GW - 40

REPORTS

YEAR(S):

1986

CONCERNS AND REQUEST FOR FURTHER DATA ACQUISITION EAST LEE ACRES LANDFILL

February 6, 1986

Submitted to:

NMEID/BLM/SAN JUAN COUNTY

Prepared for:

Giant Industries, Inc.
7227 North 16th Street
Phoenix, Arizona 85020

Prepared by:

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500 Copper Avenue, NW
Suite 325
Albuquerque, New Mexico 87102

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1.0 EXECUTIVE SUMMARY

The East Lee Acres Landfill lies north and west of Giant Industries, Inc.'s (Giant) Bloomfield refinery. The landfill is located in an alluvial aquifer that is adjacent to and underlies the refinery site. The landfill has accepted unknown quantities and compositions of oilfield and other wastes (some RCRA hazardous constituents) for over six years. Upon learning of this situation in early 1985, Giant became significantly concerned about the potential for liquids from the impoundment at the landfill to contaminate shallow ground water upgradient from the refinery.

Giant has never had any unlined wastewater impoundments nor land treatment facilities on the Bloomfield site. Giant is concerned that contaminants may have migrated from the impoundments at Lee Acres to the downgradient refinery property. Not True

In October, 1985, NMEID and NMOCD performed a shallow geophysical survey of the site. This survey was performed in a series of transects across the arroyo starting at the landfill and proceeding south. These transects were extended onto the refinery property. A significant anomaly was detected by NMEID with this survey. This anomaly, indicative of a plume of contaminated groundwater has its' source in the Lee Acres landfill and appears to have crossed the north and west property boundaries onto Giant's Bloomfield Facility. The anomaly could not be defined accurately on Giant's property due to cultural influences such as buried pipes and links, etc.

At the present time, no monitor wells have been placed near the impoundments to detect any potential ground water contamination. Giant believes that the owners of the land and/or the operators of the sanitary landfill should be required to perform a contamination assessment to determine if shallow ground water has been impacted and what must be done to mitigate the effect of potential contamination on downgradient facilities.

2.0 BACKGROUND AND SITE DESCRIPTION

The East Lee Acres Landfill is on BLM land leased to San Juan County (operators of the landfill) which is classified as a modified sanitary landfill by NMEID.

The landfill is located approximately 3,000 feet from the Giant Refinery in a NW direction (See Figure 2-1). One active and two inactive disposal impoundments were identified in our inspection. The four photographs included in this report (Figures 2-2 through 2-5) are photographs taken of the active impoundment Monday morning, March 12, 1985 during the inspection. Figures 2-2 and 2-3 show the impoundment; the picture was taken facing the direction of the refinery(note the stacks and buildings of Giant's Refinery in the background). The active impoundment is bounded on the west and south by a built up, uncompacted berm of silty sand that may have been excavated and moved from the base when the impoundment was built. Figure 2-4 shows a view to the NE towards the access road where tank trucks apparently open their valves and dispose of the water/sludge mixtures (just to the left of the tan Blazer). Note the shallow channel that has formed by discharges flowing into the impoundment.

At the time of our initial inspection (March 12, 1985), the liquid in the impoundment appeared to consist of several phases of liquid and semisolid petroleum wastes. Figure 2-5 shows the sticky, sludge-like material that floats on top of much of the impoundment and is from 0 to 4" thick. This material consists of heavy ends (asphaltic) of petroleum hydrocarbons similar to sludges that may form in tank bottoms or in an API separator. The impoundment also contains some paraffin-like, yellow-orange compounds. The bulk of the material is aqueous with a slight oil cut.

NMEID (ground water section - Dennis McQuillan) has informed us about the regulatory status of the impoundment at the landfill. The preliminary regulatory analysis indicates that since much of the wastes appear to be related to oil and gas production, and are not likely to exceed the

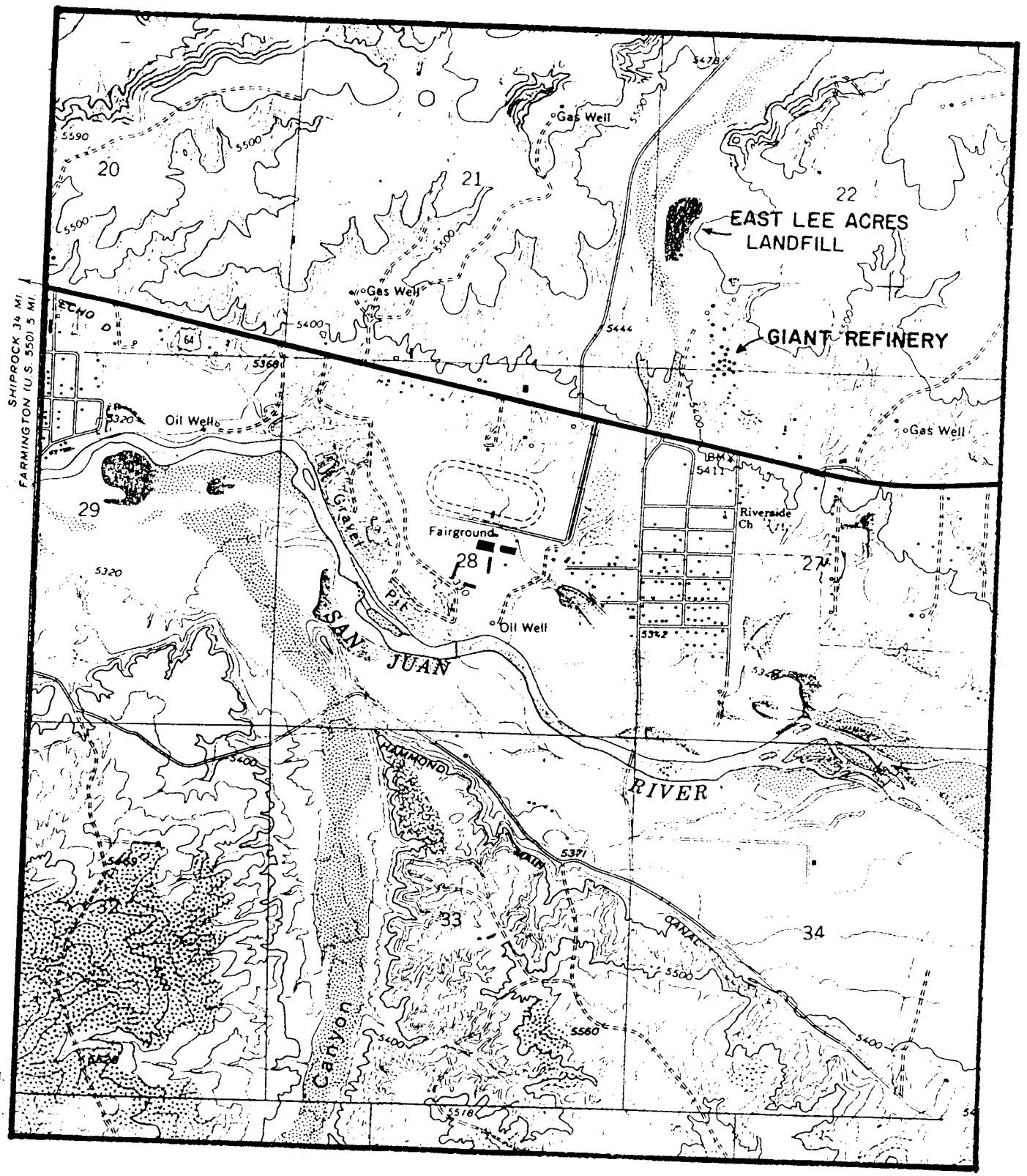


Figure 2-1 Location Map

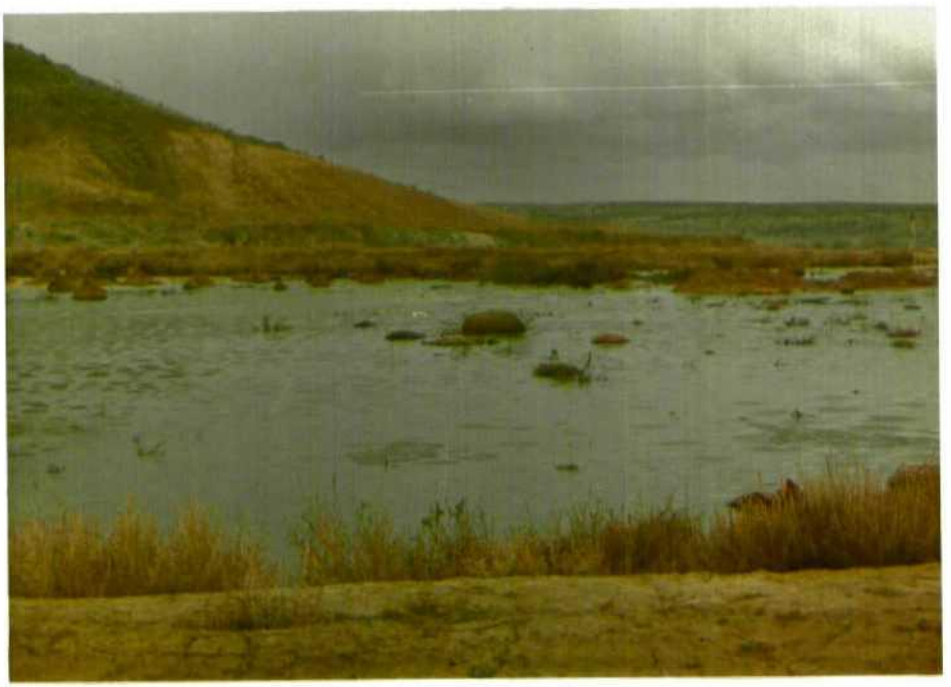


Figure 2-2 Photograph of impoundment at East Lee Acres landfill looking southeast towards Giant Refinery 3/12/85

Figure 2-3 Photograph of impoundment of East Lee Acres looking south towards Giant Refinery 3/12/85.

Figure 2-4 Photograph of impoundment at East Lee Acres looking northeast showing area where vacuum trucks apparently dump into the impoundment 3/12/85.

Figure 2-5 Photograph of edge of impoundment at East Lee Acres showing petroleum product sludge floating on surface 3/12/85.

standards of the EP Toxicity test (based on available analysis), the impoundment would not be covered under the New Mexico Hazardous Waste Regulations (RCRA). NMEID and OCD currently are attempting to determine the status of the impoundment under the WQCC (discharge plan) regulations. NMEID has been aware of the potential problem at the East Lee Acres Landfill and the disposal of petroleum products at this location for at least 6 years. This is documented in the recently published (December, 1984) NMEID report by Ms. Devon Jercinovic: "Petroleum-product Contamination of Soil and Water in New Mexico". This report specifically states on page 198:

> "East Lee Acres (T29N, R12W, 22.31) During an August 1979 SIA [Surface Impoundment Assessment] field investigation, the EID discovered oil discharged into a small pit on the east side of an arroyo. The amount of oil discharged and impacts on soil and ground water have not been determined."

NMEID has conducted limited investigations and no enforcement action has been taken on this matter. The work that has been performed to date (to the best of our knowledge) is sampling performed by Dave Boyer (NMOCD), remedial action by IT Corporation, and sampling of nearby wells by NMEID staff.

It is clear that the landfill was in violation of at least one of the requirements of a modified sanitary landfill (waste must be covered every 2 weeks in winter, 1 week in summer) and could be in violation of WQCC regulations.

Dave Boyer (NMOCD) sampled water from the pit in February, 1985. The results of these analyses were obtained from NMEID files in my conversation with Mr. McQuillan on 3/19/85. These results are shown in Table 2-1. The original lab sheets are included in Appendix A. The results of the preliminary analyses (Table 2-1) show that some materials in addition to those normally detected in "produced water" have been discharged to the impoundment. In particular, halogenated hydrocarbon compounds are not typical of oil/gas production or refining process operations. The remainder of the constituents appear very similar to the analyses of "produced water" from oil and gas wells in the San Juan Basin and could

TABLE 2-1
ANALYSES OF IMPOUNDMENT LIQUID

Analysis of Water From Lee Acres Landfill
Improvement (Sample Taken by Dave Boyer, OCD in February 1985)
Personal Communication Dennis McQuillan, EID 3/19/85

Parameter/Compound		Concentration
	Specific conductance	10,154 umhos/cm
	pH	7.14
	TDS	6,308 mg/l
	Cl	2,758.9 mg/l
	Na	1,507 mg/l
	Al	2.3 mg/l
	Ba	0.74 mg/l
	Bo	0.61 mg/l
Metals	Cr (total)	0.28 mg/l
	Mg	19.0, 26.8 mg/l
	Fe	6.9 mg/l
	Zn	0.29 mg/l
	Sr	4.4 mg/l
	Be	<0.10 mg/l
	Cd	<0.10 mg/l
	Ca	170,204 mg/l
	Co	<0.10 mg/l
	Cu	<0.10 mg/l
	Mn	1.5 mg/l
	Mo	<0.10 mg/l
	Ni	<0.10 mg/l
	Si	1.2 mg/l
	Ag	<0.10 mg/l
	Sn	<0.10 mg/l
	V	<0.10 mg/l
	Y	<0.10 mg/l
	K	885 mg/l
	F	3.58 mg/l
	SO_4	430 mg/l
	Benzene	440 ppb
Purgeable	Tolyene	950 ppb
Organics	Ethylbenzene	100 ppb
	Paraxylene	130 ppb
	Metaxylene	380 ppb
	Orthoxylene	200 ppb
Halogenated	Methylene Chloride	2,000 ppb
Hydrocarbons	1,1,-TCA	400 ppb
	TCE	Trace

be expected in waste discarded by oil/gas production or refining operations.

On April 18, 1985, a breach in the dike occurred, releasing some wastes into the arroyo adjacent to the landfill. Reports were made to NMEID of several individuals who became ill due to fumes from the landfill impoundments. Concern over the potential for H_2S poisoning prompted an EPA visit and subsequent action by NMEID. The inspection by EPA resulted in a determination that the site did not qualify for an emergency action under CERCLA. For this reason, NMEID proceeded to take the action required to address the situation immediately and protect human health. Remedial actions were initiated and these are described in Section 3.0 of this report.

3.0 REMEDIAL ACTION AND SUBSEQUENT NMEID INVESTIGATIONS

3.1 REMEDIAL ACTION

On April 23, 1985, NMEID notified IT Corporation to investigate and neutralize the H_2S detected at the Lee Acres Landfill. Samples were collected and a recommendation was made by IT Corporation to treat the impoundments with ferric chloride which would convert dissolved sulfide into a more stable, non-toxic iron sulfide. NMEID authorized this treatment on April 27, 1985. The treatment was performed from May 1 to May 3, 1985. A complete account of the treatment of the impoundment liquids is included in Appendix B. The analyses of samples taken at the impoundments prior to treatment are summarized in Tables 3-1 and 3-2.

3.2 NMEID WELL SAMPLING

NMEID has sampled several downgradient domestic wells on the south side of the road to attempt to assess if gross ground water contamination has resulted from the impoundments. Location of these wells is plotted on Figure 3-1. The results of these analyses are included as Table 3-3. A comparison between the results of these analyses and the constituents in the impoundments shows that some of the same compounds were detected although not in similar proportions. Since the halogenated organics (Table 3-3) found in the Reynolds well (Figure 3-1) samples are common contaminants of ground water in light industrial areas, and no information on the hydrologic relationship between these sample locations and the ground water beneath the impoundment has been established, it is likely that the impoundments are the source of the observed contamination in the wells.

3.3 NMEID GEOPHYSICAL SURVEY

On October 23-24, 1985, GCL personnel accompanied NMEID on an electromagnetic-induction (EM) survey of the arroyo which drains the landfill area, where the arroyo crosses Giant property (Figure 3-2). A total of 6 EM lines were run, labeled A through F on Figure 3-2.

Lines A, B and C revealed anomalously high ground-water conductance along the east ride of the arroyo. Results of lines D, E and F were

TABLE 3-1

Analyses of Impoundment Liquid and Sludge
by IT Corporation (4/85)

	IMP-1	IMP-2 (TOP)	IMP-2 (SLUDGE)	IMP-3 (TOP)	IMP-4 (SOIL)
Cyanide[2]	<10 ND	<10 ND	<10 ND	<10 ND	<10 ND
Sulfide	40	42	80	7	7
Chloride	2800	680	440	84	280
Nitrate[2]	<100 ND	<100 ND	<100 ND	<100 ND	<100 ND
Sulfate[2]	<100 ND	<100 ND	<100 ND	<100 ND	<100 ND
PCBs	<0.1 ND	<0.1 ND	<0.1 ND	<0.1 ND	<0.1 ND
pH	8.5	8.5	7.5	7.0	6.0

[1] Concentrations expresses as parts per million (ppm);
ND = not detected at the lower limit of detection given

[2] The best achievable lower limits of detection for these compounds is less than those shown; however, these analyses were performed using standard methods to ensure rapid data acquisiton.

TABLE 3-2

Analyses of Impoundment Liquid and Sludge
by IT Corporation

	Compound	Concentration[2]
SAMPLE IMP-1		
Volatile Compounds:		
	Benzene	260
	Ethylbenzene	51
	Methylene Chloride	19
	Toluene	670
	Acetone	5400
	Total Xylenes	610
Semi-Volatile Compounds: (base/neutral/acid)		
	C_{12} - C_{30} aliphatic hydrocarbons	10,000
SAMPLE IMP-2 (TOP)		
Volatile Compounds:		
	Benzene	60
	Methylene Chloride	33
	Toluene	80
	Acetone	3400
	Total Xylenes	59
	Isopropyl Alcohol	60
Semi-Volatile Compounds: (base/neutral/acid)		
	C_{12} - C_{30} aliphatic hydrocarbons	140,000

(1) Only those compounds detected are presented here, a list of compounds for which analyses were performed, including the lower limit of detection for each, is given in Tables 3 and 4 for volatile organics and Tables 5 and 6 for semi-volatile organics.

(2) Concentrations expressed as micrograms per liter.

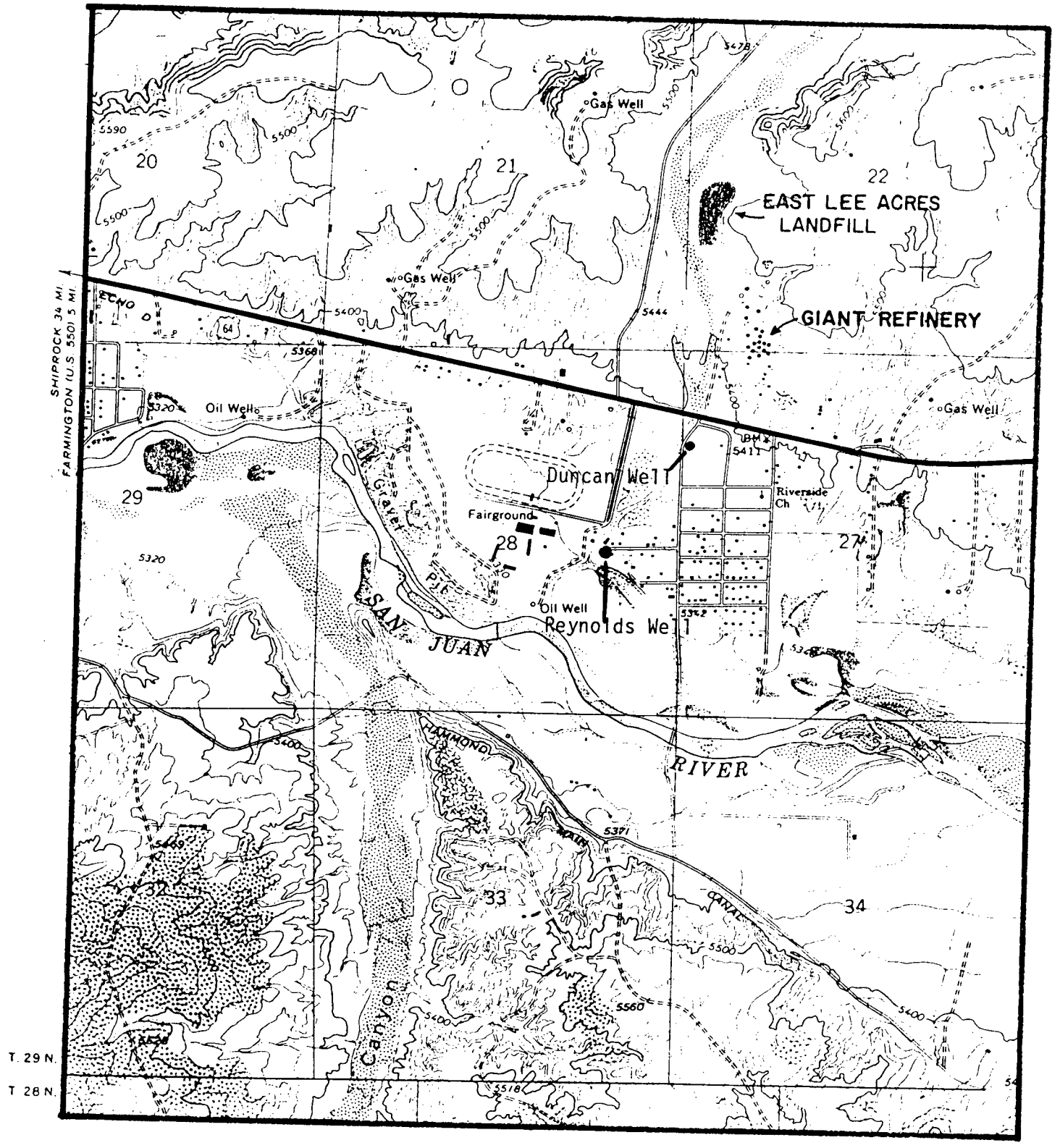


Figure 3-1 Location of Wells Sampled by NMEID

TABLE 3-3

NMEID ANALYSES OF DOMESTIC WELLS SOUTH OF IMPOUNDMENTS

PARAMETERS	SAMPLE LOCATION		
	1# Reynolds Well (4/22)	#2 Reynolds Well (4/26)	#2 Du
1-1 Dichloroethene	1.0	trace <1	
1-1 Dichloroethane	6.0	2.0	
1-2 Dichloroethene	1.0	trace <1	
1-1 Trichloroethylene	22.0	20.0	
Benzene	8.0	trace <1	
Tetrachloroethylene	10.0	4.0	
Trichloroethene	2.0	2.0	

Note: All concentrations in ug/l (ppb)
ND = None Detected

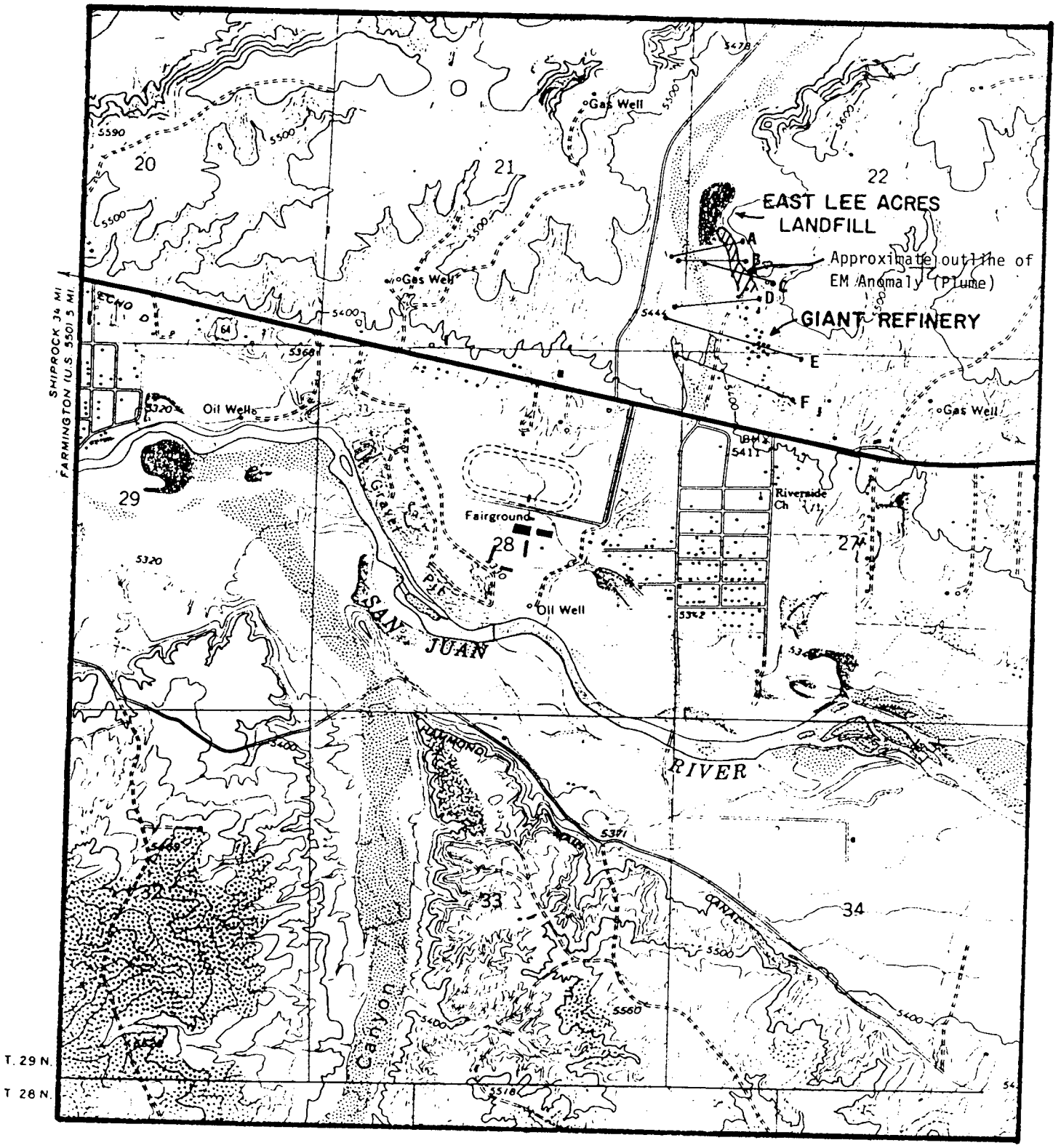


Figure 3-2 Preliminary EM Survey of The East Lee Acres Site

EM Survey Transects are represented as lines labeled **A-F**
Approximate Outline of EM Anomaly (plume) shown as hachured area

ambiguous due to the presence of tanks, underground lines, fences and buildings. The anomalies seen in lines A, B and C were consistent with values observed in lines nearer the landfill, indicating that a plume of contaminated ground water exists along the eastern side of the arroyo. The approximate location of the inferred contaminant plume is shown on Figure 3-2.

The presence, location and areal extent of the contaminant plume is inferred on the basis of raw field-data. Until NMEID releases the interpreted data (Expected January, 1986), it is impossible to:

- o Ascertain the effectiveness and accuracy of the EM survey
- o Determine the plume's exact geometry
- o Calculate the magnitude of the conductance anomaly
- o Determine the depth to ground water and approximate vertical extent of the plume

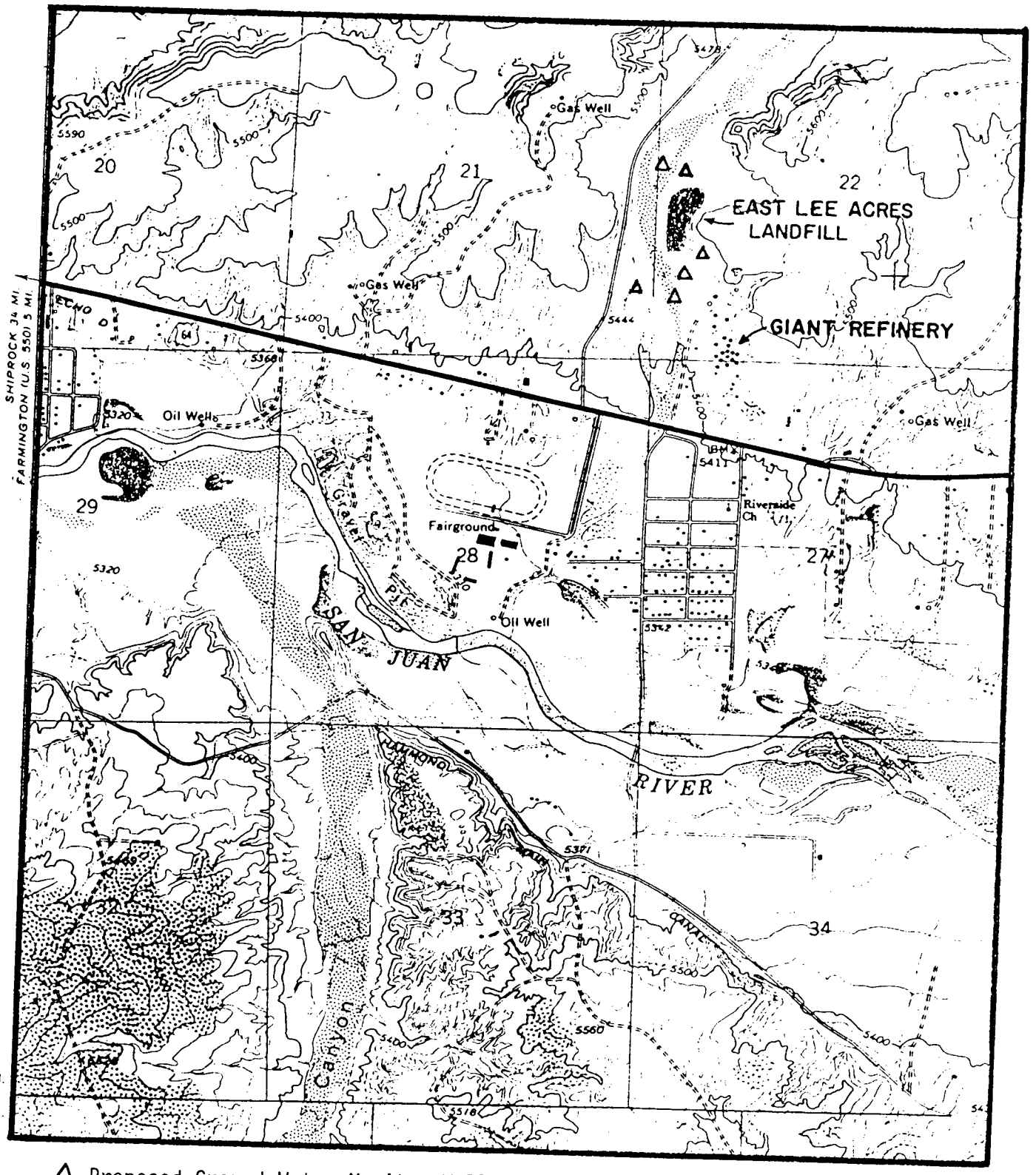
Because of the presence of numerous surface and buried metallic objects on the Giant site, it is unlikely that an EM survey could accurately define potential subsurface anomalies. The results of the EM survey should be used to plan a drilling program in order to directly sample ground water in the arroyo. This recommendation is discussed in section 4.0.

4.0 PROBLEMS AND RECOMMENDATIONS

The aqueous nature of the waste, the location of the impoundment, construction techniques and the apparently permeable berm and bottom materials indicate that substantial subsurface seepage may be occurring into the shallow alluvium in the valley where the landfill is located. The silty/sand nature of the sediments and the hydraulic head difference between the refinery area and the impoundment create the potential for a plume of ground water contamination to migrate from the landfill area to the refinery area. Since the wastes in the impoundment contain petroleum products, any ground water contamination that results from landfill leachate could, at some point in the future, be attributed incorrectly to Giant's activities.

To assess the extent of the potential for a problem, it will be necessary to examine the ground water hydrology of the small valley in which the landfill and refinery are located and to determine the best locations to install monitoring points upgradient and downgradient from the impoundments (upgradient from the refinery boundary). In order to determine whether ground water contamination has occurred due to the disposal of unknown quantities of unknown wastes at East Lee Acres, it will be necessary to install a ground water monitoring network in the vicinity of the impoundments. The design for this network should be based on a thorough analysis of all available hydrogeologic and EM survey data.

Giant believes that the installation of such a network represents the only prudent and reasonable course of action for the owner/operator of the East Lee Acres Landfill. Giant must be assured that any potential contaminants from the impoundments not be allowed to migrate downgradient beneath their facility. The precise location and number of wells required for an accurate assessment of ground water contamination must await a detailed hydrogeologic study; however, based on the results of the EM survey and other available data, a system similar to that proposed in Figure 4-1 will be required. Giant hereby requests that the appropriate regulatory agencies and the owners/operators of the impoundments



Δ Proposed Ground Water Monitor Well

Figure 4-1 Potential Locations for Proposed Monitor Wells

report to Giant on the progress of their investigations and that ground water monitoring be initiated promptly.

APPENDIX A
ORIGINAL LABORATORY REPORTS

REPORT TO: Ann Claassen
Gw/Hw Bureau, NMEID
PO Box 968
SANTA FE NM 87504

LABORATORY ______

LAB NUMBER 85-0359 C 359-H 4/25/85

SLD Users Code No. 53300

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other ______

Water Supply and/or Code No. #1, Reynolds well

City & County Lee Acres, San Juan Co

Collected (date & time) 4/23/85; 3:00 pm By (name) A. Claassen/K. Miller

pH= 6.?; Conductivity= ______ umho/cm at ______ °C; Chlorine Residual= ______

Dissolved Oxygen= ______ mg/l; Alkalinity= ______ Flow Rate= ______

Sampling Location, Methods & Remarks (i.e. odors etc.)

bathroom sink tap, ... building
let water run several minutes before sampling

RECEIVED
JUN 24 1985
HAZARDOUS WASTE SECTION

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed [signature]

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed ______

Method of Shipment to Laboratory Hand carried.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as: specimen ______; duplicate ______; triplicate ______; blank(s) ______, and ______ amber glass jug(s) with teflon-lined cap(s) identified as ______, and ______ other container(s) (describe) ______ identified as ______.

Containers are marked as follows to indicate preservation (circle):

NP: No preservation; sample stored at room temperature (~20°C).

P-ICE: Sample stored in an ice bath.

P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from Ann Claassen to Bruce Gallaher at (location) Crown Bldg, SF on (date & time) 4/24/85, 16:55 and that the statements in this block are correct.

Disposition of Sample ______. Seal(s) Intact: Yes ☒ No ☐.

Signature(s) [signature] Bruce Gallaher

I (we) certify that this sample was transferred from Bruce Gallaher to Richard Meyerhein at (location) SLD on (date & time) 4/25/85 12:00 and that the statements in this block are correct.

Disposition of Sample ______. Seal(s) Intact: Yes ☐ No ☐.

Signature(s) Richard Meyerhein Bruce Gallaher

ANALYSES REQUESTED

LAB. No.: ORG- 359

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTITATIVE	PURGEABLE SCREENS	QUALITATIVE	QUANTITATIVE	EXTRACTABLE SCREENS
		ALIPHATIC HYDROCARBON SCREEN			ALIPHATIC HYDROCARBONS
		AROMATIC HYDROCARBON SCREEN			CHLORINATED HYDROCARBON PESTICIDES
		HALOGENATED HYDROCARBON SCREEN			CHLOROPHENOXY ACID HERBICIDES
		GAS CHROMATOGRAPH/MASS SPECTROMETER			HYDROCARBON FUEL SCREEN
					ORGANOPHOSPHATE PESTICIDES
					POLYCHLORINATED BIPHENYLS (PCB's)
					POLYNUCLEAR AROMATIC HYDROCARBONS
					TRIAZINE HERBICIDES
		SPECIFIC COMPOUNDS			SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	[PPB]	COMPOUND	[PPB]
GC/MS Purgeables			
1,1-Dichloroethene	1		
1,1-Dichloroethane	6		
1,2-Dichloroethene	1		
1,1,1-Trichloroethane	22		
Trichloroethene	2		
Benzene	8		
Tetrachloroethene	10	* DETECTION LIMIT	1 ug/L

REMARKS:

CERTIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes ___ NO — . Seal(s) broken by: _____ date: _____

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.

Date(s) of analysis: 4/25/85 . Analyst's signature: [signature]

I certify that I have reviewed and concur with the analytical results for this sample and with the statements in this block

85-0371-C

REPORT TO: Environmental Improvement Division
Health & Environment Department
P.O. Box 968 - Crown Building
Santa Fe, New Mexico 87504-0968
ATTENTION: Ann Crassen
BUREAU: Groundwater/Hazardous Waste

LABORATORY 5/24/85
LAB NUMBER CR 371 A,B.
SLD Users Code No. 53300

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

RECEIVED
JUN 24 1985
HAZARDOUS WASTE SECTION

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other _____

Water Supply and/or Code No. Private Reynolds

City & County Lea Cress — Sini Jual

Collected (date & time) 4/24/85 / 11:20AM By (name) Jack Ellinger

pH= NA ; Conductivity= NA umho/cm at NA °C; Chlorine Residual= NA

Dissolved Oxygen= NA mg/l; Alkalinity= NA ; Flow Rate= NA

Sampling Location, Methods & Remarks (i.e. odors etc.)
Bathroom Sink at the home of Linda Reynolds — This sample was taken to confirm one taken earlier this week.

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed Jack Ellinger

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed _____

Method of Shipment to Laboratory _____

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen _____; duplicate _____; triplicate _____; blank(s) _____,
and _____ amber glass jug(s) with teflon-lined cap(s) identified as _____,
and _____ other container(s) (describe) _____ identified as _____.

Containers are marked as follows to indicate preservation (circle):
NP: No preservation; sample stored at room temperature (~20°C).
P-ICE: Sample stored in an ice bath.
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block are correct.

Disposition of Sample _____. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s) _____ _____

RECEIVED
JUN 24 1985
LIQUID WASTE

I (we) certify that this sample was transferred from _____ to _____ at (location) _____ on (date & time) _____ and that the statements in this block

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

OG-371

QUALITATIVE	QUANTATIVE	PURGEABLE SCREEN
		ALIPHATIC HYDROCARBON SCREEN
		AROMATIC HYDROCARBON SCREEN
		HALOGENATED HYDROCARBON SCREEN
		GAS CHROMATOGRAPH/MASS SPECTROMETER
		SPECIFIC COMPOUNDS

QUALITATIVE	QUANTATIVE	EXTRACTABLES SCREEN
		ALIPHATIC HYDROCARBONS
		CHLORINATED HYDROCARBON PESTICIDES
		CHLOROPHENOXY ACID HERBICIDES
		HYDROCARBON FUEL SCREEN
		ORGANOPHOSPHATE PESTICIDES
		POLYCHLORINATED BIPHENYLS (PCB's)
		POLYNUCLEAR AROMATIC HYDROCARBONS
		SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	CONCENTRATION	COMPOUND	CONCENTRATION
1,2-dichloroethane	trace < 1 ppb		
1,1-dichloroethane	trace < 1 ppb		
benzene	trace < 1 ppb		
1,1,1-trichloroethane	20 ppb		
trichloroethene	2 ppb		
tetrachloroethene	4 ppb		
1,1-dichloroethene	2 ppb	* DETECTION LIMIT	1 ug/l

REMARKS:

CERTIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes (No) . Seal(s) Broken by _____ date _____

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.

Date(s) of analysis 8/4/87 & 8/5/87 Analyst signature

REPORT TO: ANN CLAASSEN
GW/HW BUREAU, NMEID
PO BOX 968
SANTA FE NM 87504

LABORATORY

LAB NUMBER 85-0358-C 358-A, 4/25/85

SLD Users Code No. 53300

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

RECEIVED
JUN 24 1985
HAZARDOUS WASTE SECTION

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other

Water Supply and/or Code No. #2; Duncan well

City & County Lee Acres, San Juan Co.

Collected (date & time) 4/22/85; 3:30 PM By (name) A. Claassen / C. Miller

pH= 6.0 ; Conductivity= umho/cm at °C; Chlorine Residual=

Dissolved Oxygen= mg/l; Alkalinity= ; Flow Rate=

Sampling Location, Methods & Remarks (i.e. odors etc.)

Faucet next to well. Let run ~ 5 minutes before sampling.

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed

Method of Shipment to Laboratory Hand carried.

THIS FORM ACCOMPANIES 2 septum vials with teflon-lined discs identified as:
specimen ; duplicate ; triplicate ; blank(s) ,
and amber glass jug(s) with teflon-lined cap(s) identified as ,
and other container(s) (describe) identified as .

Containers are marked as follows to indicate preservation (circle):

N: No preservation; sample stored at room temperature (~20°C).
P-ICE: Sample stored in an ice bath.
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40 ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from ANN CLAASSEN to BRUCE Gallagher at (location) Crown Bldg, SF on (date & time) 4/24/85; 16:55 and that the statements in this block are correct.

Disposition of Sample . Seal(s) Intact: Yes ☒ No ☐ .

Signature(s) Bruce Gallagher

I (we) certify that this sample was transferred from Bruce Gallagher to Richard Megerchian at (location) SLD on (date & time) 4/25/85 1345 and that the statements in this block are correct.

RECEIVED

Disposition of Sample . Seal(s) Intact: Yes ☒ No ☐ .

Signature(s) Richard Megerchian

JUN 24 1985

LIQUID WASTE/GROUND WATER SURVEY

ANALYSES REQUESTED

LAB. No.: ORG- 358

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTITATIVE	PURGEABLE SCREENS	QUALITATIVE	QUANTITATIVE	EXTRACTABLE SCREENS
		ALIPHATIC HYDROCARBON SCREEN			ALIPHATIC HYDROCARBONS
		AROMATIC HYDROCARBON SCREEN			CHLORINATED HYDROCARBON PESTICIDES
		HALOGENATED HYDROCARBON SCREEN			CHLOROPHENOXY ACID HERBICIDES
		GAS CHROMATOGRAPH/MASS SPECTROMETER			HYDROCARBON FUEL SCREEN
					ORGANOPHOSPHATE PESTICIDES
					POLYCHLORINATED BIPHENYLS (PCB's)
					POLYNUCLEAR AROMATIC HYDROCARBONS
					TRIAZINE HERBICIDES
		SPECIFIC COMPOUNDS			SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	[PPB]	COMPOUND	[PPB]
GC/MS Purgeables	None Detected *		
		* DETECTION LIMIT	1 ug/L

REMARKS:

CERTIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes ___ NO ✓. Seal(s) broken by: _____ date: _____

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.

Date(s) of analysis: 4/25/85. Analyst's signature: [signature]

I certify that I have reviewed and concur with the analytical results

Lab Number: HM# 69

Date Submitted: 1/21/85

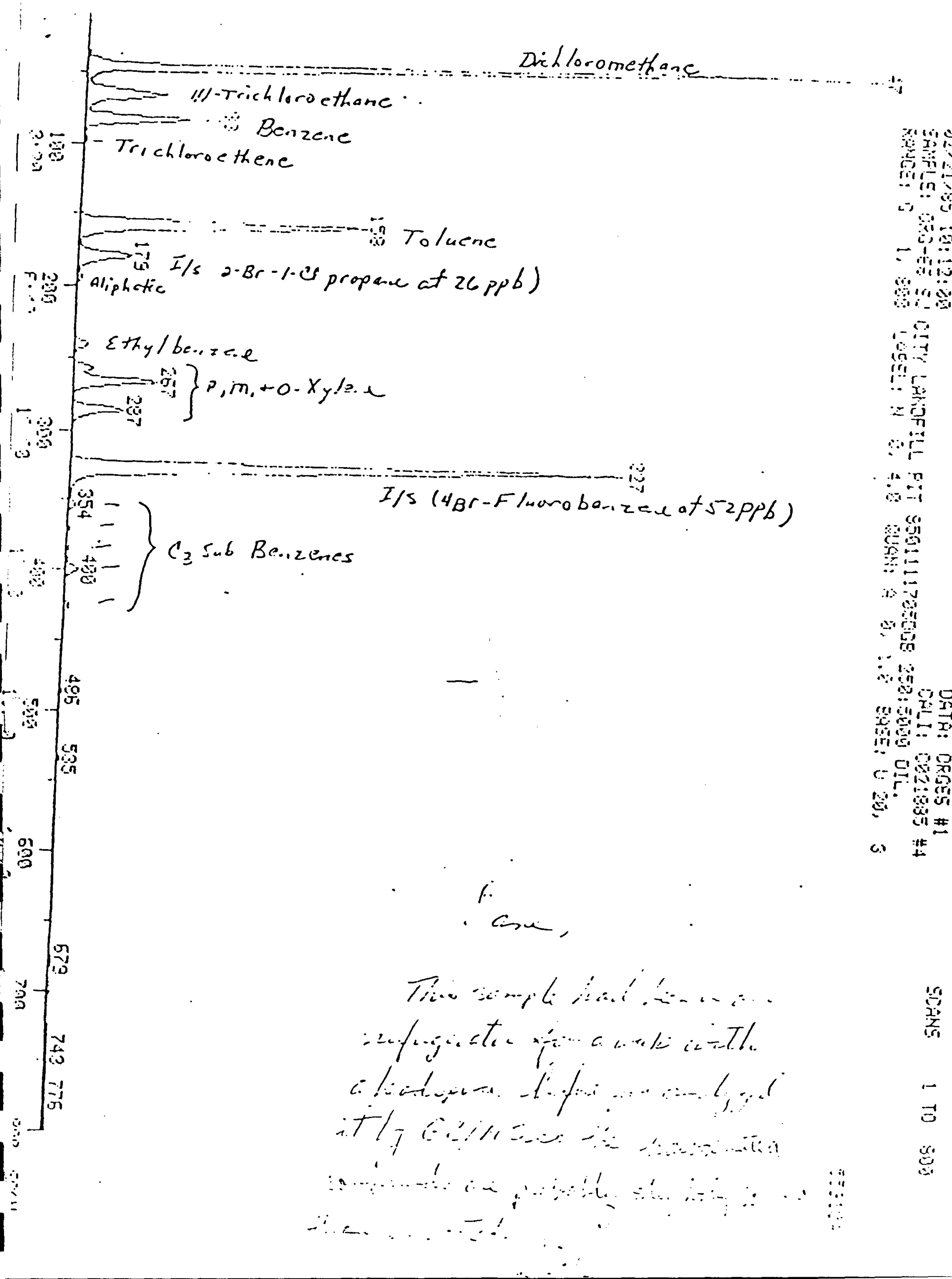
By: Boyer/Baca

Sample Code: San Juan Sandfills

Date Reported: 2/18/85

By: MP

Determination	Concentration (µg/ml)
Aluminum	2.3
Barium	0.74
Beryllium	<0.10
Boron	0.61
Cadmium	<010
Calcium	170.
Chromium	0.28
Cobalt	<0.10
Copper	<0.10
Iron	6.9
Lead	<0.10
Magnesium	19.
Manganese	1.5
Molybdenum	<0.10
Nickel	<0.10
Silicon	1.2
Silver	<0.10
Strontium	4.4
Tin	<0.10
Vanadium	<0.10
Yttrium	<0.10
Zinc	0.29


RIC
DATA: ORG55 #1
CALI: C021885 #4
CITY LANDFILL
SCANS 1 TO 800
Dichloromethane
111-Trichloroethane
Benzene
Trichloroethene
Toluene
I/s 2-Br-1-Cl propane at 26 ppb)
Aliphatic
Ethylbenzene
p, m, + o-Xylene
I/s (4Br-Fluorobenzene at 52 ppb)
C_3 Sub Benzenes

New Mexico Health and Environment Department
SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED 1/21/85 | LAB NO 11C.231 | USER CODE ☐ 59300 ☐ 59600 ☒ OTHER: 82235

Collection DATE 65101 11' | Collection TIME 1705 | Collected by — Personal Agency Boyd/Bela OCD

SITE INFORMATION

Sample location: San Juan County Landfill, Farmington-Bloomfield Highway

Collection site description: From Dairy animal, produced water, septic tank, unit joint ppty in landfill south of Giant refinery T29N, R12W, Sec 22.311

Station/well code:

Owner: San Juan Cty (?)

SEND FINAL REPORT TO ►

ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87501

Attn: David Boyer

SAMPLING CONDITIONS

☐ Bailed ☒ Dipped ☐ Pump ☐ Tap	Water level: —	Discharge: —	Sample type: Grab
pH (00400): —	Conductivity (Uncorrected): — µmho	Water Temp. (00010): °C	Conductivity at 25°C (00094): — µmho

Field comments:

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted: 1

☒ NF: Whole sample (Non-filtered) ☐ F: Filtered in field with 0.45 µm membrane filter ☐ A: 2 ml H_2SO_4/L added

☒ NA: No acid added ☐ Other-*specify:*

ANALYTICAL RESULTS from SAMPLES

NF, NA		Units	Date analyzed
☒ Conductivity (Corrected) 25°C (00095)	10,154	µmho	
☐ Total non-filterable residue (suspended) (00530)		mg/l	
☒ Other: pH	7.14		
☐ Other:			
☐ Other:			

NF, ~~Acl,CO₃~~ NB

☐ Nitrate-N +, Nitrate-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☒ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

NA NF	10,7	Units	Date analyzed
☒ Calcium (00915)	204	mg/l	1/31
☒ Magnesium (00925)	26.8	mg/l	1/25
☒ Sodium (00930)	1507	mg/l	1/21
☒ Potassium (00935)	88.5	mg/l	11
☒ Bicarbonate (00440)		mg/l	
☒ Chloride (00940)	2758.7	mg/l	3/1
☒ Sulfate (00945)	430	mg/l	2/11
☒ Total filterable residue (dissolved) (70300)	6308	mg/l	2/25
☒ Other: CO_3 F	3.58	mg/L	1/28

F, A-H, SO_4

☐ Nitrate-N +, Nitrate-N dissolved (00631)		mg/l	
☐ Ammonia-N dissolved (00608)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Other:			

Analyst	Date Reported	Reviewed by

OR66B.

MAR 07 1985

OIL CONSERVATION DIVISION

8/21/85

REPORT TO:

David G. Boyer
New Mexico Oil Conservation Division
P. O. Box 2088
Santa Fe, NM 87501

LABORATORY

LAB NUMBER OR 66A

SLD Users Code No. 822-35

ALL CONTAINERS WHICH THIS FORM ACCOMPANIES ARE COLLECTIVELY REFERRED TO AS "SAMPLE".

CERTIFICATE OF FIELD PERSONNEL

Sample Type: Water ☒ Soil ☐ Other

Water Supply and/or Code No. San Juan City Landfit Pit, Not Giant Refinery

City & County San Juan City Between Farmington & Bloomfield Co

Collected (date & time) 8/21/1705 By (name) Boyer/Boyd

pH=; Conductivity= µmho/cm at °C; Chlorine Residual=

Dissolved Oxygen= mg/l; Alkalinity=; Flow Rate=

Site Location, Methods & Remarks (i.e. odors etc.)

Large Pit ~~Pitted~~ inside gate of left of dry rubbish pit. Pit contained oil, Grease, muds, chemicals, dead animals and probably septic wastes.

I certify that the statements in this block accurately reflect the results of my field analyses, observations and activities. Signed David G Boyer

I certify that I witnessed these field analyses, observations and activities and concur with the statements in this block. Signed

Method of Shipment to Laboratory

THIS FORM ACCOMPANIES 1 M septum vials with teflon-lined discs identified as:
specimen X; duplicate ##; triplicate; blank(s),
and amber glass jug(s) with teflon-lined cap(s) identified as,
and other container(s) (describe) identified as.
Containers are marked as follows to indicate preservation (circle):

N: No preservation; sample stored at room temperature (~20°C). one vile
P-ICE: Sample stored in an ice bath. Refrigerated
P-$Na_2O_3S_2$: Sample preserved with 3 mg $Na_2O_3S_2$/40/ml and stored at room temperature.

CERTIFICATE(S) OF SAMPLE RECEIPT

I (we) certify that this sample was transferred from to

at (location) on

(date & time) and that the statements in this block are correct.

Disposition of Sample. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s)

I (we) certify that this sample was transferred from to

at (location) on

(date & time) and that the statements in this block are correct.

Disposition of Sample. Seal(s) Intact: Yes ☐ No ☐ .

Signature(s)

ANALYSES REQUESTED — LAB. No.: ORG- 66

PLEASE CHECK THE APPROPRIATE BOXES BELOW TO INDICATE THE TYPE OF ANALYTICAL SCREENS REQUIRED. WHENEVER POSSIBLE LIST SPECIFIC COMPOUNDS SUSPECTED OR REQUIRED.

QUALITATIVE	QUANTITATIVE	PURGEABLE SCREENS	QUALITATIVE	QUANTITATIVE	EXTRACTABLE SCREENS
		ALIPHATIC HYDROCARBON SCREEN			ALIPHATIC HYDROCARBONS
X	X	AROMATIC HYDROCARBON SCREEN *			CHLORINATED HYDROCARBON PESTICIDES
		HALOGENATED HYDROCARBON SCREEN			CHLOROPHENOXY ACID HERBICIDES
		GAS CHROMATOGRAPH/MASS SPECTROMETER			HYDROCARBON FUEL SCREEN
					ORGANOPHOSPHATE PESTICIDES
					POLYCHLORINATED BIPHENYLS (PCB's)
		* Benzenes, etc.			POLYNUCLEAR AROMATIC HYDROCARBONS
					TRIAZINE HERBICIDES
		SPECIFIC COMPOUNDS			SPECIFIC COMPOUNDS

REMARKS:

ANALYTICAL RESULTS

COMPOUND	[PPB]	COMPOUND	[PPB]
Benzene	440	[illegible]	[200]
Toluene	950	1,1,1-Trichloroethane	[400]
ethylbenzene	100	Trace Trichloroethene	[~4]
p-Xylene	130		
m-Xylene	380		
o-Xylene	200		
		* DETECTION LIMIT	/

REMARKS: Sample may also contain significant amounts of halogenated hydrocarbons with R.T. between CH_2Cl_2 & $CHCl_3$. This is verified by [illegible] unsaturated hydrocarbons also detected. *
[illegible] values for Halogenated compounds [illegible] due to [illegible] before analysis

CERTIFICATE OF ANALYTICAL PERSONNEL

Seal(s) Intact: Yes___ NO X. Seal(s) broken by:________ date:____

I certify that I followed standard laboratory procedures on handling and analysis of this sample unless otherwise noted and that the statements in this block and the analytical data on this page accurately reflect the analytical results for this sample.

Date(s) of analysis: 11/15-?/85 Analyst's signature: [illegible]

I certify that I have reviewed and concur with the analytical results for this sample and with the statements in this block. Reviewers signature: [illegible]

New Mexico Health and Environment Department
SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE
Albuquerque, NM 87106 — (505) 841-2555

Heavy Metal
~~GENERAL WATER CHEMISTRY and NITROGEN~~ ANALYSIS

DATE RECEIVED 1/21/85	LAB NO. HM-69	USER CODE ☐ 59300 ☐ 59600 XX OTHER: 82235	
Collection DATE	SITE INFORMATION ►	Sample location: San Juan County Landfill (Farmington-Bloomfield)	
Collection TIME 1205		Collection site description: from Dead animal, produced water, septic tank, in pit (?) in landfill north of Giant refinery. T29N, R12W, Sec 31	
Collected by — Person/Agency Boyer / Baca OCD			

SEND FINAL REPORT TO ►
ENVIRONMENTAL BUREAU
NM OIL CONSERVATION DIVISION
State Land Office Bldg, PO Box 2088
Santa Fe, NM 87501
Attn: David Boyer

Station/well code

Owner: San Juan Co. (?)

SAMPLING CONDITIONS

☐ Bailed ☐ Pump X Dipped ☐ Tap	Water level —	Discharge —	Sample type Grab
pH (00400) —	Conductivity (Uncorrected) — µmho	Water Temp. (00010) — °C	Conductivity at 25°C (00094) — µmho

Field comments

SAMPLE FIELD TREATMENT — *Check proper boxes*

No. of samples submitted 1	X NF: Whole sample (Non-filtered)	☐ F: Filtered in field with 0.45 µmembrane filter.	☐ A: 2 ml H_2SO_4/L added

☐ NA: No acid added X Other-specify: A HNO3

ANALYTICAL RESULTS from SAMPLES

NF, ~~NA~~ A HNO3		Units	Date analyzed
☐ Conductivity (Corrected) 25°C (00095)		µmho	
☐ Total non-filterable residue (suspended) (00530)		mg/l	
X Other: ICAP SCAN			
X Other: As	0.022		
X Other: Se	0.026		

F, NA		Units	Date analyzed
☐ Calcium (00915)		mg/l	
☐ Magnesium (00925)		mg/l	
☐ Sodium (00930)		mg/l	
☐ Potassium (00935)		mg/l	
☐ Bicarbonate (00440)		mg/l	
☐ Chloride (00940)		mg/l	
☐ Sulfate (00945)		mg/l	
☐ Total filterable residue (dissolved) (70300)		mg/l	
☐ Other:			

NF, A-H_2SO_4		Units	Date analyzed
☐ Nitrate-N +, Nitrate-N total (00630)		mg/l	
☐ Ammonia-N total (00610)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Chemical oxygen demand (00340)		mg/l	
☐ Total organic carbon ( )		mg/l	
☐ Other:			
☐ Other:			

F, A-H_2SO_4		Units	Date analyzed
☐ Nitrate-N +, Nitrate-N dissolved (00631)		mg/l	
☐ Ammonia-N dissolved (00608)		mg/l	
☐ Total Kjeldahl-N ( )		mg/l	
☐ Other:			

Analyst	Date Reported	Reviewed by
	2/18/85	[illegible]

Laboratory remarks

APPENDIX B
IT CORPORATION REPORT TO NMEID

ENCLOSURE 1

INVESTIGATION AND HYDROGEN SULFIDE NEUTRALIZATION AT THE LEE ACRES LANDFILL SURFACE IMPOUNDMENT

The information presented below provides a chronological recount of the steps taken by IT Corporation to investigate and neutralize the hydrogen sulfide at the Lee Acres Landfill surface impoundment during the period of April 23 through May 3, 1985.

April 23, Tuesday

NMEID placed a verbal order in the late afternoon for IT to investigate and sample landfill. A. Chavez, an industrial hygiene/health and safety engineer, arrived in Albuquerque in late evening from the IT office in Wilmington, California. Necessary equipment (protective clothing, gas monitoring devices, sample containers, etc.) was assembled and packed for transport to Lee Acres.

April 24, Wednesday

J. Register (Project Engineer), A. Chavez and K. Porter (Project Manager) arrived on site at the surface impoundment in the morning. J. Register and A. Chavez donned protective clothing and SCBA's to inspect impoundment dike and to measure hydrogen sulfide concentrations (using Draeger tubes) along the perimeter of the impoundment. No hydrogen sulfide was detected at six measurement stations along the perimeter. Measurements were made Less than five feet from the surface of the impoundment waste.

The impoundment waste consisted of a bottom sludge of unknown thickness, a primarily aqueous phase with a maximum depth of a few feet and a four to six-inch thick hydrocarbon layer across the entire surface of the aqueous phase. A total of five samples were collected at three locations around the perimeter of the impoundment. Sample IMP-1 was a composite sample collected from the impoundment perimeter near the middle of the dike. IMP-2 (top) and IMP-2 (sludge) were collected near the (IMP-1) sampling location. Sample IMP-3 (top) was collected from the northern perimeter of the impoundment about one-quarter of the distance around the impoundment from the middle of the dike. IMP-3 (soil) was collected from the area discolored from spills and dumping adjacent to the impoundment. After the samples were collected and shipped, IT personnel returned home to await the analytical results.

The samples were chilled to about 4°C and shipped at this temperature by air express to IT analytical laboratories in California. All samples were analyzed for pH and cyanide and dissolved sulfide, chloride, nitrate and sulfate. All samples were also analyzed for PCBs. The results of these analyses are presented in Table 1. Samples IMP-1 and IMP-2 (top) were also analyzed for volatile and base-neutral-acid extractable organic compounds. The results of these analyses are given in Table 2.

Certificates of Analysis for all these analyses are in the IT project files in Albuquerque.

April 26, Friday

J. Register and K. Porter met with the Director of EID and the Director's staff in Santa Fe to help plan a course of action to mitigate the hydrogen sulfide emissions from the Lee Acres surface impoundment. Discussions occurred over most the afternoon. After a portion of the analytical results were available from samples collected on April 24, IT recommended that ferric chloride be added to the impoundment to precipitate dissolved sulfide as iron sulfide. The EID indicated that it would notify IT personnel on Saturday, April 27 if EID elected to use this mode of treatment.

The Director of EID requested that IT provide a qualified individual to be on call in Farmington over the weekend to relieve some of the EID personnel who had been on site for over a week. Thus, A. Chavez was dispatched to Farmington from the IT office in Wilmington, California.

April 27, Saturday

A. Chavez was on call in Farmington and periodically performed hydrogen sulfide measurements at the surface impoundment. At the time the measurements were performed, hydrogen sulfide was below the lower limit of detection of 1 ppm. Mr. Chavez also attempted to identify potential local suppliers for ferric chloride and the equipment that would be required to mix the chemical with the impoundment contents.

In the afternoon, EID directed IT to perform the ferric chloride treatment as soon as possible. No local supply of ferric chloride could be identified and potential vendors outside the Farmington area were unavailable during the weekend. A local supplier was identified, however, that could supply the necessary pumps, piping, etc. to mix the ferric chloride with the impoundment fluids.

April 28, Sunday

Mr. Chavez remained on call in Farmington and periodically made inspections of the surface impoundment and measurements of hydrogen sulfide near the impoundment surface. No hydrogen sulfide was detected.

April 29, Monday

The nearest source of a sufficient quantity of ferric chloride to treat the impoundment was found to be in Denver. Fourteen 55-gallon drums of 38 to 40 percent ferric chloride solution were priority shipped by truck from Denver to Lee Acres and were expected to arrive on Tuesday, April 30. Mr. Chavez notified the local pump and equipment supplier that IT would need his equipment on Tuesday afternoon. Mr. Chavez also remained on call and periodically performed inspection of the surface impoundment and measurements of hydrogen sulfide concentrations. No hydrogen sulfide was detected.

April 30, Tuesday

IT dispatched a chemical process engineer and two technicians from its California offices to Lee Acres to perform the in situ treatment of the impoundment contents. A civil engineer with extensive experience in earthen dam design and inspections from the Albuquerque office of IT was also sent to perform a detailed inspection of the impoundment dikes. He was also instructed to monitor the integrity of the dikes during the treatment process to ensure that agitation of impoundment fluids did not result in dike failure.

The ferric chloride arrived and pumps, piping and other equipment were mobilized to the landfill and assembled. Assembly was not completed until near dark and work was suspended until May 1.

May 1, Wednesday

Ferric chloride was added to the impoundment by drawing fluid from the impoundment and aspirating the chemical into the suction side of a large centrifugal pump. The resulting ferric chloride solution was discharged into the opposite side of the impoundment. Initially, the discharge line was elevated above the surface of the impoundment to enhance agitation and mixing; however, vigorous agitation caused significant emissions of hydrogen sulfide (the hydrogen sulfide concentration near the pond was measured to be as high as 20 ppm). Thus, the discharge line outlet was placed beneath the surface of the impoundment to lessen hydrogen sulfide emissions. About eight drums of ferric chloride were added to the impoundment with sufficiently rapid pumping to ensure thorough mixing of the chemical with the impoundment contents.

After ensuring that proper health and safety procedures were being followed by on-site IT personnel, Mr. Chavez returned to Wilmington, California.

May 2, Thursday

The remaining six drums of ferric chloride were added to the impoundment using the same basic system. Additional pumping capacity was utilized to ensure that all portions of the impoundment contents were thoroughly mixed with the ferric chloride. The expected effectiveness of the in situ treatment was verified by the results of the dissolved sulfide analyses performed by a local laboratory on samples collected by IT personnel. The results of these analyses (Table 7) indicate that dissolved sulfide concentrations were reduced to a small fraction of their pretreatment concentrations presented in Table 1. After all the ferric chloride had been added, pumping continued for a number of hours to ensure thorough mixing of the impoundment contents. Additional samples were collected and shipped to IT laboratories in California for dissolved sulfide analyses that verified the results obtained from the local laboratory.

May 3, Friday

The equipment was disassembled and thoroughly cleaned on site using a hot waste pressure washer. The equipment was then released to the supplier for demobilization and remaining IT personnel returned home.

TABLE 1

PRETREATMENT ANALYSIS OF LEE ACRES LANDFILL
SURFACE IMPOUNDMENT SAMPLES FOR SELECTED PARAMETERS[1]

	IMP-1	IMP-2 (TOP)	IMP-2 (SLUDGE)	IMP-3 (TOP)	IMP-4 (SOIL)
Cyanide[2]	<10 ND	<10 ND	<10 ND	<10 ND	<10 ND
Sulfide	40	42	80	7	7
Chloride	2800	680	440	84	280
Nitrate[2]	<100 ND	<100 ND	<100 ND	<100 ND	<100 ND
Sulfate[2]	<100 ND	<100 ND	<100 ND	<100 ND	<100 ND
PCBs	<0.1 ND	<0.1 ND	<0.1 ND	<0.1 ND	<0.1 ND
pH	8.5	8.5	7.5	7.0	6.0

(1) Concentrations expresses as parts per million (ppm);
ND = not detected at the lower limit of detection given

(2) The best achievable lower limits of detection for these compounds is less than those shown; however, these analyses were performed using standard methods to ensure rapid data acquisiton.

TABLE 2

PRETREATMENT ANALYSIS OF LEE ACRES LANDFILL SURFACE IMPOUNDMENT SAMPLES FOR VOLATILE AND SEMI-VOLATILE ORGANIC COMPOUNDS(1)

	Compound	Concentration(2)
SAMPLE IMP-1		
Volatile Compounds:		
	Benzene	260
	Ethylbenzene	51
	Methylene Chloride	19
	Toluene	670
	Acetone	5400
	Total Xylenes	610
Semi-Volatile Compounds: (base/neutral/acid)		
	$C_{12} - C_{30}$ aliphatic hydrocarbons	10,000
SAMPLE IMP-2 (TOP)		
Volatile Compounds:		
	Benzene	60
	Methylene Chloride	33
	Toluene	80
	Acetone	3400
	Total Xylenes	59
	Isopropyl Alcohol	60
Semi-Volatile Compounds: (base/neutral/acid)		
	$C_{12} - C_{30}$ aliphatic hydrocarbons	140,000

(1) Only those compounds detected are presented here, a list of compounds for which analyses were performed, including the lower limit of detection for each, is given in Tables 3 and 4 for volatile organics and Tables 5 and 6 for semi-volatile organics.

(2) Concentrations expressed as micrograms per liter.