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April 18, 1990

9382,040.02

California Regional Water Quality Control Board,
San Francisco Bay Region
1800 Harrison Street, Suite 700
Oakland, California 94607

Attention: Mr. Donald Dalke

Gentlemen:

**Report of Exceedences of NPDES Permit Limitations
Dewatering Effluent Treatment System
Chinatown Redevelopment Project Area
Oakland, California**

This letter transmits Harding Lawson Associates' (HLA) *Report of System Monitoring, March 1990, Dewatering Effluent Treatment System, Chinatown Redevelopment Project Area, Oakland, California*, which discusses the operations and monitoring of the carbon treatment system at 10th and Webster Streets in Oakland.

The report documents exceedences of NPDES permit discharge limitations for 1,2-dichloroethane (1,2-DCA) and ethylene dibromide (EDB) measured in effluent samples collected March 1, 1990. Fresh carbon was installed in the downstream contactor on March 14, 1990; a sample collected after carbon changeout showed EDB in excess of the discharge limitation. Possible reasons for the exceedence for EDB are discussed in the report; the most likely explanation - channeling of water passing through the fresh carbon in the downstream contactor - was addressed by backwashing. A regular monthly sampling round was conducted April 11, 1990. Results of laboratory analyses of samples will be reported to you when they become available.

These events were communicated verbally to Cecil Felix by David Leland of HLA on April 12, 1990.

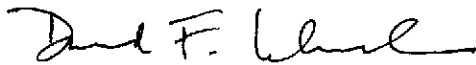
April 18, 1990
9382,040.02
California RWQCB, San Francisco Bay Region
Mr. Donald Dalke
Page 2

Harding Lawson Associates

Please call either David Leland at 899-7352, Peter Mote at 899-7397, or Peter Chen of the Agency at 273-3692 if you have any questions regarding this letter or the attached report. We would be pleased to discuss any aspect of the system with you.

Very truly yours,

HARDING LAWSON ASSOCIATES



David F. Leland
Associate Hydrologist

DFL:alf/z1/041

Attachment: Report of System Monitoring, March 1990
Dewatering Effluent Treatment System, Chinatown Redevelopment
Project Area

cc: Peter Chen, Agency
Donnell Choy (without attachment)
~~Lowell Miller~~, Alameda County Health Department
Cecil Felix, RWQCB (without attachment)

A Report Prepared for

California Regional Water Quality Control Board
San Francisco Bay Region
1800 Harrison Street, Suite 700
Oakland, California 94607

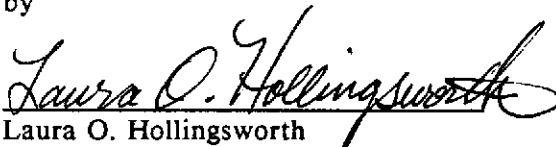
**REPORT OF SYSTEM MONITORING
MARCH 1990
DEWATERING EFFLUENT TREATMENT SYSTEM
CHINATOWN REDEVELOPMENT PROJECT AREA
OAKLAND, CALIFORNIA**

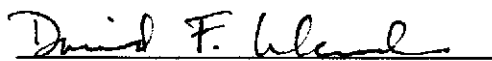
HLA Job No. 09382,040.02

Submitted on behalf of:

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

by


Laura O. Hollingsworth
Staff Engineer


David F. Leland
Associate Hydrologist

Harding Lawson Associates
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P.O. Box 578
Novato, California 94948
415/892-0821

April 18, 1990

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I INTRODUCTION

This report discusses the operation and monitoring of the groundwater treatment system at 10th and Webster streets, Oakland, California for March 1990. The system is treating groundwater produced from extraction wells located in the area bounded by 9th, 11th, Webster and Franklin streets. Groundwater 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-DCA), 1,2-dichloropropane, trichloroethylene, 1,1,2-trichloroethane, benzene, xylenes, and ethylbenzene; 0.5 ppb for toluene; 0.01 ppb for ethylene dibromide (EDB); and 0.0 ppb for total residual chlorine. The treatment system is designed to reduce concentrations of hydrocarbons in groundwater to less than discharge limits specified in the NPDES permit.

II TREATMENT SYSTEM OPERATION

The groundwater 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 groundwater extraction wells may be pumped through either module first. Currently, one carbon contactor in each module is being utilized. 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 March 1, 1990 to April 1, 1990, total effluent discharged from the system was 1,058,590 gallons, based on readings of the flowmeters located on each extraction well. Average flow through the treatment system for the month was 23.7 gallons per minute (gpm). Of the 1,058,590 gallons of treatment system effluent, 92 percent, or 974,520 gallons, were recycled to the PRP biotreatment injection system and 84,070 gallons, or 8 percent, were discharged to the storm drain.

Bag filters were replaced approximately every 2 to 3 days. The sand filter was backwashed with fresh water twice a day on the days there were site visits, i.e., approximately every other day. The sand in the sand filter was replaced on March 16. Cartridge filters were changed on March 7. The carbon vessels were backwashed on March 9 and 13. On March 14, fresh carbon was removed from one contactor that has been out of service and used to replace the carbon in a second contactor. The water flowpath is currently routed in series through two contactors, the second of which contains fresh carbon.

III TREATMENT SYSTEM MONITORING

March treatment system samples were collected on March 1 from the influent, intermediate, and effluent sampling ports. A duplicate intermediate sample was also collected and submitted for analysis. An additional effluent sample was collected on March 14, after the carbon change-out.

All samples were analyzed by Pace Laboratories, Novato, California, a California-certified laboratory. All samples were analyzed for benzene, toluene, ethylbenzene, and xylenes by EPA Test Method 8020, for halogenated organics by EPA Test Method 8010, and for TPH as gasoline by EPA Test Method 8015. In addition, influent and effluent samples collected on March 1 were analyzed for EDB by EPA Test Method 504, for residual chlorine by Standard Method 408E, and for dissolved oxygen by EPA Test Method 360.2, and the March 14 effluent sample was analyzed for EDB.

Results of analyses of samples collected October 5, 1989 through March 14, 1990 are summarized in Tables 1 through 4. Analytical results for samples collected March 1 and March 14 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 dates (March 1 and March 14, 1990), the carbon treatment system removed most constituents to nondetectable levels; NPDES discharge limits were exceeded for two constituents in the March 1 sample, and one constituent in the March 14 sample.

In all, four individual constituents were detected in the March 1 effluent sample. Benzene and chloroform were detected at concentrations of 0.2 ppb and 2.8 ppb, respectively. These concentrations do not exceed discharge limits. Chloroform was also detected in the field blank sample at a concentration of 2.8 ppb.

EDB and 1,2-DCA were detected in the March 1 effluent sample at 0.25 ppb and 6.3 ppb, respectively; these concentrations exceeded the associated discharge limits of 0.01 and 5.0 ppb, respectively.

The initial Pace Laboratory report of the March 1 sample results was received March 21 and results did not indicate the presence of 1,2-DCA in the effluent sample. After review of results by HLA, and subsequently by Pace, it was determined that 1,2-DCA was identified in the sample at a concentration of 6.3 ppb. A letter and report of revised results with an explanation of the source of the error were received from Pace on April 4, 1990 and are included in the Appendix.

In the effluent sample taken after carbon change-out, EDB was detected at 0.2 ppb, and 1,2-DCA was measured at 1.4 ppb. The 1,2-DCA concentration meets the discharge limit.

The results of the treatment system water sample analyses indicate that since the carbon change-out, the carbon contactors are removing most constituents to discharge limits.

The presence of EDB in the March 14 sample of effluent water may be the result of channeling of flow in the carbon contactors, breakthrough as a result of carbon exhaustion, sample contamination during field operations, laboratory analytical procedures, or configuration of the carbon modules. Breakthrough is considered unlikely because carbon was recently replaced in the downstream contactor. To address the possibility of channeling, active vessels were backwashed April 6, a procedure which had not been conducted since the change-out. In addition, the configuration of the modules is being checked to verify that the vessel containing fresh carbon is the second in line.

TABLE 1. TREATMENT SYSTEM WATER ANALYSIS: INFLUENT SAMPLES

HLA SAMPLE ID # DATE	8910CSIN 10/05/89	89451124 11/02/90	89490017 12/05/90	90010311 01/03/90	90013109 01/31/90	90094001 03/01/90
TEST METHOD/ COMPOUNDS						
EPA 8020						
Benzene	2.2	ND < 0.2	3.7	2	7	3.5
Toluene	1.7	ND < 0.2	0.7	0.4	4.1	0.9
Ethylbenzene	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2	0.6	ND < 0.2
Xylenes	38	12	25	10	20	13
All other 8020 compounds	NT	NT	NT	NT	NT	NT
EPA 8015						
TPH (Gasoline)	120	ND < 50	50	ND < 50	70	ND < 50
EPA 8010						
1,1-dichloroethene	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	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
1,1-dichloroethane	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
Chloroform	ND < 0.5	5.5	3.3	ND < 0.5	2.7	1.2
1,1,1-trichloroethane	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
1,2-dichloroethane	6.6	10	7.1	6.7	6	6.2
Trichloroethene	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
1,2-dichloropropane	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
Bromodichloromethane	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
Cis-1,3-dichloropropene	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
Chlorobenzene	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
1,1,2,2-tetrachloroethane	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5
Dibromochloromethane	ND < 0.5	ND < 0.5	0.63	0.69	ND < 0.5	ND < 0.5
All other 8010 compounds	ND	ND	ND	ND	ND	ND
EPA 504						
Ethylene dibromide	1.6	2.8	LT 4.0	2.1	.9 (*)	1.5
Standard Method 40BE						
Residual chlorine (mg/l)	ND < 0.05	0.1	ND < 0.05	ND < 0.05	ND < 0.05	ND < 0.05
EPA 360.2						
Dissolved oxygen (mg/l)	5.6	3.4	5.6	8.4	9.4	1.8

LT - Detected but not quantified at a concentration less than indicated value.

ND - Not detected at stated detection limit.

NT - Not Tested.

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

(*) - Analysis conducted in excess of EPA holding times.

TABLE 2. TREATMENT SYSTEM WATER ANALYSIS: INTERMEDIATE SAMPLES

PAGE 1

HLA SAMPLE ID #	8910CSIT	89451126	89490018	90010312	90013110	90094002
DATE	10/05/89	11/02/89	12/05/89	01/03/90	01/31/90	03/01/90
TEST METHOD/COMPOUNDS						
EPA 8020						
Benzene	1.7	NT	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
Toluene	ND < 0.2	NT	1.8	ND < 0.2	4	ND < 0.2
Ethylbenzene	ND < 0.2	NT	ND < 0.2	ND < 0.2	ND < 0.2	ND < 0.2
Xylenes	ND < 0.2	NT	ND < 0.2	ND < 0.2	2.6	ND < 0.2
All other 8020 compounds	NT	NT	NT	NT	NT	NT
EPA 8015						
TPH (Gasoline)	ND < 50	NT	ND < 50	ND < 50	ND < 50	ND < 50
EPA 8010						
Methylene chloride	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NT	ND < 0.5
1,1-dichloroethane	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NT	ND < 0.5
Chloroform	ND < 0.5	ND < 0.5	3.8	3.6	NT	2.8
1,1,1-trichloroethane	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NT	ND < 0.5
1,2-dichloroethane	7.7	7.5	6.6	6.3	NT	6.9
Tetrachloroethene	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NT	ND < 0.5
Chlorobenzene	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NT	ND < 0.5
Bromoform	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NT	ND < 0.5
1,3-dichlorobenzene	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	NT	ND < 0.5

 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

PAGE 1

HLA SAMPLE ID #	8910CSTB	89451125	89490020	-	-	90094003
DATE	10/05/89	11/02/89	12/05/89	01/03/90	01/31/90	03/01/90
TEST METHOD/COMPOUNDS						
EPA 8020						
Benzene	ND < 0.2	ND < 0.2	ND < 0.2	NT	NT	ND < 0.2
Toluene	ND < 0.2	ND < 0.2	ND < 0.2	NT	NT	ND < 0.2
Ethylbenzene	ND < 0.2	ND < 0.2	ND < 0.2	NT	NT	ND < 0.2
Xylenes	ND < 0.2	ND < 0.2	ND < 0.2	NT	NT	ND < 0.2
All other 8020 compounds	NT	NT	NT	NT	NT	NT
EPA 8015						
TPH (Gasoline)	ND < 50	ND < 50	ND < 50	NT	NT	ND < 50
EPA 8010						
Dichlorodifluoromethane	ND < 2.0	ND < 2.0	NT	NT	NT	ND < 2.0
1,1-dichloroethene	ND < 0.5	ND < 0.5	NT	NT	NT	ND < 0.5
Methylene chloride	ND < 0.5	ND < 0.5	NT	NT	NT	ND < 0.5
1,1,1-trichloroethane	ND < 0.5	ND < 0.5	NT	NT	NT	ND < 0.5
1,2-dichloroethane	ND < 0.5	ND < 0.5	NT	NT	NT	ND < 0.5
Chloroform	ND	ND	NT	NT	NT	2.8
Bromodichloromethane	ND	ND	NT	NT	NT	1.1
All other 8010 compounds	ND	ND	NT	NT	NT	ND

 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

April 3, 1990

- 4 1990

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

Re: PRP 09382.039.02
PACE Project Number 400301.503

In response to your questions regarding Harding Lawson Associates sample number 90094004 (PACE sample number 721790) the sample data was rechecked. It was discovered that the presence of 1,2-Dichloroethane (EDC) had been confirmed, but that as a result of a data entry error it did not get recorded on the sample data report sheet.

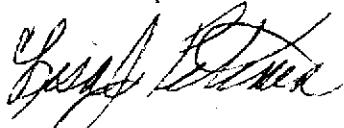
PACE apologizes for the error and regrets any inconvenience this may have caused you. Harding Lawson Associates will not be charged for the analysis of this sample by EPA Method 8010.

We also checked this sample to determine what was causing matrix interference in the EDB analysis. This sample was foot noted on the raw data sheets as being very dirty and was therefore diluted. Interference was seen throughout the sample chromatogram which made it impossible to detect EDB at the normal detection limit.

We have changed the wording of the footnote on the revised report dated March 30, 1990 to read "Sample dilution required for analysis due to matrix components." I believe this is a better explanation of the interference which was encountered.

If you have any further questions, please feel free to contact me.

Sincerely,
PACE Incorporated



Lisa J. Petersen
Project Manager

LJP154/jlh

March 30, 1990

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

RE: PACE Project No. 400301.503
PRP 09382.039.02

Dear Mr. Leland:

Enclosed is the report of laboratory analyses for samples received
March 01, 1990.

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

Sincerely,

Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

March 30, 1990
PACE Project
Number: 400314507

Attn: Mr. David Leland

PRP Monitoring

PACE Sample Number:

Date Collected:

Date Received:

Parameter

Units

MDL

EFFLUENT

728240

03/14/90

03/14/90

90110001

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):

Total Purgeable Fuels, as Gasoline mg/L 0.05 ND

PURGEABLE AROMATICS (BTXE BY EPA 8020):

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

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

Carbon Tetrachloride ug/L 0.5 ND

1,2-Dichloroethane (EDC) ug/L 0.5 1.4

Trichloroethene (TCE) ug/L 0.5 ND

1,2-Dichloropropane ug/L 0.5 ND

Bromodichloromethane ug/L 0.5 ND

2-Chloroethylvinyl ether ug/L 0.5 ND

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

Mr. David Leland
Page 2

March 30, 1990
PACE Project
Number: 400314507

PRP Monitoring

PACE Sample Number: 728240
Date Collected: 03/14/90
Date Received: 03/14/90
Parameter Units MDL 90110001

ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

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)			117%
1,4-Dichlorobutane (Surrogate Recovery)			130%
1,2-DIBROMOETHANE (EDB) EPA METHOD 504			
1,2-Dibromoethane	ug/L	0.02	0.2
Date Extracted			03/19/90

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 supervision.

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

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

CHAIN OF CUSTODY FORM

Lab. PAKES 1-4-00

Job Number: 9382 05702
 Name/Location: PRP Monitoring
 Project Manager: D. Ireland

Samplers: Robert L. Nelson
 Recorder: Robert L. Nelson
 (Signature Required)

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.			SAMPLE NUMBER OR LAB NUMBER			DATE				
	Water	Sediment	Soil	Oil	Unpres.	H ₂ SO ₄	HNO ₃	HCL	Yr	Wk	Seq	Yr	Mo	Dy	Time
10	X				4		3		90	1	0001	90	3	17	16:25

STATION DESCRIPTION/NOTES
PAGE # 72824

ANALYSIS REQUESTED	
EPA 601/8010	
EPA 602/8020	
EPA 624/8240	
EPA 625/8270	
Priority Pllmt. Metals	
Benzene/Toluene/Xylene	<input checked="" type="checkbox"/>
Total Petrol. Hydrocarb.	<input checked="" type="checkbox"/>
<u>8010 TPH for Gasoline</u>	
<u>EDB by 501</u>	

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						4/2
						STD

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>Robert L. Nelson</u>	RECEIVED BY: (Signature)	DATE/TIME
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)	DATE/TIME	RECEIVED FOR LAB BY: (Signature) <u>3/14/90</u> 1800
METHOD OF SHIPMENT <u>PAGE</u>		

DISTRIBUTION

REPORT OF SYSTEM MONITORING
MARCH 1990
DEWATERING EFFLUENT TREATMENT SYSTEM
CHINATOWN REDEVELOPMENT PROJECT AREA
OAKLAND, CALIFORNIA
April 18, 1990

Copy No. 4

		<u>Copy No.</u>
1 copy:	California Regional Water Quality Control Board San Francisco Bay Region 1800 Harrison Street, Suite 700 Oakland, California 94607 Attention: Mr. Don Dalke	1
2 copies:	City of Oakland Redevelopment Agency One City Hall Plaza Oakland, California 94612 Attention: Mr. Peter Chen	2-3
1 copy:	Alameda County Department of Environmental Health 80 Swan Way, Room 200 Oakland, California 94621 Attention: Mr. Lowell Miller	4
1 copy:	Job File	5
1 copy:	QC/Bound Report File	6

LOH/DFL/ld/LOH793-R

QUALITY CONTROL REVIEWER

Tamara L. Williams
Tamara L. Williams
Geologist - 3954