom clean + hard | | | | | | | | |

| | |
|---|---|
| Did well dewater? YES <u>NO</u> | Total volume removed: <u>27</u> (gal / L) |
| Sample method (if applicable): Disp Bailer <input checked="" type="checkbox"/> Ded. Tubing <input type="checkbox"/> New Tubing <input type="checkbox"/> Ext. Port <input type="checkbox"/> Other <input type="checkbox"/> | |
| Sample date: / / | Sample time: : : DTW at sample: / / |
| Sample ID: / / | Lab: / / Number of bottles: / |
| Analysis: / / | |

Development Data Sheet

| | | |
|---|---|--|
| Job#: B1-110104 | Developer: J Kerns B Myers | Client: Arcadis |
| Well ID: <i>MW-37</i> | Date: 1/4/11 | Site: Campus Bay |
| Well diam: 1/4" 1" <u>2"</u> 3" 4" 6" Other: | DTW: <i>2.88</i> | TD Before: <i>17.81</i> TD After: <i>17.86</i> |
| Purge equip: ES - diam: Bladder Peri Waterra Positive Air Displacement Ext. System | | |
| disp bailer <u>teflon bailer</u> other: Surge block used: <u>Y</u> N | | |
| Length of time surged prior to development: <i>10 mins</i> | | |
| Pump depth/ intake: | Multipliers: 1"= 0.04 2"= 0.16 3"= 0.37 4"= 0.65 5"= 1.02 6"= 1.47 Radius ² X 0.163 | |
| (TD - DTW X Multiplier = 1 Volume | | 80% Recovery (TD - DTW X 0.20 + DTW) |

1 Volume = 2.4 x 10 = 24 (Total Purge) Meter(s):

| Time | Temp (C/F) | pH | Cond (ms / μS) | Turbidity (NTU) | Purge Rate (gal or mL/ min) | Volume Removed (gal / L) | DTW | Notes |
|------|------------|-----|-------------------------|-----------------|-----------------------------|--------------------------|------|----------------------------|
| 914 | 13.1 | 5.9 | 9263 | 71000 | — | 2.4 | — | Hard bottom, Turbid, silty |
| 916 | 14.7 | 5.7 | 8618 | 71000 | — | 4.8 | — | Turbid, silty |
| 919 | 14.7 | 5.8 | 8846 | 71000 | — | 7.2 | — | Turbid |
| 924 | 14.7 | 5.9 | 8967 | 71000 | — | 9.6 | — | " |
| 928 | 14.5 | 6.0 | 9186 9186 | 71000 | — | 12 | — | " |
| 932 | 14.4 | 6.0 | 9297 | 71000 | — | 14.4 | — | " |
| 936 | 14.2 | 6.0 | 9036 | 71000 | — | 16.8 | — | " |
| 940 | 14.0 | 6.0 | 8946 | 71000 | — | 19.2 | — | " |
| 944 | 14.0 | 6.0 | 8889 | 71000 | — | 21.6 | — | " |
| 948 | 13.6 | 6.0 | 8844 | 71000 | — | 24 | — | " |
| | | | | | | | 2.71 | |

A well bottom clean + hard

| | |
|---|---|
| Did well dewater? YES <input type="radio"/> NO <input checked="" type="radio"/> | Total volume removed: <u>24</u> (gal / L) |
| Sample method (if applicable): Disp Bailer <input checked="" type="checkbox"/> Ded. Tubing <input type="checkbox"/> New Tubing <input type="checkbox"/> Ext/Port <input type="checkbox"/> Other: <input type="checkbox"/> | |
| Sample date: <i>/</i> | Sample time: <i>/</i> DTW at sample: <i>/</i> |
| Sample ID: <i>/</i> | Lab: <i>/</i> Number of bottles: <i>/</i> |
| Analysis: <i>/</i> | |

Development Data Sheet

| | | | | | |
|---|--|-----------------------------------|---|-------------------------|---|
| Job#: B1-110104 | | Developer: J Kerns B Myers | | Client: Arcadis | |
| Well ID: <u>HWSB</u> | | Date: 1/4/11 | | Site: Campus Bay | |
| Well diam: 1/4" 1" <u>2"</u> 3" 4" 6" Other: | | | DTW: <u>3.08</u> | | TD Before: <u>20.5</u> TD After: <u>20.80</u> |
| Purge equip: ES - diam: Bladder Peri Waterra Positive Air Displacement Ext. System | | | | | |
| disp bailer <u>teflon bailer</u> other: | | | Surge block used: <u>Y</u> <u>N</u> | | |
| Length of time surged prior to development: <u>10</u> mins | | | | | |
| Pump depth/ intake: | | | Multipliers: 1"= 0.04 2"= 0.16 3"= 0.37 4"= 0.65 5"= 1.02 6"= 1.47 Radius ² X 0.163 | | |
| (TD - DTW X Multiplier = 1 Volume | | | 80% Recovery (TD - DTW X 0.20 + DTW) | | |

1 Volume = 2.8 X 10 = 28 (Total Purge)

Meter(s): Ultrasonic, HACH

| Time | Temp (°C/°F) | pH | Cond (mS / (S)) | Turbidity (NTU) | Purge Rate (gal or mL / min) | Volume Removed (gal / L) | DTW | Notes |
|-------------------------------|--------------|-----|-----------------|-----------------|------------------------------|--------------------------|-------------|----------------------------|
| 1201 | 15.0 | 7.3 | 7955 | 71000 | — | 2.8 | — | Hard bottom, turbid, silty |
| 1205 | 16.1 | 6.7 | 8788 | 71000 | — | 5.6 | — | Turbid |
| 1208 | 16.6 | 6.5 | 8594 | 71000 | — | 8.4 | 17.15 | Turbid |
| Well dewatered @ 8.5 gallons | | | | | | | | |
| 1315 | 16.1 | 7.5 | 8823 | 71000 | — | 11.2 | — | |
| 1319 | 16.4 | 7.1 | 8821 | 71000 | — | 14 | — | |
| 1323 | 16.6 | 7.0 | 8601 | 71000 | — | 16.8 | — | |
| Well dewatered @ 17 gallons | | | | | | | DTW = 19.87 | |
| 1340 | 16.3 | 7.2 | 8843 | 71000 | — | 19.6 | — | |
| 1348 | 16.7 | 6.6 | 8745 | 71000 | — | 22.4 | — | |
| Well dewatered @ 22.5 gallons | | | | | | | DTW = 19.87 | |
| 1418 | 16.5 | 7.3 | 8894 | 71000 | — | 25.2 | — | |
| 1424 | 16.7 | 7.3 | 8821 | 71000 | — | 28 | — | |
| | | | | | | | 17.88 | |

| | | | |
|---|--|---|--|
| Did well dewater? <u>YES</u> NO | | Total volume removed: <u>28</u> (gal / L) | |
| Sample method (if applicable): <u>Disp Bailer</u> <u>Ded. Tubing</u> <u>New Tubing</u> <u>Ext. Port</u> <u>Other:</u> | | | |
| Sample date: <u>/</u> | | Sample time: <u>/</u> | |
| Sample ID: <u>/</u> | | Lab: <u>/</u> | |
| Analysis: <u>/</u> | | DTW at sample: <u>/</u> | |
| | | Number of bottles: <u>/</u> | |

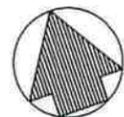
ATTACHMENT 3

Figure 6 of 2001 URS Report

EXCEEDANCES OF 10 X AWQC*

| Location | Arsenic | Cadmium | Copper | Lead | Mercury | Nickel | Zinc |
|-----------|---------|---------|--------|------|---------|--------|--------|
| 10 X AWQC | 360 | 93 | 31 | 56* | 0.25* | 82 | 580* |
| A4-1A | 6.3 | <5 | <10 | <3 | 0.73 | <20 | <20 |
| A4-2A | <5 | <5 | <10 | <3 | 0.35 | <20 | <20 |
| A4-2B | 72 | <5 | <10 | <3 | 0.5 | <20 | <20 |
| A4-3B | 190 | <5 | <10 | <3 | 0.38 | <20 | <20 |
| A4-4B | 28 | <5 | <10 | <3 | 0.47 | <20 | <20 |
| A4-5A | 16 | <5 | <10 | <3 | <0.20 | 21 | 600 |
| A4-5B | 400 | <5 | <10 | <3 | <3 | <20 | 31 |
| A4-9B | 370 | 51 | <10 | <3 | <3 | 440 | 21,000 |
| A4-10B | 59 | 46 | <10 | 3.2 | <0.2 | 420 | 21,000 |
| A4-12A | 18 | 6.6 | <10 | <3 | <0.20 | 150 | 5,800 |
| A4-13A | 15 | <5 | <10 | <3 | <0.20 | 22 | 600 |
| A4-13A | <5 | <5 | <10 | <3 | <0.20 | 110 | 38 |
| A4-13B | 25 | 37 | <10 | 59 | <0.2 | 380 | 19,000 |
| A4-14 | 95 | 150 | <10 | 8.3 | <0.20 | 530 | 27,000 |
| A4-16B | 15 | <5 | <10 | <3 | 0.39 | <20 | 270 |
| B-2-W | 220 | 6.3 | ND | ND | ND | 15 | 1,600 |
| MF-104 | 24 | <5 | 10 | <3 | 1.5 | <20 | 22 |
| MF116-GW | 26 | <5 | <10 | <3 | 2 | <20 | <20 |
| PB-12 | 92 | 160 | 14,000 | 54 | <0.2 | 790 | 33,000 |
| SD-102-GW | <5 | <5 | 89 | <3 | <0.2 | <20 | 80 |
| SL-101-GW | 17 | 13 | <10 | <3 | <0.2 | 320 | 12,000 |

Note: units reported as ug/L.
* Locations without an exceedance are not listed.



LEGEND

- ⊙ Sampling Location (Borings)
- ⊠ Sampling Location (Test Pits)
- ⊡ Mercury exceedance
- ⊡ As, Cd, Cu, Pb, Ni, Zn exceedances
- No Exceedance
- Proposed monitoring well
- Property Boundary

- ∇ Stege Marsh
- ∇ Storm Drain System (Approximate)
- ∇ Industrial Drain (Approximate)
- ∇ Sanitary Sewer System (Approximate) (dashed line to be verified)
- ∇ Edge of Surface Water

NOTES:

Project No.
51-09967067.00

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University of California, Berkeley
Richmond Field Station

URS

Metals in Groundwater
> 10 x AWQC

November 2001

Scale 1" = 150'

Figure 6