WESTERN FORGE AND FLANGE

ALBANY, CALIFORNIA, FACILITY

PROBLEM DEFINITION REPORT

JULY 1984

BROWN AND CALDWELL
CONSULTING ENGINEERS

July 10, 1984

Mr. Peter Zaklan, President
Western Forge and Flange Company
700 Reed Street
Santa Clara, California 95050

43-1928-04/1

Subject: Western Forge and Flange, Albany
Facility--Problem Definition Report

Dear Mr. Zaklan:

Enclosed is a copy of the Final Problem Definition Report including coverage of additional concerns raised by representatives of the California Department of Health Services and Regional Water Quality Control Board on July 5, 1984. This report will serve as a basis for the correction plan at the Albany Facility which is necessary to bring the site into full compliance with state regulations for management of hazardous waste materials.

We are available to assist you in future discussions with the regulatory authorities regarding the Albany Facility site. Please contact me or Mr. Brian Bracken if you have any questions relating to the Problem Definition Report.

Very truly yours,

BROWN AND CALDWELL

Hilary M. Theisen
Vice President

John T. Bouey
Project Manager

JTB:dlm
Enclosure

BROWN AND CALDWELL PROJECT STAFF

ENGINEERING

John Bouey
Brian Bracken
Mike Dean
Reed Larson
Mary Lucas
Susan Osborn
Richard Stone
Larry Theisen
Tom Wheeler

LABORATORY STAFF

Steve Fisher
Jim Hatfield

CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

On May 21 and 22 and July 9 and 11, 1984, Brown and Caldwell conducted a field investigation at Western Forge and Flange (WFF) in Albany, California. Previous sampling by the Department of Health Services (DHS) and Brown and Caldwell at the site showed the presence of chromium, copper, lead, nickel, and zinc in the soils behind the WFF facility. The purpose of this investigation was to characterize the potential sources of metals in the soil, determine the nature and extent of soil contamination by the metals, and determine if groundwater contamination by metals or oil and grease has occurred. Fieldwork performed on July 9 and 11, 1984, was a direct result of DHS and Regional Water Quality Control Board review of the Draft Problem Definition Report and requirements for additional information to adequately prepare a correction plan.

All of the samples described in the work plan were collected and analyzed, with the following exceptions:

1. The upgradient well could not be installed at the planned location because sandstone was encountered near the land surface. On July 9, the upgradient well was installed inside the WFF facility through a portion of dirt floor.

2. A groundwater sample from each of the three monitoring wells was analyzed for oil and grease.

3. Additional surface and near-surface soil samples were also collected from two locations east of WFF operations to determine background metals concentrations in the soils.

4. At the request of the DHS, soil samples were also collected from a marshy area to the west of the WFF facility.

5. There was no surface water in the vicinity of the facility at the time of sampling, and the planned surface water samples could not be collected.

Field activities and analytical results are described in Chapter 2.

CHAPTER 2

FIELD METHODS AND PROCEDURES

Several sampling methods were utilized in collecting samples at Western Forge and Flange (WFF). This section describes each sampling method as well as equipment decontamination and sampling handling procedures. Sampling methods for soil and water samples analyzed by Brown and Caldwell for a previous investigation at the site in March 1984 are not included.

Floor Residue Sampling

Discrete floor residue samples were collected from seven locations inside the WFF facility. Each discrete sample was collected by hand and placed directly into the sample container. They were composited at the laboratory on an equal-weight basis into one sample for metals analysis.

Process Water Sampling

Water samples were collected from the quench tank, oil water separator, and roof condensate runoff. The separator and quench tank samples were collected by siphoning water through a 3-foot length of Tygon tubing directly into the sample containers. Water was allowed to run through the tubing for approximately 10 to 15 seconds before collecting the sample. The roof condensate was collected through a plastic funnel into the sample containers. There was no visible oil in any of the samples.

Surface and Near-Surface Soil Sampling

Seventeen surface and near-surface soil samples were collected from ten locations at WFF (Figure 2-1). A representative of DHS was present during the collection of samples S1 through S5 to designate these sampling locations. Surface soil samples were generally collected from a depth of 0 to 6 inches using a manual soil sampler equipped with a 6-inch-long by 2-inch-diameter sampling tube. Near-surface samples were collected from seven surface sampling locations by lowering the sampler through the orignial sampling hole and driving the sampler to a depth of 12 inches. Approximately 1/4 to 1/2 inch of loose soil was considered slough from the surface and discarded from the top of each 6- to 12-inch sample.

Each surface and near-surface sample was extruded from the sampler into the sample container. A field split of sample S4, 6 to 12 inches, was provided to DHS. This sample was homogenized in a plastic bag before being split into two sample containers.

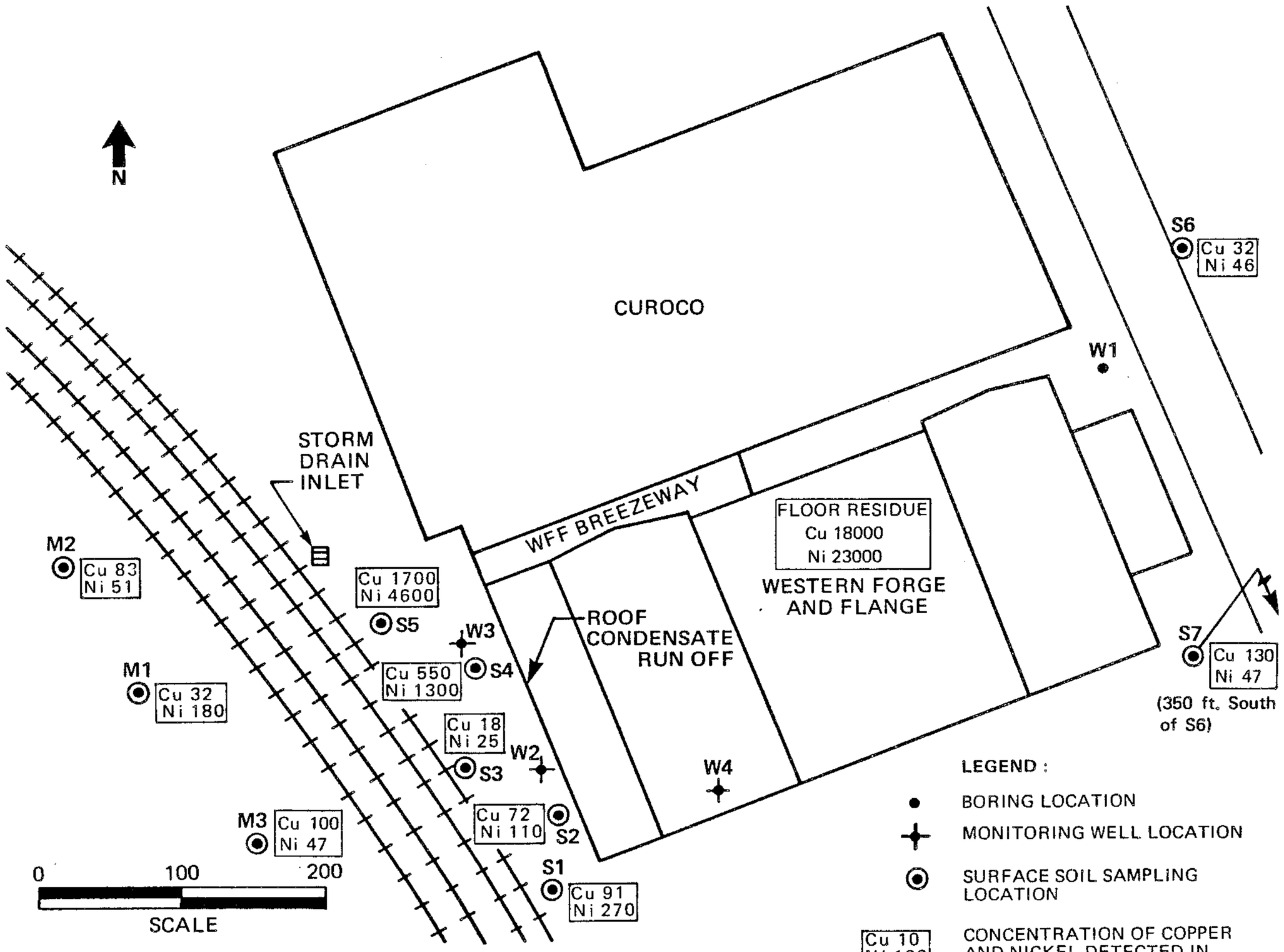


Figure 2-1 Albany Site Map

Monitoring Well Installation

On May 21, 1984, three shallow soil boreholes (W1, W2, and W3) were completed in the locations shown on Figure 2-1. The boreholes were drilled using a CME 55 drilling rig equipped with 6-1/2-inch-outside-diameter, hollow-stem, continuous-flight augers. Representative soil samples were collected either by pushing a 2- or 2-1/2-foot-long, 2-inch-diameter, Shelby tube ahead of the auger or in a standard penetration sampler pushed ahead of the auger. Once the sampler was retrieved, the auger was generally advanced to the depth of penetration and sampling was repeated. All soil samples were visually examined to produce the borehole logs, and those collected in Shelby tubes were retained but not submitted for analyses. Samples collected in the standard penetration sampler were discarded at the site.

Borehole W1 was completed at a depth of 13.5 feet because dry sandstone was encountered through the entire depth. Boreholes W2 and W3 were completed when unweathered sandstone was first encountered at depths of 19 and 16 feet, respectively.

On July 9, 1984, an additional borehole (W4) was completed at the location shown on Figure 2-1 using a 4-inch-diameter hand auger. This borehole was completed at a depth of 13 feet when an impenetrable layer was encountered. The impenetrable layer may be the top of unweathered sandstone.

The borehole logs and records of sample collection are presented in Attachment A.

Monitoring wells were constructed in boreholes W2 and W3 by inserting flush-threaded, 2-inch-diameter, Schedule 40, PVC casing and screen through the hollow-stem augers. Number 3 sand was used as the gravel pack, and bentonite pellets were used to seal the annulus after the augers had been removed. A cement seal and 6-inch protective steel casing were installed at the surface. A monitoring well was constructed in borehole W4 by inserting flush-threaded, 2-inch-diameter, Schedule 80, PVC casing and screen directly into the borehole. Number 2 sand was used as a gravel pack, and the remaining annular space was sealed as described above. A lockable utility box was emplaced at the surface.

Well completion records for the wells are included in Attachment A. Borehole W1 was backfilled with drill cuttings because it was a dry hole.

Monitoring Well Development and Sampling

Immediately following construction, each well was developed by bailing with a Teflon bailer and pumping. A Masterflex peristaltic pump was used on well W2, and an ISCO Model 1680 peristaltic pump

was used in wells W3 and W4. Each pump was equipped with Tygon tubing as intake and discharge line. A record of the quantity of water removed from each well is included on the well construction summaries. A total of 4.6, 4.1, and 10.1 well volumes were removed from wells W2, W3, and W4, respectively.

Immediately after development, groundwater samples were collected from each well with the pump used for development. Samples for metals analyses were cooled at the site and filtered through a 0.45-micron filter and acidified with 2 milliliters of nitric acid immediately upon receipt at the laboratory. Samples for hexavalent chromium were not filtered or preserved. The groundwater samples were filtered to remove sediment and colloidal material, thereby obtaining representative groundwater samples. A discussion on the filtration of samples and filter pore size is included in Gibb, Schuller, and Griffin, 1981,[a] and other references.

Water Level Measurements

Additional fieldwork included the collection of water level data. The top of PVC casing and ground surface elevation at each well were surveyed by Brown and Caldwell on July 11, 1984. Depth to water measurements were obained on May 22, July 9, July 10, and July 11 with the wetted tape method or a steel tape, and the top of casing elevation was used as a reference to calculate the water table elevations. These methods are accurate to $\pm$0.01 foot.

Sample Handling Procedures

Proper sample handling procedures are essential in the collection of a representative sample and ensuring its integrity. A summary of the container and preservation method for each type of sample collected is included in Table 2-1. Each sample was maintained under strict chain of custody protocol throughout delivery at the laboratory and analysis.

Equipment Decontamination

To prevent cross-contamination of samples, all sampling equipment was decontaminated before use. The augers and Shelby tubes were steam-cleaned prior to drilling, and other sampling equipment was washed with Alconox and tap water then rinsed with tap water between uses.

---

[a]Gibb, James P., Rudolph M. Schuller, Robert A. Griffin. "Procedures for the Collection of Representative Water Quality Data From Monitoring Wells." Illinois State Water Survey, 1981.

Table 2-1 Sample Containers and Methods of Field Preservation

Parameter	Container	Method of preservation
Soil samples		
Metals[a]	16-ounce glass jar	None
Process water samples		
Metals[a]	500-ml plastic bottle	2 ml 1:1 nitric acid, cool to 4 degrees C
Hexavalent chromium	500-ml plastic bottle	Cool to 4 degrees C
Oil and grease	16-ounce glass jar	Cool to 4 degrees C
Groundwater samples		
Metals[a]	500-ml plastic bottle	Filter through 0.45-micron filter 2 ml nitric acid
Hexavalent chromium	500-ml plastic bottle	Cool to 4 degrees C
Oil and grease	16-ounce glass jar	Cool to 4 degrees C

[a]The metals analyzed were trivalent chromium, copper, lead, nickel, and zinc.

CHAPTER 3

ANALYTICAL PROCEDURES

Samples collected during the investigation were analyzed as follows:

1. Water samples were analyzed using liquid-liquid extraction with Freon and analyzed with infrared detectors to determine if oil and grease were present.

2. Sample preparation followed Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, SW-46, Second Edition, USEPA, 1982. All metals were analyzed according to methods described in Hazardous Materials Laboratory Procedures by the California State Department of Health Services (DHS) and EPA Methods for Chemical Analysis of Water and Wastewater EPA 600/4-79-020. All metals, except hexavalent chromium, were quantified using atomic absorption (flame). Hexavalent chromium was quantified using colorimetric methods. Soils samples required digestion prior to analysis.

3. The analyses of soil samples to determine the soluble threshold limit concentration were performed in accordance with the waste extraction test procedures as set forth in Section 700 of the DHS Criteria and Guidelines for the Identification of Hazardous and Extremely Hazardous Wastes.

CHAPTER 4

DISCUSSION OF FIELD AND ANALYTICAL RESULTS

Field observations and results of analyses performed on the WFF samples were used to characterize the potential contaminant sources, to confirm data collected previously, and to determine if the soil and groundwater behind the WFF have been contaminated by metals and/or grease. Soil and water samples were also collected and sent to the Brown and Caldwell laboratory for analyses in February 1984. Table 4-1 summarizes results of these analyses. A discussion of the results of the ensuing investigation follows.

Geologic and Hydrologic Conditions

Regionally, the plant site lies on Quaternary alluvium between the older southeast-northwest trending Berkeley Hills and the San Francisco Bay. The Mesozoic Franciscan Formation outcrops locally east and northeast of the site. Local stratigraphy underlying the plant site consists of sandstone overlain by 0 to 14 feet of clay. Figure 4-1 is a generalized cross section constructed from logs of three boreholes drilled on site. Borehole W1, drilled on the eastern portion of the site, towards the Albany Hill outcrop, contains less than 1 foot of clay and is primarily composed of weathered sandstone. Horizontally, the clay bed increases in thickness to the west to a maximum of 14 feet at borehole W3. Vertically, the underlying weathered sandstone grades into unweathered sandstone.

Water level elevations were measured at 5 to 6 feet beneath the ground surface in monitoring wells W2 (5.93 feet), W3 (5.48 feet), and W4 (6.11 feet) on July 11, 1984. These data indicate groundwater flows in a north-northwesterly direction beneath the plant site. The local groundwater gradient is approximately 3×10^{-3} ft/ft.

Potential Sources of Contamination

Potential sources of site contamination are (1) the floor residue material and (2) process water. The results of the metals analyses performed on the floor residue sample are presented in Attachment B and summarized in Table 4-2. The floor residue material contained concentrations of nickel and copper above the January 1984 draft 22 CAC 66699 total threshold limit concentration (TTLC). The concentrations of trivalent chromium, lead, and zinc were detected at elevated concentrations, but less than the TTLC. Hexavalent chromium was not detected in the sample.

Table 4-1 Concentration of Metals Detected in Liquid and Soil Samples, February and March 1984

CAM metals	Water quench tank sample, mg/l	Boiler blow down sample, mg/l	Catch basin water sample, mg/l	Surface soil sample southwest of building, mg/kg	Surface soil sample west of building, mg/kg	Surface soil sample northwest of building, mg/kg	TTLC[a]	STLC[b]
Arsenic	<0.01	<0.01	-	9.5	15	5.6	500	5.0
Barium	<0.1	<0.1	<0.1	140	53	170	10,000	100
Cadmium	<0.01	<0.01	-	0.1	<0.1	<0.1	100	1.0
Chromium	-	-	0.33	-	-	-	2,500	560
Chromium, hexavalent	0.06	<0.02	-	<1	<1	2	500	5
Chromium, trivalent	<0.02	<0.02	-	76	360	80	2,500	560
Cobalt	<0.02	0.15	<0.02	17	100	7.6	8,000	80
Copper	1.7	0.17	0.81	110	3,300	22	2,500	25
Lead	<0.1	<0.1	<0.1	160	85	81	1,000	5.0
Nickel	1.7	0.03	0.48	150	9,400	24	2,000	20
Selenium	<0.01	<0.01	-	<0.1	<0.1	<0.1	100	1.0
Zinc	0.08	1.3	1.2	1,500	190	320	5,000	250

[a]TTLC, 22 CAC 66699, January 11, 1984, CAM criteria.
[b]STLC, 22 CAC 66699, January 11, 1984, CAM criteria.

Note: Dash (-) indicates analysis was not performed.

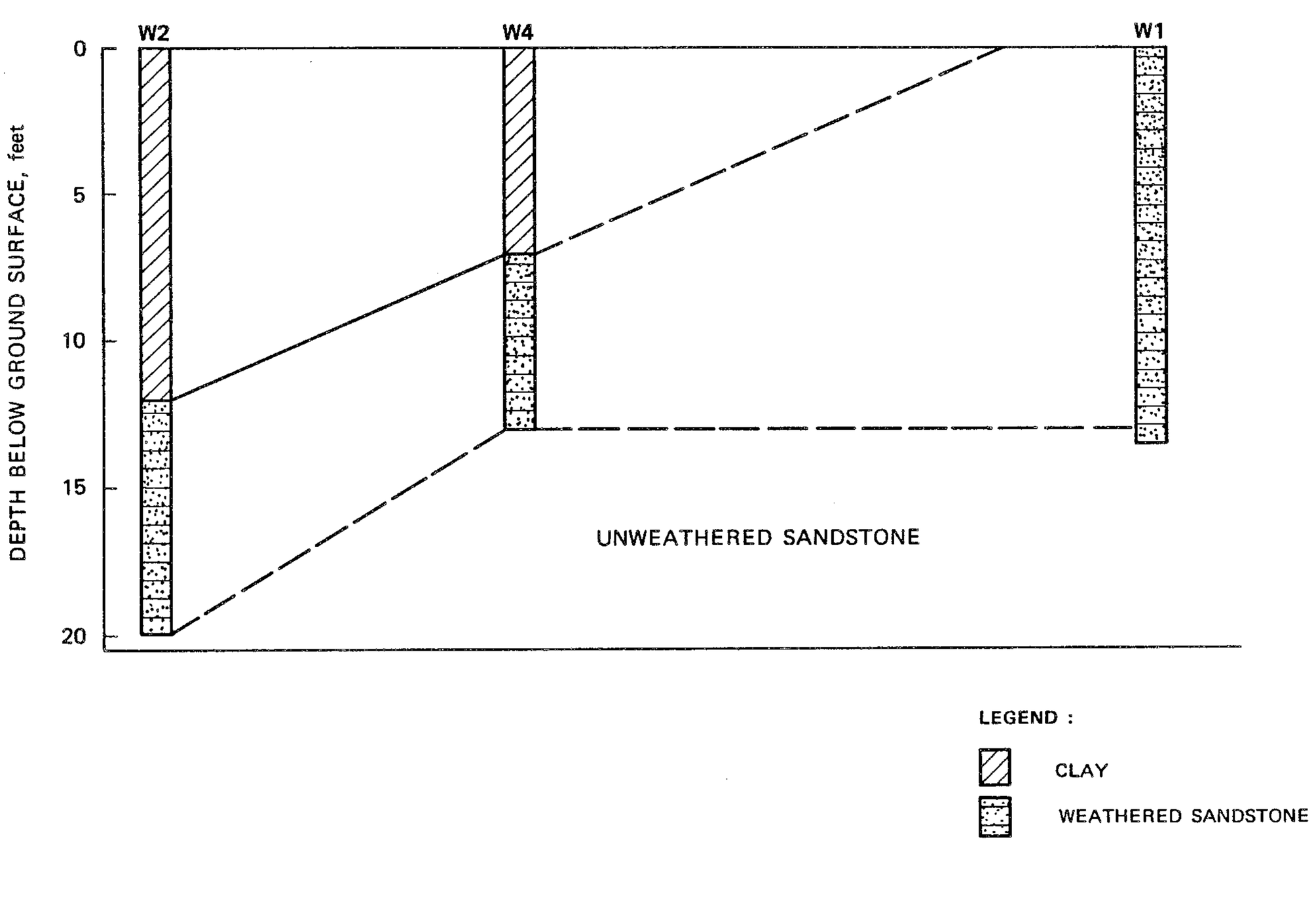


Figure 4-1 Generalized Cross Section Through Site

Table 4-2 Concentration of Metals Detected in Floor Residue Material and Soil Samples

Sample identification	Concentration, mg/kg				
	Chromium, trivalent	Copper	Lead	Nickel	Zinc
Floor residue	610	18,000	84	23,000	320
S1					
0 to 6 inches	160	91	190	270	780
6 to 12 inches	200	63	61	240	48
S2					
0 to 6 inches	47	72	140	110	820
6 to 12 inches	71	72	94	140	220
S3					
0 to 6 inches	15	18	95	25	120
6 to 12 inches	22	51	160	42	230
S4					
0 to 6 inches	270	550	370	1,300	420
6 to 12 inches	120	240	710	370	620
S5					
0 to 6 inches	410	1,700	200	4,600	630
6 to 12 inches	16	15	76	19	90
S6--background sample					
0 to 6 inches	24	32	150	46	190
6 to 12 inches	12	16	100	23	250
S7--background sample					
0 to 6 inches	-	130	240	47	660
6 to 11 inches	-	33	170	47	390
M1					
0 to 6 inches	99	32	100	180	91
M2					
0 to 6 inches	35	83	310	51	83
M3					
0 to 6 inches	-	100	440	47	160
TTLC[a]	2,500	2,500	1,000	2,000	5,000
STLC[b]	560	25	5.0	20	250

[a]TTLC, 22 CAC 66699, January 11, 1984, CAM criteria, double underlined numbers designate concentrations above TTLC.

[b]STLC, 22 CAC 66699, January 11, 1984, CAM criteria, single underlined numbers designate concentrations above STLC and below TTLC.

Note: Hexavalent chromium was not detected in any of the above samples.
Dash (-) indicates analysis was not performed.

The results of the metals and oil and grease analyses performed on the process water and monitoring well samples are included in Attachment B and summarized in Table 4-3. Measurements of the temperature, pH, and conductivity of the samples were obtained in the field, and these values are included in Table 4-4.

Liquid from the quench tank and roof condensate runoff were sampled as potential sources of contamination. Overflow from the quench tank has historically drained from the plant onto the soil behind the plant, and the roof condensate runs off from the roof to the soil sporadically each day. The roof condensate results from steam venting from the boiler. The oil-water separator discharges water to the municipal sewer; this is not a potential source of soil contamination.

Liquid from the quench tank contained high concentrations of trivalent chromium, copper, and nickel, but these metals were not detected in the roof condensate sample. Concentrations of copper and nickel were 0.7 and 1.2 milligrams per liter (mg/l) as compared to effluent quality requirements for ocean discharges of 0.2 and 0.1 mg/l, respectively. Trivalent chromium measured 0.7 mg/l in the quench tank sample. Low concentrations of zinc were detected in both samples. Hexavalent chromium and lead were not detected in either of the samples.

Based on these findings, trivalent chromium, copper, nickel, and zinc are potential site contaminants. These metals are more thoroughly discussed in the remainder of this report.

Soil Samples

The results of the metals analyses performed on the soil samples are presented in Attachment B and summarized in Table 4-2. The floor residue material and quench tank runoff are potential sources of trivalent chromium, copper, and nickel in the soil behind the WFF facility. If these materials are the source of some metals in the soil, it would be expected that metals mentioned above would be present at elevated concentrations in the soils affected by the plant operations. The following trends in metals concentrations were observed:

1. Nickel was detected at a concentration greater than the TTLC in sample S5 (0 to 6 inches). No other metals were detected above the TTLC in any of the soil samples.

2. The concentrations of copper and nickel were significantly greater in samples S4 (0 to 6 and 6 to 12 inches) and S5 (0 to 6 inches) than in any of the other soil samples collected.

Table 4-3 Concentration of Metals and Oils and Grease Detected in Liquid Samples

Sample identification	Concentration, mg/l					
	Chromium, trivalent	Copper	Lead	Nickel	Zinc	Oil and grease
Quench tank	NDa	0.70	ND	1.2	0.06	5
Separator tank	ND	ND	0.008	0.12	0.22	20
Roof condensate	ND	ND	ND	ND	0.26	69
W2	ND	ND	ND	0.03	0.03	7
W3	ND	ND	0.5	0.42	0.03	ND
W4	-	.04	ND	.12	0.32	7
Ambient water quality criteria[c]	10.3	0.004 0.023	0.025	0.071 0.14	0.058 0.17	-b
Effluent quality requirements[d]	0.005	0.2	0.1	0.1	0.3	10

[a]ND indicates parameter was not detected. The detection limits for each parameter in mg/l are trivalent chromium, 0.02/0.04; hexavalent chromium, 0.01; copper, 0.01/0.02; lead, 0.1/0.002; nickel, 0.02/0.04; zinc, 0.01; and oil and grease, 5. First number indicates detection limit for groundwater samples, second number represents detection limit for process water.

[b]Dash (-) indicates parameter was not analyzed in sample or criteria has not been established.

[c]Ambient water quality criteria for the maximum protection of saltwater aquatic life. 79318 Federal Register, Volume 45, No. 231, Friday, November 28, 1980. Upper number represents criteria for 24-hour average, lower number represents maximum criteria at any time.

[d]Water Quality Control Plan for Ocean Waters of California, July 6, 1972.

Table 4-4 Field Measurements Obtained for Liquid Samples

Sample identification	Parameter		
	Temperature, degrees C	pH[a]	Electrical conductivity, umhos/cm
Quench tank	63	6.0	4,850
Separator tank	39	10.0	460
Roof condensate	42	6.0	400
W2	18	6.5	9,700
W3	18	6.5	42,000
W4	18	-[b]	2,080

[a]pH was determined using Color Phast pH paper.
[b]Dash (-) indicates measurement was not obtained.

3. The concentrations of lead in all of the samples and zinc in one sample were detected at elevated concentrations, but they were detected at similar concentrations in the background soil samples S6 (0 to 6 and 6 to 12 inches) and S7 (0 to 6 and 6 to 12 inches).

4. The concentration of trivalent chromium was low in all of the samples, and hexavalent chromium was not detected in any of the samples.

Because only one soil sample exceeded the TTLC, a waste extraction test (WET) was performed on a select number of samples to test solubility of these contaminants within the soil matrix. The results of the WETs are included in Table 4-5. Samples were selected for analysis where the concentration of copper and nickel exceeded the soluble threshold limit concentration (STLC) by four times. (This is a good approximation because the WET results are expressed in mg/l.) Selected samples were analyzed for lead. Samples were analyzed for copper, nickel, and lead and were found to contain concentrations exceeding STLC values reported in the California Assessment Manual (CAM) for hazardous waste identification.

Discrete soil samples were collected from the depths of 0 to 6 and 6 to 12 inches to determine the depth of contaminated soil behind the facility. In general, the concentration of metals decreased in the deeper sampling interval. Results of the WETs performed on samples S1 (6 to 12 inches), S2 (6 to 12 inches), and S4 (6 to 12 inches) indicate soils at this depth are not hazardous materials as defined by January 1984 CAM criteria.

At the request of the California State Department of Health Services, three soil samples (M1, M2, and M3, 0 to 6 inches) were collected from the marsh area west of the railroad tracks. Drainage from the facility enters a storm drain inlet west of the facility. The storm drain may be part of a drainage system for the general area, and materials containing metals may be transported through the storm drain inlet to the marsh. Although these marsh samples exhibited similar concentrations of most metals as samples S1, S2, and S3, it is not possible to identify WFF as the source of this contamination as the result of transport of materials through the storm drain.

On July 9, 1984, Brown and Caldwell ran tap water through a hose to the storm drain for approximately 2 1/2 hours in an attempt to find the outlet of the storm drain. There were two potential outlets identified, but there was no water observed at either location. A north or northwest trending pipe (approximately 8 to 10 inches in diameter) leads from the drain, and water in the drain appears to enter the pipe. If the pipe trends to the northwest, it

Table 4-5 Concentration of Metals Detected in Soil Samples, Waste Extraction Test (WET) Results

Sample identification	Copper	Lead	Nickel
S1			
0 to 6 inches	-[a]	5.9	3.5
6 to 12 inches	-	-	7.2
S2			
0 to 6 inches	-	-	52
6 to 12 inches	-	-	3.1
S4			
0 to 6 inches	49	24	130
6 to 12 inches	12	81	15
TTLC[b]	2,500	1,000	2,000
STLC[c]	25	5.0	20

[a]Dash (-) indicates that metal was not analyzed in extract.

[b]TTLC, 22 CAC 66699, January 11, 1984, CAM criteria.

[c]STLC, 22 CAC 66699, January 11, 1984, CAM criteria. Underline designates concentrations above STLC and below TTLC.

may drain into the marsh approximately 50 feet to the northwest of the inlet. If the pipe trends north, the outlet may eventually discharge into an arm of the bay, approximately 600 feet to the north. Presently, it is not clear where the storm drain discharges.

Groundwater Samples

Results of the metals and oil and grease analyses performed on the groundwater samples are included in Attachment B and summarized in Table 4-3. Field measurements of the temperature, pH, and electrical conductivity of the samples are included in Table 4-4. Ambient water quality criteria for aquatic life and effluent quality requirements for the metals analyzed are also included in Table 4-3. When the concentrations of metals detected in the groundwater are compared to these criteria, the following observations can be made:

1. None of the samples contained detectable levels of trivalent chromium, hexavalent chromium, or copper.

2. Sample W2 contained very low concentrations of zinc and nickel.

3. Sample W3 contained concentrations of nickel and lead, and sample W4 contained concentrations of nickel and zinc above effluent quality requirements for waste discharges as specified in the California Ocean Plan. However, these criteria are established for point discharge and do not directly apply to groundwater. Sample W3 also contains a very low concentration of zinc.

Samples from wells W2 and W4 contained low concentration of oil and grease, but no oil and grease was detected in the sample from W3.

CHAPTER 5

CONCLUSIONS

In summary, the field investigation has established the following:

1. Contamination generated by Western Forge and Flange (WFF) operations include copper, nickel, and zinc. Concentrations of lead were also found in the floor residue composite sample but do not exceed background concentrations of lead in the vicinity of the facility site.

2. One surface soil sample exceeded the total threshold limit concentration for nickel.

3. Waste extraction tests were performed on a number of soil samples to evaluate the solubility of metal contaminants. Of the six samples analyzed, only four showed elevated levels of contamination (i.e., exceeded the soluble threshold limit concentration as defined by the California Assessment Manual criteria).

4. Geohydrologic evaluation of the site indicated the presence of hard sandstone at a shallow depth at the facility site--10 to 20 feet below surface grade. Surface soils are generally clay material with relatively low permeability as evidenced by the difficulty in obtaining adequate volumes of water from the test wells for analysis. The presence, quantity, and direction of groundwater flow is likely dependent on seasonal precipitation but is not expected to be significant due to the limited depth and permeability of the site surface soils.

5. Presence of contamination (lead and nickel) was detected in the groundwater samples obtained at the site.

6. Surface drainage is to the northwest to a drainage culvert adjacent to the Southern Pacific right-of-way. Although it was not possible to locate the discharge of this storm drain inlet, its most probable connection with the surface waters of San Francisco Bay is a drainage ditch about 500 feet north of WFF property boundary on the east side of the Southern Pacific track bed.

Based on the above findings, it is apparent that remedial action is warranted to remove contaminants from the surface soils behind the buildings and from the working areas where metal forging operations are taking place. Although the by-product oily waste material is classified as a hazardous waste by the state regulation, and both soil and groundwater contamination are present at the site, the import of such contamination relative to the beneficial use of the local surface and groundwater is relatively small due to the amount of contamination (soluble metals) actually migrating off site. The extent of the remedial cleanup activities and the changes in management operation (housekeeping) necessary to preclude subsequent contamination of the site's soil, surface water, and groundwater will be addressed in the Site Correction Plan, submitted under separate cover.

APPENDIX A

BC BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL

BORING / WELL: W-1	PROJECT: Western Forge JOB NO.: 1928-07	SHEET: 1 / 1

__X__ BACKFILLED SOIL BORING ____ MONITOR WELL ____ MULTI-CASED WELL

DRILL CONTRACTOR: J.H. Kleinfelder
DRILL RIG: CME 55
BC PERSONNEL: Lucas/Larson

HOLE DIAMETER: 6½"
SAMPLE TYPE: shelby tube/split spoon
DRIVE ENERGY: pushed

	TIME	DATE
START:	1030	5/21/84
FINISH:	1140	5/21/84
BACKFILL:		
FINISH WELL:		

ELEVATIONS

DATUM:
GROUND SURFACE:
TOP WELL CASING:

SUBSURFACE FLUIDS / GROUNDWATER

DEPTH FROM GROUND	TIME	DATE

DEPTH, FT.	SAMPLE	BLOWS PER 6 IN.	USC SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS
1–2		pushed 24"		3" asphalt and base rock 0.25 - 1.35' sand, light brown/rust, fine grained. locally oxidized, gravel at top 2.0~3.5' sand, brown, fine grained, contains some large gravel, slightly silty
3–4		pushed 24"		~3.5 - 4.0' sand, very fine grained, rust, very silty 4.0 4.5' dark brown clay, dry
5–6		pushed 30"		~4.5 -6.1' sandstone, rust, very fine grained, very silty.
7–8		pushed 18"		6.5 - 7.6' sandstone as above, medium grained at bottom, black staining locally, dry Could not push sampler through 8' Drill to 13.5' - sandstone as above could not push sampler.
9–15				BOH 13.5' DRY HOLE

BORING WELL NO. W-1

BC BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL

BORING / WELL: W-2	PROJECT: Western Forge	JOB NO.: 1928-07	SHEET: 1 / 3

___ BACKFILLED SOIL BORING X MONITOR WELL ___ MULTI-CASED WELL

DRILL CONTRACTOR: J.H. Kleinfelder
DRILL RIG: CME 55
BC PERSONNEL: Lucas/Larson

HOLE DIAMETER: 6½"
SAMPLE TYPE: shelby tube/split spoon
DRIVE ENERGY: pushed

	TIME	DATE
START:	1205	5/21/84
FINISH:	1250	5/21/84
BACKFILL:		
FINISH WELL:		

ELEVATIONS

DATUM: Caltrans Mean Sea Level
GROUND SURFACE: 9.03 ft
TOP WELL CASING: 9.75 ft

SUBSURFACE FLUIDS / GROUNDWATER

DEPTH FROM GROUND	TIME	DATE
3.47 ft BTOC	0900	5/22/84
3.76 ft BTOC	0940	7/09/84
3.82 ft BTOC	0950	7/11/84

DEPTH, FT.	SAMPLE	BLOWS PER 6 IN.	USC SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS
1		pushed 30"		clay, brown, visible oil intermixed, moist
2				
3		pushed 30"		clay, brown, slightly sandy, moist
4				
5				
6		pushed 30"		as above
7				pushed standard penetration sampler
8		pushed 18"		7.5 - 9.0' clay, brown, sandy micaceous moist, dryer, consistency of modelling clay at 8.4-8.7', dirty green
9				
10				10.0 - 10.5' clay, brown, as above 10.5 - 12.0' clay, green, intermixing with rust sandstone
11		pushed 30"		
12				12.0 - 12.5' fine grained sandstone, rust, silty, dry
13				12.5 - 14.4' Sand, fine grained, rust color, silty, clayey at top
14		pushed 24"		
15				

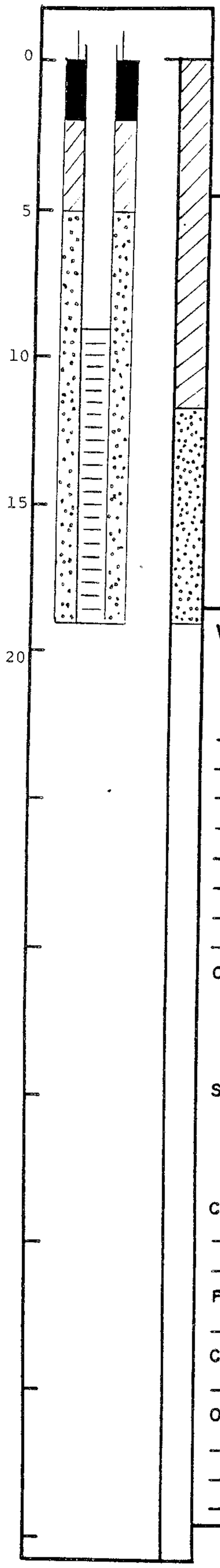
BORING WELL NO. W-2

BC BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL (CONTINUED)

BORING / WELL: W-2				PROJECT: Western Forge	SHEET: 2 / 3
DEPTH, FT.	SAMPLE	BLOWS PER 6 IN.	USC SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS	
15		pushed 24"		15.0- 16.9' sand to sandstone, Fine grained, rust color, silty, wet	
		pushed 12"		hard drilling at 17.5' pushed standard penetration sampler could not push through 19'	
20				sandstone as above, fine-medium grained, rust color mottled with tan, dry BOH 20'	

BORING WELL NO. W-2



WELL W-2

WELL CONSTRUCTION SUMMARY

LOCATION or COORDS: Western Forge and Flange - Albany

ELEVATION: GROUND LEVEL

TOP OF CASING

DRILLING SUMMARY:

TOTAL DEPTH 19'

BOREHOLE DIAMETER 6½"

DRILLER J.H. Kleinfelder and Associates

RIG CME 55

BIT(S) Hollow Stem Auger

DRILLING FLUID None

SURFACE CASING 6" steel

WELL DESIGN:

BASIS: GEOLOGIC LOG X GEOPHYSICAL LOG

CASING STRING(S): C=CASING S=SCREEN

+1	9	C1			
9	19	S1			

CASING: C1 schedule 40 2" Ø PVC flush threaded joints

SCREEN: S1 schedule 40 2" Ø PVC, 0.020" slots, flush threaded joints

CENTRALIZERS

FILTER MATERIAL #3 Monterey sand 5-19'

CEMENT 0-2'

OTHER 3/8" bentonite pellet seal 2-5'

CONSTRUCTION TIME LOG:

TASK	START DATE	START TIME	FINISH DATE	FINISH TIME
DRILLING:	5/21/84		5/21/84	
GEOPHYS. LOGGING:				
CASING:	5/21/84		5/21/84	
FILTER PLACEMENT:	5/21/84		5/21/84	
CEMENTING:	5/21/84		5/21/84	
DEVELOPMENT:	5/21/84		5/23/84	
OTHER: sample			5/23/84	

WELL DEVELOPMENT

Removed 40 gallons, using bailer and masterflex peristaltic pump. Slightly cloudy water, no sediment.

COMMENTS:

Gravel pack is slightly bridged.

BC BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL

BORING / WELL: W-3	PROJECT: Western Forge	JOB NO.: 1928-07	SHEET: 1 /3

___ BACKFILLED SOIL BORING _X_ MONITOR WELL ___ MULTI-CASED WELL

DRILL CONTRACTOR: J.H. Kleinfelder
DRILL RIG: CME 55
BC PERSONNEL: Lucas/Larson

HOLE DIAMETER: 6½"
SAMPLE TYPE: shelby tube/standard penetration
DRIVE ENERGY: pushed

	TIME	DATE
START:	1340	5/21/84
FINISH:	1410	5/21/84
BACKFILL:		
FINISH WELL:		

ELEVATIONS

DATUM: Caltrans Mean Sea Level
GROUND SURFACE: 8.82
TOP WELL CASING: 9.99

SUBSURFACE FLUIDS / GROUNDWATER

DEPTH FROM GROUND	TIME	DATE
6.27 ft BTOC	0930	5/22/84
4.05 ft BTOC	0925	7/09/84
4.5 ft BTOC	0945	7/11/84

DEPTH, FT.	SAMPLE	BLOWS PER 6 IN.	USC SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS
1				rubble - drill to 3'. silt, sandy, brown, contains pieces of brick and rock.
2				
3				
4		pushed 24"		clay, green , sandy. contact with silt at top
5				
6		pushed 24"		clay, green gray - sandy. Bay Mud
7				
8		pushed 24"		clay, green as above, damp on bottom of sampler
9				
10				
11				drill to 15'
12				
13				
14				hard drilling at 14'
15				

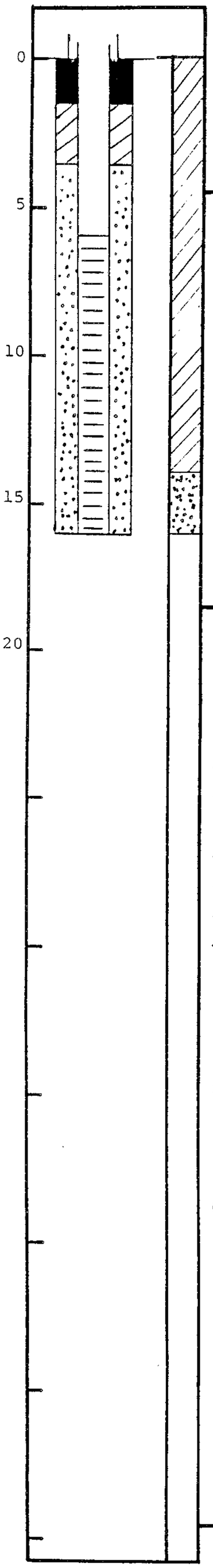
BORING WELL NO. _____

BC BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL (CONTINUED)

BORING / WELL: W-3				PROJECT: Western Forge	SHEET: 2 / 3
DEPTH, FT.	SAMPLE	BLOWS PER 6 IN.	USC SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS	
		pushed 18"		used standard penetration sampler sand, fine grained, rust color intermixed with tan, very silty/clayey in areas	
17				BOH 16'	

BORING WELL NO. W-3



WELL W-3

WELL CONSTRUCTION SUMMARY

LOCATION or COORDS: Western Forge and Flange - Albany

ELEVATION: GROUND LEVEL

TOP OF CASING

DRILLING SUMMARY:

TOTAL DEPTH 16'

BOREHOLE DIAMETER 6¼"

DRILLER J.H. Kleinfelder and Associates

RIG CME 55

BIT(S) Hollow stem auger

DRILLING FLUID None

SURFACE CASING 6" steel

WELL DESIGN:

BASIS: GEOLOGIC LOG X GEOPHYSICAL LOG

CASING STRING(S): C=CASING S=SCREEN

+1	–	6	C1		–		
6	–	16	S1		–		
	–				–		
	–				–		
	–				–		
	–				–		
	–				–		
	–				–		

CASING: C1 schedule 40 2" Ø PVC flush threaded joints

SCREEN: S1 schedule 40 2" Ø PVC 0.020 inch slots, flush threaded joints

CENTRALIZERS

FILTER MATERIAL #3 Monterey sand 3½ - 16'

CEMENT 0-1½'

OTHER 3/8" bentonite pellet seal 1½ - 3½'

CONSTRUCTION TIME LOG:

TASK	START DATE	START TIME	FINISH DATE	FINISH TIME
DRILLING:	5/21/84		5/21/84	
GEOPHYS. LOGGING:				
CASING:	5/21/84		5/21/84	
FILTER PLACEMENT:	5/21/84		5/21/84	
CEMENTING:	5/21/84		5/21/84	
DEVELOPMENT:	5/21/84		5/23/84	
OTHER: sample			5/23/84	

WELL DEVELOPMENT

Removed 24 gallons using bailer and ISCO pump. Clear water.

COMMENTS:

BROWN AND CALDWELL CONSULTING ENGINEERS

BC BROWN AND CALDWELL

LOG OF SOIL BORING OR MONITOR WELL

BORING / WELL: W-4	PROJECT: Western Forge	JOB NO.: 1928-07	SHEET: 1/2

___ BACKFILLED SOIL BORING X MONITOR WELL ___ MULTI-CASED WELL

DRILL CONTRACTOR: Brown and Caldwell
DRILL RIG: Hand Augered
BC PERSONNEL: R. Larson/M. Lucas

HOLE DIAMETER: 4 inches
SAMPLE TYPE: hand auger-sand bucket
DRIVE ENERGY:

	TIME	DATE
START:	0915	7/9/84
FINISH:	1115	7/9/84
BACKFILL:		
FINISH WELL:	1400	7/9/84

ELEVATIONS

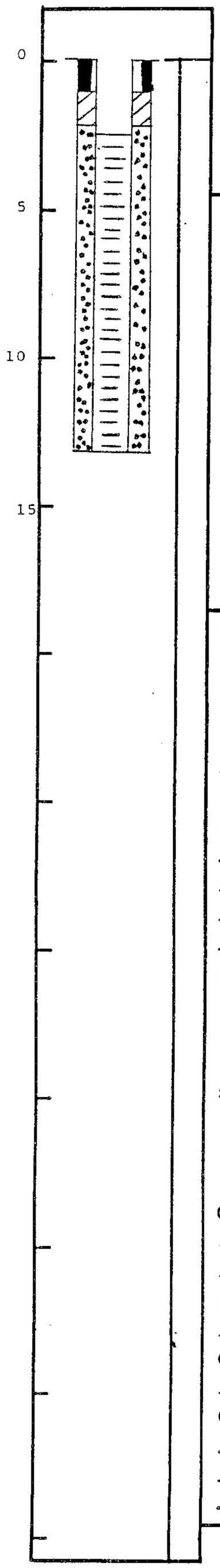
DATUM: Caltrans Mean Sea Level
GROUND SURFACE: 9.42
TOP WELL CASING: 8.89

SUBSURFACE FLUIDS / GROUNDWATER

DEPTH FROM GROUND	TIME	DATE
3.35 ft BTOC	1630	7/9/84
2.66 ft BTOC	0900	7/10/84
2.78 ft BTOC	0955	7/11/84

DEPTH, FT.	SAMPLE	BLOWS PER 6 IN.	USC SOIL TYPE	DESCRIPTION OF SUBSURFACE MATERIALS
1				0-0.8 ft Clay with fine grained sand, dark brown, compact, dry 0.8-1.2 ft Sand, finegrained, clayey, brown, dry 1.2-3.5 ft Clay, dry
3				3.5-5.0 ft Clay, brown-grey, moist
5				5.0-6.8 ft As above, water bearing
7				6.8 ft-10.0 Sandstone, rust, finegrained, silty, wet
10				10.0-12.0 As above, with ½ inch gravel and some sand
12				Could not hand auger through 13 ft
13				BOH Bft
15				

BORING WELL NO. W-4



WELL W-4

WELL CONSTRUCTION SUMMARY

LOCATION or COORDS: Western Forge and Flange - Albany

ELEVATION: GROUND LEVEL 9.42 ft
TOP OF CASING 8.89 ft

DRILLING SUMMARY:

TOTAL DEPTH 13'
BOREHOLE DIAMETER 4 inches
DRILLER R. Larson
RIG hand augered
BIT(S)
DRILLING FLUID none
SURFACE CASING utility box

WELL DESIGN:

BASIS: GEOLOGIC LOG X GEOPHYSICAL LOG

CASING STRING(S): C=CASING S=SCREEN

0	–	2½	C 1		–		
2½	–	13	S 1		–		
	–				–		
	–				–		
	–				–		
	–				–		
	–				–		
	–				–		

CASING: C1 2-inch Ø schedule 80 PVC, flush threaded

SCREEN: S1 2-inch Ø schedule 80 PVC, flush threaded, 0.010-inch slots

CENTRALIZERS none

FILTER MATERIAL #2 monterey sand 2-13 ft

CEMENT portland 0-1 ft

OTHER Bentonite pellet seal (3/8" pellets) 1-2 ft

CONSTRUCTION TIME LOG:

TASK	START DATE	START TIME	FINISH DATE	FINISH TIME
DRILLING:	7/9/84	0915	7/9/84	1115
GEOPHYS. LOGGING:				
CASING:	7/9/84	1120	7/9/84	1135
FILTER PLACEMENT:	7/9/84	1135	7/9/84	1140
CEMENTING:	7/9/84		7/9/84	
DEVELOPMENT:	7/9/84		7/9/84	
OTHER:				
sampled	7/9/84	1630		

WELL DEVELOPMENT

Removed 14½ gallons of liquid using peristaltic pump.

COMMENTS:

APPENDIX B

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-5-258

Date Sampled 5/22/84
Date Received 5/22/84
Date Reported 6/07/84

Job# 1928-01

Reported To:
Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

cc. Ms. Mary Lucas

Laboratory Director

Log No.	SOLID SAMPLES — Sample Description
5-258-1	Floor; Composite of Discretes - 1 through 7
5-258-2	S-1; 0-6"
5-258-3	S-1; 6-12"
5-258-4	S-2; 0-6"
5-258-5	S-2; 6-12"

Concentration: mg/Kg; as received

	5-258-1	5-258-2	5-258-3	5-258-4	5-258-5	
Chromium, Trivalent	610	160	200	47	71	
Chromium, Hexavalent	< 0.2	< 5	< 4	< 1	< 5	
Copper	18,000	91	63	72	72	
Lead	84	190	61	140	94	
Nickel	23,000	270	240	110	140	
Zinc	320	780	48	820	220	

ht

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-5-258

Date Sampled 5/22/84
Date Received 5/22/84
Date Reported 6/07/84

Job# 1928-01

Reported To: Mr. John Bouey
Brown and Caldwell

cc. Ms. Mary Lucas

Laboratory Director

Log No.	SOLID SAMPLES Sample Description
5-258-6	S-3; 0-6"
5-258-7	S-3; 6-12"
5-258-8	S-4; 0-6"
5-258-9	S-4; 6-12"
5-258-10	S-5; 0-6"
5-258-11	S-5; 6-12"

Concentration: mg/Kg; as received

	5-258-6	5-258-7	5-258-8	5-258-9	5-258-10	5-258-11
Chromium, Trivalent	15	22	270	120	410	16
Chromium, Hexavalent	< 5	< 4	< 2	< 2	< 5	< 5
Copper	18	51	550	240	1700	15
Lead	95	160	370	710	200	76
Nickel	25	42	1300	370	4600	19
Zinc	120	230	420	620	630	90

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-5-258

Date Sampled 5/22/84
Date Received 5/22/84
Date Reported 6/07/84

Job# 1928-01

Reported To: Mr. John Bouey
Brown and Caldwell

cc.

Laboratory Director

Log No.	SOLID SAMPLES Sample Description
5-258-12	S-6; 0-6"
5-258-13	S-6; 6-12"

Concentration: mg/Kg; as received

	5-258-12	5-258-13				
Chromium, Trivalent	24	12				
Chromium, Hexavalent	< 5	< 5				
Copper	32	16				
Lead	150	100				
Nickel	46	23				
Zinc	190	250				

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-5-258

Date Sampled 5/22/84
Date Received 5/22/84
Date Reported 6/07/84

Job# 1928-01

Reported To: Mr. John Bouey
Brown and Caldwell

Laboratory Director

cc.

Log No.	AQUEOUS SAMPLES Sample Description
5-258-14	Roof Condensate
5-258-15	Quench Tank
5-258-16	Separator Tank

Concentration: mg/L; as received

	5-258-14	5-258-15	5-258-16			
Chromium, Trivalent	< 0.04	< 0.04	< 0.04			
Chromium, Hexavalent	< 0.01	< 0.01	< 0.01			
Copper	< 0.02	0.70	< 0.02			
Lead	< 0.002	< 0.002	0.008			
Nickel	< 0.04	1.2	0.12			
Zinc	0.26	0.06	0.22			
Oil and Grease	69	5	20			

BROWN AND CALDWELL
ANALYTICAL LABORATORIES

June 7, 1984

E84-5-258

Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

JOB#1928-01

Subject: Sample E84-5-258-1 through 5

Dear Mr. Bouey:

We have a chain-of-custody card on file for your sample (s). Our customary procedure is to hold all samples for 30 days, then discard or return them to the client. If we do not hear from you within 30 days from the date of this letter, we will discard your sample (s) and mail your chain-of-custody card to you. Other arrangements can be made for your sample (s) by contacting myself or our laboratory director, Jim Hatfield, before our intended discard date.

Very truly yours,

BROWN AND CALDWELL

Carol Trent - csm

Carol Trent
Sample Receptionist

CT: csm

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-6-63

Date Sampled 5/23/84
Date Received 6/06/84
Date Reported 6/18/84

Revised 6/20/84

1928-02

Reported To:
Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Laboratory Director

cc. Ms. Mary Lucas - BC, Pleasant Hill

Log No.	Sample Description
6-63-1	M-1; Marsh west of breezeway
6-63-2	M-2; Marsh at outlet

Concentration: mg/Kg

	6-63-1	6-63-2				
Chromium, Trivalent	99	35				
Chromium, Hexavalent	< 2	< 2				
Copper	32	83				
Lead	100	310				
Nickel	180	51				
Zinc	91	83				

csm

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-6-63

Date Sampled 5/23/84
Date Received 6/06/84
Date Reported 6/18/84

Revised 6/20/84

1928-02

Reported To:
Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Laboratory Director

cc. Ms. Mary Lucas - BC, Pleasant Hill

Log No.	Sample Description
6-63-1	M-1; Marsh west of breezeway
6-63-2	M-2; Marsh at outlet

Concentration: mg/Kg

	6-63-1	6-63-2				
Chromium, Trivalent	99	35				
Chromium, Hexavalent	< 2	< 2				
Copper	32	83				
Lead	100	310				
Nickel	180	51				
Zinc	91	83				
csm						

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-5-273

Date Sampled 5/23/84
Date Received 5/23/84
Date Reported 6/07/84

1928-03

Reported To:
Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

cc. Ms. Mary Lucas BC, - Pleasant Hill

Laboratory Director

Log No.	WESTERN FORGE AND FLANGE Sample Description
5-273-1	W-2 4:20 p.m.
5-273-2	W-3 4:30 p.m.

Concentration: mg/L

	5-273-1	5-273-2				
Chromium, Hexavalent	< 0.01	< 0.01				
Chromium, Trivalent	< 0.02	< 0.02				
Copper	< 0.01	< 0.01				
Lead	< 0.1	0.5				
Nickel	0.03	0.42				
Zinc	0.03	0.03				
ht						

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-5-273

Date Sampled 5/23/84
Date Received 5/23/84
Date Reported 6/07/84

1928-03

Reported To:

Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Laboratory Director

cc. Ms. Mary Lucas BC, - Pleasant Hill

Log No.	WESTERN FORGE AND FLANGE Sample Description
5-273-1	W-2 4:20 p.m.
5-273-2	W-3 4:30 p.m.

Concentration: mg/L

	5-273-1	5-273-2				
Chromium, Hexavalent	< 0.01	< 0.01				
Chromium, Trivalent	< 0.02	< 0.02				
Copper	< 0.01	< 0.01				
Lead	< 0.1	0.5				
Nickel	0.03	0.42				
Zinc	0.03	0.03				
ht						

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-5-258 WET

Date Sampled 5/22/84
Date Received 5/22/84
Date Reported 7/02/84

1928-03

Reported To:
Mr. John Bouey
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

cc.

Laboratory Director

CALIFORNIA WASTE EXTRACTION TEST

Log No.	Sample Description
5-258-2	SOIL SAMPLES S1; 0-6"
5-258-3	S1; 6-12"
5-258-4	S2; 0-6"
5-258-5	S2; 6-12"
5-258-8	S4; 0-6"

Concentration: mg/L

	5-258-2	5-258-3	5-258-4	5-258-5	5-258-8	STLC[a]
Lead	5.9	---	---	---	24	180
Nickel	3.5	7.2	52	3.1	130	20
Copper	---	---	---	---	49	25

[a] Soluble Threshold Limit Concentration as specified in the California Assessment Manual (CAM), Criteria for Identification of Hazardous and Extremely Hazardous Wastes. Draft of January 11, 1984.

ht

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-7-84

Date Sampled 7/09/84
Date Received 7/09/84
Date Reported 7/10/84

Job# 1928-03

Reported To:

Mr. Brian Bracken
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Laboratory Director

cc.

Log No.	Sample Description
7-84-1	S7; 0-6"; Soil Sample
7-84-2	S7; 6-11"; Soil Sample
7-84-3	M-1; Soil Sample
7-84-4	W-4; Aqueous Sample
7-84-5	W-2; Aqueous Sample
7-84-6	W-3; Aqueous Sample

	7-84-1	7-84-2	7-84-3	7-84-4	7-84-5	7-84-6
Concentration:	mg/Kg	mg/Kg	mg/Kg	mg/L	mg/L	mg/L
Copper	130	33	100	0.04	---	---
Nickel	47	47	47	0.12	---	---
Lead	240	170	440	< 0.1	---	---
Zinc	660	390	160	0.32	---	---
Oil and Grease	---	---	---	7	7	< 5
ht						

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428 2300

Log No. E84-3-160-1

Date Sampled Not Given
Date Received 3/14/84
Date Reported 3/19/84

Reported To: Mr. Vern Mallison
Western Forge and Flange
Post Office Box 327
Santa Clara, California 95052

cc. Mr. Brian Bracken
Brown and Caldwell, Pleasant Hill

Laboratory Director

Log No.	Sample Description
3-160-1	Water Sample

Concentration: mg/L

	3-160-1
Barium	< 0.1
Chromium	0.33
Cobalt	< 0.02
Copper	0.81
Lead	< 0.1
Nickel	0.48
Zinc	1.2

ht

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-2-184

Date Sampled 2/16/84
Date Received 2/16/84
Date Reported 3/9/84

Reported To:
Mr. Vern Mallison
Western Forge and Flange
Post Office Box 327
Santa Clara, California 95052

cc. Mr. Brian Bracken
Brown and Caldwell

Laboratory Director

Log No.	Sample Description
2-184-1	W-1 Water quench tank
2-184-2	W-2 Boiler blow down

Concentration: mg/L

CAM METALS	2-184-1	2-184-2				
Arsenic	< 0.01	< 0.01				
Barium	< 0.1	< 0.1				
Cadmium	< 0.01	< 0.01				
Chromium, Hexavalent	0.06	< 0.02				
Chromium, Trivalent	< 0.02	< 0.02				
Cobalt	< 0.02	0.15				
Copper	1.7	0.17				
Lead	< 0.1	< 0.1				
Nickel	1.7	0.03				
Selenium	< 0.01	< 0.01				
Zinc	0.08	1.3				

BROWN AND CALDWELL
CONSULTING ENGINEERS
ANALYTICAL SERVICES DIVISION
1255 POWELL STREET
EMERYVILLE, CA 94608
PHONE (415) 428-2300

Log No. E84-2-184

Date Sampled 2/16/84
Date Received 2/16/84
Date Reported 3/09/84

Reported To: Mr. Vern Mallison
Western Forge and Flange

cc.

Laboratory Director

Log No.	Sample Description
2-184-3	S-1; SW of Bldg.
2-184-4	S-2; W of Bldg.
2-184-5	S-3; NW of Bldg.
TTLC	Total threshold limit concentration, taken from the California Assessment Manual (CAM), Draft Regulatory Criteria, September 15, 1983.

Concentration: mg/kg

CAM METALS	2-184-3	2-184-4	2-184-5	TTLC		
Arsenic	9.5	15	5.6	500		
Barium	140	53	170	10,000		
Cadmium	0.1	< 0.1	< 0.1	100		
Chromium, Hexavalent	< 1	< 1	2	500		
Chromium, Trivalent	76	360	80	2500		
Cobalt	17	100	7.6	8000		
Copper	110	3300	22	2500		
Lead	160	85	81	1000		
Nickel	150	9400	24	2000		
Selenium	< 0.1	< 0.1	< 0.1	100		
Zinc	1500	190	320	5000		
ht						