Maintenance Yard

AMERICAN
ENVIRONMENTAL MANAGEMENT CORP.

Please Refer to:
AEMC Job No. 81980

4 January 1990

Mr. Dave Wells
San Francisco Department of Public Health
101 Grove Street
San Francisco, California 94102

RE: REMOVAL OF OIL AND GREASE CONTAMINATED SOILS AND CONFORMATION SAMPLING AND ANALYSIS AT THE SUNOL FACILITY, SUNOL, CALIFORNIA

Dear Mr. Wells:

American Environmental Management Corporation (AEMC) was retained by the San Francisco Department of Public Health (SFDPH) to assist in the field activities at the Sunol Facility in Sunol, California (see Site Location Map - Figure 1) by providing a California Registered Geologist to supervise the excavation which was being conducted by the City and County of San Francisco. This letter report discusses the activities which occurred at the Sunol site and it presents the analytical results from samples obtained during the field activities. AEMC coordinated all field and analytical activities with SFDPH. Photos of the activities are found in Appendix B.

EXCAVATION AND SOIL SAMPLING

On 15 November 1989, The City and County of San Francisco excavated and [illegible] on [illegible]teen, approximately 60 cubic yards of oil and grease contaminated soil to be bio-remediated over the next several months. During and upon completion of the excavation, samples were taken from the site to verify the concentrations of the material in the worst area as well as confirmation sampling to show that the contaminated soils had been removed.

On or about 30 November 1989, an additional 1½ to 2 feet of material near the storage shed was removed from the excavation due to the laboratory results, dated 29 November 1989, which showed a TPH concentration of 290 parts per million (ppm).

Sample Sunol No. 1 was taken from the sidewall just under the foundation of the storage shed where the greatest contamination appeared to occur. This sample provides the constituents and their concentrations of what had been dumped in the area. This area located near the southeast corner of the storage shed was used as an unlined sump where the waste oil and grease was disposed of.

The remainder of the sampling was conducted for conformation purposes and their locations are found on Figure 2.

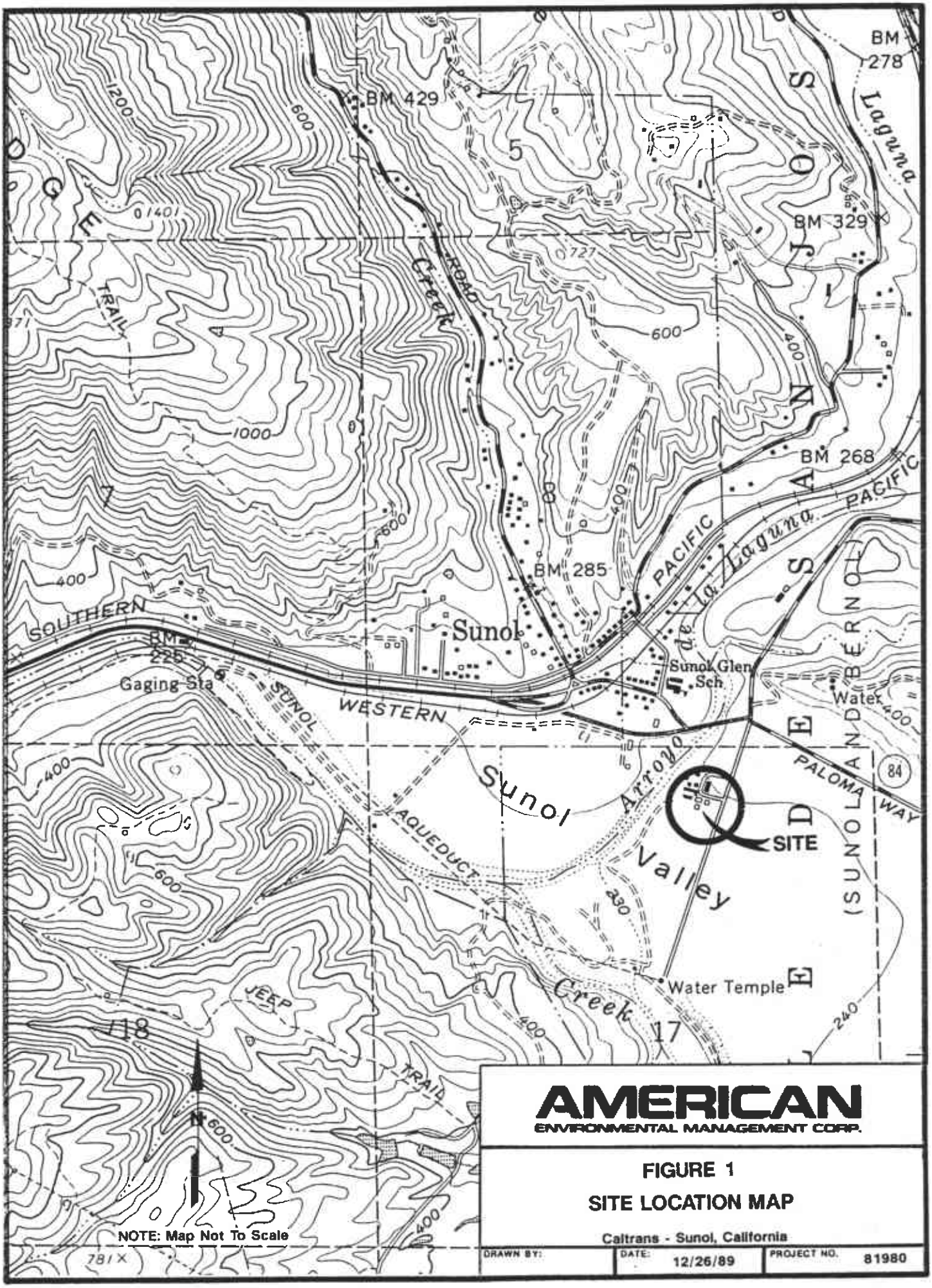

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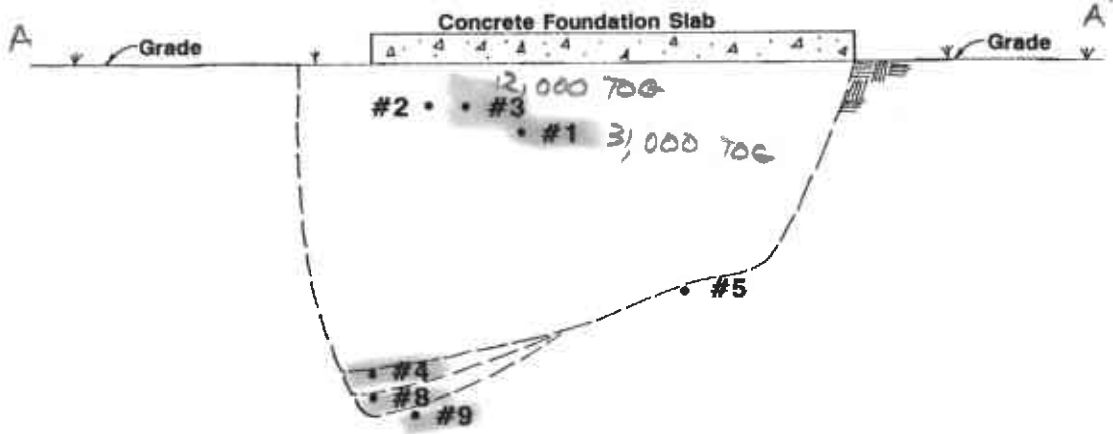
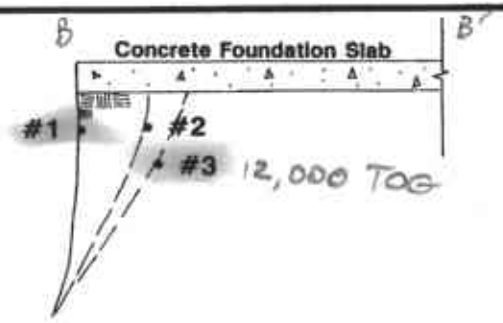
FIGURE 1
SITE LOCATION MAP

Caltrans - Sunol, California

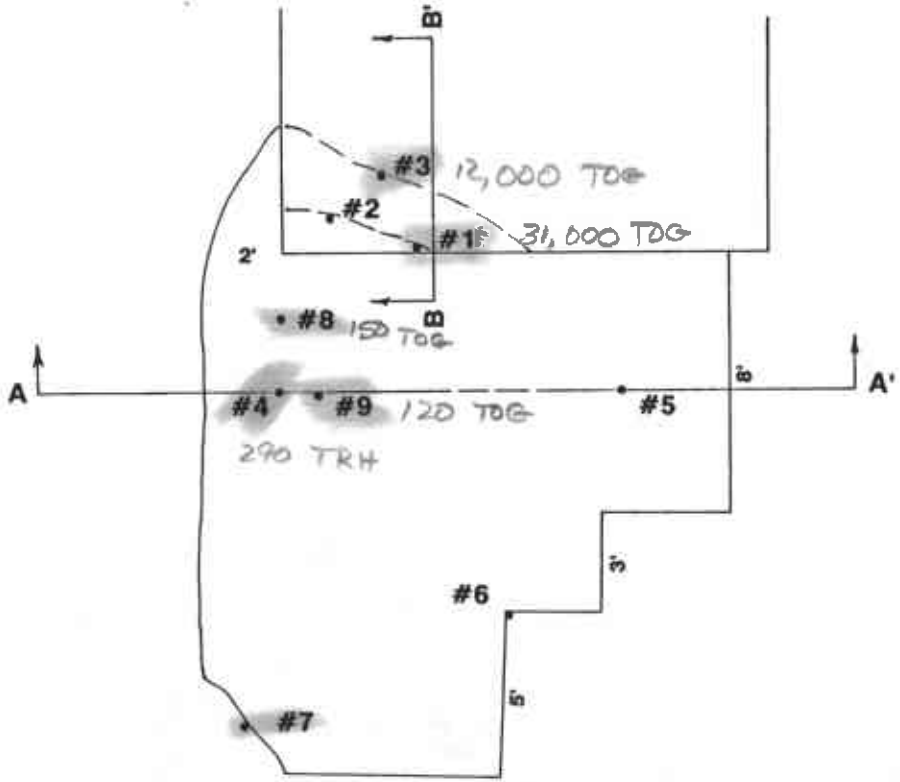
DRAWN BY:	DATE: 12/26/89	PROJECT NO. 81980



SECTION A - A'



SECTION B - B'



PLAN VIEW

N

NOTE: Drawing Not To Scale

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FIGURE 2

SAMPLE LOCATION MAP

San Francisco Department of Public Health

DRAWN BY:	DATE:	PROJECT NO.
JAV	12/22/89	81980

SFDPH personnel used the following procedures for collecting the soil samples from the excavation:

> Samples Sunol No. 1, 2, and 3 were taken from the side wall when the excavation was less than 5 feet deep.
>
> Samples Sunol No. 4, 5, 6, 7, 8, and 9 were taken from the side wall and bottom of the excavation with the backhoe bucket.
>
> All sampling was taken from the native soils using brass tubes. The sampling tube was driven into the soil with a rubber mallet. The tube was then removed full of soil, the ends covered with aluminum foil, capped with plastic end caps, sealed with black electrical tape and labeled. Once the sample had been sealed and labeled, it was then stored on ice. The samples were logged on a Sample Management/Chain-of-Custody form and taken the same day to Sacramento where on the next day, 16 November 1989, the samples were taken to AEMC's California Certified Laboratory for analysis.

The soils in the area of the excavation are as follows:

0'-4.5'	Clayey Silt, moderately plastic, firm, 5-15% very fine sand, moist, medium brown but darker where high oil and grease saturation exists. ML-CH.
4.5'-7.5'	Silty Sand, slightly plastic, 10-20% clay, well graded, very fine to fine grained, moist, yellowish brown. SW-ML.

LABORATORY ANALYSIS

The soils were analyzed for four basic contaminants, Volatile Organics - Method EPA 8240, Oil and Grease - Method EPA 9071, Total Recoverable Hydrocarbons - Method EPA 418.1, and four metals, Cadmium, Chromium, Lead, and Zinc. The results of the laboratory analysis tested on 20 September, 20 November, and 1 December 1989 are found in Appendix A.

A brief analysis of the results are as follows:

> The Volatile Organic analysis was conducted on 20 September 1989 by Curtis & Tompkins, Ltd for the City and County of San Francisco. AEMC also tested for the Volatile Organics on 22 November 1989 and since the results of the AEMC analysis was higher, comments on that analysis are as follows:
>
> The concentrations of both confirmation samples were below the reporting limit, hence all volatile organics have been removed. Sample No. 1, taken to evaluate what was there as well as what was to go into the bioremediation project, has the following constituents and their concentrations as listed in the following table.

~~Early~~ AEMC data

Curtis & Tompkins

COMPOUND	CONCENTRATION (ppb)	(ppm)	TDL (ppb)	TLV (ppm)	
1,1-Dichloroethane	400	0.4	1,000	none	0.4
Ethylbenzene	320	0.3	29,999	100	0.32
Tetrachloroethene	3,200	3.2	170	50	2.3
Toluene	910	1.0	100,000	100	0.69
1,1,1-Trichloroethane	740	0.75	200,000	350	0.57
Xylenes, total	2,300	2.3	620,000	100	3.2

0.037 benzene

The concentrations of 1,1-DCA, Ethylbenzene, Tetrachloroethen, Toluene, 1,1,1-Trichloroethane, and total Xylenes are not considered hazardous to preclude conducting bioremediation. In addition, the concentrations can be considered insignificant with respect to impacting local air quality.

The concentrations of oil and grease were nondetectable in the confirmation sampling except in sample Sunol No. 3 which was taken beneath the foundation of the storage shed. The total recoverable hydrocarbons found in samples Sunol No. 4, 8, and 9 can be a combination of oil and grease and other organics such as plant life, animal or other decayed material. However, since Sunol No. 5 and 6 were nondetectable, we can assume that the oil and grease constituent is the likely choice.

The metals analysis as seen in Appendix A shows some variation from sample location to location; however, all metals detected are below each metal's respective TTLC value. Therefore, the metal concentrations are not considered a hazardous waste and should cause little or no concern in the bioremediation process for final disposition.

CONCLUSIONS

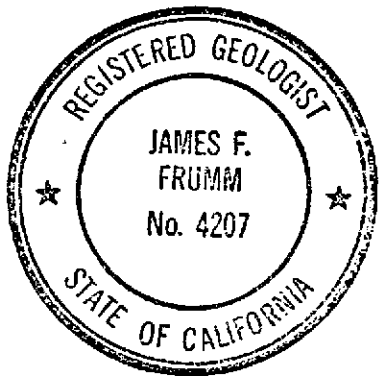
Based on the results of the laboratory analysis, there are only two areas that may require additional excavation. The area under the existing storage shed still has high concentrations of oil and grease as well as potential volatile organic compounds and should be removed. It my understanding that the storage shed is scheduled for removal sometime in 1990 and that the SFDPH will remove the contaminated soil at that time. The concentrations of total recoverable hydrocarbons of 120 ppm and 150 ppm may be above the Alameda County allowable limits and may be required to be removed at the same time the soils below the storage shed are taken care of.

Field sampling and laboratory services utilize equipment, methods, and QA/QC procedures in strict compliance with the procedures established by both the State of California and the San Francisco Department of Health.

Should you have any questions regarding this report, please do not hesitate to call me at (916) 364-8872.

Sincerely,

James F. Frumm



James F. Frumm, R.G., R.E.A.
Regional Manager
Engineering Division

JFF/scg
r1csf-01(jf-2)

Enclosures

initial sample?

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 18291-1
CLIENT: SAN FRANCISCO DEPARTMENT OF HEALTH
SAMPLE ID: SUNOL

DATE RECEIVED: 09/18/89
DATE ANALYZED: 09/20/89
DATE REPORTED: 09/22/89

EPA METHOD 8240: VOLATILE ORGANICS IN SOILS & WASTES

COMPOUND	Result ug/kg	Detection Limit ug/kg
chloromethane	ND	50
bromomethane	ND	50
vinyl chloride	ND	50
chloroethane	ND	50
methylene chloride	ND	25
trichlorofluoromethane	ND	25
1,1-dichloroethene	ND	25
1,1-dichloroethane	400	25
trans-1,2-dichloroethene	ND	25
chloroform	ND	25
1,2-dichloroethane	ND	25
1,1,1-trichloroethane	570	25
carbon tetrachloride	ND	25
bromodichloromethane	ND	25
1,2-dichloropropane	ND	25
cis-1,3-dichloropropene	ND	25
trichloroethylene	ND	25
dibromochloromethane	ND	25
1,1,2-trichloroethane	ND	25
benzene	37	25
trans-1,3-dichloropropene	ND	25
2-chloroethylvinyl ether	ND	50
bromoform	ND	25
1,1,2,2-tetrachloroethane	ND	25
tetrachloroethylene	2,300	25
toluene	690	25
chlorobenzene	ND	25
ethyl benzene	320	25

Non-Priority Hazardous Pollutant Substances List Compounds

acetone	ND	50
carbon disulfide	ND	25
2-butanone	ND	50
vinyl acetate	ND	50
2-hexanone	ND	50
4-methyl-2-pentanone	690	50
styrene	ND	25
total xylenes	3,200	25

QA/QC SUMMARY: SURROGATE RECOVERIES	
1,2-Dichloroethane-d4	98
Toluene-d8	108
Bromofluorobenzene	90

AMERICAN
ENVIRONMENTAL MANAGEMENT CORP.
ANALYTICAL SERVICES

11/30/89

AEMC
11855 White Rock Road
Rancho Cordova, CA 95670

Attn: J. Frumm

Re: Project: City & Cty. of S.F./Sunol
AEMC Lab Reference No.: L4016 Job No.: 81980
Date Samples Received: 11/16/89
No. Samples Received: 7 Soils samples

The above referenced samples were analyzed as follows:

No. of Samples	Analysis
3	Volatile Organics
4	Oil & Grease
4	Cd, Cr, Pb, Zn
3	Total Recoverable Hydrocarbons
25	Brass Tubes
2	Poly Sheeting

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

Michael Gray — for GH

George Hampton
Laboratory Director

11855 White Rock Road, Rancho Cordova, California 95670 / (916) 985-6666

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ANALYTICAL SERVICES

ANALYSIS REPORT: Oil & Grease, EPA Method 9071

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova, CA 95742

P.O/Contract No.:
Contact: J. Frumm
Phone:

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/20/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Matrix: Soil
Sample Location:

AEMC I.D.: L4016

AEMC I.D.	Client I.D.	Total Oil & Grease (mg/kg)	Reporting Limit (mg/kg)
L4016-1	Sunol #1	31,000	100
L4016-2	Sunol #2	ND	100
L4016-3	Sunol #3	12,000	100
L4016-7	Sunol #7	ND	100

ND = Not Detected at or above indicated Reporting Limit.

11855 White Rock Road, Rancho Cordova, California 95670 / (916) 985-6666

AMERICAN
ENVIRONMENTAL MANAGEMENT CORP.
ANALYTICAL SERVICES

ANALYSIS REPORT: Oil & Grease, EPA Method 9071

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova, CA 95742

P.O/Contract No.:
Contact: J. Frumm
Phone:

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/20/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Matrix: Soil
Sample Location:

AEMC I.D.: L4016

AEMC I.D.	Client I.D.	Total Oil & Grease (Recovery)
L4016-MS	Batch 4755 M Spike	74%
L4016-MSD	Batch 4755 M Spike D	82%

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ANALYSIS REPORT: Total Recoverable Hydrocarbons, EPA Method 418.1

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova, CA 95742

P.O/Contract No.:
Contact: J. Frumm
Phone:

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/20/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Matrix: Soil
Sample Location:

AEMC I.D.: L4016

Client Sample I.D.	AEMC I.D.	Total Recoverable Hydrocarbons (mg/kg)	Reporting Limit (mg/kg)
Sunol #4	L4016-4	290	10
Sunol #5	L4016-5	ND	10
Sunol #6	L4016-6	ND	10

ND = Not Detected at or above indicated Reporting Limit.

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ANALYTICAL SERVICES

ANALYSIS REPORT: Total Recoverable Hydrocarbons, EPA Method 418.1

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova, CA 95742

P.O/Contract No.:
Contact: J. Frumm
Phone:

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/20/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Matrix: Soil
Sample Location:

AEMC I.D.: L4016

Client Sample I.D.	AEMC I.D.	Total Recoverable Hydrocarbons (Recovery)
Batch 4766 M Spike	L4016-MS	101%
Batch 4766 M Spike D	L4016-MSD	96%

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ANALYTICAL SERVICES

ANALYSIS REPORT: Cadmium, Chromium, Lead and Zinc, TTLC

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova CA 95670

P.O./Contract No.:
Contact: J. Frumm
Phone: (916) 985-6666

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/24/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Client Sample I.D.: Sunol #1
Sample Location:

AEMC I.D.: L4016-1
Matrix: Soil

Element/Analysis	Results mg/kg	R.L.* mg/kg	Method
Cd (Cadmium)	ND	1.0	6010
Cr (Chromium - total)	73	5.0	6010
Pb (Lead)	42	5.0	6010
Zn (Zinc)	72	5.0	6010

* R.L. = Reporting Limit
ND = Not Detected at or above indicated Reporting Limit.

>8911280831<

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ENVIRONMENTAL MANAGEMENT CORP.
ANALYTICAL SERVICES

ANALYSIS REPORT: Cadmium, Chromium, Lead and Zinc, TTLC

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova CA 95670

P.O./Contract No.:
Contact: J. Frumm
Phone: (916) 985-6666

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/24/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Client Sample I.D.: Sunol #4
Sample Location:

AEMC I.D.: L4016-4
Matrix: Soil

Element/Analysis	Results mg/kg	R.L.* mg/kg	Method
Cd (Cadmium)	ND	1.0	6010
Cr (Chromium - total)	79	5.0	6010
Pb (Lead)	11	5.0	6010
Zn (Zinc)	45	5.0	6010

* R.L. = Reporting Limit
ND = Not Detected at or above indicated Reporting Limit.

>8911280831<

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ENVIRONMENTAL MANAGEMENT CORP.
ANALYTICAL SERVICES

ANALYSIS REPORT: Cadmium, Chromium, Lead and Zinc, TTLC

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova CA 95670

P.O./Contract No.:
Contact: J. Frumm
Phone: (916) 985-6666

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/24/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Client Sample I.D.: Sunol #5
Sample Location:

AEMC I.D.: L4016-5
Matrix: Soil

Element/Analysis	Results mg/kg	R.L.* mg/kg	Method
Cd (Cadmium)	ND	1.0	6010
Cr (Chromium - total)	81	5.0	6010
Pb (Lead)	14	5.0	6010
Zn (Zinc)	41	5.0	6010

* R.L. = Reporting Limit
ND = Not Detected at or above indicated Reporting Limit.

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ENVIRONMENTAL MANAGEMENT CORP.
ANALYTICAL SERVICES

ANALYSIS REPORT: Cadmium, Chromium, Lead and Zinc, TTLC

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova CA 95670

P.O./Contract No.:
Contact: J. Frumm
Phone: (916) 985-6666

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/24/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Client Sample I.D.: Sunol #7
Sample Location:

AEMC I.D.: L4016-7
Matrix: Soil

Element/Analysis	Results mg/kg	R.L.* mg/kg	Method
Cd (Cadmium)	ND	1.0	6010
Cr (Chromium - total)	86	5.0	6010
Pb (Lead)	18	5.0	6010
Zn (Zinc)	45	5.0	6010

* R.L. = Reporting Limit
ND = Not Detected at or above indicated Reporting Limit.

>8911280831<

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ENVIRONMENTAL MANAGEMENT CORP.
ANALYTICAL SERVICES

ANALYSIS REPORT: Cadmium, Chromium, Lead and Zinc, TTLC

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova, CA 95742

P.O/Contract No.:
Contact: J. Frumm
Phone: (916) 985-6666

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/24/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Matrix: Soil
Batch: 50135

AEMC I.D.: L4016

COMPOUND	%Recovery Matrix Spike	%Recovery Matrix Spike Dup.	Method
Cd (Cadmium)	86%	96%	6010
Cr (Chromium - total)	105%	93%	6010
Pb (Lead)	124%	94%	6010
Zn (Zinc)	114%	90%	6010

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ANALYTICAL SERVICES

ANALYSIS REPORT: Purgeable Organic Compounds, EPA Method 8240

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova, CA 95742

P.O/Contract No.:
Contact: J. Frumm
Phone:

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/22/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Client Sample I.D.: **Sunol #1**
Sample Location:

AEMC I.D.: L4016-1
Matrix: Soil

COMPOUND	CAS #	CONCENTRATION (ug/kg)	REPORTING LIMIT (ug/kg)
Acetone	67-64-1	ND	4000
Benzene	71-43-2	ND	200
Bromodichloromethane	75-27-4	ND	200
Bromoform	75-25-2	ND	200
Bromomethane	74-83-9	ND	400
2-Butanone	78-93-3	ND	4000
Carbon disulfide	75-15-0	ND	200
Carbon tetrachloride	56-23-5	ND	200
Chlorobenzene	108-90-7	ND	200
Chloroethane	75-00-3	ND	200
2-Chloroethyl vinyl ether	110-75-8	ND	2000
Chloroform	67-66-3	ND	200
Chloromethane	74-87-3	ND	400
Dibromochloromethane	124-48-1	ND	200
1,1-Dichloroethane	75-34-3	400	200
1,2-Dichloroethane	107-06-2	ND	200
1,1-Dichloroethene	75-35-4	ND	200
1,2-Dichloroethene, total	540-59-0	ND	200
1,2-Dichloropropane	78-87-5	ND	200
cis-1,3-Dichloropropene	10061-01-5	ND	200
trans-1,3-Dichloropropene	10061-02-6	ND	200
Ethylbenzene	100-41-4	320	200
2-Hexanone	591-78-6	ND	2000
Methylene chloride	75-09-2	ND	200
4-Methyl-2-pentanone	108-10-1	ND	2000
Styrene	100-42-5	ND	200
1,1,2,2-Tetrachloroethane	79-34-5	ND	200
Tetrachloroethene	127-18-4	3200	200
Toluene	108-88-3	910	200
1,1,1-Trichloroethane	71-55-6	740	200
1,1,2-Trichloroethane	79-00-5	ND	200
Trichloroethene	79-01-6	ND	200
Vinyl acetate	108-05-4	ND	2000
Vinyl chloride	75-01-4	ND	400
Xylenes, total	----	2300	400
1,3-Dichlorobenzene	541-73-1	ND	200
1,4-Dichlorobenzene	106-46-1	ND	200
1,2-Dichlorobenzene	95-50-1	ND	200

ND = Not Detected at or above indicated Reporting Limit

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ENVIRONMENTAL MANAGEMENT CORP.
ANALYTICAL SERVICES

ANALYSIS REPORT: Purgeable Organic Compounds, EPA Method 8240

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova, CA 95742

P.O/Contract No.:
Contact: J. Frumm
Phone:

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/22/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Client Sample I.D.: Sunol-#4
Sample Location:

AEMC I.D.: L4016-4
Matrix: Soil

COMPOUND	CAS #	CONCENTRATION (ug/kg)	REPORTING LIMIT (ug/kg)
Acetone	67-64-1	ND	4000
Benzene	71-43-2	ND	200
Bromodichloromethane	75-27-4	ND	200
Bromoform	75-25-2	ND	200
Bromomethane	74-83-9	ND	400
2-Butanone	78-93-3	ND	4000
Carbon disulfide	75-15-0	ND	200
Carbon tetrachloride	56-23-5	ND	200
Chlorobenzene	108-90-7	ND	200
Chloroethane	75-00-3	ND	200
2-Chloroethyl vinyl ether	110-75-8	ND	2000
Chloroform	67-66-3	ND	200
Chloromethane	74-87-3	ND	400
Dibromochloromethane	124-48-1	ND	200
1,1-Dichloroethane	75-34-3	ND	200
1,2-Dichloroethane	107-06-2	ND	200
1,1-Dichloroethene	75-35-4	ND	200
1,2-Dichloroethene, total	540-59-0	ND	200
1,2-Dichloropropane	78-87-5	ND	200
cis-1,3-Dichloropropene	10061-01-5	ND	200
trans-1,3-Dichloropropene	10061-02-6	ND	200
Ethylbenzene	100-41-4	ND	200
2-Hexanone	591-78-6	ND	2000
Methylene chloride	75-09-2	ND	200
4-Methyl-2-pentanone	108-10-1	ND	2000
Styrene	100-42-5	ND	200
1,1,2,2-Tetrachloroethane	79-34-5	ND	200
Tetrachloroethene	127-18-4	ND	200
Toluene	108-88-3	ND	200
1,1,1-Trichloroethane	71-55-6	ND	200
1,1,2-Trichloroethane	79-00-5	ND	200
Trichloroethene	79-01-6	ND	200
Vinyl acetate	108-05-4	ND	2000
Vinyl chloride	75-01-4	ND	400
Xylenes, total	----	ND	400
1,3-Dichlorobenzene	541-73-1	ND	200
1,4-Dichlorobenzene	106-46-1	ND	200
1,2-Dichlorobenzene	95-50-1	ND	200

ND = Not Detected at or above indicated Reporting Limit

AMERICAN
ENVIRONMENTAL MANAGEMENT CORP.
ANALYTICAL SERVICES

ANALYSIS REPORT: Purgeable Organic Compounds, EPA Method 8240

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova, CA 95742

P.O/Contract No.:
Contact: J. Frumm
Phone:

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/22/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Client Sample I.D.: [redacted]
Sample Location:

AEMC I.D.: L4016-7
Matrix: Soil

COMPOUND	CAS #	CONCENTRATION (ug/kg)	REPORTING LIMIT (ug/kg)
Acetone	67-64-1	ND	4000
Benzene	71-43-2	ND	200
Bromodichloromethane	75-27-4	ND	200
Bromoform	75-25-2	ND	200
Bromomethane	74-83-9	ND	400
2-Butanone	78-93-3	ND	4000
Carbon disulfide	75-15-0	ND	200
Carbon tetrachloride	56-23-5	ND	200
Chlorobenzene	108-90-7	ND	200
Chloroethane	75-00-3	ND	200
2-Chloroethyl vinyl ether	110-75-8	ND	2000
Chloroform	67-66-3	ND	200
Chloromethane	74-87-3	ND	400
Dibromochloromethane	124-48-1	ND	200
1,1-Dichloroethane	75-34-3	ND	200
1,2-Dichloroethane	107-06-2	ND	200
1,1-Dichloroethene	75-35-4	ND	200
1,2-Dichloroethene, total	540-59-0	ND	200
1,2-Dichloropropane	78-87-5	ND	200
cis-1,3-Dichloropropene	10061-01-5	ND	200
trans-1,3-Dichloropropene	10061-02-6	ND	200
Ethylbenzene	100-41-4	ND	200
2-Hexanone	591-78-6	ND	2000
Methylene chloride	75-09-2	ND	200
4-Methyl-2-pentanone	108-10-1	ND	2000
Styrene	100-42-5	ND	200
1,1,2,2-Tetrachloroethane	79-34-5	ND	200
Tetrachloroethene	127-18-4	ND	200
Toluene	108-88-3	ND	200
1,1,1-Trichloroethane	71-55-6	ND	200
1,1,2-Trichloroethane	79-00-5	ND	200
Trichloroethene	79-01-6	ND	200
Vinyl acetate	108-05-4	ND	2000
Vinyl chloride	75-01-4	ND	400
Xylenes, total	----	ND	400
1,3-Dichlorobenzene	541-73-1	ND	200
1,4-Dichlorobenzene	106-46-1	ND	200
1,2-Dichlorobenzene	95-50-1	ND	200

ND = Not Detected at or above indicated Reporting Limit

AMERICAN
ENVIRONMENTAL MANAGEMENT CORP.
ANALYTICAL SERVICES

ANALYSIS REPORT: Purgeable Organic Compounds, EPA Method 8240

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova, CA 95742

P.O/Contract No.:
Contact: J. Frumm
Phone:

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/22/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Client Sample I.D.: Batch 4761 M Spike
Sample Location:

AEMC I.D.: L4016-MS
Matrix: Soil

COMPOUND	CAS #	CONCENTRATION (Recovery)
Benzene	71-43-2	108%
Chlorobenzene	108-90-7	91%
1,1-Dichloroethene	75-35-4	103%
Toluene	108-88-3	115%
Trichloroethene	79-01-6	101%

AMERICAN
ENVIRONMENTAL MANAGEMENT CORP.
ANALYTICAL SERVICES

ANALYSIS REPORT: Purgeable Organic Compounds, EPA Method 8240

CLIENT: AEMC
11855 White Rock Road
Rancho Cordova, CA 95742

P.O/Contract No.:
Contact: J. Frumm
Phone:

Project: City & Cty. of S.F./Sunol
Date Samples Received: 11/16/89
Date Analysis Completed: 11/22/89

AEMC Contact: J. Frumm
Job No.: 81980
SMR Log No.: 20140

Client Sample I.D.: Batch 4761 M Spike D
Sample Location:

AEMC I.D.: L4016-MSD
Matrix: Soil

COMPOUND	CAS #	CONCENTRATION (Recovery)
Benzene	71-43-2	108%
Chlorobenzene	108-90-7	88%
1,1-Dichloroethene	75-35-4	104%
Toluene	108-88-3	112%
Trichloroethene	79-01-6	99%

AMERICAN ENVIRONMENTAL MANAGEMENT CORP.

CHAIN OF CUSTODY

L4016
LOG NO. 20140

CLIENT NAME: CITY AND COUNTY OF SAN FRANCISCO
ADDRESS: 101 Grove St. Room 207
San Francisco, CA 94102
PROJECT NAME: Sunol (Waste oil cleanup)
PROJECT MANAGER: Dave Wells PHONE # (415) 554-2796
SAMPLED BY: J. Rapp, D. Wells
JOB DESCRIPTION: cleanup of ground
SITE LOCATION: 505 Paloma Way
Sunol, CA

CLIENT JOB NUMBER: 8 19.80

DESTINATION LABORATORY:
- [X] AETC 3249 FITZGERALD RD. RANCHO CORDOVA, CA. 95670
- [ ] OTHER

PRESERVATIVES

ANALYSIS REQUESTED: ~~8240~~ 8246; 9070; 9071; Total Lead Cd. Co. Zn

FIELD CONDITIONS: Clear, cool (70°) Sunny (mostly)

COMPOSITE:

SPECIAL INSTRUCTIONS:

DATE	TIME	SAMPLE IDENTIFICATION	DEPTH	METHOD	TYPE	CONTAINER NO.	CONTAINER TYPE	~~8240~~ 8246	9070	9071	Total Lead Cd. Co. Zn	TURN AROUND TIME: 24 HOURS	48 HOURS	1 WEEK	2 WEEKS	NOTE / FIELD READINGS
11-15-89	9:55 A	Sunol #1	2'(SW)	Drive TUBE	SOIL	1	BRASS TUBE	X	X	X	X				X	Det. Limit 100 9070 9071
	10:30 A	Sunol #2	1.5(SW)	"	"	1	"		X	X					X	" " "
	1:45 P	Sunol #3	1.5(SW)	"	"	1	"		X	X					X	" " "
	2:40 P	Sunol #4	7.0-7.5'	"	"	1	"	X	X	X	X				X	Det. Limit 5-2 9070 9071
	2:45 P	Sunol #5	6.0-6.5'	"	"	1	"		X	X	X				X	" " "
	3:00 P	Sunol #6	3.0 (SW)	"	"	1	"		X	X					X	" " "
	3:10 P	Sunol #7	4.5(SW)	"	"	1	"	X	X	X	X				X	" " "

SUSPECTED CONSTITUENTS

SAMPLE RETENTION TIME

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	REMARKS
David Wells	11-15-89/3:45	J. Frumm	11-15-89/3:45	
Jenny Frumm	11-16-89 1:06	J. McIntosh	11-16-89 1306	
John McIntosh	11-16-89-1455	Mike Weitzel	11-16-89 1450	

PRESERVATIVES:
(1) HCL
(2) HNO_3
(3) = COLD
(4)

LAB TO SEND RESULTS TO:
Dave Wells — ORIGINAL
J. FRUMM — COPY

SHIPPED VIA: [ ] FED X [ ] UPS [X] OTHER Courier. AIRBILL #

Curtis & Tompkins, Ltd.

LAB NUMBER: 18826
CLIENT: S.F. HEALTH DEPT.

DATE RECEIVED: 11/30/89
DATE ANALYZED: 12/01/89
DATE REPORTED: 12/04/89

ANALYSIS: OIL AND GREASE
METHOD: SMWW 503E

LAB ID	SAMPLE ID	RESULT	UNITS	DETECTION LIMIT
18826-1	SUNOL #8	150	mg/Kg	50
18826-2	SUNOL #9	120	mg/Kg	50

QA/QC SUMMARY

RPD, %	9
RECOVERY, %	88

Photo 1. Looking north at the general excavation area just east of storage shed.

Photo 2. Photo showing co inated soil (dark gray) directly below the storage shed.

Photo 3. Bottom of excavation at north end showing light colored (uncontaminated) soils where conformation sample Sunol No. 5 was taken.

Photo 4. Photo looking east from the excavation area at the area where bio-remediation will take place.

Photo 5. Mixture of contaminated soil and non-contaminated soil to be placed on treatment site.

Photo 6. Cut exposure along storage shed where sample Sunol No. 1 was taken.

Photo 7. Excavation of contaminated soils near center of pit.

Photo 8. Excavation of material around the south east corner of the storage shed.

Photo 9. Excavating in area where sample Sunol No.4 was taken.

Photo 10. Exposed contaminated soil in southeast portion of the excavation.

Photo 11. SFDPH engineer taking conformation soil sample, Sunol No.4, in brass tube from soil in south end of excavation.

Photo 12. Contaminated soil being placed on visqueen for bio-remediation process on-site.