

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 DL
Date: June 15, 1989
Subject: May 1989 Ground-Water Treatment System Monitoring Report
Job No.: 09382,040.02

Remarks: Please find attached a copy of the *Report of System Monitoring: May 1989, Dewatering Effluent Treatment System, Chinatown Redevelopment Project Area, Oakland, California*, describing the operations and monitoring of the ground-water treatment system located at 10th and Webster streets in Oakland, California.

DL/jmg/dl031#m2

cc:

Engineering and
Environmental Services

ALAMEDA COUNTY
DEPT. OF ENVIRONMENTAL HEALTH
HAZARDOUS MATERIALS
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A Report Prepared for

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

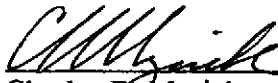
**REPORT OF SYSTEM MONITORING:
MAY 1989
DEWATERING EFFLUENT TREATMENT SYSTEM
CHINATOWN REDEVELOPMENT PROJECT AREA
OAKLAND, CALIFORNIA**

HLA Job No. 9382,040.02

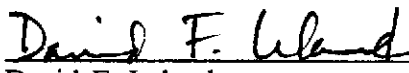
Submitted on behalf of:

City of Oakland Redevelopment Agency
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by



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June 15, 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 May 1 to May 31, 1989. The system is treating ground water produced from extraction wells located in the area bounded by 9th, 11th, Webster and Franklin streets, in conjunction with dewatering associated with construction of the East Bay Municipal Utility District (EBMUD) administration building to the north of 10th Street and in situ biological treatment of soil at the Pacific Renaissance Plaza (PRP) site bounded by 9th, Franklin, and Webster streets and the 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 Agency's 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 on 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 comprises 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.

As of May 1, five dewatering wells were producing ground water from the EBMUD site. The balance of the ground water treated by the system was produced by extraction wells associated with the PRP site.

Treated effluent is either recycled to the PRP biological treatment system or discharged to the storm drain. From May 2 to June 5, 1989, total effluent from the system was 1,160,000 gallons, based on an estimated flow of 6.0 gpm from the extraction wells on the EBMUD site, and a measured flow of 17.74 gpm from the extraction wells in the biotreatment system. Of the 1,160,000 gallons of treatment system effluent, approximately 92 percent, or 1,070,000 gallons, was recycled to the PRP injection system and 8 percent, or 90,000 gallons, was discharged to the storm drain. The flow totalizing

meter on the discharge line of the carbon adsorption unit was reinstalled during May and will be used to measure the total treatment system effluent for the month of June.

Cartridge filters were changed on May 4, 7, 13, 17, 26 and 31. Bag filters were replaced on a daily basis as a result of biological fouling.

III TREATMENT SYSTEM MONITORING

A. Sample Collection and Analysis

During this reporting period, treatment system samples were collected on May 3 from the influent, intermediate, and effluent sampling ports. A field blank was submitted with the samples collected.

All treatment system samples collected were analyzed by Pace Laboratories, of Novato, California, a California-certified laboratory. All samples and the blank 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 using EPA Test Method 8015, for ethylene dibromide by EPA Test Method 504, and for residual chlorine by Standard Method 408E.

Results of analyses of samples collected December 7, 1988 through May 3, 1989 are summarized in Tables 1 through 4. Revised laboratory results for EPA Test Methods 8015 and 504 for samples taken February 8, March 10, and April 6 were received on May 19; revisions for those dates are reflected in Tables 1 through 4. Laboratory reports for treatment system samples collected on February 8, March 10, April 6 and May 3 are presented in Appendix A. Analytical results for samples collected in May are discussed in this report.

B. Discharge Limit Exceedences

There were no exceedences of permitted effluent discharge limits during this reporting period.

IV RESULTS

Results of influent, intermediate, and effluent sample analyses for TPH and for EPA Test Method 8010, 8020, and 504 compounds indicate that on the sampling date, the treatment system removed most individual constituents to below detection levels. Benzene was detected at a concentration of 0.3 $\mu\text{g}/\text{l}$ (equivalent to ppb) and xylenes were detected at a concentration of 0.3 $\mu\text{g}/\text{l}$ in the effluent sample taken May 3. Xylenes were also detected at a concentration of 0.7 $\mu\text{g}/\text{l}$ in the field blank from the same sampling date.

TABLE 1. TREATMENT SYSTEM WATER ANALYSIS: INFLUENT SAMPLES

HLA SAMPLE ID #	88491201	88501501	88512101	89010501	89021201	89060801	89101101	89140601	89180330
DATE	12/07	12/15	12/21	01/05	01/12	02/08	03/10	04/06	05/03
TEST METHOD/COMPOUNDS									
EPA 8020									
Benzene	ND < 0.2	NT	NT	9.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	0.5
Toluene	ND < 0.2	NT	NT	6.1	NT	1.1	ND < 0.2	ND < 0.2	0.2
Chlorobenzene	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
Ethylbenzene	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
Xylenes	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	68	ND < 0.2	ND < 0.2
1,2-Dichlorobenzene	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
All other 8020 compounds	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
EPA 8015									
TPH (Gasoline)	ND < 50	NT	NT	130	NT	90	340	70	70
Diesel	NT	NT	NT	NT	NT	NT	NT	NT	NT
EPA 8010									
1,1-dichloroethene	NT	ND < 0.5	ND < 0.5	0.8	ND < 0.5	ND < 0.5	ND < 0.5	0.8	ND < 0.5
Methylene chloride	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	6.3	ND < 0.5	ND < 0.5	9.8
1,1-dichloroethane	NT	ND < 0.5	ND < 0.5	1.9	0.5	1.2	3.2	1.1	ND < 0.5
Chloroform	NT	ND < 0.5	1.1	2.1	0.8	1.5	0.65	8.8	ND < 0.5
1,1,1-trichloroethane	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	1.8	0.7	ND < 0.5
1,2-dichloroethane	NT	9.2	4.8	10.5	4.9	8.6	42	16.2	6.8
Trichloroethene	NT	390	112	140	290	420	ND < 0.5	3.6	4.4
1,2-dichloropropene	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
Bromodichloromethane	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	0.7
Cis-1,3-dichloropropene	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	0.65	1.0
Tetrachloroethene	NT	ND < 0.5	ND < 0.5	1.4	0.4	0.66	ND < 0.5	ND < 0.5	ND < 0.5
Chlorobenzene	NT	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	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
1,1,2,2-tetrachloroethane	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
Dibromochloromethane	NT	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	NT	ND	ND	ND	ND	ND	ND	ND	ND
EPA 8240									
1,1-dichloroethene	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
Methylene chloride	0.6	NT	NT	NT	NT	NT	NT	NT	NT
1,1-dichloroethane	0.7	NT	NT	NT	NT	NT	NT	NT	NT
Chloroform	0.7	NT	NT	NT	NT	NT	NT	NT	NT
1,2-dichloroethane	5.8	NT	NT	NT	NT	NT	NT	NT	NT
Benzene	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
Trichloroethene	91.1	NT	NT	NT	NT	NT	NT	NT	NT
Toluene	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
1,1,2-trichloroethane	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
Tetrachloroethene	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
Chlorobenzene	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
All other 8240 compounds	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
EPA 504									
Ethylene dibromide	0.02	NT	NT	ND < 0.02	NT	0.05	ND < 0.01	0.47	ND < 0.01
Standard Method 408E									
Residual chlorine (mg/l)	ND < 0.01	NT	NT	ND < 0.01	NT	ND < 0.01	ND < 0.01	0.05	ND < 0.01*
EPA 360.2									
Dissolved oxygen (mg/l)	NT	NT	NT	NT	NT	6.6	7.5	7.9	NT

ND - Not detected at stated detection limit.
 NT - Not Tested.
 All results reported in parts per billion (ppb) except where indicated.
 * Sample was held over the time limit for Standard Method 408E.

TABLE 2. TREATMENT SYSTEM WATER ANALYSIS: INTERMEDIATE SAMPLES

PAGE 1

HLA SAMPLE ID #	88491202	88501502	88512102	89010502	89021202	89060802	89101102	89140602	89180331
DATE	12/07	12/15	12/21	01/05	01/12	02/08	03/10	04/06	05/03
TEST METHOD/COMPOUNDS									
EPA 8020									
Benzene	NT	NT	NT	ND < 0.2	NT	NT	NT	ND < 0.2	0.3
Toluene	NT	NT	NT	ND < 0.2	NT	NT	NT	ND < 0.2	ND < 0.2
Ethylbenzene	NT	NT	NT	ND < 0.2	NT	NT	NT	ND < 0.2	0.4
Xylenes	NT	NT	NT	ND < 0.2	NT	NT	NT	ND < 0.2	0.3
Chlorobenzene	NT	NT	NT	ND < 0.2	NT	NT	NT	ND < 0.2	ND < 0.2
1,3-Dichlorobenzene	NT	NT	NT	ND < 0.2	NT	NT	NT	ND < 0.2	ND < 0.2
All other 8020 compounds	NT	NT	NT	ND < 0.2	NT	NT	NT	ND < 0.2	ND < 0.2
EPA 8015									
TPH (Gasoline)	NT	NT	NT	ND < 50	NT	NT	NT	NT	NT
Diesel	NT	NT	NT	NT	NT	NT	NT	NT	NT
EPA 8010									
Methylene chloride	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	1.5	ND < 0.5	ND < 0.5	ND < 0.5
1,1-dichloroethane	NT	ND < 0.5	0.6	ND < 0.5	ND < 0.5	1.3	ND < 0.5	ND < 0.5	ND < 0.5
Chloroform	NT	ND < 0.5	1.2	ND < 0.5	ND < 0.5	1.4	ND < 0.5	ND < 0.5	ND < 0.5
1,1,1-trichloroethane	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	2.2	ND < 0.5	ND < 0.5
1,2-dichloroethane	NT	7.1	6.0	3.4	1.4	8.2	ND < 0.5	0.55	ND < 0.5
Trichloroethene	NT	33.0	ND < 0.5	18.0	16.0	9.7	ND < 0.5	ND < 0.5	ND < 0.5
Tetrachloroethene	NT	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	NT	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	NT	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	NT	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	NT	ND	ND	ND	ND	ND	ND	ND	ND
EPA 8240									
Methylene chloride	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
1,1-dichloroethane	1.5	NT	NT	NT	NT	NT	NT	NT	NT
Chloroform	1.7	NT	NT	NT	NT	NT	NT	NT	NT
1,2-dichloroethane	9.4	NT	NT	NT	NT	NT	NT	NT	NT
Trichloroethene	18.7	NT	NT	NT	NT	NT	NT	NT	NT
Toluene	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
1,2-dichlorobenzene	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
All other 8240 compounds	ND	NT	NT	NT	NT	NT	NT	NT	NT
EPA 504									
Ethylene dibromide	NT	NT	NT	NT	NT	NT	NT	NT	NT
Residual chlorine									
Residual chlorine (mg/l)	NT	NT	NT	NT	NT	NT	NT	NT	NT

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

PAGE 1

H/A SAMPLE ID #	88491204	88501503	88512103	89010504	89021204	89060803	89101103	89140603	89180332
DATE	12/07	12/15	12/21	01/05	01/12	02/08	03/10	04/06	05/03
TOTAL FLOW (THOUSAND GALLONS)	6762.0	6830.6	6972.2	7200.0	7310.7	7784.3	8000.0	8495.9	8948.7
AVERAGE FLOW (GPM)	11.6	6.0	16.4	10.5	11.0	12.2	23.0	23.9	23.7
TEST METHOD/COMPOUNDS									
EPA 8020									
Benzene	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.3
Toluene	ND < 0.2	NT	NT	ND < 0.2	NT	0.88	ND < 0.2	ND < 0.2	ND < 0.2
Ethylbenzene	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
Xylenes	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.3
Diphenylhydrazine	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
All other 8020 compounds	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
EPA 8015									
TPH (Gasoline)	ND < 50	NT	NT	ND < 50	NT	ND < 50	ND < 50	ND < 50	ND < 50
Diesel	NT	NT	NT	NT	NT	NT	NT	NT	NT
EPA 8010									
Dichlorodifluoromethane	NT	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-dichloroethene	NT	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	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	1.4	ND < 0.5	ND < 0.5	ND < 0.5
1,1-dichloroethane	NT	ND < 0.5	ND < 0.5	1.0	0.9	1.4	ND < 0.5	ND < 0.5	ND < 0.5
Chloroform	NT	ND < 0.5	ND < 0.5	1.4	1.0	1.6	ND < 0.5	ND < 0.5	ND < 0.5
1,1,1-trichloroethane	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	2.4	ND < 0.5	ND < 0.5
1,2-dichloroethane	NT	4.3	3.5	6.8	5.3	9.1	ND < 0.5	ND < 0.5	ND < 0.5
Trichloroethene	NT	ND < 0.5	ND < 0.5	0.8	1.0	2.2	ND < 0.5	ND < 0.5	ND < 0.5
Tetrachloroethene	NT	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	NT	ND	ND	ND	ND	ND	ND	ND	ND
EPA 8240									
Methylene Chloride	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
1,1-dichloroethane	0.8	NT	NT	NT	NT	NT	NT	NT	NT
Chloroform	0.8	NT	NT	NT	NT	NT	NT	NT	NT
1,2-dichloroethane	5.1	NT	NT	NT	NT	NT	NT	NT	NT
Trichloroethene	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
Toluene	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
All other 8240 compounds	ND	NT	NT	NT	NT	NT	NT	NT	NT
EPA 360.2									
Dissolved oxygen (mg/l)	NT	NT	NT	NT	NT	9.9	8.0	7.8	NT
EPA 625									
All compounds	NT	NT	NT	NT	NT	NT	NT	NT	NT
EPA 504									
Ethylene dibromide	ND < 0.02	NT	NT	ND < 0.02	NT	0.06	ND < 0.01	ND < 0.01	ND < 0.01
Standard Method 408E									
Residual chlorine (mg/l)	ND < 0.01	NT	NT	ND < 0.01	NT	ND < 0.01	ND < 0.01	ND < 0.05	ND < 0.01*
Lead 7421									
Lead (mg/l)	NT	NT	NT	NT	NT	NT	NT	NT	NT

ND - Not detected at stated detection limit.

NT - Not Tested.

All results reported in parts per billion (ppb) except where indicated.

* Sample was held over the time limit for Standard Method 408E.

TABLE 4. TREATMENT SYSTEM WATER ANALYSIS: BLANK SAMPLES

PAGE 1

MLA SAMPLE ID #	88491205	88501505	88512105	89010505	89021205	89060805	89101105	---	89180334
DATE	12/07	12/15	12/21	01/05	01/12	02/08	03/10	04/06	05/03
TEST METHOD/COMPOUNDS									
EPA 8020									
Benzene	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	NT	ND < 0.2
Toluene	ND < 0.2	NT	NT	ND < 0.2	NT	0.95	ND < 0.2	NT	ND < 0.2
Ethylbenzene	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	NT	ND < 0.2
Xylenes	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	NT	ND < 0.7
All other 8020 compounds	ND < 0.2	NT	NT	ND < 0.2	NT	ND < 0.2	ND < 0.2	NT	ND < 0.2
TPH									
Gasoline	ND < 50	NT	NT	NT	NT	ND < 50	ND < 50	NT	NT
Diesel	NT	NT	NT	NT	NT	NT	NT	NT	NT
EPA 8010									
Dichlorodifluoromethane	NT	ND < 2.0	ND < 2.0	ND < 2.0	ND < 2.0	ND < 2.0	ND < 2.0	NT	ND < 2.0
1,1-dichloroethene	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NT	ND < 0.5
Methylene chloride	NT	13	ND < 0.5	9.6	1.0	2.9	42	NT	ND < 0.5
1,1,1-trichloroethane	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	5.9	NT	ND < 0.5
1,2-dichloroethane	NT	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NT	ND < 0.5
All other 8010 compounds	NT	ND	ND	ND	ND	ND	ND	NT	ND
EPA 8240									
Toluene	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
Methylene Chloride	25.3	NT	NT	NT	NT	NT	NT	NT	NT
Chloroform	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
Diphenylhydrazine	ND < 0.5	NT	NT	NT	NT	NT	NT	NT	NT
All other 8240 compounds	ND	NT	NT	NT	NT	NT	NT	NT	NT
EPA 625									
All compounds	NT	NT	NT	NT	NT	NT	NT	NT	NT
EPA 504									
Ethylene dibromide	NT	NT	NT	NT	NT	NT	NT	NT	NT

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

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94947

March 09, 1989 (Revised May 19, 1989)
PACE Project Number: 490208.504

TREATMENT SYSTEM : 2/8/89

Attn: Mr. David Leland

Re: City of Oakland

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

PACE Sample Number:
Parameter

	INFLUENT	INTERMEDIATE	EFFLUENT
	70539	70540	70541
Units	89060801	89060802	89060803
MDL			

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Chlorine, Total Residual	mg/L	0.01	ND	-	ND
Oxygen, Dissolved	mg/L	0.5	6.6	-	9.9

ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Petroleum Fuels, Purgeable, as Gasoline (EPA Method 8015, Modified)	mg/L	0.05	0.09	-	ND
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HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/L	2.0	ND	ND	ND
Chloromethane	ug/L	2.0	ND	ND	ND
Vinyl Chloride	ug/L	2.0	ND	ND	ND
Bromomethane	ug/L	2.0	ND	ND	ND
Chloroethane	ug/L	2.0	ND	ND	ND
Trichlorofluoromethane	ug/L	2.0	ND	ND	ND
1,1-Dichloroethene	ug/L	0.5	ND	ND	ND
Methylene Chloride	ug/L	0.5	6.3	1.5	1.4
trans-1,2-Dichloroethene	ug/L	0.5	ND	ND	ND
1,1-Dichloroethane	ug/L	0.5	1.2	1.3	1.4
Chloroform	ug/L	0.5	1.5	1.4	1.6
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND	ND	ND
Carbon Tetrachloride	ug/L	0.5	ND	ND	ND
1,2-Dichloroethane (EDC)	ug/L	0.5	8.6	8.2	9.1
Trichloroethene (TCE)	ug/L	0.5	420	9.7	2.2
1,2-Dichloropropane	ug/L	0.5	ND	ND	ND
Bromodichloromethane	ug/L	0.5	ND	ND	ND
2-Chloroethylvinyl ether	ug/L	0.5	ND	ND	ND

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

Mr. David Leland
Page 2

March 09, 1989
PACE Project Number: 490208.504

PACE Sample Number: Parameter	Units	MDL	INFLUENT	INTER	EFFLUENT
			70539 89060801	70540 89060802	70541 89060803
ORGANIC ANALYSIS					
HALOGENATED VOLATILE COMPOUNDS EPA 8010					
trans-1,3-Dichloropropene	ug/L	0.5	ND	ND	ND
cis-1,3-Dichloropropene	ug/L	0.5	ND	ND	ND
1,1,2-Trichloroethane	ug/L	0.5	ND	ND	ND
Tetrachloroethene	ug/L	0.5	0.66	ND	ND
Dibromochloromethane	ug/L	0.5	ND	ND	ND
Chlorobenzene	ug/L	0.5	ND	ND	ND
Bromoform	ug/L	0.5	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	ND	ND
1,3-Dichlorobenzene	ug/L	0.5	ND	ND	ND
1,4-Dichlorobenzene	ug/L	0.5	ND	ND	ND
1,2-Dichlorobenzene	ug/L	0.5	ND	ND	ND
Bromochloromethane (Surrogate Recovery)	%		84	82	80
1,4-Dichlorobutane (Surrogate Recovery)	%		99	98	91
AROMATIC VOLATILE COMPOUNDS EPA 8020					
Benzene	ug/L	0.2	ND	-	ND
Toluene	ug/L	0.2	1.1	-	0.88
Chlorobenzene	ug/L	0.2	ND	-	ND
Ethylbenzene	ug/L	0.2	ND	-	ND
Xylene	ug/L	0.2	ND	-	ND
1,3-Dichlorobenzene	ug/L	0.2	ND	-	ND
1,4-Dichlorobenzene	ug/L	0.2	ND	-	ND
1,2-Dichlorobenzene	ug/L	0.2	ND	-	ND
Fluorobenzene (Surrogate Recovery)	%		98	-	86
1,2-DIBROMOETHANE (EDB) EPA METHOD 504					
1,2-Dibromoethane	ug/L	0.01	0.05	-	0.06
Date extracted			02-10-89	-	02-10-89

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

Mr. David Leland
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March 09, 1989
PACE Project Number: 490208.504

PACE Sample Number: Parameter	Units	EFFLUENT		BLANK
		MDL	70542 89060804	70543 89060805

ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Petroleum Fuels, Purgeable, as Gasoline	mg/L	0.05	ND	ND
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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	ug/L	2.0	ND	ND
1,1-Dichloroethene	ug/L	0.5	ND	ND
Methylene Chloride	ug/L	0.5	1.4	2.9
trans-1,2-Dichloroethene	ug/L	0.5	ND	ND
1,1-Dichloroethane	ug/L	0.5	1.4	ND
Chloroform	ug/L	0.5	1.5	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	8.8	ND
Trichloroethene (TCE)	ug/L	0.5	2.0	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
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

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

Mr. David Leland
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March 09, 1989
PACE Project Number: 490208.504

PACE Sample Number: Parameter	Units	EFFLUENT		BLANK
		MDL	70542 89060804	70543 89060805

ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

1,2-Dichlorobenzene	ug/L	0.5	ND	ND
Bromochloromethane (Surrogate Recovery)	%		82	73
1,4-Dichlorobutane (Surrogate Recovery)	%		89	84

AROMATIC VOLATILE COMPOUNDS EPA 8020

Benzene	ug/L	0.2	ND	ND
Toluene	ug/L	0.2	0.93	0.95
Chlorobenzene	ug/L	0.2	ND	ND
Ethylbenzene	ug/L	0.2	ND	ND
Xylene	ug/L	0.2	ND	ND
1,3-Dichlorobenzene	ug/L	0.2	ND	ND
1,4-Dichlorobenzene	ug/L	0.2	ND	ND
1,2-Dichlorobenzene	ug/L	0.2	ND	ND
Fluorobenzene (Surrogate Recovery)	%		88	84

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

Approved:

Lisa J. Petersen
Lisa J. Petersen
Project Manager for
PACE Laboratories

Douglas E. Oram
Douglas E. Oram
Technical Reviewer for
PACE Laboratories

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94947

March 29, 1989 (Revised May 19, 1989)
PACE Project Number: 490310.504

CARBON TREATMENT SYSTEM
3-10-89

Attn: Mr. David Leland

Re: City of Oakland

Date Sample(s) Collected: 03/10/89
Date Sample(s) Received: 03/10/89

PACE Sample Number:
Parameter

		INFLUENT	INTERMEDIATE	EFFLUENT
	Units	71224 89101101	71225 89101102	71226 89101103
		MDL		

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Chlorine, Total Residual	mg/L	0.01	ND	-	ND
Oxygen, Dissolved	mg/L	0.2	7.5	-	8.0

ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Petroleum Fuels, Purgeable, as Gasoline (EPA Method 8015, Modified)	mg/L	0.05	0.34	-	ND
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HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/L	2.0	ND	ND	ND
Chloromethane	ug/L	2.0	ND	ND	ND
Vinyl Chloride	ug/L	2.0	ND	ND	ND
Bromomethane	ug/L	2.0	ND	ND	ND
Chloroethane	ug/L	2.0	ND	ND	ND
Trichlorofluoromethane	ug/L	2.0	ND	ND	ND
1,1-Dichloroethene	ug/L	0.5	ND	ND	ND
Methylene Chloride	ug/L	0.5	ND	ND	ND
trans-1,2-Dichloroethene	ug/L	0.5	ND	ND	ND
1,1-Dichloroethane	ug/L	0.5	3.2	ND	ND
Chloroform	ug/L	0.5	0.65	ND	ND
1,1,1-Trichloroethane (TCA)	ug/L	0.5	1.8	2.2	2.4
Carbon Tetrachloride	ug/L	0.5	ND	ND	ND
1,2-Dichloroethane (EDC)	ug/L	0.5	42	ND	ND
Trichloroethene (TCE)	ug/L	0.5	ND	ND	ND
1,2-Dichloropropane	ug/L	0.5	ND	ND	ND
Bromodichloromethane	ug/L	0.5	ND	ND	ND
2-Chloroethylvinyl ether	ug/L	0.5	ND	ND	ND

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

Mr. David Leland
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March 29, 1989
PACE Project Number: 490310.504

PACE Sample Number: Parameter	Units	MDL	INFLUENT	INTER	EFFLUENT
			71224 89101101	71225 89101102	71226 89101103
ORGANIC ANALYSIS					
HALOGENATED VOLATILE COMPOUNDS EPA 8010					
trans-1,3-Dichloropropene	ug/L	0.5	ND	ND	ND
cis-1,3-Dichloropropene	ug/L	0.5	ND	ND	ND
1,1,2-Trichloroethane	ug/L	0.5	ND	ND	ND
Tetrachloroethene	ug/L	0.5	ND	ND	ND
Dibromochloromethane	ug/L	0.5	ND	ND	ND
Chlorobenzene	ug/L	0.5	ND	ND	ND
Bromoform	ug/L	0.5	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	ND	ND
1,3-Dichlorobenzene	ug/L	0.5	ND	ND	ND
1,4-Dichlorobenzene	ug/L	0.5	ND	ND	ND
1,2-Dichlorobenzene	ug/L	0.5	ND	ND	ND
Bromochloromethane (Surrogate Recovery)			85%	86%	87%
1,4-Dichlorobutane (Surrogate Recovery)			85%	86%	87%
AROMATIC VOLATILE COMPOUNDS EPA 8020					
Benzene	ug/L	0.2	ND	-	ND
Toluene	ug/L	0.2	ND	-	ND
Chlorobenzene	ug/L	0.2	ND	-	ND
Ethylbenzene	ug/L	0.2	ND	-	ND
Xylene	ug/L	0.2	68	-	ND
1,3-Dichlorobenzene	ug/L	0.2	ND	-	ND
1,4-Dichlorobenzene	ug/L	0.2	ND	-	ND
1,2-Dichlorobenzene	ug/L	0.2	ND	-	ND
Fluorobenzene (Surrogate Recovery)			99%	-	98%
1,2-DIBROMOETHANE (EDB) EPA METHOD 504					
1,2-Dibromoethane	ug/L	0.01	ND	-	ND
Date extracted			03/14/89	-	03/14/89

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

Mr. David Leland
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March 29, 1989
PACE Project Number: 490310.504

PACE Sample Number: Parameter	Units	EFFLUENT		BLANK
		MDL	71227 89101104	71228 89101105

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Chlorine, Total Residual	mg/L	0.01	ND	-
Oxygen, Dissolved	mg/L	0.2	10.0	-

ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Petroleum Fuels, Purgeable, as Gasoline (EPA Method 8015, Modified)	mg/L	0.05	ND	ND
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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	ug/L	2.0	ND	ND
1,1-Dichloroethene	ug/L	0.5	ND	ND
Methylene Chloride	ug/L	0.5	ND	42
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	5.9
Carbon Tetrachloride	ug/L	0.5	ND	ND
1,2-Dichloroethane (EDC)	ug/L	0.5	ND	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
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

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

Mr. David Leland
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March 29, 1989
PACE Project Number: 490310.504

PACE Sample Number: Parameter	Units	EFFLUENT		BLANK
		MDL	71227 89101104	71228 89101105

ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

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)			86%	85%
1,4-Dichlorobutane (Surrogate Recovery)			82%	79%

AROMATIC VOLATILE COMPOUNDS EPA 8020

Benzene	ug/L	0.2	ND	ND
Toluene	ug/L	0.2	ND	ND
Chlorobenzene	ug/L	0.2	ND	ND
Ethylbenzene	ug/L	0.2	ND	ND
Xylene	ug/L	0.2	ND	ND
1,3-Dichlorobenzene	ug/L	0.2	ND	ND
1,4-Dichlorobenzene	ug/L	0.2	ND	ND
1,2-Dichlorobenzene	ug/L	0.2	ND	ND
Fluorobenzene (Surrogate Recovery)			99%	97%

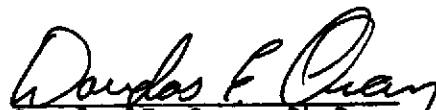
1,2-DIBROMOETHANE (EDB) EPA METHOD 504

1,2-Dibromoethane	ug/L	0.01	ND	-
Date extracted			03/14/89	-

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

Approval:


Stephen F. Nackord
Project Manager for
PACE Laboratories


Douglas E. Oram, Ph.D.
Technical Reviewer for
PACE Laboratories

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94947

April 13, 1989 (Revised May 19, 1989)
PACE Project Number: 490406500

CARBON TREATMENT SYSTEM

4-6-89

Attn: Mr. David Leland

City of Oakland

Date Sample(s) Collected: 04/06/89
Date Sample(s) Received: 04/06/89

PACE Sample Number:
Parameter

Units

	<u>INFLUENT</u>	<u>INTER</u>	<u>EFFLUENT</u>
	720120	720130	720140
	89140601	89140602	89140603

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Chlorine, Total Residual	mg/L	0.05	0.05	-	ND
Oxygen, Dissolved	mg/L	0.1	7.9	-	7.8

ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Purgeable Fuels, as Gasoline (EPA 8015)	mg/L	0.05	0.07	-	ND
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HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/L	2.0	ND	ND	ND
Chloromethane	ug/L	2.0	ND	ND	ND
Vinyl Chloride	ug/L	2.0	ND	ND	ND
Bromomethane	ug/L	2.0	ND	ND	ND
Chloroethane	ug/L	2.0	ND	ND	ND
Trichlorofluoromethane	ug/L	2.0	ND	ND	ND

1,1-Dichloroethene	ug/L	0.5	0.8	ND	ND
Methylene Chloride	ug/L	0.5	ND	ND	ND
trans-1,2-Dichloroethene	ug/L	0.5	ND	ND	ND
1,1-Dichloroethane	ug/L	0.5	1.1	ND	ND
Chloroform	ug/L	0.5	8.8	ND	ND
1,1,1-Trichloroethane (TCA)	ug/L	0.5	0.7	ND	ND

Carbon Tetrachloride	ug/L	0.5	ND	ND	ND
1,2-Dichloroethane (EDC)	ug/L	0.5	16.2	0.55	ND
Trichloroethene (TCE)	ug/L	0.5	3.6	ND	ND
1,2-Dichloropropane	ug/L	0.5	ND	ND	ND
Bromodichloromethane	ug/L	0.5	ND	ND	ND
2-Chloroethylvinyl ether	ug/L	0.5	ND	ND	ND

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

Mr. David Leland
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April 13, 1989
PACE Project Number: 490406500

PACE Sample Number:
Parameter

Units

MDL

EFFLUENT
720150
89140604

ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Parameter	Units	MDL	Result
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) 89%
1,4-Dichlorobutane (Surrogate Recovery) 101%

PURGEABLE AROMATIC COMPOUNDS, EPA 8020

Parameter	Units	MDL	Result
Benzene	mg/L	0.0002	ND
Ethylbenzene	mg/L	0.0002	ND
Toluene	mg/L	0.0002	ND
Xylenes, total	mg/L	0.0002	ND

1,2-DIBROMOETHANE (EDB) EPA METHOD 504

Parameter	Units	MDL	Result
1,2-Dibromoethane	ug/L	0.01	ND
Date extracted			04/07/89

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

Approval:

Steven F. Nackord
Steven F. Nackord
Project Manager for
PACE Laboratories

Douglas E. Oram
Douglas E. Oram
Technical Reviewer for
PACE Laboratories

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94947

May 19, 1989
PACE Project Number: 490503501

Attn: Mr. David Leland

P.R.P. Oakland

Date Sample(s) Collected: 05/03/89
Date Sample(s) Received: 05/03/89

PACE Sample Number:

Parameter

Units

INFLUENT INTERMEDIATE EFFLUENT

727760 727770 727780

MDL 89180330 89180331 89180332

INORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Chlorine, Residual

mg/L

0.01

ND(*)

-

ND(*)

ORGANIC ANALYSIS

INDIVIDUAL PARAMETERS

Ethylene Dibromide

ug/L

0.01

ND

-

ND

PURGEABLE FUELS AND AROMATICS

TOAL PETROLEUM HYDROCARBONS, LIGHT FRAC.

Purgeable Fuels, as Gasoline (EPA 8015)

mg/L

0.05

0.07

-

ND

PURGEABLE AROMATICS (BTXE BY EPA 8020)

Benzene

mg/L

0.0002

0.0005

0.0003

0.0003

Ethylbenzene

mg/L

0.0002

ND

ND

ND

Toluene

mg/L

0.0002

0.0002

0.0004

ND

Xylenes, total

mg/L

0.0002

ND

0.0003

0.0003

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane

ug/L

2.0

ND

ND

ND

Chloromethane

ug/L

2.0

ND

ND

ND

Vinyl Chloride

ug/L

2.0

ND

ND

ND

Bromomethane

ug/L

2.0

ND

ND

ND

Chloroethane

ug/L

2.0

ND

ND

ND

Trichlorofluoromethane

ug/L

2.0

ND

ND

ND

1,1-Dichloroethene

ug/L

0.5

ND

ND

ND

Methylene Chloride

ug/L

0.5

9.8

ND

ND

trans-1,2-Dichloroethene

ug/L

0.5

ND

ND

ND

1,1-Dichloroethane

ug/L

0.5

ND

ND

ND

MDL Method Detection Limit

ND Not detected at or above the MDL.

* Analysis conducted in excess of EPA holding time.

Mr. David Leland
Page 2

May 19, 1989
PACE Project Number: 490503501

PACE Sample Number: Parameter	Units	MDL	INFLUENT	INTERMEDIATE	EFFLUENT
			727760 89180330	727770 89180331	727780 89180332

ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Chloroform	ug/L	0.5	ND	ND	ND
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND	ND	ND
Carbon Tetrachloride	ug/L	0.5	ND	ND	ND
1,2-Dichloroethane (EDC)	ug/L	0.5	6.8	ND	ND
Trichloroethene (TCE)	ug/L	0.5	4.4	ND	ND
1,2-Dichloropropane	ug/L	0.5	ND	ND	ND
Bromodichloromethane	ug/L	0.5	0.7	ND	ND
2-Chloroethylvinyl ether	ug/L	0.5	ND	ND	ND
trans-1,3-Dichloropropene	ug/L	0.5	ND	ND	ND
cis-1,3-Dichloropropene	ug/L	0.5	1.0	ND	ND
1,1,2-Trichloroethane	ug/L	0.5	ND	ND	ND
Tetrachloroethene	ug/L	0.5	ND	ND	ND
Dibromochloromethane	ug/L	0.5	ND	ND	ND
Chlorobenzene	ug/L	0.5	ND	ND	ND
Bromoform	ug/L	0.5	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	ND	ND
1,3-Dichlorobenzene	ug/L	0.5	ND	ND	ND
1,4-Dichlorobenzene	ug/L	0.5	ND	ND	ND
1,2-Dichlorobenzene	ug/L	0.5	ND	ND	ND
Bromochloromethane (Surrogate Recovery)			93%	89%	89%
1,4-Dichlorobutane (Surrogate Recovery)			92%	97%	94%

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

Mr. David Leland
Page 3

May 19, 1989
PACE Project Number: 490503501

PACE Sample Number: Parameter	Units	EFFLUENT		BLANK	MW-5
		MDL	727790 89180333	727800 89180334	727810 89180317
<u>INORGANIC ANALYSIS</u>					
INDIVIDUAL PARAMETERS					
Chlorine, Residual	mg/L	0.01	ND(*)	-	-
<u>ORGANIC ANALYSIS</u>					
INDIVIDUAL PARAMETERS					
Ethylene Dibromide	ug/L	0.01	ND	-	-
PURGEABLE FUELS AND AROMATICS					
TOAL PETROLEUM HYDROCARBONS, LIGHT FRAC. Purgeable Fuels, as Gasoline (EPA 8015)	mg/L	0.05	ND	-	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020)					
Benzene	mg/L	0.0002	ND	ND	ND
Ethylbenzene	mg/L	0.0002	ND	ND	ND
Toluene	mg/L	0.0002	ND	ND	ND
Xylenes, total	mg/L	0.0002	ND	0.0007	0.029
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	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	ND	ND	-
Trichloroethene (TCE)	ug/L	0.5	ND	ND	-

MDL Method Detection Limit
 ND Not detected at or above the MDL.
 * Analysis conducted in excess of EPA holding time.

Mr. David Leland
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May 19, 1989
PACE Project Number: 490503501

PACE Sample Number: Parameter	Units	EFFLUENT	BLANK	MW-5
		727790 MDL	727800 89180334	727810 89180317

ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

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	-
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)			100%	89%	-
1,4-Dichlorobutane (Surrogate Recovery)			108%	93%	-

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

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May 19, 1989
PACE Project Number: 490503501

PACE Sample Number:
Parameter

Units

MDL

MW-7
727820
89180318

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOAL PETROLEUM HYDROCARBONS, LIGHT FRAC.

Purgeable Fuels, as Gasoline (EPA 8015)

mg/L

0.05

0.27

PURGEABLE AROMATICS (BTXE BY EPA 8020)

Benzene

mg/L

0.0002 ND

Ethylbenzene

mg/L

0.0002 0.0018

Toluene

mg/L

0.0002 0.0012

Xylenes, total

mg/L

0.0002 0.0048

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

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. Mackord
Stephen F. Mackord
Director, Sampling and Analytical Services

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

DISTRIBUTION

REPORT OF SYSTEM MONITORING: MAY 1989
DEWATERING EFFLUENT TREATMENT SYSTEM
CHINATOWN REDEVELOPMENT PROJECT AREA
OAKLAND, CALIFORNIA
June 15, 1989

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QUALITY CONTROL REVIEWER

Tamara L. Williams

Tamara L. Williams
Geologist - 3954