DELPHI

FACILITY INVESTIGATIVE REPORT

APPENDIX A
SECTION 10

CONT. REVISED EVALUATION OF REMEDIAL ACTION ALTERNATIVE 2-89

Estimates of the quantity of rainfall that may effectively reach ground water in arid regions such as southern California is typically less than five percent of the total rainfall. However, infiltration is not uniform over a given area, and the majority of it is expected to occur principally in areas where the soil is very permeable such as river beds and flood plains. As discussed previously, the site is underlain by a dense to medium dense silt and clay layer, 15 to 20 feet thick. Such a layer is expected to have very low hydraulic conductivity (permeability) and does not transmit water easily. Therefore, it is expected that very little, if any, rain falling on the site to actually infiltrate more than a few feet below the surface. According to representatives of Delco Remy, irrigation at the northwest field does not occur nor is it expected to occur in the future.

Even if a negligible amount of water infiltrates into the soil, water must dissolve the lead to be able to mobilize and transport it to the ground water. Potential lead mobility is discussed in the following subsection.

4.2.2 POTENTIAL LEAD MOBILITY

Lead and lead compounds are generally of very low solubility. Lead solubility is controlled by various lead minerals such as oxides, carbonates, and phosphates (Rai, et al., 1984). Hem (1977) states that lead carbonate and basic lead carbonate are potential controls for lead solubility, especially in alkaline environments such as the soil at the site. Limited investigations at the site indicate that the soils are naturally alkaline with pH values ranging from 7.05 to 8.85 (Table 2). Therefore, the solubility of lead in the onsite soil is expected to be very low, if any.

Potential migration of dissolved lead, if any, is strongly controlled by retention in soil through ion exchange and specific retention (Rai, et al., 1984). One of the soil

properties that most often correlate with lead adsorption is soil clay content (Singh and Sekhon, 1977; Soldatini et al., 1976; Rilfaldi et al., 1976; Abd-Elfattah and Wada, 1981). Considering that the site is underlain by a 15- to 20-foot layer of dense to medium dense silt and clay, even if lead is dissolved in infiltrating water, the dissolved lead is expected to be strongly retained by the clay content of the soil, hence retarding its downward movement to the ground water.

Based on the above discussions, it is unlikely that natural infiltrating water, if any, will mobilize lead in the onsite soil and carry it to the ground water.

4.3 POTENTIAL EXPOSURE PATHWAYS

Potential pathways by which humans, animals, or plants may be exposed to lead include:

- Ingestion of lead contaminated soil;
- Inhalation of airborne lead via lead laden dust;
- Dermal skin contact;
- Via water, either by drinking lead-affected water or via habitat (in the case of fish or birds); and
- Uptake of lead in the soil by vegetation.

The potential for human exposure to lead via these potential pathways is largely dependent on the nature of lead in soil, the existing and planned future site land use, and the environmental conditions. In our opinion, lead exposure through ingestion of soil or lead-laden dust or by inhalation of airborne dust seems to be the possible exposure pathways that should be addressed. Because of restricted site access, the potential for exposure, if any, is deemed to be limited to individuals working at the site.

Dermal contact is not considered a significant exposure pathway because lead in the soil is believed to be inorganic. Lead exposure via ground water is not considered to be significant due to expected immobility of lead in soil, as discussed previously in Section 4.2. Surface water does not occur at the site.

Potential exposure through ingestion of plants with absorbed lead is not considered significant because of general absence of vegetation in the northwest field of the site.

4.4 EVALUATION OF REMEDIAL ALTERNATIVES

A wide range of remedial alternatives can be considered for the site and a brief description of each follows:

No Action - This alternative would involve leaving the site in its existing condition with exposed soil at the ground surface. This action would not limit the potential direct contact to lead in soil or dust generation. In addition, soil with excessive lead content could be eroded (washed) and carried to the retention basin by surface runoff during heavy rainwater. Therefore, this alternative is not recommended.

Capping (Paving) - Covering the lead-bearing soil with a contoured pavement would limit direct contact, further reduce the possibility of incidental rain-water infiltration into the soil, effectively control the airborne lead-laden dust, and practically eliminate the possibility of soil erosion at the site. The capping material could consist of a layer of clean native soil, concrete, asphalt, or other appropriate material

Excavation and Off-site Disposal - An excavation program could be implemented to remove the lead-bearing soil and haul it to an offsite Class I landfill for disposal. The advantage of this method is that the source of lead is

removed. The disadvantages of this method are: (1) the lead is not eliminated, but only transferred somewhere else, (2) off-site disposal can cause potential long term liabilities, and it occupies the existing scarce landfill space for hazardous wastes that cannot be handled by any other method, (3) extensive excavation would expose the workers to lead, and (4) this process is not cost-effective, if it can be avoided.

Excavation and Onsite Treatment - The material could be excavated and processed by an on-site treatment unit to render the soil as non-hazardous. After excavation and treatment, the treated material would be used as on-site fill, or disposed of in a Class III landfill as a designated or non-hazardous waste. Available treatment techniques consist of a cement or pozzolanic-based stabilization process, vitrification, soil washing, bioreclamation, or chemical fixation. The advantage of onsite treatment is that it immobilizes the lead and reduces its potential migration. The disadvantages are: (1) extensive excavation would expose the workers to lead, (2) treatment may not be adequately effective if lead concentrations are high, and (3) if the lead is practically immobile due to the site's hydrogeological, geochemical, and meterological conditions, treatment does not provide any appreciable advantage, thus, the method becomes cost ineffective.

In-situ Treatment - In-situ treatment may be applied in certain situations by injecting treatment chemicals into the affected soil to immobilize the lead. The advantage of this method is that it immobilizes the lead and reduces its potential migration. However, there are disadvantages involved with this method including: (1) the treatment chemicals may not be uniformly distributed in the affected soil zone, thus, pockets of untreated or

inadequately treated soil may remain in the ground, (2) if concentrations are high, treatment may not be as effective, and (3) if the lead is practically immobile due to the site's hydrogeological, geochemical, and meterological conditions, in-situ treatment does not provide any appreciable advantage, thus, this method becomes cost ineffective.

5.0 SELECTION OF AND RECOMMENDATION FOR REMEDIAL ACTION ALTERNATIVE

Selection of an appropriate remedial action or combination of actions involves consideration of such factors as site conditions, including the concentration and extent of lead in the background and site soils, environmental factors that might affect migration of lead from the site, potential biological receptors and exposure pathways, past and future land use at the site, and cost effectiveness. The potential remedial alternatives outlined in Section 4.4 were evaluated in light of these factors and their ability to achieve the site remediation objectives. Consequently, a remedial action was selected for recommendations, as follows.

5.1 RECOMMENDED REMEDIAL ACTION

Based on the above factors, Dames & Moore recommends a remedial action for the site including a combination of partial excavation/offsite disposal, followed by capping of the northwest field. The rest of this section describes the area of excavation, the area of capping, and justification for the recommended remedial action.

Based on the results of soil sampling and analyses, it appears that the soil in a strip along the eastern part of the northwest field contains lead concentrations exceeding the background concentrations. This strip is reprsented by sampling location NW1 and NW4 (Figure 4). According to Delco Remy personnel, this strip had been used in the past to store defective batteries. It is conceivable that possible leaks from these batteries have impacted a thin layer of soil, about a foot thick, in this strip. According to Delco Remy's personnel, the strip that was used for the defective battery storage was about 17-feet wide and it extended parallel to the onsite railroad track, 8 feet to the east of the center of the track (Figure 7). The south end of the strip, where the sam-

pling point MW 1 is located (Figures 4 and 7), was apparently used more extensively, because higher total and soluble lead concentrations were observed in NW1-A sample than NW4-A Sample (Table 2). These samples, collected at a depth of 0-0.5 feet showed total lead concentrations of 9850 mg/kg and 2700 mg/kg, respectively (Table 2). Samples NW1-B and NW4-B, collected at a depth of 1-1.5 feet, had total lead concentrations of 152 mg/kg and 3.8 mg/kg, respectively, which are within the range of concentrations observed in the background samples (Table 1). Total and soluble lead concentrations in other soil samples collected in the northwest field (Figure 4 and Table 2) are within the range of concentrations observed in the off-site background samples (Table 1).

We recommend that the lead-bearing soil in the impacted strip be excavated and disposed of in a Class I landfill. The soil excavated from the impacted strip is expected to have total lead concentrations exceeding the TTLC levels. Therefore, an on-site treatment is not expected to be effective. The strip to be excavated (Figure 7) will be 17 feet wide, extending 8 feet from the center of the onsite railroad track. Excavation will extend to about 1 foot below the present grade. At the completion of the excavation, confirmatory samples will be collected at the bottom of the excavated area and analysed for total lead. If the total concentrations of these confirmatory samples were within the range of background samples (Table 2), the excavated area will be leveled by bringing soil from the other areas of the northwest field. Otherwise excavation will continue until the total lead concentrations are within the background range. Finally, the northwest field will be paved with asphalt for future use as a parking lot or other uses.

During excavation and off-site transportation a strict health and safety plan (Appendix C) will be implemented to protect workers as well as the residents in the area. The

details of the health and safety plan are delineated in Appendix C. The salient features of the plan are as follows:

- To prevent airborne dusts, the excavation and piling areas will be sprayed with water to subside dust.
- Workers will be equipped with protective clothes and respirators, when necessary.
- Air sampling equipment will be installed in critical areas to monitor the amount of fugitive dust and potential intake of the workers. The results of dust monitoring at the site, during previous excavation and on-site treatment have indicated safe working environment.
- The workers will be monitored for blood lead levels before and after the implementation of the recommended remedial actions.
- During excavation, an area within the site will be designated as a loading zone for loading the soil on the end dumpster and transfer units. The trucks will be tarped in a tarping station before leaving the site. Precautions will be taken during loading and tarping to minimize dust.

To transport the lead-affected soil to a disposal facility, a transportation plan that specifies general and emergency measures will be implemented. The excavated area will be filled with soil from other parts of the northwest field and packed to 90 percent of its maximum dry density before final capping with asphalt.

5.2 JUSTIFICATION FOR RECOMMENDED REMEDIAL ACTION

There is strong justification for selecting the above recommended remedial action based on information contained in this report. To summarize, the following rationale justifies this remedial action:

- As discussed in Section 4.2, the site specific environmental factors would effectively mitigate the potential downward migration of lead to ground water. Therefore, even if the soil in the impacted strip (Figure 7) is not removed, there would be little chance of lead to migrate to the ground water. However, in order to be very conservative, we recommend the excavation and removal of the soil from the impacted soil (Figure 7).

- After the removal of the impacted soil, based on the data in Table 2, the lead concentrations remaining in the soil in the northwest field will be well within the background concentrations range (Table 2). Therefore, in our opinion, the potential environmental risks, if any, arising from the lead concentrations in the northwest field soils will not be greater than the off-site background soils. However, to be very conservative, we recommend the northwest field to be paved with asphalt.

- Pavement will also help to further minimize the potential for negligible infiltration of incidental precipitation.

- Pavement will also help to practically eliminate soil erosion and its movement during incidental heavy rain to the retention basin at the site.

- Pavement will be contoured so that the surface runoff will be directed to the retention basin and or the Magnolia Storm Drain System.

- The covered site may be used as a parking lot or other purposes.

In summary, it is our opinion that partial removal and capping, by using an asphalt pavement cover, will be a conservative way to effectively achieve the primary goals of site remediation of protecting human health and the environment and the waters of the state from adverse degradation.

60EE.11-19

TABLE 1
TOTAL AND SOLUBLE LEAD CONCENTRATIONS
IN BACKGROUND SOIL SAMPLES

SAMPLE ID	SAMPLE DEPTH (ft)	SOLUBLE LEAD IN CONCENTRATION (mg/l)	TOTAL LEAD CONCENTRATION (mg/kg)	PERCENT EXTRACTED BY WET ANALYSIS
NF-1	0-0.5	4.2	54	78
NF-2	0-0.5	11	130	85
NF-3	0-0.5	72.	690	100
NF-4	0-0.5	5.3	69	77
NF-5	0-0.5	2.7	32	84
NF-6	0-0.5	2.3	25	92
NF-7	0-0.5	7.1	100	71
NF-8	0-0.5	2.3	34	68
NF-9	0-0.5	4.6	49	94
NF-10	0-0.5	11.	120	92
NF-11	0-0.5	5.7	57	100
NF-12	0-0.5	13.	140	93
NF-13	0-0.5	4.9	53	92
NF-14	0-0.5	14.	150	93
Blank		ND (0.02)	ND (0.5)	--

60EE.50

TABLE 2
ANALYTICAL RESULTS OF NORTHWEST FIELD SOIL SAMPLES

Sample Location & Designation	Depth bgs(ft)[a]	T-Pb(mg/kg)[b]	S-Pb(mg/l)[c]	pH[d]
DD1-A	0-1		21	8.75
DD1-B	1-2		16	
DD1-C	2-2.5		39.6	
DD1-D	2.5-3		11.6	
DD1-E	3-3.5		0.31	
DD2-A	0-1		24	
DD2-B	1-2		18	
DD2-C	2-2.5		0.25	
DD2-D	2.5-3		0.11	
DD3-A	0-1		225	7.05
DD3-B	1-2		2.2	
DD4-A	0-1		10	
DD4-B	1-2		1.3	
DD5-A	0-1		103	8.00
DD5-B	1-2		7.5	
DD5-C	2-2.5		2.55	
DD5-D	2.5-3		0.27	
DD6-A	0-1		55	8.20
DD6-B	1-2		2.6	
DD7-A	0-1		30	
DD7-B	1-2		8.0	
DD7-C	2-2.5		0.24	
DD7-D	2.5-3		0.14	
DD8-A	0-1		30	7.60
DD8-B	1-2		2.6	
DD9-A	0-1		0.8	
DD9-B	1-2		0.4	
DD10-A	1-2		12.1	
DD10-B	2-2.5		0.18	
DD11-A	1-2		0.82	
DD11-B	2-2.5		0.12	
DD12-A	1-2		0.25	
DD12-B	2-2.5		0.15	
DD13-A	1-2		0.21	
DD13-B	2-2.5		0.98	
DD14-A	1-2		1.69	
DD14-B	2-2.5		0.28	
NW1-A	0-.5	9850	1130	8.45
NW1-B	1-1.5	152	14	
NW2-A	0-.5	150	14	
NW2-B	1-1.5	128	8.2	
NW2-C	1.5-2		ND<0.1	
NW2-D	2-2.5		0.10	
NW3-A	0-.5	120	14	8.85
NW3-B	1-1.5	213	31	

TABLE 2 (continued)

Sample Location & Designation	Depth bgs(ft)	T-Pb(mg/kg)	S-Pb(mg/l)	pH
NW3-C	1.5-2		2.08	
NW3-D	2-2.5		ND<0.1	
NW4-A	0-.5	2700	333	8.15
NW4-B	1-1.5	3.8	NA	
NW5-A	0-.5	120	10	
NW5-B	1-1.5	138	10	
NW6-A	0-.5	110	11	
NW6-B	1-1.5	4.0	NA	
NW7-A	0-.5	480	30	
NW7-B	1-1.5	5.0		
NW8-A	0-.5	54	3.6	8.25
NW8-B	1-1.5	20		
NW9-A	1.5-2		ND<0.1	
NW9-B	2-2.5		ND<0.1	
NW10-A	1.5-2		0.27	
NW10-B	2-2.5		ND<0.1	
NW11-A	1.5-2		4.10	
NW11-B	2-2.5		ND<0.1	
NW12-A	1.5-2		1.11	
NW12-B	2-2.5		ND<0.1	
NW13-A	1.5-2		1.60	
NW13-B	2-2.5		ND<0.1	
NW14-A	1.5-2		ND<0.1	
NW14-B	2-2.5		ND<0.1	
NW15-A	1.5-2		ND<0.1	
NW15-B	2-2.5		ND<0.1	
NW16-A	1.5-2		5.41	
NW16-A	2-2.5		0.53	
TD1	4		0.15	
TD2	3		15.2	
TD3	3		50.6	
BERM1	1		10.4	
BERM2	1		2.23	
BERM3	1		3.36	
BERM4	1		2.70	
A1	2		ND<0.1	
A2	2		6.87	
A3	2		0.30	
A4	2		3.37	
A8(e)	2.5		26.8	
A9(e)	2.5		1.23	
A10(e)	2.5		1.95	
A11(e)	2		32.1	
A12(e)	2		1.60	
A13(e)	2.5		0.33	
A14(e)	2		0.59	

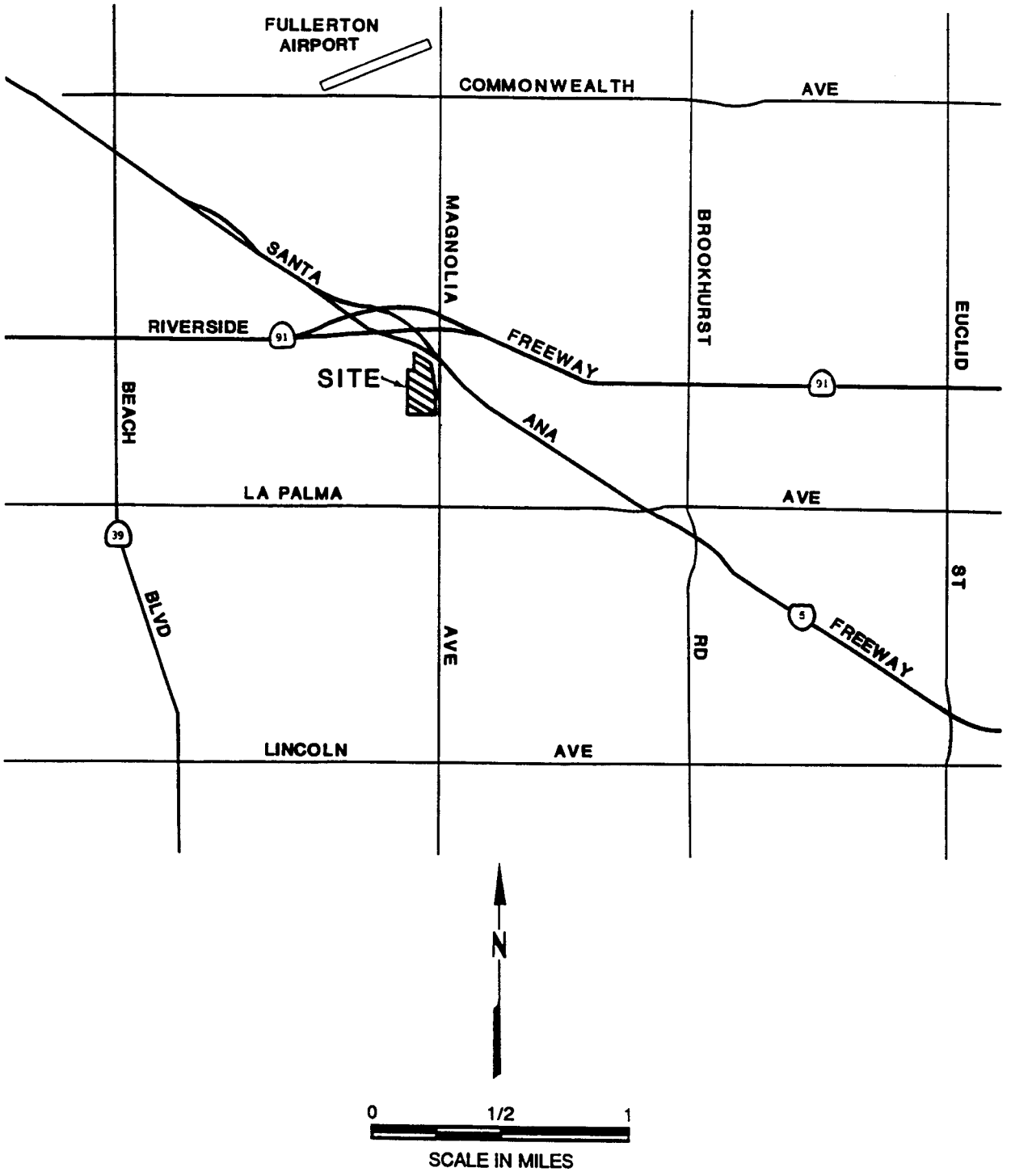
TABLE 2 (continued)

Sample Location & Designation	Depth bgs(ft)	T-Pb(mg/kg)	S-Pb(mg/l)	pH
A15(e)	2		0.47	
A16(e)	4		1.26	
A17(e)	4		0.52	
A18(e)	5		0.85	
A19(e)	3		ND<0.1	
A20(e)	3		0.58	
A21(e)	3		0.46	
A22(e)	3		0.55	
RS1(e)	3.5		0.27	
RS2(e)	3		0.16	

KEY:

(a)bgs= below ground surface
(b)T-Pb= Total Lead Concentration
(c)S-Pb= Soluble Lead Concentration
(d) pH = -log [hydrogen ion concentration]
(e)=These samples were collected with Mr. David Dixon from the Orange County Health Care Agency present during the sampling activities.
NA= Not Analyzed
ND<0.1= Not Detected, Detection limit is 0.1/mg/l

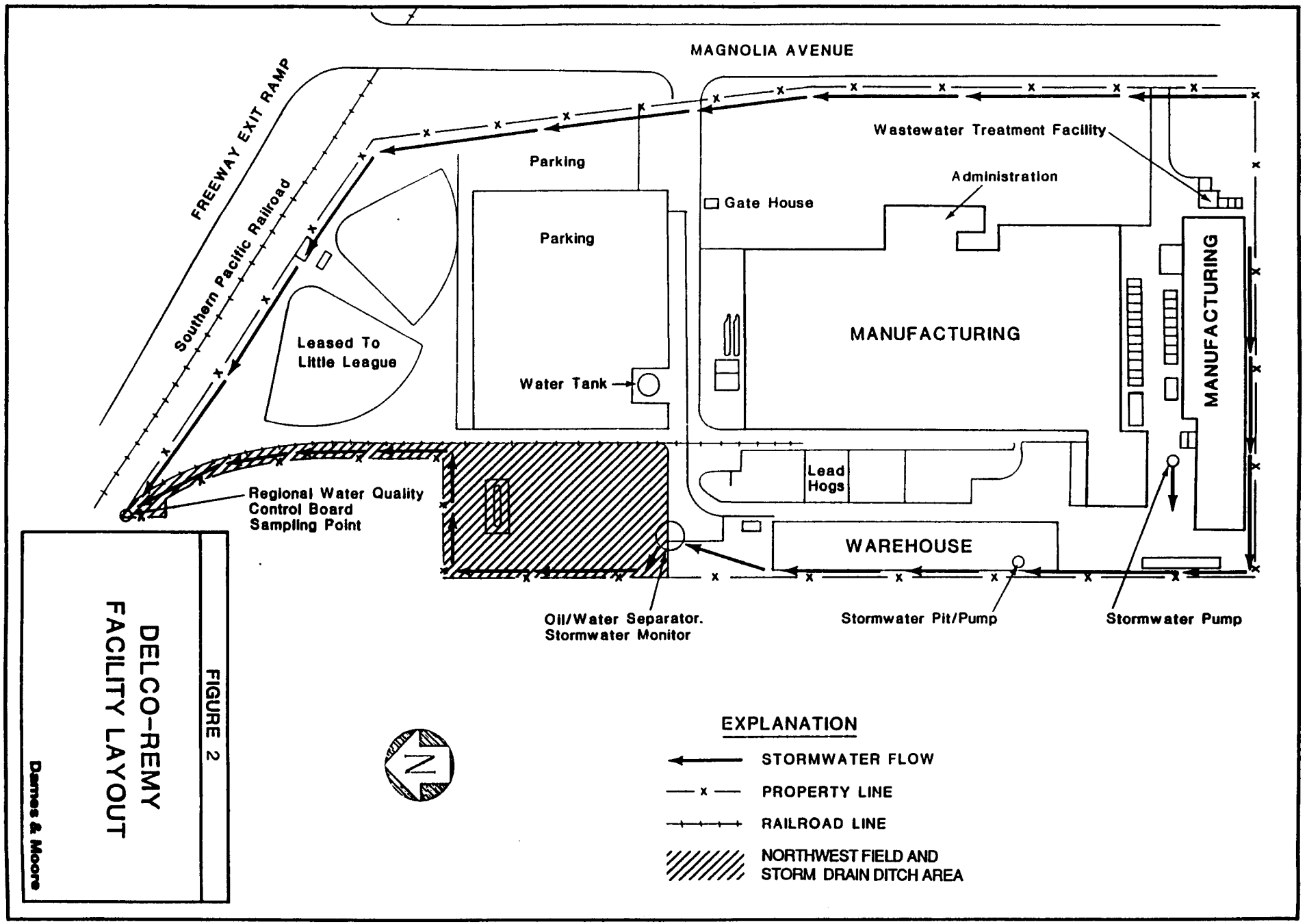
18EE.51-51.1

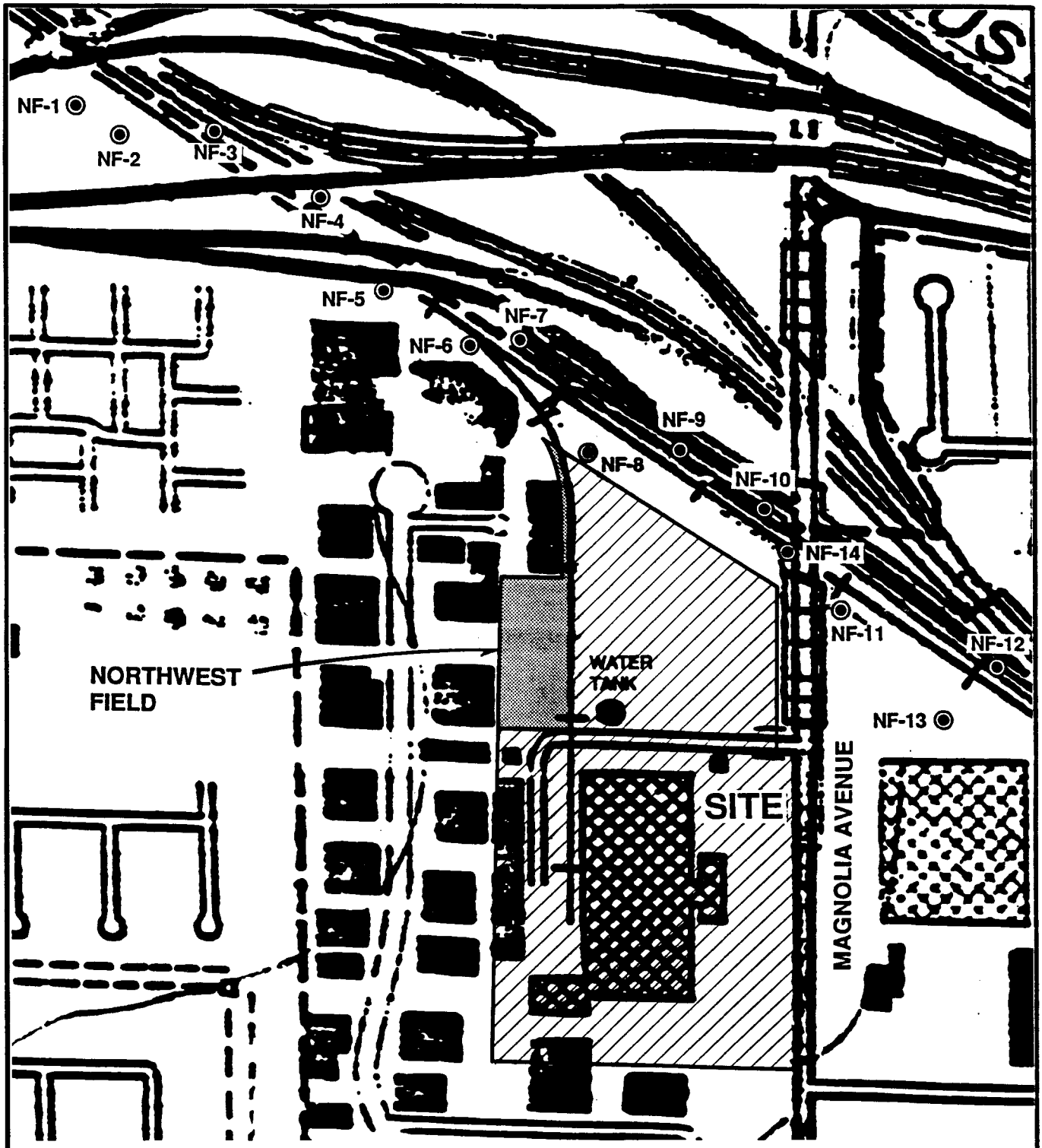


VICINITY MAP

DELCO REMY SITE
ANAHEIM, CALIFORNIA

Dames & Moore
FIGURE 1

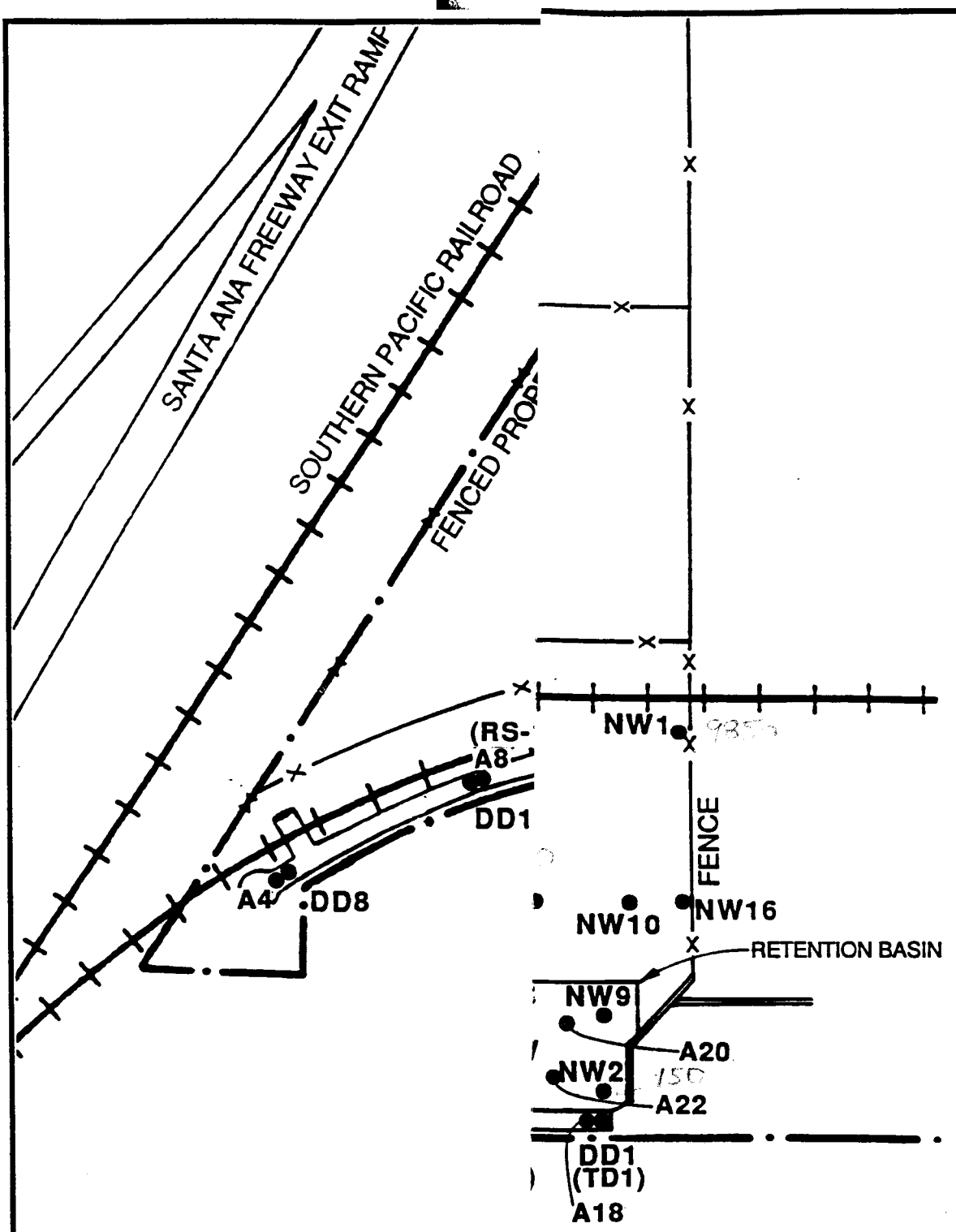

MAGNOLIA AVENUE
FREEWAY EXIT RAMP
Southern Pacific Railroad
Parking
Parking
Leased To
Little League
Water Tank
Gate House
Wastewater Treatment Facility
Administration
MANUFACTURING
MANUFACTURING
Lead
Hogs
WAREHOUSE
Regional Water Quality
Control Board
Sampling Point
Oil/Water Separator.
Stormwater Monitor
Stormwater Pit/Pump
Stormwater Pump
N
EXPLANATION
STORMWATER FLOW
PROPERTY LINE
RAILROAD LINE
NORTHWEST FIELD AND
STORM DRAIN DITCH AREA
DELCO-REMY
FACILITY LAYOUT
FIGURE 2
Dames & Moore



OFFSITE BACKGROUND SAMPLING LOCATIONS

DELCO REMY SITE
ANAHEIM, CALIFORNIA

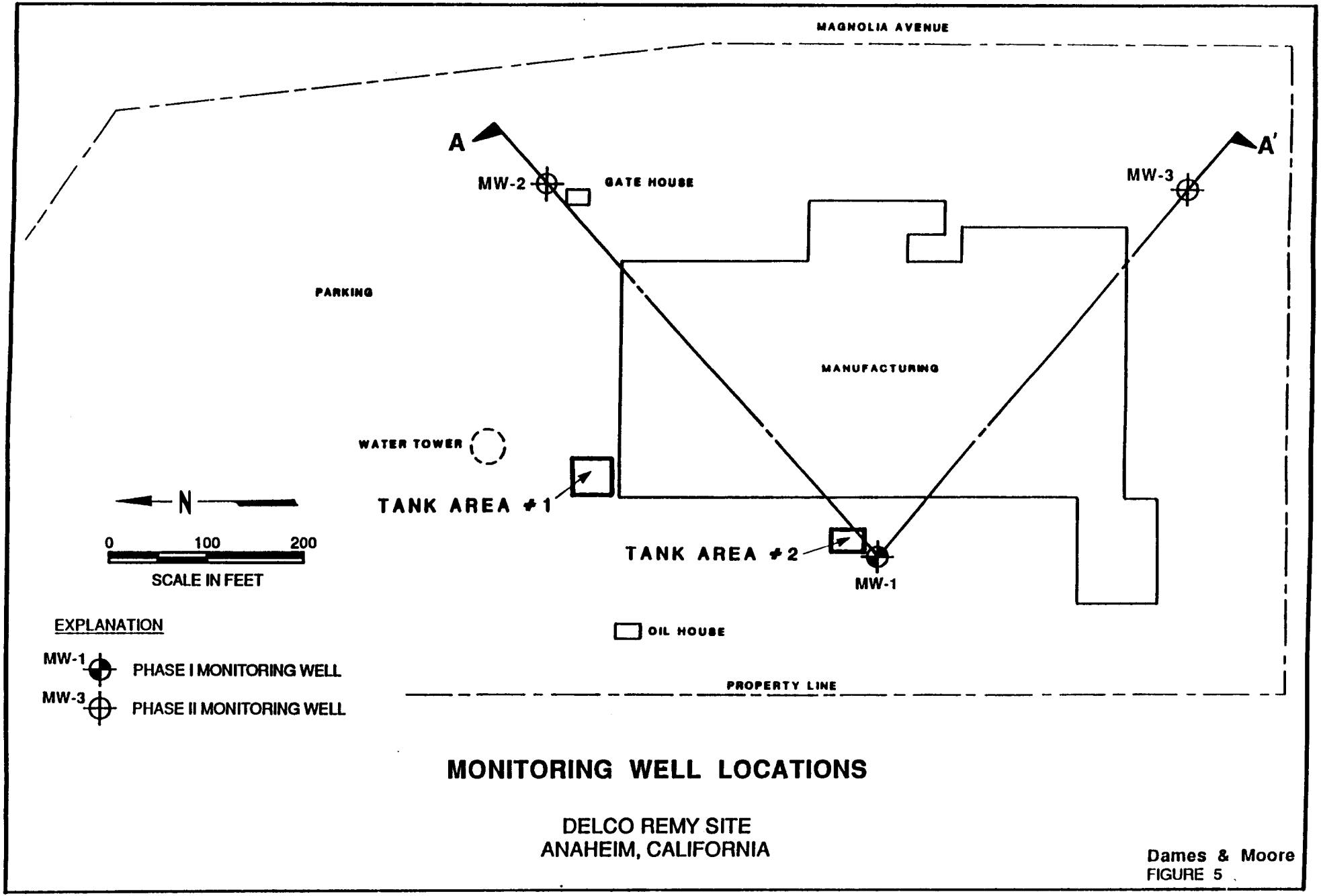
Dames & Moore
FIGURE 3



SOIL SAMPLING LOCATIONS

DELCO REMY SITE
ANAHEIM, CALIFORNIA

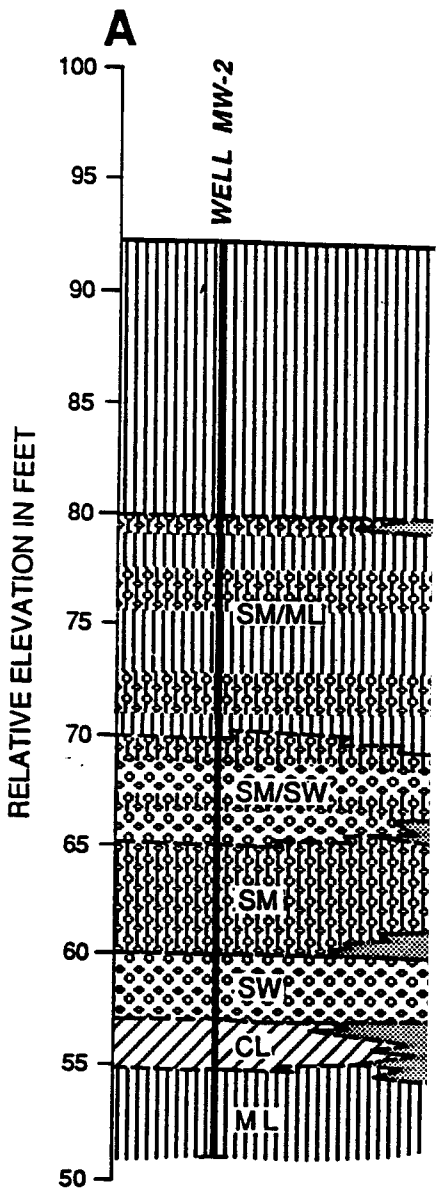
Dames & Moore
FIGURE 4



MONITORING WELL LOCATIONS

DELCO REMY SITE
ANAHEIM, CALIFORNIA

Dames & Moore
FIGURE 5



KEY:

SW	WELL-GRADED SANDS, GRAVELLY-SANDS, LITTLE OR NO FINES
SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
SM	SILTY SANDS, SAND-SILT MIXTURES
ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS

NOTE: LOCATION OF CROS

IDEALIZED CROSS SECTION

DELCO REMY SITE
ANAHEIM, CALIFORNIA

Dames & Moore
FIGURE 6

APPENDIX A

Laboratory Reports

Enseco - CRL / South Coast
7440 Lincoln Way • Garden Grove, CA 92641
(714) 898-6370 • (213) 598-0458 • (800) LAB-1-CRL
FAX: (714) 891-5917

September 14, 1989

DAMES & MOORE
6 HUTTON CENTER DR., STE 700
SANTA ANA, CA 92707
ATTN: MR. ESSI ESMAILI

Analysis No.: G-8925405-001/014
Date Sampled: 8-SEP-1989
Date Sample Rec'd: 8-SEP-1989
Project: (14197-009) DELCO REMY

Enclosed with this letter is the report on the chemical and physical analyses on the samples from ANALYSIS NO: G-8925405-001-014 shown above.

The samples were received by CRL in a chilled state, intact and with the chain-of-custody record attached.

Please note that ND( ) means not detected at the detection limit expressed within the parentheses.

Solid samples are reported on "as received" basis.

Preliminary data were provided on September 12, 1989 at 4:10 P.M.

Reviewed

Approved

Enseco - CRL / South Coast
7440 Lincoln Way • Garden Grove, CA 92641
(714) 898-6370 • (213) 598-0458 • (800) LAB-1-CRL
FAX: (714) 891-5917

Enseco

Laboratory Report

DAMES & MOORE
6 HUTTON CENTER
SUITE 700
SANTA ANA, CA 92707
ATTN: MR. ESSI ESMAILI
Project: (14197-009) DELCO REMY

Analysis No.: G-8925405-001/014
Date Sampled: 8-SEP-1989
Date Sample Rec'd: 8-SEP-1989
Date Analyzed: 12-SEP-1989
Sample Type: SOLID

Sample ID	Lead mg/kg EPA 7420
NF-1	54.
NF-2	130.
NF-3	690.
NF-4	69.
NF-5	32.
NF-6	25.
NF-7	100.
NF-8	34.
NF-9	49.
NF-10	120.
NF-11	57.
NF-12	140.
NF-13	53.
NF-14	150.
Blank	ND(0.5)

Enseco - CRL / South Coast
7440 Lincoln Way • Garden Grove, CA 92641
(714) 898-6370 • (213) 598-0458 • (800) LAB-1-CRL
FAX: (714) 891-5917

Laboratory Report

DAMES & MOORE
6 HUTTON CENTER
SUITE 700
SANTA ANA, CA 92707
ATTN: MR. ESSI ESMAILI
Project: (14197-009) DELCO REMY

Analysis No.: G-8925405-001/014
Date Sampled: 8-SEP-1989
Date Sample Rec'd: 8-SEP-1989
Sample Type: SOLID

QA/QC Summary

Date	Parameter (Method)	QC Type	Average Spike Recovery	Acceptable Range	Relative Percent Difference	Acceptable Range
12-SEP-1989	LEAD (EPA 7420)	M	80	35-180	15.	40

M = Matrix Spike
L = Laboratory Control Sample Spike

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7440 Lincoln Way • Garden Grove, CA 92641
(714) 898-6370 • (213) 598-0458 • (800) LAB-1-CRL
FAX: (714) 891-5917

Enseco

September 22, 1989

DAMES & MOORE
6 HUTTON CENTER DR., STE 700
SANTA ANA, CA 92707
ATTN: MR. ESSI ESMAILI

Analysis No.: G-8925621-001/014
Date Sampled: 8-SEP-1989
Date Sample Rec'd: 8-SEP-1989
Date Relogged: 13-SEP-1989
Project: (14197-009) DELCO REMY

Enclosed with this letter is the report on the chemical and physical analyses on the samples from ANALYSIS NO: G-8925621-001/014 shown above.

The samples were received by CRL in a chilled state, intact and with the chain-of-custody record attached.

Please note that ND( ) means not detected at the detection limit expressed within the parentheses.

Solid samples are reported on "as received" basis.

Reviewed

Approved

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FAX: (714) 891-5917

Enseco

Laboratory Report

DAMES & MOORE
6 HUTTON CENTER
SUITE 700
SANTA ANA, CA 92707

ATTN: MR. ESSI ESMAILI
Project: (14197-009) DELCO REMY

Analysis No.: G-8925621-001/014
Date Sampled: 8-SEP-1989
Date Sample Rec'd: 8-SEP-1989
Date Relogged: 13-SEP-1989
Sample Type: SOLID

QA/QC Summary

Date	Parameter (Method)	QC Type	Average Spike Recovery	Acceptable Range	Relative Percent Difference	Acceptable Range
20-SEP-1989	LEAD (EPA 239.1)	L	80	65-144	0.	25

M = Matrix Spike
L = Laboratory Control Sample Spike

Enseco - CRL / South Coast
7440 Lincoln Way • Garden Grove, CA 92641
(714) 898-6370 • (213) 598-0458 • (800) LAB-1-CRL
FAX: (714) 891-5917

Enseco

Laboratory Report

DAMES & MOORE
6 HUTTON CENTER
SUITE 700
SANTA ANA, CA 92707
ATTN: MR. ESSI ESMAILI

Analysis No.: G-8925621-001/014
Date Sampled: 8-SEP-1989
Date Sample Rec'd: 8-SEP-1989
Date Analyzed: 20-SEP-1989
Date Relogged: 13-SEP-1989
Sample Type: SOLID

Project: (14197-009) DELCO REMY

Sample ID	Lead/STLC mg/L EPA 239.1
NF-1	4.2
NF-2	11.
NF-3	72.
NF-4	5.3
NF-5	2.7
NF-6	2.3
NF-7	7.1
NF-8	2.3
NF-9	4.6
NF-10	11.
NF-11	5.7
NF-12	13.
NF-13	4.9
NF-14	14.
Blank	ND(0.02)

Job No. 14194-009

CHAIN OF CUSTODY RECORD

GENERATOR INFORMATION

Facility DelcoRemy 925405

Address Anaheim, CA

Telephone ( )

COLLECTOR INFORMATION

Collected by DAMES & MOORE

Address Cotton Center #700
Santa Ana, CA 92707

Telephone (714) 433-2000

SAMPLE INFORMATION

No.	DEPTH	TYPE	DATE	TIME
NF-1	Surf	SOIL	9/8/89	950
-2				955
-3				1000
-4				1005
-5				1010
-6				1015
-7				1020
-8				1025
-9				1030
-10				1035
-11				1040
-12				1045
-13				1050
-14				1055

Suspected Waste Constituents Lead

Field Conditions/Remarks (circled) HOLD ALL SAMPLES - LAB INSTRUCTIONS WILL BE PHONED IN

SAMPLE ALLOCATION

Name CRL/ENSECO

Address 7990 LINCOLN Wy
STANTON, CA

Telephone ( )

X sample received intact

___ sample received damaged or missing (describe on back)

(Signature) 9/8/89 (Date)

CHAIN OF POSSESSION

	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
1.		9/8/89	11:20		9/8/89	11:20
2.						
3.						
4.						

Distribution

White-w/shipment-for consignee files
Blue-w/shipment-forward to Dames & Moore
Attn: ESSI ESMAILI

Pink-with report
Goldenrod-Dames & Moore - Job File

Dames & Moore

Chemical Research Laboratories, Inc.
SOUTHERN CALIFORNIA DIVISION
7440 Lincoln Way ● Garden Grove, CA 92641
(714)898-6370 ● FAX: (714)891-5917 ● (800)LAB-1CRL

LABORATORY REPORT

DAMES AND MOORE
3 Corporate Park, Suite 100
Irvine, CA 92714
ATTN: B.G. Randolph

ANALYSIS NO.: 816617-019/026
ANALYSES: EPA Method 7420 (TTLC)
DATE SAMPLED: 06/14/88
DATE SAMPLE REC'D: 06/14/88
DATE ANALYZED: 06/17-21/88
SAMPLE TYPE: Solid
PROJECT: 14197-005-042
Delco Remy

The following analytical determinations were conducted according to the guideline set forth in the California Administrative Code, Title 22, Chapter 30, Article II (January 12, 1985). The analyses were performed on a total sample digestion.

SAMPLE IDENTIFICATION	LEAD EPA METHOD 7420 (TTLC) (mg/kg)
NW 1A 0-6"	9,850.
NW 2A 0-6"	150.
NW 3A 0-6"	120.
NW 4A 0-6"	2,700.
NW 5A 0-6"	120.
NW 6A 0-6"	110.
NW 7A 0-6"	480.
NW 8A 0-6"	54.

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SOUTHERN CALIFORNIA DIVISION
7440 Lincoln Way ● Garden Grove, CA 92641
(714)898-6370 ● FAX: (714)891-5917 ● (800)LAB-1CRL

LABORATORY REPORT

DAMES AND MOORE
3 Corporate Park, Suite 100
Irvine, CA 92714
ATTN: B.G. Randolph

ANALYSIS NO.: 816617-027/034
ANALYSES: EPA Method 7421 (TTLC)
DATE SAMPLED: 06/14/88
DATE SAMPLE REC'D: 06/14/88
DATE ANALYZED: 06/21/88
SAMPLE TYPE: Solid
PROJECT: 14197-005-042
Delco Remy

The following analytical determinations were conducted according to the guideline set forth in the California Administrative Code, Title 22, Chapter 30, Article II (January 12, 1985). The analyses were performed on a total sample digestion.

SAMPLE IDENTIFICATION	LEAD EPA METHOD 7421 (TTLC) (mg/kg)
NW 1B 12-18"	152.
NW 2B 12-18"	128.
NW 3B 12-18"	213.
NW 4B 12-18"	3.8
NW 5B 12-18"	138.
NW 6B 12-18"	4.0
NW 7B 12-18"	5.0
NW 8B 12-18"	20.

Chemical Research Laboratories, Inc.
SOUTHERN CALIFORNIA DIVISION
7440 Lincoln Way ● Garden Grove, CA 92641
(714)898-6370 ● FAX: (714)891-5917 ● (800)LAB-1CRL

LABORATORY REPORT

DAMES AND MOORE
3 Corporate Park, Suite 100
Irvine, CA 92714
ATTN: B.G. Randolph

ANALYSIS NO.: 816617-019/026
ANALYSES: EPA Method 7420 (STLC)
DATE SAMPLED: 06/14/88
DATE SAMPLE REC'D: 06/14/88
DATE ANALYZED: 06/20/88
SAMPLE TYPE: Solid
PROJECT: 14197-005-042
Delco Remy

The following analytical determinations were conducted according to the guideline set forth in the California Administrative Code, Title 22, Chapter 30, Article II (January 12, 1985). The analyses were performed on a 48 hour citric acid extract (CAC-Waste Extraction Test) for soluble metals.

SAMPLE IDENTIFICATION	LEAD EPA METHOD 7420 (STLC) (mg/L)
NW 1A 0-6"	1,130.
NW 2A 0-6"	14.
NW 3A 0-6"	14.
NW 4A 0-6"	333.
NW 5A 0-6"	10.
NW 6A 0-6"	11.
NW 7A 0-6"	30.
NW 8A 0-6"	3.6

Chemical Research Laboratories, Inc.
7440 Lincoln Way • Garden Grove, CA 92641
(714) 898-6370 • (213) 598-0458

LABORATORY REPORT

DAMES AND MOORE
3 Corporate Park, Suite 100
Irvine, CA 92714
ATTN: B.G. Randolph

ANALYSIS NO.: 816617-027/031
ANALYSES: EPA Method 7420 (STLC)
DATE SAMPLED: 06/14/88
DATE SAMPLE REC'D: 06/14/88
DATE ANALYZED: 06/24/88
SAMPLE TYPE: Solid
PROJECT: 14197-005-042
Delco Remy

The following analytical determinations were conducted according to the guideline set forth in the California Administrative Code, Title 22, Chapter 30, Article II (January 12, 1985). The analyses were performed on a 48 hour citric acid extract (CAC-Waste Extraction Test) for soluble metals.

SAMPLE IDENTIFICATION	LEAD EPA METHOD 7420 (STLC) (mg/L)
NW 1B 12-18"	14.
NW 2B 12-18"	8.2
NW 3B 12-18"	31.
NW 5B 12-18"	10.

Chemical Research Laboratories, Inc.
SOUTHERN CALIFORNIA DIVISION
7440 Lincoln Way ● Garden Grove, CA 92641
(714)898-6370 ● FAX: (714)891-5917 ● (800)LAB-1CRL

LABORATORY REPORT

DAMES AND MOORE
3 Corporate Park, Suite 100
Irvine, CA 92714
ATTN: B.G. Randolph

ANALYSIS NO.: 816617-027/031
ANALYSES: EPA Method 7421 (STLC)
DATE SAMPLED: 06/14/88
DATE SAMPLE REC'D: 06/14/88
DATE ANALYZED: 06/24/88
SAMPLE TYPE: Solid
PROJECT: 14197-005-042
Delco Remy

The following analytical determinations were conducted according to the guideline set forth in the California Administrative Code, Title 22, Chapter 30, Article II (January 12, 1985). The analyses were performed on a 48 hour citric acid extract (CAC-Waste Extraction Test) for soluble metals.

SAMPLE IDENTIFICATION	LEAD EPA METHOD 7420 (STLC) (mg/L)
NW 1B 12-18"	14.
NW 2B 12-18"	8.2
NW 3B 12-18"	31.
NW 5B 12-18"	10.

Chemical Research Laboratories, Inc.
SOUTHERN CALIFORNIA DIVISION
7440 Lincoln Way ● Garden Grove, CA 92641
(714)898-6370 ● FAX: (714)891-5917 ● (800)LAB-1CRL

LABORATORY REPORT

DAMES AND MOORE
3 Corporate Park, Suite 100
Irvine, CA 92714
ATTN: B.G. Randolph

ANALYSIS NO.: 816617-001/018
ANALYSES: EPA Method 7421 (STLC)
DATE SAMPLED: 06/14/88
DATE SAMPLE REC'D: 06/14/88
DATE ANALYZED: 06/20/88
SAMPLE TYPE: Solid
PROJECT: 14197-005-042
Delco Remy

The following analytical determinations were conducted according to the guideline set forth in the California Administrative Code, Title 22, Chapter 30, Article II (January 12, 1985). The analyses were performed on a 48 hour citric acid extract (CAC-Waste Extraction Test) for soluble metals.

SAMPLE IDENTIFICATION	LEAD EPA METHOD 7421 (STLC) (mg/L)
DD 1A 0-12"	21.
DD 2A 0-12"	24.
DD 3A 0-12"	225.
DD 4A 0-12"	10.
DD 5A 0-12"	103.
DD 6A 0-12"	55.
DD 7A 0-12"	30.
DD 8A 0-12"	30.
DD 9A 0-12"	0.8
DD 1B 12-14"	16.
DD 2B 12-24"	18.
DD 3B 12-24"	2.2
DD 4B 12-24"	1.3
DD 5B 12-24"	7.5
DD 6B 12-24"	2.6
DD 7B 12-24"	8.0
DD 8B 12-24"	2.6
DD 9B 12-24"	0.4

Chemical Research Laboratories, Inc.
SOUTHERN CALIFORNIA DIVISION
7440 Lincoln Way ● Garden Grove, CA 92641
(714)898-6370 ● FAX: (714)891-5917 ● (800)LAB-1CRL

LABORATORY REPORT

DAMES AND MOORE
3 Corporate Park, Suite 100
Irvine, CA 92714
ATTN: B.G. Randolph

ANALYSIS NO.: 816617-001/026
ANALYSES: EPA Method 9040
DATE SAMPLED: 06/14/88
DATE SAMPLE REC'D: 06/14/88
DATE ANALYZED: 06/21/88
SAMPLE TYPE: Solid
PROJECT: 14197-005-042
Delco Remy

SAMPLE IDENTIFICATION	pH EPA METHOD 9040 (units)
DD 1A 0-12"	8.75
DD 3A 0-12"	7.05
DD 5A 0-12"	8.00
DD 6A 0-12"	8.20
DD 8A 0-12"	7.60
NW 1A 0-6"	8.45
NW 3A 0-6"	8.85
NW 4A 0-6"	8.15
NW 8A 0-6"	8.25

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT

Dames and Moore (2746)
3 Corporate Park
Suite 100
Irvine, CA 92714
Attn: B.G. Randolph

LAB NO F52904

REPORTED 09/09/88

SAMPLE Soil

RECEIVED 08/29/88

IDENTIFICATION Delco Remy, Anaheim, Job No. 14197-006-42

BASED ON SAMPLE As Submitted

	Lead (STLC)
DD-1 C	39.6 mg/l
DD-1 D	11.6 mg/l
DD-2 C	0.25 mg/l
DD-2 D	0.11 mg/l
DD-10 A	12.1 mg/l
DD-10 B	0.18 mg/l
DD-11 A	0.82 mg/l
DD-11 B	0.12 mg/l
DD-5 C	2.55 mg/l
DD-5 D	0.27 mg/l
DD-12 A	0.25 mg/l
DD-12 B	0.15 mg/l
DD-13 A	0.21 mg/l
DD-13 B	0.98 mg/l
DD-7 C	0.24 mg/l
DD-7 D	0.14 mg/l
DD-14 A	1.69 mg/l
DD-14 B	0.28 mg/l

ASSOCIATED LABORATORIES

Edward S. Behare

Edward S. Behare, Ph.D.

ESB/hl

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 30 days from date reported.

TESTING & CONSULTING
Chemical •
Microbiological •
Environmental •

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT

Dames and Moore
3 Corporate Park
Suite 100
Irvine, CA 92714
Attn: B.G. Randolph

(2746)

LAB NO F52918

REPORTED 09/09/88

SAMPLE Soil

IDENTIFICATION Job No. 14197-006-42

BASED ON SAMPLE As Submitted

RECEIVED 08/30/88

	Lead (STLC)
NW-2 C, 18-24, 8/30/88, 7:55	ND< 0.1 mg/l
NW-2 D, 24-30, 8/30/88, 8:00	0.10 mg/l
NW-11 A, 18-24, 8/30/88, 8:10	4.10 mg/l
NW-11 B, 24-30, 8/30/88, 8:15	ND< 0.1 mg/l
NW-12 A, 18-24, 8/30/88, 8:25	1.11 mg/l
NW-12 B, 24-30, 8/30/88, 8:30	ND< 0.1 mg/l
NW-13 A, 18-24, 8/30/88, 8:50	1.60 mg/l
NW-13 B, 24-30, 8/30/88, 8:55	ND< 0.1 mg/l
NW-9 A, 18-24, 8/30/88, 8:45	ND< 0.1 mg/l
NW-9 B, 24-30, 8/30/88, 8:50	ND< 0.1 mg/l
NW-14 A, 18-24, 8/30/88, 9:05	ND< 0.1 mg/l
NW-14 B, 24-30, 8/30/88, 9:10	ND< 0.1 mg/l
NW-16 A, 18-24, 8/30/88, 9:00	5.41 mg/l
NW-16 B, 24-30, 8/30/88, 9:10	0.53 mg/l
NW-3 C, 18-24, 8/30/88, 9:20	2.08 mg/l
NW-3 D, 24-30, 8/30/88, 9:25	ND< 0.1 mg/l
NW-15 A, 18-24, 8/30/88, 9:25	ND< 0.1 mg/l
NW-15 B, 24-30, 8/30/88, 9:30	ND< 0.1 mg/l

ASSOCIATED LABORATORIES

Edward S. Behare

Edward S. Behare, Ph.D.

ESB/hl

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 30 days from date reported.

C-1 10M

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT
Dames and Moore
3 Corporate Park
Suite 100
Irvine, CA 92714
Attn: B.G. Randolph

(2746)

LAB NO F53006

REPORTED 09/09/88

SAMPLE Soil

IDENTIFICATION Job #14197-006-42

BASED ON SAMPLE As Submitted

RECEIVED 08/31/88

	Lead (STLC)
NW-10 A, 18-24", 8/30/88, 1705	0.27 mg/l
NW-10 B, 24-30", 8/30/88, 1710	ND< 0.1 mg/l

ASSOCIATED LABORATORIES

Edward S. Behare, Ph.D.

ESB/hl

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 30 days from date reported.

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT

Dames and Moore (2746)
3 Corporate Park
Suite 100
Irvine, CA 92714
Attn: Esmail Esmaili, Ph.D.

LAB NO F53881

REPORTED 09/23/88

SAMPLE Soil

IDENTIFICATION Delco-Remy, Job #14197-005-042

BASED ON SAMPLE As Submitted

RECEIVED 09/20/88

	Lead (STLC)
A1, surface	ND< 0.1 mg/l
A2, surface	6.87 mg/l

ASSOCIATED LABORATORIES

Edward S. Behare, Ph.D.

ESB/ql

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 30 days from date reported.

1 10M

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT

Dames and Moore (2746)
3 Corporate Park
Suite 100
Irvine, CA 92714
Attn: Esmail Esmaili, Ph.D.

LAB NO F53927

REPORTED 09/26/88

SAMPLE Soil

IDENTIFICATION Delco-Remy, Job #14197-005-042

BASED ON SAMPLE As Submitted

RECEIVED 09/21/88

	Lead (STLC)
A3	0.30 mg/l
A4	3.37 mg/l

ASSOCIATED LABORATORIES

Edward S. Behare, Ph.D.

ESB/hl

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 30 days from date reported.

1 10M

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT

Dames and Moore (2746)
3 Corporate Park
Suite 100
Irvine, CA 92714
Attn: Esmail Esmaili, Ph.D.

LAB NO F53869

REPORTED 09/23/88

SAMPLE Soil

IDENTIFICATION Delco-Remy, Job # 14197-005-042

BASED ON SAMPLE As Submitted

RECEIVED 09/20/88

	Lead (STLC)
Berm 1	10.4 mg/l
Berm 2	2.23 mg/l
Berm 3	3.36 mg/l
Berm 4	2.70 mg/l

ASSOCIATED LABORATORIES

Edward S. Behare, Ph.D.

ESB/ql

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 30 days from date reported.

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT

Dames and Moore (2746)
3 Corporate Park
Suite 100
Irvine, CA 92714
Attn: Esmail Esmaili, Ph.D.

LAB NO F54207

REPORTED 09/30/88

SAMPLE Soil

IDENTIFICATION Delco-Remy

BASED ON SAMPLE As Submitted

RECEIVED 09/28/88

	Lead (STLC)
RS-1	0.27 mg/l
RS-2	0.16 mg/l

ASSOCIATED LABORATORIES

Edward S. Behare, Ph.D.

ESB/hl

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 30 days from date reported.

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT

Dames and Moore (2746)
3 Corporate Park
Suite 100
Irvine, CA 92714
Attn: Esmail Esmaili, Ph.D.

LAB NO F54088

REPORTED 09/26/88

SAMPLE Soil

IDENTIFICATION Delco-Remy, Job #14197-005-042

BASED ON SAMPLE As Submitted

RECEIVED 09/23/88

	Lead (STLC)
A-8	26.8 mg/l
A-9	1.23 mg/l
A-10	1.95 mg/l
A-11	32.1 mg/l
A-12	1.60 mg/l
A-13	0.33 mg/l
A-14	0.59 mg/l
A-15	0.47 mg/l
A-16	1.26 mg/l
A-17	0.52 mg/l
A-18	0.85 mg/l
A-19	ND< 0.10 mg/l
A-20	0.58 mg/l
A-21	0.46 mg/l
A-22	0.55 mg/l

ASSOCIATED LABORATORIES

Edward S. Behare, Ph.D.

ESB/hl

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 30 days from date reported.

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT

Dames and Moore (2746)
3 Corporate Park
Suite 100
Irvine, CA 92714
Attn: Esmail Esmaili, Ph.D.

LAB NO F53848

REPORTED 09/27/88

SAMPLE Soil

IDENTIFICATION Delco Remy, Job # 14197-006-042

BASED ON SAMPLE As Submitted

RECEIVED 09/19/88

	Lead (STLC)
TD-1 @ 6"	0.15 mg/l
TD-2 @ 6"	15.2 mg/l
TD-3 @ 6"	50.6 mg/l

ASSOCIATED LABORATORIES

Edward S. Behare, Ph.D.

ESB/ql

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 30 days from date reported.

JOB NO. 14199-006-04

CHAIN OF CUSTODY RECORD

GENERATOR INFORMATION

Facility Delco Remy

Address 1201 N. Magnolia
Anaheim Ca.

Telephone 714 220-6036

COLLECTOR INFORMATION

Collected by Dames & Moore

Address #3 Corporate Park
Irvine Ca

Telephone 714 261-7616

SAMPLE INFORMATION

No.	DEPTH	TYPE	DATE	TIME
TD-1	6"	Soil	9-18-88	1600
TD-2	6"	Soil	9-18-88	1600
TD-3	6"	Soil	9-18-88	1600

Suspected Waste Constituents Lead Analysis for WET Test (Lead only)

Field Conditions/Remarks

SAMPLE ALLOCATION

Name Associated Labs

Address 501 N. Batavia
Orange Ca 92668

Telephone 714 771-6900

___ sample received intact

___ sample received damaged or missing (describe on back)

Kim Dalby 9/19/88
(Signature) (Date)

CHAIN OF POSSESSION

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
1.					
2.					
3.					
4.					

Distribution

White-w/shipment-for consignee files
Blue-w/shipment-forward to Dames & Moore
Attn:

Pink-with report
Goldenrod-Dames & Moore - Job File

Dames & Moore

APPENDIX B

Boring Logs

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

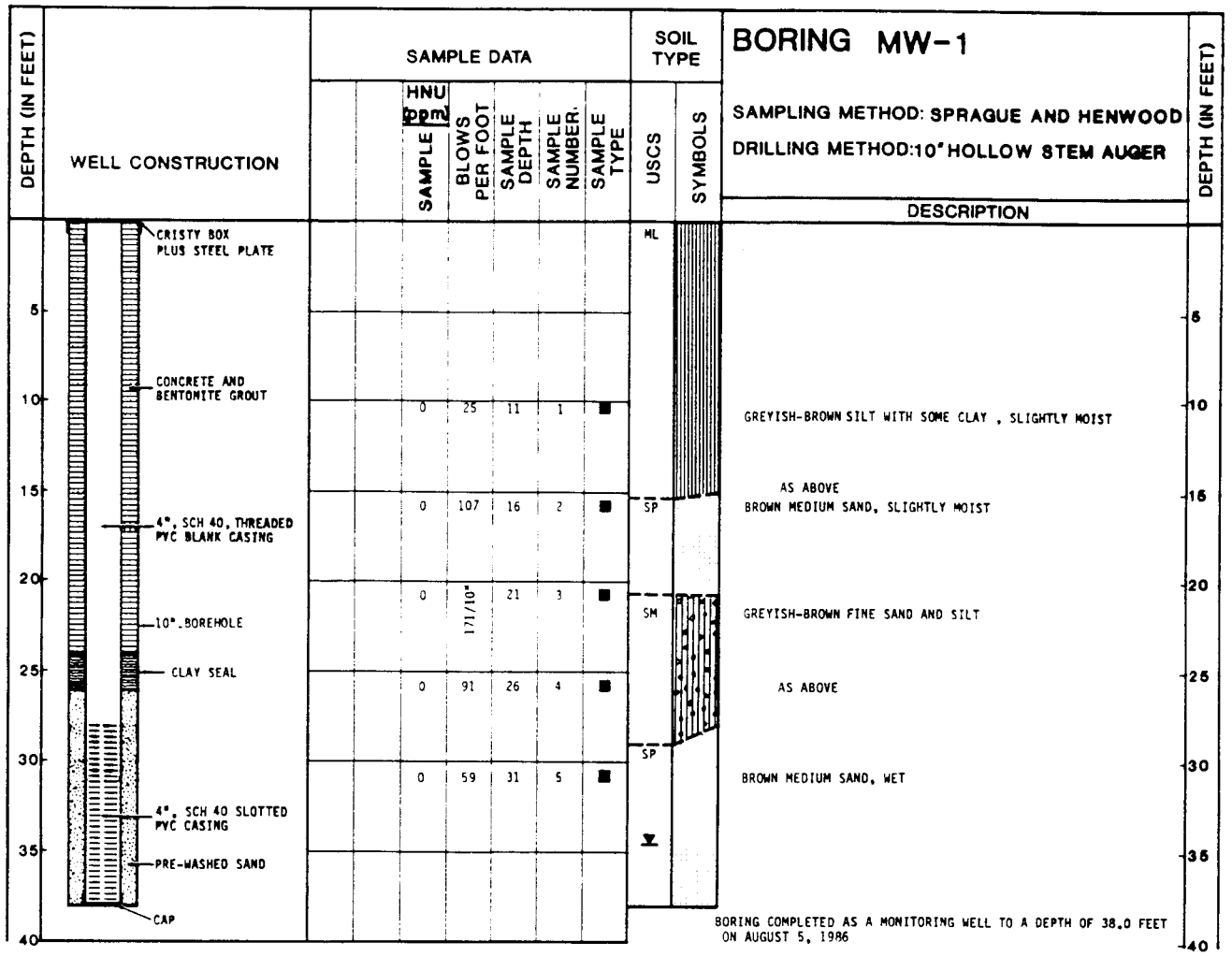
NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

KEY TO LOG OF BORINGS

SAMPLES & BLOWCOUNTS

- ■ INDICATES UNDISTURBED DAMES & MOORE SAMPLE
- ⊠ INDICATES DISTURBED DAMES & MOORE SAMPLE
- ◪ STANDARD PENETRATION TEST SAMPLE
- □ INDICATES NO RECOVERY

SAMPLES DRIVEN WITH A 140-POUND HAMMER DROPPING 30 INCHES

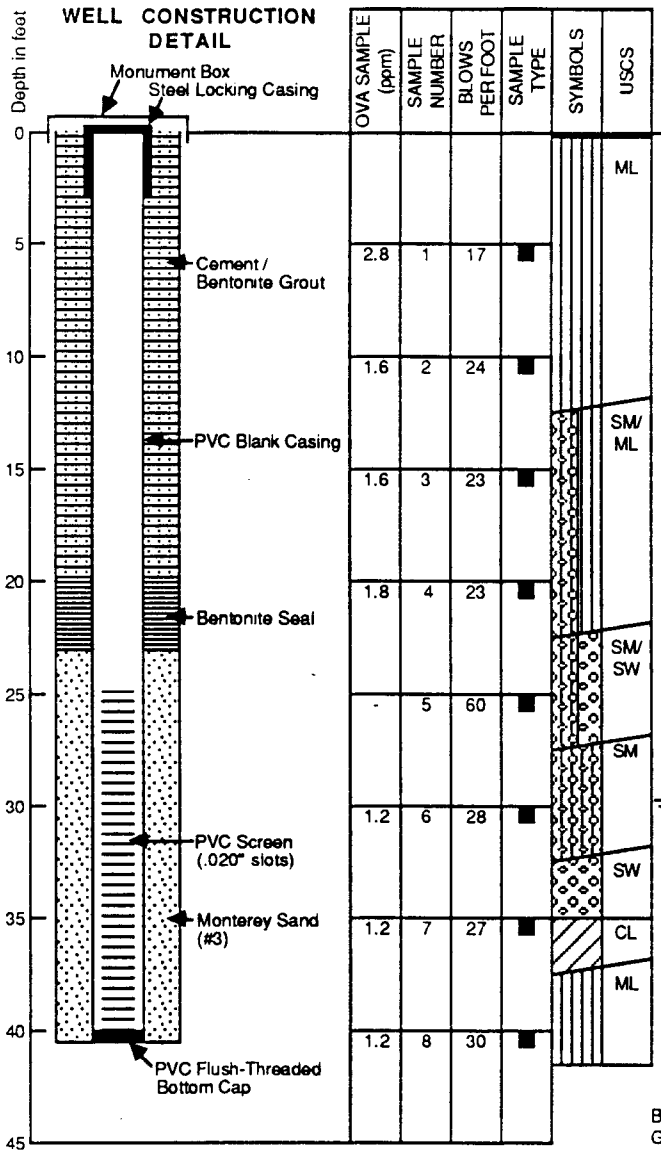


LOG OF BORING

Dames & Moore

BORING MW-2

SAMPLING METHOD: Dames & Moore U-Type
DRILLING METHOD: 10-Inch Hollow Stem Auger



OVA SAMPLE (ppm)	SAMPLE NUMBER	BLOWS PER FOOT	SAMPLE TYPE	SYMBOLS	USCS	DESCRIPTION
						2.5 inches asphaltic concrete
					ML	Brown silt with some very fine to coarse sand, medium dense, moist, no odor
2.8	1	17	■			
1.6	2	24	■			Light brown very fine to fine sandy silt with trace clay (?), medium dense, slightly moist, no odor
					SM/ ML	Brown silty very fine to fine sand - very fine to fine sandy silt, medium dense, slightly moist, no odor
1.6	3	23	■			
1.8	4	23	■			
					SM/ SW	Dark tan brown very fine to coarse sand with some silt, very dense, moist, no odor
-	5	60	■			
					SM	Brown silty very fine to medium sand-very fine to medium sandy silt, medium dense, very moist to saturated, no odor
						▽ Ground water encountered
1.2	6	28	■			
					SW	Tan medium to very coarse sand, saturated
1.2	7	27	■		CL	Brown silty clay, medium dense, saturated, no odor
					ML	Brown clayey silt with little thin discontinuous laminae of very fine to fine sand, medium dense, saturated, no odor
1.2	8	30	■			

Boring completed at a depth of 41-1/2 feet on July 11,1988. No caving.
Ground water encountered at a depth of approximately 29 feet

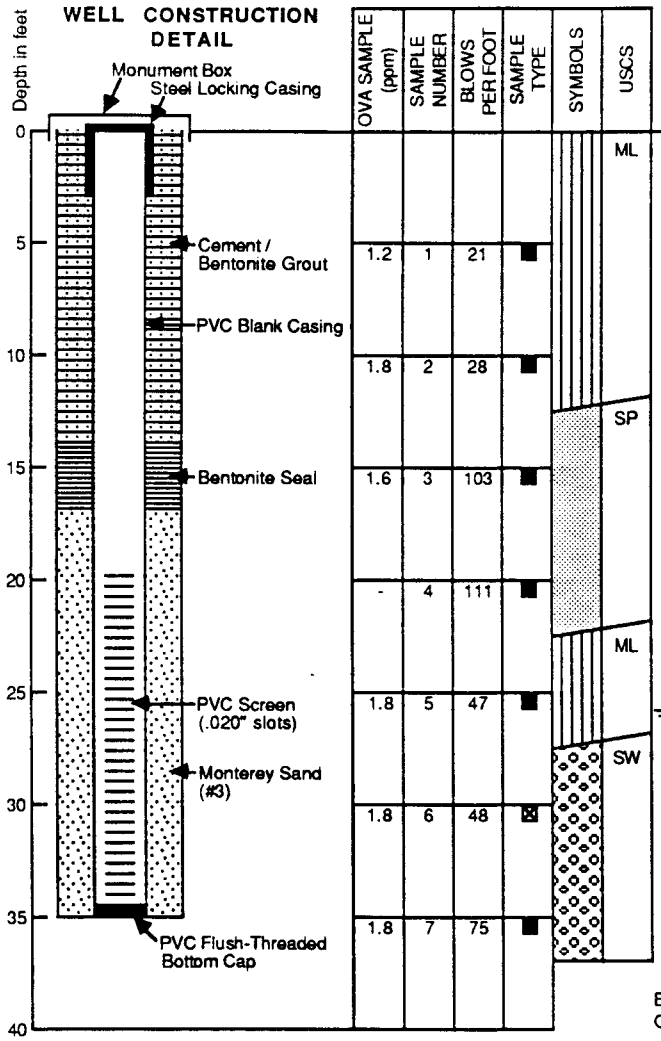
LOG OF BORING

DELCO REMY SITE
ANAHEIM, CALIFORNIA

Dames & Moore

BORING MW-3

SAMPLING METHOD: Dames & Moore U-Type
DRILLING METHOD: 10-Inch Hollow Stem Auger



OVA SAMPLE (ppm)	SAMPLE NUMBER	BLOWS PER FOOT	SAMPLE TYPE	USCS	DESCRIPTION
				ML	Brown clayey silt with trace very fine to fine sand, medium dense, slightly moist, no odor
1.2	1	21	■		
1.8	2	28	■		Brown clayey silt with some very fine to fine sand, medium dense, slightly moist, no odor
				SP	Tan very fine to medium sand with trace coarse to very coarse sand, very dense, slighlty moist, no odor
1.6	3	103	■		
-	4	111	■		
				ML	Brown clayey silt with some very fine to fine sand, very moist, dense, no odor
1.8	5	47	■		▽ Ground water encountered
				SW	Tan very fine to coarse sand, dense, very moist to saturated, no odor
1.8	6	48	⊠		
1.8	7	75	■		Tan very fine to very coarse sand, very dense, saturated, no odor

Boring completed at a depth of 37 feet on July 11, 1988. No caving.
Ground water encountered at a depth of approximately 25-1/2 feet

LOG OF BORING

DELCO REMY SITE
ANAHEIM, CALIFORNIA

Dames & Moore

APPENDIX C

Health and Safety Plan

HEALTH AND SAFETY PLAN
FOR THE REMEDIATION OF EXCAVATED SOILS
ANAHEIM BATTERY PLANT
1201 NORTH MAGNOLIA
ANAHEIM, CALIFORNIA
FOR DELCO REMY

JOB NO. 14197-006-042
NOVEMBER 17, 1988

IRVINE, CALIFORNIA

TABLE OF CONTENTS

6H-S.TC

GLOSSARY OF TERMS, ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
atm	atmosphere
°C	Centigrade
Cal-OSHA	California Occupational Safety and Health Administration
Carcinogen	A substance that can cause cancer
cc	cubic centimeter
CGI	combustible gas indicator
CNS	central nervous system
Contractor	Refers to prime contractor to Delco Remy Corporation for the Anaheim Battery Plant. The contractor for this project is R-FOX Construction Company.
DHS	Department of Health Services, State of California
EPA	Environmental Protection Agency
°F	Fahrenheit
kg	kilogram
LEL	Lower Explosive Limit
LPM	Liter Per Minute
m	meter
mg	milligram
mgM^3	milligram per cubic meter
ml	milliliter
mm	millimeter
ND	not detected
NIOSH	National Institute for Occupational Safety and Health

NSC	National Safety Council
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
ppb	parts per billion
Proposition 65	California's Safe Drinking Water and Toxic Enforcement Act of 1986
ppm	parts per million
RAP	Remedial Action Plan
psf	pounds per square foot
SSO	Site Safety Officer
STEL	Short Term Exposure Limit
STLC	Soluble Threshold Limit Concentration. Concentration limits set by the DHS for waste extracts.
Subcontractor	Refers to any individual or company hired by the Contractor to complete a scope of services.
TLV	Threshold Limit Value
TTLC	Total Threshold Limit Concentration. Values specified by the DHS for priority chemical concentrations in a waste sample.
UEL	Upper Explosive Limit
WET	Waste Extraction Test. California extraction procedure for analysis for STLCs.

H-S.1

1.0 INTRODUCTION

This document establishes health and safety guidelines and requirements for the safety of personnel involved in the remediation of hazardous wastes at the Delco Remy Anaheim Battery Plant. This remediation activity is a continuation of excavation activities covered under the September 8, 1988 Health and Safety Plan for The Excavation of Contaminated Soils at the Delco Remy Anaheim Battery Plant. Dames & Moore prepared this document for Delco Remy to be a continuation of the remedial action program. A glossary has been provided as a ready reference of abbreviations.

1.1 PURPOSE

The purpose of this document is to highlight "Safety on the Job" during the removal of contaminated soils at the Anaheim Battery Plant. The primary intent of this Health and Safety Plan is to provide information that will augment normal excavation safety activities, thereby protecting workers from the potentially hazardous materials found onsite. Information herein must not be construed to represent all such material contained in the safety rules and regulations as stated by the Occupational Safety and Health Administration (OSHA) and other entities, such as Federal, State or Local (Orange County and City of Anaheim) governments. This Health and Safety Plan is to be used as a supplement and guide for Contractors and Subcontractors to follow when establishing their safety programs as required for the Delco Remy project.

1.2 SCOPE

The health and safety requirements presented in this document are based on the results of a completed investigation of contaminants at the site and an analysis of the potential hazards associated with excavation of the site. This manual provides an overview of hazards and established guidelines for worker safety.

2.0 SITE INFORMATION

2.1 SITE LOCATION

The site is located at 1201 North Magnolia, Anaheim, California (Figure 2-1). The site is roughly rectangular in shape and covers approximately 27 acres.

2.2 SITE HISTORY

Prior to 1954 the entire site was an orange grove. In 1954 the existing battery plant was built at the present location. The northwest field (Figure 2-2) remained vacant except for a period during the early 1970's when it may have been utilized as a temporary staging area for batteries being shipped out by train. During August through October 1988, potentially hazardous soils were excavated and stockpiled onsite pending remediation or removal.

2.3 WORK PLAN

Waste washing has been selected for remediation of contaminated soil. The process is described in summary below, and a flow diagram outlining the process steps is given in Figure 2.3.

The purpose of the process is to treat contaminated soil to reduce the concentration of lead to a level acceptable to the Orange County Department of Health Services and the South Coast Air Quality Monitoring District (SCAQMD).

2.3.1 EXCAVATION/SCREENING AND CRUSHING

The excavated material will be loaded with a front-end loader onto a screen located at the top of the soil hopper which will remove any large lumps. A conveyer belt will transfer the screened soil into the mixing and reaction chamber at a controlled rate.

2.3.2 SLURRY/GRINDING/CHEMICAL TREATMENT

The proprietary chemical chelation agent, sodium silicate and water will be continuously discharged under alkaline conditions onto the soil surface from a chemical addition hopper. The mixing and reaction chamber is tunnel-shaped and divided into top and bottom sections. The top section can be opened for inspection and cleaning purposes, and the bottom section is equipped with a network of sprayer nozzles and a horizontally mounted mixing auger. The soil and chemicals, after entering the mixing and reaction chamber, will be mixed by the auger.

2.3.3 PRECIPITATION

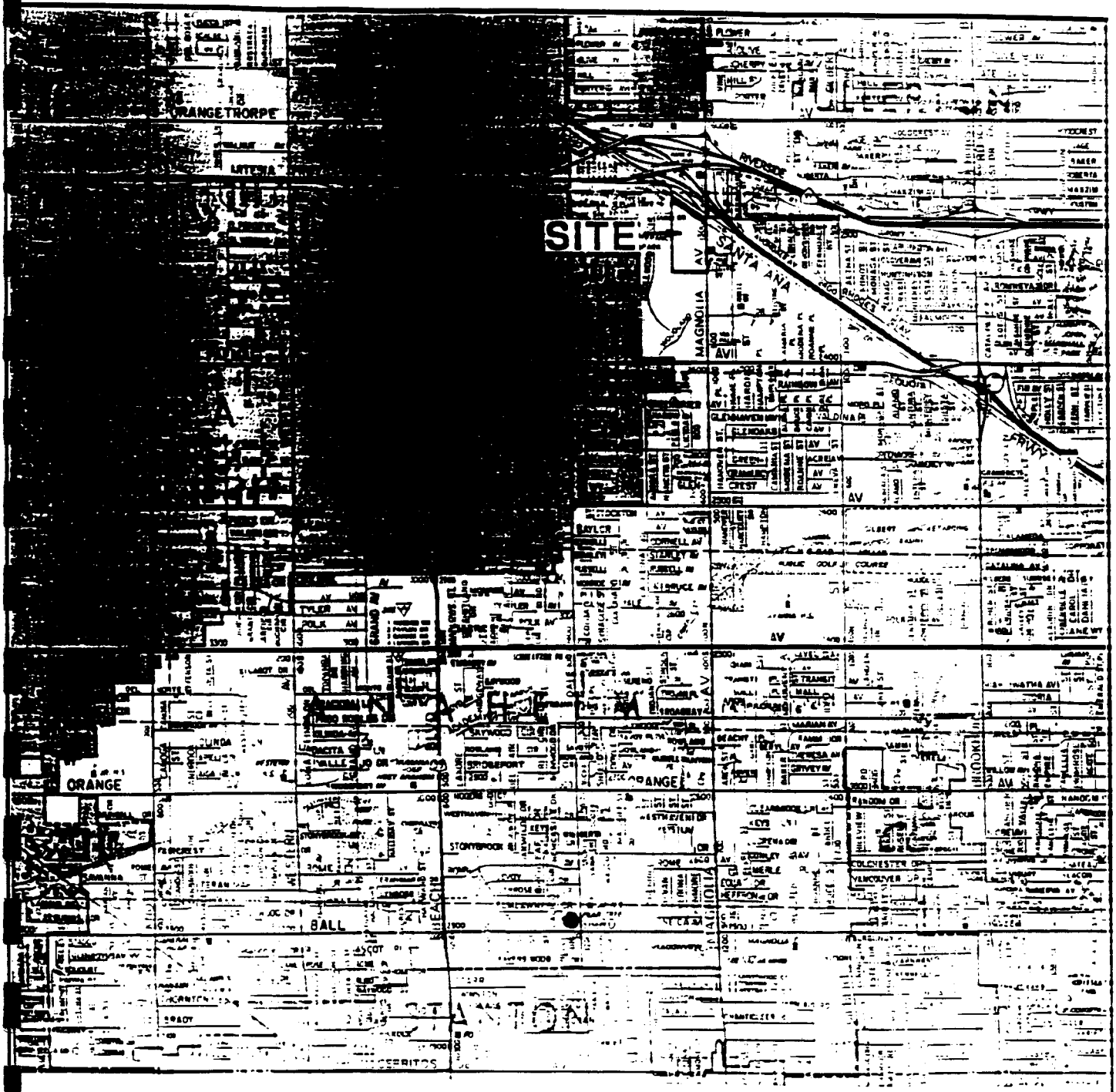
Chemicals and heavy metals will be completely mixed by the auger, and fixation of soluble heavy metals will take place inside the enclosed chamber. Sodium hydroxide and chelated lead hydroxide silicate complexes will be precipitated in the slurry.

2.3.4 SPILL CONTAINMENT

The treatment and chemical storage areas will each be bermed to prevent any chemical constituents from migrating off the site.

2.3.5 BACKFILLING

After chemical treatment of soils is completed, the excavated areas will be sprayed with chelating agents prior to backfilling with clean soil to form a barrier against upward migration of soluble lead from the underlying soil.

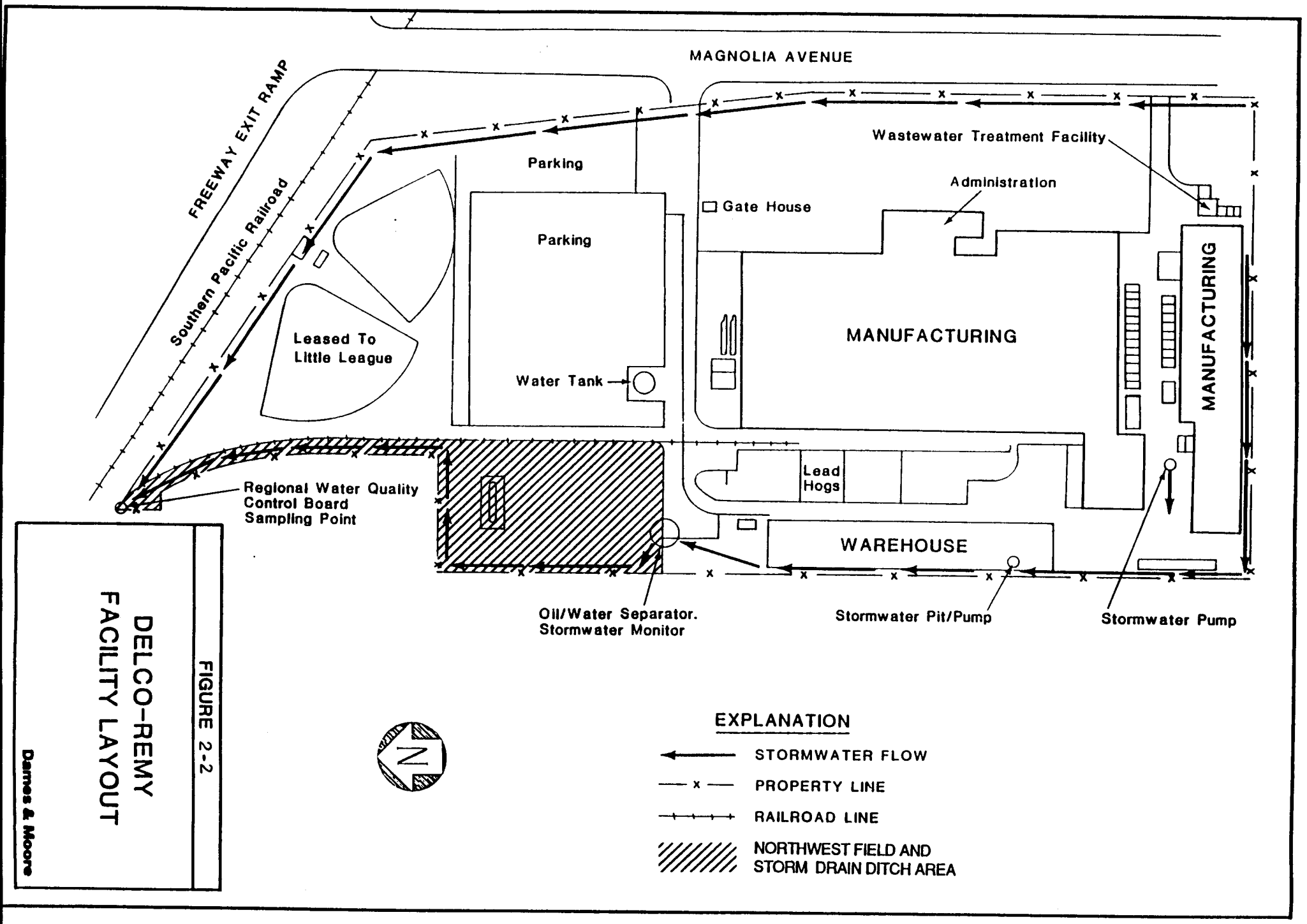


SITE MAP

DELCO REMY
Anaheim, California

REFERENCE: The Thomas Guide, Thomas Bros. Maps, Los Angeles & Orange Counties, Map Page 10, 1987 Updated Edition.

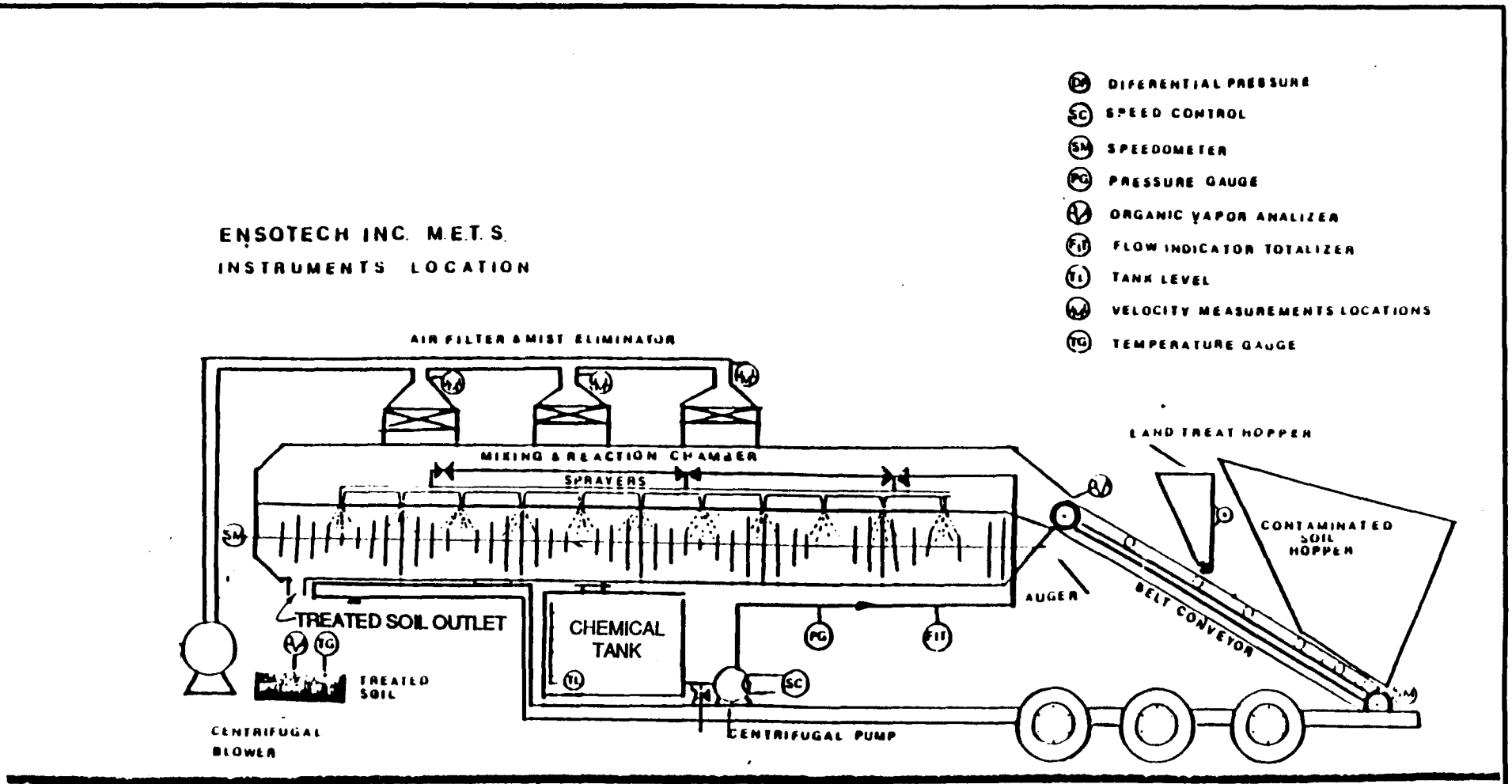
Dames & Moore
FIGURE 2-1



DELCO-REMY
FACILITY LAYOUT

FIGURE 2-2

Dames & Moore



PICTORIAL ILLUSTRATION OF ENSOTECH MOBILE ENVIRONMENTAL TREATMENT SYSTEM

DELCO REMY SITE
ANAHEIM, CALIFORNIA

REFERENCE: ENSOTECH, INC.

Dames & Moore
FIGURE 2-3

3.0 AUTHORITY AND RESPONSIBILITIES

Delco Remy will have overall site safety and health responsibility. Each Contractor and Subcontractor will be held accountable for the safe and healthful performance of work by each of their employees, subcontractor, or support personnel who may enter the site.

The Contractor and all Subcontractors involved in handling contaminated soils are required to ensure that all employees, visitors, subcontractors, and their suppliers/vendors, while on the work site and in the conduct of Delco Remy contracts, comply with the provisions of this manual and the minimum standards set forth by OSHA. Any specific operation, machine, or process not covered in these orders will be governed by other applicable State and Federal regulations, and Orange County and the City of Anaheim. The Contractor and Subcontractors are required to know the safety regulations which apply to their operations.

The provisions of the safety manual along with the applicable regulations issued by Federal, State, and County governments and City of Anaheim will be strictly enforced by Delco Remy.

3.1 SITE SAFETY OFFICER

The Dames & Moore Site Safety Officer (SSO) will be responsible for the daily management of the health and safety program. The SSO will be onsite during excavation activities to monitor health and safety, decontamination, and environmental monitoring activities. Prior to initiation of site activities the Delco Remy Site Manager with the assistance of the SSO, will verify that site personnel: 1) have been trained in site specific environmental health and safety procedures, 2) have been fit tested for the appropriate respirators, and 3) have signed the Safety Plan Compliance Agreement. The Site

Manager has the authority to stop work to achieve compliance with the Safety Plan. The SSO shall have the duty to stop work in an emergency or whenever a violation of the Safety Plan poses a threat of injury or contamination. Work may be restarted following communication with the Site Safety Manager and the SSO.

The SSO will perform the following functions:

1. Maintain a documentation file of safety inspections and written notices to the Subcontractors.

2. Receive copies of the Subcontractors' initial and subsequent accident reports and injury reports for review and analysis.

3. Provide technical assistance to Subcontractors and field safety personnel.

4. Check the daily medical monitoring of personnel, if deemed appropriate, and conduct environmental monitoring (i.e., personnel exposure monitoring) where required by the Safety Plan (Appendix A).

5. Monitor work areas on a daily basis (Appendix A).

6. Monitor the Subcontractors' weekly on-the-job safety meetings and conduct additional safety meetings when necessary (Appendix A).

The SSO does not have responsibility for or authority over excavation or remediation means or methods. Job safety is the responsibility of Delco Remy and their Contractors and Subcontractors.

3.2 SITE MANAGER

The Site Manager, an employee of Delco Remy, will be responsible for directing all excavation and remediation activities for the duration of the project. The Site Manger will ensure that personnel comply with the provisions of this Health and Safety Plan. The Site Manager will be knowledgeable of the project's health and safety concerns and will modify or stop any activity that the SSO deems a potential health or safety hazard.

3.3 SUBCONTRACTOR'S SAFETY REPRESENTATIVE

Each Subcontractor is required to designate a Safety Representative. The Safety Representative is responsible for the safe and healthful performance of work by his work force and Subcontractors. During the Subcontractor's activities onsite, the Subcontractor's Safety Representative (SSR) will perform continuing work area inspections, and conduct toolbox and foreman safety meetings and safety orientation for all new employees. The SSR will attend a weekly safety meeting with the SSO. The SSO will ensure that all reports are prompt and correct. The Safety Representative will also investigate all accidents that may require further investigation by the SSO. When requested by the SSO, the Subcontractor will prepare reports to show steps taken to prevent accidents.

3.4 HEALTH AND SAFETY PERSONNEL

Table 3-1 lists the key safety personnel by name and company. This list of responsible individuals will be maintained onsite by the SSO and be available to state and local agencies, and posted for worker information.

TABLE 3-1

KEY PROJECT PERSONNEL[1]

TITLE/COMPANY	DESIGNATED INDIVIDUAL
Construction Site Superintendent	
Site Manager Delco Remy	Ken Rayle
Site Safety Officers Dames & Moore	Ronald Miller Noreen Considine
Safety Representatives	

[1] Up-to-date information will be compiled prior to start of construction so that a list of responsible individuals can be maintained onsite, be available to appropriate state and local agencies and posted for worker information.

4.0 HAZARD ASSESSMENT FOR EXCAVATION

The following information provides basic safety guidelines for excavation activities at the Delco Remy site. Technical references and principal hazards of these operations are provided below. Additional information can be found in Appendix D.

4.1 EXCAVATION

4.1.1 TECHNICAL REFERENCES

a. Cal-OSHA Regulations - "Construction Safety Orders" Article 6: Excavations, Trenches, Earthwork

b. OSHA Regulations - "Part 1926-Occupational Safety and Health Standards," Sections 1926.600 to 1926.653

c. NSC Data Sheets
   254 - Trench Excavation (1983)
   482 - General Excavation (1983)

4.1.2 PRINCIPAL HAZARDS

a. Suffocation, crushing, or other injury from falling material.

b. Damage/failure of installed underground services and consequent hazards.

c. Tripping, slipping, or falling into excavation

d. Possible explosive, flammable, toxic, or oxygen-deficient atmospheres

4.2 HAND AND POWER TOOLS

4.2.1 TECHNICAL REFERENCES

a. Cal-OSHA Regulations - "General Industry Safety Orders"
   Article 56: Metal Working machines
   Article 59: Wood Working Machines

b. OSHA Regulations - "Part 1910 - Safety and Health Standards"
   Subpart P- Hand and Portable Power Tools and Other Hand-Held Equipment

c. NSC Data Sheets
   236 - Power-Actuated Hand Tools (1985)
   385 - Electric Cord and Fittings (1979)
   392 - Air-Powered Hand Tools (1978)
   498 - Live Line Tools (1984)
   583 - Portable Grinders (1982)
   675 - Electric Hand Saws (1982)
   684 - Equipment Grounding (1980)

4.2.2 PRINCIPAL HAZARDS

a. Failure or disintegration of tool.

b. Cuts, punctures, abrasions from moving or cutting parts of tool.

c. Flying particles from tool and work.

d. Heat and sparks.

e. Electrical shock.

f. Crushing or pinching.

4.3 MOBILE EQUIPMENT

4.3.1 TECHNICAL REFERENCES

a. Cal-OSHA Regulations - "Construction Safety Orders"
   Article 10: Haulage and Earth Moving
   Article 11: Jobsite Vehicles

b. OSHA Regulations - "Part 1926-Occupational Safety and Health Standards"

c. NSC Data Sheets
   256 - Motor Graders, Bulldozers, and Scrapers (1985)
   330 - Motor Trucks for Mines, Quarries and Construction (1983)
   589 - Front End Loaders (1984)

4.3.2 PRINCIPAL HAZARDS

a. A large mass in motion

b. Possible malfunction of the equipment

c. Response of operator to constantly changing conditions.

4.4 ELECTRICAL POWER SYSTEMS

4.4.1 TECHNICAL REFERENCES

a. Cal-OSHA Regulations - "Electrical Safety Orders"
   Group 1 - Low-voltage Electrical Safety Orders

b. OSHA Regulations - "Part 1910 Safety and Health Standards"
   Subpart S - Electrical

c. NSC Data Sheets
   385 - Electric Cord and Fittings (1979)

498 - Live Line Tools (1984)

515 - Temporary Electric Wiring for Construction Sites (1982)

607 - Direct Buried Utility Cable (1985)

636 - Grounding Fault Circuit Interrupters for Personnel Protection

684 - Grounding Equipment (1980)

4.4.2 PRINCIPAL HAZARDS

a. The major hazard of electricity is electrical shock and the possibility of death. Fatal electrical shock can occur at less than 120 volts at currents of 50 to 200 miliamperes. Care must be exercised with any work utilizing electricity since the hazard is present over the range of currents and voltages which may be in service at the site.

b. Fires or sources of ignition are also potential hazards with electrical systems.

4.5 FIRE PREVENTION AND PROTECTION

4.5.1 TECHNICAL REFERENCES

a. Cal-OSHA Regulations - "General Industry Safety Orders" Group 27 - Fire Protection

b. OSHA Regulations - "Part 1910-Safety and Health Standards"

Subpart L: Fire Protection

4.5.2 PRINCIPAL HAZARDS

a. Burns and smoke inhalation

b. Exposure to toxic fumes

c. Property damage.

4.6 ROLLOVER PROTECTIVE STRUCTURES

OSHA Section 1926.1000 requires that material handling machinery manufactured on or after September 1, 1972 shall be equipped with rollover protective structures which meet the performance standards prescribed in 1926.1001 and 1926.1002. Those manufactured between July 1, 1969 to September 1, 1972 must be retrofitted.

5.0 HAZARD ASSESSMENT

The following information provides a basic safety guide for remediation activities at the Delco Remy site. Technical references and principal hazards of these operations are provided below.

5.1 DRY PROCESSING EQUIPMENT - CONVEYERS, CRUSHERS, HOPPERS

5.1.1 TECHNICAL REFERENCES

a. Cal-OSHA Regulations - "General Industry Safety Orders" Group 6: Power Transmission Equipment, Prime Movers, Machines, and Machine Parts

b. OSHA Regulations - "Part 1910 Safety and Health Standards"
Subpart G - Occupational Health and Environmental Control

Subpart O - Machinery and Machine Guarding

5.1.2 PRINCIPAL HAZARDS

a. Dragging, amputation, or crushing from exposed moving parts.

b. Electric shock.

c. Cuts, punctures, and abrasions from equipment or process materials.

d. Slipping, tripping, or falling.

e. Noise.

5.2 WET PROCESSING EQUIPMENT - MIXING AND REACTION CHAMBER, MIXING AUGER, CHEMICAL SPRAYING SYSTEM

5.2.1 TECHNICAL REFERENCES

a. Cal-OSHA Regulations - "General Industry Safety Orders" Article 15 - Vats, Pans, Bins, Bunkers and Similar Containers and Vessels
Article 70 - Chemical Industry Machines

b. OSHA Regulations - "Part 1910 Safety and Health Standards"

Subpart R - Special Industries

5.2.2 PRINCIPAL HAZARDS

a. Dragging, amputation, or crushing from exposed moving parts.

b. Electric shock.

c. Cuts, punctures, and abrasions from equipment or process materials.

d. Slipping, tripping, or falling.

e. Noise.

5.3 MATERIAL HANDLING

5.3.1 TECHNICAL REFERENCES

a. Cal-OSHA Regulations - "General Industry Safety Orders" Article 15: Vats, Pans, Bins, Bunkers, Hoppers and Similar Containers and Vessels

b. OSHA Regulations - "Part 1926-Occupational Safety and Health Standards"
Subpart H - Materials Handling, Storage, Use and Disposal

c. NSC Data Sheets
653 - Powered Industrial Lift Trucks (1982)

5.3.2 PRINCIPAL HAZARDS

a. Contact with falling or moving material and equipment.

b. Pinching or crushing.

c. Cuts, punctures, and abrasions.

d. Strains.

6.0 CHEMICAL AND PHYSICAL HAZARD ASSESSMENT

6.1 CHEMICALS

Laboratory analyses of soil contaminants are available but have not been included in this plan. Lead is the major contaminant of concern. The highest level of lead reported in the soils prior to the previous excavation was 9850 ppm. Lead levels in the spoils piles are not known. If very dusty conditions (10 to 15 mg total dust/m^3) were to occur during further excavation and/or relocation of existing spoils, it is possible that exposure to lead could exceed current OSHA standards for exposure to site personnel. The hazards associated with some of the soil treatment chemicals and lead can be found in Appendix B. Material Safety Data Sheets will be available onsite for chemicals used in the treatment process.

6.2 INHALATION HAZARD

Lead is specifically regulated under Section 5216 of the California General Industry Safety Orders (Cal/OSHA) and 29 CFR 1910.1025 (OSHA). These regulations may be found in Appendix B. Respiratory protection will be required during any activity where dry soils are disturbed. Exposure monitoring for lead will be done in accordance with Cal/OSHA and OSHA regulations.

6.3 DERMAL EXPOSURE

Remediation process chemicals may be extremely corrosive and should not come into contact with the skin. For this reason direct skin contact with chemicals or spoils shall be avoided by wearing protective coveralls and gloves. Protective coveralls, gloves, and face shields will be required in areas where chemicals or contaminated or remediated soil is handled. Uncoated Tyvek-type coveralls may be used under dry conditions; water-resistant Saranex, or equivalent, should be worn under wet conditions.

6.4 INGESTION HAZARD

Lead and other chemicals can enter the body through ingestion. Because of this, drinking, eating, and smoking will not be allowed onsite. Each worker's hands and face will be washed and outer coveralls removed prior to eating, smoking, or leaving the site.

6.5 NOISE HAZARD

Hearing protection, ear inserts, and/or ear muffs will be worn by workers exposed to noise equal to or greater than 85 decibels (A scale). Excavation and remediation operations will be expected to exceed these levels.

6.6 HARD HAT

Dames & Moore personnel and their subcontractors will wear hard hats at all times onsite.

6.7 HEAT STRESS

Due to the southern California climate, heat stress may be a concern. Commercially available drinking water and/or GatorAde will be available at the decontamination areas so that workers can conveniently restore body fluids. A modified decon procedure will be in effect so that workers will not have to remove all contaminated garments prior to consuming water or GatorAde. Heat stress can result from protective clothing preventing natural body ventilation. If temperatures onsite exceed 75°F while protective coveralls are being worn, then heat stress monitoring (Appendix C) will be employed.

7.0 MEDICAL CLEARANCE

7.1 MEDICAL CLEARANCE

A medical clearance will be required of all site workers. A medical evaluation is currently required by both

Federal/OSHA and Cal/OSHA regulations for persons at risk of exposure to lead.

Prior to the commencement of site work, written evidence in the form of a signed physician's approval, stating that each prospective site worker is medically qualified to wear a respirator and that blood lead level is within acceptable standards. The physician must further certify that the worker is physically capable of performing the tasks required on this project. The medical evaluation will be at the expense of the individual companies involved. Contractor or Subcontractors who are not in compliance with 29 CFR 1910.1025 "Lead Biological Monitoring" as required by this Health and Safety Plan when arriving onsite will be required by the Delco Remy Anaheim Battery Plant to submit a blood sample for each employee for baseline monitoring. Dames & Moore personnel associated with this project currently meet this requirement.

7.2 HAZARDOUS WASTE TRAINING

Workers should not be assigned to field activities until they have been trained to a level commensurate with their job function/responsibilities and the degree of anticipated hazards.

OSHA's Interim Final Rule for Hazardous Waste Operations (December 19, 1986, Federal Register, pp. 45654-45675) states that,

> "All employees shall at the time of job assignment receive a minimum of 40 hours of initial instruction off the site, and a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor, except for those employers with less than 90 days accumulation of hazardous wastes as defined in 40 CFR 262.34;"

The SSO will require proof of site specific training for workers involved in any activity within contaminated work zones where protective clothing is mandatory or a contingency.

7.3 RECORD KEEPING

The following records or copies of records will be maintained onsite by the SSO (see Appendix A):

- A list of personnel medically qualified to wear respirators.
- A list of personnel who have been "fit tested" and the types of respirators each individual is authorized to wear.
- When required, heat stress monitoring documentation will be completed and filed.

8.0 GENERAL HEALTH AND SAFETY REQUIREMENTS

8.1 SITE SAFETY MEETING

Site safety orientation/training meetings must be convened a) before the field work begins, b) when there are modifications to the site safety plan that are applicable to the field personnel, or c) when additional staff or subcontractors begin field work. The meetings will be attended by personnel involved in carrying out the project and presided over by the SSO or his designee.

The meeting agenda must include the following:

a. A review of the Site Safety Plan;

b. Verification of medical and safety training clearances, including respirator fit testing;

c. Distribution of Site Safety Plan modifications; and

d. Attendee signatures, acknowledging receipt and understanding of the plan and an agreement to comply.

8.2 WEEKLY SAFETY MEETING

A safety meeting of the Site Manager, Contractor, and Subcontractor's supervisors must be held on a weekly basis (or at least every 10 days).

8.3 SITE CONTROL

Barriers will be utilized in order to define the 25-foot NO SMOKING and Limited Access Zone around the excavation site. Guidance offered in General Excavation Site Hazard Information (Appendix D) will be reviewed and followed when applicable. Once excavating work begins, no one will be allowed into the

limited access zone without the appropriate protective gear and training required by this Plan. The SSO will require proof of training and inspect equipment prior to granting entry.

8.4 VISITOR CLEARANCE

No visitors will be allowed within 25 feet of intrusive work unless they comply with the safety requirements of this Plan.

8.5 PERSONAL PROTECTION

Personal protective equipment for activities covered by this Plan include a hard hat, disposable coveralls, overshirt, long pants, and safety shoes. Neoprene gloves will be worn during sampling or handling of the potentially contaminated materials or process chemicals. Eye and ear protection will be used when machinery is in operation and as needed elsewhere. High-efficiency dust cartridges for respirators must be available and worn any time dry soil or dust is disturbed. Dust generated during these operations will be suppressed with water. Half-face or full-face respirators with high-efficiency dust filters will be worn if any visible dust is observed within the excavation area. Exposure data will be gathered by personnel monitoring for lead-contaminated dusts. Table 8-1 lists the monitoring instruments required in this plan.

8.6 PERSONNEL MONITORING

OSHA requires that air monitoring shall be used to identify and quantify airborne levels of hazardous substances. This will be accomplished by monitoring site personnel in a rotating basis. Measurements for lead and total dust will be made by using SKC multiflow personal air samplers (or equivalent). Breathing zone samples will be collected and

analyzed according to standard NIOSH methodology. Results will be discussed with the workers. The data will be used to assess worker protection and compliance with OSHA regulations concerning exposures to lead and other contaminants.

Lead and dust sampling will be performed at all work locations. Personnel will be selected by the SSO for personal sampling according to their assigned work tasks and projected length of exposure. Breathing zone samples will be collected and analyzed according to standard NIOSH methodology for lead and dust (NIOSH Manual of Analytical Methods, Third Edition; Method 90982).

Monitoring for airborne dust contamination will involve personal sampling of persons working onsite using SKC air sampling pumps set at 2 $\pm$ 0.5 LPM with 0.8 um mixed cellulose ester sampling medium. Samples collected will be analyzed for lead.

8.7 PERIMETER MONITORING/COMMUNITY PROTECTION

Area monitoring for environmental levels of lead will be accomplished by using SKC sampling pumps set at 2 $\pm$ 0.5 LPM at three locations along the site perimeter. If visible dust is observed leaving the site boundary, the excavation activity at Delco Remy will be shut down, and soils and other dust-generating materials will be wetted down with water. Traffic routes, spoil piles, and excavation areas will be watered sufficiently to suppress dust.

8.8 HEAT STRESS MONITORING

In addition to the procedures listed in Appendix C, if outdoor temperature exceeds 75°F, oral temperatures of workers in protective clothing will be monitored. This will be done twice daily and the results recorded. If no temperatures are elevated at the end of the first week of activity, temperature

monitoring frequency may be decreased at the discretion of the SSO.

8.9 PERSONNEL AND EQUIPMENT DECONTAMINATION

Decontamination procedures are discussed in more depth in Section 10.0. Personnel decontamination will involve washing of hands and face with soap and water after removal of protective gear and prior to eating. Boots, respirators, gloves, and hard hats will be placed in a plastic bag for disposal. A full description of this procedure will be included in the Safety Completion Report.

8.10 EATING, DRINKING, AND SMOKING

Eating, drinking, and handling of smoking materials will not be permitted with the exclusion zone.

8.11 FIRE

No smoking or open flame will be allo[illegible] within the exclusion zone.

TABLE 8-1

MONITORING INSTRUMENTATION

Equipment Type	Parameter	Manufacturer Model
Sound Level Meter	Noise	Quest M-78
SKC (2 LPM) Mixed Cellulose Ester	Lead/Total Dust	SKC

9.0 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The appropriate personal protective equipment required is outlined and discussed below:

9.1 HEAD PROTECTION

Hard hats will be worn by all personnel working within the exclusion zone.

9.2 EYE PROTECTION

Safety goggles and/or safety glasses with side shields will be worn by all personnel working onsite. Face shields will be worn by all personnel working with or near open containers of chemicals.

9.3 SKIN PROTECTION

Waterproof and solvent-resistant gloves will be worn by personnel who may come in contact with wet or contaminated materials or process chemicals onsite. Personnel will discard gloves and other skin protective equipment that become torn, punctured, or appear to deteriorate under chemical action.

9.4 FOOTWEAR

Steel-toed boots will be worn by personnel while in the contaminated zone. As an alternative, disposable chemical-resistant rubber over-boots will be worn over steel-toed boots at the direction of the SSO.

9.5 CLOTHING

Disposable clothing will be worn by all personnel within the contaminated zone. Personnel will have uncoated Tyvek coveralls for dry conditions, and Saranex coveralls or splash aprons for wet conditions.

9.6 RESPIRATORY PROTECTION

Respiratory protection is important. Half-face or full-face respirators with high-efficiency dust filters must be immediately available. Respiratory protection will be required during any activity where dry soils are disturbed.

Prior to commencing field work, personnel assigned to the contaminated zone will be fit tested with respirators. Personnel with beards will not be fit tested nor will they be allowed within the contaminated work area. Sideburns or moustaches which interfere with proper respirator seal will not be permitted (Cal-OSHA, Title 8, California Administrative Code, General Industrial Safety Orders).

Personnel will change cartridges on a daily basis unless directed by the SSO to change them more frequently. Personnel must be fit tested for the specific size and brand of respirator used. A respirator that has not been successfully fit tested cannot be used by an individual. The SSO or his designee will be capable of performing a qualitative fit test on workers at the site.

9.7 PRESCRIPTION LENSES

Contact lenses may not be worn in the contamination zone. Personnel who wear prescription glasses and expect to use respirators will use spectacle inserts. It will be the responsibility of each individual to obtain prescription eye wear designed to be worn with respiratory equipment.

10.0 DECONTAMINATION FOR HAZARDOUS WASTE ZONE

Decontamination of equipment and personnel is necessary to confine the contaminants to the site and to preclude migration elsewhere. Prior to leaving the contamination zone, all major equipment, tools, and materials will be cleaned to remove grease, oil, chemical residue, or encrusted dirt.

10.1 EQUIPMENT DECONTAMINATION

All major reusable equipment and other tools for excavation work will be decontaminated prior to leaving the contamination zone. Cleaning will normally consist of scrubbing to remove encrusted materials, followed by a soap-and-water wash and potable water rinse using a high-pressure low-volume water spray or steam cleaning unit. Containers of detergent solutions for cleaning tools, boots, and gloves will be available in excavation remediation zone.

The entire contaminated zone will be fenced. A decontamination area will be established where trucks and other heavy equipment will be cleaned before moving out of the fenced area. If necessary, the steam cleaning area will be sloped to collect washwater for subsequent containment and disposal. Decontamination will be performed at a designated equipment decontamination area within the contaminated zone, (See Figure 10-1).

Personnel responsible for steam cleaning will use appropriate personal protective equipment and employ the buddy system. This area will be restricted to all other personnel. Special consideration should be applied to wind speed and direction. Downwind areas should remain free of personnel to avoid inadvertent airborne exposures.

10.2 PERSONNEL DECONTAMINATION

Decontamination of personnel will be performed at a designated location within the contamination zone. Decontamination will consist primarily of soap-and-water washing and water rinse of exterior protective gear to remove contaminants, followed by removal of gear. Disposable coveralls should be removed by turning the clothing inside out. A general sequence of doffing procedures is outlined below. The extent of required washing, or modifications to the sequence, may be specified as appropriate.

Steps in decontamination will be as follows:

- Wash work gloves and boots;
- Rinse respirator; and
- Wash hands and face.

Contaminated protective clothing will be properly disposed. Provisions for emergency decontamination will be available at the excavation site. Clean water will be provided to rinse work gloves and boots.