EXPERT REPORT
OF
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In the Matter of HUMBOLDT BAYKEEPER and ECOLOGICAL RIGHTS FOUNDATION
v
UNION PACIFIC RAILROAD COMPANY and NORTH COAST RAILROAD AUTHORITY, CUE VI, LLC

Prepared for:

Humboldt Baykeepers/Ecological Rights Foundations

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1.0 INTRODUCTION

I was retained by Lawyers for Clean Water on behalf of Humboldt Baykeeper and the Ecological Rights Foundation to evaluate pollutant releases to the environment and appropriate remedial actions to be taken at the 30-acre property located at 736 Broadway, Eureka, California (Balloon Track). All opinions expressed in this report are expressed to a reasonable degree of engineering certainty.

I am currently president of Carpenter Environmental Associates, Inc., (CEA) of Monroe, New York, an environmental science and engineering firm. I hold a Bachelor's degree in civil engineering, a Master's degree in environmental engineering, and a Ph.D. in environmental engineering, all from New York University. I am a registered professional engineer in New York, New Jersey, and Pennsylvania. I am Board Certified by the American Academy of Environmental Engineers. I have over 37 years experience in environmental engineering.

My experience includes RCRA investigations and closures, the design and evaluation of wastewater treatment plants and collection systems, as well as teaching of courses in environmental engineering at the undergraduate and graduate levels. My qualifications, along with a list of my publications, are contained in my curriculum vitae, which is attached as Appendix A.

I have been recognized as an expert in environmental engineering by federal courts and have provided testimony at depositions and at trial. In particular, I have been qualified as an expert for a RCRA case in Federal District Court. A list of my testimony at deposition and trial during the last four years is attached as Appendix B.

A list of the documents that I have utilized in my investigation and in the preparation of this report is attached as Appendix C.

The opinions expressed in this report are based on my professional experience; documents, exhibits, and references cited, and personal communications with Plaintiffs' experts.

Compensation to CEA for the work resulting in this report and for future work including my testimony at trial will be at the rates that are attached as Appendix D. My time is billed as a Principal.

2.0 SITE HISTORY

The Balloon Track site (the site) is an approximately 30-acre property located on three Assessor Parcel Numbers (APN) 003-021-09, APN 003-031-06, and APN 003-041-07 in Eureka, California (Figure 1).[1] The site is currently zoned as Zone "P," Public.[2] The site was originally tidal marsh land until purchased by Northwestern Pacific Railroad Company in the late 1800's.[3] The site was filled and the railroad switching, maintenance, and freight yard facility constructed in 1926-1927.[4] Locomotives, railroad boxcars, and passenger cars were repaired and refueled at the site. In 1990, Eureka Southern Railroad Company (ESRC), the yard operator at that time, removed all but two of the western tracks. The western tracks remained active until at least 1991.[5]

At one time or another, the site contained:

- Roundhouse
- Car Repair Shed
- Aboveground Diesel, Bunker C Oil, Motor Oil Storage Tanks

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1 *Soil Removal Report, Former Railroad Yard Site, Eureka, California*, Geomatrix Consultants, September 2002.

2 *Phase 1 Environmental Site Assessment, Former SPTCo Railroad Yard (APNs 3-021-09, 3-031-06, 3-041-07) and Adjacent Properties (APNs 3-051-01, 3-041-05, 3-041-06), Eureka, CA,* SHN Consulting Engineers & Geologists, Inc., March 1999.

3 Cleanup and Abatement Order No. R1-2001-26 For Union Pacific Railroad Company, 736 Broadway, Eureka, California, Humboldt County, California Regional Water Quality Control Board, North Coast Region (RWQCB), May 9, 2001.

4 Van Kirk, Susie, *Historic Resources Report "Balloon Tract," Eureka, California,* October 2001.

5 *Summary Report Soil and Groundwater Investigations Volume I of II – Report* , Southern Pacific Transportation Company, Eureka Railroad Yard, Geomatrix Consultants, November 12, 1991.

- Diesel Fuel Tank Cars
- Locomotive Service Platform
- Locomotive Fueling Platforms and Diesel Fuel Pumps
- Oil/Water Separator and Collection System
- Waste Oil Disposal Pits
- Underground gasoline storage tanks
- Turntable
- Locker and wash house
- Sheds
- Storehouse
- Radio Shop
- Railroad Tracks
- Rail Tie Piles

Figure 2 shows the historic site layout with relevant features.

2.1. Repair and Maintenance Activities

Most of the major locomotive repair was performed at the roundhouse and car repair shed.[6] The roundhouse was constructed by 1931 and operated until at least 1984.[7] Repair and maintenance activities included lead-acid battery replacement, motor and part lubrication, waste oil draining, degreasing, refueling vehicles, and draining and replacement of other engine fluids.[8,9] A review of aerial photographs dated December 27, 1946, and August 22, 1962, identified two, unlined oil-disposal pits located immediately south of the roundhouse and topographically upgradient of monitoring stations B and C (Figure 2).[10]

Locomotive refueling occurred primarily at the locomotive service platform and the locomotive fueling platforms. Historical review of operations indicates that waste

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6 *Summary Report, Soil and Groundwater Investigations, Volume I of II – Report*, Southern Pacific Transportation Company, Eureka Railroad Yard, Geomatrix Consultants, November 12, 1991.

7 *Summary Report, Soil and Groundwater Investigations, Volume I of II – Report*, Southern Pacific Transportation Company, Eureka Railroad Yard, Geomatrix Consultants, November 12, 1991.

8 *Draft Proposed Remedial Action and Site Development Plan – Former Rail Yard Eureka, California*, *for Union Pacific Railroad Company*, Geomatrix Consultants, Inc., June 1999.

9 *Draft Proposed Remedial Action and Site Development Plan – Former Rail Yard Eureka, California*, *for Union Pacific Railroad Company*, Geomatrix Consultants, Inc., June 1999.

10 *Draft Proposed Remedial Action and Site Development Plan – Former Rail Yard Eureka, California, for Union Pacific Railroad Company*, Geomatrix Consultants, Inc., June 1999.

generated at the locomotive refueling platforms included Bunker C oil, diesel, lubricating oils, waste oils, metals, and chlorinated solvents.[11]

In 1989, the following waste materials and obvious contamination were identified on site:[12]

- 17, 55-gallon waste oil drums
- Heavily contaminated soils adjacent to the abandoned drums
- Used oil filters
- Two, 12,000-gallon diesel fuel aboveground storage tanks
- Three, 500-gallon aboveground storage tanks

From 1915 until 1954, Bunker C oil was the fuel used in the locomotives and was stored in a 650,000 gallon aboveground storage tank (AST).[13] The Bunker C oil was replaced with diesel after 1954. In 1954, the Bunker C tank was cut down to contain two, 12,700-gallon aboveground diesel storage tanks. The diesel tanks were replaced in 1979 and the new tanks were in service until 1984.[14] Due to decreased operations starting in 1984, locomotives were refueled by a tank truck until 1989.[15]

Cars and trucks were refueled from three, leaded-gasoline underground storage tanks (USTs), with capacities ranging from 600 to 2500 gallons. The USTs were located south of the car repair shed.[16] Although documents to date do not give a specific date of installation, the tanks were removed in 1988.[17] Groundwater samples collected after

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11 *Draft Proposed Remedial Action and Site Development Plan – Former Rail Yard Eureka, California, for Union Pacific Railroad Company*, Geomatrix Consultants, Inc. June 1999.

12 "Water Front Yard and Eureka Main Yard Waste Removal Project, IT Corporation RFQ# 710," International Technology Corporation, July 19, 1989.

13 *Summary Report, Soil and Groundwater Investigations, Volume I of II – Report*, Southern Pacific Transportation Company, Eureka Railroad Yard, Geomatrix Consultants, November 12, 1991.

14 *Summary Report Soil and Groundwater Investigations Volume I of II – Report,* Southern Pacific Transportation Company Eureka Railroad Yard, Geomatrix Consultants, November 12, 1991.

15 *Summary Report Soil and Groundwater Investigations Volume I of II – Report*, Southern Pacific Transportation Company Eureka Railroad Yard, Geomatrix Consultants, November 12, 1991.

16 *Draft Proposed Remedial Action and Site Development Plan*, Geomatrix Consultants, June 1999.

17 *Draft Proposed Remedial Action and Site Development Plan*, Geomatrix Consultans, June 1999.

removal of the USTs detected petroleum hydrocarbons, benzene, toluene, and xylene above the method detection limit.[18]

2.2. Waste Handling Operations

From 1976 until approximately 1986, oily water wastes were managed on-site via an oil-water collection and treatment system consisting of underground conveyance and collection pipes, standpipes, and an oil-water separator.[19] The California Regional Water Qualtiy Control Board, North Coast Region (RWQCB) required the installation and monitoring of an oil/water separator in 1976 and issued an NPDES permit after Northwestern Pacific Railroad Co., the operator of the facility at that time, reported a waste discharge.[20] The permit required monitoring for oil and grease. The treated oily water discharged into Clark Slough at the eastern side of the site and ultimately discharged under a NPDES permit to Humboldt Bay.

The site contained additional facilities including: three sheds, a storehouse, a locker and wash house, a radio shop, and a turntable which switched locomotives and boxcars between various tracks. We have limited information documenting materials specifically used or stored at/in these locations; however, the turntable area was considered to be a potentially hazardous substance source area by the USEPA.[21]

Evidence of past waste disposal practices was documented over time. Soil and debris piles (Photograph 1), abandoned equipment and debris (Photographs 2, 3), railroad ties (Photograph 4), and evidence of tire burning (Photograph 5) remain on-site.

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18 Soil Sampling Data, Underground Storage Tank Closures, Southern Pacific Transportation Company, Eureka and Scotia, California, Canonie Environmental, February 7, 1989.

19 *Summary Report Soil and Groundwater Investigations Volume I of II – Report Southern Pacific Transportation Company Eureka Railroad Yard*, Geomatrix Consultants, November 12, 1991.

20 RWQCB Order No. 76-9, NPDES No. CA 0023698, Waste Discharge Requirements for Northwestern Pacific Railroad Company, Humboldt County, January 29, 1976.

21 USEPA Region IX, Hazardous Waste Management Division, Field Operations Branch Field Sample Plan, June 5, 2000.

3.0 SITE CONTAMINATION

Historically, contamination associated with rail yards as a result of railcar/engine maintenance activities includes the following:[22,23]

- Oil and Grease Removal
- Painting
- Locomotive maintenance
- Treated railroad tie storage
- Vehicle fueling
- Track maintenance
- Site maintenance (weed control)
- Waste handling, storage, and disposal

These activities may release the following contaminants:

- diesel range organics
- total petroleum hydrocarbons
- polynuclear aromatic hydrocarbons
- PCBs
- volatile organic compounds (VOCs) including spent solvents
- heavy metals – antimony, arsenic, beryllium, cadmium, chromium (hexavalent and total), copper, lead, mercury, nickel, selenium, silver, thallium, and zinc.
- herbicide residuals

All of these typical contaminants have been detected at the Balloon Track site.

Union Pacific and its corporate predecessor, Southern Pacific Transportation Company, has been investigating site contamination and conducting interim cleanup activities since 1988.[24] A Cleanup and Abatement Order (CAO) was issued by the RWQCB in 2001, requiring, among other actions, interim measures for the mitigation of soil contamination at the site.[25] In 2002, Union Pacific conducted soil removal in the disposal pit area due to

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22 USEPA, Region 3, Mid-Atlantic Brownfields, Rail Yards, http:www.epa.gov/reg3hwmd/bfs/regional/industry/railyard.htm, July 26th 2007.

23 "Environmental Update #20, Environmental Contamination of Rail Yards," Hazardous Substance Research Centers, South & Southwest Outreach Programs, Louisiana State University, November 2005.

24 *Phase I Hazardous Waste Survey – NWP Railroad Yard, Eureka, California,* Pace Laboratories, Inc., December 13, 1988.

25 Cleanup and Abatement Order No. R1-2001-26 For Union Pacific Railroad Company, 736 Broadway, Eureka, California, Humboldt County, RWQCB, May 9, 2001.

contamination with lead (1,800 and 1,700 milligrams per kilogram [mg/kg]) and copper (3,100 and 3,900 mg/kg) in excess of the total threshold limit concentrations (TTLC) values of 1,000 mg/kg and 2,500 mg/kg, respectively, classifying the soil as hazardous. Approximately 700 cubic yards of lead and copper contaminated soils were removed from the pits and adjacent stockpiles. The pits were backfilled with soil.[26]

The following sections discuss the findings of site investigations regarding contamination of soil, groundwater, surface water, stormwater, and sediments, above applicable screening criteria.

3.1. Soil

Investigation has been conducted at the site including the collection and analysis of soil samples since 1988, beginning with samples collected as part of the removal of three USTs.[27] Since that time, 241 investigation related soil samples in areas of the site remaining unremediated have been collected and analyzed for numerous constituents.[28,29,30,31,32,33,34,35,36] For the purposes of my assessment, soil concentrations were screened against the following criteria:

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26 *Soil Removal Report, Former Rail Yard, Eureka, California,* Geomatrix Consultants, September 2002.

27 Draft *Final Remedial Action Plan, UPRR Eureka Railroad Yard and Adjacent Lease Properties, Eureka, California*, MFG, Inc., July 1, 2005.

28 *Phase I Hazardous Waste Survey – NWP Railroad Yard, Eureka, California,* Pace Laboratories, Inc., December 13, 1988.

29 *Interim Remedial Action Plan,* Former Rail Yard, Eureka, California, Geomatrix Consultants, December 2001.

30 *Soil Removal Report, Former Railroad Yard Site,* Eureka, California, Geomatrix Consultants, September 2002.

31 *Preliminary Assessment/Site Inspection*, State of California Regional Water Quality Control Board, May 7, 2001.

32 Laboratory Report for Canonie Environmental, July 1, 1988.

33 *Additional Soil Removal, Confirmation Soil Sampling, and Destruction of Piezometer P-9A*, Geomatrix Consultants, December 19, 2003.

34 *Health Risk Assessment Report, Former Railroad Yard, Eureka, California*, Geomatrix Consultants, Inc., June 1997.

35 *Soil Investigation and Groundwater Monitoring Well Installation Report, Former SPTCo Railroad Yard, Eureka, California*, Geomatrix Consultants, January 1994.

36 *Summary Report, Soil and Groundwater Investigation, Volume I of III Report*, Geomatrix Consultants, November 12, 1991.

- USEPA, Region 9, Preliminary Remediation Goals (PRGs), Direct Contact Exposure Pathways, Residential Soil
- USEPA, Region 9, PRGs, Direct Contact Exposure Pathways, Industrial Soil
- USEPA, Soil Screening Levels, Migration to Ground Water
- California Code of Regulations, Title 22, Chapter 11, Article 3, "Characteristics of Hazardous Waste," Section 66261.24 (a)(C)(2)(A), Total Threshold Limit Concentration (TTLC) Values

Of the 241 investigative soil samples, the following constituents were detected above the USEPA, Region 9, Preliminary Remediation Goals (PRGs), residential, industrial, and/or impact to groundwater:

- Arsenic – 124 exceedances
- Lead – 19 exceedances

Table 1 provides a summary of soil metal concentrations exceeding applicable guidance. Figures 3 and 4 show the sample locations exceeding residential and industrial PRGs, respectively.

Samples collected as part of the waste disposal site excavation/characterization have not been evaluated in this report. They do not represent current site conditions.

3.1.1 Arsenic

Of the 241 investigative soil samples analyzed for arsenic, 88 exceeded the industrial PRG of 1.6 mg/kg. Of these, 26 exceeded the impact to groundwater soil screening criterion of 29 mg/kg (Figure 5). An additional nine samples exceeded the residential PRG of 0.39 mg/kg but were below the industrial PRG of 1.6 mg/kg. One sample, SHN-S-17, contained arsenic concentrations in excess of the TTLC of 500 mg/kg, thereby classifying the material as hazardous.[37]

[37] California Code of Regulations, Section 66261.24, Title 22, Chapter 11, Article 3. Characteristics of Hazardous Waste, California Office of Administrative Law, http://weblinks.westlaw.com.

Arsenic is prevalent across the site with the highest concentrations located in the northeastern corner of the site where the railroad tracks enter the site. There were four rail lines in close proximity to each other at this location. The use of arsenical herbicides at the tracks likely resulted in exceedances of the residential and industrial PRGs as well as the impact to groundwater criterion for arsenic.[38]

According to Dr. Benjamin Ross, Disposal Safety, Inc., the shallow (A-Zone) groundwater in the northern area of the site flows towards and ultimately discharges into Humboldt Bay.[39] MW-2A is located along the western portion of the site and hydraulically downgradient of a number of the samples exceeding impact to groundwater criterion. Concentrations of arsenic in 8 of 14 shallow groundwater samples collected from MW-2A exceeded the groundwater Water Quality Objective (WQO) of 0.1 ug/l showing a potential completed pathway for arsenic soils to impact groundwater and migrate to Humboldt Bay.[40] In addition, many results of the analyses of the remaining samples from MW-2A were reported as below detection limits; at times using method detection limits up to 50 times the groundwater WQO for arsenic. Use of such high detection levels does not permit a full evaluation of arsenic in groundwater or the impact to groundwater in MW-2A from soils containing elevated arsenic concentrations.

Groundwater from the northern portion of the northeastern portion of the site, which contains numerous samples with arsenic concentrations above the impact to groundwater criterion flows to Humboldt Bay.[41] There are no A-Zone monitoring wells that will intercept groundwater flow between these sample locations and Humboldt Bay. This data gap prevents an assessment of groundwater contamination as well as transport of arsenic in groundwater to Humboldt Bay.

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38 Draft *Final Remedial Action Plan, UPRR Eureka Railroad Yard and Adjacent Lease Properties, Eureka, California*, MFG, Inc., July 1, 2005.

39 Benjamin Ross, Ph.D., *Ground-Water Movement at the Balloon Track Site*, Eureka, California, January 28, 2008.

40 Cleanup and Abatement Order No. R1-2001-26 for Union Pacific Railroad Company, 736 Broadway, Eureka, California, Humboldt County, RWQCB, May 9, 2001.

41 Benjamin Ross, Ph.D., *Ground-Water Movement at the Balloon Track Site*, Eureka, California, January 28, 2008.

3.1.2 Lead

Of the 241 investigation soil samples analyzed for lead, 3 exceeded the industrial PRG of 800 mg/kg. An additional 25 samples exceeded the residential PRG of 150 mg/kg but were below the industrial PRG of 800 mg/kg. Lead concentrations did not exceed the impact to groundwater criterion. The lead contaminated soils are concentrated near the former tank locations on the northern side of the site (Figures 3 and 4).

3.1.3 Other Contaminants

The following constituents were detected above the PRG/ impact to groundwater criteria:

- Antimony – 4 exceedances
- Benzo(a)anthracene – 4 exceedances
- Copper – 1 exceedance
- Tetrachloroethylene – 1 exceedance
- Iron – 1 exceedance

Antimony Out of 241 investigative soil samples collected and analyzed for antimony, 3 samples exceeded the impact to groundwater criterion concentration of 5 mg/kg. The soil samples containing concentrations of antimony in excess of the impact to groundwater criterion are concentrated in the area east of the car repair shed. Antimony concentrations in one sample exceeded residential PRG of 31 mg/kg from the same location. None of the detected concentrations exceeded the industrial PRG. Groundwater measurements show that groundwater flows to the east.[42] There are no monitoring wells in that area that would detect groundwater contaminated with antimony. This data gap prevents a determination of potential impact to groundwater by antimony from this area.

[42] Benjamin Ross, Ph.D., *Ground-Water Movement at the Balloon Track Site*, Eureka, California, January 28, 2008.

Benzo(a)anthracene

Out of 241 investigative soil samples analyzed for benzo(a)anthracene, 4 exceeded the residential PRG of 0.062 mg/kg. None exceeded the industrial PRG or the impact to groundwater criterion of 8.0 mg/kg. Samples containing Benzo(a)anthracene at concentrations exceeding residential PRGs are present in soils in the vicinity of the former roundhouse and in one sample collected west of the railroad tracks along Waterfront Drive.[43]

Copper Out of 241 investigative soil samples collected and analyzed for copper, one sample exceeded the residential PRG of 3,100 mg/kg. The sample was collected east of the car repair shed.

Tetrachloroethene

Out of 241 investigative soil samples collected and analyzed for Tetrachloroethene (PCE), 3 samples contained concentrations of PCE in excess of the residential PRGs in the northeast corner of the site and southeast of the car repair shed.

Iron Out of 241 investigative samples collected and analyzed for iron, one sample exceeded the residential PRG of 23,000 mg/kg. The sample was located in the northeast corner of the site

3.2. Surface Water

Surface water bodies that may be impacted by site contaminants include Clark Slough, Humboldt Bay, and on-site wetlands. CAO surface water monitoring locations are shown on Figure 6.

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[43] *Interim Remedial Action Plan, Former Rail Yard, Eureka, California,* Geomatrix Consultants, December 2001.

3.2.1 Clark Slough

Discharges reach Clark Slough from the ditch that runs along the west side of the site (western ditch) through a culvert directly to Clark Slough. These discharges are sampled at Station D. There is a ditch that runs along the southeastern edge of the site (southeastern ditch). The southeastern ditch discharges into a pipe located at the site property line that enters into the Del-Reka Distributing Corporation site, located at 510 West Washington Street.[44] It is likely that water contained in this pipe ultimately discharges to Clark Slough. Flow in these on-site ditches contains a combination of stormwater runoff from the site, site surface water, and site groundwater from the shallow groundwater aquifer (A-Zone).[45]

The western ditch is sampled at Station D and then discharges to Clark Slough through a culvert. Clark Slough is Estuarine. There is tidal influence in Clark Slough. WQOs for Enclosed Bays and Estuaries apply.[46] Because there is no mixing zone, WQOs apply at the end of the discharge pipe.[47,48]

CAO R1-2001-26 applies to the site and requires that water be monitored for, among other pollutants, copper, lead, and zinc as well as for flow to coincide with the first rainfall event that results in runoff each month.[49] Station D is one of the locations that must be monitored. Station D is approximately 20 feet north of the location where the western ditch enters the culvert that discharges to Clark Slough. On certain occasions during high tide, water from Clark Slough backs up through the culvert and enters the western ditch. No samples at Station D, however, have been collected when water from

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44 Personal Communication, William J. Rogers, Ph.D., January 23, 2008.

45 Benjamin Ross, Ph.D., *Ground-Water Movement at the Balloon Track Site*, Eureka, California, January 28, 2008.

46 Cleanup and Abatement Order No. R1-2001-26 for Union Pacific Railroad Company 736 Broadway, Eureka, California, RWQCB, May 9, 2001.

47 Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California, State Water Resource Control Board, California Environmental Protection Agency, 2005.

48 40 CFR Part 131: Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California, Rule, Federal Register Part III, May 18, 2000

49 Cleanup and Abatement Order No. R1-2001-26 for Union Pacific Railroad Company 736 Broadway, Eureka, California, RWQCB, May 9, 2001.

Clark Slough has backed up into the western ditch. In my opinion, samples taken at Station D represent the quality of the water being discharged from the western ditch to Clark Slough.

We have compared the discharges to Clark Slough from the western ditch (measured at Station D) to the WQOs for Enclosed Bays and Estuaries. We have data from sampling events required by the CAO order from November 28, 2001 to April 12, 2007.[50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75]

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[50] December 2001 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, Geomatrix Consultants, January 25, 2002.

[51] January 2002 Stormwater Observations and Analytical Results Former Eureka Railroad Yard, Eureka, California, Geomatrix Consultants, February 14, 2002.

[52] February 2002 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, Geomatrix Consultants, March 25, 2002.

[53] December 2002 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, Geomatrix Consultants, January 29, 2003.

[54] January 2003 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, Geomatrix Consultants, February 27, 2003.

[55] February 2003 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, Geomatrix Consultants, March 28, 2003.

[56] March 2003 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, Geomatrix Consultants, April 29, 2003.

[57] April 2003 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, Geomatrix Consultants, May 28, 2003.

[58] May 2003 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, Geomatrix Consultants, June 26, 2003.

[59] December 2003 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., January 30, 2004.

[60] January 2004 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., March 23, 2004.

[61] February 2004 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., April 5, 2004.

[62] March 2004 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., May 7, 2004.

[63] October 2004 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., December 8, 2004.

[64] December 2004 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., January 31, 2005.

[65] January 2005 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., March 1, 2005.

[66] February 2005 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., April 1, 2005.

[67] March 2005 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., May 5, 2005.

[68] April 2005 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., June 1, 2005.

During that time period, 14 sampling events reported numerical values for copper concentration that could be compared to the WQO for copper in estuaries (Table 4). There were 8 events, for which copper was reported as less than 5 micrograms per liter (ug/l) and thus the results could not be compared to the WQO of 3.1 ug/l. During the remaining events, Station D was not sampled. Of the 14 samples that can be compared to the WQO for copper, 12 (86%) had copper concentrations exceeding the WQO.

Monitoring Wells 2A, 3A, and 4A sample Zone-A groundwater that discharges to the ditch.[76] Figure 7 shows the monitoring well locations. Analytical results of groundwater samples from these monitoring wells show copper concentrations in exceedance of the 3.1 ug/l WQO at least once in each of monitoring wells. For approximately 75% of the samples submitted for analysis, the method detection limits ranged from 1.7 times to 8.3 times the WQO. Use of such high detection levels does not permit a full evaluation of copper in groundwater and its potential impact on copper concentrations in the western ditch surface waters.[77]

The pipe at the property line of the site and Del-Reka Distributing Corporation receives discharge from the southeastern ditch and discharges off-site. This discharge was not covered in the CAO nor was it sampled by defendants. Thus the water that is discharged from the site at this point is not characterized.

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69 May 2005 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., July 5, 2005.

70 November 2005 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., December 30, 2005.

71 December 2005 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., January 30, 2006.

72 January 2006 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., February 28, 2006.

73 March 2006 Stormwater Observations and Analytical Results, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., April 28, 2006.

74 April 2007 Surface Water Monitoring Report, Former Union Pacific Railroad Yard, Eureka, California, SHN Consulting Engineers and Geologists, Inc, June 1, 2007.

75 June 2006 Stormwater Observations, Former Eureka Railroad Yard, Eureka, California, MFG, July 15, 2006

76 Benjamin Ross, Ph.D., *Ground-Water Movement at the Balloon Track Site*, Eureka, California, January 28, 2008.

77 Master Data Tables GW SW 12 12 07.xls, Lawyers for Clean Water, December 12, 2007.

Site groundwater enters the southeastern ditch from the site and mingles with stormwater and surface water from the site before discharging from the site via the pipe at Del-Reka Distributing Corporation. There are no monitoring wells that intercept this groundwater flow. Thus, there exists a data gap that prevents determination of pollutant concentrations in the groundwater entering the ditch directly and through discharge from the wetland.[78]

3.2.2 Wetlands Water Quality

Mapped wetlands are located on the site. The site contains mapped wetlands including four ditches; the eastern ditch, the southeastern ditch, the "L shaped ditch," and western ditch as well as an area in the southeast corner of the site.[79,80] Three of the on-site ditches contain wet weather sampling points A, B, C, D, and F. No samples have been taken of water from the southeastern ditch that discharges into the pipe at Del-Reka Distributing Corporation or the wetlands area in the southeastern corner of the site. Freshwater WQOs apply in the ditches.[81,82] Samples from Station C at the end of the L-shaped ditch are analyzed for hardness as part of the CAO monitoring program. Station C is the only freshwater sampling station requiring monitoring for hardness and thus is used as representative of hardness in all freshwater samples collected on the site. Data from all available observations and sample results were tabulated and analyzed to determine exceedances of freshwater WQOs (Tables 2 through 5).

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78 Benjamin Ross, Ph.D., *Ground-Water Movement at the Balloon Track Site*, Eureka, California, January 28, 2008.

79 *Balloon Track Coastal Zone Wetland Delineation Coastal Commission Methodology, Project No.:874 PIE*, Zentner, March 2007.

80 *Investigation of the Presence of Wetlands Subject to Regulation under the California Costal Act Balloon Track Properties, Eureka, Humboldt County, California,* Huffman-Broadway Group, April 2007.

81 40 CFR Part 131, Water Quality Standards: Establishment of Numeric Criteria for Toxic Pollutants for the State of California; Rule, May 18, 2000.

82 State Water Resources Control Board, *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California,* 2005.

On certain occasions during high tide, water from Clark Slough backs up through the culvert and enters the western ditch. No water samples at Station D, however, have been taken when water from Clark Slough has backed up into the western ditch. [83,84,85] Samples were only taken when there was flow in the western ditch at Station D.

In my opinion, samples taken at Station D represent the quality of the water in the western ditch. Water in the western ditch is freshwater except on occasions during high tide when water backs up from Clark Slough into the western ditch. Freshwater WQOs apply to the ditch (wetlands). Copper concentrations exceeded hardness based freshwater WQOs 7 out of 23 sampling events (over 30% of the time) during which copper was analyzed. The highest copper concentration reported in the western ditch was 160 ug/l; over 15 times the WQO (Table 4).

Sampling Stations F, at the northern end of the eastern ditch, and A, at the southern end of the eastern ditch, represent water quality in the eastern ditch. Based on figures prepared by MFG, Inc., Station A discharges to a ditch that runs along the alignment of a former railroad track and discharges to the wetlands located in the southeastern corner of the site.[86] During Plaintiff's January 10, 2008 inspection, water was observed to flow from F to A then to the wetlands in the southeast corner of the site. Water from the southeastern wetlands was observed to discharge to the southeastern ditch and then into the culvert at Del-Reka Distributing Corporation.[87]

At Station F, freshwater WQOs have been exceeded for copper, lead, and zinc. Freshwater WQOs for copper and zinc are hardness based. The freshwater WQO for lead

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83 June 2006 Stormwater Observations, Former Eureka Railroad Yard, Eureka, California, MFG, Inc., July 15, 2006.

84 May 2005 Stormwater Observations and Analytical Results Former Eureka Railroad Yard, Eureka, California, MFG Inc, July 5, 2005.

85 June 2004 Stormwater Observations and Analytical Results Former Eureka Railroad Yard, Eureka, California, MFG, Inc, July 27, 2004.

86 Former Eureka Railroad Yard, Eureka, California, Figure 1, Stormwater and Surface Water Sampling Locations, Project 030282, MFG, Inc., April 2006.

87 Personal Communication, Benjamin Ross, Ph.D., January 23, 2008

is set at 3 ug/l based upon analytical limitations.[88] Copper concentrations exceeded hardness dependant freshwater WQOs in 15 out of 23 (over 65%) sampling events when the samples were analyzed for copper. The highest copper concentration reported at Station F was 62 ug/l; over 6 times the WQO. Zinc concentrations exceeded hardness dependant freshwater WQOs in 8 out of 23 (over 30%) sampling events when the samples were analyzed for zinc. The highest zinc concentration reported at Station F was 560 ug/l; over 4 times the WQO. Lead concentrations exceeded the freshwater WQO in 19 out of 23 (over 80%) sampling events when the samples were analyzed for lead The highest lead concentration reported at Station F was 130 ug/l; over 40 times the WQO (Table 5).

At Station A, freshwater WQOs have been exceeded for copper, lead, and zinc. Copper concentrations exceeded hardness dependant freshwater WQOs in 15 out of 28 (over 50%) sampling events when the samples were analyzed for copper (Table 2). The highest copper concentration reported at Station A was 48 ug/l; over 5 times the WQO. Zinc concentrations exceeded hardness dependant freshwater WQOs in 3 out of 28 (over 10%) sampling events when the samples were analyzed for zinc. The highest zinc concentration reported at Station A was 540 ug/l; over 4 times the WQO. Lead concentrations exceeded the freshwater WQO in 17 out of 28 (over 60%) sampling events when the samples were analyzed for lead. The highest lead concentration reported at Station A was 58.8 ug/l; over 15 times the WQO.

Station B is located in the "L shaped" ditch. Water from the PVC pipe emerging from the pea gravel Best Management Practice (BMP) area reaches Station B.[89] At Station B, freshwater WQOs have been exceeded for copper, lead, and zinc. Copper concentrations exceeded hardness dependant freshwater WQOs in 21 out of 27 (over 75%) sampling events when the samples were analyzed for copper (Table 3). The highest copper

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88 Cleanup and Abatement Order No. R1-2001-26 for Union Pacific Railroad Company 736 Broadway, Eureka, California, RWQCB, 2001

89 *Final Remedial Action Plan, UPRR Eureka Railroad Yard and Adjacent Lease Properties, Eureka, California*, MFG, Inc., July 1, 2005.

concentration reported at Station B was 400 ug/l; over 40 times the WQO. Zinc concentrations exceeded hardness dependant freshwater WQOs in 4 out of 27 (over 10%) sampling events when the samples were analyzed for zinc. The highest zinc concentration reported at Station B was 1,100 ug/l; over 9 times the WQO. Lead concentrations exceeded the freshwater WQO in 20 out of 27 (over 70%) sampling events when the samples were analyzed for lead. The highest lead concentration reported at Station B was 790 ug/l; over 260 times the WQO. Water from the "L shaped" ditch near Station B was observed during Plaintiff's January 2008 wet weather inspection to be overflowing the berm and entering the wetlands in the southeastern corner of the site. [90]

3.3. Sediment

During Plaintiff's dry weather sampling event, conducted July 30, 2007, Plaintiff's consultant Soil/Water/Air Assessment Protection Enterprise (SWAPE) collected five on-site sediment samples. Sampling and analysis were performed in accordance with SWAPE's Sampling and Analysis Plan (SAP).[91] CEA reviewed and approved the SAP prior to the field event. All field modifications, including addition and deletion of proposed sample locations and relocation of sample collection points, were done under my direction. Modification of SAPs to account for field conditions is a common practice. All samples were analyzed at a certified laboratory by EPA approved methods. Analytical results are summarized in Table 6.[92] The results of previous sediment sampling conducted in July 2000 by the RWQCB under the direction of EPA are summarized in Table 7. Sediment sample locations for both sampling events are shown on Figure 8.[93]

The 2000 RWQCB samples were analyzed for metals and semi-volatile organic compounds (SVOCs). Both metals and SVOCs were detected in the collected samples

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[90] Personal Communication, Benjamin Ross, Ph.D., January 23, 2008.

[91] *Sampling and Analysis Plan, Former Eureka Rail Yard, "Balloon Track,"* Eureka, CA, SWAPE, July 27, 2007.

[92] STL Analytical Report-STL Sacramento Project Number G7G310164, STL, August 23, 2007.

[93] *Preliminary Assessment/Site Inspection*, State of California Regional Water Quality Control Board, May 7, 2001.

above the method detection limits. The 2007 samples were analyzed for volatile organic compounds (VOCs), SVOCs, polychlorinated biphenyls (PCBs), pesticides, dioxins/furans, and total petroleum hydrocarbons (TPH). No SVOCs were detected in any of the 2007 samples.

We compared the freshwater and Clark Slough (marine) sediment concentrations from both sampling events for metals, PCBs, and dioxin/furans to the National Oceanographic and Atmospheric Administration's Screening Quick Reference Tables (SQuiRT) Upper Effects Threshold (UET) values and Apparent Effect Threshold (AET) values, respectively.[94] SQuiRT values are intended as screening values. AETs represent concentrations above which adverse impacts would always be expected to the biological indicator used in deriving the SQuiRT values. UETs are the freshwater equivalents of AETs and thus, analogous to AETs in that adverse impacts to biota would be expected at concentrations above UETs. UETs for organic pollutants are normally listed for sediments at 1% Total Organic Carbon (TOC).[95] Because no TOC data exist, we compared organic sediment concentrations directly to the UET values listed in the SQuiRT.

The 2000 Preliminary Assessment/Site Inspection (PA/SI) describes samples S-1, S-9, and S-11 as background samples. I do not agree that these samples represent background conditions. EPA has defined a background sample as "A sample (usually a grab sample) collected from an area, water body, or site similar to one being studied, but located in an area known or thought to be free from pollutants of concern."[96] Sample S-1 is located in the eastern ditch adjacent to railroad tracks. Inspection of Figure 3-1 from the PA/SI and Figure 1, Stormwater and Surface Water Sampling Locations, from observation reports submitted to the RWQCB, show that drainage from railcar maintenance operation areas

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[94] Buchmann, M.F., NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, NOAA, 1999.

[95] Buchmann, M.F., NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, NOAA, 1999.

[96] USEPA, Region 4, *Environmental Investigation Standard Operating Procedures and Quality Assurance Manual*, November 2001.

of the site as well as from the railroad tracks reach location S-1.[97] Sample S-9 is located in the western ditch at the upstream end of the ditch. That on-site location would have received drainage from two sets of railroad tracks, any track maintenance, and any other operations that may have occurred in the area. Sample S-11 is in Clark Slough upstream of the site discharge at Station D from the site to Clark Slough. Clark Slough is tidal. Thus, discharges to Clark slough from the site near Station D will impact sediments at the location of Sample S-11.

During the 2000 sampling event, samples collected from the eastern ditch, contained concentrations of metals, including arsenic, cadmium, copper, lead, nickel, and zinc, above UET levels indicating likely adverse impacts to sensitive biota. The one sample collected as part of the Plaintiff's 2007 sampling event contained concentrations of arsenic, chromium, lead, and nickel above UET levels.

Other than sample S-9, which the RWQCB claimed as a background sample, no sediment samples were collected from the western ditch during either sampling event. In sample S-9, arsenic, copper, lead, and nickel concentrations exceeded the UET levels, which I believe likely resulted from site operations. Analytical results of two samples collected during the Plaintiffs' 2007 sampling event, S-5 and S-7, reported concentrations of arsenic and nickel above UET levels, with one sample, S-5, containing arsenic concentrations over 40 times the UET.

A sediment sample taken at Station B by the RWQCB in 2000 contained nickel concentrations in excess of UET levels. Analytical results of samples collected at Station B during the Plaintiffs' 2007 sampling event reported arsenic, lead, and nickel concentrations in excess of the UET levels.

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[97] December 2005 Stormwater Observations & Analytical Results Former Eureka Railroad Yard, Eureka, California, MGF, Inc, January 30, 2006.

Sediment samples were collected at Station C by both the RWQCB in 2000 and Plaintiffs' in 2007. Analytical results of the RWQCB sediment samples reported lead and nickel concentrations exceeding UET levels. Analytical results of the Plaintiffs' sediment samples reported arsenic, copper, lead, nickel, and zinc at concentrations exceeding UET.

No sediment samples were collected by either entity from the southeastern ditch sediments, prior to Plaintiffs' January 10, 2008, wet weather sampling event. The southeastern ditch discharges into a pipe at the Del-Reka Distributing Company. The results of Plaintiff's sediment sampling are not yet available.

In 2000, the RWQCB sampled Clark Slough in three locations. Analytical results of Sample S-11, which was claimed to represent background, and Sample S-13, located in Clark Slough between the site and Humboldt Bay did not detect concentrations of metals exceeding AET levels. Sediment Sample S-12, collected from Clark Slough adjacent to where Station D discharges to Clark Slough, however, contained barium, chromium, mercury, selenium, vanadium, and zinc concentrations in excess of AET levels.

In July 2007, Plaintiffs' conducted limited sampling for PCBs (Samples S-1 and S-6) and dioxins/furans (Samples S-1, S-5, and S-6). PCB concentrations were detected in sediments in the eastern ditch and at Station B in excess of the UET. Dioxin/furan concentrations expressed as TEQs (2,3,7,8 TCDD) were detected above freshwater UETs in the eastern ditch and Stations B and D. It is likely that dioxins/furans found at Station D would be transported into Clark Slough attached to small particulates when the western ditch is discharging to Clark Slough.

4.0 REMEDY

Contaminant concentrations in excess of screening levels have been identified discharging to Clark Slough, in on-site surface waters, in on-site shallow groundwater, in groundwater discharging to Humboldt Bay, in on-site soils, and in on- and off-site

sediments. There are significant data gaps in the site characterization as described in Section 3 of this report. For example, dioxins/furans have been found in concentrations far above screening levels in Plaintiffs' sampling but no other sampling for dioxin/furans has been done on-site.

Given the data gaps, in my opinion, Defendants should proceed with a site remedy containing a minimum of:

1. Complete the site characterization by closing the data gaps.
2. Characterize site waste discharges and obtain required permits.
3. Once the site characterization is complete, perform an appropriate remedial alternatives analysis in support of a corrective measures study.
4. Implement, in a timely manner, the selected alternative that is fully protective of human health and the environment.

Tables

Table 1
Analytical Results Summary - Metals in Soils
(mg/kg)
CEA No. 07040

Location/ Sample ID	Depth (ft)		Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese
		prg residential	**76000**	**31**	**0.39**	**5400**	**150**	**37**		**100000**	**30**	**900**	**3100**	**23000**	**150**		**1800**
		prg industrial	**100000**	**410**	**1.6**	**67000**	**1900**	**450**		**100000**	**64**	**1900**	**41000**	**100000**	**800**		**19000**
		migration to groundwater DAF 20		**5**	**29**												
A-1	1.00	mg/kg	ND	ND	**63.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-1	2.00	mg/kg	ND	ND	**240.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-10	1.00	mg/kg	ND	ND	**14.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-10	2.00	mg/kg	ND	ND	**27.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-2	1.00	mg/kg	ND	ND	**57.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-2	2.00	mg/kg	ND	ND	**10.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-3	1.00	mg/kg	ND	ND	**62.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-3	2.00	mg/kg	ND	ND	**12.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-4	1.00	mg/kg	ND	ND	**93.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-4	2.00	mg/kg	ND	ND	**35.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-5	1.00	mg/kg	ND	ND	**250.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-5	2.00	mg/kg	ND	ND	**310.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-6	1.00	mg/kg	ND	ND	**60.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-6	2.00	mg/kg	ND	ND	**100.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-7	1.00	mg/kg	ND	ND	**140.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-7	2.00	mg/kg	ND	ND	**47.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-8	1.00	mg/kg	ND	ND	**340.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-8	2.00	mg/kg	ND	ND	**19.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-9	1.00	mg/kg	ND	ND	**230.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-9	2.00	mg/kg	ND	ND	**88.00**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
B-1	2.00	mg/kg	ND	ND	0.18	ND	ND	ND	ND	27.00	ND	7.90	1.80	ND	7.00	ND	ND
B-14	2.00	mg/kg	ND	ND	**1.60**	31.00	ND	ND	ND	30.00	ND	7.50	23.00	ND	19.00	ND	ND
B-5	2.00	mg/kg	ND	ND	0.90	44.00	ND	ND	ND	40.00	ND	13.00	42.00	ND	4.00	ND	ND
B-7	2.00	mg/kg	ND	ND	0.16	1.10	ND	ND	ND	38.00	ND	11.00	15.00	ND	10.00	ND	ND
D-1	na	mg/kg	10500.00	1.60	**35.90**	260.00	0.19	1.40	4700.00	54.90	ND	10.50	117.00	**41400.00**	138.00	ND	539.00
D-3	na	mg/kg	ND	ND	**5.90**	ND	ND	ND	ND	ND	ND	ND	ND	ND	530.00	ND	ND
D-4	na	mg/kg	ND	**8.20**	**7.10**	ND	ND	ND	ND	ND	ND	ND	1670.00	ND	**988.00**	ND	ND
G-1	0.00	mg/kg	ND	2.00	**18.00**	100.00	0.20	0.20	ND	54.00	ND	13.00	150.00	ND	49.00	ND	ND
G-10	0.00	mg/kg	ND	ND	**2.90**	61.00	0.20	ND	ND	48.00	ND	6.20	16.00	ND	40.00	ND	ND
G-11	0.00	mg/kg	ND	1.00	**5.90**	100.00	0.10	ND	ND	41.00	ND	9.70	70.00	ND	150.00	ND	ND
G-12	0.00	mg/kg	ND	1.00	**11.00**	120.00	0.20	ND	ND	58.00	ND	12.00	54.00	ND	150.00	ND	ND
G-13	0.00	mg/kg	ND	1.00	**7.50**	290.00	0.30	1.20	ND	49.00	ND	8.40	81.00	ND	150.00	ND	ND
G-14	0.00	mg/kg	ND	2.00	ND	79.00	0.30	ND	ND	49.00	ND	10.00	45.00	ND	85.00	ND	ND
G-15	0.00	mg/kg	ND	ND	**19.00**	100.00	ND	ND	ND	73.00	ND	21.00	290.00	ND	730.00	ND	ND
G-16	0.00	mg/kg	ND	**5.00**	**93.00**	260.00	0.20	1.40	ND	71.00	ND	13.00	230.00	ND	420.00	ND	ND
G-17	0.00	mg/kg	ND	1.00	ND	110.00	0.10	0.60	ND	35.00	ND	8.60	34.00	ND	60.00	ND	ND
G-18	0.00	mg/kg	ND	2.00	**2.80**	120.00	ND	1.10	ND	33.00	ND	12.00	110.00	ND	270.00	ND	ND
G-19	0.00	mg/kg	ND	2.00	**8.50**	100.00	0.20	0.30	ND	50.00	ND	9.30	80.00	ND	110.00	ND	ND
G-2	0.00	mg/kg	ND	ND	**17.00**	53.00	0.30	ND	ND	70.00	ND	11.00	29.00	ND	16.00	ND	ND
G-20	0.00	mg/kg	ND	3.00	**20.00**	200.00	0.20	7.50	ND	67.00	ND	12.00	220.00	ND	410.00	ND	ND
G-21	0.00	mg/kg	ND	ND	**34.00**	170.00	ND	ND	ND	90.00	ND	20.00	220.00	ND	480.00	ND	ND
G-22	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	64.00	ND	ND	ND	ND	ND	ND	ND

Table 1
Analytical Results Summary - Metals in Soils
(mg/kg)
CEA No. 07040

Location/ Sample ID	Depth (ft)		Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese
		prg residential	**76000**	**31**	**0.39**	**5400**	**150**	**37**		**100000**	**30**	**900**	**3100**	**23000**	**150**		**1800**
		prg industrial	**100000**	**410**	**1.6**	**67000**	**1900**	**450**		**100000**	**64**	**1900**	**41000**	**100000**	**800**		**19000**
		migration to groundwater DAF 20		**5**	**29**												
G-23	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	54.00	ND	ND	ND	ND	ND	ND	ND
G-28	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	5.70	ND	ND	ND	ND	ND	ND	ND
G-34	4.00	mg/kg	ND	2.00	ND	ND	ND	ND	ND	36.00	ND	ND	ND	ND	ND	ND	ND
G-38	4.00	mg/kg	ND	ND	ND	19.00	ND	ND	ND	42.00	ND	6.60	15.00	ND	51.00	ND	ND
G-4	0.00	mg/kg	ND	1.00	**4.80**	100.00	0.20	0.50	ND	31.00	ND	7.50	35.00	ND	150.00	ND	ND
G-40	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	32.00	ND	ND	ND	ND	ND	ND	ND
G-43	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.00	ND	10.00	ND	ND
G-44	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.00	ND	5.00	ND	ND
G-45	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17.00	ND	25.00	ND	ND
G-45	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	110.00	ND	98.00	ND	ND
G-46	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3900.00	ND	510.00	ND	ND
G-46	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	120.00	ND	59.00	ND	ND
G-47	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.90	ND	6.00	ND	ND
G-48	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	310.00	ND	270.00	ND	ND
G-48	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	310.00	ND	270.00	ND	ND
G-49	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	62.00	ND	62.00	ND	ND
G-5	0.00	mg/kg	ND	ND	**2.90**	98.00	0.20	0.30	ND	35.00	ND	5.30	23.00	ND	200.00	ND	ND
G-54	0.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22.00	ND	ND
G-55	0.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190.00	ND	ND
G-55	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	77.00	ND	ND
G-55	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	83.00	ND	ND
G-56	0.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	65.00	ND	ND
G-57	0.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	72.00	ND	ND
G-58	0.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	79.00	ND	ND
G-59	0.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	83.00	ND	ND
G-6	0.00	mg/kg	ND	ND	**9.60**	84.00	0.20	0.20	ND	50.00	ND	9.90	41.00	ND	93.00	ND	ND
G-67	3.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	30.00	ND	ND
G-68	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	56.00	ND	ND
G-7	0.00	mg/kg	ND	15.00	**6.80**	62.00	ND	0.20	ND	23.00	ND	7.70	3100.00	ND	**810.00**	ND	ND
G-8	0.00	mg/kg	ND	1.00	**5.50**	80.00	0.10	ND	ND	42.00	ND	8.90	78.00	ND	96.00	ND	ND
G-9	0.00	mg/kg	ND	1.00	**42.00**	65.00	ND	0.40	ND	32.00	ND	10.00	97.00	ND	110.00	ND	ND
PL-10	0.40	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40.80	ND	ND
PL-10	0.83	mg/kg	ND	0.15	**21.90**	111.00	ND	ND	ND	40.30	ND	11.30	121.00	ND	ND	ND	ND
PL-11	0.50	mg/kg	ND	0.11	**7.02**	57.60	ND	ND	ND	14.50	ND	4.03	7.62	ND	15.20	ND	ND
PL-2	0.30	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	54.20	ND	ND
PL-2	1.25	mg/kg	ND	0.27	0.41	17.50	ND	ND	ND	31.00	ND	6.50	19.20	ND	ND	ND	ND
PL-3	0.30	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	75.00	ND	ND
PL-3	0.66	mg/kg	ND	ND	**30.60**	56.10	ND	ND	ND	29.00	ND	8.42	29.70	ND	ND	ND	ND
PL-5	0.75	mg/kg	ND	0.24	**12.80**	99.60	ND	ND	ND	35.70	ND	10.30	37.10	ND	ND	ND	ND
PL-5	0.80	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	192.00	ND	ND
PL-6	0.40	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	48.60	ND	ND
PL-6	0.75	mg/kg	ND	0.15	**15.60**	92.40	ND	ND	ND	41.10	ND	10.00	25.60	ND	ND	ND	ND

Table 1
Analytical Results Summary - Metals in Soils
(mg/kg)
CEA No. 07040

Location/ Sample ID	Depth (ft)		Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese
		prg residential	**76000**	**31**	**0.39**	**5400**	**150**	**37**		**100000**	**30**	**900**	**3100**	**23000**	**150**		**1800**
		prg industrial	**100000**	**410**	**1.6**	**67000**	**1900**	**450**		**100000**	**64**	**1900**	**41000**	**100000**	**800**		**19000**
		migration to groundwater DAF 20		**5**	**29**												
PL-9	0.40	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31.60	ND	ND
PL-9	0.75	mg/kg	ND	0.19	**8.86**	102.00	ND	ND	ND	32.90	ND	9.10	22.00	ND	ND	ND	ND
S-2	1.00	mg/kg	ND	2.60	**4.80**	ND	ND	ND	ND	ND	ND	ND	155.00	ND	ND	ND	ND
S-3	1.00	mg/kg	ND	**5.60**	**15.10**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-1	na	mg/kg	ND	ND	**31.8**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-10	na	mg/kg	ND	ND	**68**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-13	na	mg/kg	ND	ND	**2**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-2	na	mg/kg	ND	ND	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-3	na	mg/kg	ND	ND	**26.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-4	na	mg/kg	ND	ND	**12.4**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-6	na	mg/kg	ND	ND	**4.8**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-7	na	mg/kg	ND	ND	**5.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-8	na	mg/kg	ND	ND	**5.4**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-9	na	mg/kg	ND	ND	**112**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-01	1.00	mg/kg	ND	ND	**52**	ND	ND	ND	ND	ND	ND	ND	ND	ND	92	ND	ND
SHN-S-02	1.00	mg/kg	ND	ND	**31**	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	ND	ND
SHN-S-03	1.00	mg/kg	ND	ND	**15**	ND	ND	ND	ND	ND	ND	ND	ND	ND	54	ND	ND
SHN-S-03	6.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	ND	ND
SHN-S-04	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140	ND	ND
SHN-S-05	1.00	mg/kg	ND	ND	**7.8**	ND	ND	ND	ND	ND	ND	ND	ND	ND	77	ND	ND
SHN-S-06	1.00	mg/kg	ND	ND	**130**	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	ND	ND
SHN-S-07	1.00	mg/kg	ND	ND	**490**	ND	ND	ND	ND	ND	ND	ND	ND	ND	180	ND	ND
SHN-S-08	1.00	mg/kg	ND	ND	**27**	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.5	ND	ND
SHN-S-09	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	23	ND	ND
SHN-S-10	1.00	mg/kg	ND	ND	**370**	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	ND	ND
SHN-S-11	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	ND	ND
SHN-S-13	1.00	mg/kg	ND	ND	**7.4**	ND	ND	ND	ND	ND	ND	ND	ND	ND	260	ND	ND
SHN-S-14	1.00	mg/kg	ND	ND	**7.4**	ND	ND	ND	ND	ND	ND	ND	ND	ND	43	ND	ND
SHN-S-15	1.00	mg/kg	ND	ND	**4.4**	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ND	ND
SHN-S-16	1.00	mg/kg	ND	ND	**10**	ND	ND	ND	ND	ND	ND	ND	ND	ND	200	ND	ND
SHN-S-17	1.00	mg/kg	ND	ND	**520**	ND	ND	ND	ND	ND	ND	ND	ND	ND	140	ND	ND
SHN-S-18	1.00	mg/kg	ND	ND	**6.1**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-21	1.00	mg/kg	ND	ND	**22**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-22	1.00	mg/kg	ND	ND	**6.1**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-23	1.00	mg/kg	ND	ND	**11**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-25	1.00	mg/kg	ND	ND	**9.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-27	1.00	mg/kg	ND	ND	**2.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SS-1	1.00	mg/kg	ND	ND	**19**	ND	ND	ND	ND	ND	ND	ND	ND	87	40	ND	ND
SS-1	2.00	mg/kg	ND	ND	**81**	ND	ND	ND	ND	ND	ND	ND	ND	56	130	ND	ND
SS-10	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5	2.7	ND	ND
SS-10	2.00	mg/kg	ND	ND	**4.2**	0.039	ND	ND	ND	ND	ND	ND	ND	3.2	2.8	ND	ND
SS-2	1.00	mg/kg	ND	ND	**250**	1.6	ND	ND	ND	ND	ND	ND	ND	21	28	ND	ND

Table 1
Analytical Results Summary - Metals in Soils
(mg/kg)
CEA No. 07040

Location/ Sample ID	Depth (ft)		Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese
		prg residential	**76000**	**31**	**0.39**	**5400**	**150**	**37**		**100000**	**30**	**900**	**3100**	**23000**	**150**		**1800**
		prg industrial	**100000**	**410**	**1.6**	**67000**	**1900**	**450**		**100000**	**64**	**1900**	**41000**	**100000**	**800**		**19000**
		migration to groundwater DAF 20		**5**	**29**												
SS-2	2.00	mg/kg	ND	ND	**12**	ND	ND	ND	ND	ND	ND	ND	ND	4	3.3	ND	ND
SS-3	1.00	mg/kg	ND	ND	**25**	0.26	ND	ND	ND	ND	ND	ND	ND	10	4	ND	ND
SS-3	2.00	mg/kg	ND	ND	**8.8**	ND	ND	ND	ND	ND	ND	ND	ND	3.9	3.4	ND	ND
SS-4	1.00	mg/kg	ND	ND	**1.7**	ND	ND	ND	ND	ND	ND	ND	ND	54	78	ND	ND
SS-4	2.00	mg/kg	ND	ND	**7.5**	ND	ND	ND	ND	ND	ND	ND	ND	83	790	ND	ND
SS-5	1.00	mg/kg	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	160	170	ND	ND
SS-5	2.00	mg/kg	ND	ND	3.5	ND	ND	ND	ND	ND	ND	ND	ND	200	320	ND	ND
SS-6	1.00	mg/kg	ND	ND	**6.6**	ND	ND	ND	ND	ND	ND	ND	ND	8.4	7.4	ND	ND
SS-6	2.00	mg/kg	ND	ND	**2.6**	ND	ND	ND	ND	ND	ND	ND	ND	3.8	3.5	ND	ND
SS-7	1.00	mg/kg	ND	ND	**23**	ND	ND	ND	ND	ND	ND	ND	ND	32	70	ND	ND
SS-7	2.00	mg/kg	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	7.7	4.2	ND	ND
SS-8	1.00	mg/kg	ND	ND	**210**	0.029	ND	ND	ND	ND	ND	ND	ND	44	100	ND	ND
SS-8	2.00	mg/kg	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	13	20	ND	ND
SS-9	1.00	mg/kg	ND	ND	**1.7**	ND	ND	ND	ND	ND	ND	ND	ND	6.6	3.5	ND	ND
SS-9	2.00	mg/kg	ND	ND	**1.7**	ND	ND	ND	ND	ND	ND	ND	ND	4.8	2.9	ND	ND
T1W-S05	1.50	mg/kg	ND	ND	**2.7**	68.6	0.44	ND	ND	71.9	ND	9.8	9.5	ND	3.2	ND	ND
T1W-S06	4.00	mg/kg	ND	ND	**1.8**	12.2	ND	ND	ND	19.6	ND	4.5	6.5	ND	2	ND	ND
T1E-S01	1.50	mg/kg	ND	ND	**13.2**	96.1	0.23	ND	ND	32	ND	6.6	46.4	ND	121	ND	ND
T1E-S02	3.50	mg/kg	ND	ND	**2.2**	13.1	ND	ND	ND	30.4	ND	6.1	13.7	ND	3.8	ND	ND
T1E-S03	2.00	mg/kg	ND	ND	**2.1**	17	0.26	ND	ND	37.3	ND	6.2	8.5	ND	3.5	ND	ND
T1E-S04	3.50	mg/kg	ND	ND	1.5	12.4	0.2	ND	ND	29.3	ND	5.6	6.4	ND	2.2	ND	ND
T3E-S01	1.50	mg/kg	ND	ND	**2.9**	20.6	ND	ND	ND	34.1	ND	6.6	22	ND	12.7	ND	ND
T3E-S02	4.00	mg/kg	ND	ND	**2.6**	12.7	ND	ND	ND	29.2	ND	5.3	9.2	ND	2.4	ND	ND
T3E-S07	2.50	mg/kg	ND	ND	**4.9**	82.5	ND	ND	ND	39.1	ND	6.8	10.6	ND	5	ND	ND
T3E-S08	4.00	mg/kg	ND	ND	**3**	11.5	ND	ND	ND	28.8	ND	4.9	6.9	ND	2.4	ND	ND
T3W-S25	1.50	mg/kg	ND	ND	**9.8**	57.2	0.27	ND	ND	33	ND	6.6	15	ND	11.6	ND	ND
T3W-S26	4.00	mg/kg	ND	ND	**1.9**	15	ND	ND	ND	27.7	ND	5.7	5.6	ND	3.2	ND	ND
T3W-S28	2.00	mg/kg	ND	ND	**2.5**	82.6	0.65	ND	ND	56	ND	20.6	15.7	ND	4.2	ND	ND
T3W-S29	4.00	mg/kg	ND	ND	**2.1**	15.2	ND	ND	ND	35.1	ND	5.7	5.8	ND	3	ND	ND
T5-S01	2.5	mg/kg	ND	ND	**2.7**	13.2	0.23	ND	ND	40.1	ND	5.2	7.2	ND	3.2	ND	ND
T5-S10	3.00	mg/kg	ND	ND	**2**	22.4	0.2	ND	ND	39.8	ND	5.8	10.1	ND	2.7	ND	ND
T5-S11	4.00	mg/kg	ND	ND	**2.1**	13.5	ND	ND	ND	34.9	ND	5	6.2	ND	2.7	ND	ND
T5-S24	3.50	mg/kg	ND	ND	**2.7**	88.6	0.4	ND	ND	56.7	ND	8.7	21.7	ND	3.7	ND	ND
TS-S25	5.00	mg/kg	ND	ND	1.3	34	0.22	ND	ND	44.3	ND	5.5	12.2	ND	5	ND	ND
T7E-S01	1.60	mg/kg	ND	ND	**5.9**	86.3	0.33	ND	ND	68.7	ND	7.4	46.3	ND	15.8	ND	ND
T7E-S02	3.50	mg/kg	ND	ND	**10.8**	199	0.35	0.58	ND	42.4	ND	10.1	124	ND	222	ND	ND
T7W-S02	3.80	mg/kg	ND	ND	**3.1**	59.6	0.31	ND	ND	55.1	ND	5.2	15.7	ND	3.7	ND	ND
T15-S01	2.00	mg/kg	ND	0.2	0.12	530	ND	ND	ND	33	ND	12	100	ND	210	ND	ND
T13-S08	2.00	mg/kg	ND	ND	0.07	540	ND	3.7	ND	32	ND	12	160	ND	**1800**	ND	ND
T19-S01	4.00	mg/kg	ND	ND	0.52	14	ND	ND	ND	16	ND	7.5	14	ND	25	ND	ND
T20-S05	3.00	mg/kg	ND	ND	**3.2**	ND	ND	ND	ND	27	ND	7.4	8.5	ND	14	ND	ND
T21-S02	3.50	mg/kg	ND	1	ND	17	ND	ND	ND	4.4	ND	3.1	520	ND	590	ND	ND

Table 1
Analytical Results Summary - Metals in Soils
(mg/kg)
CEA No. 07040

Location/ Sample ID	Depth (ft)		Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese
		prg residential	76000	31	0.39	5400	150	37		100000	30	900	3100	23000	150		1800
		prg industrial	100000	410	1.6	67000	1900	450		100000	64	1900	41000	100000	800		19000
		migration to groundwater DAF 20		5	29												

Red Text - Exceeds Residential PRG
Red Bold Text - Exceeds Industrial PRG
Red/Bold Text/Blue Highlight - Exceeds Impact to Groundwater Standard
Indicates sample exceeding TTLC
ND - Not Detected above the method detection limit

Table 1
Analytical Results Summary - Metals in Soils
(mg/kg)
CEA No. 07040

Location/ Sample ID	Depth (ft)		Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		prg residential	**23**	**390**			**390**	**390**		**5.2**	**78**	**23000**
		prg industrial	**310**	**5100**			**5100**	**5100**		**67**	**1000**	**100000**
		migration to groundwater DAF 20										
A-1	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-1	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-10	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-10	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-2	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-2	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-3	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-3	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-4	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-4	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-5	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-5	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-6	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-6	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-7	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-7	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-8	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-8	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-9	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
A-9	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
B-1	2.00	mg/kg	0.06	ND	36.00	ND	ND	0.20	ND	ND	16.00	33.00
B-14	2.00	mg/kg	0.14	ND	42.00	ND	0.46	0.20	ND	ND	30.00	89.00
B-5	2.00	mg/kg	0.17	ND	78.00	ND	0.13	0.60	ND	ND	38.00	69.00
B-7	2.00	mg/kg	0.11	ND	64.00	ND	0.27	0.50	ND	ND	34.00	47.00
D-1	na	mg/kg	0.19	ND	52.50	732.00	0.96	0.12	488.00	9.10	42.40	139.00
D-3	na	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
D-4	na	mg/kg	ND	ND	ND	ND	ND	1.70	ND	ND	ND	1050.00
G-1	0.00	mg/kg	ND	0.80	76.00	ND	ND	ND	ND	ND	35.00	180.00
G-10	0.00	mg/kg	ND	1.10	34.00	ND	ND	ND	ND	ND	34.00	63.00
G-11	0.00	mg/kg	ND	0.90	50.00	ND	ND	0.10	ND	ND	34.00	110.00
G-12	0.00	mg/kg	ND	1.30	60.00	ND	ND	0.10	ND	ND	36.00	110.00
G-13	0.00	mg/kg	0.12	1.80	48.00	ND	ND	0.30	ND	ND	27.00	360.00
G-14	0.00	mg/kg	0.24	ND	41.00	ND	ND	ND	ND	ND	49.00	100.00
G-15	0.00	mg/kg	0.07	8.00	92.00	ND	ND	ND	ND	ND	37.00	380.00
G-16	0.00	mg/kg	0.35	11.00	70.00	ND	ND	0.30	ND	ND	35.00	290.00
G-17	0.00	mg/kg	ND	0.30	45.00	ND	ND	ND	ND	ND	27.00	110.00
G-18	0.00	mg/kg	0.09	1.10	32.00	ND	ND	ND	ND	ND	58.00	280.00
G-19	0.00	mg/kg	ND	0.90	49.00	ND	ND	ND	ND	ND	37.00	170.00
G-2	0.00	mg/kg	0.06	1.50	74.00	ND	ND	ND	ND	ND	42.00	69.00
G-20	0.00	mg/kg	2.15	6.60	74.00	ND	ND	0.60	ND	ND	31.00	460.00
G-21	0.00	mg/kg	3.10	6.00	96.00	ND	ND	ND	ND	ND	55.00	410.00
G-22	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 1
Analytical Results Summary - Metals in Soils
(mg/kg)
CEA No. 07040

Location/ Sample ID	Depth (ft)		Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		prg residential	**23**	**390**			**390**	**390**		**5.2**	**78**	**23000**
		prg industrial	**310**	**5100**			**5100**	**5100**		**67**	**1000**	**100000**
		migration to groundwater DAF 20										
G-23	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-28	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-34	4.00	mg/kg	ND	ND	ND	ND	1.00	ND	ND	ND	ND	ND
G-38	4.00	mg/kg	0.06	ND	36.00	ND	ND	ND	ND	ND	23.00	36.00
G-4	0.00	mg/kg	0.11	ND	35.00	ND	ND	ND	ND	ND	24.00	230.00
G-40	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-43	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-44	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-45	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-45	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-46	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-46	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-47	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-48	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-48	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-49	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-5	0.00	mg/kg	0.11	ND	30.00	ND	ND	0.10	ND	ND	28.00	240.00
G-54	0.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-55	0.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-55	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-55	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-56	0.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-57	0.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-58	0.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-59	0.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-6	0.00	mg/kg	ND	0.40	64.00	ND	ND	0.10	ND	ND	33.00	120.00
G-67	3.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-68	4.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G-7	0.00	mg/kg	0.13	1.10	60.00	ND	ND	0.60	ND	9.00	26.00	360.00
G-8	0.00	mg/kg	0.10	2.60	70.00	ND	ND	ND	ND	ND	29.00	92.00
G-9	0.00	mg/kg	0.18	ND	40.00	ND	ND	0.10	ND	4.00	47.00	260.00
PL-10	0.40	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PL-10	0.83	mg/kg	ND	ND	58.90	ND	ND	ND	ND	ND	ND	ND
PL-11	0.50	mg/kg	ND	ND	19.00	ND	ND	ND	ND	ND	ND	ND
PL-2	0.30	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PL-2	1.25	mg/kg	ND	ND	40.10	ND	ND	ND	ND	ND	ND	ND
PL-3	0.30	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PL-3	0.66	mg/kg	ND	ND	44.00	ND	ND	ND	ND	ND	ND	ND
PL-5	0.75	mg/kg	ND	ND	45.80	ND	ND	ND	ND	ND	ND	ND
PL-5	0.80	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PL-6	0.40	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PL-6	0.75	mg/kg	ND	ND	55.50	ND	ND	ND	ND	ND	ND	ND

Table 1
Analytical Results Summary - Metals in Soils
(mg/kg)
CEA No. 07040

Location/ Sample ID	Depth (ft)		Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		prg residential	**23**	**390**			**390**	**390**		**5.2**	**78**	**23000**
		prg industrial	**310**	**5100**			**5100**	**5100**		**67**	**1000**	**100000**
		migration to groundwater DAF 20										
PL-9	0.40	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PL-9	0.75	mg/kg	ND	ND	48.14	ND	ND	ND	ND	ND	ND	ND
S-2	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-3	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-1	na	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-10	na	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-13	na	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-2	na	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-3	na	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-4	na	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-6	na	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-7	na	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-8	na	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-9	na	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-01	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-02	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-03	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-03	6.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-04	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-05	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-06	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-07	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-08	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-09	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-10	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-11	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-13	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-14	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-15	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-16	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-17	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-18	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-21	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-22	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-23	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-25	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHN-S-27	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SS-1	1.00	mg/kg	0.016	0.52	ND	ND	ND	ND	ND	ND	ND	ND
SS-1	2.00	mg/kg	0.02	2.9	ND	ND	ND	ND	ND	ND	ND	ND
SS-10	1.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SS-10	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SS-2	1.00	mg/kg	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND

Table 1
Analytical Results Summary - Metals in Soils
(mg/kg)
CEA No. 07040

Location/ Sample ID	Depth (ft)		Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		prg residential	**23**	**390**			**390**	**390**		**5.2**	**78**	**23000**
		prg industrial	**310**	**5100**			**5100**	**5100**		**67**	**1000**	**100000**
		migration to groundwater DAF 20										
SS-2	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SS-3	1.00	mg/kg	ND	0.073	ND	ND	ND	ND	ND	ND	ND	ND
SS-3	2.00	mg/kg	0.008	ND	ND	ND	ND	ND	ND	ND	ND	ND
SS-4	1.00	mg/kg	0.025	2	ND	ND	ND	ND	ND	ND	ND	ND
SS-4	2.00	mg/kg	0.012	74	ND	ND	ND	ND	ND	ND	ND	ND
SS-5	1.00	mg/kg	0.28	1.4	ND	ND	ND	ND	ND	ND	ND	ND
SS-5	2.00	mg/kg	0.066	0.35	ND	ND	ND	ND	ND	ND	ND	ND
SS-6	1.00	mg/kg	0.006	ND	ND	ND	ND	ND	ND	ND	ND	ND
SS-6	2.00	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SS-7	1.00	mg/kg	0.032	3.5	ND	ND	ND	ND	ND	ND	ND	ND
SS-7	2.00	mg/kg	0.014	0.078	ND	ND	ND	ND	ND	ND	ND	ND
SS-8	1.00	mg/kg	0.023	3.3	ND	ND	ND	ND	ND	ND	ND	ND
SS-8	2.00	mg/kg	0.01	0.15	ND	ND	ND	ND	ND	ND	ND	ND
SS-9	1.00	mg/kg	ND	0.16	ND	ND	ND	ND	ND	ND	ND	ND
SS-9	2.00	mg/kg	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND
T1W-S05	1.50	mg/kg	ND	ND	45.8	ND	ND	ND	ND	ND	ND	ND
T1W-S06	4.00	mg/kg	ND	ND	23.2	ND	ND	ND	ND	ND	ND	ND
T1E-S01	1.50	mg/kg	ND	ND	41.8	ND	ND	ND	ND	ND	ND	ND
T1E-S02	3.50	mg/kg	ND	ND	35.6	ND	ND	ND	ND	ND	ND	ND
T1E-S03	2.00	mg/kg	ND	ND	38.1	ND	ND	ND	ND	ND	ND	ND
T1E-S04	3.50	mg/kg	ND	ND	34.5	ND	ND	ND	ND	ND	ND	ND
T3E-S01	1.50	mg/kg	ND	ND	38.3	ND	ND	ND	ND	ND	ND	ND
T3E-S02	4.00	mg/kg	ND	ND	30.8	ND	ND	ND	ND	ND	ND	ND
T3E-S07	2.50	mg/kg	ND	ND	41.2	ND	ND	ND	ND	ND	ND	ND
T3E-S08	4.00	mg/kg	ND	ND	31.2	ND	ND	ND	ND	ND	ND	ND
T3W-S25	1.50	mg/kg	ND	ND	29.1	ND	ND	ND	ND	ND	ND	ND
T3W-S26	4.00	mg/kg	ND	ND	30.1	ND	ND	ND	ND	ND	ND	ND
T3W-S28	2.00	mg/kg	ND	ND	32.1	ND	ND	ND	ND	ND	ND	ND
T3W-S29	4.00	mg/kg	ND	ND	35.7	ND	ND	ND	ND	ND	ND	ND
T5-S01	2.5	mg/kg	ND	ND	21.1	ND	ND	ND	ND	ND	ND	ND
T5-S10	3.00	mg/kg	ND	ND	35.32	ND	ND	ND	ND	ND	ND	ND
T5-S11	4.00	mg/kg	ND	ND	31.4	ND	ND	ND	ND	ND	ND	ND
T5-S24	3.50	mg/kg	ND	ND	38.6	ND	ND	ND	ND	ND	ND	ND
TS-S25	5.00	mg/kg	ND	ND	38.5	ND	ND	ND	ND	ND	ND	ND
T7E-S01	1.60	mg/kg	ND	2.1	61.1	ND	ND	ND	ND	ND	ND	ND
T7E-S02	3.50	mg/kg	ND	ND	52.6	ND	ND	ND	ND	ND	ND	ND
T7W-S02	3.80	mg/kg	ND	ND	38.1	ND	ND	ND	ND	ND	ND	ND
T15-S01	2.00	mg/kg	ND	ND	53	ND	ND	0.7	ND	ND	ND	ND
T13-S08	2.00	mg/kg	0.41	ND	52	ND	ND	0.7	ND	ND	ND	ND
T19-S01	4.00	mg/kg	0.08	ND	47	ND	0.08	0.3	ND	ND	ND	ND
T20-S05	3.00	mg/kg	0.044	ND	29	ND	0.18	0.4	ND	ND	ND	ND
T21-S02	3.50	mg/kg	0.054	ND	47	ND	ND	0.3	ND	ND	ND	ND

Table 1
Analytical Results Summary - Metals in Soils
(mg/kg)
CEA No. 07040

Location/ Sample ID	Depth (ft)		Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		prg residential	**23**	**390**			**390**	**390**		**5.2**	**78**	**23000**
		prg industrial	**310**	**5100**			**5100**	**5100**		**67**	**1000**	**100000**
		migration to groundwater DAF 20										

Red Text - Exceeds Residential PRG
Red Bold Text - Exceeds Industrial
Red/Bold Text/Blue Highlight - Exc
Indicates sample exceeding TTLC
ND - Not Detected above the method

Table 2
Analytical Results Summary - Surface Water
Station A
CEA No. 07040

LOCATION	DATE	ARSENIC (total) WQO: 150	COPPER (total) WQO: 2.7- 9 ug/l	LEAD (total) WQO:3 ug/l	ZINC (total) WQO: 36 - 120 ug/l	Zinc Freshwater CMC at Noted Hardness ug/l	Copper Freshwater CMC at Noted Hardness ug/l	Station C Hardness mg/l $CaCO_3$
A	11/28/2001	<5	17	<15	55	69	9	63
A	12/17/2001	6.5	18	9.4	72	39	5	32
A	1/8/2002	NA	NA	NA	NA	80	9	75
A	2/7/2002	1.9	8.8	7.4	27	120	9	180
A	12/19/2002	5.7	23	50	80	120	9	140
A	1/13/2003	9.07	27.5	58.8	92.6	36	3	19
A	2/19/2003	5.38	23.8	42.3	75.6	111	9	110
A	3/26/2003	1.42	12.4	12.3	33.7	120	9	160
A	4/2/2003	1.2 J	13	13.4	25.6	120	9	250
A	5/8/2003	3.75	18.4	14	24.9	120	9	130
A	12/29/2003	NA	<10	<10	<20	75	9	69
A	1/9/2004	NA	<10	<5.0	<10	120	9	190
A	2/2/2004	NA	48	40	540	120	9	130
A	3/26/2004	NA	13	<5.0	14	120	9	180
A	10/19/2004	NA	21	17	37	98	9	95
A	12/8/2004	NA	5.3	<5.0	16	54	7	47
A	1/7/2005	NA	6.9	9.9	21	102	9	100
A	2/28/2005	NA	8.7	5.9	19	120	9	170
A	3/23/2005	NA	7.2	<5	11	120	9	160
A	4/7/2005	NA	7.3	<5.0	15	120	9	140
A	5/9/2005	NA	15	<5.0	14	99	9	96
A	11/3/2005	NA	17	<5.0	14	36	3	18
A	12/1/2005	NA	7.9	<5.0	13	62	8	55
A	1/3/2006	NA	6.4	7.4	13	75	9	69
A	2/27/2006	NS	NS	NS	NS	NS	NS	NS
A	3/16/2006	NA	6.1	8.3	14	57	8	50
A	4/30/2006	NS	NS	NS	NS	NS	NS	NS
A	5/30/2006	NS	NS	NS	NS	NS	NS	NS
A	6/30/2006	NS	NS	NS	NS	NS	NS	NS
A	10/1/2006	NS	NS	NS	NS	NS	NS	NS
A	11/21/2006	NA	12	13	23	73	9	67
A	12/12/2006	NA	8	<5.0	12	61	8	54
A	2/21/2007	NA	8.7	6.4	13	79	9	74
A	3/27/2007	NA	30	6	21	72	9	66
A	4/12/2007	NS	NS	NS	NS	NS	NS	NS

WQO - Water Quality Objective
Red Text - Exceedance of WQO
ug/l - micrograms per liter
CMC - Criteria Maximum Concentration

Table 3
Analytical Results Summary - Surface Water
Station B
CEA No. 07040

LOCATION	DATE	ARSENIC (total) WQO: 150	COPPER (total) WQO: 2.7-9 ug/l	LEAD (total) WQO: 3 ug/l	ZINC (total) WQO: 36-120 ug/l	Zinc Freshwater CMC at Noted Hardness ug/l	Copper Freshwater CMC at Noted Hardness ug/l	Station C Hardness mg/l $CaCO_3$
B	11/28/2001	27	400	790	1100	69	9	63
B	12/17/2001	5.7	21	3.2	40	90	9	86
B	1/8/2002	14	55	110	120	80	9	75
B	2/7/2002	11	26	32	54	120	9	180
B	12/19/2002	<2	16	19	45	120	9	140
B	1/13/2003	5.34/4.37	33.7/35.3	160/176	179/197	36	3	19
B	2/19/2003	<1/1.25	24.4/26.4	66.8/74.2	85.7/95.9	111	9	110
B	3/26/2003	3.49/4.16	19.6/20	31.9/30.3	53.6/53.2	120	9	160
B	4/2/2003	6.43 J/ 4.65 J	38/34	106/107	123/120	120	9	250
B	5/8/2003	6.62/5.99	25.4/25.1	81.9/81.6	70.3/69.8	120	9	130
B	12/29/2003	NA	29/19	5.9/5.1	16/17	75	9	69
B	1/9/2004	NA	10/<10	<5.0/5.2	<10/<10	120	9	190
B	2/2/2004	NA	13/20	<5.0/18	18/35	120	9	130
B	3/26/2004	NA	11/15	<5.0/<5.0	16/21	120	9	180
B	10/19/2004	NA	12/10	5.4/5.6	18/11	98	9	95
B	12/8/2004	NA	8.5/8.7	<5.0/<5.0	16/25	54	7	47
B	1/7/2005	NA	<5.0/<5.0	5.3/6.1	<10/11	102	9	100
B	2/28/2005	NA	5.1/4.8	1.6/1.4	6.5/8.3	120	9	170
B	3/23/2005	NA	10/9.5	<5.0/<5.0	<10/<10	120	9	160
B	4/7/2005	NA	7.5/6.7	<5.0/<5.0	12/<10	120	9	140
B	5/9/2005	NA	7.3/7.6	<5.0/<5.0	<10/<10	99	9	96
B	11/3/2005	NA	9.2/7.4	6.1/<5.0	18/15	36	3	18
B	12/1/2005	NA	19/17	6.4/5.6	18/17	62	8	55
B	1/3/2006	NA	7.4/7.4	7.4/7.7	<10/<10	75	9	69
B	2/27/2006	NS	NS	NS	NS	NS	NS	NS
B	3/16/2006	NA	6.6/6.1	9.5/9.1	14/25	57	8	50
B	4/30/2006	NS	NS	NS	NS	NS	NS	NS
B	5/30/2006	NS	NS	NS	NS	NS	NS	NS
B	6/30/2006	NS	NS	NS	NS	NS	NS	NS
B	10/1/2006	NS	NS	NS	NS	NS	NS	NS
B	11/21/2006	NA	25/19	33/21	67/48	73	9	67
B	12/12/2006	NS	NS	NS	NS	61	8	54
B	2/21/2007	NA	10	<5.0	<10	79	9	74
B	3/27/2007	NS	NS	NS	NS	72	9	66
B	4/12/2007	NS	NS	NS	NS	NS	NS	NS

WQO - Water Quality Objective
Red Text - Exceedance of WQO
ug/l - micrograms per liter
CMC - Criteria Maximum Concentration

Table 4
Analytical Results Summary - Surface Water
Station D
CEA No. 07040

LOCATION	DATE	ARSENIC (total) WQO: 36 ug/l	ESTUARY COPPER (total) WQO: 3.1 ug/l	LEAD (total) WQO: 8.1 ug/l	ZINC (total) WQO: 81 ug/l	Freshwater COPPER (total) WQO: 2.7 - 9 ug/l	Freshwater ZINC (total) WQO: 36 - 120 ug/l	Zinc Freshwater CMC at Noted Hardness ug/l	Copper Freshwater CMC at Noted Hardness ug/l	Station C Hardness mg/l $CaCO_3$
D	11/28/2001	NS	NS	NS	NS	NS	NS	69	9	63
D	12/17/2001	NA	NA	NA	NA	NA	NA	90	9	86
D	1/8/2002	NA	NA	NA	NA	NA	NA	80	9	75
D	2/7/2002	NA	NA	NA	NA	NA	NA	120	9	180
D	12/19/2002	17	5.9	1	1.3	5.9	1.3	120	9	140
D	1/13/2003	28.1	3.56	1.22	14.3	3.56	14.3	36	3	19
D	2/19/2003	20.1	3.18	<1	15.9	3.18	15.9	111	9	110
D	3/26/2003	17.6	4.24	<1	19.9	4.24	19.9	120	9	160
D	4/2/2003	56.8 J	24.3	2.77	27.2	24.3	27.2	120	9	250
D	5/8/2003	9.78	1.87	<1	10.3	1.87	10.3	120	9	130
D	12/29/2003	NA	33	<5.0	24	33	24	75	9	69
D	1/9/2004	NA	<10	<5.0	<10	<10	<10	120	9	190
D	2/2/2004	NA	16	<5.0	27	16	27	120	9	130
D	3/26/2004	NA	5	<5.0	26	5	26	120	9	180
D	10/19/2004	NS	NS	NS	NS	NS	NS	98	9	95
D	12/8/2004	NA	<5.0	<5.0	27	<5.0	27	54	7	47
D	1/7/2005	NA	<5.0	<5.0	<10	<5.0	<10	102	9	100
D	2/28/2005	NA	2.4	<1	7.9	2.4	7.9	120	9	170
D	3/23/2005	NA	<5	<5	<10	<5	<10	120	9	160
D	4/7/2005	NA	<5	<5	10	<5	10	120	9	140
D	5/9/2005	NA	<5	<5	<10	<5	<10	99	9	96
D	11/3/2005	NS	NS	NS	NS	NS	NS	24	3	18
D	12/1/2005	NA	9.5	<5	13	9.5	13	62	8	55
D	1/10/2006	NA	<5.0	<5	<10	<5.0	<10	75	9	69
D	2/27/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS
D	3/16/2006	NA	<5.0	<3	<10	<5.0	<10	57	8	50
D	4/30/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS
D	5/30/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS
D	6/30/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS
D	10/1/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS
D	11/21/2006	NA	160	<5.0	34	160	34	73	9	67
D	12/12/2006	NA	19	<5.0	16	19	16	61	8	54
D	2/21/2007	NA	6.6	<5.0	<10	6.6	<10	79	9	74
D	3/27/2007	NA	<5.0	<5.0	<10	<5.0	<10	72	9	66
D	4/12/2007	NS	NS	NS	NS	NS	NS	NS	NS	NS

WQO - Water Quality Objective
Red Text - Exceedance of WQO
ug/l - micrograms per liter
CMC - Criteria Maximum Concentration

Table 5
Analytical Results Summary - Surface Water
Station F
CEA No. 07040

LOCATION	DATE	ARSENIC (total) WQO: 150	COPPER (total) WQO: 2.7- 9 ug/l	LEAD (total) WQO: 3 ug/l	ZINC (total) WQO: 36 - 120 ug/l	Zinc Freshwater CMC at Noted Hardness ug/l	Copper Freshwater CMC at Noted Hardness ug/l	Station C Hardness mg/l $CaCO_3$
F	11/28/2001	<5	24	<15	190	69	9	63
F	12/17/2001	13	17	29	300	90	9	86
F	1/8/2002	NA	NA	NA	NA	80	9	75
F	2/7/2002	21	27	87	560	120	9	180
F	12/19/2002	7.1	34	130	230	120	9	140
F	1/13/2003	5.03	19.7	55.6	123	36	3	19
F	2/19/2003	2.33	25.7	71	140	111	9	110
F	3/26/2003	4.3	9	4.85	3.03	120	9	160
F	4/2/2003	<1 UJ	13.4	16.9	40.9	120	9	250
F	5/8/2003	3.01	19	10.7	37.3	120	9	130
F	12/29/2003	NA	40	7.8	190	75	9	69
F	1/9/2004	NA	62	130	320	120	9	190
F	2/2/2004	NA	22	39	110	120	9	130
F	3/26/2004	NA	25	<5.0	39	120	9	180
F	10/19/2004	NA	13	18	37	98	9	95
F	12/8/2004	NS	NS	NS	NS	54	7	47
F	1/7/2005	NA	8.3	21	46	102	9	100
F	2/28/2005	NA	14	6.3	47	120	9	170
F	3/23/2005	NA	12	<5	32	120	9	160
F	4/7/2005	NA	5.9	7.4	47	120	9	140
F	5/9/2005	NA	7.4	8.3	43	99	9	96
F	11/3/2005	NS	NS	NS	NS	36	3	18
F	12/1/2005	NA	7.4	5.9	34	62	8	55
F	1/3/2006	NA	6.5	16	32	75	9	69
F	2/27/2006	NS	NS	NS	NS	NS	NS	NS
F	3/16/2006	NA	<5	11	28	57	8	50
F	4/30/2006	NS	NS	NS	NS	NS	NS	NS
F	5/30/2006	NS	NS	NS	NS	NS	NS	NS
F	6/30/2006	NS	NS	NS	NS	NS	NS	NS
F	10/1/2006	NS	NS	NS	NS	NS	NS	NS
F	11/21/2006	NA	NA	NA	NA	73	9	67
F	12/12/2006	NS	NS	NS	NS	61	8	54
F	2/21/2007	NA	6.2	<5.0	63	79	9	74
F	3/27/2007	NS	NS	NS	NS	72	9	66
F	4/12/2007	NS	NS	NS	NS	NS	NS	NS

WQO - Water Quality Objective
Red Text - Exceedance of WQO
ug/l - micrograms per liter
CMC - Criteria Maximum Concentration

TABLE 6
Analytical Results Summary - Sediment
July 30, 2007, Sampling Event
CEA No. 07040

Sample ID	SQuiRTS - FRESHWATER	SQuiRTS - MARINE	S-1 (EASTERN DITCH)	Q	S-4 (STATION C)	Q	S-5 (STATION D)	Q	S-6 (STATION B)	Q	S-7 (WESTERN DITCH)	Q
Sampling Date	Upper Effects Threshold	Apparent Effects Threshold	7/30/2007		7/30/2007		7/30/2007		7/30/2007		7/30/2007	
Metals - mg/kg												
Antimony	3.000	9.3	2.3		3.9		3.9		1.8		2.9	
Arsenic	17.00	35.00	19.1		30.1		695.0		37.5		107	
Barium	na	48.00	90.7		296.0		460.0		140.0		106	
Beryllium	na	na	0.25		0.48		0.41		0.3		0.5	
Cadmium	3.00	3.0	2.3		4.7		1.2		0.89		1	
Chromium	95.00	62.0	114.0		81.0		54.8		64.1		73.9	
Copper	86.00	390.0	57.1		154.0		61.6		64.7		84.2	
Lead	127.00	400.0	149.0		145.0		97.2		154.0		111	
Mercury	0.56	0.41	0.22		0.21		0.21		0.17		0.24	
Molybdenum	na	na	1		5.90		6.4		3.20		2	
Nickel	43.00	110.0	62.9		81.5		101.0		64.3		85.1	
Selenium	na	1	0.4		1.1		0.9		0.37		0.63	
Silver	4.50	3.1	0.14		0.36		0.25	B	0.18		0.26	
Thallium	na	na	0.94	B	ND		ND		ND		0.13	B
Vanadium	na	57	31		62.6		58.7		47.7		66.3	
Zinc	520.00	410.0	393.0		1030.0		319.0		206.0		236	
PCBs - ug/kg												
Total PCBs	26.00	110.00	120		ND		ND		63.0		NA	
Pesticides - ug/kg												
4-4'- DDT	na	na	6.7		NA		5.2	JPG	17.0	J	NA	
4,4'-DDE	na	na	ND		NA		ND		200.0		NA	

TABLE 6
Analytical Results Summary - Sediment
July 30, 2007, Sampling Event
CEA No. 07040

Sample ID	SQuiRTS - FRESHWATER	SQuiRTS - MARINE	S-1 (EASTERN DITCH)	Q	S-4 (STATION C)	Q	S-5 (STATION D)	Q	S-6 (STATION B)	Q	S-7 (WESTERN DITCH)	Q
Sampling Date	**Upper Effects Threshold**	**Apparent Effects Threshold**	**7/30/2007**		**7/30/2007**		**7/30/2007**		**7/30/2007**		**7/30/2007**	
Dioxins/Furans, pg/g												
2,3,7,8-TCDD as TEQs	8.80	3.60	216.6		NA		592.72		402.3		NA	
Total Petroleum Hydrocarbons - mg/kg												
TPH - MO	na	na	ND	B	3700.0	G	380.0	G	ND		110	G
Volatile Organic Compounds - ug/kg												
Tetrachloroethene	450.00	na	11.00		ND		ND		ND		ND	
Toluene	5000.00	na	43.00		ND		240.0		ND		ND	
Semi Volatile Organic Compounds, ug/kg												
Benzaldehyde	na	na	ND		NA		ND		ND		ND	
Phenol	48.00	130.0	ND		NA		ND		ND		ND	
4-Methylphenol	na	8.0	ND		NA		ND		ND		ND	
Napthalene	600.00	230.0	ND		NA		ND		ND		ND	
Caprolactam	na	na	ND		NA		ND		ND		ND	
2-Methylnaphthalene	na	64.0	ND		NA		ND		ND		ND	
Acenaphthylene	160.00	71.0	ND		NA		ND		ND		ND	
Dibenzofuran	5100	110.0	ND		NA		ND		ND		ND	
Pentachlorophenol	na	17.0	ND		NA		ND		ND		ND	
Phenanthrene	800	660.0	ND		NA		ND		ND		ND	
Anthracene	260	280.0	ND		NA		ND		ND		ND	
Fluoranthene	1500	1300.0	ND		NA		ND		ND		ND	
Pyrene	1000	2400.0	ND		NA		ND		ND		ND	
Chrysene	800	950.0	ND		NA		ND		ND		ND	
bis(2-Ethylhexyl)phthalate	na	na	ND		NA		ND		ND		ND	
4-Nitrophenol	na	1000.0	ND		NA		ND		ND		ND	
2,4-Dinitrotoluene	na	na	ND		NA		ND		ND		ND	
Carbazole	na	na	ND		NA		ND		ND		ND	
Benzo(a)anthracene	500	960.0	ND		NA		ND		ND		ND	
Di-n-octylphthalate	na	61.0	ND		NA		ND		ND		ND	

TABLE 6
Analytical Results Summary - Sediment
July 30, 2007, Sampling Event
CEA No. 07040

Sample ID	SQuiRTS - FRESHWATER	SQuiRTS - MARINE	S-1 (EASTERN DITCH)	Q	S-4 (STATION C)	Q	S-5 (STATION D)	Q	S-6 (STATION B)	Q	S-7 (WESTERN DITCH)	Q
Sampling Date	**Upper Effects Threshold**	**Apparent Effects Threshold**	**7/30/2007**		**7/30/2007**		**7/30/2007**		**7/30/2007**		**7/30/2007**	
Benzo(b)fluroanthene	na	1800.0	ND		NA		ND		ND		ND	
Benzo(k)fluoranthene	13400	1800.0	ND		NA		ND		ND		ND	
Benzo(a)pyrene	700	1100.0	ND		NA		ND		ND		ND	
Indeno(1,2,3-cd)pyrene	330	600.0	ND		NA		ND		ND		ND	
Benzo(g,h,i)perylene	300	670.0	ND		NA		ND		ND		ND	
Bold - Greater than UET/AET												
B - Analyte found in associated blank and sample												
RLA - The reporting limit for this analyte is elevated due to sample dilution												
NA - Not Analyzed												
na - not applicable												
ND - Not Detected												
J - Estimated result, Result is less than the Reporting Limit												
PG - The percent difference between the original and confirmation analyses is greater than 40%												
U - Analyte was analyzed for but not detected above the sample detection limit												
Data Source for S-1 to S-14, is *Preliminary Assessment Site Inspection,* CARWQCB, May 7, 2001. The report refers to these samples as "soil samples" in the Sediment Sampling Section												

Table 7
Analytical Results Summary- Sediment
July 12, 2000, Sampling Event
CEA No. 07040

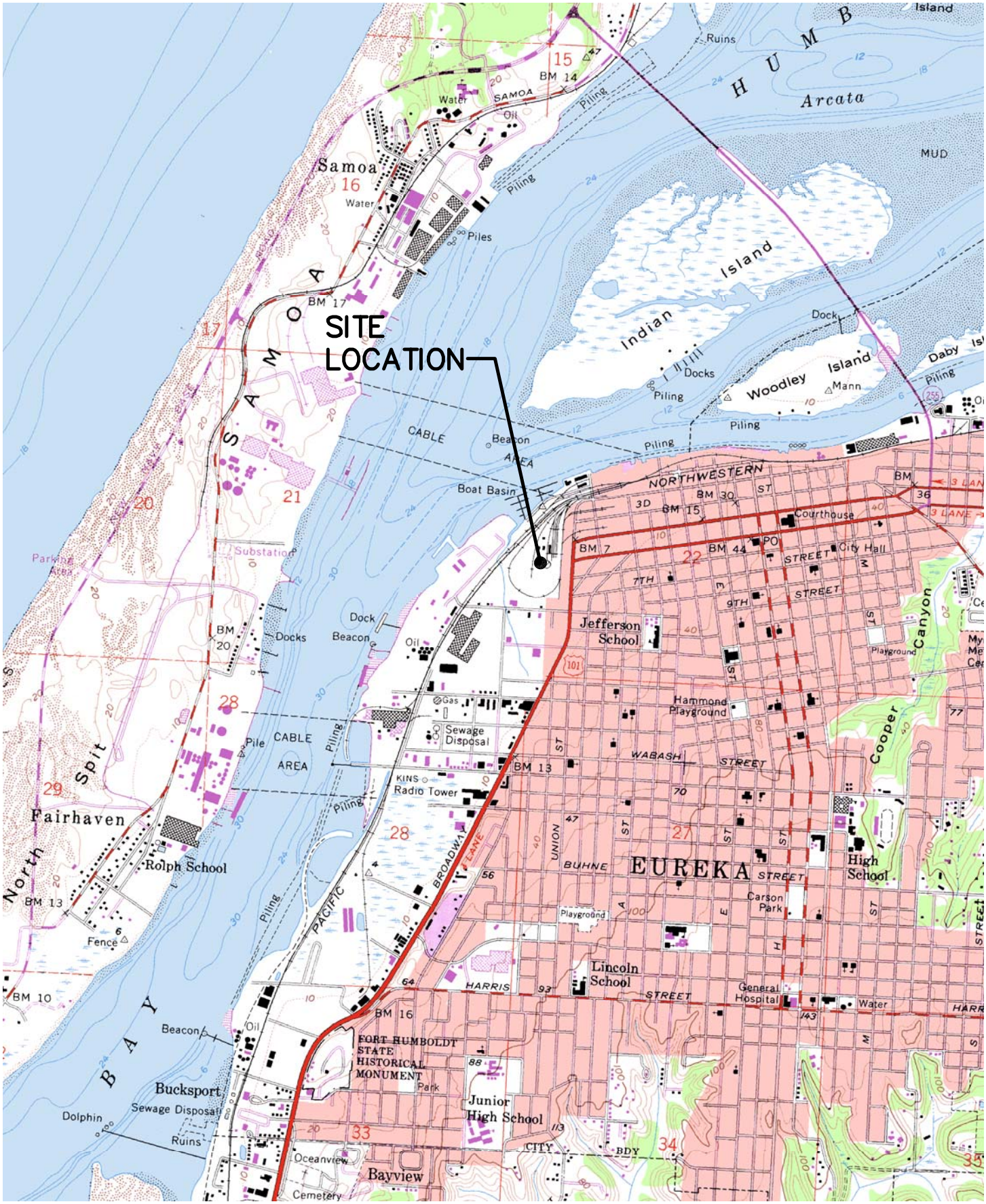
Sample ID	SQuiRTS - FRESHWATER	SQuiRTS - MARINE	S-1 (EASTERN DITCH)	Q	S-2 (EASTERN DITCH)	Q	S-3 (EASTERN DITCH)	Q	S-4 (EASTERN DITCH)	Q	S6 (STATION C)	Q	S7 (STATION B)	Q	S8 (SOUTHERN DITCH)	Q	S9 (WESTERN DITCH)	Q	S10 (EASTERN DITCH)	Q	S-11 (CLARK SLOUGH	Q	S-12 (CLARK SLOUGH)	Q	S-13 (CONNECTION BETWEEN CLARK SLOUGH/HUMBOLDT BAY)	Q	S-14 (DUPLICATE OF S-4)	Q
Sampling Date	**Upper Effects Threshold**	**Apparent Effects Threshold**	**7/11/2000**		**7/11/2000**		**7/11/2000**		**7/11/2000**		**7/12/2000**		**7/12/2000**		**7/12/2000**		**7/12/2000**		**7/12/2000**		**7/12/2000**		**7/12/2000**		**7/12/2000**		**7/11/2000**	
Metals - mg/kg																												
Antimony	3.000	9.3	1.7	J	0.42	UJ	3.1	J	1.6	J	0.46	UJ	0.92	J	0.81	J	1.4	J	1.3	J	1.1	J	2.9	J	0.7	J	1.8	J
Arsenic	17.00	35.00	31.80		25.00		26.60		12.40		4.80		5.60		5.40		112.00		6.80		3.60		10.80		2.00	J	8.00	
Barium	na	48.00	72.60		54.60		146.00		67.60		99.70		74.60		91.10		190.00		56.30		45.70	J	87.70	J	74.90		42.40	J
Beryllium	na	na	0.19	J	0.22	J	0.40	J	0.25	J	0.28	J	0.33	J	0.49	J	0.50	J	0.31	J	0.18	J	0.50	J	0.35	J	0.22	J
Cadmium	3.00	3.0	3.2		1.2		3.7		2.8		0.55	J	0.43	J	0.25	J	0.94	J	2.3		0.67	J	1.7	J	0.19	J	2.4	
Chromium	95.00	62.0	32.0		44.7		66.3		51.3		51.7		57.1		74.6		78.6		53.8		36.4		80.3		59.2		41.2	
Copper	86.00	390.0	60.6		35.3		105.0		47.6		39.2		35.0		32.6		102.0		54.2		75.6		138.0		27.0		38.5	
Lead	127.00	400.0	145.0		81.0		292.0		75.9		649.0		71.1		13.0		160.0		99.4		93.4		214.0		30.2		102.0	
Mercury	0.56	0.41	0.47	J	0.1	J	0.38	J	0.16	J	0.13	J	0.17	J	0.14	J	0.3	J	0.16	J	0.2	J	0.46	J	0.16	J	0.13	J
Molybdenum	na	na	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Nickel	43.00	110.0	37.6		52.0		89.0		53.3		64.0		70.1		99.1		91.0		58.2		34.8		80.0		74.9		47.9	
Selenium	na	1	1.2	UJ	1.1	UJ	1.6	UJ	1.2	UJ	1.2	UJ	1.3	J	1.2	UJ	1.4	UJ	1.2	UJ	1.7	J	3.9	UJ	1.3	UJ	1.1	U
Silver	4.50	3.1	0.15	U	0.13	U	0.2	U	0.14	U	0.15	U	0.22	J	0.15	U	0.17	U	0.14	U	0.58	J	1	J	0.16	U	0.21	J
Thallium	na	na	4.1		4.8		5.4		3.7		3.7		4.7		6.8		7.6		3.5		3.2	J	9		4.3		3.8	
Vanadium	na	57	24.2		32.9		54.8		39.7		31.3		38.8		49		69.5		45.2		27		60.8		42.6		32.4	
Zinc	520.00	410.0	752.0		324.0		764.0		514.0	J	255.0	J	109.0	J	82.9	J	238.0	J	506.0	J	243.0	J	526.0	J	66.2	J	404.0	J
Semi Volatile Organic Compounds, ug/kg																												
Benzaldehyde	na	na	74.0	J	ND		ND		320.0	J	ND		ND		ND		ND		ND		ND		ND		ND		ND	
Phenol	48.00	130.0	440.0	UJ	440.0	UJ	690.0	UJ	420.0	UJ	520.0	UJ	390.0	UJ	410.0	UJ	360.0	UJ	420.0	UJ	ND		ND		460.0	J	350.0	J
4-Methylphenol	na	8.0	49.0	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Napthalene	600.00	230.0	240.0	J	57.0	J	110.0	J	45.0	J	ND		ND		ND		39.0	J	ND		ND		ND		ND		43.0	J
Caprolactam	na	na	ND		ND		ND		ND		ND		ND		ND		ND		ND		96.0	J	ND		ND		ND	
2-Methylnaphthalene	na	64.0	200.0	J	ND		120.0	J	90.0	J	ND		57.0	J	ND		44.0	J	ND		ND		ND		ND		84.0	J
Acenaphthylene	160.00	71.0	81.0	J	ND		ND		ND		ND		ND		ND		58.0	J	ND		ND		ND		ND		ND	
Dibenzofuran	5100	110.0	62.0	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Pentachlorophenol	na	17.0	210.0	J	10000.0	UJ	1700.0	UJ	1100.0	UJ	1300.0	UJ	990.0	UJ	1000.0	UJ	910.0	UJ	1100.0	UJ	1100.0	UJ	3400.0	UJ	1200.0	UJ	880.0	UJ
Phenanthrene	800	660.0	330.0	J	96.0	J	160.0	J	62.0	J	81.0	J	100.0	J	74.0	J	140.0	J	54.0		580.0		460.0	J	52.0	J	37.0	J
Anthracene	260	280.0	69.0	J	ND		ND		ND		ND		44.0	J	ND		66.0	J	ND		100.0	J	ND		ND		ND	
Fluoranthene	1500	1300.0	250.0	J	70.0	J	170.0	J	66.0	J	110.0	J	400.0		82.0	J	350.0	J	54.0		1300.0		1300.0	J	93.0	J	38.0	J
Pyrene	1000	2400.0	290.0	J	77.0	J	210.0	J	68.0	J	98.0	J	490.0		99.0	J	370.0		66.0	J	1300.0		1200.0	J	91.0	J	47.0	J
Chrysene	800	950.0	140.0	J	ND		ND		ND		ND		170.0	J	44.0	J	270.0	J	ND		610.0		820.0	J	66.0	J	ND	
bis(2-Ethylhexyl)phthalate	na	na	440.0	J	410.0	J	ND		420.0	UJ	520.0	UJ	ND		410.0	UJ	360.0	UJ	ND		2400.0		10000.0		500.0		350.0	UJ
4-Nitrophenol	na	1000.0	ND		ND		ND		ND		ND		ND		ND		ND		ND		1100.0	UJ	ND		ND		ND	
2,4-Dinitrotoluene	na	na	ND		ND		ND		ND		ND		ND		ND		ND		ND		450.0	UJ	ND		ND		ND	
Carbazole	na	na	ND		ND		ND		ND		ND		ND		ND		37.0	J	ND		84.0	J	ND		ND		ND	
Benzo(a)anthracene	500	960.0	ND		ND		ND		ND		ND		130.0	J	ND		170.0	J	ND		460.0		420.0	J	ND		ND	
Di-n-octylphthalate	na	61.0	ND		ND		ND		ND		ND		ND		ND		ND		ND		450.0	UJ	ND		ND		ND	
Benzo(b)fluroanthene	na	1800.0	ND		ND		ND		ND		99.0	J	140.0	J	ND		340.0	J	ND		730.0		940.0	J	64.0	J	ND	
Benzo(k)fluoranthene	13400	1800.0	ND		ND		ND		ND		ND		74.0	J	ND		95.0	J	ND		260.0	J	ND		ND		ND	
Benzo(a)pyrene	700	1100.0	ND		ND		ND		ND		ND		ND		ND		160.0	J	ND		500.0		610.0	J	ND		ND	
Indeno(1,2,3-cd)pyrene	330	600.0	ND		ND		ND		ND		ND		ND		ND		110.0	J	ND		360.0	J	670.0	J	ND		ND	
Benzo(g,h,i)perylene	300	670.0	ND		ND		ND		ND		ND		ND		ND		110.0	J	ND		350.0	J	770.0	J	ND		ND	

Bold - Greater than UET/AET
J - Estimated result. Result is less than the Reporting Limit
na - not applicable
ND - Not Detected

Table 7
Analytical Results Summary- Sediment
July 12, 2000, Sampling Event
CEA No. 07040

U - analyte was analyzed for but not detected above the sample detection limit
Data Source for S-1 to S-14, is *Preliminary Assessment Site Inspection,* CARWQCB, May 7, 2001. The report refers to these samples as "soil samples" in the Sediment Sampling Section (3.2.2)

Figures



SOURCE: USGS GEOLOGICAL SURVEY 7.5 MINUTE QUADRANGLE, EUREKA, CA. 1958, PHOTO REVISED 1972

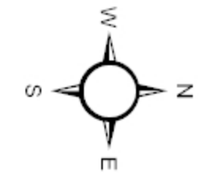
CARPENTER ENVIRONMENTAL ASSOCIATES, Inc.
CEA ENGINEERS, P.C.

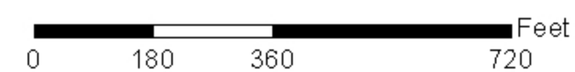
SITE LOCATION MAP

UNION PACIFIC BALLOON TRACK
EUREKA, CALIFORNIA

FIGURE 1

DATE: JANUARY 2008
FILE: 07040-SITELOC
SCALE: 1:24000

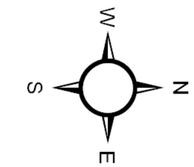




Site Layout
Union Pacific Balloon Track
Eureka, California

Figure 2

CEA No. 07040



Legend

- Lead >= 150 mg/kg
- Arsenic >= 0.39 mg/kg
- Copper >= 3100 mg/kg
- Drainage Ditch

0 175 350 700 Feet

Lead, Arsenic, Copper in Soil Exceeding the Residential PRG
Union Pacific Balloon Track
Eureka, California

Figure 3

CEA No. 07040

Legend

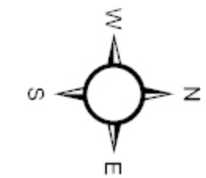
- Lead >= 800 mg/kg
- Arsenic >= 1.6 mg/kg
- Drainage Ditch

0 175 350 700 Feet

Lead, Arsenic in Soil Exceeding the Industrial PRG
Union Pacific Balloon Track
Eureka, California

Figure 4

CEA No. 07040



Legend

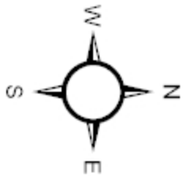
- Arsenic >= 29 mg/kg
- Monitoring Well
- Drainage Ditch

0 175 350 700 Feet

Samples Exceeding Impact to Groundwater Soil Screening Levels - Arsenic
Union Pacific Balloon Track
Eureka, California

Figure 5

CEA No. 07040



Legend

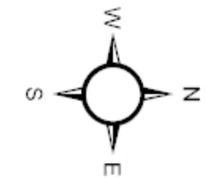
- Surface Water Sample Locations
- Surface Water Bodies/Wetlands
- Drainage Ditch

0 180 360 720 Feet

Surface Water Sample Collection Stations
Union Pacific Balloon Track
Eureka, California

Figure 6

CEA No. 07040



Legend

Monitoring Well Locations

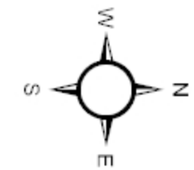
Drainage Ditch

0 180 360 720 Feet

Monitoring Well Locations
Union Pacific Balloon Track
Eureka, California

Figure 7

CEA No. 07040



Legend

- Sediment Samples - 7/12/2000
- Sediment Samples - 7/30/2007
- Drainage Ditch

0 180 360 720 Feet

Sediment Sample Collection Locations
Union Pacific Balloon Track
Eureka, California

Figure 8

CEA No. 07040

Appendices

Appendix A
Curriculum Vitae

CARPENTER ENVIRONMENTAL ASSOCIATES, INC.
CEA ENGINEERS, P.C.

CURRICULUM VITAE

BRUCE A. BELL, Ph.D., P.E., BCEE, PRESIDENT

EDUCATION

B.S. Civil Engineering, New York University, 1968
M.S. Civil Engineering, New York University, 1969
Ph.D. Environmental Engineering, New York University, 1974

REGISTRATION

Registered professional engineer in New York , New Jersey, and Pennsylvania
Board Certified Environmental Engineer by the American Academy of Environmental Engineers

PROFESSIONAL HISTORY

President, Carpenter Environmental Associates, Inc., Monroe, New York, 1978 - present
Promoted to President in 1991.

Responsible for technical direction of all engineering activities of the firm including:

Wastewater/Stormwater

- Design and supervision of construction for the upgrading of municipal sewage treatment plants.
- Design of several small private wastewater treatment plants.
- Collection system evaluations: CSO/SSO.
- Operational evaluation, process testing and review, and troubleshooting of POTWs.
- Facility Planning review and analysis.
- Conceptual design for biological nutrient removal.
- Peer review of biological nutrient removal and BAF applied research
- Waste treatability studies for industrial wastes.
- Sludge treatment and management evaluations.
- Water quality modeling; Waste assimilative capacity studies.
- Stormwater runoff modeling.
- NPDES permitting, comments, negotiations, and appeals.
- Industrial pretreatment studies and implementation of industrial pretreatment programs.
- Preparation of stormwater management plans and Stormwater Pollution Prevention Plans (SWPPPs).

Site Assessments/Hazardous Materials

- SPCC/DPCC Plans.
- Hazardous waste site assessment and remediation.
- Preparation and evaluation of environmental impact statements.
- RCRA closures.

Litigation Support

- Technical litigation support and expert witness testimony at deposition and trial in federal and state courts in the areas of: Clean Water Act, RCRA, CAFOs, Storm Water, and Insurance.

Associate Professor and Professor of Engineering, The George Washington University, Washington, D.C., 1978 - 1987
Promoted to Professor of Engineering in 1982.

Responsible for the University's environmental engineering program.

Directed both graduate and sponsored research.

Taught undergraduate and graduate courses in water supply, wastewater treatment, industrial waste treatment, sanitary engineering design, hydraulics, environmental chemistry, principles of environmental engineering, and environmental impact assessment.

Served as visiting research scientist and consultant at the U.S. Army Medical Bioengineering Research and Development Laboratory.

Project Manager and Vice President, Flood & Associates, Inc., Consulting Engineers of Jacksonville, Florida, 1975 - 1978
Promoted to vice president and director of environmental engineering design in 1976.

Responsible for the technical and financial aspects of all of the firm's environmental engineering design projects.

Served as project manager for numerous major treatment plant, collection system, and pumping station design projects including: design of a 20 MGD advanced wastewater treatment plant which included phosphorous removal, nitrification, denitrification, filtration and ozonation, as well as sludge incineration and lime recovery through recalcination; design of the upgrading and expansion of a 10 MGD lime water softening plant; design of sludge and solids handling systems for a 35 MGD municipal wastewater treatment plant; design of a 5 MGD pure oxygen expansion for a combined municipal/brewery waste treatment plant; design of a 15 MGD activated sludge plant; and design of several large wastewater pumping stations and associated gravity sewers.

Responsible for review of technical content of the firm's 201 Facilities Plans and sludge management studies.

Directed the firm's efforts as consultant to the Commonwealth of Virginia in the research, development, planning, and design related to the contamination of the James River and Hopewell wastewater treatment plant with the pesticide Kepone. Responsible for the preparation of alternative analysis for the remediation of Kepone contamination of the Hopewell wastewater treatment plant. Directed research efforts in Kepone biodegradation and incineration.

Systems Manager, Envirotech Corporation, Belmont, California, 1973 - 1975
Responsible for profit and loss for chemical-physical and advanced wastewater treatment systems, including thermal and solids handling systems and carbon regeneration systems.

Provided marketing and technical sales support, as well as application engineering.

Responsible for allocation and management of research and development funds in the area of advanced wastewater treatment.

Directed pilot studies in the areas of advanced wastewater treatment, carbon regeneration, and thermal sludge disposal. Carried out research into carbon adsorption and regeneration.

Responsible for process and system designs for solids handling systems and advanced wastewater treatment systems.

Instructor of Civil Engineering, New York University, New York, 1969 - 1973
Taught sixteen different courses in Civil and Sanitary Engineering.

Maintained active consulting practice in environmental engineering.

Consulting activities included wastewater treatability studies, pilot plant investigations, design of industrial pretreatment facilities, lake evaluations, and environmental impact analysis.

AFFILIATIONS

Water Environment Federation
International Water Association
American Society of Civil Engineers
American Academy of Environmental Engineers

HONORS

Board Certified by theAmerican Academy of Environmental Engineers
Member of Tau Beta Pi, Chi Epsilon, and Perstare et Preaestare honor societies
Received the Founders Day Award and Hydraulics Prize from New York University
Received the Outstanding Design Achievement Award from the Florida WPCA
Nominated for the WPCF Eddy Medal for paper on Munitions Waste Treatment
Listed in **Who's Who in the South and Southwest, International Who's Who in Engineering,** and **American Men and Women of Science**

PROFESSIONAL ACTIVITIES

Served as a reviewer for WPCF (WEF) Manuals of Practice for Sludge Thickening, Nutrient Removal, and Sludge Conditioning.
Member of ASCE publication review committee (1979 -).
Member WPCF Technical Practices Committee (1977 - 1988).
Reviewer, Research and Equipment proposals, NSF (1979 - 1988).
Member Program Committee and Conference Co-chair, Seminar on Development and Assessment of Environmental Quality Standards, American Academy of Environmental Engineers (1981).
Faculty, short course on Hazardous Waste Management, Harvard School of Public Health (1982).
Faculty, short courses on Hazardous Waste Management in the 80's, American Public Health Association (1983).
Conference Co-Chairman, Conference on the Treatment of Metal Bearing Wastewaters, NRDC/Texas Instruments, Inc., Mansfield, MA. (1985).
State Membership Chairman, American Academy of Environmental Engineers (1985 - 1987).
Faculty member and developer of course materials, Industrial Pretreatment Enforcement - A Workshop for POTW Attorneys, USEPA and Environmental Law Institute (1990 - 1992).
Faculty member New England Judges' Conference on Environmental Law, Environmental Law Institute, (1991).
Faculty member, New Jersey Judicial College (1992).
Course developer and faculty member "Basic Enforcement Skills," USEPA National Environmental Training Institute, (1992-1993).
Member, Nitrogen Technical Advisory Committee, New York City Department of Environmental Protection (1994 -).
Member, Technical Review Committee for upgrading of Passaic Valley Sewerage Commissioners 330 mgd pure oxygen treatment plant, Newark, New Jersey (1995 - 2000)
Adjunct Professor, taught graduate course - Analysis of Receiving Waters, New Jersey Institute of Technology (1995 - 1997).
Member, Water Supply and Wastewater sub-committee, American Academy of Environmental Engineers, (1996-).
Member, Plant Operation and Design Technical Advisory Committee for 100,000 gpd municipal package plant, Town of Saluda, North Carolina (1998 - 2002).
Reviewer, ***Reference Manual on Scientific Evidence***, Federal Judicial Center (2000).

PUBLICATIONS

1. Schneider, G., Cardenas, R.R., Jr., Bell, B.A. and Beale, D., *The Passaic River*, Proceedings, Essex County Environmental Problems and Resources Conference, 1971.

2. Cardenas, R.R., Jr. and Bell, B.A., *Impact - An Environmental Case Study Involving a Lake and a Builder*, Proceedings, American Water Resources Association Conference, St. Louis, MO, 1972.

3. Bell, B.A., *Advanced Wastewater Treatment*, Australian Process Engineering, 1974.

4. Bell, B.A., *Concepts and Operating Experiences - Advanced Wastewater Treatment Plants*, Proceedings, Sixth Federal Convention, Australian Water and Wastewater Association, Melbourne, Australia, 1974.

5. Bell, B.A. and Molof, A.H., *A New Model of Granular Activated Carbon Adsorption Kinetics*, Water Research, 9, 857-860, 1975.

6. Bell, B.A. and Molof, A.H., *Use of Continuously Stirred Flow Systems for Laboratory Investigation of Wastewater Treatability with Activated Carbon*, Proceedings 30th Annual Purdue Industrial Waste Conference West Lafayette, IN, 1975.

7. Gidlund, E.R. and Bell, B.A., G*roundwater*, in Encyclopedia of Environmental Science and Engineering, E. Ziegler and J. Pfafflin, Eds., Gordon and Breach, Science Publication, New York, 1976.

8. Bell, B.A. and Tsumpes, R.V., *Advanced Wastewater Treatment - Pensacola, Florida*, Proceedings, Florida Section, ASCE, Orlando, FL, 1976.

9. Bell, B.A. and Tsumpes, R.V., *Brewery Waste Treatment - Trials and Tribulations*, Proceedings 5th Annual WWEMA Industrial Pollution Conference, Atlanta, GA, 1977.

10. Bell, B.A. and Zaferatos, T.E., *Evaluation of Alternate Solids Handling Methods for Advanced Waste Treatment Lime Sludges*, Journal of the Water Pollution Control Federation, 49, 146, 1977.

11. Bell, B.A. and Welday, J.M., *Comparison of Complete Mixed Activated Sludge and Unox Treatment of Brewery Wastes*, Water – 1977, G. Bennett, Ed. AIChE Symposium Series, 74, 29, 1978.

12. Bell, B.A., Whitmore, F.C. and Cardenas, R.R. Jr., *Anaerobic Biodegradation of Kepone in Sewage Sludge*, Proceedings, 1978 National Conference on Control of Hazardous Material Spills, Miami Beach, Florida, 1978.

13. Bell, B.A., Gilley, W.F. and Welday, J.M., *Alternate Methods for the Disposal of the Pesticide Kepone*, Proceedings, Third Annual Conference on Treatment and Disposal of Industrial Wastewaters and Residues, Houston, Texas, 1978.

14. Bell, B.A. and Welday, J.M., *Pure Oxygen and Air Activated Sludge Treatment of Brewery Wastes*, Proceedings, International Environmental Colloquium, University of Liege, Liege, Belgium, 1978.

15. Bell, B.A. and Welday, J.M., *Thermal Conditioning and Incineration of Combined Brewery/Municipal Sludges*, Proceedings, 7th Annual WWEMA Industrial Pollution Conference, Philadelphia, PA, 1979.

16. Bell, B.A., *Energy Conservation and Production from the Anaerobic Digestion of Thermally Conditioned Sludges and Decant Liquors*, Proceedings Energy Optimization of Water and Wastewater Management for Municipal and Industrial Applications Conference, US D.O.E., ANL/EES-TM-96, 1979.

17. Bell, B.A., Jeris, J.S. and Welday, J.M., *Anaerobic Fluidized Bed Treatment of Sludge Conditioning Decant Liquor*, Proceedings Anaerobic Filters: An Energy Plus for Wastewater Treatment, US D.O.E. Symposium, Orlando, FL, 1980.

18. Bell, B.A., *Advanced Wastewater Treatment*, in Manual of Instruction for Wastewater Treatment Plant Operators, New York State Department of Environmental Conservation, 1980.

19. Bell, B.A., Jeris, J.S. and Welday, J.M., *Treatment of Liquors from Thermally Conditioned Sludges by Conventional and Fluid Bed Anaerobic Systems*, Proceedings ASCE National Conference on Environmental Engineering, New York, NY, 1980.

20. Bostater, C.R., Jr., Ambrose, R.B. and Bell, B.A., *Modeling the Fate and Transport of Chemicals in Estuaries: Current Approaches and Future Needs*, Aquatic Toxicology and Hazard Assessment: 4th Congress ASTM, STP 737, D.R. Branson and K.L. Dickson, Eds. American Society for Testing and Materials, 1981.

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22. Bell, B.A., Cardenas, R.R., Jr., Huddleston, R.E., Jr. and Martin A.R., *Procedure for Evaluation of the Impact of Intermittently Discharged Industrial Wastes on Municipal Treatment Facilities*, in Industrial Wastes, J.E. Alleman and J.T. Kavanagh Eds., Ann Arbor Science Publishers, Ann Arbor, MI, 1982.

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25. Bell, B.A., and Hardcastle, G.J., *Treatment of a High Strength Industrial Waste in a Continuously Fed, Intermittently Operated Activated Sludge System*, Journal of the Water Pollution Control Federation, 56, 11, 1160-1164, 1984.

26. Gidlund, E.R. and Bell, B.A., *Groundwater*, in Encyclopedia of Environmental Engineering, 2nd Ed., J. Pfafflin, Ed., Gordon Breach Publishers, London, England, 1984.

27. Biswas, H., Bell, B.A., and Stuart, T.S., *A Method for Establishing Site-Specific Stream Design Flows for Wasteload Allocations*, Journal of the Water Pollution Control Federation, 56, 10, 1123-1130, 1984.

28. Bell, B.A., and Burrows, W.D., *Biological Treatment of Explosive Bearing Wastewaters*, in Toxic and Hazardous Wastes, Proceedings of the Nineteenth Mid-Atlantic Industrial Waste Conference, Jeffrey C. Evans, Ed., 1987.

29. Cardenas, Jr., R.R., Bell, B.A., and Hatim, M., *Application of Ultraviolet Disinfection in Small Systems*, in Resource Mobilization for Drinking Water and Sanitation in Developing Countries, pp 678 - 685, F.W. Montanari, T.P. Thompson, T.P. Curran, and W. Saukin, Eds., 1987.

30. Bell, B.A. and Burrows, W.D., Removal and Degradation of TNT in a Semicontinuous Activated Sludge Treatment System, in Hazardous and Industrial Wastes, Proceedings of the Twenty First Mid-Atlantic Industrial Waste Conference, C.A. Cole and D.A. Long, Eds., pp 344 - 356, 1989.

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32. Garabed, S., Amuro, A., Stone, J., Bell, B., and Melnyk, P.*, A Full Scale Comparison of Conventional and DAF Primary Treatment*, NYWEA Environmental Technical Conference, Lake George, NY, 1996.

SELECTED TECHNICAL REPORTS

Environmental Impact of a Proposed Housing Development on Lake Waneta, N.Y., with R.R. Cardenas, Jr., 1972.

Water System Evaluation, Pensacola, Florida, Flood & Associates, Inc., 1976.

Kepone Incineration Test Program, with F.V. Whitmore, U.S.E.P.A., EPA-600/278-108, 1978.

Anaerobic Digestion of Thermal Sludge Conditioning Decant Liquor and Conditioned Sludge, Carpenter Associates, Inc., 1979.

Discharge and Treatment of Spent Toner Wastes, Carpenter Environmental Associates, Inc., 1981.

Final Technical Report, Cation Toxicity in the Anaerobic Digestion of Lime Sludge, U.S. Army Medical Bioengineering Research and Development Laboratory, Technical Report 8205, 1982.

Final Technical Report, Munitions Wastewater Treatment in Semicontinuous Activated Sludge Treatment Systems, U.S. Army Armament Research and Development Center, Large Caliber Weapon Systems Laboratory, Dover, N.J., Contractor Report ARLCD-CR-84029, 1984.

Environmental Evaluation of the Use, Handling, Storage and Transportation of Chemicals at an Industrial Facility in Briarcliff Manor, N.Y., Carpenter Environmental Associates, Inc., 1985.

Final Technical Report, A Simplified Method for the Determination of Mixing Zones in Estuaries, USEPA, 1985.

Final Technical Report, Pilot Scale Evaluation of Semicontinuous Activated Sludge Treatment of Munitions Bearing Wastewater, U.S. Army Armament Research and Development Center, Large Caliber Weapon Systems Laboratory, Dover, N.J. Carpenter Environmental Associates, Inc., 1987.

Engi*neering Report - Hamlet Sewage Treatment Plant Improvements, Town of Tuxedo, N.Y.*, Carpenter Environmental Associates, Inc., 1987.

Expert Witness Report *Evaluation of Lack of Compliance with NJPDES Permit, P. D. Oil & Chemical Storage, Inc., Bayonne, New Jersey*, Carpenter Environmental Associates, Inc., 1988.

Final Report, Conceptual Design, Biological Nutrient Removal, Annapolis Water Reclamation Facility, Annapolis, Maryland, Carpenter Environmental Associates, Inc., 1989.

SPCC and ISC plans, ARDEC, Picatinny Arsenal, New Jersey, Carpenter Environmental Associates, Inc., 1990. Updated 1999.

Expert Witness Report *Evaluation of Lack of Compliance with NJPDES Permit, Yates/Circuit Foil, Bordentown, New Jersey*, Carpenter Environmental Associates, Inc., 1992.

New Lisbon Development Center Wastewater Treatment Plant Optimization Study, New Jersey Department of Human Services, Carpenter Environmental Associates, Inc.,1992.

Comparison of Dissolved Air Flotation and Conventional Clarification, Sand Island Wastewater Treatment Plant, Honolulu, Hawaii, P.B. Melnyk, GMP Associates, Inc. and Carpenter Environmental Associates, Inc., 1994.

Nitrification Toxicity Study, Mount Pocono (PA) Municipal Authority, Carpenter Environmental Associates, Inc., 1994.

Evaluation of Wastewater Treatment Plant, New Lisbon Development Center, New Jersey Department of Human Services, Carpenter Environmental Associates, Inc., 1995.

Wastewater Treatment Plant Preliminary Evaluation at Floyd Bennett Field, U. S. Department of the Interior, Carpenter Environmental Associates, Inc.,1995.

Expert Witness Report*: Interference with Operation of the Hammond Sanitary District Wastewater Treatment Plant, Combined Sewer Overflow not in Compliance with Permit Conditions and Pollutant Loadings to the West Branch of the Grand Calumet River*, prepared for USDOJ, Carpenter Environmental Associates, Inc.,1995, Updated 1999.

Report on the Actions Needed for Evans Industries, Inc., Evans Cooperage Company, Inc., and Evans Container Corporation, Inc. to Come into Compliance with their Clean Water Act Discharge Permit, Carpenter Environmental Associates, Inc., 1997.

Evaluation Of and Comments on UPRC's Draft NPDES Permit, Carpenter Environmental Associates, Inc., 2000.

Problem Assessment From, and Approach to Minimizing Sanitary Sewer Overflows Along the California Coastline, Carpenter Environmental Associates, Inc., 2001.

Needs Assessment and Cost Estimate to Upgrade Tewskbury, NJ Wastewater Treatment Plant, Carpenter Environmental Associates, Inc., 2001.

Evaluation of Proposed Trickling Filter and Clarifier Upgrades at the Tinicum, PA Wastewater Treatment Plant, Carpenter Environmental Associates, Inc., 2002.

Expert Witness Report of Bruce A. Bell, Ph.D., P.E., DEE Regarding City of Los Angeles, California, Capacity Related SSOs, Prepared for the Santa Monica Baykeeper and USDOJ, 2003.

Appendix B
Testimony at Deposition and Trial

UPDATED: January 24, 2008				
CASE	**COURT**	**TYPE**	**ACTION NO.**	**YEAR**
American Canoe Association; Professional Paddlesports Association; Conservation Council of North Carolina; United States of America v. Murphy Farms, Inc., d/b/a Murphy Family Farms and D.M. Farms of Rose Hill, L.L.C.	US District Court for the Eastern District of North Carolina Southern Division	Deposition & Trial Testimony	7-98-CV-4-V(1) 7-98-CV-19-F(1) 5-98-CV-209-F(1)	1998, 2001 & 2004
Interfaith Community Organization v. Honeywell Int'l, et. al.	US District Court for the District of New Jersey	Deposition & Trial Testimony	96-2997	2001 & 2004
Santa Monica Baykeeper, et. al. V. The City of Los Angeles.	United States District Court Central District of California	Deposition Testimony	No. 98-9039 RSWL (SHx), No. 01-191 Consolidated Case	2003 & 2004
Tappan Wire & Cable, Inc. v. County of Rockland, et al.	Supreme Court of the State of New York, Count of Rockland	Trail Testimony	Index No. 3273/00 (WKN)	2004
Friends of Milwaukee's Rivers and Alliance for the Great Lakes v. Milwaukee Metropolitan Sewer District	United States District Court Northern District of Illinois, Eastern Division	Deposition and Trial Testimony	02-C-0270	2005
In Re: Flood Litigation, Upper Guyandotte River, Sub-Watersheds 2A (Mullens) and 2E (Oceana)	Circuit Court of Raleigh County, West Virginia	Deposition and Trial Testimony	Civil Action 02-C-727	2006
BILL THIEBAUT, in his official capacity as District Attorney for the Tenth Judicial District of Colorado, and Sierra Club v. Colorado Springs Utilities and City of Colorado Springs	United States District Court for the District of Colorado	Deposition Testimony	Civil Action No. 05-CV-01994-WDM-BNB (consolidated with 05-CV-02468-WDM-BNB)	2006
Robert C. Carter v. Monsanto Company and Apogee Coal Company	Circuit Court of Putnum County, West Virginia	Deposition Testimony	Civil Action No. 00-C-300	2007

Appendix C
Documents Considered

Documents Considered
CEA No. 07040

DATE	TITLE	BATES NO.		
18-May-90	Summarized Activity Progress Prior to December 1989	PLTFS	2025	2060
12-Nov-91	Summary Report Soil & Groundwater Investigation Vol. I of II Reports	PLTFS	2194	2283
	Public Participation, Cleanup Process, Progress since July 99', Health Risk Assessment, Prior Investigation Findings, Historical Contaminant Sources & Balloon Track - Presentation	PLTFS	2186	2193
22-May-92	Soil Sampling & Well Installation Work Plan	PLTFS	2284	2343
1-Jan-89	Site Figures	PLTFS	2017	2022
15-Nov-02	Semi-Annual Groundwater Monitoring Report May through October 2002	PLTFS	8423	8535
19-Dec-03	Additional Soil Removal, Confirmation Soil Sampling & Destruction of Piezometer P-9A	PLTFS	9123	9201
1-Dec-95	Groundwater Monitoring Report July to September 1995	PLTFS	2413	2501
21-Feb-96	Documentation of Groundwater Monitoring Program	PLTFS	2502	2576
1-Apr-96	Shallow Soil Investigation Report	PLTFS	2717	2918
2-Jul-96	Stormwater Runoff Sampling & Analysis Results	PLTFS	3271	
22-Jul-96	Documentation of Groundwater Monitoring Program & Installation of Monitoring Well MW-10A	PLTFS	3131	3270
19-Aug-96	Trench Investigation Near Clark Slough	PLTFS	3306	3341
14-Jan-97	Site History Review	PLTFS		4536
25-Mar-97	Documentation of Groundwater Monitoring Program July 1996	PLTFS	3630	3743
2-Jun-97	Documentation of Groundwater Monitoring Program March 1997	PLTFS	3744	3923
4-May-98	Documentation of Groundwater Monitoring & Recommendation to Terminal GWMP November 1997 Sampling	PLTFS	4140	4257
18-Jun-98	Stormwater Runoff Sampling & Analytical Results Jan-Feb 1998	PLTFS	4258	4350
17-Feb-99	Soil & Groundwater Investigation Work Plan	PLTFS	4537	4603
17-Aug-99	Documentation of Groundwater Monitoring-May 1999 Sampling Former Railroad Yard	PLTFS	4797	4880
5-Nov-99	Results of Soil & Groundwater Investigation Former Underground Fuel Tanks	PLTFS	4881	5107
27-Jun-00	Draft Feasibility Study & Proposed Remedial Action Plan	PLTFS	7768	7889
28-Sep-00	Documentation of Monitoring Well Installation Former Railroad Yard	PLTFS	6381	6430
26-Jun-01	Annual GWM Summary Report-Former UST Area Former Railroad Yard	PLTFS	6572	6670
14-Dec-01	Interim Remedial Action Plan	PLTFS	7043	7198
26-Jul-01	Work Plan for Additional Shallow Soil Sampling Clean Up & Abatement Order No. R1-2001-26 Former Railroad	PLTFS	6671	6687
27-Jul-01	Annual Groundwater Monitoring Summary Report Former General Petroleum Site	PLTFS	6688	6854
8-Aug-01	Quarterly GWM Report May Through July 2001	PLTFS	6855	7014
14-Nov-01	Quarterly GWM Report August Through October 2001	PLTFS	6431	6571
9-Jan-02	Site Investigation Work Plan	PLTFS	7925	7963
25-Jan-02	December 2001 Stormwater Observations & Analytical Results	PLTFS	7890	7924
14-Feb-02	January 2002 Stormwater Observations & Analytical Results	PLTFS	7964	7995
28-Feb-02	Quarterly GWM Report November 2001 through January 2002	PLTFS	7996	8182
18-Mar-03	February 2003 Stormwater Observations & Analytical Results	PLTFS	8536	8623
14-May-02	Quarterly GWM Report February through April 2002	PLTFS	8240	8398
29-May-02	Interim Soil Management Plan (Rev.1)	PLTFS	8399	8410
29-May-02	Soil Removal Work Plan	PLTFS	8411	8422
29-Jan-03	December 2002 Stormwater Observations & Analytical Results	PLTFS	7414	7562
27-Feb-03	January 2003 Stormwater Observations & Analytical Results	PLTFS	7563	7626
1-May-02	Semi-Annual Groundwater Monitoring Report November 2002 through April 2003	PLTFS	8756	8870

Documents Considered
CEA No. 07040

DATE	TITLE	BATES NO.		
29-Apr-03	March 2003 Stormwater Observations & Analytical Results	PLTFS	8871	8973
28-May-03	April 2003 Stormwater Observations & Analytical Results	PLTFS	7627	7768
26-Jun-03	May 2003 Stormwater Observations & Analytical Results	PLTFS	8974	9123
13-Nov-03	Semi-Annual Groundwater Monitoring Report May through October 2003	PLTFS	8624	8755
17-May-04	Semi-Annual GWMR February 2004 Monitoring Report	PLTFS	9452	9595
8-Dec-04	October 2004 SW Observations & Analytical Results			
9-Dec-04	November 2004 SW Observations			
31-Jan-05	December 2004 SW Observations & Analytical Results			
1-Mar-05	January 2005 SW Observations & Analytical Results			
1-Apr-05	February 2005 SW Observations & Analytical Results			
5-May-05	March 2005 SW Observations & Analytical Results			
25-May-05	Semi Annual GWMR March 2005 Monitoring Event			
1-Jun-05	April 2005 SW Observations & Analytical Results			
5-Jun-05	May 2005 SW Observations & Analytical Results			
30-Dec-05	November 2005 SW Observations & Analytical Results			
30-Jan-06	December 2005 SW Observations & Analytical Results			
28-Feb-06	January 2006 Stormwater Observations & Analytical Results			
28-Apr-06	March 2006 SW Observations & Analytical Results			
31-May-06	Semi Annual GWMR February 2006 Monitoring Event			
15-Nov-06	Semi Annual GWMR August 2006 Monitoring Event	PLTFS	12523	12676
30-Nov-06	October 2006 Surface Water Monitoring Report	PLTFS	12677	12691
11-Jul-00	Figure 3-1 Sample Locations			
25-Mar-02	February 2002 Stormwater Observations & Analytical Results	PLTFS	8183	8239
30-Jan-04	December 2003 Stormwater Observations & Sample Results	PLTFS	9203	9287
23-Mar-04	January 2004 SW Observations & Analytical Results	PLTFS	9288	9361
15-Apr-04	February 2004 SW Observations & Analytical Results	PLTFS	9362	9451
7-May-04	March 2004 SW Observations & Analytical Results	PLTFS	9596	9675
12-Nov-91	Soil & Groundwater Investigation Summary Report Vol II of II	PLTFS	10908	11388
1-Jan-94	Soil Investigation & Groundwater Monitoring Well Installation Report	PLTFS	11389	12116
27-Jun-96	Health Risk Assessment Work Plan	PLTFS	2919	3130
16-Jun-97	Health Risk Assessment Report	PLTFS	3924	4139
24-Apr-00	Health Risk Assessment Addendum	PLTFS	5570	5780
7-May-01	Preliminary Assessment/Site Inspection Report	UP	4794	4960
21-Nov-05	Semi Annual GWMR August 2005 Monitoring Report			
20-Jul-07	Site Health & Safety Plan			
1-Dec-06	Stormwater & Surface Water Sampling Locations			
21-Aug-07	Monitoring Data on CD			
18-Aug-07	TEQ Calculations			
1-Apr-04	Eureka Railroad Yard Database Review			
23-Aug-07	Final Balloon Track Sampling Results, 8/23/07			
1-Sep-99	NOAA Squirts-Screening Quick Reference Table			
5-Jun-00	USEPA Field Operations Branch Field Sample Plan & Results			
9-Feb-93	Additional Groundwater Investigation-Eureka Yard (additional page)	UP	9262	9262
9-Feb-93	Additional GW Investigation-Eureka Yard	UP	9258	9259
2-Mar-95	Field Investigation And Quarterly GW Monitoring Work Plan Former SPTCo Railroad Yard	UP	1551	1558
18-Apr-90	Letter re Past Waste Management Activities at Balloon Track	UP	9513	9514
25-Apr-02	March 2002 Stormwater Observations	UP	1575	1577
26-Apr-02	Observations of SW Sampling Locations, April 24, 2002	UP	8808	8811

Documents Considered
CEA No. 07040

DATE	TITLE	BATES NO.		
26-May-98	Notes on Surface Water Discharges	UP	9823	9825
28-May-92	Additional GW Investigation-Eureka Yard	UP	9263	9264
7-Jun-91	Draft RAA Report	UP	9067	9072
30-Nov-89	Progress Report Southern Pacific Transportation Company	UP	2774	32855
26-May-98	Surface Water Discharges	UP	9823	9825
	Maps_UP01543-01547	UP	1543	1547
	Trench Sections And Locations	UP	1526	1542
	Sample Locations Of Former Railroad Yard Eureka, California Project No. 1480.05 Figure 7			
1-Apr-06	Figure 1 Stormwater And Surface Water Sampling Locations, Project # 030282			
	Table 3 Summary Of Precision Data For Analysis Of Stormwater Runoff Samples			
1-Aug-06	Figure 2 Site Plan With Groundwater Monitoring Well Locations			
1-Apr-06	Figure 1 Stormwater And Surface Water Sampling Locations			
9-May-01	Monitoring & Reporting Program No. R1-2001.29 for Union Pacific Railroad Co.			
7-Feb-89	Laboratory Report for Canonie Environmental, UST Removal			
30-Dec-88	Phase I Hazardous Waste Survey, NWP Railroad Yard, Eureka, California, Humboldt County			
1-Jul-05	Draft Final Remedal Action Plan, UPRR Eureka Railroad Yard and Adjacent Properties, Eureka, California	UP	41658	42333
22-Jul-02	Monitoring & Reporting Program No. R1-2002-0082 for Union Pacific Railroad Co.			
9-May-01	Cleanup & Abatement Order No. R1-2001-26 for Union Pacific Railroad			
	California Toxic Rule, 40CFR131.38, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California			
26-Jul-07	EPA Region 3, Mid-Atlantic Brownfields, Rail Yards			
29-Mar-06	February 2006 Surface Water Monitoring Report			
28-Mar-07	February 2007 Surface Water Monitoring Report			
25-Apr-07	March 2007 Surface Water Monitoring Report			
26-Jan-07	December 2006 Surface Water Monitoring Report			
1-Jun-07	April 2007 Surface Water, Monitoring Report			
13-Jun-07	May 2007 Surface Water Monitoring Report			
6-Jul-04	May 2004 Stormwater Observations	UP	13983	13994
27-Jun-04	June 2004 Stormwater Observations	UP	13995	14012
30-Jun-06	May 2006 Stormwater Observations	UP	15712	15724
28-May-04	April 2004 Stormwater Observations	UP	13957	13967
25-May-06	April 2006 Stormwater Observations			
15-Jul-06	June 2006 Stormwater Observations			
	Record of Climatological Observations, Eureka WFO Woodley Island, National Climatic Data Center			
8-Sep-06	Site Investigation Report, Former General Petroleum Company, 736 Broadway, Eureka, California			
	Tables 1-3, Stormwater Information			
	Trench Figures	UP	1526	1542
	Figures	UP	1543	1547
18-Oct-07	City of Eureka GIS - Stormwater Information Query			
	City of Eureka GIS - Stormwater Information/Query (2)			
4-May-89	Photos 050489	UP	2636	2695
17-Jul-91	Letter re: Eureka Yard Site Cleanup Status	UP	1449	1452
1-Oct-01	Historic Resources Report "Balloon Tract" Eureka, California	UP	5738	5763
14-Nov-95	Site Photographs of Former Railroad Yard Site, Eureka, CA	UP	2788	2813

Documents Considered
CEA No. 07040

DATE	TITLE	BATES NO.		
1-Jun-08	Balloon Track Historical Doc. V.1.			
1-Apr-06	Figure 1, Stormwater & Surface Water Sampling Locations			
	Tables 1-6, Groundwater Information			
	CADD Drawings			
	Sample Locations, Former Railroad Yard, Eureka, California			
	005265 - Base.dwg			
1-Nov-05	Environmental Update #20, Environmental Contamination of Rail Yards			
15-Jul-02	Technical Approaches to Characterizing & Cleaning Up Brownfield Site: Railroad Yards			
7-Mar-00	Letter Re: Balloon Tract Evaluation Status & Criteria	UP	32659	32662
7-Aug-01	Stormwater Work Plan for the Former Eureka Railroad Yard	UP	18411	18416
16-Oct-03	Stormwater Work Plan for the Former Eureka Railroad Yard, 2003-2004	UP	18397	18402
8-Aug-90	Trenching Field Notes - Evidence of Pit	UP	17529	17532
1-Aug-97	Letter Re: Observations of Clark Slough & Trenches T-23 & T-24, April 1996 & January 1997, Former Railroad Yard, Eureka, California	UP	25459	25474
1-Sep-89	Health & Safety Plan, Debris Removal & Site Characterization	UP	19258	19280
30-Jan-90	Letter Re: Toxic Pits Cleanup Act (TPCA) Requirements at the Eureka Yard, Fourth & Broadway, Eureka, California	UP	19156	19157
1-Jan-89	1989 Photos	UP	19036	19147
1-Jul-88	Environmental Impact Report, Humboldt County Jail, Draft	UP	18638	18849
25-Jun-90	Draft Exploratory Trenching & Soil Sampling Plan	UP	17724	17734
1-Mar-99	Draft Phase I Environmental Site Assessment, Former Railroad Yard (APNs -3-021-09-3-031-06, 3-041-07) & Adjacent Properties (AP	UP	32317	32451
19-Jul-89	Proposal for Water Front Yard & Eureka Main Yard Waste Removal	UP	19198	19201
6-Feb-96	Photos February 6, 1996	UP	22361	22380
21-Sep-95	Site Photographs, September 21, 1995	UP	22667	22728
26-Jan-97	Photographs & Field Notes from Slough Inspection, January 26, 1997	UP	30445	30486
11-Jun-99	Phase 2 Investigation Workplan, Former SPTCo Railroad Yard; APNs 3-021-09, 3-031-06, & 3-041-07; Eureka, California	UP	32535	32546
11-Nov-03	Photographs of Spreading Gravel Adjacent to Station B; Hazardous Soil Bin Offhaul, November 11, 2003	UP	41415	41433
10-May-99	Preliminary Geotechnical Engineering Investigation, Proposed Wal-Mart Store, Third & Broadway Streets, Eureka, California	UP	32213	32257
1-Sep-95	September 1995 Analytical Data Reports	UP	22407	22529
18-May-00	Part III Environmental Protection Agency 40 CFR Part 131 Water Quality Standards; Establishment Of Numeric Criteria For Priorit			
22-Feb-99	Work Plan / Health And Safety Plan Geotechnical Engineering Investigation Proposed Wal-Mart Site Former Southern Pacific/ Union	UP	32149	32255
1-Jan-05	Policy For Implementation Of Toxics Standards For Inland Surface Waters, Enclosed Bays, And Estuaries Of California, 2005			
	References For End Of Pipe Application Of CTR			
1-Apr-07	Investigation Of The Wetlands Subject To Regulation Under The California Coast Act Balloon Track Property, Eureka, Humbolt County			
1-Mar-07	Balloon Track Coastal Zone Wetland Delineation Coastal Commission Methodology Project No.: 874PIE			
22-Nov-06	Results Of First Flush 2006 At Clark Slough	PLTFS	33415	33506
8-Nov-05	Laboratory Results From First Flush 2005 At Clark Slough	PLTFS	33308	33343

Documents Considered
CEA No. 07040

DATE	TITLE	BATES NO.		
	Humboldt Bay First Flush 2005 Report	PLTFS	33921	33954
10-Jan-08	Draft Streamborn Level Survey			
	Stormwater Runoff Field Data Log Sheets			
18-Jan-08	Locations of Sediment Surface Water Samples Collected 1/10/2008			
24-Jul-74	Contingency Planning & Notification Requirements for Accidental Spills & Discharges, Order No. 74-151	UP	29368	29369
29-Jan-76	Order No. 76-9 NPDES No. CA 0023698, Waste Discharge Requirements for Northwestern Pacific Railroad Company	UP	29359	29367
18-Jan-08	Preliminary Analytical Data, Wet Weather Sampling Event, January 10, 2008			
10-Jan-08	Ecorights Site Visit Photographs, January 10, 2008			
19-Dec-02	December 2002 Eureka Railyard Stormwater Sampling Data Sheets & Chain of Custody	UP	38490	
28-Nov-01	Stormwater Runnoff Field Data Sheets, November 2001	UP	38051	38062
7-Feb-02	Stormwater Runoff Field Data Log Sheets, February 2002	UP	38240	38249
8-Jan-02	Stormwater Runoff Field Data Log Sheets, January 2002	UP	38316	38323
10-Nov-08	Wet Weather Event Field Logo w/GPS Coordinates			
	22CCR66261.24, Title 22, Chapter 11, Article 3, Characteristics of Hazardous Waste			
1-Dec-01	Environmental Investigators Standard Operating Procedures & Quality Assurance Manual, Region 4			
27-Jul-07	Final Site Health & Safety Plan: Site Screening Assessment Field Operations Former Union Pacific Railroad Maintenance Facility			
4-Jan-08	Sampling Plan Amendment Two			
30-Nov-07	Sampling Plan Amendment One			
1-Dec-05	Stormwater & Surface Water Sampling Locations Color Figure			
	Photo Log - Balloon Track Site Visit January 10, 2008 by Dr. Jim Rogers			
1-Apr-06	Balloon Track Groundwater Monitoring Wells Locations			
27-Jul-07	Sampling & Analysis Plan, Former Eureka Rail Yard, "Balloon Track," Eureka, CA			
20-Jul-07	Site Health & Safety Plan: Site Screening Assessment Field Operations Former Union Pacific Railroad Maintenance Facility, Eurek			
1-Oct-04	Region 9, Preliminary Remediation Goal (PRG) Table			
22-Jan-08	Draft Groundwater Movement at the Balloon Track Site, Eureka, California			
	Table 3.1, Specific Water Quality Objectives for North Coast Region, North Coast Regional Water Quality Control Board, Basin Plan			
9-Aug-90	Daily Field Record, August 9, 1990	UP	17529	17532
5-Oct-93	Memorandum Re: Site Inspection, March 25, 1993	UP	29351	29356
	33 CFR Part 328 Definition of Waters of the United States			
13-Aug-98	California Wetlands Information Systems, Defining Wetlands			
28-Nov-07	NPL Site Narrative for Union Pacific Railroad Tie Treatment			
31-May-07	First Semiannual 2007 Groundwater Monitoring Report	CUE	319	418
24-Jan-08	Sediment Sampling, July 30, 2007 Former Eureka Rail Yard, "Balloon Track," Eureka, California			

Appendix D
Billing Rates

Carpenter Environmental Associates, Inc.
CEA Engineers, P.C.

Hourly Rates

Category Description	**Hourly Rates***
Principal	$275.00
Sr. Vice President	$235.00
Sr. Engineer	$180.00
Sr. Scientist	$138.00
Sr. Project Engineer	$117.00
Project Engineer	$114.00
Environmental/Civil Engineer	$106.00
Environmental Scientist	$104.00
Information Technology Specialist	$90.00
Graphics Technician	$83.00
Sr. Technician	$74.00
Technician	$69.00
Clerical	$66.00

*Hourly rates are valid through September 30, 2008.

09/07

Appendix E
Site Photographs

Photograph 1 – Soil and Debris Piles

Photograph 2 – Abandoned Railroad Trucks (exposed metal debris)

Photograph 3 – Abandoned railcars and metal debris.

Photograph 4 – Railroad Ties

Photograph 5 – Tire Burning Area