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SOIL CLEAN-UP REPORT
FOR
1829 CLEMENT AVENUE
ALAMEDA, CALIFORNIA

Kaldveer Associates
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July 18, 1990
KE1179-1, 16314

Mr. Loren Smith
3527 Magnolia Drive
Alameda, California 94501

RE: SOIL CLEAN-UP REPORT
1829 CLEMENT AVENUE
ALAMEDA, CALIFORNIA

Dear Mr. Smith:

Kaldveer Associates is pleased to submit our soil clean-up report for the property at 1829 Clement Avenue, in Alameda, California. The enclosed report contains a description of our investigation, results of soil sample analyses, and our conclusions regarding clean-up of contaminated soils at the site.

We appreciate the opportunity to provide services to you on this project and trust this report meets your needs at this time. If you have any questions or require additional information, please don't hesitate to call.

Very truly yours,

KALDVEER ASSOCIATES, INC.

Dennis Laduzinsky, C.E.G.
Senior Engineering Geologist

David F. Hoexter, C.E.G./R.E.A.
Environmental/Geological Services
Associate

DL/DFH:pv
Copies: Addressee (4)
Alameda County Department of Environmental Health (2)
Attention: Mr. Ariu Levi
Alameda Marina (1)
Attention: Mr. Wayne Milani

SOIL CLEAN-UP REPORT

For
1829 CLEMENT AVENUE
ALAMEDA, CALIFORNIA

To
Mr. Loren Smith
3527 Magnolia Drive
Alameda, California

By

KALDVEER ASSOCIATES, INC.

Dennis Laduzinsky, C.E.G.
Senior Engineering Geologist

David F. Hoexter, C.E.G./R.E.A.
Environmental/Geological Services
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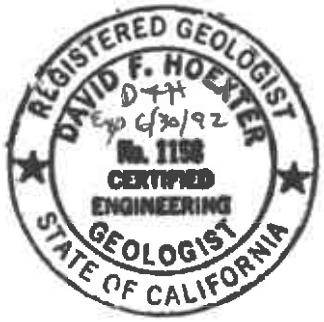
July, 1990



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SOIL CLEAN-UP REPORT
FOR
1829 CLEMENT AVENUE
ALAMEDA, CALIFORNIA

I. INTRODUCTION

This report presents the results of a contaminated soil clean-up program performed at 1829 Clement Avenue in Alameda, California. The site location is shown on the Site Vicinity Map, Figure 1, and the layout of the site is presented on the Site Plan, Figure 2. The purpose of this clean-up program has been to remove contaminated soil, sediment, and other debris from beneath the existing building at the site. The scope of the clean-up program is based on the results of Kaldveer Associates' previous investigations at the site, as outlined in our Soil Testing Report for 1829 Clement Avenue, dated April 4, 1990. The results of that investigation indicated that significant quantities of cyanide or metals were restricted to the top 3 to 6 inches of soil beneath the former etch-process areas at the western portion of the building, and to a dried sediment on top of the asphalt paving located beneath the eastern portion of the building. In accordance with clean-up recommendations outlined in the report, Kaldveer submitted to the Alameda County Department of Environmental Health (ACDEH) a Work Plan for Partial Site Clean-Up, dated March 12, 199[illegible]. Although this work plan detailed a clean-up program only for the asphalt area beneath the eastern portion of the building, Kaldveer met with representatives of ACDEH on April 16, 1990 to discuss clean-up of the entire site. Subsequent to that meeting, Mr. Ariu Levi of ACDEH issued a Site Remediation letter dated April 17, 1990 that outlined clean-up requirements at the site based on the information contained in Kaldveer's April 4, 1990 report.

The clean-up program described in this report included high-efficiency vacuuming of the asphalt pavement surface beneath the eastern portion of the building and hand-removal of contaminated surface soils at the western portion of the building. The pavement surface and concrete footings at the eastern end of the building were sealed with three inches of cement slurry and stucco. Concrete footings at the western end of the building were sealed with latex enamel paint. Contaminated materials were removed to a licensed disposal facility by a licensed hazardous waste hauler. An investigation of building interior environmental quality was performed by a Certified Industrial Hygenist.

WEST END

soil dug out

1) TESTED remaining soil
found 8.3 ppm. CN &
.78 ppm sol. CN.

PAINTED.

2) WIPE SAMPLES AFTER PAINTING
FOUND .071 ppm / 100 cm²

EAST END.

AFTER VACUUMING

Pb .88 mg/ 100 cm²

CN 7.9 mg/ 100 cm²

PAINTED.

AFTER PAINTING FOUND

CN .1 mg/100 cm²

3" CONCRETE CAP INSTALLED

AFTER CONCRETE FOUND

CN .007 mg/ 100 cm²

II. CONCLUSIONS

Based on the information collected during this soil clean-up program, and the results of the laboratory analyses, it is our opinion that contaminated soil clean-up has been performed in accordance with Alameda County Department of Environmental Health specifications. Details of the site clean-up are presented by specific area of concern in the following sections.

In addition to clean-up of contaminated soil at the site, an investigation of building interior environmental quality performed by a Certified Industrial Hygenist indicates that the building is safe for human occupancy. A copy of the report is included herein as Appendix II.

A. Former Etch Process Room Areas - West End of Building

Surficial soils containing significant levels of cyanide and metals have been removed from beneath the former etch process room areas at the west end of the building. Laboratory analysis of nine surficial soil samples collected following removal of the contaminated soil indicates residual cyanide concentrations of from non-detect to 8.3 mg/kg. Analysis of three of these samples for soluble cyanide using the Waste Extraction Test (Title 22, CCR) indicates soluble cyanide concentrations of from 0.18 to 0.78 ppm (mg/l).

Analysis for selected metals did not indicate the presence of detectable quantities of hexavalent chromium or molybdenum. Laboratory analyses indicate the presence of copper in surficial soils at the west end of the building at concentrations of 5.6 to 100 mg/kg. These concentrations are well below levels of significant environmental concern.

Following removal of contaminated soils from beneath the west end of the building, concrete footing surfaces were sprayed with latex enamel paint to provide a surface seal. Three of four wipe samples from the painted surface did not contain detectable quantities of cyanide. The fourth sample contained cyanide at 0.071 mg/100 cm^2 of footing surface. In our opinion, the latex paint provides an effective seal on the concrete surfaces.

B. Former Treatment and Storage Room Area - East End of Building

Clean-up beneath the former treatment and storage room area at the east end of the building consisted of high-efficiency vacuuming of the concrete footings and asphalt paving surface underlying this portion of the building. Wipe samples collected from the footing and asphalt paving surfaces following vacuuming indicated the presence of lead at from 0.0088 to 0.88 mg/100 cm^2, molybdenum from non-detect to 0.23 mg/100 cm^2, copper at 0.0051 to 0.16 mg/100 cm^2,

arsenic from 0.019 to 1.6 mg/100 cm2, and cyanide at from 0.079 to 7.9 mg/100 cm^2. Following receipt of the chemical data, two coats of latex enamel paint were applied to the footings and asphalt paving surface to act as a sealant. Analysis of six subsequent wipe samples for cyanide indicate the presence of cyanide from 0.0058 to 0.10 mg/100 cm^2.

Finally, a three-inch concrete cap was placed over the asphalt surface, and metal lath covered by stucco was applied to the footing walls to provide a final seal. Arsenic and lead were not detected on six subsequent wipe samples. Cyanide was detected at 0.0050 and 0.0070 mg/100cm^2 on two wipe samples collected from the slab surface. Cyanide was not detected on four wipe samples collected from the footing surfaces. The measured concentrations of cyanide on the slab surface are at or near the laboratory detection limit. The cyanide is probably related to disturbance of the asphalt surface during placement of the concrete. In our opinion, these levels do not represent a significant environmental concern.

OK

Soil samples collected from beneath the asphalt paving during the initial previous site investigation containing greater than 6 ppm total cyanide were analyzed for soluble cyanide using the WET method. Whereas total cyanide levels in these samples ranged from 7.0 to 160 mg/kg, measured soluble cyanide levels were reported to range from 0.24 to 5.8 ppm (mg/l). The results indicate that in-place soluble cyanide levels are below the Alameda County Department of Environmental Health specified level of 6 ppm (mg/l) based on the WET method analysis.

C. Contaminated Soil Disposal

Approximately 28 cubic yards of contaminated soil, along with the former process piping and stained wood flooring materials were removed from the site by a licensed waste hauler. Contaminated materials were transported under manifest to a licensed disposal facility.

OK copies.

III. SCOPE OF SERVICES

The scope of work performed during this study consisted of the following tasks:

1. Preparation of site clean-up program specifications.
2. Selection of remediation contractors.
3. Observation of the site clean-up operations.

4. Collection of soil and wipe samples to confirm clean-up effectiveness.

5. Analysis of samples by a contract analytical laboratory.

6. Analysis of building interior environmental quality by a Certified Industrial Hygenist.

7. Preparation of this report.

IV. CONTAMINATED SOIL CLEAN-UP PROGRAM

A. Site Clean-Up Specifications

Clean-up levels for contaminated soils at the site were specified by ACDEH at the April 16, 1990 meeting at ACDEH offices. Based on toxicological considerations, ACDEH specified a soil clean-up level for cyanide of 6 parts per million as soluble cyanide. ACDEH specified that soluble cyanide concentration be determined by the Waste Extraction Test (WET) method as outlined in Title 22 of the Code of California Regulations (CCR). ACDEH also specified that acceptable levels of metals in soil be evaluated in accordance with Title 22 CCR specifications.

In their April 17, 1990 Site Remediation letter, ACDEH lists as acceptable, Kaldveer's recommendation to remove the top six inches of contaminated soil beneath the western portion of the building as the initial step to site clean-up. In addition, at the April 16, 1990 meeting, ACDEH approved the clean-up of the eastern portion of the building as outlined in Kaldveer's March 12, 1990 Work Plan for Partial Site Clean-Up.

B. Contaminated Soil Clean-Up - Etch Process Room Area, West End of Building

Clean-up of contaminated soil beneath the former etch process rooms at the western portion of the building was performed by IT Corporation of Martinez, California between April 16 and 20, 1990. Clean-up consisted of the manual removal of approximately 6 inches of surface soil from the area shown on Figure 3. Contaminated soil was hand-excavated by shovel, placed in buckets and transferred to a roll-off bin stored on the site. The thickness of contaminated soil beneath this portion of the building varied from about 3 inches to over 1 foot, and was easily identified on the basis of discoloration; contaminated soils were black to blue-green in color, whereas uncontaminated soils (as verified by analytical testing) were brown in color. Approximately 6 inches of non-discolored soil were also removed within an approximate 5-foot radius of former soil Boring B-6 (previously found to contain high lead at the 0.5 foot depth).

A hand auger was used to probe the soil surface at up to 20 locations within each of the three former etch-process rooms to check for soil discoloration to evaluate removal effectiveness. Following removal of the discolored soil, three soil samples were collected within 3 inches of the surface from each of three etch-process rooms. The nine samples were analyzed for hexavalent chromium, molybdenum, copper, and total cyanide. In addition, any sample containing greater than 6 ppm total cyanide was analyzed for soluble cyanide using both the Title 22 Waste Extraction Test and a similar extraction process test using deionized water. Sample locations are shown on Figure 3.

Soil sample analytical results are listed on Table 1 and are attached to this report as Appendix I. The results indicate that following initial removal of the discolored soil from beneath the western portion of the building, residual concentrations of copper at the surface range from 5.6 to 100 ppm, with the exception of Sample CS-9 which was found to contain 360 ppm. Analysis of sample CS-9 by the WET method indicated the sample contained 27 mg/l soluble copper. As this level exceeds the State STLC of 25 mg/l, additional soil was removed from this area on June 15, 1990. Analysis of three additional closure samples (CS-11, CS-12, CS-13) indicated the presence of 17 to 22 ppm total copper. In light of the copper analysis results from this investigation and the results from samples collected from the 0.5 to 6.0 foot depth outlined in our April 4, 1990 report (6.0 to 52 ppm), it is our opinion that soils containing significant levels of copper have been effectively removed from beneath the building. Molybdenum and hexavalent chromium were not detected in any of the closure samples analyzed.

Total cyanide analyses indicate residual cyanide levels of from non-detect to 8.3 ppm in surficial soils remaining beneath this portion of the building. The three samples containing greater than 6 ppm total cyanide were analyzed for soluble cyanide using the WET method. Soluble cyanide analyses on these samples indicated the presence of 0.18 to 0.78 ppm (milligrams per liter, mg/l) soluble cyanide when analyzed in accordance with the Title 22 WET method, and from non-detect to 1.7 ppm (mg/l) soluble cyanide when analyzed with a deionized water extraction. The three analyses do not indicate any consistent relationship between the two analytical methods. In either case, residual concentrations of soluble cyanide following excavation of discolored soil from beneath the former etch-process rooms are less than the ACDEH specified clean-up level of 6 ppm soluble cyanide.

Soil Sample CS-10 was collected from the ground surface following removal of about 6 inches of soil within an approximate five foot radius of previous Boring B-6. As outlined in our April 4, 1990 Soil Testing Report, a sample collected from a depth of 0.5 feet at this location was found to contain 1100 ppm lead. Sample CS-10, collected during this investigation, following removal of

approximately 6 inches of surface soils this area, was found to contain 12 ppm lead, indicating that soil in this area containing elevated levels of lead has been successfully removed from beneath the building.

C. Concrete Footing - Etch Process Room Areas, West End of Building

Two initial wipe samples were collected from the surface of the concrete footings at the western portion of the building following removal of contaminated soils. Wipe samples were collected by saturating a 9.0 cm diameter filter pad with deionized water and wiping a 10 cm by 10 cm area with both sides of the filter pad. One wipe sample was analyzed for hexavalent chromium, copper, and molybdenum. The second wipe sample was analyzed for cyanide. As shown on Table 2, hexavalent chromium and molybdenum were not found to be present in detectable quantities. Results for copper and cyanide are reported as 67 and 8.0 mg/100 cm^2, respectively.

Following the removal of contaminated soils and collection of wipe samples from the footing surfaces, the exposed footings were sprayed with latex enamel paint to provide a surface seal on the concrete. Following application of the paint sealer, four wipe samples were collected from the footing surface and analyzed for total cyanide. The analytical results, shown as Samples CFS-1 through CFS-4 on Table 2, indicate that three of the four wipe samples did not contain cyanide in detectable quantities. One of the samples contained 0.071 mg cyanide per 100 cm^2. In our opinion, application of the latex enamel paint has provided an effective seal on the concrete footing surface.

D. Site Clean-Up - Treatment and Storage Room Areas, East End of Building

Site clean-up beneath the former treatment and storage room areas at the eastern end of the building consisted of high-efficiency vacuuming of the underlying asphalt paving surface and adjacent concrete footing surfaces. Site clean-up was conducted between April 16 and May 24, 1990 by IT Corporation of Martinez, California. Vacuuming of the asphalt and concrete footing surfaces was performed using high-efficiency vacuum canisters of the type commonly used for asbestos removal operations.

Six initial wipe samples were collected from the footing and asphalt paving surfaces following the vacuuming by saturating a 9.0 cm diameter filter paper with deionized water and wiping down a 10 cm X 10 cm area using both sides of the filter pad. The location of the three samples collected from the footing walls and three samples collected from the asphalt paving surface are shown on Figure 4 (samples designated WS for asphalt paving samples and FS for footing wall samples). The samples were analyzed for

cyanide, arsenic, beryllium, copper, molybdenum and lead. Analytical results are presented on Table 3. The results indicated the presence of all constituents except beryllium.

Following receipt of the wipe sample analytical data, the footing walls and asphalt paving surface beneath the building were sealed with two coats of latex enamel paint. Analytical results for cyanide analyses for six footing and asphalt surface wipe samples collected after application of the latex paint sealer are also listed on Table 3 (sample designation CFS on Figure 4). The results indicate the presence of only cyanide in all six samples.

Finally, a three-inch thick concrete topping slab was applied to the asphalt paving surface, and steel lath covered by stucco was applied to the footing stem walls. Analysis of final wipe samples (designated WPC on Figure 4) indicate that lead and arsenic are not present on the concrete or stucco surfaces above the laboratory detection limits. Cyanide was not detected on the four footing wall samples but was present in the two concrete slab samples at concentrations of 0.007 and 0.005 mg/100cm^2. These concentrations are at, or just barely exceed the laboratory detection limit of 0.0050 mg/wipe. The cyanide is probably related to disturbance of the asphalt surface during concrete placement. In our opinion, these levels do not represent a significant environmental concern, and it appears that the concrete and stucco toppings provide an effective seal of residual cyanide or metals on the asphalt and footing surfaces beneath this portion of the building.

In addition to analysis of wipe samples, soil and sediment samples collected during the initial investigation phase were reanalyzed for soluble cyanide using the Waste Extraction Test as specified by ACDEH. A variety of samples collected from both the eastern and western portions of the building were analyzed in an attempt to establish a relationship between total cyanide and soluble cyanide. As indicated on Table 4, no straight-forward relationship is apparent. However, it should be noted that based on the analytical results, all soil or sediment found to contain hazardous levels of metals, or greater than 6 ppm soluble cyanide as determined by the WET, has been removed from the site in accordance with ACDEH requirements.

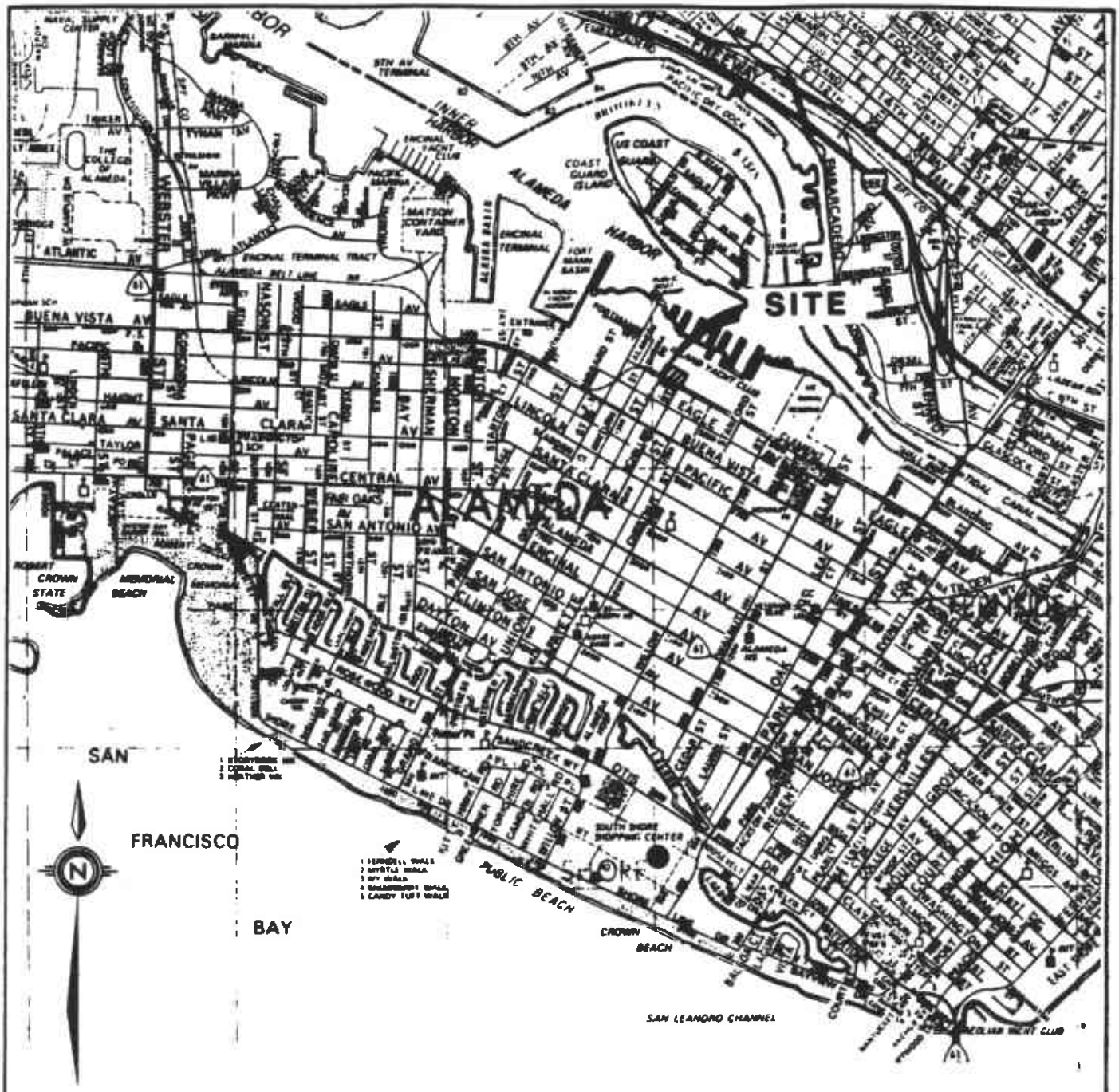
E. Disposition of Contaminated Soil and Debris

Approximately 28 cubic yards of contaminated soil was removed from the site on May 29, 1990 by Sturgeon and Son Inc. of Bakersfield, California, a licensed waste hauler. In addition to removal of the contaminated soil, all former process piping and stained wood flooring removed from the building during the site clean-up were removed from the site. Contaminated soil and other debris were

WHAT ABOUT SOIL (W) (GOT) LOOK AT TABLE 4

transported under manifest to Envirosafe Services of Idaho, a licensed hazardous waste disposal facility.

* * * * * * * * * * * * * * * * * *



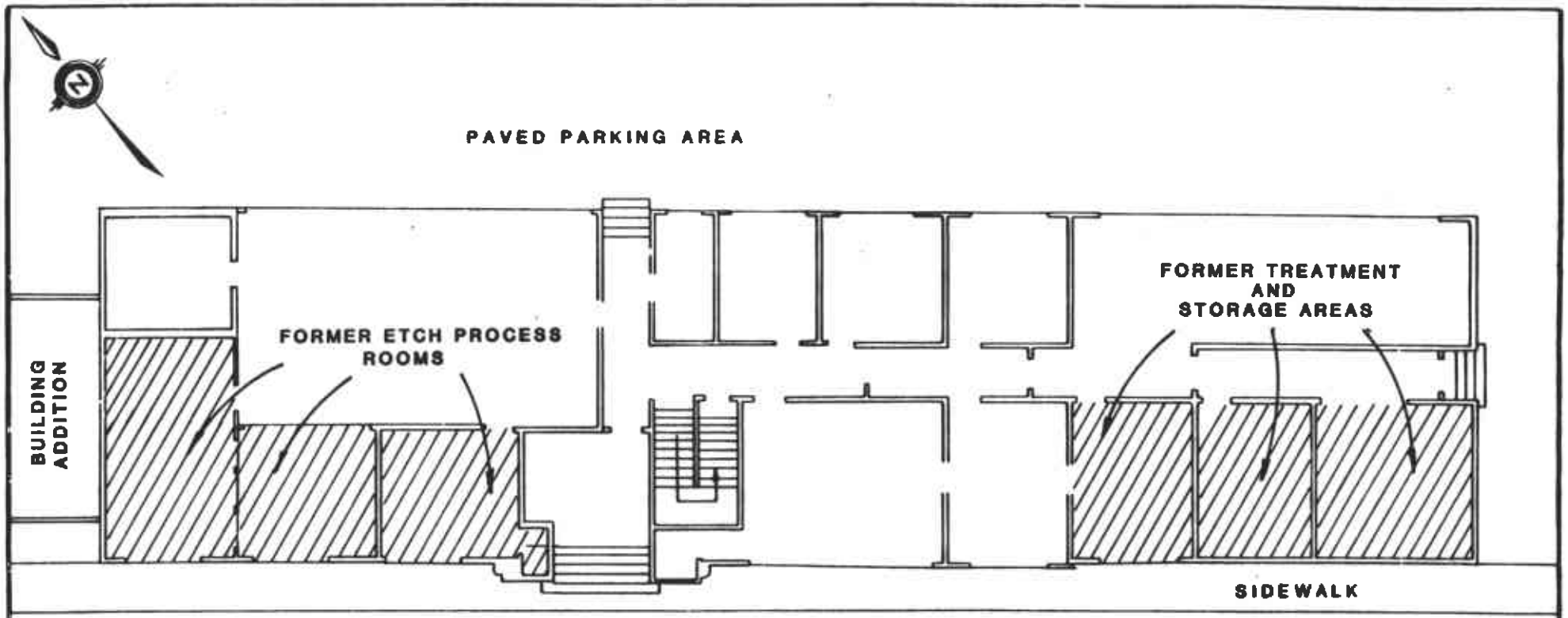
Base: Thomas Bros Maps, Alameda County, Page 11, 1988

Kaldveer Associates
Geoscience Consultants
A California Corporation

SITE VICINITY MAP

1829 CLEMENT AVENUE
Alameda, California

PROJECT NO.	DATE	
KE1179-1	July 1990	Figure 1



Kaldveer Associates
Geoscience Consultants
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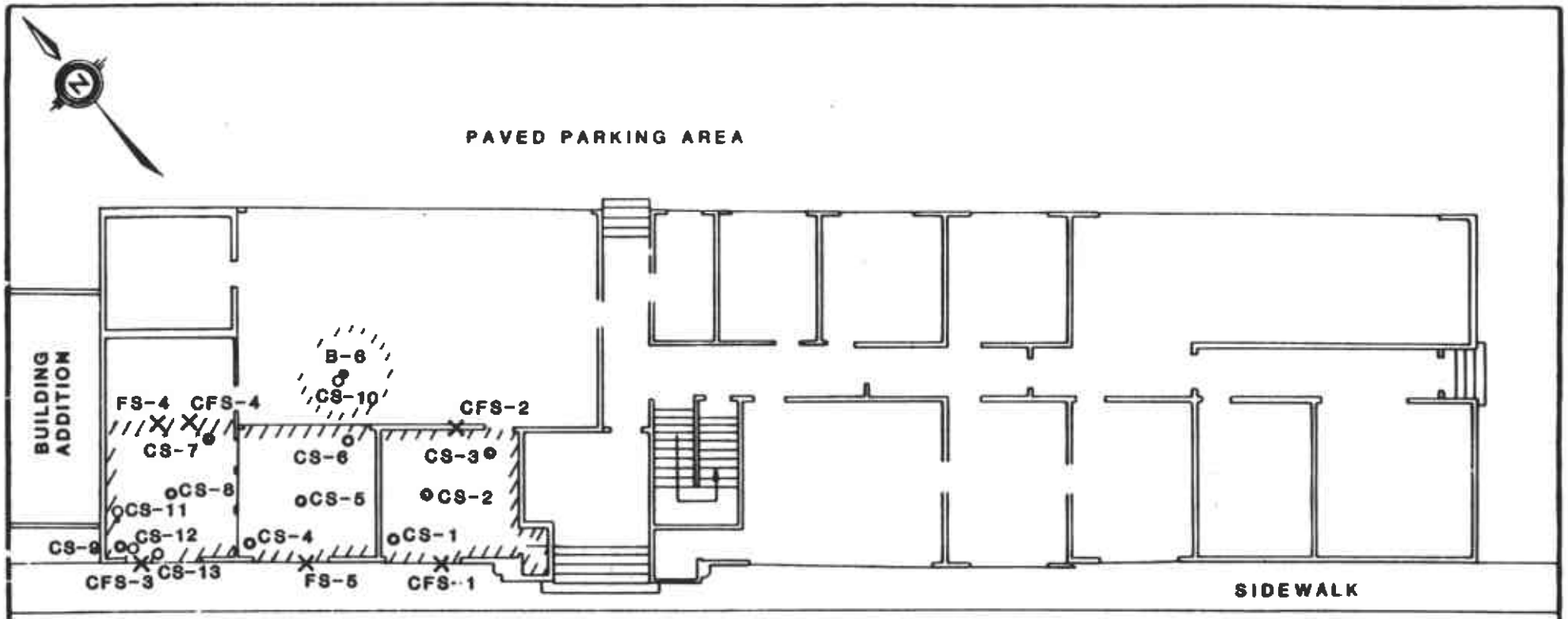
SITE PLAN

1829 CLEMENT AVENUE
Alameda, California

PROJECT NO	DATE	
KE1179-1	July 1990	Figure 2



Clement Avenue

APPROXIMATE SCALE IN FEET

0 15 30

LEGEND

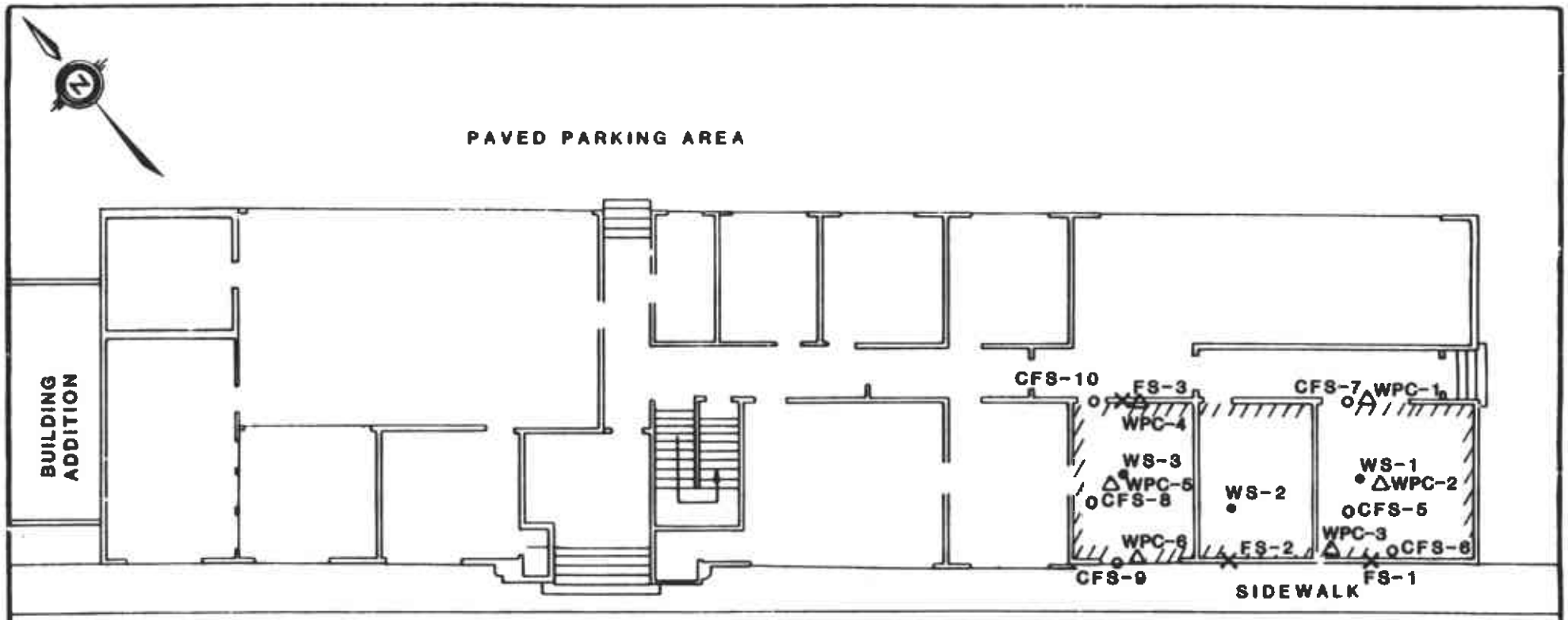
- SOIL REMOVAL AREA ENCLOSED BY CROSS- HATCHING
- B-6 ● PREVIOUS BORING B-6
- CS-5 ○ LOCATION OF SURFACE SOIL SAMPLE
- FS-3 ✕ / CFS-3 ✕ FOOTING SURFACE WIPE SAMPLE LOCATIONS

Kaldveer Associates
Geoscience Consultants
A California Corporation

FORMER ETCH PROCESS ROOMS
SOIL REMOVAL AREA

1829 CLEMENT AVENUE
Alameda, California

PROJECT NO	DATE	
KE1179-1	July 1990	Figure 3



LEGEND

SEDIMENT REMOVAL AREA ENCLOSED BY CROSS-HATCHING

WS-1 ● WIPE SAMPLE LOCATION FROM ASPHALT PAVING

FS-1 × WIPE SAMPLE LOCATION FROM FOOTING WALL

CFS-5 o FOLLOW-UP WIPE SAMPLE LOCATIONS, ASPHALT SURFACE AND FOOTING WALLS

WPC-6 △ FINAL WIPE SAMPLE LOCATIONS, ASPHALT SURFACE AND FOOTING WALLS

APPROXIMATE SCALE IN FEET

0 15 30

Kaldveer Associates
Geoscience Consultants
A California Corporation

FORMER TREATMENT AND STORAGE ROOM SEDIMENT REMOVAL AREA

1829 CLEMENT AVENUE
Alameda, California

PROJECT NO	DATE	
KE1179-1	July 1990	Figure 4

TABLE 1

SOIL SAMPLE ANALYTICAL RESULTS
FORMER ETCH PROCESS ROOM AREA - WEST END OF BUILDING

Sample Number	Copper (mg/kg)	Molybdenum (mg/kg)	Hexavalent Chromium (mg/kg)	Lead (mg/kg)	Total Cyanide (mg/kg)	Soluble Cyanide Title 22 - WET (mg/l)	Soluble Cyanide DI Water (mg/l)
CS-1	36	ND	ND	--	2.1	--	--
CS-2	5.6	ND	ND	--	8.3	0.78	0.41
CS-3	9.7	ND	ND	--	1.4	--	--
CS-4	28	ND	ND	--	1.3	--	--
CS-5	97	ND	ND	--	2.8	--	--
CS-6	100	ND	ND	--	6.5	0.49	ND
CS-7	55	ND	ND	--	6.3	0.18	1.7
CS-8	91	ND	ND	--	ND	--	--
CS-9	360	ND	ND	--	ND	27	--
CS-10	--	--	--	12	--	--	--
CS-11	17	--	--	--	--	--	--
CS-12	21	--	--	--	--	--	--
CS-13	22	--	--	--	--	--	--

TABLE 2

CONCRETE FOOTING WIPE SAMPLE RESULTS
FORMER ETCH PROCESS ROOM AREA - WEST END OF BUILDING
(all results reported as mg/100 cm^2)

1. Samples collected prior to application of paint seal.

Sample Designation	Cyanide	Chromium VI	Copper	Molybdenum
FS-4	--	ND	67	ND
FS-5	8.0	--	--	--
Detection Limit	1.0	0.050	0.50	2.5

2. Samples collected after application of paint seal.

Sample Designation	Cyanide
CFS-1	ND
CFS-2	ND
CFS-3	0.071
CFS-4	ND
Detection Limit	0.020

TABLE 3

CONCRETE FOOTING AND ASPHALT PAVING WIPE SAMPLES
FORMER TREATMENT ROOM AREA- EAST END OF BUILDING
(all results reported as mg/100 cm^2)

1. Samples collected prior to application of paint seal.

Sample Designation	CN	As	Be	Cu	Mo	Pb
WS-1	1.7	0.24	ND	0.096	0.23	0.88
WS-2	7.9	0.064	ND	0.16	0.11	0.031
WS-3	2.0	1.6	ND	0.078	0.059	0.053
FS-1	0.079	0.099	ND	0.026	ND	0.013
FS-2	1.6	0.019	ND	0.033	ND	0.0088
FS-3	0.83	0.25	ND	0.0051	0.033	0.010
Detection Limit	0.02	0.0005	0.001	0.001	0.001	0.0005

2. Samples collected after application of paint seal.

Sample Designation	Cyanide
CFS-5	0.087
CFS-6	0.0067
CFS-7	0.10
CFS-8	0.0058
CFS-9	0.0065
CFS-10	0.0065
Detection Limit	0.005

3. Samples collected after application of concrete seal and stucco.

Sampler Designation	As	Pb	CN
WPC-1	ND	ND	ND
WPC-2	ND	ND	0.007
WPC-3	ND	ND	ND
WPC-4	ND	ND	ND
WPC-5	ND	ND	0.005
WPC-6	ND	ND	ND
WPC-B (Blank)	ND	ND	ND
Detection Limit	0.005	0.005	0.005

TABLE 4
SUMMARY OF TOTAL vs. SOLUBLE CYANIDE TEST RESULTS

Sample Designation	Total Cyanide (mg/kg)	Soluble Cyanide+ (mg/l)
B1,B2-0.5*	160	4.2
B1,B2-3*	24	5.8
B3-0.5*	26	2.2
B3-6*	22	0.24
B4-0.5*	7.1	0.05
S-2**	510	8.8
S-3**	120	2.7
S-4**	650	2.0
S-7**	1100	18

Notes:

\+ = Soluble cyanide determined by Waste Extraction Test, CCR Title 22.
* = These soils left in-place beneath asphalt at east end of building.
** = These soils removed from the west end of building.

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

RECEIVED

APR 24 1990

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 17, 1990
425 Roland Way	Sample Descript:	Wipes	Received:	Apr 17, 1990
Oakland, CA 94621	Analysis for:	Cyanide		
Attention: Dennis Laduzinski	First Sample #:	004-2429	Reported:	Apr 21, 1990

LABORATORY ANALYSIS FOR: Cyanide

Sample Number	Sample Description	Detection Limit mg/100 cm²	Sample Result mg/100 cm²
0042429 A-B	WS-1	0.020	1.7
0042430 A-B	WS-2	0.020	7.9
0042431 A-B	WS-3	0.020	2.0
0042432 A-B	FS-1	0.020	0.079
0042433 A-B	FS-2	0.020	1.6
0042434 A-B	FS-3	0.020	0.83

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 17, 1990
425 Roland Way	Sample Descript:	Wipes	Received:	Apr 17, 1990
Oakland, CA 94621	Analysis for:	Arsenic		
Attention: Dennis Laduzinski	First Sample #:	004-2429	Reported:	Apr 21, 1990

LABORATORY ANALYSIS FOR: Arsenic

Sample Number	Sample Description	Detection Limit mg/100 cm²	Sample Result mg/100 cm²
004-2429	WS-1	0.0005	0.24
004-2430	WS-2	0.0005	0.064
004-2431	WS-3	0.0005	1.6
004-2432	FS-1	0.0005	0.099
004-2433	FS-2	0.0005	0.019
004-2434	FS-3	0.0005	0.25

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Lawver

Diane Eilch Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 17, 1990
425 Roland Way	Sample Descript:	Wipes	Received:	Apr 17, 1990
Oakland, CA 94621	Analysis for:	Beryllium		
Attention: Dennis Laduzinski	First Sample #:	004-2429	Reported:	Apr 21, 1990

LABORATORY ANALYSIS FOR: Beryllium

Sample Number	Sample Description	Detection Limit mg/100 cm²	Sample Result mg/100 cm²
004-2429	WS-1	0.0010	N.D.
004-2430	WS-2	0.0010	N.D.
004-2431	WS-3	0.0010	N.D.
004-2432	FS-1	0.0010	N.D.
004-2433	FS-2	0.0010	N.D.
004-2434	FS-3	0.0010	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Lawver

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 17, 1990
425 Roland Way	Sample Descript:	Wipes	Received:	Apr 17, 1990
Oakland, CA 94621	Analysis for:	Copper		
Attention: Dennis Laduzinski	First Sample #:	004-2429	Reported:	Apr 21, 1990

LABORATORY ANALYSIS FOR: Copper

Sample Number	Sample Description	Detection Limit mg/100 cm²	Sample Result mg/100 cm²
004-2429	WS-1	0.0010	0.096
004-2430	WS-2	0.0010	0.16
004-2431	WS-3	0.0010	0.078
004-2432	FS-1	0.0010	0.026
004-2433	FS-2	0.0010	0.033
004-2434	FS-3	0.020	0.0051

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
KE1179-1	Clement

Sampler's Name (printed): Dennis Laduzinsky

Boring Number	Date	Time	Soil	Water	Sample Location or Depth	Sample Number	Number/Type of Containers	Analytical Tests: Cyanide	Arsenic	Beryllium	Copper	Molybdenum	Lead	Remarks
	4/11/90	AM	X		10cm x 10cm Area covered by wipe	WS-1	2x Pint Jar 40 ml	X	X	X	X	X	X	
						WS-2		X	X	X	X	X	X	
						WS-3		X	X	X	X	X	X	
						FS-1		X	X	X	X	X	X	
						FS-2		X	X	X	X	X	X	
						FS-3		X	X	X	X	X	X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time 4-17-90 2:55	Received for Laboratory by: (Signature)

Ship To: Sequoia Analytical

Attention:

Phone No:

Requested Turnaround Time: 24-48 hour

Kaldveer Assoc. Contact: Dennis Laduzinsky

Remarks:

Please address correspondence to:
Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

Kaldveer Associates
Geoscience Consultants
A California Corporation

White - Kaldveer Associates Yellow - Analytical Laboratory

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 18, 1990
425 Roland Way	Sample Descript:	Soil, CS-2	Received:	Apr 18, 1990
Oakland, CA 94621				
Attention: Dennis Laduzinski	Lab Number:	004-2616	Analyzed:	Apr 19, 1990
			Reported:	Apr 21, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cyanide	1.0	8.3
Hexavalent Chromium	0.050	N.D.
Molybdenum	2.5	N.D.
Copper	0.50	5.6

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled: Apr 18, 1990
425 Roland Way	Sample Descript:	Soil, CS-1	Received: Apr 18, 1990
Oakland, CA 94621			
Attention: Dennis Laduzinski	Lab Number:		Analyzed: Apr 19, 1990
			Reported: Apr 21, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cyanide	1.0	1.4
Hexavalent Chromium	0.050	N.D.
Molybdenum	2.5	N.D.
Copper	0.50	9.7

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

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680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 18, 1990
425 Roland Way	Sample Descript:	Soil, CS-4	Received:	Apr 18, 1990
Oakland, CA 94621				
Attention: Dennis Laduzinski	Lab Number:	004-2618	Analyzed:	Apr 19, 1990
			Reported:	Apr 21, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cyanide	1.0	1.3
Hexavalent Chromium	0.050	N.D.
Molybdenum	2.5	N.D.
Copper	0.50	28

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

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(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 18, 1990
425 Roland Way	Sample Descript:	Soil, CS-5	Received:	Apr 18, 1990
Oakland, CA 94621				
Attention: Dennis Laduzinski	Lab Number:	004-2619	Analyzed:	Apr 19, 1990
			Reported:	Apr 21, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cyanide	1.0	2.8
Hexavalent Chromium	0.050	N.D.
Molybdenum	2.5	N.D.
Copper	0.50	97

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 18, 1990
425 Roland Way	Sample Descript:	Soil, CS-6	Received:	Apr 18, 1990
Oakland, CA 94621				
Attention: Dennis Laduzinski	Lab Number:	004-2620	Analyzed:	Apr 19, 1990
			Reported:	Apr 21, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cyanide	1.0	6.5
Hexavalent Chromium	0.050	N.D.
Molybdenum	2.5	N.D.
Copper	0.50	100

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

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(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 18, 1990
425 Roland Way	Matrix Descript:	Liquid	Received:	Apr 18, 1990
Oakland, CA 94621	Analysis for:	STLC, Cyanide		
Attention: Dennis Laduzinski	First Sample #:	0042616 R	Reported:	Apr 25, 1990

LABORATORY ANALYSIS FOR: STLC, Cyanide

Sample Number	Sample Description	Detection Limit mg/kg	Date Analyzed	Sample Result mg/kg
0042616 R	CS-2	0.010	4/24/90	0.78
0042620 R	CS-6	0.010	4/24/90	0.49

Method of Analysis:

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Lawver

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled: Apr 18, 1990
425 Roland Way	Matrix Descript:	Liquid	Received: Apr 18, 1990
Oakland, CA 94621	Analysis for:	Soluble Cyanide	
Attention: Dennis Laduzinski	First Sample #:	R42616	Reported: Apr 25, 1990

LABORATORY ANALYSIS FOR: Soluble Cyanide

Sample Number	Sample Description	Detection Limit mg/kg	Date Analyzed	Sample Result mg/kg
0042616 R	CS-2	1.0	4/24/90	0.41
0042620 R	CS-6	1.0	4/24/90	N.D.

Method of Analysis:

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawyer
Project Manager

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
KE1179-1	Clement

Sampler's Name (printed): D. Laduzinsky

Boring Number	Date	Time	Soil	Water	Sample Location or Depth	Sample Number	Number/Type of Containers	Analytical Tests: Cyanide (total)	Chromium VI	Molybdenum	Copper			Remarks
	4/10/20		X		0-3"	CS-1	8oz Jars	X	X	X	X			CYANIDE ANALYSES — RUN CAL. WET for cyanide on any sample having more than 6 ppm Total Cyanide.
	↓		↓		↓	CS-2	↓	X	X	X	X			
						CS-3		X	X	X	X			
						CS-4		X	X	X	X			
						CS-5		X	X	X	X			
						CS-6		X	X	X	X			

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	4/10/20 15:17	T. Bilyeu
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
Dennis Layman	4/10/20 15:19	

Ship To: Sequoia Analytical

Attention:

Phone No:

Requested Turnaround Time: 24 hr - 48 hr.

Kaldveer Assoc. Contact: Dennis Laduzinsky

Remarks:

Please address correspondence to:

Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

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680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 20, 1990
425 Roland Way	Sample Descript:	Soil, CS-7	Received:	Apr 20, 1990
Oakland, CA 94621				
Attention: Dennis Laduzinsky	Lab Number:	004-3028	Analyzed:	Apr 24, 1990
			Reported:	Apr 25, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cyanide	1.0	6.3
Hexavalent Chromium	0.050	N.D.
Copper	0.50	66
Molybdenum	2.5	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 20, 1990
425 Roland Way	Sample Descript:	Soil, CS-8	Received:	Apr 20, 1990
Oakland, CA 94621				
Attention: Dennis Laduzinsky	Lab Number:	004-3029	Analyzed:	Apr 24, 1990
			Reported:	Apr 25, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cyanide	1.0	N.D.
Hexavalent Chromium	0.050	N.D.
Copper	0.50	91
Molybdenum	2.5	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Lawver

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 20, 1990
425 Roland Way	Sample Descript:	Soil, CS-9	Received:	Apr 20, 1990
Oakland, CA 94621				
Attention: Dennis Laduzinsky	Lab Number:	004-3030	Analyzed:	Apr 24, 1990
			Reported:	Apr 25, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cyanide	1.0	N.D.
Hexavalent Chromium	0.050	N.D.
Copper	0.50	360
Molybdenum	2.5	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 20, 1990
425 Roland Way	Sample Descript:	Soil, CS-7	Received:	Apr 20, 1990
Oakland, CA 94621				
Attention: Dennis Laduzinsky	Lab Number:	004-3028	Analyzed:	May 1, 1990
			Reported:	May 3, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Cyanide, STLC	0.010	0.18
Soluble Cyanide	0.010	1.7

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Lawver

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 20, 1990
425 Roland Way	Sample Descript:	Soil, CS-10	Received:	Apr 20, 1990
Oakland, CA 94621				
Attention: Dennis Laduzinsky	Lab Number:	004-3031	Analyzed:	Apr 23, 1990
			Reported:	Apr 25, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Lead	6.25	12

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 20, 1990
425 Roland Way	Sample Descript:	Soil, CS-9	Relogged:	Apr 20, 1990
Oakland, CA 94621				
Attention: Dennis Laduzinsky	Lab Number:	004-3030	Analyzed:	Jun 5, 1990
			Reported:	Jun 12, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit	Sample Results
Copper, STLC, mg/L	0.010	27
Copper, TTLC, mg/kg	0.50	290

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 20, 1990
425 Roland Way	Sample Descript:	Wipes, FS-4.	Received:	Apr 20, 1990
Oakland, CA 94621				
Attention: Dennis Laduzinsky	Lab Number:	004-3032	Reported:	Apr 25, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Hexavalent Chromium	0.050	N.D.
Copper	0.50	67
Molybdenum	2.5	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement	Sampled:	Apr 20, 1990
425 Roland Way	Sample Descript:	Soil, FS-5	Received:	Apr 20, 1990
Oakland, CA 94621				
Attention: Dennis Laduzinsky	Lab Number:	004-3033	Analyzed:	Apr 24, 1990
			Reported:	Apr 25, 1990

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cyanide	1.0	8.0

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.
425 Roland Way
Oakland, CA 94621
Attention: Dennis Laduzinsky

Client Project ID: #KE1179-1, Clement
QC Sample Group: 43028 - 31
Reported: Apr 25, 1990

QUALITY CONTROL DATA REPORT

ANALYTE	Hexavalent Chromium	Copper	Molybdenum	Lead
Method:	EPA 7196	EPA 6010	EPA 6010	EPA 6010
Analyst:	R. Sharma	B. Oliver	B. Oliver	B. Oliver
Reporting Units:	mg/kg	mg/L	mg/L	mg/L
Date Analyzed:	Apr 20, 1990	Apr 23, 1990	Apr 23, 1990	Apr 23, 1990
QC Sample #:	004-3126	004-3029	004-3029	004-1606
Sample Conc.:	N.D.	1.8	N.D.	3.6
Spike Conc. Added:	0.50	1.0	1.0	50
Conc. Matrix Spike:	0.50	2.9	0.79	56
Matrix Spike % Recovery:	100	110	79	100
Conc. Matrix Spike Dup.:	0.50	2.9	0.75	61
Matrix Spike Duplicate % Recovery:	100	110	75	110
Relative % Difference:	0.26	0.0	5.2	8.5

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
KE1179-1	Clement

Sampler's Name (printed): Dennis Ladoziusky.

Boring Number	Date	Time	Soil	Water	Sample Location or Depth	Sample Number	Number/Type of Containers	Analytical Tests: CYANIDE	CHROMIUM III	COPPER	MOLYBDENUM	LEAD	Remarks
	4/20/90		X		0-3"	CS-7	Amber Jar	X	X	X	X		Run W.E.T ~~for~~ and DI, W.E.T. (for soluble cyanide) for any sample with >6 ppm total cyanide
	↓		↓		↓	CS-8	↓	X	X	X	X		
						CS-9		X	X	X	X		
						CS-10						X	
			WIPE		10cm x 10cm Area	FS-4	Filter PAD	X	X	X	X		
			WIPE		10cm x 10cm Area	FS-5		X	X	X	X		

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	4/24/90 [illegible]	[signature]
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)

Ship To: Sequoia Analytical

Attention:

Phone No:

Requested Turnaround Time: 24-48 hr TAT

Kaldveer Assoc. Contact: Dennis Ladoziusky

Remarks:

Please address correspondence to:

Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

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Geoscience Consultants
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MID-PACIFIC ENVIRONMENTAL LABORATORY

Kaldveer Associates
425 Roland Way
Oakland, CA 94621

April 24, 1990
MPELI ID: 9004074
Client PO: Ke1179-1

Attention: Dennis Laduzinsky

Subject: Analysis of 9 Soil Samples, Received 3/21/90.

The samples were prepared by extracting with a citrate buffer for 48 hours. The resulting extract was filtered and analyzed for Cyanide . The resulting values are the soluble threshold limit concentrations for the requested compound. The results are presented in Table 1.

If you should have any technical questions, please contact the undersigned at (415)964-0844.

Approved by: _____
for M. Claire Ferguson
Client Services Manager

These results were obtained by following standard laboratory procedures; the liability of Mid-Pacific Environmental Laboratory, Inc. shall not exceed the amount paid for this report. In no event shall Mid-Pacific be liable for special or consequential damages.

Table 1. General Chemical Results

Kaldveer Sample ID

Parameter	EPA Method	B1,B2 0.5 mg/L	B1,B2 -3 mg/L	B3-0.5 mg/L	B3-6 mg/L	B4-0.5 mg/L
Cyanides, total	335.2 C	4.2	5.8	2.2	0.24	0.05

C - colorimetric

Table 1. General Chemical Results

Kaldveer Sample ID

Parameter	EPA Method	S2 mg/L	S3 mg/L	S4 mg/L	S7 mg/L	Spike % Recov
Cyanides, total	335.2 C	8.8	2.7	2.0	18	85

C - colorimetric

Table 1. General Chemical Results

Kaldveer Sample ID

Parameter	EPA Method	Dup RPD	Control Sample % Recov	Method Blank mg/L	Method Detection Limit mg/L
Cyanides, total	335.2 C	17	88.8	<0.01	0.01

C - colorimetric

9003058

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
KE 179-1	Alameda

Sampler's Name (printed): D. Ladwzinsky

ALEDTAK I.D. 100505

Boring Number	Date	Time	Soil	Water	Sample Location or Depth	Sample Number	Number/Type of Containers	Analytical Tests						
	4/11		X		S-2	012	glass				X			
					S-3	023								
					S-4	034								
					S-5	044								
					S-6	054								
					S-7	064								

Cab. 1, shelf 1
Anaheim

Remarks

4/11/90: Samples returned to Dennis Ladwzinsky on 4/11/90 at 2:20 by Suzanne Silvers

Kaldveer

4/19/90: Add'l work requested by D. Ladwzinsky to be done @ MPELI - See Samples S-2, S-3, S-4, S-7

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
	4/11/90 2:55 PM	

Ship To: Mail-Box

Attention: C. Ferguson

Phone No: MPELI

Requested Turnaround Time: ASAP

Remarks:

Kaldveer Assoc. Contact: Dennis Ladwzinsky

Please address correspondence to:

Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

Kaldveer Associates
Geoscience Consultants

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K-4, 2-1

MED-TOX ASSOCIATES, INC.
ANALYTICAL REQUEST/CHAIN OF CUSTODY FORM
(Complete Information on Opposite Side)

CLIENT Kaldveer Associates
CLIENT JOB REF.: KE1179-1
LAB PROJECT NO: 9002074 (lab use only)

Date: 2-12-90
SAMPLER(S): Dennis Laduzinsky.

* Tubes with arrows should be analyzed from the arrow end

CLIENT SAMPLE IDENTIFICATION	DATE	Lab Number (lab use only) 9002074	AIR VOLUME (Liters)	NO. CONT.	SAMPLE TYPE *	Cyanide	Arsenic	Beryllium	Chromium	Molybdenum	Lead	Copper	phenols (420.1)	pH	WET (D.I.) Cr	WET Extract	COMMENTS/ INTERFERENC
S-1	2-11-90	01A		1	Sediment	X	X	X	X	X	X	X	X	X			
B1-0.5	↓	〉		1	Soil ↓	X	X	X	X	X	X	X	X	X	⊗	⊗	} composite
B2-0.5		02A		1													
B1-3		〉		1		X	X	X	X	X	X	X	X	X	⊗	⊗	} composite
B2-3		03A		1													
B2-6, B1-6		〉 04A		2		X	X	X	X	X	X	X	X	X			composite of 2
B3-0.5		05A		1		X	X	X	X	X	X	X	X	X	⊗	⊗	
B3-3		06A		1		X	X	X	X	X	X	X	X	X			
B3-6		07A		1		X	X	X	X	X	X	X	X	X	⊗	⊗	
B4-0.5		08A		1		X	X	X	X	X	X	X	X	X	⊗	⊗	
B4-3		09A		1		X	X	X	X	X	X	X	X	X			
B4-7	↓	10A			↓	X	X	X	X	X	X	X	X	X			

→ 4/19/90: Add'l work requested by D.Laduzinsky to be done @ MPELL-5 samples B1, B2
B1 } 2
B2
B3-0.5
B3-6
B4-0.5
M Claire Ferguson

ONE WEEK TAT.

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature) [signature]	2/12/90	0904	Received by: (Signature)		
Dispatched by: (Signature)	Date	Time	Received for lab by: (Signature) Denise Harrington	2/12/90	
Method of Shipment:			Lab Comments:		

*SAMPLE TYPE (SPECIFY): (1) 37 mm 0.8 um MCEF; 2) 25 mm 0.8 um MCEF; (3) 25 mm 0.4 um polycarb. filter; (4) PVC filter, diam. _____ pore size _____; (5) Charcoal tube; (6) Silica gel tube (7) Water: (8) Soil: (9) Bulk Sample:

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	Clement, KE 1179-1	Sampled:	May 8, 1990
425 Roland Way	Sample Descript:	Wipe	Received:	May 9, 1990
Oakland, CA 94621	Analysis for:	Cyanide		
Attention: Dennis Laduzinsky	First Sample #:	005-1299		
			Reported:	May 15, 1990

LABORATORY ANALYSIS FOR: Cyanide

Sample Number	Sample Description	Detection Limit mg/wipe	Sample Result mg/wipe
005-1299	CFS-1	0.020	N.D.
005-1300	CFS-2	0.020	N.D.
005-1301	CFS-3	0.020	0.071
005-1302	CFS-4	0.020	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Lawver

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.
425 Roland Way
Oakland, CA 94621
Attention: Dennis Laduzinsky

Client Project ID: Clement, KE 1179-1

QC Sample Group: 0051299-302

Reported: May 15, 1990

QUALITY CONTROL DATA REPORT

ANALYTE	Cyanide

Method:	EPA 335.2
Analyst:	A. Chu
Reporting Units:	mg/L
Date Analyzed:	May 14, 1990
QC Sample #:	004-3928

Sample Conc.:	N.D.
Spike Conc. Added:	1.0
Conc. Matrix Spike:	0.92
Matrix Spike % Recovery:	92
Conc. Matrix Spike Dup.:	0.93
Matrix Spike Duplicate % Recovery:	93
Relative % Difference:	1.1

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
KE1179-1	Clement

Sampler's Name (printed): Dennis Ladouzinsky

Boring Number	Date	Time	Soil	DI Water / wipe	Sample Location or Depth	Sample Number	Number/Type of Containers	Analytical Tests: Total Cyanide	Remarks
	5/8/90			DI wipe	10cm x 10cm area	CFS-1	wipe		
						CFS-2			
						CFS-3			
						CFS-4			

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time 5/9/90 3:05 P	Received for Laboratory by: (Signature)

Ship To: Sequoia Analytical

Attention:

Phone No:

Requested Turnaround Time: 48 hour TAT

Kaldveer Assoc. Contact: Dennis Ladouzinsky

Remarks:

Please address correspondence to:

Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

Kaldveer Associates
Geoscience Consultants
A California Corporation

White - Kaldveer Associates Yellow - Analytical Laboratory

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

JUN 5 1990

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Alameda	Sampled:	May 24, 1990
425 Roland Way	Sample Descript:	Wipe	Received:	May 25, 1990
Oakland, CA 94621	Analysis for:	Cyanide		
Attention: Dennis Laduzinsky	First Sample #:	005-0429	Analyzed:	May 30, 1990
			Reported:	May 31, 1990

LABORATORY ANALYSIS FOR: Cyanide

Sample Number	Sample Description	Detection Limit mg/wipe	Sample Result mg/wipe
005-0429	CFS - 5	0.0050	0.087
005-0430	CFS - 6	0.0050	0.0067
005-0431	CFS - 7	0.0050	0.10
005-0432	CFS - 8	0.0050	0.0058
005-0433	CFS - 9	0.0050	0.0065
005-0434	CFS - 10	0.0050	0.0065

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

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(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.
425 Roland Way
Oakland, CA 94621
Attention: Dennis Laduzinsky

Client Project ID: #KE1179-1, Alameda

QC Sample Group: 0050429 - 0050434

Reported: May 31, 1990

QUALITY CONTROL DATA REPORT

ANALYTE	Cyanide

Method:	EPA 335.2
Analyst:	A. Chu
Reporting Units:	mg/L
Date Analyzed:	May 30, 1990
QC Sample #:	DI Water
Sample Conc.:	N.D.
Spike Conc. Added:	0.10
Conc. Matrix Spike:	0.10
Matrix Spike % Recovery:	100
Conc. Matrix Spike Dup.:	0.094
Matrix Spike Duplicate % Recovery:	94
Relative % Difference:	6.2

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

Lab Job # _____

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
KE1179-1	Location Alameda

Sampler's Name (printed): Dennis Ladouzinsky

KA Sample I.D. Number	Lab Sample I.D. Number	Date	Soil	wipe Water Sludge	Number/Type of Container	Total Cyanide	Remarks
CFS-5		5/24/90		X	10cm x 10cm	X	
CFS-6					AREA	X	
CFS-7						X	
CFS-8						X	
CFS-9						X	
CFS-10				X		X	

Analytical Tests: Method 8015 - TPH as Gasoline; Method 8015 - TPH as Diesel; Method 8240 - Volatile Organics; Method 8270 - Semi-Volatile Organics; Method 8010 - Halogenated Volatile Organics; Method 8080 - Organochlorine Pesticides & PCB's; Waste Oil - Metals -

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	5/25/90 9:20 AM	Carl Walter
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
Carl Walter	5/25/90 9:58	[signature]

Ship To: Sequoia Analytical

Attention: _____

Phone No: _____

Requested Turnaround Time: 48 hr. TAT

Kaldveer Assoc. Contact: Dennis Ladouzinsky

Please address correspondence and return cooler # _____ to:

Remarks:

Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

Kaldveer Associates
Geoscience Consultants
A Corporation

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement - Alameda	Sampled:	Jun 15, 1990
425 Roland Way	Sample Descript:	Soil	Received:	Jun 15, 1990
Oakland, CA 94621	Analysis for:	Copper		
Attention: Dennis Laduzinsky	First Sample #:	006-2476		
			Reported:	Jun 19, 1990

LABORATORY ANALYSIS FOR: Copper

Sample Number	Sample Description	Detection Limit mg/kg	Sample Result mg/kg
006-2476	CS-11	0.50	17
006-2477	CS-12	0.50	21
006-2478	CS-13	0.50	22
006-2479	EX-1	0.50	24
006-2480	EX-2	0.50	35

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement - Alameda		Sampled:	Jun 15, 1990
425 Roland Way	Sample Descript:	Wipe		Received:	Jun 15, 1990
Oakland, CA 94621	Analysis for:	Cyanide			
Attention: Dennis Laduzinsky	First Sample #:	006-2481	A - B	Analyzed:	Jun 19, 1990
				Reported:	Jun 19, 1990

LABORATORY ANALYSIS FOR: Cyanide

Sample Number	Sample Description	Detection Limit mg/wipe	Sample Result mg/wipe
0062481 A-B	WPC-1	0.0050	N.D.
0062482 A-B	WPC-2	0.0050	0.0070
0062483 A-B	WPC-3	0.0050	N.D.
0062484 A-B	WPC-4	0.0050	N.D.
0062485 A-B	WPC-5	0.0050	0.0050
0062486 A-B	WPC-6	0.0050	N.D.
0062487 A-B	WPC-B	0.0050	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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Diane Elich Lawver
Project Manager

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680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement - Alameda		Sampled:	Jun 15, 1990
425 Roland Way	Sample Descript:	Wipe		Received:	Jun 15, 1990
Oakland, CA 94621	Analysis for:	Arsenic			
Attention: Dennis Laduzinsky	First Sample #:	006-2481	A - B	Analyzed:	Jun 19, 1990
				Reported:	Jun 19, 1990

LABORATORY ANALYSIS FOR: Arsenic

Sample Number	Sample Description	Detection Limit mg/kg	Sample Result mg/kg
0062481 A-B	WPC-1	0.0050	N.D.
0062482 A-B	WPC-2	0.0050	N.D.
0062483 A-B	WPC-3	0.0050	N.D.
0062484 A-B	WPC-4	0.0050	N.D.
0062485 A-B	WPC-5	0.0050	N.D.
0062486 A-B	WPC-6	0.0050	N.D.
0062487 A-B	WPC-B	0.0050	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.	Client Project ID:	#KE1179-1, Clement - Alameda	Sampled:	Jun 15, 1990
425 Roland Way	Sample Descript:	Wipe	Received:	Jun 15, 1990
Oakland, CA 94621	Analysis for:	Lead		
Attention: Dennis Laduzinsky	First Sample #:	006-2481 , A - B	Analyzed:	Jun 19, 1990
			Reported:	Jun 19, 1990

LABORATORY ANALYSIS FOR: Lead

Sample Number	Sample Description	Detection Limit mg/wipe	Sample Result mg/wipe
0062481 A-B	WPC-1	0.0050	N.D.
0062482 A-B	WPC-2	0.0050	N.D.
0062483 A-B	WPC-3	0.0050	N.D.
0062484 A-B	WPC-4	0.0050	N.D.
0062485 A-B	WPC-5	0.0050	N.D.
0062486 A-B	WPC-6	0.0050	N.D.
0062487 A-B	WPC-B	0.0050	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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(415) 364-9600 • FAX (415) 364-9233

Kaldveer Associates, Inc.
425 Roland Way
Oakland, CA 94621
Attention: Dennis Laduzinsky

Client Project ID: #KE1179-1, Clement - Alameda

QC Sample Group: 0062476 - 0062487

Reported: Jun 19, 1990

QUALITY CONTROL DATA REPORT

ANALYTE	Copper	Arsenic	Lead
Method:	EPA 6010	EPA 7060	EPA 7421
Analyst:	B. Oliver	S. Foster	R. Sharma
Reporting Units:	mg/kg	mg/wipe	mg/wipe
Date Analyzed:	Jun 18, 1990	Jun 19, 1990	Jun 19, 1990
QC Sample #:	006-0966	006-2614	006-2481
Sample Conc.:	20	5.6	N.D.
Spike Conc. Added:	500	50	0.050
Conc. Matrix Spike:	500	54	0.052
Matrix Spike % Recovery:	96	97	100
Conc. Matrix Spike Dup.:	390	52	0.051
Matrix Spike Duplicate % Recovery:	74	93	100
Relative % Difference:	25	3.8	2.0

SEQUOIA ANALYTICAL

Diane Elich Lawver
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

Lab Job # _____

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name / Location
KE1179-1	Clement / Alameda.

Sampler's Name (printed): Dennis Ladoziusky

KA Sample I.D. Number	Lab Sample I.D. Number	Date	Soil	Water	Number/Type of Container	Analytical Tests: Method 8015 – TPH as Gasoline	Method 8015 – TPH as Diesel	Method 8240 – Volatile Organics	Method 8270 – Semi-Volatile Organics	Method 8010 – Halogenated Volatile Organics	Method 8080 – Organochlorine Pesticides & PCB's	Waste Oil – Metals –	Total Copper	Total Cyanide	Arsenic	Lead	Remarks
CS-11		6/15	X		40 ml glass								X				RUN Waste Extraction test for any sample having ≥ 250 ppm total copper
CS-12			X										X				
CS-13			X										X				
Ex-1			X										X				
Ex-2			X										X				
WPC-1		6/15		wipe	wipE Sample from 10 cm x 10 cm area 2 wipes Per sample									X	X	X	
WPC-2														X	X	X	
WPC-3														X	X	X	
WPC-4														X	X	X	
WPC-5														X	X	X	
WPC-6														X	X	X	
WPC-B														X	X	X	← Method Blank

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	4/19/10 1540	[signature]
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)

Ship To: Sequoia Analytical

Attention: _____

Phone No: _____

Requested Turnaround Time: 48 hour

Kaldveer Assoc. Contact: Dennis Ladoziusky

Remarks:

Please address correspondence and return cooler # _____ to:

Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

Kaldveer Associates
Geoscience Consultants
A California Corporation

APPENDIX II

REPORT ON AIR AND WIPE SAMPLING
1829 CLEMENT AVENUE
BUILDING EVALUATION
BY
ENVIRONMENTAL HEALTH CONSULTANTS

REPORT ON AIR AND WIPE SAMPLING

1829 CLEMENT AVENUE

BUILDING EVALUATION

Prepared for:

Loren Smith

Prepared by:

Environmental Health Consultants, Inc.

TABLE OF CONTENTS

1.0 Introduction

This report addresses the air monitoring and wipe sampling conducted at the building at 1829 Clement Avenue in Alameda, California on April 26, 1990. The monitoring program was conducted in order to characterize the potential exposure of future occupants of the building to chemical constituents known to be used in various processes by former tenants of the building. These chemicals were known to exist in the materials beneath the building. However, it was not known to what extent they were present inside the building, and what exposure pathways may exist for future tenants. Through the sampling it was found that the site constituents are present inside the building at very low levels, if at all, and then only on uncovered or unpainted surfaces. No airborne constituents were found at any amount above detectable levels.

2.0 Sampling Strategy

In order to characterize the average concentrations present in the building, a strategy was chosen in which the existing site chemical data and site observations were used to determine the most likely potential constituents for exposure. Appropriate sampling/analysis methods were then chosen, samples collected and analyzed, and results matched with their respective building locations.

3.0 Selection of Analytes

Analytes for the samples were chosen according to: their prevalence on site; the likelihood of exposure of building occupants; and chemical volatility, toxicity, and carcinogenicity.

Metals (specifically arsenic, beryllium, chromium, copper, molybdenum, and lead), and cyanides were chosen as parameters because site data showed that both were used by the former tenants of the building during the plating and etching operations, and that both are present in the materials beneath the building.

4.0 Sampling Protocol

4.1 Sampling and Analytical Methods

The sampling was conducted in accordance with standardized NIOSH and OSHA methods for sampling and analysis, or a suitable equivalent. Specifically, the methods used for the sampling were: NIOSH Method 7300 for airborne metals; NIOSH Method 7904 for airborne cyanides; and a modified OSHA method for wipe sampling using the appropriate wetting solution. These methods specify QA/QC provisions for instrument calibration, sample media, collection parameters, packaging, storage, preparation for analysis, and analytical procedures. Both air and wipe metals samples were analyzed via inductively-coupled argon plasma spectrophotometry. All cyanide samples were analyzed via ion-specific electrode. A copy of the NIOSH methods cited above are included in Appendix A.

4.2 Recordkeeping

Detailed sample documentation is an integral part of the overall sampling program. This documentation is necessary in order to demonstrate the accuracy and validity of sample data. All sampling data was recorded in ink in the sampling log. Any problems encountered during the sample period were recorded in the log. The following information was also recorded for the samples;

1. Date of sampling;
2. Sample location;
3. Sample identification number;
4. Start and stop times, total minutes sampled, and sample volume (air samples);
5. Pump number (air samples);
6. Pump calibration data and sample flow rate (air samples);

In addition to preserving accurate sampling data, shipping and handling of the samples were documented through the use of a chain-of-custody form which accompanied the samples to the laboratory.

4.3 Sample Media

Several types of media were utilized for the sampling. These media included mixed cellulose ester fiber (MCEF) filters for airborne metals; MCEF filters in conjunction with sodium hydroxide (NaOH) solution in an impinger for airborne cyanides; and Watman ashless filter paper for the wipe sampling. The Watman filters were pre-wetted by the laboratory with NaOH for the cyanides analysis, and were wetted in the field with purified distilled water for the metals analysis.

4.4 Air Sample Collection

4.4.1 Pump Calibration

All sample pumps were calibrated before and after use to verify the accuracy of the flowrate at which the samples were collected. Pumps were calibrated utilizing a precision rotameter, which was in turn calibrated to a Gilibrator primary standard. The lowest of the pre- and post-calibration flowrates was used in the volume determination. The use of the lower air volume results in a higher calculated airborne concentration, and is therefore more conservative.

4.4.2 Sample Placement

The air samples were collected by placing the sample at a location near the middle of each room, attached to a stanchion which allowed the sample to be collected at a height of approximately three feet above the floor. These locations were chosen in order to obtain the average as far as airborne chemical constituents in

the breathing zone throughout the building. Air sample locations are shown on Figure 1. Samples were collected for cyanides at all locations. Metals samples were taken at locations 1, 3, 5, 6, 8, and 9.

4.4.3 Sample Collection

For both the metals and the cyanides air samples, the sampling pump was operated in the high-flow configuration. The pump senses changes in resistance across the filter and adjusts its speed correspondingly, thus assuring a consistent flow rate. The metals samples were collected at a flow rate of approximately two liters/minute (l/min.), while the cyanides samples were run at one l/min. The plastic plugs were removed from the filter cassette and saved for resealing it after the sampling event. For the cyanides samples, the bubbler impinger was put in-line between the filter and the pump. The sampling trains were attached to the pump by a length of tubing such that the air sample was drawn in through the port on the cassette marked "INLET".

4.4.4 Sampling Control

The sample start and stop times were recorded in order to calculate the total sample volume. The pumps were observed periodically throughout the sampling period to verify the consistency of the flowrate, and any problems which arose were noted. No tampering with the samples was tolerated. All samples ran for a period of 480 minutes, except Sample A-4.26C-3. On this sample, the pump faulted out after 317 minutes due to battery failure. Another battery was installed and the pump restarted. The total sampling time, and hence the sample volume, was adjusted to reflect the period during which the pump was not operating. At the end of the sampling period, the shut-off time and the pump timer reading were recorded for all the pumps. The total air volume for each ambient air sample was calculated by multiplying the flowrate by the total

number of minutes sampled.

4.4.5 Sample Handling

The MCEF filter samples for metals were left in the filter cassette for shipment to the laboratory. The cassette plugs were replaced, and the cassettes were placed in a Ziplock bag and stored in a safe location until shipment. The filters for the cyanides samples were removed from the cassettes with tweezers, transferred to a vial supplied by the laboratory, and labelled with the label from the cassette. The impinger solution was transferred to a separate vial, and the impinger was rinsed into the vial with a small amount of fresh NaOH solution. The label was then placed on the vial.

4.5 Wipe Sample Collection

4.5.1 Sample Locations

Sample locations were chosen in order to obtain an average characterization of concentrations of chemicals on exposed surfaces within the building. An effort was made to obtain a worst-case scenario by sampling only those areas which had not recently been painted or covered with new materials. As such, the areas sampled were the sections of original flooring throughout the building, with nearly every room that was used in the former operations being sampled. Both cyanides and metals samples were taken at every location.

4.5.2 Sample Collection

At each location, two adjacent 10-centimeter (cm) by 10-cm squares were marked on the surface to be sampled, one square for the cyanides sample and one for the metals. A clean pair of latex gloves was used for each sample location in order to prevent cross-contamination of samples.

4.5.3 Sample Handling

After each wipe sample was collected, it was placed in a separate pre-labelled vial and the lid was securely fastened. At the end of the sampling, the vials were placed in the cooler for shipment to the laboratory.

4.6 Field Blanks

One field blank was prepared for each type of sample collected. One of each of the sample media was handled as though it were being used to sample. The plugs from the filter cassettes for the metals samples were removed and then replaced. The MCEF filter for a cyanide air sample was removed from the cassette and placed in a vial. An amount of NaOH solution was poured directly into another vial as a blank for the cyanides impinger samples. The Watman filter for the wipe samples for cyanides was briefly taken from its vial and placed back in the same vial. A wipe filter for metals was moistened with the same distilled water used for the other metals samples and placed in a vial. The blank samples were labelled, stored, and shipped in the same manner as the other samples.

4.7 Chain of Custody and Shipment

Each sample number was listed on the chain-of-custody form with the analysis to be performed, along with other pertinent information.

The samples were shipped via overnight delivery to the laboratory. The samples and chain-of-custody were placed in a cooler with blue ice and packing material (the metals samples do not require blue ice.) The cooler was then taped shut to assure evidence of any tampering, and to prevent accidental loss of the samples from the cooler. All samples were sent to Clayton Environmental Consultants, Inc., for analysis. Clayton is a laboratory

accredited by the American Industrial Hygiene Association (AIHA). Chain-of-custody forms for the samples are included in Appendix B.

5.0 Analytical Results

All sample data was reviewed for the sampling procedures followed, recordkeeping, and validity and accuracy of the data. The actual analytical results reported by Clayton are included in Appendix C. The number at the end of each sample identification number corresponds to the location numbers delineated on Figure 1.

Volumes for the air samples ranged from 434 to 480 liters for the cyanides samples, and all metals samples volumes were 960 liters. Detection limits for metals ranged from 1 to 5 micrograms of metal per cubic meter of air (ug/m^3), and for cyanides from 13 to 14 ug/m^3. All of these detection levels are well below the current OSHA Permissible Exposure Limits (PEL)s.

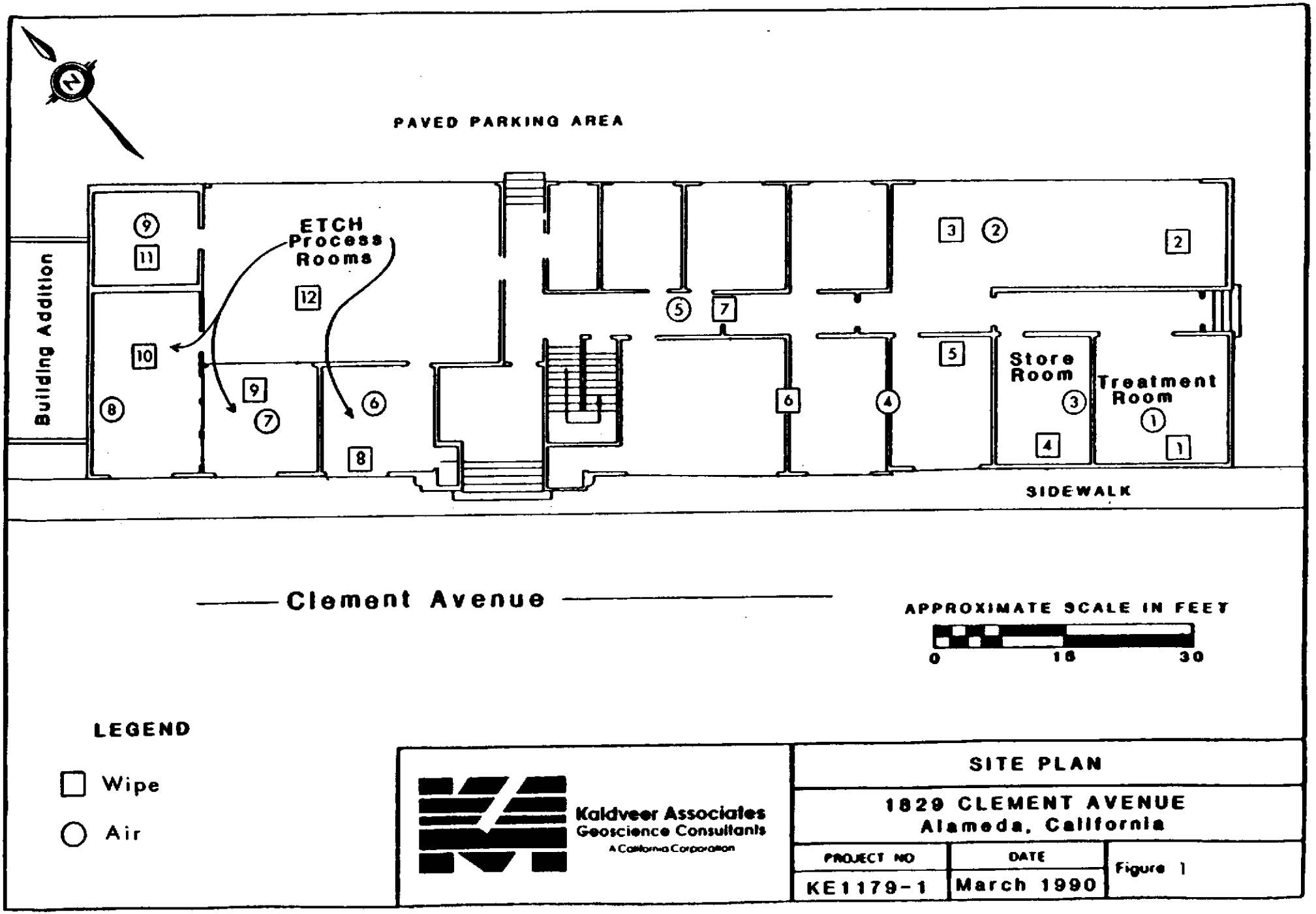
The detection limits for the wipe samples for metals ranged from 2 to 7 ug, while the cyanides detection level was 3 ug.

All of the results for the air samples for both cyanides and metals were below the detection limits, as were all of the cyanides wipe samples. Two of the wipe samples for metals contained amounts just at or above the detection level. The wipe sample from the "Treatment Room", Location 1, contained copper at 7 ug, right at the detection level. The sample from the corner storage room, Location 11, contained lead at 4 ug, just above the detection level of 3 ug.

6.0 Recommendations

As of the writing of this document, the intended use for the building at 1829 Clement Avenue is for business office space. The walls have been painted, some of the floors have been replaced, and other floors have been or are going to be covered over with plywood and carpet. All of these measures will tend to reduce or eliminate any potential exposures which may occur to the occupants through a contact route of exposure. Because of the non-detectable to low concentrations found on the building surfaces, and because the samples were taken as a worst-case example, such measures should be sufficient.

Air quality is not of concern, since the samples were all below the limits of detection, which are all well below OSHA permissible levels.



Kaldveer Associates
Geoscience Consultants
A California Corporation

SITE PLAN

1829 CLEMENT AVENUE
Alameda, California

PROJECT NO	DATE	
KE1179-1	March 1990	Figure 1

APPENDIX A

NIOSH ANALYTICAL METHODS

FORMULA: HCN and salts

M.W.: 27.03 (HCN); 65.11 (KCN)

CYANIDES, aerosol and gas

METHOD: 7904
ISSUED: 2/15/84

OSHA: 11 mg/m³; skin (HCN)
5 mg/m³; skin (cyanides, as CN^-)
NIOSH: 5 mg/m³/10 min (as CN^-) [1]
ACGIH: C 10 mg/m³; skin (HCN);
5 mg/m³; skin (cyanides, as CN)

PROPERTIES: HCN: gas, BP 26 °C
KCN: solid, d 1.52 g/mL, MP 634 °C

SYNONYMS: HCN: hydrocyanic acid, prussic acid, formonitrile, CAS #74-90-8.
cyanides: CAS #151-50-8; CAS #143-33-9.

SAMPLING

SAMPLER: FILTER + BUBBLER
(0.8-µm cellulose ester membrane
+ 10 mL 0.1 N KOH)

FLOW RATE: 0.5 to 1 L/min

VOL-MIN: 10 L @ 5 mg/m³ (as CN^-)
-MAX: 180 L @ 11 mg/m³ (as CN^-)

SHIPMENT: routine

SAMPLE STABILITY: HCN stable in 0.1 N KOH at least 1 week [1]; particulate on filter may liberate HCN gas [2]

BLANKS: 2 to 10 field blanks per set

ACCURACY

RANGE STUDIED: 5 to 21 mg/m³ (HCN) [3];
2.6 to 10 mg/m³ (KCN) [2]

BIAS: not significant [2,3]

OVERALL PRECISION (s_r): 0.081 (HCN) [3];
0.103 (KCN) [2]

MEASUREMENT

TECHNIQUE: ION-SPECIFIC ELECTRODE

ANALYTE: cyanide ion (CN^-)

EXTRACT FILTER: 25 mL 0.1 N KOH; 30 min

RINSE BUBBLER: 2 mL 0.1 N KOH; dilute to 25 mL with 0.1 N KOH

MEASURE: mV reading of cyanide ion electrode vs. reference electrode

CALIBRATION: solutions of KCN in 0.1 N KOH

RANGE: 0.05 to 2 mg CN^-

ESTIMATED LOD: 2.5 µg CN^- [2]

PRECISION (s_r): 0.043 (HCN) [3];
0.038 (KCN) [2]

APPLICABILITY: The working range (as CN^-) is 0.5 to 15 mg/m³ for a 90-L air sample or 5 to 20 mg/m³ for a 10-L air sample.

INTERFERENCES: Sulfide, chloride, iodide, bromide, cadmium, zinc, silver, nickel, cuprous iron and mercury interfere. In humid atmospheres, some particulate cyanide collected on the filter will liberate hydrogen cyanide which will be trapped in the bubbler [2]. The method cannot distinguish between HCN formed in this manner and HCN originally present in air.

OTHER METHODS: This method combines and replaces Methods S288 [4], S250 [5], and P&CAM 116 [6].

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REAGENTS:

1. Double distilled (d.d.) water.
2. Potassium cyanide.*
3. Calibration stock solution, 1000 µg CN^-/mL. Dissolve 0.250 g KCN in 0.1 N KOH to make 100 mL solution. Stable for at least 1 week in polyethylene bottle.
4. Potassium hydroxide (KOH), 0.1 N. Dissolve 5.6 g KOH in d.d water; dilute to 1000 mL.
5. Lead acetate paper.
6. Cadmium carbonate (if sulfide present).
7. Hydrogen peroxide, 30% (if sulfide present).
8. Sodium sulfite, 1 M (if sulfide present).

*See Special Precautions.

EQUIPMENT:

1. Sampler: mixed cellulose ester membrane filter, 37-mm diameter, 0.8-µm pore size, followed by a glass midget bubbler containing 15 mL 0.1 N KOH.
2. Personal sampling pump, 0.5 to 1 L/min, with splashover protection and flexible connecting tubing.
3. Vials, polyethylene, with screw caps, 20-mL, and plastic tape for sealing.
4. Cyanide ion electrode, (Orion 94-06 or equivalent).
5. Reference electrode.
6. pH meter, readable to 0.1 mV.
7. Magnetic stirrer and stirring bars.
8. Jars, ointment, 60-mL, squat-form with aluminum-lined screw caps.
9. Pipets, 0.05- to 2-and 25-mL, with pipet bulb.
10. Volumetric flasks, 25-mL.
11. Beakers, 50-mL.
12. Analytical balance, readable to 0.1 mg.

SPECIAL PRECAUTIONS: Hydrogen cyanide gas and the cyanide particulates may be fatal if swallowed, inhaled or absorbed through the skin. Work in a hood.

Amyl nitrite is the antidote for cyanide poisoning [1].

SAMPLING:

1. Calibrate each personal sampling pump with a representative sampler in line.
2. Sample at 0.5 to 1 L/min for a total sample size of 10 to 180 L.
   NOTE: Maintain bubblers in a vertical position during sampling. Do not allow the solution level to fall below 10 mL.
3. Remove the bubbler stem and tap it gently against the inside wall of the bubbler. Rinse the bubbler stem with 1 to 2 mL of unused 0.1 N KOH. Add the rinse to the bubbler.
4. Quantitatively transfer the contents of the bubbler to a 20-mL vial. Close cap tightly and wrap with plastic tape to avoid sample loss during transit. Label each vial.

SAMPLE PREPARATION:

5. Transfer the filter from the cassette filter holder to a 60-mL ointment jar.
6. Pipet 25.0 mL 0.1 N KOH into the jar. Cap and allow to stand for at least 30 min with occasional shaking to complete extraction. Analyze within 2 hrs after extraction.
7. Empty the contents of the vial into a 25-mL volumetric flask using 0.1 N KOH to rinse the vial. Add rinse to the volumetric flask. Dilute to the mark with 0.1 N KOH.
   NOTE: Sulfide ion irreversibly poisons the cyanide ion specific electrode and must be removed if present. Check for the presence of sulfide ion by touching a drop of sample to a piece of lead acetate paper; the paper will discolor in the presence of sulfide ion. If this test is positive, remove sulfide by one of the following methods:
   a. Add 1 mL 1 M H_2O_2 and 1 mL 1 M Na_2SO_3 to sample solutions prior to diluting to volume; or

b. Add a small amount (spatula tip) of powdered cadmium carbonate to the sample. Swirl to disperse the solid and recheck the liquid with lead acetate paper. If sulfide ion has not been removed completely, add more cadmium carbonate. Avoid a large excess of cadmium carbonate and long contact time with the solution. When a drop of liquid no longer discolors a strip of lead acetate paper, filter the sample through a small plug of glass wool in a Pasteur pipette and proceed with the analysis.

CALIBRATION AND QUALITY CONTROL:

8. Prepare at least five working standards fresh daily to cover the range 50 to 2000 µg CN^- per sample by diluting aliquots of 1000 µg/mL calibration stock solution with 0.1 N KOH (e.g., 0.05 to 2.0 mL calibration stock solution diluted to 25 mL).
9. Analyze the working standards according to steps 11 and 12 together with the samples and blanks.
10. Prepare a calibration graph on semilog paper by plotting cyanide ion concentration on the logarithmic axis and mV on the linear axis.

MEASUREMENT:

11. Transfer the solution to be measured to a 50-mL beaker. Immerse the cyanide ion electrode and reference electrode in the sample and start the magnetic stirrer.
12. With the magnetic stirrer on, allow the potential reading to stabilize. Record the mV reading.

NOTE 1: Potential readings are a function of temperature. Measure samples and working standards at the same temperature (± 2 °C).

NOTE 2: The cyanide electrode will malfunction if chloride, iodide and bromide ions, which form insoluble silver salts, are present in sufficient quantity. Several metal ions are also known to complex with cyanide such as cadmium, zinc, silver, nickel, cuprous iron and mercury. Consult the electrode instruction manual for the procedure to use when such ions are present.

CALCULATIONS:

13. Read the mass, µg, of cyanide ion present in the sample filter (W_f), sample bubbler (W_b), average media blank filter (B_f) and media blank bubblers (B_b) from the calibration graph.
14. Calculate the concentration (mg/m³) of particulate cyanide, Cp, and hydrogen cyanide, C_{HCN}, in the air volume sampled, V (L):

$$Cp = \frac{W_f - B_f}{V}, \text{ mg/m}^3 \text{ and } C_{HCN} = \frac{(W_b - B_b) \cdot 1.04}{V}, \text{ mg/m}^3$$

where 1.04 is the stoichiometric conversion factor from CN^- to HCN.

NOTE: Particulate cyanides will be collected on the filter. In humid atmospheres, however, it has been observed that during the collection of particulate cyanide, HCN is gradually liberated [2]; therefore, particulate cyanide interference is not completely removed.

EVALUATION OF METHOD:

HCN: Method S288 was issued on September 2, 1977 [4]. Test atmospheres of HCN were generated by calibrated flow from a compressed mixture of HCN in nitrogen [3,7]. The range of HCN concentrations in air was 5 to 21 mg/m³ for 12-L air samples. Eighteen HCN samples collected at 0.2 L/min for 60 min indicated overall precision of 6.2%, with a 96.7% recovery. An eight-day storage stability study involving six samples at the OSHA standard concentration

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level indicated a 92.4% average recovery for the one-day old samples and a 92.6% for eight-day old samples. A collection efficiency study at twice the OSHA standard level, which included backup bubblers, indicated that an average of 99.8% of HCN was collected in the first bubbler. The HCN air generated concentrations were independently confirmed by a titration method [3].

KCN: Method S250 was issued on January 30, 1976 [5]. A set of six weighed KCN samples in the range of 1.8 to 2.5 mg KCN per filter indicated a 97% recovery and a 3.8% measurement precision [2]. Spiking with aqueous or basic solutions of KCN proved unsuccessful (low recovery) because of the cyanide instability in the presence of water and CO_2. Test atmospheres of KCN were generated by atomization of an aqueous solution (162 g/L) of KCN into a dry airstream. Eighteen KCN samples collected in 0.1 N NaOH at 1.5 L/min for 60 min indicated overall precision, s_r, of 0.09. Collection was accomplished with cellulose ester membrane filters followed with backup bubblers. The collection efficiency at twice the OSHA level was 100.0% on the filters. Cyanide salts are known to decompose in moist air with liberation of HCN. This instabilty was determined with two sets of six samples at the one and two times the OSHA level. Each of the samples which were twice the OSHA level were connected with two backup bubblers. Both sets indicated a loss of 16.5%.

REFERENCES:

[1] Criteria for a Recommended Standard...Occupational Exposure to Hydrogen Cyanide and Cyanide Salts, S-9, U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 77-108 (1976).
[2] Documentation of the NIOSH Validation Tests, S250, U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 77-185 (1977).
[3] Backup Data Report for Hydrogen Cyanide, S288, available as "Ten NIOSH Analytical Methods, Set 5," Order No. BP 287-499 from NTIS, Springfield, VA 22161.
[4] NIOSH Manual of Analytical Methods, 2nd. ed., V. 4, S288, U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 78-175 (1978).
[5] Ibid, V. 3, S250, U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 77-157-C (1977).
[6] Ibid, V. 1, P&CAM 116, U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 77-157-A (1977).
[7] NIOSH Research Report-Development and Validation of Methods for Sampling and Analysis of Workplace Toxic Substances, U.S. Department of Health and Human Services, Publ. (NIOSH) 80-133 (1980).

METHOD REVISED BY: J. Palassis, NIOSH/DPSE; S250 and S288 originally validated under NIOSH Contracts CDC-99-74-45 and 210-76-0123, respectively.

ELEMENTS (ICP)

METHOD: 7300
ISSUED: 2/15/84

M.W.: Table 1

OSHA/NIOSH/ACGIH: Table 1

PROPERTIES: Table 1

ELEMENTS:	aluminum	cobalt	manganese	silver	tungsten
	arsenic	copper	molybdenum	sodium	vanadium
	beryllium	iron	nickel	tellurium	yttrium
	cadmium	lead	phosphorus	thallium	zinc
	calcium	lithium	platinum	tin	zirconium
	chromium	magnesium	selenium	titanium	

SYNONYMS: vary depending upon the compound.

SAMPLING

SAMPLER: FILTER
(0.8-µm, cellulose ester membrane)

FLOW RATE: 1 to 4 L/min

VOL-MIN: Table 1
-MAX: Table 1

SHIPMENT: routine

SAMPLE STABILITY: stable

BLANKS: 2 to 10 field blanks per set

ACCURACY

RANGE STUDIED: not studied

BIAS: none identified

OVERALL PRECISION (s_r): not evaluated

MEASUREMENT

TECHNIQUE: INDUCTIVELY COUPLED ARGON PLASMA, ATOMIC EMISSION SPECTROSCOPY

ANALYTE: elements above

ASHING REAGENTS: conc. HNO_3, 4 mL;
and conc. $HClO_4$, 1 mL
CONDITIONS: room temperature, 30 min;
150 °C to near dryness

FINAL SOLUTION: 4% HNO_3, 1% $HClO_4$, 10 mL

WAVELENGTH: depends upon element; Table 2

BACKGROUND CORRECTION: spectral wavelength shift

CALIBRATION: elements in 4% HNO_3, 1% $HClO_4$

RANGE: 2.5 to 1000 µg per sample [1]

ESTIMATED LOD: 1 µg per sample [1]

PRECISION (s_r): Table 2

APPLICABILITY: The working range of this method is 0.005 to 2.0 mg/m³ for each element in a 500-L air sample. This is simultaneous elemental analysis, not compound specific. Verify that the types of compounds in the samples are soluble with this ashing procedure.

INTERFERENCES: Spectral interferences are the primary interferences encountered in ICP-AES analysis. These are minimized by judicious wavelength selection, interelement correction factors and background correction [1,2].

OTHER METHODS: This method replaces P&CAM 351 [2] for trace elements. Atomic absorption spectroscopy (e.g., Methods 7OXX) is an alternate analytical technique for many of these elements.

ELEMENTS (ICP) METHOD: 7300

REAGENTS:
1. Nitric acid, conc.
2. Perchloric acid, conc.*
3. Ashing acid: 4:1 (v/v) HNO_3:$HClO_4$. Mix 4 volumes conc. HNO_3 with 1 volume conc. $HClO_4$.
4. Calibration stock solutions, 1000 µg/mL. Commercially available, or prepared per instrument manufacturer's recommendation (see step 12).
5. Dilution acid, 4% HNO_3, 1% $HClO_4$. Add 50 mL ashing acid to 600 mL water; dilute to 1 L.
6. Argon.
7. Distilled,deionized water.

*See Special Precautions.

EQUIPMENT:
1. Sampler: cellulose ester membrane filter, 0.8-µm pore size, 37-mm diameter; in cassette filter holder.
2. Personal sampling pump, 1 to 4 L/min, with flexible connecting tubing.
3. Inductively coupled plasma-atomic emission spectrometer, equipped as specified by the manufacturer for analysis of elements of interest.
4. Regulator, two-stage, for argon.
5. Beakers, Phillips, 125-mL, or Griffin, 50-mL, with watchglass covers.*
6. Volumetric flasks, 10- and 100- mL.*
7. Assorted volumetric pipets as needed.*
8. Hotplate, surface temperature 150 °C.

*Clean all glassware with conc. nitric acid and rinse thoroughly in distilled water before use.

SPECIAL PRECAUTIONS: Perform all perchloric acid digestions in a perchloric acid hood.

SAMPLING:
1. Calibrate each personal sampling pump with a representative sampler in line.
2. Sample at an accurately known flow rate between 1 and 4 L/min for a total sample size of 200 to 2000 L (see Table 1) for TWA measurements. Do not exceed a filter loading of approximately 2 mg total dust.

SAMPLE PREPARATION:
3. Open the cassette filter holders and transfer the samples and blanks to clean beakers.
4. Add 5 mL ashing acid. Cover with a watchglass. Let stand 30 min at room temperature.
   NOTE: Start a reagent blank at this step.
5. Heat on hotplate (120 °C) until ca. 0.5 mL remains.
   NOTE: Some species of Li, Mn, Mo, Sn, W, and Zr will not be completely solubilized by this procedure. Alternative solubilization techniques for most of these elements can be found elsewhere [2,3,4,5,6,7].
6. Add 2 mL ashing acid and repeat step 5. Repeat this step until the solution is clear.
7. Remove watchglass and rinse into the beaker with distilled water.
8. Increase the temperature to 150 °C and take the sample to dryness.
9. Dissolve the residue in 2 to 3 mL dilution acid.
10. Transfer the solutions quantitatively to 10-mL volumetric flasks.
11. Dilute to volume with dilution acid.

CALIBRATION AND QUALITY CONTROL:
12. Calibrate the spectrometer according to the manufacturers recommendations.
    NOTE: Typically, an acid blank and 10 µg/mL multielement working standards are used. The following multielement combinations are chemically compatible in 4% HNO_3/1% $HClO_4$:
    a. Ag, Ca, Co, Mn, Pb, V, Zn;
    b. Al, Be, Cd, La, Li, Ni, Tl;
    c. As, B, Ba, Mg, Mo, P, Sn;

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d. Cu, Fe, Na, Pt, Sr, Te, Y;
e. Cr, K, Sb, Se, Ti, Zr; and
f. Si, W (distilled water only)

13. Analyze a standard for every ten samples.
14. Check recoveries with at least two spiked media blanks per ten samples.

MEASUREMENT:

15. Set spectrometer to conditions specified by manufacturer.
16. Analyze standards and samples.
    NOTE: If the values for the samples are above the range of the standards, dilute the solutions with dilution acid, reanalyze and apply the appropriate dilution factor in the calculations.

CALCULATIONS:

17. Obtain the solution concentrations for the sample, C_s (µg/mL), and the average media blank, C_b (µg/mL), from the instrument.
18. Using the solution volumes of sample, V_s (mL), and media blank, V_b (mL), calculate the concentration, C (mg/m^3), of each element in the air volume sampled, V (L):

$$C = \frac{C_s V_s - C_b V_b}{V}, \ mg/m^3.$$

EVALUATION OF METHOD:

Method P&CAM 351 was evaluated in 1981 [1,2]. The precision and recovery data were determined at 2.5 and 1000 µg of each element per sample on spiked filters. The precision and recovery data, instumental detection limits, sensitivity, and analytical wavelengths are listed in Table 2. The values in Table 2 were determined with a Jarrell-Ash Model 1160 ICP operated according to manufacturer's instructions.

REFERENCES:

[1] Hull, R.D. "Multielement Analysis of Industrial Hygiene Samples," NIOSH Internal Report, presented at the American Industrial Hygiene Conference, Portland, Oregon (May 1981).
[2] NIOSH Manual of Analytical Methods, 2nd ed., V. 7, P&CAM 351, U.S. Department of Health and Human Services, Publ. (NIOSH) 82-100 (1981).
[3] Ibid, S341 (Lead).
[4] Ibid, V. 2, S5 (Manganese), U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 77-157-B (1977).
[5] Ibid, V. 4, P&CAM 271 (Tungsten), U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 78-175 (1978).
[6] Ibid, V. 5, P&CAM 173 (Metals by Atomic Absorption), U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 79-141 (1979).
[7] Ibid, V. 3, S183 (Tin), S185 (Zirconium), and S376 (Molybdenum), U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 77-157-C (1977).

METHOD REVISED BY: R. DeLon Hull and Mark Millson, NIOSH/DPSE.

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Table 1. Properties and sampling volumes.

Element (Symbol)	Properties: Atomic Weight	Properties: MP, °C	Permissible Exposure Limits, mg/m³ TWA OSHA/NIOSH/ACGIH	Air Volume @ OSHA, L: MIN	Air Volume @ OSHA, L: MAX
Silver (Ag)	107.87	961	0.01/ — / 0.1	250	2000
Aluminum (Al)	26.98	660	— / — / 10.	5 (g)	100 (g)
Arsenic (As)	74.92	817*	0.5/C 0.002/ 0.2	5	2000
Beryllium (Be)	9.01	1278	0.002/ 0.0005/ 0.002	1250	2000
Calcium (Ca)	40.08	842	5 (b)/ — / 2 (b)	5	200
Cadmium (Cd)	112.40	321	0.2/ 0.04/ 0.05	13	2000
Cobalt (Co)	58.93	1495	0.1/ — / 0.1	25	2000
Chromium (Cr)	52.00	1890	1.0 (c)/ 0.025/ 0.5 (c)	5	1000
Copper (Cu)	63.54	1083	1.0/ — / 1.0	5	1000
Iron (Fe)	55.85	1535	10 (b)/ — / 5 (b)	5	100
Lithium (Li)	6.94	179	0.025 (d)/ — / 0.025 (d)	100	2000
Magnesium (Mg)	24.31	651	15 (b)/ — / 10 (b)	5	67
Manganese (Mn)	54.94	1244	C 5/ — / C 5	5	200
Molybdenum (Mo)	95.94	651	15 (e)/ — / 10 (e)	5	67
Sodium (Na)	22.99	98	2 (C) / C 2 (f)/ C 2 (f)	13	2000
Nickel (Ni)	58.71	1453	1/ 0.015/ 1 (c)	5	1000
Phosphorus (P)	30.97	44	— / — / 0.1	25 (g)	2000 (g)
Lead (Pb)	207.19	328	0.05/ 0.1/ 0.15	50	2000
Platinum (Pt)	195.09	1769	0.002 (a)/ — / 1 (c)	1250	2000
Selenium (Se)	78.96	217	0.2/ — / —	13	2000
Tin (Sn)	118.69	232	2/ — / 2 (c)	5	500
Tellurium (Te)	127.60	450	0.1/ — / 0.1	25	2000
Titanium (Ti)	47.90	1675	— / — / 10 (b)	5	100
Thallium (Tl)	204.37	304	0.1 (a)/ — / 0.1 (a)	25	2000
Vanadium (V)	50.94	1890	C 0.5/ 1 (c)/ 0.05 (V_2O_5)	5	2000
Tungsten (W)	183.85	3410	— / 5 (e)/ 5 (e)	5 (g)	200 (g)
Yttrium (Y)	88.91	1495	1/ — / 1	5	1000
Zinc (Zn)	65.37	419	5 (b)/ 5 (b)/ 5 (b)	5	200
Zirconium (Zr)	91.22	1852	5/ — / 5	5	200

(a) soluble
(b) oxide
(c) metal
(d) hydride
(e) insoluble
(f) hydroxide
(g) at the ACGIH TLV

Table 2. Measurement procedures and data (a).

Element	Wavelength (nm)	Instrumental LOD (ng/mL)	Sensitivity (Intensity/ µg/mL)	Recovery (%)		Precision (s_r) (N = 3)	
				@ 2.5 µg/ filter (b)	@ 1000 µg/ filter	@ 2.5 µg/ filter	@ 1000 µg/ filter
Ag	328.3	26	0.65	111	91	0.02	0.075
Al	308.2	14	0.23	93	100	0.092	0.023
As	193.7	13	0.57	103	99	0.062	0.026
Be	313.0	1.5	1.29	107	90	0.040	0.034
Ca	315.9	10	0.49	99	95	0.036	0.014
Cd	226.5	1.6	0.83	107	99	0.032	0.020
Co	231.2	7.4	0.38	101	95	0.040	0.005
Cr	205.6	1.3	0.50	98	106	0.053	0.016
Cu	324.8	2.1	0.72	98	99	0.036	0.022
Fe	259.9	3.9	0.13	94	97	0.068	0.016
Li	670.8	2.8	0.48	89	95	0.171	0.043
Mg	279.6	24	0.22	105	106	0.084	0.027
Mn	257.6	0.4	0.74	84	93	0.062	0.035
Mo	281.6	7.0	0.18	94	88	0.023	0.049
Na	589.0	10	0.76	(c)	101	(c)	0.045
Ni	231.6	3.4	0.41	105	97	0.027	0.020
P	214.9	22	0.17	(c)	91	(c)	0.056
Pb	220.4	17	0.42	105	95	0.060	0.011
Pt	203.7	15	0.6°	106	91	0.041	0.075
Se	190.6	21	0.28	105	97	0.068	0.049
Sn	190.0	64	0.49	74	67	0.33	0.16
Te	214.3	29	0.41	102	94	0.050	0.063
Ti	334.9	1.2	0.55	96	108	0.051	0.029
Tl	190.9	17	0.22	103	99	0.043	0.017
V	310.2	3.2	0.88	99	94	0.043	0.014
W	207.9	13	2.58	35	23	0.053	0.60
Y	371.0	0.8	2.35	99	100	0.015	0.013
Zn	213.9	0.6	0.60	101	94	0.013	0.013
Zr	339.2	1.9	0.88	75	98	0.049	0.008

(a) Values reported were obtained with a Jarrell-Ash Model 1160 ICP; performance may vary with instrument and should be independently verified.
(b) 2.5 µg/filter corresponds to 5 µg/m³ for a 500-L air sample.
(c) Blank levels too high to make accurate determinations

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APPENDIX B

CHAIN-OF-CUSTODY FORMS

Clayton ENVIRONMENTAL CONSULTANTS

A Marsh & McLennan Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

For Clayton Use Only	Page 1 of 3
Project No.	
Batch No.	
Client No.	
Date Received	By
Date Logged In	By

Purchase Order No. | Client Job No. 89-055

SEND INVOICE TO
Name Mary Agnes Nabors
Company Environmental Health Cons. | Dept.
Address 22955 Caminito Luz
City, State, Zip Laguna Hills CA 92653

REPORT RESULTS TO
Name Irene Hayashi | Title President
Company Environmental Health Consultants | Dept.
Mailing Address P.O. Box 117910
City, State, Zip Burlingame, CA 94011-7910
Telephone No. 347-9805 | Telefax No. Same

Date Results Required: | Rush Charges Authorized? ☒ Yes ☐ No

Special Instructions: (method, limit of detection, phone results, rush results, etc.)
* denotes 48-hour TAT,
otherwise normal TAT

* Explanation of Preservative:

CLIENT SAMPLE IDENTIFICATION		DATE SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	Metals (1CP)	FOR LAB USE ONLY
A-4.26M-1	*	4-26-90	MCE	Will Call	1	X	
-3	*		(Air)				
-5	*						
-6							
-8							
-9							
-Please add + analyze a blank of the appropriate lot.							

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added*)

CHAIN OF CUSTODY (If required)
Relinquished by: [signature] Date/Time 4/26/90 - 3p
Relinquished by: Date/Time
Method of Shipment:

Received by: Date/Time
Received at lab by: Date/Time
Sample condition upon receipt:

Authorized by: [signature] - SHE Date 4-26-90
(Client Signature Must Accompany Request)

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive
Novi, MI 48050
(313) 344-1770

Raritan Center
160 Fieldcrest Ave.
Edison, NJ 08837
(201) 225-6040

400 Chastain Center Blvd., N.W.
Suite 490
Kennesaw, GA 30144
(404) 499-7500

1252 Quarry Lane
Pleasanton, CA 94566
(415) 426-2600

DISTRIBUTION:
WHITE - Clayton Laboratory
YELLOW - Clayton Accounting
PINK - Client Retains

7/89 20K

Clayton
ENVIRONMENTAL CONSULTANTS
A Marsh & McLennan Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

For Clayton Use Only	Page 2 of 3
Project No.	
Batch No.	
Client No.	
Date Received	By
Date Logged In	By

Purchase Order No. | Client Job No. 89-055

SEND INVOICE TO
Name Mary Agnes Nekoras
Company | Dept.
Address See Page 1
City, State, Zip

REPORT RESULTS TO
Name Irene Fanelli | Title
Company | Dept.
Mailing Address
City, State, Zip See Page 1
Telephone No. | Telefax No.

Date Results Required: | Rush Charges Authorized? [X] Yes [ ] No

Special Instructions: (method, limit of detection, phone results, rush results, etc.)

* Explanation of Preservative: * 48-hour TAT for all samples on this page

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	ANALYSIS REQUESTED: Metals (ICP)	FOR LAB USE ONLY
W-426M-1	4-26-90	Wipe	Wipe	1		
-2		Ashless Filter	100 cm²			
-3						
-4						
-5						
-6						
-7						

CHAIN OF CUSTODY (If required)
Relinquished by: [signature] | Date/Time 4/27/90 6:30pm
Relinquished by: | Date/Time
Method of Shipment:

Received by: | Date/Time
Received at lab by: | Date/Time
Sample condition upon receipt:

Authorized by: [signature] - FMC Date 4-26-90
(Client Signature Must Accompany Request)

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive, Novi, MI 48050, (313) 344-1770
Raritan Center, 160 Fieldcrest Ave., Edison, NJ 08837, (201) 225-6040
400 Chastain Center Blvd., N.W., Suite 490, Kennesaw, GA 30144, (404) 499-7500
1252 Quarry Lane, Pleasanton, CA 94566, (415) 426-2600

DISTRIBUTION:
WHITE - Clayton Laboratory
YELLOW - Clayton Accounting
PINK - Client Retains

7/89 20K

Clayton ENVIRONMENTAL CONSULTANTS

A Marsh & McLennan Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

For Clayton Use Only | Page 3 of 3

Project No.

Batch No.

Client No.

Date Received | By

Date Logged In | By

Purchase Order No. | Client Job No. 89-055

SEND INVOICE TO

Name Mary Agnes Nefros

Company See page 1 | Dept.

Address

City, State, Zip

REPORT RESULTS TO

Name Jane Fanelli | Title

Company | Dept.

Mailing Address See page 1

City, State, Zip

Telephone No. | Telefax No.

Date Results Required: | Rush Charges Authorized? ☐ Yes ☒ No

Special Instructions: (method, limit of detection, phone results, rush results, etc.)

* Explanation of Preservative: Normal TAT for all samples on this page

ANALYSIS REQUESTED (Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	Metals (ICP)	FOR LAB USE ONLY
W-4.26M-8	4-26-90	Whatman	Wipe	1	X	
-9		Acid Leached Filter	100 cm^2			
-10						
-11						
-12						
-Blank						

CHAIN OF CUSTODY (If required)

Relinquished by: | Date/Time 4/26/90 1:30 | Received by: | Date/Time

Relinquished by: | Date/Time | Received at lab by: | Date/Time

Method of Shipment: | Sample condition upon receipt:

Authorized by: _____ Date 4-26-90

(Client Signature Must Accompany Request)

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive Novi, MI 48050 (313) 344-1770	Raritan Center 160 Fieldcrest Ave. Edison, NJ 08837 (201) 225-6040	400 Chastain Center Blvd., N.W. Suite 490 Kennesaw, GA 30144 (404) 499-7500	1252 Quarry Lane Pleasanton, CA 94566 (415) 426-2600

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7/89 20K

Clayton ENVIRONMENTAL CONSULTANTS

A Marsh & McLennan Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

For Clayton Use Only	Page 1 of 3
Project No.	
Batch No.	
Client No.	
Date Received	By
Date Logged In	By

Purchase Order No. | **Client Job No.** 89-055

SEND INVOICE TO
- Name: Mary Agnes Notopoulos
- Company: Environmental Health Consultants | Dept.
- Address: 22955 Cenicento Luz
- City, State, Zip: Laguna Hills, CA 92653

REPORT RESULTS TO
- Name: Irene Fanelli | Title: President
- Company: Environmental Health Consultants | Dept.
- Mailing Address: P.O. Box 117910
- City, State, Zip: Burlingame CA 94011-7910
- Telephone No.: 415-347-9305 | Telefax No.: Same

Date Results Required:

Rush Charges Authorized? ☒ Yes ☐ No

Special Instructions: (method, limit of detection, phone results, rush results, etc.)
* denotes 48-hour TAT.

*** Explanation of Preservative:** otherwise, normal TAT.

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MATRIX/ MEDIA	AIR VOLUME* (specify units)	Number of Containers	ANALYSIS REQUESTED (Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added*) Cyanide	FOR LAB USE ONLY
AA104291 / A-4.26C-1 *	4-26-90	MCE /	Will Call	2	X	
AA10984-1 / -2 *		NaOH				
-845 / -3 *		Zinc Acetate Solution				
-840 / -4 *						
-849 / -5 *						
-842 / -6						
-843 / -7						
848 / -8						
-846 / -9						
-847 / -Blank			Blank			

CHAIN OF CUSTODY (if required)
- Relinquished by: [signature] | Date/Time: 4-26-90 6:30p
- Relinquished by: | Date/Time
- Method of Shipment:

Received by: | Date/Time

Received at lab by: | Date/Time

Sample condition upon receipt:

Authorized by: [signature] - EHC **Date** 4-26-90
(Client Signature Must Accompany Request)

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive Novi, MI 48050 (313) 344-1770	Raritan Center 160 Fieldcrest Ave. Edison, NJ 08837 (201) 225-6040	400 Chastain Center Blvd., N.W. Suite 490 Kennesaw, GA 30144 (404) 499-7500	1252 Quarry Lane Pleasanton, CA 94566 (415) 426-2600

DISTRIBUTION:
WHITE - Clayton Laboratory
YELLOW - Clayton Accounting
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7/89 20K

Clayton ENVIRONMENTAL CONSULTANTS

A Marsh & McLennan Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

For Clayton Use Only	Page 2 of 3
Project No.	
Batch No.	
Client No.	
Date Received	By
Date Logged In	By

SEND INVOICE TO

Purchase Order No. | Client Job No. 89-055

Name [redacted] MaryAgnes Nuforos

Company See page 1 | Dept.

Address

City, State, Zip

REPORT RESULTS TO

Name Irene Farolli | Title

Company | Dept.

Mailing Address See Page 1

City, State, Zip

Telephone No. | Telefax No.

Date Results Required:

Rush Charges Authorized? ☒ Yes ☐ No

Special Instructions: (method, limit of detection, phone results, rush results, etc.)

* 48-hour TAT for all Samples on this page.

* Explanation of Preservative:

ANALYSIS REQUESTED

(Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	Cyanide										FOR LAB USE ONLY
W-4.26C-1 *	4-26-90	Filter	Wipe	1	X										
-2			100cm²												
-3															
-4															
-5															
-6															
-7															

CHAIN OF CUSTODY (if required)

Relinquished by: [signature] Date/Time 4/26/90 4:30p

Relinquished by: Date/Time

Method of Shipment:

Received by: Date/Time

Received at lab by: Date/Time

Sample condition upon receipt:

Authorized by: [signature] · FMC Date 4-26-90

(Client Signature Must Accompany Request)

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive, Novi, MI 48050, (313) 344-1770

Raritan Center, 160 Fieldcrest Ave., Edison, NJ 08837, (201) 225-6040

400 Chastain Center Blvd., N.W., Suite 490, Kennesaw, GA 30144, (404) 499-7500

1252 Quarry Lane, Pleasanton, CA 94566, (415) 426-2600

DISTRIBUTION:

WHITE - Clayton Laboratory

YELLOW - Clayton Accounting

PINK - Client Retains

7/89 20K

Clayton ENVIRONMENTAL CONSULTANTS

A Marsh & McLennan Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

For Clayton Use Only	Page 3 of 3
Project No.	
Batch No.	
Client No.	
Date Received	By
Date Logged In	By

Purchase Order No. | **Client Job No.** 89-055

SEND INVOICE TO
- Name: Mary Agnes Nefouros
- Company: | Dept.
- Address: See page 1
- City, State, Zip:

REPORT RESULTS TO
- Name: Irene Farelli | Title
- Company | Dept.
- Mailing Address: See Page 1
- City, State, Zip:
- Telephone No. | Telefax No.

Date Results Required: | **Rush Charges Authorized?** ☐ Yes ☒ No

Special Instructions: (method, limit of detection, phone results, rush results, etc.)
- Normal TAT for all samples on this page

*** Explanation of Preservative:**

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	Cyanide	FOR LAB USE ONLY
W-4.26C-8	4.26.90	Filter	Wipe	1	X	
-9	"	"	100 cm²	"	"	
-10	"	"	"	"	"	
-11	"	"	"	"	"	
-12	"	"	"	"	"	
-Blank	"	"	"	"	"	

CHAIN OF CUSTODY (if required)
- Relinquished by: [signature] Date/Time 4/26/90 6:30p
- Relinquished by: Date/Time
- Method of Shipment:

Received by: Date/Time

Received at lab by: Date/Time

Sample condition upon receipt:

Authorized by: [signature] IHC **Date** 4.26.90
(Client Signature Must Accompany Request)

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive Novi, MI 48050 (313) 344-1770	Raritan Center 160 Fieldcrest Ave. Edison, NJ 08837 (201) 225-6040	400 Chastain Center Blvd., N.W. Suite 490 Kennesaw, GA 30144 (404) 499-7500	1252 Quarry Lane Pleasanton, CA 94566 (415) 426-2600

DISTRIBUTION:
- WHITE - Clayton Laboratory
- YELLOW - Clayton Accounting
- PINK - Client Retains

7/89 20K

APPENDIX C

LABORATORY ANALYTICAL REPORTS

Western Operations

1252 Quarry Lane
Pleasanton, CA 94566
(415) 426-2600
Fax (415) 426-0106

Clayton
ENVIRONMENTAL
CONSULTANTS

May 1, 1990

Ms. Irene Fanelli
ENVIRONMENTAL HEALTH CONSULTANTS. INC.
P.O. Box 117910
Burlingame, CA 94011-7910

Client Ref. No. 89-055
Work Order No. 9004182
Lab Client Code 100662

Dear Ms. Fanelli:

Attached is our analytical laboratory report for the samples received on April 27, 1990. A copy of the Chain-of-Custody form acknowledging receipt of these samples is attached.

Please note that any unused portion of the samples will be disposed of 30 days after the date of this report, unless you have requested otherwise.

We appreciate the opportunity to be of assistance to you. If you have any questions, please contact Maryann Gambino, Client Services Representative, at (415) 426-2657.

Sincerely,

Mary D. Beck for
Ronald H. Peters, CIH
Manager, Laboratory Services
Western Operations

RHP/dt
Attachments

INDUSTRIAL HYGIENE
METALS ANALYSIS

Sample I.D.: See below

Sample Received: 04/27/90

Samples Analyzed: 04/27/90

Sample Matrix: FILTER

Client: ENVIRONMENTAL HEALTH CONS.INC

Client Ref. No.: 89-055

Lab Client Code: 100662

Project No.: 9004182

Lab No.	Sample I.D.	Volume (Liters)	Analyte	Amount (mg)	Conc. (mg/m3)	Detection Limit (mg)
-01	A-4.26M-1	--	Arsenic	<0.001	--	0.001
			Beryllium	<0.0005	--	0.0005
			Chromium	<0.002	--	0.002
			Copper	<0.002	--	0.002
			Molybdenum	<0.001	--	0.001
			Lead	<0.001	--	0.001
-02	A-4.26M-3	--	Arsenic	<0.001	--	0.001
			Beryllium	<0.0005	--	0.0005
			Chromium	<0.002	--	0.002
			Copper	<0.002	--	0.002
			Molybdenum	<0.001	--	0.001
			Lead	<0.001	--	0.001
-03	A-4.26M-5	--	Arsenic	<0.001	--	0.001
			Beryllium	<0.0005	--	0.0005
			Chromium	<0.002	--	0.002
			Copper	<0.002	--	0.002
			Molybdenum	<0.001	--	0.001
			Lead	<0.001	--	0.001
-04	A-4.26M-6	--	Arsenic	<0.001	--	0.001
			Beryllium	<0.0005	--	0.0005
			Chromium	<0.002	--	0.002
			Copper	<0.002	--	0.002
			Molybdenum	<0.001	--	0.001
			Lead	<0.001	--	0.001

< = Less than the indicated limit of detection (LOD)
-- = Information not available or not applicable

INDUSTRIAL HYGIENE
METALS ANALYSIS

Sample I.D.: See below

Sample Received: 04/27/90

Samples Analyzed: 04/27/90

Sample Matrix: FILTER

Client: ENVIRONMENTAL HEALTH CONS.INC

Client Ref. No.: 89-055

Lab Client Code: 100662

Project No.: 9004182

Lab No.	Sample I.D.	Volume (Liters)	Analyte	Amount (mg)	Conc. (mg/m3)	Detection Limit (mg)
-05	A-4.26M-8	--	Arsenic	<0.001	--	0.001
			Beryllium	<0.0005	--	0.0005
			Chromium	<0.002	--	0.002
			Copper	<0.002	--	0.002
			Molybdenum	<0.001	--	0.001
			Lead	<0.001	--	0.001
-06	A-4.26M-9	--	Arsenic	<0.001	--	0.001
			Beryllium	<0.0005	--	0.0005
			Chromium	<0.002	--	0.002
			Copper	<0.002	--	0.002
			Molybdenum	<0.001	--	0.001
			Lead	<0.001	--	0.001
-20	BLANK	--	Arsenic	<0.001	--	0.001
			Beryllium	<0.0005	--	0.0005
			Chromium	<0.002	--	0.002
			Copper	<0.002	--	0.002
			Molybdenum	<0.001	--	0.001
			Lead	<0.001	--	0.001
-21	METHOD BLANK	--	Arsenic	<0.001	--	0.001
			Beryllium	<0.0005	--	0.0005
			Chromium	<0.002	--	0.002
			Copper	<0.002	--	0.002
			Molybdenum	<0.001	--	0.001
			Lead	<0.001	--	0.001

< = Less than the indicated limit of detection (LOD)
-- = Information not available or not applicable

METHOD REFERENCE: NIOSH 7300

INORGANIC LABORATORY ANALYSES

Sample I.D.:	See below	Client:	ENVIRONMENTAL HEALTH
Sample Received:	04/27/90	Client Ref. No.:	89-055
Sample Analyzed:	05/01/90	Lab Client Code:	100662
Sample Matrix:	Wipe	Lab No.:	9004182

Batch Sub. No.	Sample Identification	Arsenic (mg/wipe)	Beryllium (mg/wipe)	Chromium (mg/wipe)
-07A	W-4.26M-1	<0.003	<0.002	<0.007
-08A	W-4.26M-2	<0.003	<0.002	<0.007
-09A	W-4.26M-3	<0.003	<0.002	<0.007
-10A	W-4.26M-4	<0.003	<0.002	<0.007
-11A	W-4.26M-5	<0.003	<0.002	<0.007
-12A	W-4.26M-6	<0.003	<0.002	<0.007
-13A	W-4.26M-7	<0.003	<0.002	<0.007
-14A	W-4.26M-8	<0.003	<0.002	<0.007
-15A	W-4.26M-9	<0.003	<0.002	<0.007
Limit of Detection:		0.003	0.002	0.007
Method Reference:		NIOSH 7300 (Modified)		

< = less than, below limit of detection

INORGANIC LABORATORY ANALYSES

Sample I.D.:	See below	**Client:**	ENVIRONMENTAL HEALTH
Sample Received:	04/27/90	**Client Ref. No.:**	89-055
Sample Analyzed:	05/01/90	**Lab Client Code:**	100662
Sample Matrix:	Wipe	**Lab No.:**	9004182

Batch Sub. No.	Sample Identification	Arsenic (mg/wipe)	Beryllium (mg/wipe)	Chromium (mg/wipe)
-16A	W-4.26M-10	<0.003	<0.002	<0.007
-17A	W-4.26M-11	<0.003	<0.002	<0.007
-18A	W-4.26M-12	<0.003	<0.002	<0.007
-19A	W-4.26M-Blank	<0.003	<0.002	<0.007
-21B	Method Blank	<0.003	<0.002	<0.007
Limit of Detection:		0.003	0.002	0.007
Method Reference:		NIOSH 7300 (Modified)		

< = less than, below limit of detection

INORGANIC LABORATORY ANALYSES

Sample I.D.:	See below	Client:	ENVIRONMENTAL HEALTH
Sample Received:	04/27/90	Client Ref. No.:	89-055
Sample Analyzed:	05/01/90	Lab Client Code:	100662
Sample Matrix:	Wipe	Lab No.:	9004182

Batch Sub. No.	Sample Identification	Copper (mg/wipe)	Molybdenum (mg/wipe)	Lead (mg/wipe)
-07A	W-4.26M-1	0.007	<0.003	<0.003
-08A	W-4.26M-2	<0.007	<0.003	<0.003
-09A	W-4.26M-3	<0.007	<0.003	<0.003
-10A	W-4.26M-4	<0.007	<0.003	<0.003
-11A	W-4.26M-5	<0.007	<0.003	<0.003
-12A	W-4.26M-6	<0.007	<0.003	<0.003
-13A	W-4.26M-7	<0.007	<0.003	<0.003
-14A	W-4.26M-8	<0.007	<0.003	<0.003
-15A	W-4.26M-9	<0.007	<0.003	<0.003
Limit of Detection:		0.007	0.003	0.003
Method Reference:		NIOSH 7300 (Modified)		

< = less than, below limit of detection

INORGANIC LABORATORY ANALYSES

Sample I.D.:	See below	Client:	ENVIRONMENTAL HEALTH
Sample Received:	04/27/90	Client Ref. No.:	89-055
Sample Analyzed:	05/01/90	Lab Client Code:	100662
Sample Matrix:	Wipe	Lab No.:	9004182

Batch Sub. No.	Sample Identification	Copper (mg/wipe)	Molybdenum (mg/wipe)	Lead (mg/wipe)
-16A	W-4.26M-10	<0.007	<0.003	<0.003
-17A	W-4.26M-11	<0.007	<0.003	0.004
-18A	W-4.26M-12	<0.007	<0.003	<0.003
-19A	W-4.26M-Blank	<0.007	<0.003	<0.003
-21B	Method Blank	<0.007	<0.003	<0.003
Limit of Detection:		0.007	0.003	0.003
Method Reference:		NIOSH 7300 (Modified)		

< = less than, below limit of detection

CLAYTON ENVIRONMENTAL CONSULTANTS, INC.
22345 Roethel Drive Novi, Michigan 48050

Ms. Irene Fanelli
President
ENVIRONMENTAL HEALTH CONSULTANTS
P.O. Box 117910
Burlington, CA 94011-7910

Date Reported: 7-MAY-90
Date Received: 28-APR-90
Clayton Project No. 65309-17
Client Job No. 89-055

Dear Ms. Fanelli:

The following is our report on the samples submitted for analysis.

Table 1

Lab Number	Sample Description	Cyanide Filter (mg)	Cyanide Impinger (mg)	Cyanide Total (mg)
819325	AA-104291/A-4.26C-1	<0.003	<0.003	<0.006
819326	AA-109841/A-4.26C-2	<0.003	<0.003	<0.006
819327	AA-109845/A-4.26C-3	<0.003	<0.003	<0.006
819328	AA-109840/A-4.26C-4	<0.003	<0.003	<0.006
819329	AA-109849/A-4.26C-5	<0.003	<0.003	<0.006
819330	AA-109842/A-4.26C-6	<0.003	<0.003	<0.006
819331	AA-109843/A-4.26C-7	<0.003	<0.003	<0.006
819332	AA-109848/A-4.26C-8	<0.003	<0.003	<0.006
819333	AA-109846/A-4.26C-9	<0.003	<0.003	<0.006
819334	AA-109847/A-4.26C-BLANK	<0.003	<0.003	<0.006
Limit of Detection:		0.003 mg	0.003 mg	0.006 mg
Analytical Method (NIOSH):		7904	7904	7904

ENVIRONMENTAL HEALTH CONSULTANTS
Clayton Project No. 65309-17

Table 2

Lab Number	Sample Description	Cyanide (mg)
819335	W-4.26C-1	<0.003
819336	W-4.26C-2	<0.003
819337	W-4.26C-3	<0.003
819338	W-4.26C-4	<0.003
819339	W-4.26C-5	<0.003
819340	W-4.26C-6	<0.003
819341	W-4.26C-7	<0.003
819342	W-4.26C-8	<0.003
819343	W-4.26C-9	<0.003
819344	W-4.26C-10	<0.003
819345	W-4.26C-11	<0.003
819346	W-4.26C-12	<0.003
819347	W-4.26C-BLANK	<0.003

Limit of Detection: 0.003 mg
Analytical Method (NIOSH): 7904

We appreciate the opportunity to be of assistance to you. Please call our Client Services Department at (313) 344-2650 or me if you have any questions.

Robert Lieckfield Jr., C.I.H.
Manager, Laboratory Services