Harding Lawson Associates

Transmittal/Memorandum

To: Alameda County Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Attention: Mr. Lowell Miller

From: David Leland
Date: November 22, 1989
Subject: October 1989 Ground-Water Treatment System NPDES Monitoring Report
Job No.: 09382,040.02

Remarks: Please find attached a copy of the "Report of System Monitoring: October 1989, Dewatering Effluent Treatment System, Pacific Renaissance Plaza, Oakland, California," describing the operations and monitoring of the ground-water treatment system located at the Pacific Renaissance Plaza site in Oakland.

DL/jmg/dl130#4m

cc:

A Report Prepared for

California Regional Water Quality Control Board
San Francisco Bay Region
1111 Jackson Street, Room 6000
Oakland, California 94607

REPORT OF SYSTEM MONITORING
OCTOBER 1989
DEWATERING EFFLUENT TREATMENT SYSTEM
CHINATOWN REDEVELOPMENT PROJECT AREA
OAKLAND, CALIFORNIA

HLA Job No. 9382,040.02

Submitted on behalf of:

City of Oakland Redevelopment Agency
One City Hall Plaza
Oakland, California 94612

by

Charles E. Myrick
Project Engineer

David F. Leland
Associate Hydrologist

Harding Lawson Associates
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415/892-0821

November 22, 1989

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I INTRODUCTION

This report discusses the operation and monitoring of the ground-water treatment system at 10th and Webster streets, Oakland, California from October 1 to October 31, 1989. The system is treating ground water produced from extraction wells located in the area bounded by 9th, 11th, Webster and Franklin streets. Ground-water extraction is being conducted in conjunction with in situ biological treatment of soil at the Pacific Renaissance Plaza (PRP) site bounded by 9th, Franklin, and Webster streets and the East Bay Municipal Utility District (EBMUD) property line approximately 100 feet north of the centerline of 10th Street.

This report has been prepared by Harding Lawson Associates (HLA) on behalf of the Redevelopment Agency of the City of Oakland (Agency) and is submitted in compliance with NPDES Permit CA 0029394, adopted on July 20, 1988, by the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB). Under the NPDES permit, treatment system discharge limits are 50 parts per billion (ppb) for total petroleum hydrocarbons (TPH) identified as gasoline; 5.6 ppb for lead; 5.0 ppb each for chlorobenzene, 1,2-dichloroethane, 1,2-dichloropropane, trichloroethylene, 1,1,2-trichloroethane, benzene, xylenes, and ethylbenzene; 0.5 ppb for toluene; 0.01 ppb for ethylene dibromide; and 0.0 ppb for total residual chlorine. The treatment system is designed to reduce concentrations of petroleum hydrocarbons in ground water to less than discharge limits specified in the NPDES permit.

II TREATMENT SYSTEM OPERATION

The ground-water treatment system was installed March 8, 1988, and has been in operation since March 14, 1988. Water is treated by pumping it through four carbon contactors arranged in pairs. Organic compounds in the influent are adsorbed onto the carbon. Each pair of contactors is arranged in parallel, and together constitute a module; the two modules are arranged in series. The system is configured so that water from the ground-water extraction wells may be pumped through either module first. The system also includes a holding tank for influent water, pumps, filters, piping, and instrumentation. Four water sampling ports -- one influent, two intermediate, and one effluent -- enable water samples to be collected throughout the treatment process. The intermediate ports are located between the two modules so the effectiveness of the first pair of contactors in reducing influent concentrations can be monitored. Depending on the configuration of modules, only one of these ports is intermediate in the system at any one time.

Treated effluent is either recycled to the PRP biological treatment system or discharged to the storm drain. From October 1 to November 1, 1989, total effluent discharged from the system was 849,000 gallons, based on readings of the totalizing flowmeter located in the discharge line. Average flow for the month was 19 gallons per minute (gpm). Of the 849,000 gallons of treatment system effluent, approximately 95 percent, or 806,000 gallons was recycled to the PRP biotreatment injection system and 5 percent, or 43,000 gallons was discharged to the storm drain.

The carbon contactors were backwashed with fresh water on October 2, 5, and 27. Cartridge filters were changed on October 29. Bag filters were replaced once every one to two days as a result of biological fouling. The new sand filter was backwashed with fresh water on October 5, 20, and 27.

Prior to the month of October, one or more extraction wells installed by Viking Drillers for the EBMUD dewatering system continued to discharge to the HLA carbon treatment system. As of October 1, all Viking extraction wells had either been shut off or, in the case of one well, converted into an HLA extraction well complete with an individual flow meter. As a result, the meter reading on the treatment system can now be compared with readings from all the individual extraction well flow meters feeding into the treatment system. The average flow rate according to the extraction well flow meters for the period from October 1 to November 1 was 23.8 gpm, whereas the average flow rate according to the treatment system flow meter for the same period was 19.0 gpm; it appears that the treatment system flow meter does not function properly over the range of flow rates which the system treats. Several alternatives are being considered to solve this problem, including improving the performance of the existing meter or replacing the meter.

III TREATMENT SYSTEM MONITORING

During this reporting period, treatment system samples were collected on October 5 from the influent, intermediate, and effluent sampling ports. A field blank was submitted with samples collected on this date in conjunction with activities at the PRP site.

All treatment system samples collected were analyzed by Pace Laboratories, Novato, California, a California-certified laboratory. All samples were analyzed for halogenated organics by EPA Test Method 8010, for benzene, toluene, ethylbenzene, and xylenes by EPA Test Method 8020, and for TPH as gasoline by EPA Test Method 8015. Influent, effluent, and blank samples were analyzed for ethylene dibromide by EPA Test Method 504. Influent and effluent samples were analyzed for residual chlorine by Standard Method 408E, and for dissolved oxygen by EPA Test Method 360.2.

Results of analyses of samples collected February 8 through October 5, 1989 are summarized in Tables 1 through 4. Analytical results for samples collected in October are discussed in this report.

IV RESULTS

Results of treatment system water sample analyses for TPH and for the EPA Test Method 8010, 8020, and 504 compounds analyzed indicate that on the sampling date (October 5, 1989), the carbon treatment system removed most individual constituents to below detection levels in discharge water. Toluene and 1,2-dichloroethane were detected in the effluent sample at concentrations of 0.7 ppb and 1.7 ppb, respectively. The measured toluene concentration exceeds the 0.5 ppb effluent limit for toluene. Toluene was detected in the influent sample at a concentration of 1.7 ppb, but was not detected in the intermediate sample.

The presence of toluene in the effluent sample may be the result of sample contamination or exhaustion of the carbon beds. To assess these possibilities, analytical results from treatment system samples collected in early November will be reviewed and evaluated for patterns of exceedences. Responses to any consistent exceedences will be proposed in the November monitoring report.

TABLE 1. TREATMENT SYSTEM WATER ANALYSIS: INFLUENT SAMPLES

HLA SAMPLE ID #	89060801	89101101	89140601	89180330	89230801	89270503	8930CSIN	89090741	8910CSIN
DATE	02/08/89	03/10/89	04/06/89	05/03/89	06/08/89	07/05/89	08/01/89	09/07/89	10/05/89
TEST METHOD/ COMPOUNDS									
EPA 8020									
Benzene	ND < 0.2	ND < 0.2	ND < 0.2	0.5	1.2	11.5	710	6.3	2.2
Toluene	1.1	ND < 0.2	ND < 0.2	0.2	0.9	2.5	610	0.7	1.7
Ethylbenzene	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	46	ND < 2.0	ND < 0.2
Xylenes	ND < 0.2	68	ND < 0.2	ND < 0.2	26	71	1100	39	38
Chlorobenzene	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 2.0	NT	NT
1,2-Dichlorobenzene	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 2.0	NT	NT
All other 8020 compounds	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 2.0	NT	NT
EPA 8015									
TPH (Gasoline)	90	340	70	70	110	220	6200	ND < 50	120
EPA 8010									
1,1-dichloroethene	ND < 0.5	ND < 0.5	0.8	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 0.5	ND < 0.5
Methylene chloride	6.3	ND < 0.5	ND < 0.5	9.8	0.6	ND < 0.5	ND < 5.0	ND < 0.5	ND < 0.5
1,1-dichloroethane	1.2	3.2	1.1	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 0.5	ND < 0.5
Chloroform	1.5	0.65	8.8	ND < 0.5	4.5	2.5	ND < 5.0	4.3	ND < 0.5
1,1,1-trichloroethane	ND < 0.5	1.8	0.7	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 0.5	ND < 0.5
1,2-dichloroethane	8.6	42	16.2	6.8	8.1	8.3	ND < 5.0	7.6	6.6
Trichloroethene	420	ND < 0.5	3.6	4.4	10.3	9.8	ND < 5.0	14	ND < 0.5
1,2-dichloropropane	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 0.5	ND < 0.5
Bromodichloromethane	ND < 0.5	ND < 0.5	ND < 0.5	0.7	ND < 0.5	ND < 0.5	ND < 5.0	ND < 0.5	ND < 0.5
Cis-1,3-dichloropropene	ND < 0.5	ND < 0.5	0.65	1.0	ND < 0.5	ND < 0.5	ND < 5.0	ND < 0.5	ND < 0.5
Tetrachloroethene	0.66	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 0.5	ND < 0.5
Chlorobenzene	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 0.5	ND < 0.5
Bromoform	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 0.5	ND < 0.5
1,1,2,2-tetrachloroethane	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 0.5	ND < 0.5
Dibromochloromethane	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 5.0	ND < 0.5	ND < 0.5
All other 8010 compounds	ND	ND	ND	ND	ND	ND	ND	ND	ND
EPA 504									
Ethylene dibromide	0.05	ND < 0.01	0.47	ND < 0.01	ND < 0.01	0.09	0.09	ND < 0.02	1.6
Standard Method 408E									
Residual chlorine (mg/l)	ND < 0.01	ND < 0.01	0.05	ND < 0.01	ND < 0.05	ND < 0.01	ND < 0.05	0.5	ND < 0.05
EPA 360.2									
Dissolved oxygen (mg/l)	6.6	7.5	7.9	NT	14	6.9	20	6.8	5.6

ND - Not detected at stated detection limit.
NT - Not Tested.
All results reported in parts per billion (ppb) except where indicated.

TABLE 2. TREATMENT SYSTEM WATER ANALYSIS: INTERMEDIATE SAMPLES

HLA SAMPLE ID #	89060802	89101102	89140602	89180331	89230802	89270502	8930CSIM	89090742	8910CSIT
DATE	02/08/89	03/10/89	04/06/89	05/03/89	06/08/89	07/05/89	08/01/89	09/07/89	10/05/89
TEST METHOD/COMPOUNDS									
EPA 8020									
Benzene	NT	NT	ND < 0.2	0.3	NT	ND < 0.2	79	ND < 0.2	1.7
Toluene	NT	NT	ND < 0.2	ND < 0.2	NT	0.7	61	ND < 0.2	ND < 0.2
Ethylbenzene	NT	NT	ND < 0.2	0.4	NT	ND < 0.2	2.6	ND < 0.2	ND < 0.2
Xylenes	NT	NT	ND < 0.2	0.3	NT	ND < 0.2	140	ND < 0.2	ND < 0.2
Chlorobenzene	NT	NT	ND < 0.2	ND < 0.2	NT	ND < 0.2	ND < 0.2	NT	NT
1,3-Dichlorobenzene	NT	NT	ND < 0.2	ND < 0.2	NT	ND < 0.2	ND < 0.2	NT	NT
All other 8020 compounds	NT	NT	ND < 0.2	ND < 0.2	NT	ND < 0.2	ND < 0.2	NT	NT
EPA 8015									
TPH (Gasoline)	NT	NT	NT	NT	NT	NT	NT	NT	ND < 50
EPA 8010									
Methylene chloride	1.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
1,1-dichloroethane	1.3	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
Chloroform	1.4	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	1.5	5.6	4.7	ND < 0.5
1,1,1-trichloroethane	ND < 0.5	2.2	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
1,2-dichloroethane	8.2	ND < 0.5	0.55	ND < 0.5	1.3	3.4	ND < 0.5	6.2	ND < 0.5
Trichloroethene	9.7	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	2.7	ND < 0.5	7.7
Tetrachloroethene	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
Chlorobenzene	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
Bromoform	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
1,3-dichlorobenzene	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
All other 8010 compounds	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND - Not detected at stated detection limit.
NT - Not Tested.
All results reported in parts per billion (ppb) except where indicated.

TABLE 3. TREATMENT SYSTEM WATER ANALYSIS: EFFLUENT SAMPLES

HLA SAMPLE ID #	89060803	89101103	89140603	89180332	89230803	89270501	8930CSEF	89090740	8910CSEF
DATE	02/08/89	03/10/89	04/06/89	05/03/89	06/08/89	07/05/89	08/01/89	09/07/89	10/05/89
TOTAL FLOW (THOUSAND GALLONS)	7784.3	8000.0	8495.9	8948.7	9778.1	10953.4	12120.6	13566.4	14424.0
AVERAGE FLOW (GPM)	12.2	23.0	23.9	23.7	30.5	30.2	30.0	27.1	21.3
TEST METHOD/COMPOUNDS									
EPA 8020									
Benzene	ND < 0.2	ND < 0.2	ND < 0.2	0.3	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
Toluene	0.88	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	0.7
Ethylbenzene	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
Xylenes	ND < 0.2	ND < 0.2	ND < 0.2	0.3	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
Diphenylhydrazine	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
All other 8020 compounds	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	NT	NT
EPA 8015									
TPH (Gasoline)	ND < 50	ND < 50	ND < 50	ND < 50	ND < 50	ND < 50	ND < 50	ND < 50	ND < 50
EPA 8010									
Dichlorodifluoromethane	ND < 2.0	ND < 2.0	ND < 2.0	ND < 2.0	ND < 2.0	ND < 2.0	ND < 2.0	ND < 2.0	ND < 2.0
1,1-dichlorethene	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
Methylene chloride	1.4	ND < 0.5	ND < 0.5	ND < 0.5	0.6	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
1,1-dichloroethane	1.4	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
Chloroform	1.6	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
1,1,1-trichloroethane	ND < 0.5	2.4	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
1,2-dichloroethane	9.1	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	0.7	1.1	1.7
Trichloroethene	2.2	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
Tetrachloroethene	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
All other 8010 compounds	ND	ND	ND	ND	ND	ND	ND	ND	ND
EPA 504									
Ethylene dibromide	0.06	ND < 0.01	ND < 0.01	ND < 0.01	ND < 0.01	ND < 0.01	ND < 0.02	ND < 0.02	ND < 0.02
Standard Method 408E									
Residual chlorine (mg/l)	ND < 0.01	ND < 0.01	ND < 0.05	ND < 0.01	ND < 0.05	ND < 0.01	ND < 0.05	ND < 0.05	ND < 0.05
EPA 360.2									
Dissolved oxygen (mg/l)	9.9	8.0	7.8	NT	10	3.3	1.0	1.9	1.3

ND - Not detected at stated detection limit.
NT - Not Tested.
All results reported in parts per billion (ppb) except where indicated.

TABLE 4. TREATMENT SYSTEM WATER ANALYSIS: BLANK SAMPLES

HLA SAMPLE ID #	89060805	89101105	---	89180334	89230805	89270515	---	89090615	8910CSTB
DATE	02/08/89	03/10/89	04/06/89	05/03/89	06/08/89	07/05/89	08/01/89	09/07/89	10/05/89
TEST METHOD/COMPOUNDS									
EPA 8020									
Benzene	ND < 0.2	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	NT	ND < 0.5	ND < 0.2
Toluene	0.95	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	NT	ND < 0.5	ND < 0.2
Ethylbenzene	ND < 0.2	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	NT	ND < 0.5	ND < 0.2
Xylenes	ND < 0.2	ND < 0.2	NT	0.7	ND < 0.2	ND < 0.2	NT	ND < 0.5	ND < 0.2
All other 8020 compounds	ND < 0.2	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	NT	NT	NT
EPA 8015									
TPH (Gasoline)	ND < 50	ND < 50	NT	NT	ND < 50	ND < 50	NT	ND < 250	ND < 50
EPA 8010									
Dichlorodifluoromethane	ND < 2.0	ND < 2.0	NT	ND < 2.0	ND < 2.0	NT	NT	NT	ND < 2.0
1,1-dichloroethene	ND < 0.5	ND < 0.5	NT	ND < 0.5	ND < 0.5	NT	NT	NT	ND < 0.5
Methylene chloride	2.9	42	NT	ND < 0.5	ND < 0.5	NT	NT	NT	ND < 0.5
1,1,1-trichloroethane	ND < 0.5	5.9	NT	ND < 0.5	ND < 0.5	NT	NT	NT	ND < 0.5
1,2-dichloroethane	ND < 0.5	ND < 0.5	NT	ND < 0.5	ND < 0.5	NT	NT	NT	ND < 0.5
All other 8010 compounds	ND	ND	NT	ND	ND	NT	NT	NT	ND
EPA 504									
Ethylene dibromide	NT	NT	NT	NT	NT	NT	NT	NT	ND < 0.02

ND - Not detected at stated detection limit.
NT - Not Tested.
All results reported in parts per billion (ppb) except where indicated.

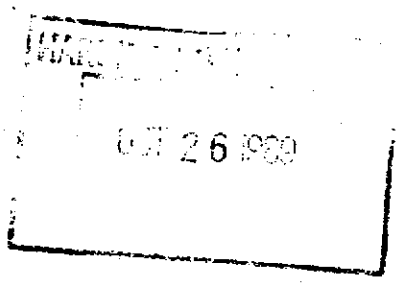
Appendix

LABORATORY ANALYTICAL RESULTS FOR TREATMENT SYSTEM SAMPLES

pace laboratories, inc.

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas



October 25, 1989

Mr. David Leland
Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

RE: PACE Project No. 491005.504

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received October 05, 1989.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

pace laboratories, inc

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas

REPORT OF LABORATORY ANALYSIS

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

October 25, 1989
PACE Project Number: 491005504
PACE WP Number: LAB1099

Attn: Mr. David Leland

Pacific Ren. Plaza

PACE Sample Number:			779430	779440	779450
Date Collected:			10/05/89	10/05/89	10/05/89
Date Received:			10/05/89	10/05/89	10/05/89
Parameter	Units	MDL	8910CSIN	8910CSEF	8910CSIN
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Chlorine, Total Residual	mg/L	0.05	-	-	ND
Oxygen, Dissolved	mg/L	0.1	5.6	1.3	-
ORGANIC ANALYSIS					
PURGEABLE FUELS AND AROMATICS					
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	-	-
Purgeable Fuels, as Gasoline (EPA 8015)	mg/L	0.05	-	-	0.12
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	-	-
Benzene	mg/L	0.0002	-	-	0.0022
Ethylbenzene	mg/L	0.0002	-	-	ND
Toluene	mg/L	0.0002	-	-	0.0017
Xylenes, total	mg/L	0.0002	-	-	0.038
HALOGENATED VOLATILE COMPOUNDS EPA 8010					
Dichlorodifluoromethane	ug/L	2.0	-	-	ND
Chloromethane	ug/L	2.0	-	-	ND
Vinyl Chloride	ug/L	2.0	-	-	ND
Bromomethane	ug/L	2.0	-	-	ND
Chloroethane	ug/L	2.0	-	-	ND
Trichlorofluoromethane (Freon 11)	ug/L	2.0	-	-	ND
1,1-Dichloroethene	ug/L	0.5	-	-	ND
Methylene Chloride	ug/L	0.5	-	-	ND
trans-1,2-Dichloroethene	ug/L	0.5	-	-	ND
1,1-Dichloroethane	ug/L	0.5	-	-	ND
Chloroform	ug/L	0.5	-	-	ND
1,1,1-Trichloroethane (TCA)	ug/L	0.5	-	-	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

pace laboratories, inc.

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas

October 25, 1989
PACE Project Number: 491005504

PACE Sample Number:			779460	779470	779480
Date Collected:			10/05/89	10/05/89	10/05/89
Date Received:			10/05/89	10/05/89	10/05/89
Parameter	Units	MDL	8910CSEF	8910CSIN	8910CSEF
ORGANIC ANALYSIS					
HALOGENATED VOLATILE COMPOUNDS EPA 8010					
1,2-Dichloropropane	ug/L	0.5	ND	-	-
Bromodichloromethane	ug/L	0.5	ND	-	-
2-Chloroethylvinyl ether	ug/L	0.5	ND	-	-
trans-1,3-Dichloropropene	ug/L	0.5	ND	-	-
cis-1,3-Dichloropropene	ug/L	0.5	ND	-	-
1,1,2-Trichloroethane	ug/L	0.5	ND	-	-
Tetrachloroethene	ug/L	0.5	ND	-	-
Dibromochloromethane	ug/L	0.5	ND	-	-
Chlorobenzene	ug/L	0.5	ND	-	-
Bromoform	ug/L	0.5	ND	-	-
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	-	-
1,3-Dichlorobenzene	ug/L	0.5	ND	-	-
1,4-Dichlorobenzene	ug/L	0.5	ND	-	-
1,2-Dichlorobenzene	ug/L	0.5	ND	-	-
Bromochloromethane (Surrogate Recovery)			108%	-	-
1,4-Dichlorobutane (Surrogate Recovery)			96%	-	-
1,2-DIBROMOETHANE (EDB) EPA METHOD 504					
1,2-Dibromoethane	ug/L	0.02	-	1.6	ND
Date Extracted			-	10/17/89	10/17/89

MDL Method Detection Limit
ND Not detected at or above the MDL.

PACE Sample Number:			779490	779500	779510
Date Collected:			10/05/89	10/05/89	10/05/89
Date Received:			10/05/89	10/05/89	10/05/89
Parameter	Units	MDL	8910CSIT	8910CSTB	8910CSTB
ORGANIC ANALYSIS					
PURGEABLE FUELS AND AROMATICS					
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	-	-
Purgeable Fuels, as Gasoline (EPA 8015)	mg/L	0.05	ND	ND	-
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	-	-
Benzene	mg/L	0.0002	0.0017	ND	-
Ethylbenzene	mg/L	0.0002	ND	ND	-
Toluene	mg/L	0.0002	ND	ND	-
Xylenes, total	mg/L	0.0002	ND	ND	-
HALOGENATED VOLATILE COMPOUNDS EPA 8010					
Dichlorodifluoromethane	ug/L	2.0	ND	ND	-
Chloromethane	ug/L	2.0	ND	ND	-
Vinyl Chloride	ug/L	2.0	ND	ND	-
Bromomethane	ug/L	2.0	ND	ND	-
Chloroethane	ug/L	2.0	ND	ND	-
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND	ND	-
1,1-Dichloroethene	ug/L	0.5	ND	ND	-
Methylene Chloride	ug/L	0.5	ND	ND	-
trans-1,2-Dichloroethene	ug/L	0.5	ND	ND	-
1,1-Dichloroethane	ug/L	0.5	ND	ND	-
Chloroform	ug/L	0.5	ND	ND	-
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND	ND	-
Carbon Tetrachloride	ug/L	0.5	ND	ND	-
1,2-Dichloroethane (EDC)	ug/L	0.5	7.7	ND	-
Trichloroethene (TCE)	ug/L	0.5	ND	ND	-
1,2-Dichloropropane	ug/L	0.5	ND	ND	-
Bromodichloromethane	ug/L	0.5	ND	ND	-
2-Chloroethylvinyl ether	ug/L	0.5	ND	ND	-
trans-1,3-Dichloropropene	ug/L	0.5	ND	ND	-

MDL Method Detection Limit
ND Not detected at or above the MDL.

pace laboratories, inc.

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas

October 25, 1989
PACE Project Number: 491005504

PACE Sample Number:			779490	779500	779510
Date Collected:			10/05/89	10/05/89	10/05/89
Date Received:			10/05/89	10/05/89	10/05/89
Parameter	Units	MDL	8910CSIT	8910CSTB	8910CSTB
ORGANIC ANALYSIS					
HALOGENATED VOLATILE COMPOUNDS EPA 8010					
cis-1,3-Dichloropropene	ug/L	0.5	ND	ND	-
1,1,2-Trichloroethane	ug/L	0.5	ND	ND	-
Tetrachloroethene	ug/L	0.5	ND	ND	-
Dibromochloromethane	ug/L	0.5	ND	ND	-
Chlorobenzene	ug/L	0.5	ND	ND	-
Bromoform	ug/L	0.5	ND	ND	-
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	ND	-
1,3-Dichlorobenzene	ug/L	0.5	ND	ND	-
1,4-Dichlorobenzene	ug/L	0.5	ND	ND	-
1,2-Dichlorobenzene	ug/L	0.5	ND	ND	-
Bromochloromethane (Surrogate Recovery)			124%	124%	-
1,4-Dichlorobutane (Surrogate Recovery)			107%	104%	-
1,2-DIBROMOETHANE (EDB) EPA METHOD 504					
1,2-Dibromoethane	ug/L	0.02	-	-	ND
Date Extracted			-	-	10/17/89

MDL Method Detection Limit
ND Not detected at or above the MDL.

pace laboratories, inc.

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas

October 25, 1989
PACE Project Number: 491005504

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.

Stephen F. Nackord
Director, Sampling and Analytical Services

Douglas E. Oram, Ph.D.
Organic Chemistry Manager

Harding Lawson Associates
200 Rush Landing Road
P.O. Box 6107
Novato, California 94948
415/892-0821
Telecopy: 415/892-1586

CHAIN OF CUSTODY FORM

Lab: PACE 491005.504

Samplers: Rob Nelson

Job Number: 9382,039.02

Name/Location: PRP Monitoring

Project Manager: D. Ward

Recorder: Robert L. Nelson
(Signature Required)

SOURCE CODE		MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	D.O.	HCL	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES (EDB#)
2	3	X							1		89	10	CS1N	89	10	05	1645	[illegible]
2	3	X				3				3	89	16	CS1N	89	10	05	1645	
2	3	X				1					89	10	CS1N	89	10	05	1645	[illegible] 3V 77947 (3)
2	3	X				2					89	10	C91T	89	10	05	1720	77949
2	3	X							1		89	10	6SEF	89	10	05	1740	[illegible] 3V
2	3	X				3				3	89	10	CSEF	89	10	05	1740	77948 (3)
2	3	X				1					89	10	CSFF	89	10	05	1740	[illegible] 3V
2	3	X				2				3	89	10	CSTB	89	10	05	1805	77950 (2) 77951 (2)

ANALYSIS REQUESTED

Row	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority Pllnt. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.	Dissolved Oxygen	8015 TPH	8010	8020 (BTXE)	504 (EDB)	Chlorine	Notes
1								X						SAME SAMPLE (rows 1–3)
2									X	X	X	X		
3													X	
4										X	X			
5								X						Same Sample (rows 5–7)
6									X	X	X	X		
7													X	
8									X	X	X	X		

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
Robert L. Nelson	D. J. Sanderson	10/5/89 19:30
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME

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OCTOBER 1989
DEWATERING EFFLUENT TREATMENT SYSTEM
CHINATOWN REDEVELOPMENT PROJECT AREA
OAKLAND, CALIFORNIA
November 22, 1989

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QUALITY CONTROL REVIEWER

Tamara L. Williams

Tamara L. Williams
Geologist - 3954