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**
**AUGUST 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
7655 Redwood Boulevard
P.O. Box 578
Novato, California 94948
415/892-0821

September 21, 1989

# TABLE OF CONTENTS

## LIST OF TABLES

# I INTRODUCTION

This report discusses the operation and monitoring of the ground-water treatment system at 10th and Webster streets, Oakland, California from August 1 to August 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 1) 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, and 2) dewatering for construction of the EBMUD administration building to the north 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 August 1 to September 1, 1989, total effluent discharged from the system was 1,249,000 gallons, based on readings of the totalizing flowmeter located in the discharge line. Average flow was 28 gallons per minute (gpm). Of the 1,249,000 gallons of treatment system effluent, approximately 97 percent, or 1,206,000 gallons, was recycled to the PRP biotreatment injection system and 3 percent, or 43,000 gallons, was discharged to the storm drain.

The carbon contactors were backwashed with freshwater on August 2, 8, 10, 11, 12, 14, 16, 17, 22, and 27. Cartridge filters were changed on August 2, 4, 8, 10, 12, 15, 24, and 30. Bag filters were replaced daily or twice daily as a result of biological

fouling. A new sand filter was installed August 24 through 28 in series with the treatment system bag filters. From August 29 through 31, the filter was operated during the day. Use of the sand filter should decrease bag and cartridge filter changes and carbon backwash requirements.

## III TREATMENT SYSTEM MONITORING

During this reporting period, treatment system samples were collected on August 1 from the influent, intermediate, and effluent sampling ports.

All treatment system samples collected were analyzed by Pace Laboratories, of Novato, California, a California-certified laboratory. All samples were analyzed for halogenated organics by EPA Test Method 8010, and for aromatic organics by EPA Test Method 8020. Influent and effluent samples were analyzed for TPH as gasoline by EPA Test Method 8015, for ethylene dibromide by EPA Test Method 504, for residual chlorine by Standard Method 408E, and for dissolved oxygen by EPA Test Method 360.2. The laboratory analytical results are attached as Appendix A.

Results of analyses of samples collected January 5, 1989 through August 1, 1989 are summarized in Tables 1 through 4. Analytical results for samples collected in August 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 (August 1, 1989), the carbon treatment system removed most individual constituents to below detection levels in discharge water. Only 1,2-dichloroethane was detected in the effluent sample, at a concentration of 0.7 ppb.

Chlorine was not detected in influent or effluent samples. Dissolved oxygen was measured in the effluent sample at 1.0 parts per million (ppm).

TABLE 1. TREATMENT SYSTEM WATER ANALYSIS: INFLUENT SAMPLES



| HLA SAMPLE ID # | 89010501 | 89021201 | 89060801 | 89101101 | 89140601 | 89180330 | 89230801 | 89270503 | 8930CSIN |
|---|---|---|---|---|---|---|---|---|---|
| DATE | 01/05/89 | 01/12/89 | 02/08/89 | 03/10/89 | 04/06/89 | 05/03/89 | 06/08/89 | 07/05/89 | 08/01/89 |
| TEST METHOD/ COMPOUNDS | | | | | | | | | |
| **EPA 8020** | | | | | | | | | |
| Benzene | 9.2 | NT | ND < 0.2 | ND < 0.2 | ND < 0.2 | 0.5 | 1.2 | 11.5 | 710 |
| Toluene | 6.1 | NT | 1.1 | ND < 0.2 | ND < 0.2 | 0.2 | 0.9 | 2.5 | 610 |
| Chlorobenzene | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 2.0 |
| Ethylbenzene | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | 46 |
| Xylenes | ND < 0.2 | NT | ND < 0.2 | 68 | ND < 0.2 | ND < 0.2 | 26 | 71 | 1100 |
| 1,2-Dichlorobenzene | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 2.0 |
| All other 8020 compounds | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 2.0 |
| **EPA 8015** | | | | | | | | | |
| TPH (Gasoline) | 130 | NT | 90 | 340 | 70 | 70 | 110 | 220 | 6200 |
| **EPA 8010** | | | | | | | | | |
| 1,1-dichloroethene | 0.8 | ND < 0.5 | ND < 0.5 | ND < 0.5 | 0.8 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 5.0 |
| Methylene chloride | ND < 0.5 | ND < 0.5 | 6.3 | ND < 0.5 | ND < 0.5 | 9.8 | 0.6 | ND < 0.5 | ND < 5.0 |
| 1,1-dichloroethane | 1.9 | 0.5 | 1.2 | 3.2 | 1.1 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 5.0 |
| Chloroform | 2.1 | 0.8 | 1.5 | 0.65 | 8.8 | ND < 0.5 | 4.5 | 2.5 | ND < 5.0 |
| 1,1,1-trichloroethane | ND < 0.5 | ND < 0.5 | ND < 0.5 | 1.8 | 0.7 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 5.0 |
| 1,2-dichloroethane | 10.5 | 4.9 | 8.6 | 42 | 16.2 | 6.8 | 8.1 | 8.3 | ND < 5.0 |
| Trichloroethene | 140 | 290 | 420 | ND < 0.5 | 3.6 | 4.4 | 10.3 | 9.8 | ND < 5.0 |
| 1,2-dichloropropane | 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 < 5.0 |
| Bromodichloromethane | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | 0.7 | ND < 0.5 | ND < 0.5 | ND < 5.0 |
| Cis-1,3-dichloropropene | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | 0.65 | 1.0 | ND < 0.5 | ND < 0.5 | ND < 5.0 |
| Tetrachloroethene | 1.4 | 0.4 | 0.66 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 5.0 |
| 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 < 5.0 |
| 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 < 5.0 |
| 1,1,2,2-tetrachloroethane | 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 < 5.0 |
| Dibromochloromethane | 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 < 5.0 |
| All other 8010 compounds | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **EPA 504** | | | | | | | | | |
| Ethylene dibromide | ND < 0.02 | NT | 0.05 | ND < 0.01 | 0.47 | ND < 0.01 | ND < 0.01 | 0.09 | 0.09 |
| **Standard Method 408E** | | | | | | | | | |
| Residual chlorine (mg/l) | ND < 0.01 | NT | ND < 0.01 | ND < 0.01 | 0.05 | ND < 0.01 | ND < 0.05 | ND < 0.01 | ND < 0.05 |
| **EPA 360.2** | | | | | | | | | |
| Dissolved oxygen (mg/l) | NT | NT | 6.6 | 7.5 | 7.9 | NT | 14 | 6.9 | 20 |

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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 # | 89010502 | 89021202 | 89060802 | 89101102 | 89140602 | 89180331 | 89230802 | 89270502 | 8930CSIM |
|---|---|---|---|---|---|---|---|---|---|
| DATE | 01/05/89 | 01/12/89 | 02/08/89 | 03/10/89 | 04/06/89 | 05/03/89 | 06/08/89 | 07/05/89 | 08/01/89 |
| TEST METHOD/COMPOUNDS | | | | | | | | | |
| EPA 8020 | | | | | | | | | |
| Benzene | ND < 0.2 | NT | NT | NT | ND < 0.2 | 0.3 | NT | ND < 0.2 | 79 |
| Toluene | ND < 0.2 | NT | NT | NT | ND < 0.2 | ND < 0.2 | NT | 0.7 | 61 |
| Ethylbenzene | ND < 0.2 | NT | NT | NT | ND < 0.2 | 0.4 | NT | ND < 0.2 | 2.6 |
| Xylenes | ND < 0.2 | NT | NT | NT | ND < 0.2 | 0.3 | NT | ND < 0.2 | 140 |
| Chlorobenzene | ND < 0.2 | NT | NT | NT | ND < 0.2 | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 |
| 1,3-Dichlorobenzene | ND < 0.2 | NT | NT | NT | ND < 0.2 | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 |
| All other 8020 compounds | ND < 0.2 | NT | NT | NT | ND < 0.2 | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 |
| EPA 8015 | | | | | | | | | |
| TPH (Gasoline) | ND < 50 | NT | NT | NT | NT | NT | NT | NT | NT |
| EPA 8010 | | | | | | | | | |
| Methylene chloride | ND < 0.5 | ND < 0.5 | 1.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 |
| 1,1-dichloroethane | ND < 0.5 | ND < 0.5 | 1.3 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 |
| Chloroform | ND < 0.5 | ND < 0.5 | 1.4 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | 1.5 | 5.6 |
| 1,1,1-trichloroethane | ND < 0.5 | ND < 0.5 | ND < 0.5 | 2.2 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 |
| 1,2-dichloroethane | 3.4 | 1.4 | 8.2 | ND < 0.5 | 0.55 | ND < 0.5 | 1.3 | 3.4 | ND < 0.5 |
| Trichloroethene | 18.0 | 16.0 | 9.7 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | 2.7 |
| 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 |

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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 # | 89010504 | 89021204 | 89060803 | 89101103 | 89140603 | 89180332 | 89230803 | 89270501 | 8930CSEF |
|---|---|---|---|---|---|---|---|---|---|
| DATE | 01/05/89 | 01/12/89 | 02/08/89 | 03/10/89 | 04/06/89 | 05/03/89 | 06/08/89 | 07/05/89 | 08/01/89 |
| TOTAL FLOW (THOUSAND GALLONS) | 7200.0 | 7310.7 | 7784.3 | 8000.0 | 8495.9 | 8948.7 | 9778.1 | 10953.4 | 12120.6 |
| AVERAGE FLOW (GPM) | 10.5 | 11.0 | 12.2 | 23.0 | 23.9 | 23.7 | 30.5 | 30.2 | 30.0 |
| TEST METHOD/COMPOUNDS | | | | | | | | | |
| EPA 8020 | | | | | | | | | |
| Benzene | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | ND < 0.2 | 0.3 | ND < 0.2 | ND < 0.2 | ND < 0.2 |
| Toluene | ND < 0.2 | NT | 0.88 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 |
| Ethylbenzene | ND < 0.2 | NT | 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 | NT | ND < 0.2 | ND < 0.2 | ND < 0.2 | 0.3 | ND < 0.2 | ND < 0.2 | ND < 0.2 |
| Diphenylhydrazine | ND < 0.2 | NT | 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 | NT | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 | ND < 0.2 |
| EPA 8015 | | | | | | | | | |
| TPH (Gasoline) | ND < 50 | NT | 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 | ND < 0.5 | ND < 0.5 | 1.4 | ND < 0.5 | ND < 0.5 | ND < 0.5 | 0.6 | ND < 0.5 | ND < 0.5 |
| 1,1-dichloroethane | 1.0 | 0.9 | 1.4 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 |
| Chloroform | 1.4 | 1.0 | 1.6 | 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 | ND < 0.5 | ND < 0.5 | 2.4 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 |
| 1,2-dichloroethane | 6.8 | 5.3 | 9.1 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | 0.7 |
| Trichloroethene | 0.8 | 1.0 | 2.2 | 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 | ND < 0.02 | NT | 0.06 | ND < 0.01 | ND < 0.01 | ND < 0.01 | ND < 0.01 | ND < 0.01 | ND < 0.02 |
| Standard Method 408E | | | | | | | | | |
| Residual chlorine (mg/l) | ND < 0.01 | NT | ND < 0.01 | ND < 0.01 | ND < 0.05 | ND < 0.01 | ND < 0.05 | ND < 0.01 | ND < 0.05 |
| EPA 360.2 | | | | | | | | | |
| Dissolved oxygen (mg/l) | NT | NT | 9.9 | 8.0 | 7.8 | NT | 10 | 3.3 | 1.0 |

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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 # | 89010505 | 89021205 | 89060805 | 89101105 | --- | 89180334 | 89230805 | 89270515 | --- |
|---|---|---|---|---|---|---|---|---|---|
| DATE | 01/05/89 | 01/12/89 | 02/08/89 | 03/10/89 | 04/06/89 | 05/03/89 | 06/08/89 | 07/05/89 | 08/01/89 |
| TEST METHOD/COMPOUNDS | | | | | | | | | |
| EPA 8020 | | | | | | | | | |
| Benzene | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | ND < 0.2 | NT |
| Toluene | ND < 0.2 | NT | 0.95 | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | ND < 0.2 | NT |
| Ethylbenzene | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | ND < 0.2 | NT |
| Xylenes | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | NT | 0.7 | ND < 0.2 | ND < 0.2 | NT |
| All other 8020 compounds | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | NT | ND < 0.2 | ND < 0.2 | ND < 0.2 | NT |
| EPA 8015 | | | | | | | | | |
| TPH (Gasoline) | NT | NT | ND < 50 | ND < 50 | NT | NT | ND < 50 | ND < 50 | NT |
| EPA 8010 | | | | | | | | | |
| Dichlorodifluoromethane | ND < 2.0 | ND < 2.0 | ND < 2.0 | ND < 2.0 | NT | ND < 2.0 | ND < 2.0 | NT | NT |
| 1,1-dichloroethene | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | NT | ND < 0.5 | ND < 0.5 | NT | NT |
| Methylene chloride | 9.6 | 1.0 | 2.9 | 42 | NT | ND < 0.5 | ND < 0.5 | NT | NT |
| 1,1,1-trichloroethane | ND < 0.5 | ND < 0.5 | ND < 0.5 | 5.9 | NT | ND < 0.5 | ND < 0.5 | NT | NT |
| 1,2-dichloroethane | ND < 0.5 | ND < 0.5 | ND < 0.5 | ND < 0.5 | NT | ND < 0.5 | ND < 0.5 | NT | NT |
| All other 8010 compounds | ND | ND | ND | ND | NT | ND | ND | NT | NT |

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

# Appendix A

## 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

September 07, 1989



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

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received 08/01/89.

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

Sincerely,

Stephen Nackord

Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

pace laboratories, inc.

# REPORT OF LABORATORY ANALYSIS

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

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

September 20, 1989 (Rev. of 09/07/89)
PACE Project Number: 490801502

Attn: Mr. David Leland

Pacific Ren. Plaza

Date Sample(s) Collected: 08/01/89
Date Sample(s) Received: 08/01/89

| PACE Sample Number: / Parameter | Units | MDL | 753510 8930CSIN | 753520 8930CSEF | 753530 8930CSIN |
|---|---|---|---|---|---|
| **INORGANIC ANALYSIS** | | | | | |
| INDIVIDUAL PARAMETERS | | | | | |
| Chlorine, Total Residual | mg/L | 0.05 | ND | ND | - |
| Oxygen, Dissolved | mg/L | 0.1 | 20 | 1.0 | - |
| **ORGANIC ANALYSIS** | | | | | |
| INDIVIDUAL PARAMETERS | | | | | |
| Purgeable Fuels, as Gasoline (EPA 8015) | mg/L | 0.05 | 6.2 | ND | - |
| VOLATILE HALOCARBONS AND AROMATICS | | | | | |
| VOLATILE HALOCARBONS BY EPA 8010 | | | - | - | - |
| Dichlorodifluoromethane | ug/L | 2.0 | LT 20 | ND | - |
| Chloromethane | ug/L | 2.0 | LT 20 | ND | - |
| Vinyl Chloride | ug/L | 2.0 | LT 20 | ND | - |
| Bromomethane | ug/L | 2.0 | LT 20 | ND | - |
| Chloroethane | ug/L | 2.0 | LT 20 | ND | - |
| Trichlorofluoromethane (Freon 11) | ug/L | 2.0 | LT 20 | ND | - |
| 1,1-Dichloroethene | ug/L | 0.5 | LT 5.0 | ND | - |
| Methylene Chloride | ug/L | 0.5 | LT 5.0 | ND | - |
| trans-1,2-Dichloroethene | ug/L | 0.5 | LT 5.0 | ND | - |
| 1,1-Dichloroethane | ug/L | 0.5 | LT 5.0 | ND | - |
| Chloroform | ug/L | 0.5 | LT 5.0 | ND | - |
| 1,1,1-Trichloroethane (TCA) | ug/L | 0.5 | LT 5.0 | ND | - |
| Carbon Tetrachloride | ug/L | 0.5 | LT 5.0 | ND | - |
| 1,2-Dichloroethane (EDC) | ug/L | 0.5 | LT 5.0 | 0.7 | - |
| Trichloroethene (TCE) | ug/L | 0.5 | LT 5.0 | ND | - |
| 1,2-Dichloropropane | ug/L | 0.5 | LT 5.0 | ND | - |

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

pace laboratories, inc.

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

# REPORT OF LABORATORY ANALYSIS



September 07, 1989
PACE Project Number: 490801502

| PACE Sample Number: / Parameter | Units | MDL | 753510 8930CSIN | 753520 8930CSEF | 753530 8930CSIN |
|---|---|---|---|---|---|
| ORGANIC ANALYSIS | | | | | |
| VOLATILE HALOCARBONS AND AROMATICS | | | | | |
| Bromodichloromethane | ug/L | 0.5 | LT 5.0 | ND | - |
| 2-Chloroethylvinyl ether | ug/L | 0.5 | LT 5.0 | ND | - |
| trans-1,3-Dichloropropene | ug/L | 0.5 | LT 5.0 | ND | - |
| cis-1,3-Dichloropropene | ug/L | 0.5 | LT 5.0 | ND | - |
| 1,1,2-Trichloroethane | ug/L | 0.5 | LT 5.0 | ND | - |
| Tetrachloroethene | ug/L | 0.5 | LT 5.0 | ND | - |
| Dibromochloromethane | ug/L | 0.5 | LT 5.0 | ND | - |
| Chlorobenzene | ug/L | 0.5 | LT 5.0 | ND | - |
| Bromoform | ug/L | 0.5 | LT 5.0 | ND | - |
| 1,1,2,2-Tetrachloroethane | ug/L | 0.5 | LT 5.0 | ND | - |
| 1,3-Dichlorobenzene | ug/L | 0.5 | LT 5.0 | ND | - |
| 1,4-Dichlorobenzene | ug/L | 0.5 | LT 5.0 | ND | - |
| 1,2-Dichlorobenzene | ug/L | 0.5 | LT 5.0 | ND | - |
| Bromochloromethane (Surrogate Recovery) | | | 100% | 114% | - |
| 1,4-Dichlorobutane (Surrogate Recovery) | | | 112% | 115% | - |
| VOLATILE AROMATICS BY EPA 8020 | | | - | - | - |
| Benzene | ug/L | 0.2 | 710 | ND | - |
| Toluene | ug/L | 0.2 | 610 | ND | - |
| Chlorobenzene | ug/L | 0.2 | LT 2.0 | ND | - |
| Ethylbenzene | ug/L | 0.2 | 46 | ND | - |
| Xylenes, Total | ug/L | 0.2 | 1100 | ND | - |
| 1,3-Dichlorobenzene | ug/L | 0.2 | LT 2.0 | ND | - |
| 1,4-Dichlorobenzene | ug/L | 0.2 | LT 2.0 | ND | - |
| 1,2-Dichlorobenzene | ug/L | 0.2 | LT 2.0 | ND | - |
| Fluorobenzene (Surrogate Recovery) | | | 106% | 102% | - |
| 1,2-DIBROMOETHANE (EDB) EPA METHOD 504 | | | | | |
| 1,2-Dibromoethane | ug/L | 0.02 | - | - | 0.09 |
| Date Extracted | | | - | - | 08/03/89 |

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

pace laboratories, inc.

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

# REPORT OF LABORATORY ANALYSIS



September 07, 1989
PACE Project Number: 490801502

| PACE Sample Number: / Parameter | Units | MDL | 753540 8930CSEF |
|---|---|---|---|
| ORGANIC ANALYSIS | | | |
| 1,2-DIBROMOETHANE (EDB) EPA METHOD 504 | | | |
| 1,2-Dibromoethane | ug/L | 0.02 | ND |
| Date Extracted | | | 08/03/89 |

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

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 Nackord
Stephen F. Nackord
Director, Sampling and Analytical Services

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

[redacted] Lawrence Associates [redacted]

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

# CHAIN OF CUSTODY FORM

[redacted] 08[redacted] Lab: [redacted] Novato

Samplers: CMC RLN

Job Number: 9382 039 02

Name/Location: PRP

Project Manager: Dave Leland

Recorder: Robert A. Nelson
(Signature Required)

| SOURCE CODE | MATRIX: Water | Sediment | Soil | Oil | #CONTAINERS & PRESERV.: Unpres. | $H_2SO_4$ | $HNO_3$ | HCl | SAMPLE NUMBER OR LAB NUMBER: Yr | Wk | Seq | DATE: Yr | Mo | Dy | Time | STATION DESCRIPTION/ NOTES: PAHE # | EDB | ANALYSIS REQUESTED: EPA 601(8010) | EPA 602/8020 BTXE | EPA 624/8240 | EPA 625/8270 | Priority Pllnt. Metals | Benzene/Toluene/Xylene | Total Petrol. Hydrocarb. | Dissolved $O_2$ | 8015 TPH | EPA 504 | Chlorine |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | \ | | | | 4 | | | V | 89 | 30 | CSIN | 89 | 08 | 01 | 1440 | 75351 | 75353 | \ | \ | | | | | | \ | \ | \ | \ |
| 23 | \ | | | | 4 | | | 3 | 89 | 30 | CSEF | 89 | 08 | 01 | 1605 | 75352 | 75354 | \ | \ | | | | | | \ | \ | \ | \ |

| LAB NUMBER: Yr | Wk | Seq | DEPTH IN FEET | COL MTD CD | QA CODE | MISCELLANEOUS |
|---|---|---|---|---|---|---|
| | | | | | | 9/1000 D/1.5 |

## CHAIN OF CUSTODY RECORD

| | | |
|---|---|---|
| RELINQUISHED BY: (Signature) Robert A. Nelson | RECEIVED BY: (Signature) David McEwan | DATE/TIME 8-1-89 16:24 |
| RELINQUISHED BY: (Signature) | RECEIVED BY: (Signature) | DATE/TIME |
| RELINQUISHED BY: (Signature) | RECEIVED BY: (Signature) | DATE/TIME |
| RELINQUISHED BY: (Signature) | RECEIVED BY: (Signature) | DATE/TIME |
| DISPATCHED BY: (Signature) David McEwan | DATE/TIME 8-1-89 16:30 | RECEIVED FOR LAB BY: (Signature) [illegible] Sontag |
| METHOD OF SHIPMENT: delivered in cooler w/ice PACE | | DATE/TIME 8/1/89 5:30 P.M. |

Laboratory Copy White | Project Office Copy Yellow | Field or Office Copy Pink

6533

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# REPORT OF LABORATORY ANALYSIS

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

August 16, 1989

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

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received 08/01/89.

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.

# REPORT OF LABORATORY ANALYSIS

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

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

August 16, 1989
PACE Project Number: 490802502

Attn: Mr. David Leland

Pacific Ren. Plaza

Date Sample(s) Collected: 08/01/89
Date Sample(s) Received: 08/02/89

| PACE Sample Number: | | | 753750 |
|---|---|---|---|
| Parameter | Units | MDL | 8930CSIM |
| **ORGANIC ANALYSIS** | | | |
| **VOLATILE HALOCARBONS AND AROMATICS** | | | |
| VOLATILE HALOCARBONS BY 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 | 5.6 |
| 1,1,1-Trichloroethane (TCA) | ug/L | 0.5 | ND |
| Carbon Tetrachloride | ug/L | 0.5 | ND |
| 1,2-Dichloroethane (EDC) | ug/L | 0.5 | ND |
| Trichloroethene (TCE) | ug/L | 0.5 | 2.7 |
| 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 |

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



August 16, 1989
PACE Project Number: 490802502

| PACE Sample Number: | | | 753750 |
|---|---|---|---|
| Parameter | Units | MDL | 8930CSIM |
| ORGANIC ANALYSIS | | | |
| VOLATILE HALOCARBONS AND AROMATICS | | | |
| 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) | | | 106% |
| 1,4-Dichlorobutane (Surrogate Recovery) | | | 109% |
| VOLATILE AROMATICS BY EPA 8020 | | | - |
| Benzene | ug/L | 0.2 | 79 |
| Toluene | ug/L | 0.2 | 61 |
| Chlorobenzene | ug/L | 0.2 | ND |
| Ethylbenzene | ug/L | 0.2 | 2.6 |
| Xylenes, Total | ug/L | 0.2 | 140 |
| 1,3-Dichlorobenzene | ug/L | 0.2 | ND |
| 1,4-Dichlorobenzene | ug/L | 0.2 | ND |
| 1,2-Dichlorobenzene | ug/L | 0.2 | ND |
| Fluorobenzene (Surrogate Recovery) | | | 100% |

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

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.

Douglas Oram

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

[redacted] 200 Rush Landing Road
P.O. [redacted]3107
Novato, California 94948
415/892-0821
Telecopy: 415/892-1586

# [redacted] CHAIN OF CUSTODY FORM [redacted] PA [redacted]

Samplers: Rob Nelson

Job Number: 9382,039.02

Name/Location: PRP

Project Manager: D. Gloard

Recorder: Robert L. Nelson
(Signature Required)

| SOURCE CODE | MATRIX: Water | Sediment | Soil | Oil | #CONTAINERS & PRESERV.: Unpres. | $H_2SO_4$ | $HNO_3$ | HCl | SAMPLE NUMBER OR LAB NUMBER: Yr | Wk | Seq | DATE: Yr | Mo | Dy | Time | STATION DESCRIPTION/ NOTES | ANALYSIS REQUESTED: EPA 601/6010 | EPA 602/8020 | EPA 624/8240 | EPA 625/8270 | Priority Pllnt. Metals | Benzene/Toluene/Xylene | Total Petrol. Hydrocarb. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 3 | X | | | | | | | 2 | 8 9 | 3 0 | C S 1 | 8 9 | 0 8 | 0 7 | 1 6 5 0 | PALE # 75375 | X | X | | | | | |

| LAB NUMBER: Yr | Wk | Seq | DEPTH IN FEET | COL MTD CD | QA CODE | MISCELLANEOUS |
|---|---|---|---|---|---|---|
| | | | | | | Regular turn around time |
| | | | | | | 6/2 |

## CHAIN OF CUSTODY RECORD

| | | |
|---|---|---|
| RELINQUISHED BY: (Signature) Robert L. Nelson | RECEIVED BY: (Signature) David M Braun | DATE/TIME 8-2-89 13:25 |
| RELINQUISHED BY: (Signature) | RECEIVED BY: (Signature) | DATE/TIME |
| RELINQUISHED BY: (Signature) | RECEIVED BY: (Signature) | DATE/TIME |
| RELINQUISHED BY: (Signature) | RECEIVED BY: (Signature) | DATE/TIME |
| DISPATCHED BY: (Signature) David M Braun 8-2-89 | DATE/TIME 13:30 | RECEIVED FOR LAB BY: (Signature) C. Santos PACE |
| METHOD OF SHIPMENT: delivered in cooler w/ice | | DATE/TIME 8/2/89 3:10 P.M. |

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6533

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**REPORT OF SYSTEM MONITORING: AUGUST 1989**
**DEWATERING EFFLUENT TREATMENT SYSTEM**
**CHINATOWN REDEVELOPMENT PROJECT AREA**
**OAKLAND, CALIFORNIA**
**September 21, 1989**

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QUALITY CONTROL REVIEWER

Tamara L. Williams

Tamara L. Williams
Geologist - 3954