GW - 114

3/94

WORK PLANS

REMEDIATION SYSTEM

file 0125 - B

Schlumberger Dowell

Dowell Schlumberger Incorporated
P.O. Box 4378
Houston, Texas 77210-4378
(713) 275-8400

March 29, 1994

Mr. Anthony Moreland
State of New Mexico Environment Department
1190 St. Francis Drive
Santa Fe, NM 87502

RE: Remediation System Implementation at the Dowell Schlumberger Incorporated Facility in Artesia, New Mexico

Dear Mr. Moreland:

Pursuant to the approved workplan, dated October 26, 1993, Dowell Schlumberger Incorporated (Dowell) has implemented a remediation system at the Artesia facility. The following is a report of the construction, startup, and operation of that remediation system.

Construction

Dowell utilized Western Water Consultants, Inc. (WWC) as project engineer and to provide construction management for the project. Construction was contracted to H2 Oil Recovery Systems, Inc. (H2) of Bend, Oregon. H2 utilized local Artesia contractors to provide services as sub-contractors.

Construction was initiated on January 10, 1994 with the installation of soil vapor extraction (SVE) wells. Drill cuttings were placed on heavy plastic, sampled, and covered with plastic. Disposal of the cuttings is discussed below. The wells were constructed in accordance with, and at the locations shown on the enclosed as-built drawings. Wells were completed on January 16, 1994.

Construction of the header piping and vacuum sheds commenced on January 17, 1994. Excavated soil was placed on plastic, sampled, and covered with plastic. Disposal of this soil is discussed below. SVE header piping was installed according to the specification and drawings, with the exception of pipe routing. The routing of pipes was altered to minimize trench excavation. This change is shown on the enclosed as-built drawings. SVE header piping installation was completed on January 23, 1994.

The vacuum shed, electrical controls, vacuum equipment, and carbon filters were installed during the week of January 24, 1994. Except for some minor equipment substitutions, the system was installed as shown on the design. The equipment changes provide equal or better performance that the equipment originally specified. Changes are noted on the as-built drawings.

Start-up

The SVE system was started on February 1, 1994. As part of the start-up, blower voltage and amperage were checked. There was an initial difficulty balancing the amperage of the 3-phase blowers. This imbalance is most likely due to the open-delta transformer arrangement provided by the power company. The imbalance does not cause the blower motor to overheat, so there should be no problem.

Vapor flow rates were determined by measuring the air velocity in the exhaust stack using a hot wire anemometer. Several measurements were taken during the first two days of operation. The vacuum applied to the system was constant and the flow rates did not vary. The vacuum and flow rates measured are:

Zone	Well Vacuum (In. H_2O)	Manifold Vacuum (In. H_2O)	Flow Velocity (FPM)	Flow Rate (CFM)
Maintenance Shop-1	41	44	3000	70
Maintenance Shop-2	43	48	3400	79
Wash Bay-1	36	38	3200	75
Wash Bay-2	41	43	3300	77
Wash Bay-3	39	41	3200	75

The vacuum at each well within a zone did not vary. This is a result of the design which had very small friction loss in the header piping. Hour meters at each blower started at 0.1 hours. Each zone operates in vacuum for two hours and is then vented while the other zones are in vacuum.

Vapor Treatment

Concentrations of volatile organics in extracted soil vapor were measured using Environmental Instruments 580D and HNu photoionization detectors (PIDs). The data are presented in Table 1. The concentrations vary depending on the zone. Concentrations in the shop area varied from 8 to 230 ppm. Concentrations at the wash bay area ranged from 137 to 1100 ppm.

For more detailed analysis, weekly samples have been sent to commercial laboratories for analysis. The initial round of samples were analyzed at Intermountain Laboratories (IML) in Bozeman, Montana, and at Cardinal Laboratories in Hobbs, New Mexico. Since then all analysis have been performed at Cardinal Laboratories. Results from these analyses are presented in the Appendix A. Figures 1 through 5 show concentrations of major contaminants plotted versus time. Concentrations reported for samples collected on 2/3/94

for the Shop Zone 2 and the Washbay N. Zone 3 are data generated by IML. No concentrations are reported for Shop Zone 1, and Washbay N. Zones 1 and 2 for 2/3/94 because no samples from these zones were submitted to IML. Subsequent data for all zones are from Cardinal Laboratories. There is no discernable trend at this time, but there is a significant amount of removal occurring.

Continued Operation

The system is being operated continuously. Dowell site personnel inspect the system daily for mechanical or electrical problems. WWC has subcontracted with Cardinal Laboratories to monitor the system weekly. This monitoring includes vacuum readings, HNu measurement of the soil vapor and exhaust gas, and sample collection for laboratory analysis.

Extra carbon filters are on site. When breakthrough is detected in the exhaust gas the carbon filters will be changed.

Soil Disposal

Laboratory analysis of the drill cuttings and excavated soils generated during system installation are presented in Appendix B. The analysis shows that the soil is nonhazardous. The soil will be disposed at East Carbon Development Corporation (ECDC) in central Utah.

If you have any comments or questions please give me a call at (713)275-8498.

Sincerely,

John Miller
Remediation Manager

cc: WWC, Laramie
Artesia District

TABLE 1
ARTESIA SOIL VAPOR EXTRACTION VAPOR PID READINGS

Area	Date	Time	EI 580D (ppm)	HNu (ppm)
Shop Zone 1	2-1	0830	117	
	2-1	1500	17	
	2-2	0830	57	
	2-2	1610	84	
	2-3	0800	53	4
	2-3	1530	8	
	2-4	0900	20	
	2-10			1
Shop Zone 2	2-1	0950	20	
	2-1	1500	83	
	2-2	0820	230	
	2-2	1610	20	
	2-3	0800	60	35
	2-3	1510	65	
	2-4	0900	60	
	2-10			12
Wash Bay Zone 1	2-1	1020	137	
	2-1	1100	150	
	2-1	1540	218	
	2-2	0830	430	
	2-2	1610	217	
	2-3	0810	137	84
	2-3	1510	237	
	2-4	0900	210	
	2-10			50
Wash Bay Zone 2	2-1	1030	148	
	2-1	1545	185	
	2-2	0830	468	
	2-2	1610	265	
	2-3	0810	234	110
	2-3	1510	237	
	2-4	0900	240	
	2-10			68
Wash Bay Zone 3	2-1	1100	303	
	2-1	1540	369	
	2-2	0830	1100	
	2-2	1610	485	
	2-3	0810	457	180
	2-3	1515	465	
	2-4	0900	420	
	2-10			89

Figure 1: Shop Zone 1
Volatile Emissions

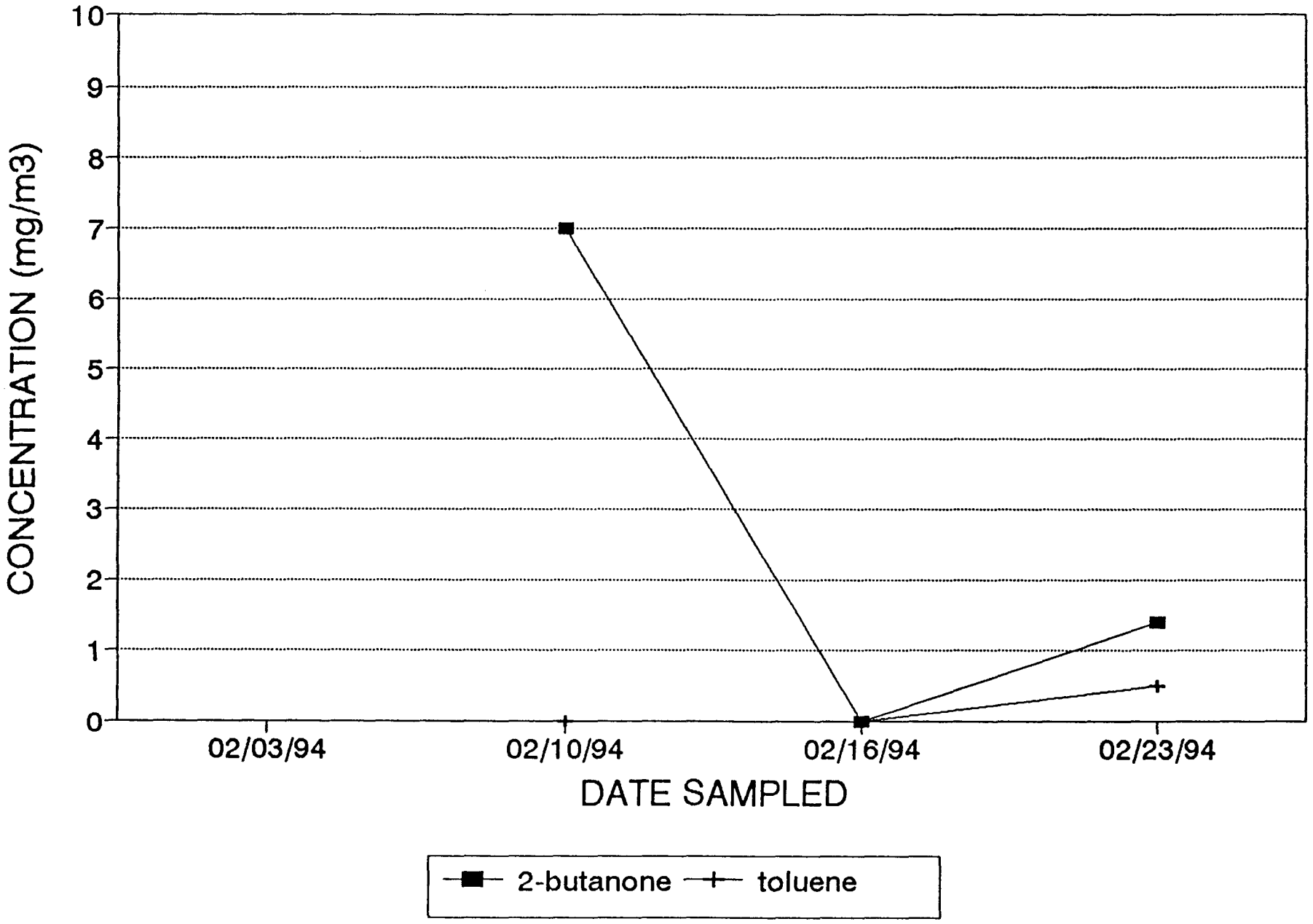


Figure 2: Shop Zone 2
Volatile Emissions

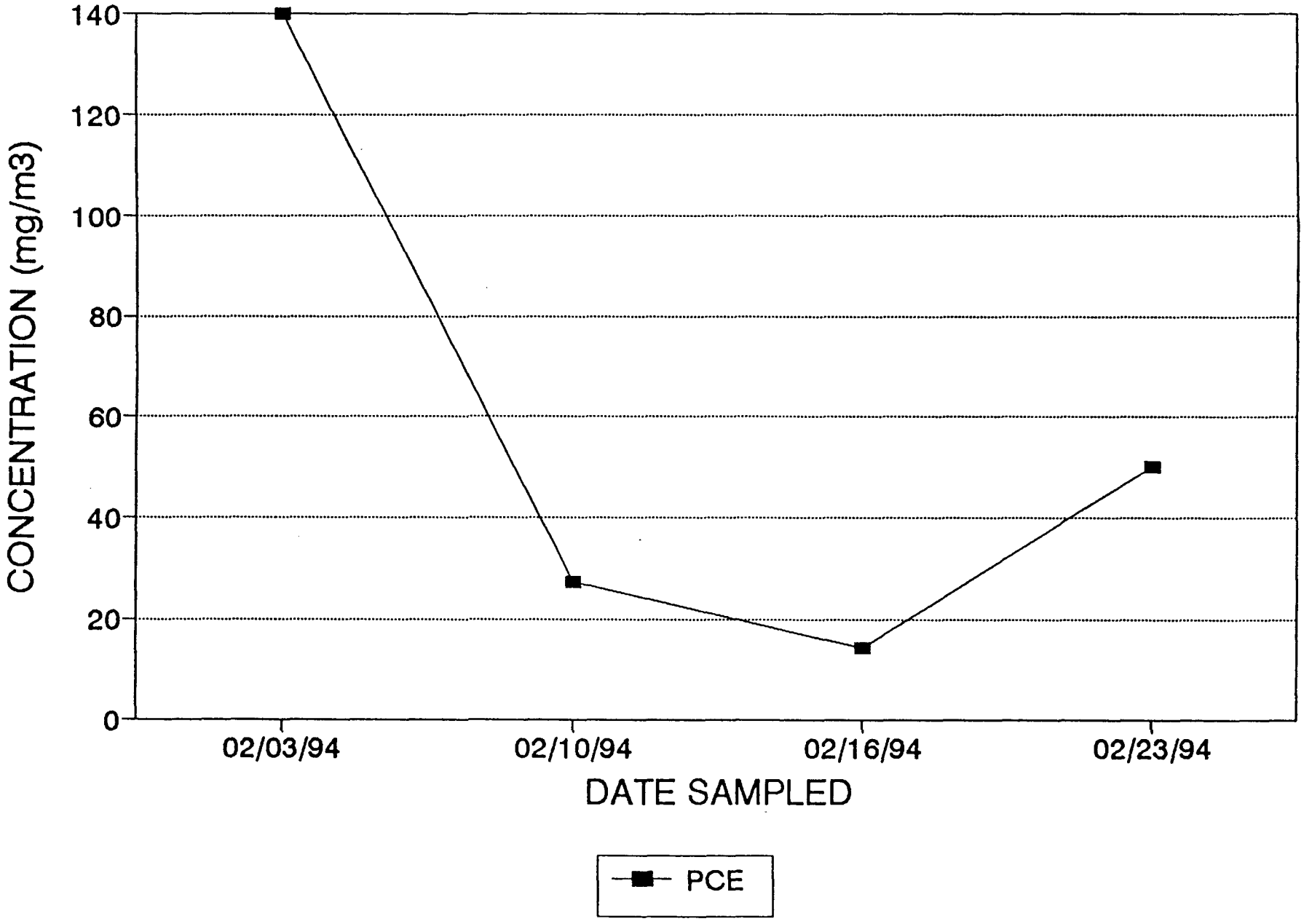


Figure 3: Washbay N. Zone 1
Volatile Emissions

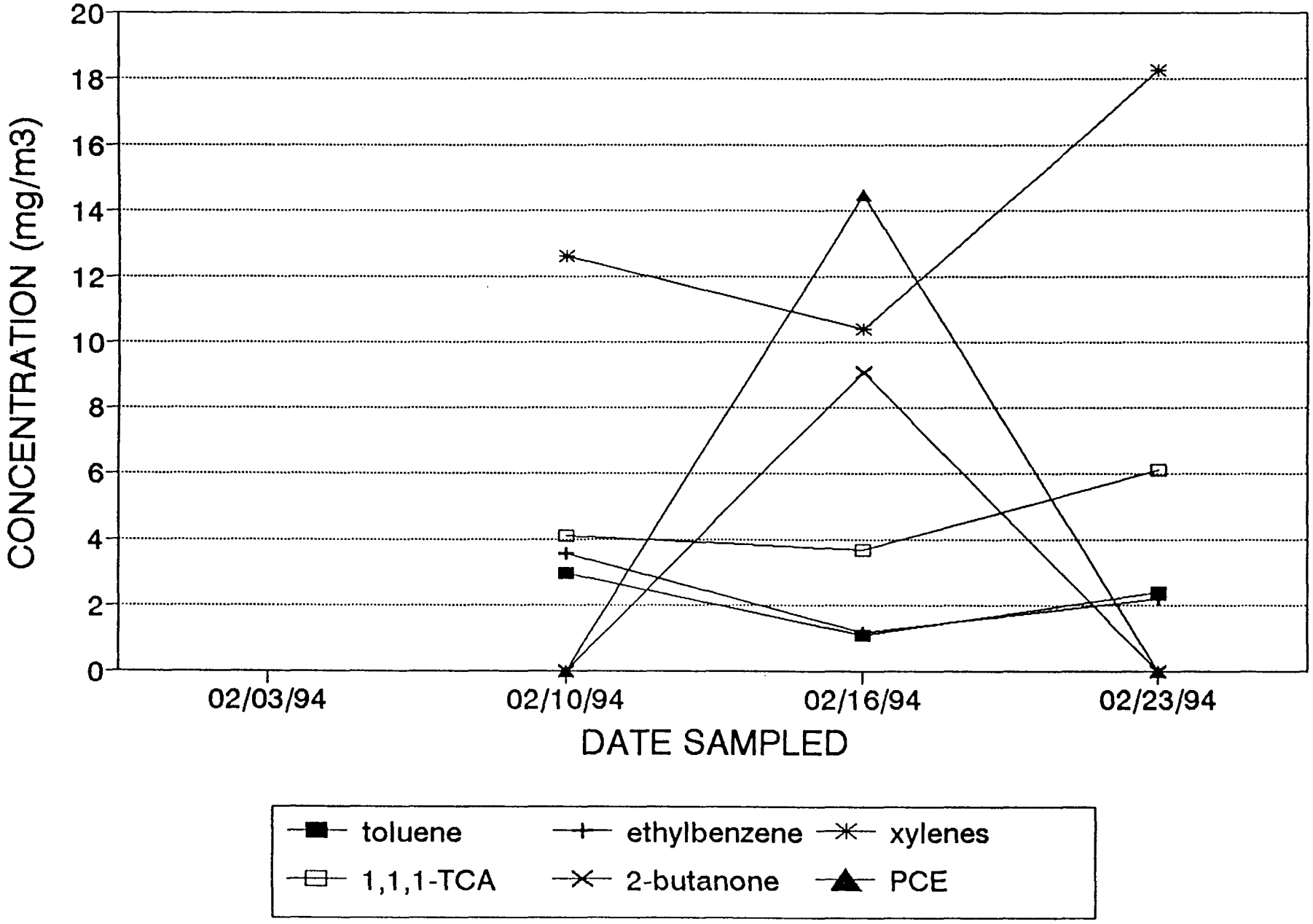


Figure 4: Washbay N. Zone 2
Volatile Emissions

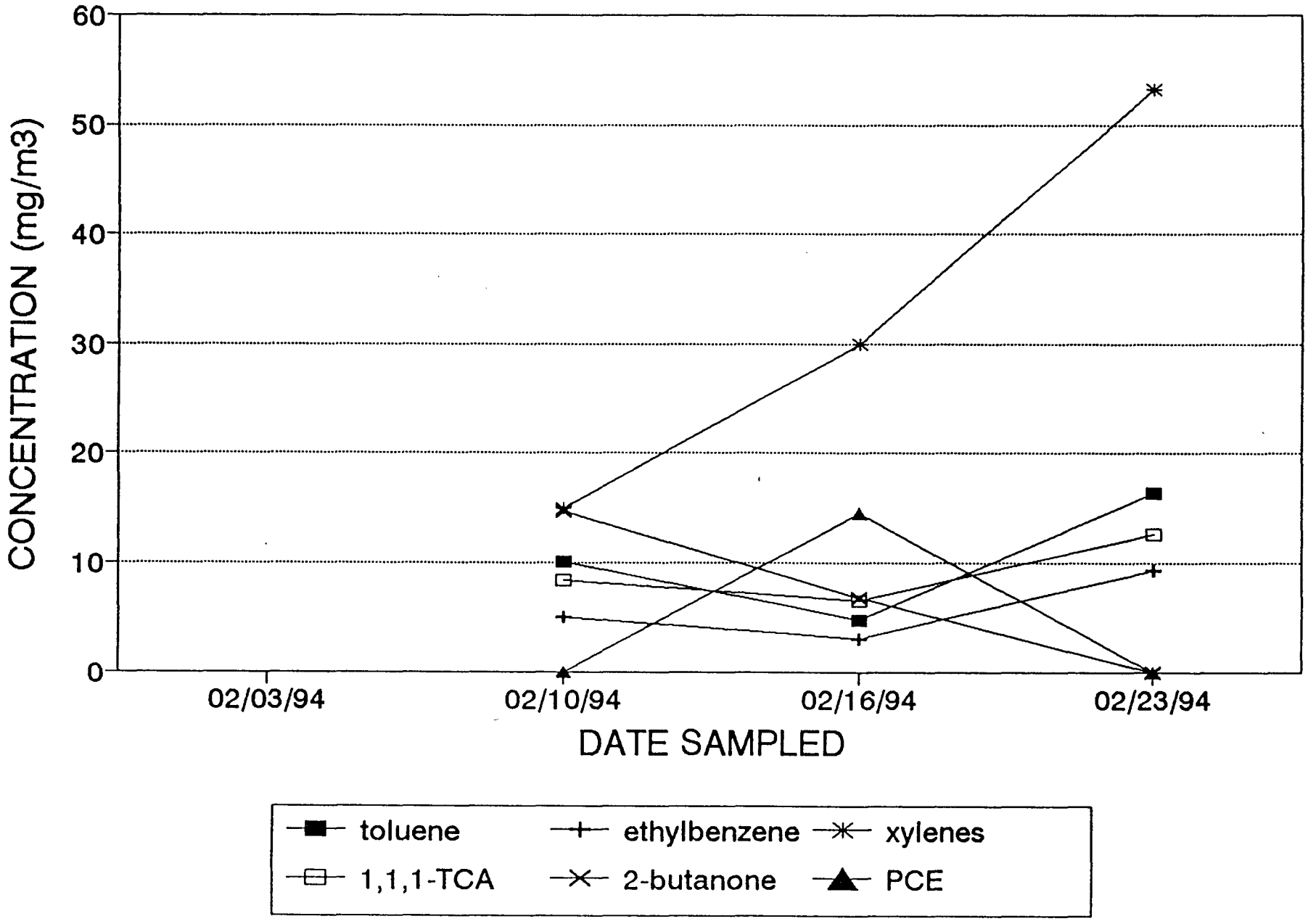
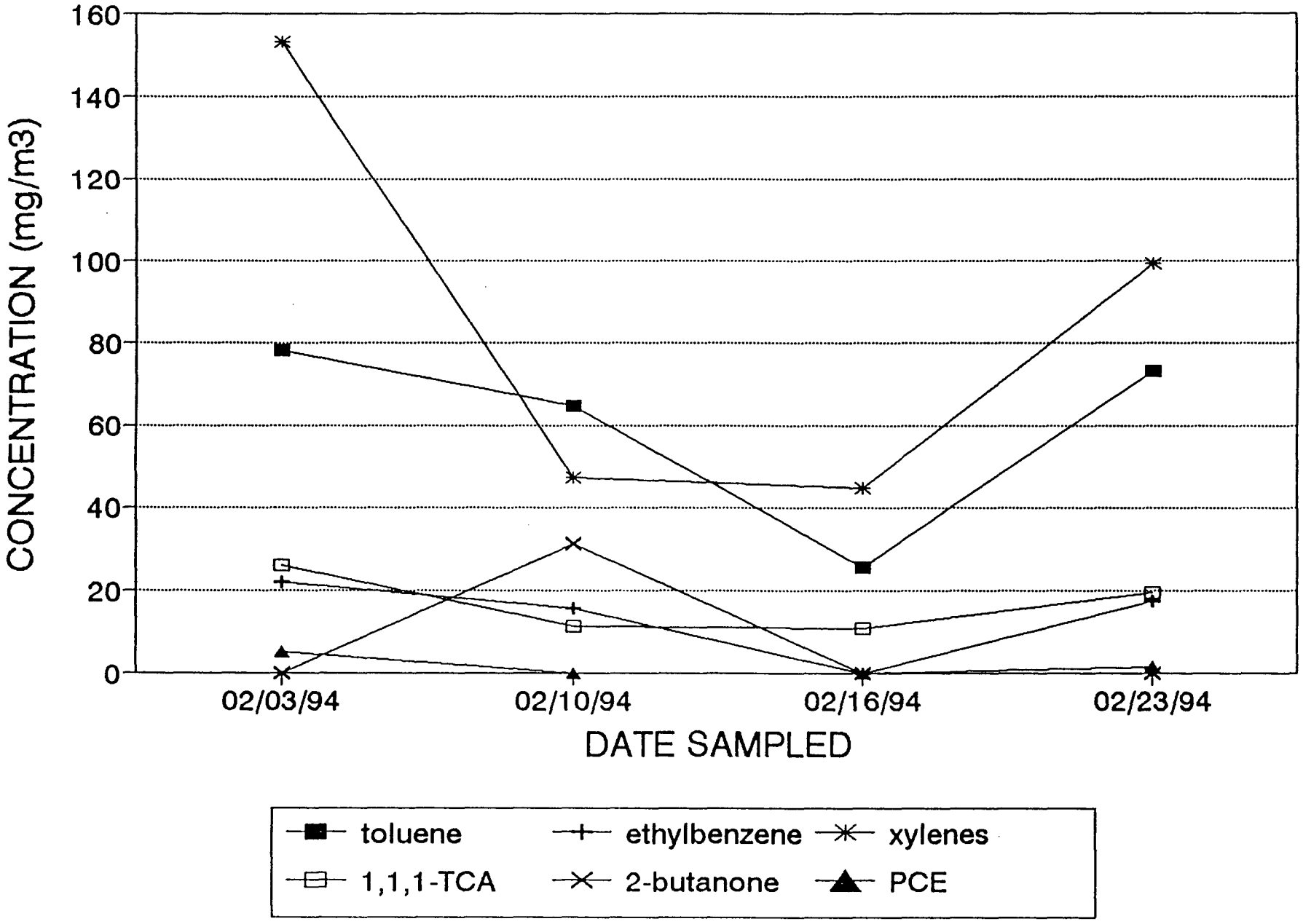


Figure 5: Washbay N. Zone 3
Volatile Emissions



APPENDIX A

Soil Vapor Laboratory Analysis

Initial SVE Analysis
Void data

CARDINAL LABORATORIES

PHONE (915) 673-7001
PHONE (505) 393-2326
PHONE (505) 326-4669 • 118

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY

Date: 02/07/94
Lab #: H1516-0

ENSTOL
LARAMIE, WY. 82070

Project Name: Dowell Schluberger
Project Location: Artesia Yard
Sampled by: BM
Type of Sample: Air
Sample ID: Zone 1

Date: 02/01/03/94
Sample Condition: Tedlar

VOLATILES

PARAMETER	RESULT	UNITS
1,1-Dichloroethene	<1.0	ug/L
1,1-Dichloroethane	<1.0	ug/L
Benzene	<0.5	ug/L
Trichloroethene	<1.0	ug/L
Toluene	<0.5	ug/L
Tetrachloroethene	<0.5	ug/L
Chlorobenzene	<0.5	ug/L
Ethyl Benzene	<0.5	ug/L
m,p-Xylene	<0.5	ug/L
o-Xylene	<0.5	ug/L
1,1,2,2-Tetrachloroethane	<0.5	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-7-94

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY

Date: 02/07/94
Lab #: H1516-2

Project Name: Dowell Schluberger
Project Location: Artesia Yard
Sampled by: BM
Type of Sample: Air
Sample ID: Zone 2

Date: 02/03/94
Sample Condition: Tedlar

VOLATILES

PARAMETER	RESULT	UNITS
1,1-Dichloroethene	<1.0	ug/L
1,1-Dichloroethane	<1.0	ug/L
Benzene	<0.5	ug/L
Trichloroethene	<1.0	ug/L
Toluene	<0.5	ug/L
Tetrachloroethene	8.1	ug/L
Chlorobenzene	<0.5	ug/L
Ethyl Benzene	<0.5	ug/L
m,p-Xylene	<0.5	ug/L
o-Xylene	<0.5	ug/L
1,1,2,2-Tetrachloroethane	<0.5	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-7-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY

Date: 02/07/94
Lab #: H1516-3

Project Name: Dowell Schluberger
Project Location: Artesia Yard
Sampled by: BM
Type of Sample: Air
Sample ID: N. Zone 1

Date: 02/03/94
Sample Condition: Tedlar

VOLATILES

PARAMETER	RESULT	UNITS
1,1-Dichloroethene	<1.0	ug/L
1,1-Dichloroethane	<1.0	ug/L
Benzene	<0.5	ug/L
Trichloroethene	<1.0	ug/L
Toluene	0.5	ug/L
Tetrachloroethene	<0.5	ug/L
Chlorobenzene	<0.5	ug/L
Ethyl Benzene	0.9	ug/L
m,p-Xylene	2.5	ug/L
o-Xylene	2.8	ug/L
1,1,2,2-Tetrachloroethane	<0.5	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-7-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY

Date: 02/07/94
Lab #: H1516-4

Project Name: Dowell Schluberger
Project Location: Artesia Yard
Sampled by: BM
Date: 02/03/94
Type of Sample: Air
Sample Condition: Tedlar
Sample ID: N. Zone 2

VOLATILES

PARAMETER	RESULT	UNITS
1,1-Dichloroethene	<1.0	ug/L
1,1-Dichloroethane	<1.0	ug/L
Benzene	<0.5	ug/L
Trichloroethene	<1.0	ug/L
Toluene	1.9	ug/L
Tetrachloroethene	<0.5	ug/L
Chlorobenzene	<0.5	ug/L
Ethyl Benzene	0.8	ug/L
m,p-Xylene	2.2	ug/L
o-Xylene	<0.5	ug/L
1,1,2,2-Tetrachloroethane	<0.5	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-7-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY

Date: 02/07/94
Lab #: H1516-5

Project Name: Dowell Schluberger
Project Location: Artesia Yard
Sampled by: BM
Type of Sample: Air
Sample ID: N. Zone 3

Date: ~~01~~ 02/03/94
Sample Condition: Tedlar

VOLATILES

PARAMETER	RESULT	UNITS
1,1-Dichloroethene	<1.0	ug/L
1,1-Dichloroethane	<1.0	ug/L
Benzene	<0.5	ug/L
Trichloroethene	<1.0	ug/L
Toluene	3.2	ug/L
Tetrachloroethene	<0.5	ug/L
Chlorobenzene	<0.5	ug/L
Ethyl Benzene	0.7	ug/L
m,p-Xylene	2.1	ug/L
o-Xylene	2.4	ug/L
1,1,2,2-Tetrachloroethane	<0.5	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-7-94

Michael R. Fowler

Environmental Analytical Services 160 miles

ARDINAL LABORATORIES

118 S. Commercial Ave.
Farmington, NM 87401
505-326-4669
FAX 505-326-4535

101 E. Marland
Hobbs, NM 88240
505-393-2326
FAX 505-393-2476

Chain of Custody Record

Project I.D. _____

Project Location Dowell - Schlumberger - Artesia

Sampled By Bill McDaniels

Client Name Western Water Consultants

Address _____

Telephone _____

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required	Remarks (Type sample, preservation, etc.)
Zone1	3/3	11:00		✓		1		Tedlar Bag
Zone2	3/3	1		✓		1		"
NZone1	3/3	1		✓		1		"
NZone2	3/3	1		✓		1		"
NZone3	3/3	1		✓		1		"

Released by: (Signature)	Date	Time	Received by: (Signature)
Scott Gustin	3/3	11:00	Bill McDaniels
Released by: (Signature)	Date	Time	Received by: (Signature)

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for the analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

CASE NARRATIVE

On February 04,1994, two air samples were received for analysis at Inter-Mountain Laboratories, Bozeman, Montana. The chain of custody form requested analysis by Method 8240. Client / Project name was listed as Western Water Consultants, Inc. / 0125.

Enclosed are the results of these analyses. Detectable levels of targeted analytes were present in the samples.

Limits of detection for each instrument/analysis are determined by sample matrix effects, instrument performance under standard conditions, and dilution requirements to maintain chromatography output within calibration ranges. Quantitations have been calculated on an as received basis.

Dirk M. Millhouse
IML-Bozeman

re:wwcf10a

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
HSL VOLATILE COMPOUNDS

Client:	WESTERN WATER CONSULTANTS, INC.		
Sample ID:	Zone 2	Date Reported:	02/10/94
Project ID:	#0125	Date Sampled:	02/03/94
Laboratory ID:	B941870	Date Received:	02/04/94
Sample Matrix:	Air	Date Extracted:	NA
Preservation:	Cool	Date Analyzed:	02/04/94
Condition:	Intact		

Parameter	Analytical Result		Detection Limit	Units
1,1,1-Trichloroethane	2.2		0.5	mg/m3
1,1,2,2-Tetrachloroethane	ND		0.5	mg/m3
1,1,2-Trichloroethane	ND		0.5	mg/m3
1,1-Dichloroethane	1.6		0.5	mg/m3
1,1-Dichloroethene	ND		0.5	mg/m3
1,2-Dichloroethane	ND		0.5	mg/m3
1,2-Dichloropropane	ND		0.5	mg/m3
2-Butanone	ND		2	mg/m3
2-Hexanone	ND		0.5	mg/m3
4-Methyl-2-pentanone	ND		0.5	mg/m3
Acetone	ND		2	mg/m3
Benzene	0.7		0.5	mg/m3
Bromodichloromethane	ND		0.5	mg/m3
Bromoform	ND		0.5	mg/m3
Bromomethane	ND		0.5	mg/m3
Carbon Disulfide	ND		0.5	mg/m3
Carbon Tetrachloride	ND		0.5	mg/m3
Chlorobenzene	ND		0.5	mg/m3
Chloroethane	ND		0.5	mg/m3
Chloroform	ND		0.5	mg/m3
Chloromethane	ND		0.5	mg/m3
cis-1,3-Dichloropropene	ND		0.5	mg/m3
Dibromochloromethane	ND		0.5	mg/m3
Ethylbenzene	0.2	J	0.5	mg/m3
m,p-Xylene	ND		0.5	mg/m3
Methylene Chloride	ND		2	mg/m3
o-Xylene	ND		0.5	mg/m3
Styrene	ND		0.5	mg/m3

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
HSL VOLATILE COMPOUNDS

Client:	WESTERN WATER CONSULTANTS, INC.		
Sample ID:	Zone 2	Date Reported:	02/10/94
Laboratory ID:	8941870	Date Sampled:	02/03/94
Sample Matrix:	Air	Date Analyzed:	02/04/94

Parameter	Analytical Result	Detection Limit	Units
Tetrachloroethene	140	5	mg/m3
Toluene	ND	0.5	mg/m3
trans-1,2-Dichloroethene	ND	0.5	mg/m3
trans-1,3-Dichloropropene	ND	0.5	mg/m3
Trichloroethene	0.68	0.5	mg/m3
Vinyl Chloride	ND	0.5	mg/m3

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	WESTERN WATER CONSULTANTS, INC.		
Sample ID:	Zone 2	Date Reported:	02/10/94
Laboratory ID:	B941870	Date Sampled:	02/03/94
Sample Matrix:	Air	Date Analyzed:	02/04/94

Tentative Identification	Retention Time (min)	Concentration	Units

No additional compounds found at levels greater than 2mg/m3.

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%	Air QC Limits
1,2-Dichloroethane-d4	103	70 - 121
Toluene-d8	103	81 - 117
Bromofluorobenzene	105	74 - 121

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Analyst

Reviewed

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
HSL VOLATILE COMPOUNDS

Client:	WESTERN WATER CONSULTANTS, INC.		
Sample ID:	N. Zone 3	Date Reported:	02/10/94
Project ID:	#0125	Date Sampled:	02/03/94
Laboratory ID:	B941871	Date Received:	02/04/94
Sample Matrix:	Air	Date Extracted:	NA
Preservation:	Cool	Date Analyzed:	02/04/94
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
1,1,1-Trichloroethane	26	1	mg\m3
1,1,2,2-Tetrachloroethane	ND	0.5	mg\m3
1,1,2-Trichloroethane	ND	0.5	mg\m3
1,1-Dichloroethane	1.2	0.5	mg\m3
1,1-Dichloroethene	2.8	0.5	mg\m3
1,2-Dichloroethane	ND	0.5	mg\m3
1,2-Dichloropropane	ND	0.5	mg\m3
2-Butanone	ND	2	mg\m3
2-Hexanone	ND	0.5	mg\m3
4-Methyl-2-pentanone	ND	0.5	mg\m3
Acetone	ND	2	mg\m3
Benzene	5.5	0.5	mg\m3
Bromodichloromethane	ND	0.5	mg\m3
Bromoform	ND	0.5	mg\m3
Bromomethane	ND	0.5	mg\m3
Carbon Disulfide	0.65	0.5	mg\m3
Carbon Tetrachloride	ND	0.5	mg\m3
Chlorobenzene	ND	0.5	mg\m3
Chloroethane	ND	0.5	mg\m3
Chloroform	ND	0.5	mg\m3
Chloromethane	ND	0.5	mg\m3
cis-1,3-Dichloropropene	ND	0.5	mg\m3
Dibromochloromethane	ND	0.5	mg\m3
Ethylbenzene	22	5	mg\m3
m,p-Xylene	71	5	mg\m3
Methylene Chloride	ND	2	mg\m3
o-Xylene	82	5	mg\m3
Styrene	ND	0.5	mg\m3

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
HSL VOLATILE COMPOUNDS

Client:	WESTERN WATER CONSULTANTS, INC.		
Sample ID:	N. Zone 3	Date Reported:	02/10/94
Laboratory ID:	B941871	Date Sampled:	02/03/94
Sample Matrix:	Air	Date Analyzed:	02/04/94

Parameter	Analytical Result	Detection Limit	Units
Tetrachloroethene	5.2	0.5	mg\m3
Toluene	78	5	mg\m3
trans-1,2-Dichloroethene	ND	0.5	mg\m3
trans-1,3-Dichloropropene	ND	0.5	mg\m3
Trichloroethene	ND	0.5	mg\m3
Vinyl Chloride	ND	0.5	mg\m3

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	WESTERN WATER CONSULTANTS, INC.		
Sample ID:	N. Zone 3	Date Reported:	02/10/94
Laboratory ID:	B941871	Date Sampled:	02/03/94
Sample Matrix:	Air	Date Analyzed:	02/04/94

Tentative Identification	Retention Time (min)	Concentration	Units
Unknown hydrocarbon	11.70	60	mg/m3
Unknown aromatic	17.20	10	mg/m3
Unknown aromatic	17.82	10	mg/m3
Unknown hydrocarbon	19.06	20	mg/m3
Unknown hydrocarbon	19.29	10	mg/m3

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%	Air QC Limits
1,2-Dichloroethane-d4	107	70 - 121
Toluene-d8 *	135	81 - 117
Bromofluorobenzene	103	74 - 121

* low surrogate recovery due to matrix effect.

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Analyst

Reviewed

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

QUALITY ASSURANCE / QUALITY CONTROL

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
HSL VOLATILE COMPOUNDS
METHOD BLANK

Client:	WESTERN WATER CONSULTANTS, INC.		
Sample ID:	Method Blank	Date Reported:	02/10/94
Project ID:	#0125	Date Sampled:	NA
Laboratory ID:	Q035B	Date Received:	NA
Sample Matrix:	Air	Date Extracted:	NA
Preservation:	NA	Date Analyzed:	02/04/94
Condition:	NA		

Parameter	Analytical Result	Detection Limit	Units
1,1,1-Trichloroethane	ND	0.5	mg/m3
1,1,2,2-Tetrachloroethane	ND	0.5	mg/m3
1,1,2-Trichloroethane	ND	0.5	mg/m3
1,1-Dichloroethane	ND	0.5	mg/m3
1,1-Dichloroethene	ND	0.5	mg/m3
1,2-Dichloroethane	ND	0.5	mg/m3
1,2-Dichloropropane	ND	0.5	mg/m3
2-Butanone	ND	2	mg/m3
2-Hexanone	ND	0.5	mg/m3
4-Methyl-2-pentanone	ND	0.5	mg/m3
Acetone	ND	2	mg/m3
Benzene	ND	0.5	mg/m3
Bromodichloromethane	ND	0.5	mg/m3
Bromoform	ND	0.5	mg/m3
Bromomethane	ND	0.5	mg/m3
Carbon Disulfide	ND	0.5	mg/m3
Carbon Tetrachloride	ND	0.5	mg/m3
Chlorobenzene	ND	0.5	mg/m3
Chloroethane	ND	0.5	mg/m3
Chloroform	ND	0.5	mg/m3
Chloromethane	ND	0.5	mg/m3
cis-1,3-Dichloropropene	ND	0.5	mg/m3
Dibromochloromethane	ND	0.5	mg/m3
Ethylbenzene	ND	0.5	mg/m3
m,p-Xylene	ND	0.5	mg/m3
Methylene Chloride	ND	2	mg/m3
o-Xylene	ND	0.5	mg/m3
Styrene	ND	0.5	mg/m3

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
HSL VOLATILE COMPOUNDS

Client:	WESTERN WATER CONSULTANTS, INC.		
Sample ID:	Method Blank	Date Reported:	02/10/94
Laboratory ID:	Q0358	Date Sampled:	NA
Sample Matrix:	Air	Date Analyzed:	02/04/94

Parameter	Analytical Result	Detection Limit	Units
Tetrachloroethene	ND	0.5	mg/m3
Toluene	ND	0.5	mg/m3
trans-1,2-Dichloroethene	ND	0.5	mg/m3
trans-1,3-Dichloropropene	ND	0.5	mg/m3
Trichloroethene	ND	0.5	mg/m3
Vinyl Chloride	ND	0.5	mg/m3

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	WESTERN WATER CONSULTANTS, INC.		
Sample ID:	Method Blank	Date Reported:	02/10/94
Laboratory ID:	Q0358	Date Sampled:	NA
Sample Matrix:	Air	Date Analyzed:	02/04/94

Tentative Identification	Retention Time (min)	Concentration	Units

No additional compounds found at detectable levels.

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%	Air QC Limits
Dibromofluoromethane	109	70 - 121
Toluene-d8	99	81 - 117
Bromofluorobenzene	102	74 - 121

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Analyst

Reviewed

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
HSL VOLATILE COMPOUNDS
METHOD BLANK

Client:	WESTERN WATER CONSULTANTS, INC.		
Sample ID:	Method Blank	Date Reported:	02/10/94
Project ID:	#0125	Date Sampled:	NA
Laboratory ID:	Q038A	Date Received:	NA
Sample Matrix:	Air	Date Extracted:	NA
Preservation:	NA	Date Analyzed:	02/07/94
Condition:	NA		

Parameter	Analytical Result	Detection Limit	Units
1,1,1-Trichloroethane	ND	0.5	mg/m3
1,1,2,2-Tetrachloroethane	ND	0.5	mg/m3
1,1,2-Trichloroethane	ND	0.5	mg/m3
1,1-Dichloroethane	ND	0.5	mg/m3
1,1-Dichloroethene	ND	0.5	mg/m3
1,2-Dichloroethane	ND	0.5	mg/m3
1,2-Dichloropropane	ND	0.5	mg/m3
2-Butanone	ND	2	mg/m3
2-Hexanone	ND	0.5	mg/m3
4-Methyl-2-pentanone	ND	0.5	mg/m3
Acetone	ND	22	mg/m3
Benzene	ND	0.5	mg/m3
Bromodichloromethane	ND	0.5	mg/m3
Bromoform	ND	0.5	mg/m3
Bromomethane	ND	0.5	mg/m3
Carbon Disulfide	ND	0.5	mg/m3
Carbon Tetrachloride	ND	0.5	mg/m3
Chlorobenzene	ND	0.5	mg/m3
Chloroethane	ND	0.5	mg/m3
Chloroform	ND	0.5	mg/m3
Chloromethane	ND	0.5	mg/m3
cis-1,3-Dichloropropene	ND	0.5	mg/m3
Dibromochloromethane	ND	0.5	mg/m3
Ethylbenzene	ND	0.5	mg/m3
m,p-Xylene	ND	0.5	mg/m3
Methylene Chloride	ND	2	mg/m3
o-Xylene	ND	0.5	mg/m3
Styrene	ND	0.5	mg/m3

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
HSL VOLATILE COMPOUNDS

Client:	WESTERN WATER CONSULTANTS, INC.		
Sample ID:	Method Blank	Date Reported:	02/10/94
Laboratory ID:	Q038A	Date Sampled:	NA
Sample Matrix:	Air	Date Analyzed:	02/07/94

Parameter	Analytical Result	Detection Limit	Units
Tetrachloroethene	ND	0.5	mg/m3
Toluene	ND	0.5	mg/m3
trans-1,2-Dichloroethene	ND	0.5	mg/m3
trans-1,3-Dichloropropene	ND	0.5	mg/m3
Trichloroethene	ND	0.5	mg/m3
Vinyl Chloride	ND	0.5	mg/m3

ND - Compound not detected at stated Detection Limit.
J - Meets identification criteria, below Detection Limit.
B - Compound detected in method blank.

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8240
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	WESTERN WATER CONSULTANTS, INC.		
Sample ID:	Method Blank	Date Reported:	02/10/94
Laboratory ID:	Q038A	Date Sampled:	NA
Sample Matrix:	Air	Date Analyzed:	02/07/94

Tentative Identification	Retention Time (min)	Concentration	Units

No additional compounds found at detectable levels.

Unknown concentrations calculated assuming a Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recovery	%	Air QC Limits
1,2-Dichloroethane-d4	94	70 - 121
Toluene-d8	102	81 - 117
Bromofluorobenzene	99	74 - 121

References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

Analyst

Reviewed

Western Water Consultants, Inc.

CHAIN OF CUSTODY RECORD AND SAMPLING SHIPPING PAPERS

PROJECT NO. 0125 — PROJECT NAME

SAMPLERS: (signature) Scott Gustin

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	SAMPLE TYPE	NO. OF CONTAINERS	CONTAINER TYPE: 1L Teflon Bag						REMARKS
Zone 2	2-3-94	1200	✓		Air	1		B94/10-70					Analysis Requested on Both
N, Zone 3	2-3-94	12.15	✓		Air	1		B94/10-71					Samples: 1) 8240
													Samples shipped to Lab within
													12 hours of collect - overnite
													Delivery

Relinquished by: (signature)	Date / Time	Received by: (signature)	Relinquished by: (signature)	Date / Time	Received by: (signature)
Scott Gustin	2-3-94/1230	UPS (Carrier)	UPS (Carrier)	2/4/94 @1030	Valerie Herzon
Relinquished by: (signature)	Date / Time	Received by: (signature)	Relinquished by: (signature)	Date / Time	Received for Laboratory by: (signature)

DISTRIBUTION: White — ORIG. RETURN TO WWC

REMARKS: questions/comments contact Scott Gustin 307-742-0031

Cooler Temp. 15.2°

CARDINAL LABORATORIES

PHONE (915) 673-70
PHONE (505) 393-
PHONE (505) 326-4669 •

Cardinal second set

FINAL ANALYSIS

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Date: 2/10/94
Type of Sample: air
Sample Condition:
Sample ID: Zone 1

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<2.0	ug/L
Chloromethane	<2.0	ug/L
Vinyl Chloride	<2.0	ug/L
Chloroethane	<2.0	ug/L
Bromomethane	<2.0	ug/L
Trichlorofluoromethane	<2.0	ug/L
trans-1,2-Dichloroethene	<2.0	ug/L
Methylene Chloride	<2.0	ug/L
1,1-Dichloroethene	<2.0	ug/L
1,1-Dichloroethane	<2.0	ug/L
2-Butanone	7.0	ug/L
Chloroform	<2.0	ug/L
1,1,1-Trichloroethane	<2.0	ug/L
1,2-Dichloroethane	<2.0	ug/L
Carbon Tetrachloride	<2.0	ug/L
1,2-Dichloropropane	<2.0	ug/L
Trichloroethene	<2.0	ug/L
Bromodichloromethane	<2.0	ug/L
2-Chloroethylvinylether	<2.0	ug/L
1,3-Dichloropropene	<2.0	ug/L
1,1,2-Trichloroethane	<2.0	ug/L
Dibromochloromethane	<2.0	ug/L
Tetrachloroethene	<2.0	ug/L
Chlorobenzene	<2.0	ug/L
Bromoform	<2.0	ug/L
1,1,2,2-Tetrachloroethane	<2.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L
Benzene	<1.0	ug/L
Toluene	<1.0	ug/L
Ethyl Benzene	<1.0	ug/L
m,p-Xylene	<1.0	ug/L
o-Xylene	<1.0	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-14-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 2/14/94
Lab # H1526-2

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Type of Sample: air
Sample ID: Zone 2

Date: 2/10/94
Sample Condition:

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<2.0	ug/L
Chloromethane	<2.0	ug/L
Vinyl Chloride	<2.0	ug/L
Chloroethane	<2.0	ug/L
Bromomethane	<2.0	ug/L
Trichlorofluoromethane	<2.0	ug/L
trans-1,2-Dichloroethene	<2.0	ug/L
Methylene Chloride	<2.0	ug/L
1,1-Dichloroethene	<2.0	ug/L
1,1-Dichloroethane	<2.0	ug/L
2-Butanone	<2.0	ug/L
Chloroform	<2.0	ug/L
1,1,1-Trichloroethane	<2.0	ug/L
1,2-Dichloroethane	<2.0	ug/L
Carbon Tetrachloride	<2.0	ug/L
1,2-Dichloropropane	<2.0	ug/L
Trichloroethene	<2.0	ug/L
Bromodichloromethane	<2.0	ug/L
2-Chloroethylvinylether	<2.0	ug/L
1,3-Dichloropropene	<2.0	ug/L
1,1,2-Trichloroethane	<2.0	ug/L
Dibromochloromethane	<2.0	ug/L
Tetrachloroethene	27.25	ug/L
Chlorobenzene	<2.0	ug/L
Bromoform	<2.0	ug/L
1,1,2,2-Tetrachloroethane	<2.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L
Benzene	<1.0	ug/L
Toluene	<1.0	ug/L
Ethyl Benzene	<1.0	ug/L
m,p-Xylene	<1.0	ug/L
o-Xylene	<1.0	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-14-94

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 2/14/94
Lab # H1526-3

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Type of Sample: air
Sample ID: N Zone 1

Date: 2/10/94
Sample Condition:

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<2.0	ug/L
Chloromethane	<2.0	ug/L
Vinyl Chloride	<2.0	ug/L
Chloroethane	<2.0	ug/L
Bromomethane	<2.0	ug/L
Trichlorofluoromethane	<2.0	ug/L
trans-1,2-Dichloroethene	<2.0	ug/L
Methylene Chloride	<2.0	ug/L
1,1-Dichloroethene	<2.0	ug/L
1,1-Dichloroethane	<2.0	ug/L
2-Butanone	<2.0	ug/L
Chloroform	<2.0	ug/L
1,1,1-Trichloroethane	4.07	ug/L
1,2-Dichloroethane	<2.0	ug/L
Carbon Tetrachloride	<2.0	ug/L
1,2-Dichloropropane	<2.0	ug/L
Trichloroethene	<2.0	ug/L
Bromodichloromethane	<2.0	ug/L
2-Chloroethylvinylether	<2.0	ug/L
1,3-Dichloropropene	<2.0	ug/L
1,1,2-Trichloroethane	<2.0	ug/L
Dibromochloromethane	<2.0	ug/L
Tetrachloroethene	<2.0	ug/L
Chlorobenzene	<2.0	ug/L
Bromoform	<2.0	ug/L
1,1,2,2-Tetrachloroethane	<2.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L
Benzene	<1.0	ug/L
Toluene	2.98	ug/L
Ethyl Benzene	3.57	ug/L
m,p-Xylene	12.60	ug/L
o-Xylene	<1.0	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-14-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 2/14/94
Lab # H1526-4

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Type of Sample: air
Sample ID: N Zone 2

Date: 2/10/94
Sample Condition:

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<2.0	ug/L
Chloromethane	<2.0	ug/L
Vinyl Chloride	<2.0	ug/L
Chloroethane	<2.0	ug/L
Bromomethane	<2.0	ug/L
Trichlorofluoromethane	<2.0	ug/L
trans-1,2-Dichloroethene	<2.0	ug/L
Methylene Chloride	<2.0	ug/L
1,1-Dichloroethene	<2.0	ug/L
1,1-Dichloroethane	<2.0	ug/L
2-Butanone	14.71	ug/L
Chloroform	<2.0	ug/L
1,1,1-Trichloroethane	8.34	ug/L
1,2-Dichloroethane	<2.0	ug/L
Carbon Tetrachloride	<2.0	ug/L
1,2-Dichloropropane	<2.0	ug/L
Trichloroethene	<2.0	ug/L
Bromodichloromethane	<2.0	ug/L
2-Chloroethylvinylether	<2.0	ug/L
1,3-Dichloropropene	<2.0	ug/L
1,1,2-Trichloroethane	<2.0	ug/L
Dibromochloromethane	<2.0	ug/L
Tetrachloroethene	<2.0	ug/L
Chlorobenzene	<2.0	ug/L
Bromoform	<2.0	ug/L
1,1,2,2-Tetrachloroethane	<2.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L
Benzene	1.67	ug/L
Toluene	10.13	ug/L
Ethyl Benzene	5.03	ug/L
m,p-Xylene	14.9	ug/L
o-Xylene	<1.0	ug/L

Methods - GCMS

Michael R Fowler

Date 2-14-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 2/14/94
Lab # H1526-5

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Type of Sample: air
Sample ID: N Zone 3

Date: 2/10/94
Sample Condition:

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<2.0	ug/L
Chloromethane	<2.0	ug/L
Vinyl Chloride	<2.0	ug/L
Chloroethane	<2.0	ug/L
Bromomethane	<2.0	ug/L
Trichlorofluoromethane	3.18	ug/L
trans-1,2-Dichloroethene	<2.0	ug/L
Methylene Chloride	<2.0	ug/L
1,1-Dichloroethene	<2.0	ug/L
1,1-Dichloroethane	<2.0	ug/L
2-Butanone	31.33	ug/L
Chloroform	<2.0	ug/L
1,1,1-Trichloroethane	11.40	ug/L
1,2-Dichloroethane	<2.0	ug/L
Carbon Tetrachloride	<2.0	ug/L
1,2-Dichloropropane	<2.0	ug/L
Trichloroethene	<2.0	ug/L
Bromodichloromethane	<2.0	ug/L
2-Chloroethylvinylether	<2.0	ug/L
1,3-Dichloropropene	<2.0	ug/L
1,1,2-Trichloroethane	<2.0	ug/L
Dibromochloromethane	<2.0	ug/L
Tetrachloroethene	<2.0	ug/L
Chlorobenzene	<2.0	ug/L
Bromoform	<2.0	ug/L
1,1,2,2-Tetrachloroethane	<2.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L
Benzene	<1.0	ug/L
Toluene	64.6	ug/L
Ethyl Benzene	15.6	ug/L
m,p-Xylene	46.9	ug/L
o-Xylene	<1.0	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-14-94

WESTERN WATER CONSULTANTS, INC.

LARAMIE, WY 82070

PHONE (915) 673-7001 • 2111 BEEC
PHONE (505) 393-2326 • 101 E. MA
PHONE (505) 326-4669 • 118 S. COMMERC

AL
RIES

Week 3

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 02/21/94
Lab # H1532-1

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Date: 02/16/94
Type of Sample: Air
Sample Condition: Tedlar Bag
Sample ID: Zone 1

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<2.0	ug/L
Chloromethane	<2.0	ug/L
Vinyl Chloride	<2.0	ug/L
Chloroethane	<2.0	ug/L
Bromomethane	<2.0	ug/L
Trichlorofluoromethane	<2.0	ug/L
trans-1,2-Dichloroethene	<2.0	ug/L
Methylene Chloride	<2.0	ug/L
1,1-Dichloroethene	<2.0	ug/L
1,1-Dichloroethane	<2.0	ug/L
2-Butanone	<2.0	ug/L
Chloroform	<2.0	ug/L
1,1,1-Trichloroethane	<2.0	ug/L
1,2-Dichloroethane	<2.0	ug/L
Benzene	<1.0	ug/L
Carbon Tetrachloride	<2.0	ug/L
1,2-Dichloropropane	<2.0	ug/L
Trichloroethene	<2.0	ug/L
Bromodichloromethane	<2.0	ug/L
2-Chloroethylvinylether	<2.0	ug/L
1,3-Dichloropropene	<2.0	ug/L
Toluene	<1.0	ug/L
1,1,2-Trichloroethane	<2.0	ug/L
Dibromochloromethane	<2.0	ug/L
Tetrachloroethene	<1.0	ug/L
Chlorobenzene	<1.0	ug/L
Ethyl Benzene	<1.0	ug/L
Xylene (m,p,o)	<1.0	ug/L
Bromoform	<2.0	ug/L
1,1,2,2-Tetrachloroethane	<2.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-21-94

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 02/21/94
Lab # H1532-2

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Date: 02/16/94
Type of Sample: Air
Sample Condition: Tedlar Bag
Sample ID: Zone 2

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<2.0	ug/L
Chloromethane	<2.0	ug/L
Vinyl Chloride	<2.0	ug/L
Chloroethane	<2.0	ug/L
Bromomethane	<2.0	ug/L
Trichlorofluoromethane	<2.0	ug/L
trans-1,2-Dichloroethene	<2.0	ug/L
Methylene Chloride	<2.0	ug/L
1,1-Dichloroethene	<2.0	ug/L
1,1-Dichloroethane	<2.0	ug/L
2-Butanone	<2.0	ug/L
Chloroform	<2.0	ug/L
1,1,1-Trichloroethane	<2.0	ug/L
1,2-Dichloroethane	<2.0	ug/L
Benzene	<1.0	ug/L
Carbon Tetrachloride	<2.0	ug/L
1,2-Dichloropropane	<2.0	ug/L
Trichloroethene	<2.0	ug/L
Bromodichloromethane	<2.0	ug/L
2-Chloroethylvinylether	<2.0	ug/L
1,3-Dichloropropene	<2.0	ug/L
Toluene	<1.0	ug/L
1,1,2-Trichloroethane	<2.0	ug/L
Dibromochloromethane	<2.0	ug/L
Tetrachloroethene	14.5	ug/L
Chlorobenzene	<1.0	ug/L
Ethyl Benzene	<1.0	ug/L
Xylene (m,p,o)	<1.0	ug/L
Bromoform	<2.0	ug/L
1,1,2,2-Tetrachloroethane	<2.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-21-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 02/21/94
Lab # H1532-3

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Date: 02/16/94
Type of Sample: Air
Sample Condition: Tedlar Bag
Sample ID: N Zone 1

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<2.0	ug/L
Chloromethane	<2.0	ug/L
Vinyl Chloride	<2.0	ug/L
Chloroethane	<2.0	ug/L
Bromomethane	<2.0	ug/L
Trichlorofluoromethane	<2.0	ug/L
trans-1,2-Dichloroethene	<2.0	ug/L
Methylene Chloride	<2.0	ug/L
1,1-Dichloroethene	<2.0	ug/L
1,1-Dichloroethane	<2.0	ug/L
2-Butanone	9.1	ug/L
Chloroform	<2.0	ug/L
1,1,1-Trichloroethane	3.7	ug/L
1,2-Dichloroethane	<2.0	ug/L
Benzene	<1.0	ug/L
Carbon Tetrachloride	<2.0	ug/L
1,2-Dichloropropane	<2.0	ug/L
Trichloroethene	<2.0	ug/L
Bromodichloromethane	<2.0	ug/L
2-Chloroethylvinylether	<2.0	ug/L
1,3-Dichloropropene	<2.0	ug/L
Toluene	1.1	ug/L
1,1,2-Trichloroethane	<2.0	ug/L
Dibromochloromethane	<2.0	ug/L
Tetrachloroethene	14.5	ug/L
Chlorobenzene	<1.0	ug/L
Ethyl Benzene	1.2	ug/L
Xylene (m,p,o)	10.4	ug/L
Bromoform	<2.0	ug/L
1,1,2,2-Tetrachloroethane	<2.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-21-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 02/21/94
Lab # H1532-4

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Type of Sample: Air
Sample ID: N Zone 2

Date: 02/16/94
Sample Condition: Tedlar Bag

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<2.0	ug/L
Chloromethane	<2.0	ug/L
Vinyl Chloride	<2.0	ug/L
Chloroethane	<2.0	ug/L
Bromomethane	<2.0	ug/L
Trichlorofluoromethane	<2.0	ug/L
trans-1,2-Dichloroethene	<2.0	ug/L
Methylene Chloride	<2.0	ug/L
1,1-Dichloroethene	<2.0	ug/L
1,1-Dichloroethane	<2.0	ug/L
2-Butanone	6.7	ug/L
Chloroform	<2.0	ug/L
1,1,1-Trichloroethane	6.5	ug/L
1,2-Dichloroethane	<2.0	ug/L
Benzene	<1.0	ug/L
Carbon Tetrachloride	<2.0	ug/L
1,2-Dichloropropane	<2.0	ug/L
Trichloroethene	<2.0	ug/L
Bromodichloromethane	<2.0	ug/L
2-Chloroethylvinylether	<2.0	ug/L
1,3-Dichloropropene	<2.0	ug/L
Toluene	4.8	ug/L
1,1,2-Trichloroethane	<2.0	ug/L
Dibromochloromethane	<2.0	ug/L
Tetrachloroethene	14.5	ug/L
Chlorobenzene	<1.0	ug/L
Ethyl Benzene	3.0	ug/L
Xylene (m,p,o)	29.9	ug/L
Bromoform	<2.0	ug/L
1,1,2,2-Tetrachloroethane	<2.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-21-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 02/21/94
Lab # H1532-5

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Date: 02/16/94
Type of Sample: Air
Sample Condition: Tedlar Bag
Sample ID: N Zone 3

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<2.0	ug/L
Chloromethane	<2.0	ug/L
Vinyl Chloride	<2.0	ug/L
Chloroethane	<2.0	ug/L
Bromomethane	<2.0	ug/L
Trichlorofluoromethane	<2.0	ug/L
trans-1,2-Dichloroethene	<2.0	ug/L
Methylene Chloride	<2.0	ug/L
1,1-Dichloroethene	<2.0	ug/L
1,1-Dichloroethane	<2.0	ug/L
2-Butanone	<2.0	ug/L
Chloroform	<2.0	ug/L
1,1,1-Trichloroethane	11.0	ug/L
1,2-Dichloroethane	<2.0	ug/L
Benzene	<1.0	ug/L
Carbon Tetrachloride	<2.0	ug/L
1,2-Dichloropropane	<2.0	ug/L
Trichloroethene	<2.0	ug/L
Bromodichloromethane	<2.0	ug/L
2-Chloroethylvinylether	<2.0	ug/L
1,3-Dichloropropene	<2.0	ug/L
Toluene	25.7	ug/L
1,1,2-Trichloroethane	<2.0	ug/L
Dibromochloromethane	<2.0	ug/L
Tetrachloroethene	<1.0	ug/L
Chlorobenzene	<1.0	ug/L
Ethyl Benzene	<1.0	ug/L
Xylene (m,p,o)	44.5	ug/L
Bromoform	<2.0	ug/L
1,1,2,2-Tetrachloroethane	<2.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-21-94

Michael R. Fowler

Group 3

160 mi/hr

Western Water Consultants, Inc.

CHAIN OF CUSTODY RECORD AND SAMPLING SHIPPING PAPERS

PROJECT NO. PROJECT NAME: 0125.4

SAMPLERS: (signature)

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	SAMPLE TYPE	NO. OF CONTAINERS	CONTAINER TYPE: Tedlar Bag						REMARKS
Zone 1			X		Air	1	✓						Analysis Requested on all samples: 1) 8240
Zone 2			X			1	✓						
N. Zone 1			X			1	✓						
N. Zone 2			X			1	✓						
N. Zone 3			X		↓	1	✓						

Relinquished by: (signature)	Date / Time	Received by: (signature)	Relinquished by: (signature)	Date / Time	Received by: (signature)
Scott Gustin	2/16/94 10:42	Bill Williams			
Relinquished by: (signature)	Date / Time	Received by: (signature)	Relinquished by: (signature)	Date / Time	Received for Laboratory by: (signature)

DISTRIBUTION: White — ORIG. RETURN TO WWC

REMARKS: Direct all questions, reports and invoices To Scott Gustin 307-721-2913 Fx. 307-742-0031 ph.

AR
LAB(
PHONE (915) 673-7001 • 2111 BEI
PHONE (505) 393-2326 • 101 E.
HONE (505) 326-4669 • 118 S. COMME

Week 4

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 02/24/94
Lab # H1546-1

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Date: 02/23/94
Type of Sample: Air
Sample Condition: Tedlar Bag
Sample ID: Zone 1

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<1.0	ug/L
Chloromethane	<1.0	ug/L
Vinyl Chloride	<1.0	ug/L
Chloroethane	<1.0	ug/L
Bromomethane	<1.0	ug/L
Trichlorofluoromethane	<1.0	ug/L
trans-1,2-Dichloroethene	<1.0	ug/L
Methylene Chloride	<1.0	ug/L
1,1-Dichloroethene	<1.0	ug/L
1,1-Dichloroethane	<1.0	ug/L
2-Butanone	1.4	ug/L
Chloroform	<1.0	ug/L
1,1,1-Trichloroethane	<1.0	ug/L
1,2-Dichloroethane	<1.0	ug/L
Benzene	<0.5	ug/L
Carbon Tetrachloride	<1.0	ug/L
1,2-Dichloropropane	<1.0	ug/L
Trichloroethene	<1.0	ug/L
Bromodichloromethane	<1.0	ug/L
2-Chloroethylvinylether	<1.0	ug/L
1,3-Dichloropropene	<1.0	ug/L
Toluene	0.51	ug/L
1,1,2-Trichloroethane	<1.0	ug/L
Dibromochloromethane	<1.0	ug/L
Tetrachloroethene	<0.5	ug/L
Chlorobenzene	<0.5	ug/L
Ethyl Benzene	<0.5	ug/L
Xylene (m,p,o)	<0.5	ug/L
Bromoform	<1.0	ug/L
1,1,2,2-Tetrachloroethane	<1.0	ug/L
1,3-Dichlorobenzene	<0.5	ug/L
1,4-Dichlorobenzene	<0.5	ug/L
1,2-Dichlorobenzene	<0.5	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-24-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TEXAS 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 02/24/94
Lab # H1546-2

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Type of Sample: Air
Sample ID: Zone 2

Date: 02/23/94
Sample Condition: Tedlar Bag

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<1.0	ug/L
Chloromethane	<1.0	ug/L
Vinyl Chloride	<1.0	ug/L
Chloroethane	<1.0	ug/L
Bromomethane	<1.0	ug/L
Trichlorofluoromethane	<1.0	ug/L
trans-1,2-Dichloroethene	<1.0	ug/L
Methylene Chloride	<1.0	ug/L
1,1-Dichloroethene	<1.0	ug/L
1,1-Dichloroethane	<1.0	ug/L
2-Butanone	1.8	ug/L
Chloroform	<1.0	ug/L
1,1,1-Trichloroethane	<1.0	ug/L
1,2-Dichloroethane	<1.0	ug/L
Benzene	<0.5	ug/L
Carbon Tetrachloride	<1.0	ug/L
1,2-Dichloropropane	<1.0	ug/L
Trichloroethene	<1.0	ug/L
Bromodichloromethane	<1.0	ug/L
2-Chloroethylvinylether	<1.0	ug/L
1,3-Dichloropropene	<1.0	ug/L
Toluene	<0.5	ug/L
1,1,2-Trichloroethane	<1.0	ug/L
Dibromochloromethane	<1.0	ug/L
Tetrachloroethene	50.2	ug/L
Chlorobenzene	<0.5	ug/L
Ethyl Benzene	<0.5	ug/L
Xylene (m,p,o)	<0.5	ug/L
Bromoform	<1.0	ug/L
1,1,2,2-Tetrachloroethane	<1.0	ug/L
1,3-Dichlorobenzene	<0.5	ug/L
1,4-Dichlorobenzene	<0.5	ug/L
1,2-Dichlorobenzene	<0.5	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-24-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TEXAS 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 02/24/94
Lab # H1546-3

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Date: 02/23/94
Type of Sample: Air
Sample Condition: Tedlar Bag
Sample ID: N Zone 1

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<1.0	ug/L
Chloromethane	<1.0	ug/L
Vinyl Chloride	<1.0	ug/L
Chloroethane	<1.0	ug/L
Bromomethane	<1.0	ug/L
Trichlorofluoromethane	<1.0	ug/L
trans-1,2-Dichloroethene	<1.0	ug/L
Methylene Chloride	<1.0	ug/L
1,1-Dichloroethene	<1.0	ug/L
1,1-Dichloroethane	<1.0	ug/L
2-Butanone	<1.0	ug/L
Chloroform	<1.0	ug/L
1,1,1-Trichloroethane	6.1	ug/L
1,2-Dichloroethane	<1.0	ug/L
Benzene	<0.5	ug/L
Carbon Tetrachloride	<1.0	ug/L
1,2-Dichloropropane	<1.0	ug/L
Trichloroethene	<1.0	ug/L
Bromodichloromethane	<1.0	ug/L
2-Chloroethylvinylether	<1.0	ug/L
1,3-Dichloropropene	<1.0	ug/L
Toluene	2.4	ug/L
1,1,2-Trichloroethane	<1.0	ug/L
Dibromochloromethane	<1.0	ug/L
Tetrachloroethene	<0.5	ug/L
Chlorobenzene	<0.5	ug/L
Ethyl Benzene	2.2	ug/L
Xylene (m,p,o)	18.3	ug/L
Bromoform	<1.0	ug/L
1,1,2,2-Tetrachloroethane	<1.0	ug/L
1,3-Dichlorobenzene	<0.5	ug/L
1,4-Dichlorobenzene	<0.5	ug/L
1,2-Dichlorobenzene	<0.5	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-24-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 02/24/94
Lab # H1546-4

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Type of Sample: Air
Sample ID: N Zone 2

Date: 02/23/94
Sample Condition: Tedlar Bag

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<1.0	ug/L
Chloromethane	<1.0	ug/L
Vinyl Chloride	<1.0	ug/L
Chloroethane	<1.0	ug/L
Bromomethane	<1.0	ug/L
Trichlorofluoromethane	<1.0	ug/L
trans-1,2-Dichloroethene	<1.0	ug/L
Methylene Chloride	<1.0	ug/L
1,1-Dichloroethene	<1.0	ug/L
1,1-Dichloroethane	<1.0	ug/L
2-Butanone	<1.0	ug/L
Chloroform	<1.0	ug/L
1,1,1-Trichloroethane	12.6	ug/L
1,2-Dichloroethane	<1.0	ug/L
Benzene	1.4	ug/L
Carbon Tetrachloride	<1.0	ug/L
1,2-Dichloropropane	<1.0	ug/L
Trichloroethene	<1.0	ug/L
Bromodichloromethane	<1.0	ug/L
2-Chloroethylvinylether	<1.0	ug/L
1,3-Dichloropropene	<1.0	ug/L
Toluene	16.4	ug/L
1,1,2-Trichloroethane	<1.0	ug/L
Dibromochloromethane	<1.0	ug/L
Tetrachloroethene	<0.5	ug/L
Chlorobenzene	<0.5	ug/L
Ethyl Benzene	9.3	ug/L
Xylene (m,p,o)	53.2	ug/L
Bromoform	<1.0	ug/L
1,1,2,2-Tetrachloroethane	<1.0	ug/L
1,3-Dichlorobenzene	<0.5	ug/L
1,4-Dichlorobenzene	<0.5	ug/L
1,2-Dichlorobenzene	<0.5	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-24-94

Michael R. Fowler

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company: Western Water Consultants
Address: 611 Skyline
City, State: Laramie, WY 82070

Date: 02/24/94
Lab # H1546-5

Project Name: Dowell Schlumberger
Project Location: Artesia, NM
Sampled by: BM
Date: 02/23/94
Type of Sample: Air
Sample Condition: Tedlar Bag
Sample ID: N Zone 3

VOLATILES

PARAMETER	RESULT	UNITS
Dichlorodifluoromethane	<1.0	ug/L
Chloromethane	<1.0	ug/L
Vinyl Chloride	<1.0	ug/L
Chloroethane	<1.0	ug/L
Bromomethane	<1.0	ug/L
Trichlorofluoromethane	<1.0	ug/L
trans-1,2-Dichloroethene	<1.0	ug/L
Methylene Chloride	<1.0	ug/L
1,1-Dichloroethene	<1.0	ug/L
1,1-Dichloroethane	<1.0	ug/L
2-Butanone	<1.0	ug/L
Chloroform	<1.0	ug/L
1,1,1-Trichloroethane	19.3	ug/L
1,2-Dichloroethane	<1.0	ug/L
Benzene	3.5	ug/L
Carbon Tetrachloride	<1.0	ug/L
1,2-Dichloropropane	<1.0	ug/L
Trichloroethene	<1.0	ug/L
Bromodichloromethane	<1.0	ug/L
2-Chloroethylvinylether	<1.0	ug/L
1,3-Dichloropropene	<1.0	ug/L
Toluene	73.2	ug/L
1,1,2-Trichloroethane	<1.0	ug/L
Dibromochloromethane	<1.0	ug/L
Tetrachloroethene	1.6	ug/L
Chlorobenzene	<0.5	ug/L
Ethyl Benzene	17.5	ug/L
Xylene (m,p,o)	99.1	ug/L
Bromoform	<1.0	ug/L
1,1,2,2-Tetrachloroethane	<1.0	ug/L
1,3-Dichlorobenzene	<0.5	ug/L
1,4-Dichlorobenzene	<0.5	ug/L
1,2-Dichlorobenzene	<0.5	ug/L

Methods - GCMS

Michael R. Fowler

Date 2-24-94

Michael R. Fowler

Include with Report for H-1546

Shop System

DATE	HNu Reading Following Carbon (Either 1 or 2)	Zone 1 Reading No carbon	Zone 2 Reading No. Carbon
2-23-94	3.0	3	8

	Hour Meter	Vac. Ga. Before	Vac. Ga. After
2-23-94	531.0	37 (Zone 2)	41

WASH BAY System

DATE	HNu Reading Following carbon (1, 2. or 3)	N. Zone 1 No carbon	N. Zone 2 No carbon	N. Zone 3 No carbon
2-23.94	3 (confirmed)	22	54	118

~~Date~~ 2-23-94	Hour Meter	Vac. Ga. Before	Vac Ga. After
	528.5	39.0	42.0 (Zone 3)

3 hours
160 miles

Western Water Consultants, Inc.

CHAIN OF CUSTODY RECORD AND SAMPLING SHIPPING PAPERS

PROJECT NO. PROJECT NAME: 0125.4

SAMPLERS: (signature)

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	SAMPLE TYPE	NO. OF CONTAINERS	CONTAINER TYPE: Tedlar Bag						REMARKS
Zone 1			X		Air	1	✓						Analysis Requested on all samples: 1) 8240
Zone 2			X			1	✓						
N. Zone 1			X			1	✓						
N. Zone 2			X			1	✓						
N. Zone 3			X		↓	1	✓						

Relinquished by: (signature)	Date / Time	Received by: (signature)	Relinquished by: (signature)	Date / Time	Received by: (signature)
Scott Gustin	2/23/94 11:40	Bill Wynn			
Relinquished by: (signature)	Date / Time	Received by: (signature)	Relinquished by: (signature)	Date / Time	Received for Laboratory by: (signature)

DISTRIBUTION: White — ORIG. RETURN TO WWC

REMARKS: Direct all questions, reports and invoices To Scott Gustin 307-721-2913 Fx. 307-742-0031 ph.

APPENDIX B

Laboratory Analysis of Soils and Drill Cuttings

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

TCLP ANALYSIS REPORT

Company: Western Water Consultants, Inc. Date: 2/7/94
Address: 611 Skyline Lab # H1509
City, State: Laramie, WY 82070

Project Name: 0125
Project Location:
Sampled by: SG Date: 1/31/94
Type of Sample: Soil Sample Condition: not supplied

Sample ID: 0125 Pile

TCLP ORGANICS

PARAMETER	RESULT	UNITS
Benzene	<0.050	mg/L
Carbon Tetrachloride	<0.050	mg/L
Chlorobenzene	<0.050	mg/L
Chloroform	<0.050	mg/L
1,2-Dichloroethane	<0.050	mg/L
1,1-Dichloroethene	<0.050	mg/L
Tetrachloroethene	<0.050	mg/L
Trichloroethene	<0.050	mg/L
Vinyl Chloride	<0.050	mg/L
2-Butanone	0.286	mg/L

TCLP INORGANICS (Leachate)

PARAMETER	RESULT	UNITS
Arsenic	0.025	mg/L
Barium	0.28	mg/L
Cadmium	0.046	mg/L
Chromium	0.05	mg/L
Lead	0.35	mg/L
Mercury	<0.0005	mg/L
Selenium	0.009	mg/L
Silver	0.055	mg/L

METHODS: TCLP VOLATILES, METALS - 1311/8240/7000

Michael R. Fowler

2-7-94

Michael R. Fowler Date

Western Water Consultants, Inc.

CHAIN OF CUSTODY RECORD AND SAMPLING SHIPPING PAPERS

PROJECT NO. PROJECT NAME: 0125

SAMPLERS: (signature)

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	SAMPLE TYPE	NO. OF CONTAINERS	CONTAINER TYPE: 8oz Jars	REMARKS
0125 - P.1c	1-31-94	0715	✓		soil	2	✓	TCLP volatile Organics and metals analysis
								Request 7 day turn around

Relinquished by: (signature)	Date / Time	Received by: (signature)	Relinquished by: (signature)	Date / Time	Received by: (signature)
	1-31-94/0900				
Relinquished by: (signature)	Date / Time	Received by: (signature)	Relinquished by: (signature)	Date / Time	Received for Laboratory by: (signature)

DISTRIBUTION: White — ORIG. RETURN TO WWC

REMARKS:

QUALITY CONTROL/QUALITY ASSURANCE DATA

TUNEFILE: VTUN0201	ANALYSIS TIME:	2/1/94	08:32
STANDARD: VMID0201	ANALYSIS TIME:	2/2/94	10:05
DATAFILE: H1509 1V	ANALYSIS TIME:	2/1/94	14:01
SPIKE: VSPK0Z01	ANALYSIS TIME:	2/1/94	11:16

***** TUNING SPECIFICATIONS *****

Mass	Range	Mass Ref	Ratio	Status
50	10-40%	95	18.63	Pass
75	30-60%	95	57.78	Pass
95	100-100%	95	100.00	Pass
96	5-9%	95	6.16	Pass
173	0-2%	174	0.40	Pass
174	50-100%	95	50.38	Pass
175	5-9%	174	7.12	Pass
176	95-101%	174	96.71	Pass
177	5-9%	176	6.03	Pass

**** MATRIX SPIKE RECOVERIES ****

Compound	Spiked Amount	Sample Amount	MS Amount	MS % Rec	Rec. Limits
Vinyl Chloride	200	0.0	203.2	101.5	10-251
1,1-Dichloroethene	100	0.0	77.0	77.0	5-234
2-Butanone	200	0.0	268.7	134.3	50-150
Chloroform	100	0.0	119.8	119.7	80-120
1,2-Dichloroethane	100	0.0	95.8	95.8	49-155
Benzene	100	0.0	120.9	120.9	37-151
Carbon tetrachloride	100	0.0	89.6	89.6	70-140
Tetrachloroethene	100	0.0	90.5	90.5	64-148
Chlorobenzene	100	0.0	109.7	109.7	37-160

***** SURROGATE RECOVERIES *****

Surrogate	Amt Found	Amt Added	Percent Recovery	Recovery Limits
Pentafluorobenzene	119.8	100.0	119.8	80%-120%
Fluorobenzene	110.1	100.0	110.1	80%-120%
4-Bromofluorobenzene	100.7	100.0	100.7	86%-115%

QUALITY CONTROL/QUALITY ASSURANCE DATA

TUNEFILE: VTUN0201	ANALYSIS TIME: 2/1/94 08:32
STANDARD: VMID0201	ANALYSIS TIME: 2/2/94 10:05
DATAFILE: H1509 1V	ANALYSIS TIME: 2/1/94 14:01
SPIKE: VSPK0Z01	ANALYSIS TIME: 2/1/94 11:16

***** INTERNAL STANDARD AREA CHECK *****

Internal Standard	Data Area	STD Area	Ratio	Accept Ratio
Bromochloromethane	197022	225204	87%	50%-200%
1,4-Difluorobenzene	183603	226579	81%	50%-200%
Chlorobenzene-d5	195688	248725	79%	50%-200%

***** INTERNAL STANDARD RT CHECK *****

Internal Standard	Data Time	STD Time	Diff. (In Sec)	Accept Diff
Bromochloromethane	283	283	0	+/- 30 secs
1,4-Difluorobenzene	410	410	0	+/- 30 secs
Chlorobenzene-d5	873	872	1	+/- 30 secs

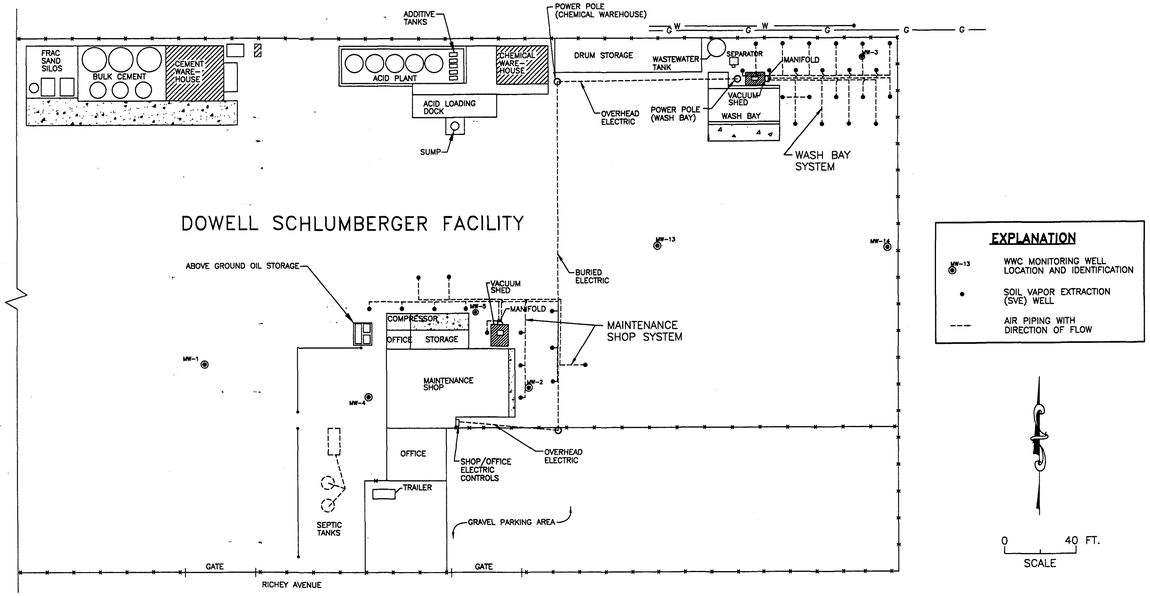
Michael R. Fowler

Date 2-10-94

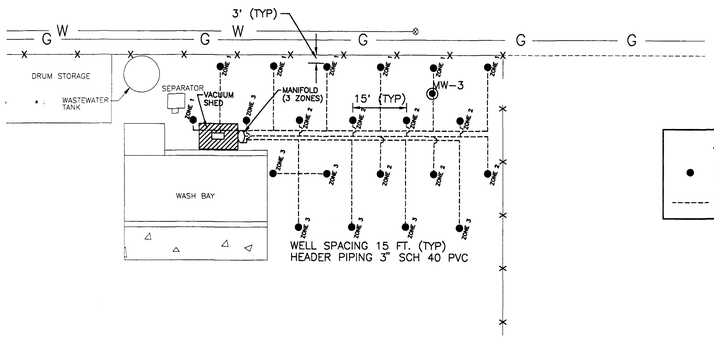
SOIL VAPOR EXTRACTION SYSTEM

AS-BUILT DRAWINGS
DOWELL SCHLUMBERGER INCORPORATED
ARTESIA, NEW MEXICO

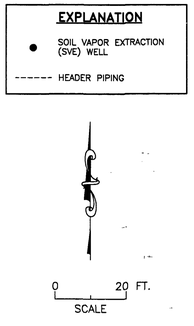
PLAN INDEX

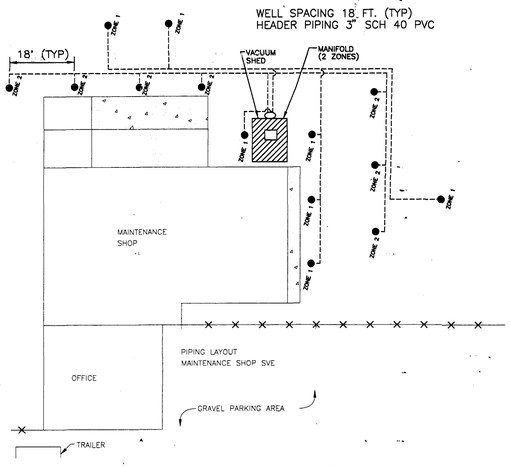


SITE PLAN



PIPING LAYOUT
WASH BAY SVE SYSTEM





PIPING LAYOUT
MAINTENANCE SHOP SVE SYSTEM

AS-BUILTS

SITE PLAN

DOWELL SCHLUMBERGER INCORPORATED
ARTESIA, NEW MEXICO

REVISED BY:	DATE:
SDH	6/93
SDH	9/93
SDH (AS BUILTS)	3/94

Western Water Consultants, Inc.

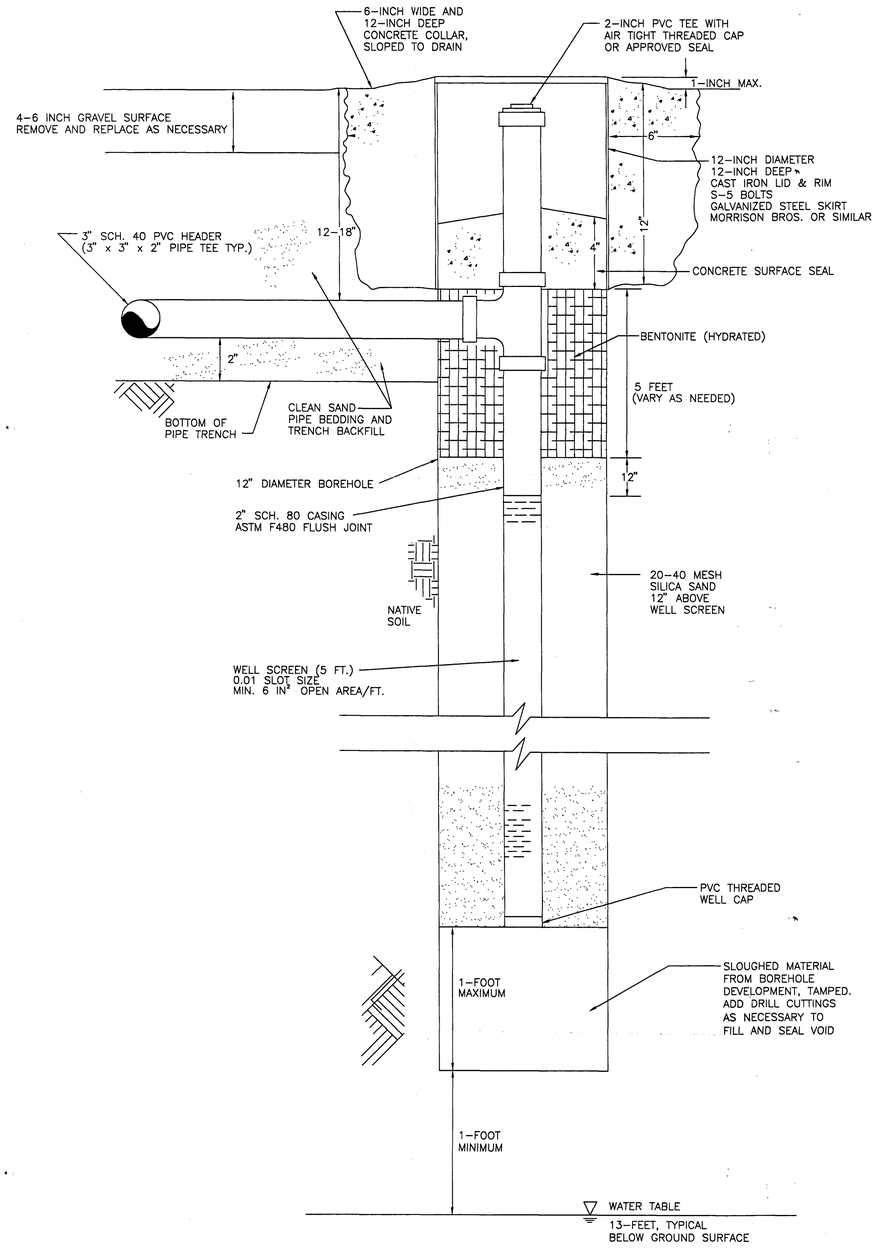
811 SKYLINE ROAD
LARAMIE, WY. 82070
(307)742-0031
FAX (307)721-2913

701 ANTLER DR., SUITE 233
CASPER, WY. 82601
(307)473-2707
FAX (307)237-0828

1949 SUGARLAND DR., SUITE 134
SHERIDAN, WY. 82801
(307)672-0761
FAX (307)674-4265

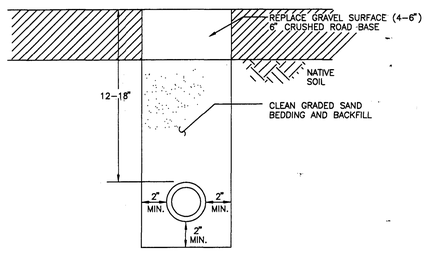
DESIGNED BY:	DATE:
DRAWN BY:	DATE:
SDH	1/93
CHECKED BY:	DATE:
JOB NO:	
0125	
DEPARTMENT:	
LW	
SHEET NO.	

1 OF 5



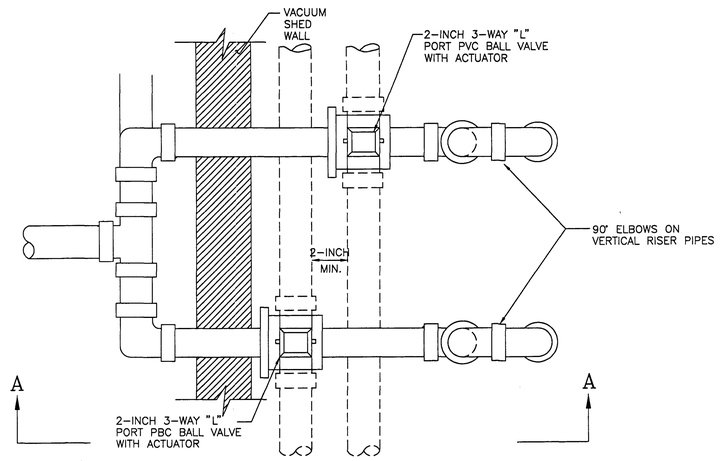
WELL COMPLETION DETAIL
BELOW-GRADE

NO SCALE



SINGLE HEADER PIPE
TRENCH DETAIL

NO SCALE

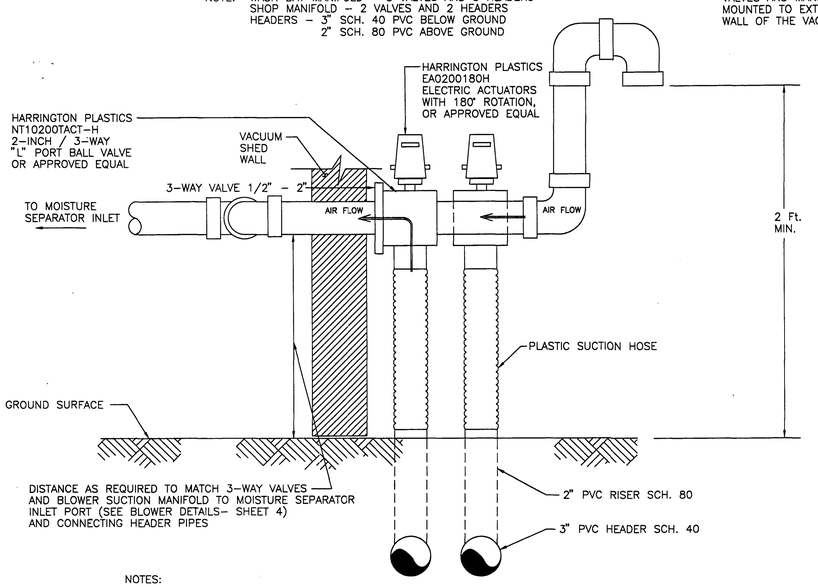


BLOWER SUCTION MANIFOLD DETAIL (TYPICAL)
PLAN

NO SCALE

NOTE: WASH BAY MANIFOLD - 3 VALVES AND 3 HEADERS
SHOP MANIFOLD - 2 VALVES AND 2 HEADERS
HEADERS - 3" SCH. 40 PVC BELOW GROUND
2" SCH. 80 PVC ABOVE GROUND

VALVES AND MANIFOLD MOUNTED TO EXTERIOR WALL OF THE VACUUM SHED.



NOTES:

1) TIMER TO OPERATE VALVES SIMULTANEOUSLY. ONLY ONE HEADER CONNECTED TO BLOWER AT A TIME, OTHERS OPEN TO ATMOSPHERE.

2) VALVES TO ALTERNATE BETWEEN VENT MODE AND VACUUM MODE (180° ROTATION)

BLOWER SUCTION MANIFOLD DETAIL
SECTION A-A

NO SCALE

AS-BUILTS

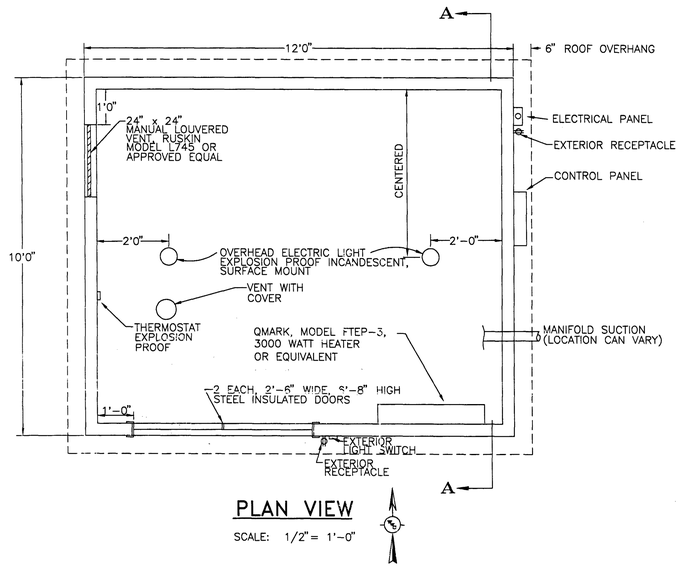
SITE WORK DETAILS

DOWELL SCHLUMBERGER INCORPORATED
ARTESIA, NEW MEXICO

REVISED BY:	DATE:
SDH	6/93
SDH (AS BUILTS)	3/94

Western Water Consultants, Inc.
611 SKYLINE ROAD, LARAMIE, WY. 82070, (307)742-0031, FAX (307)721-2913
701 ANTLER DR., SUITE 233, CASPER, WY. 82601, (307)473-2707, FAX (307)237-0828
1949 SUGARLAND DR., SUITE 134, SHERIDAN, WY. 82801, (307)672-0781, FAX (307)674-4265

DESIGNED BY:	DATE:
DRAWN BY:	DATE:
SDH	1/93
CHECKED BY:	DATE:
JOB NO:	0125
DEPARTMENT:	LW
SHEET NO:	2 OF 5



PLAN VIEW

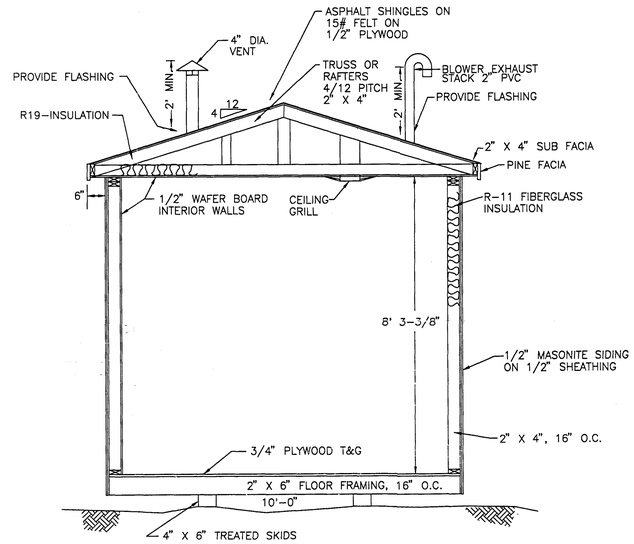
SCALE: 1/2" = 1'-0"

NOTES:

1) ELECTRICAL CONTROL PANELS SHALL BE MOUNTED ON OUTSIDE OF SHED. WHICH WALL THEY ARE MOUNTED ON CAN VARY TO BEST FIT THE SITE.

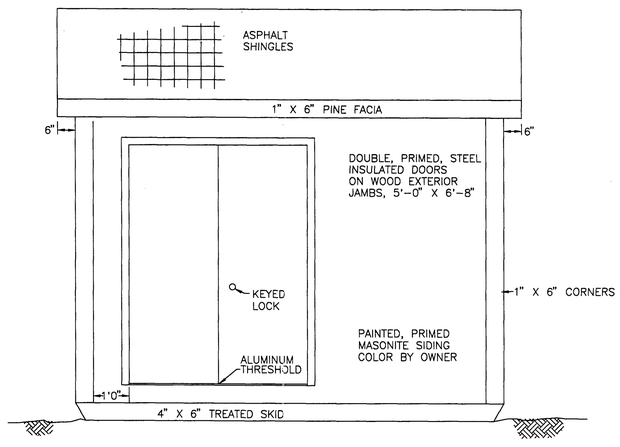
2) ALL WIRING WITHIN THE BUILDING SHALL BE CLASS 1, DIVISION 1, GROUP D. WIRING OUTSIDE THE BUILDING IS NON-CLASSIFIED.

3) TREATED WOOD SHALL BE PRESSURE TREATED WITH CCA.



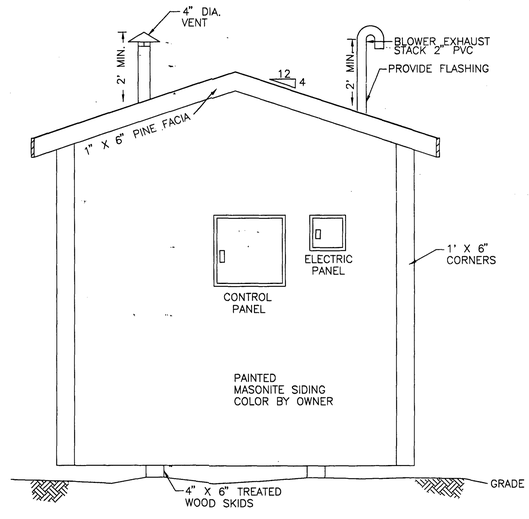
SECTION A-A

SCALE: 1/2" = 1'-0"



ELEVATION

SCALE: 1/2" = 1'-0"



ELEVATION

SCALE: 1/2" = 1'-0"

AS-BUILTS

VACUUM SHED DETAILS

DOWELL SCHLUMBERGER INCORPORATED
ARTESIA, NEW MEXICO

REVISED BY:	DATE:
SDH	6/93
SDH	9/93
SDH (AS BUILTS)	3/94

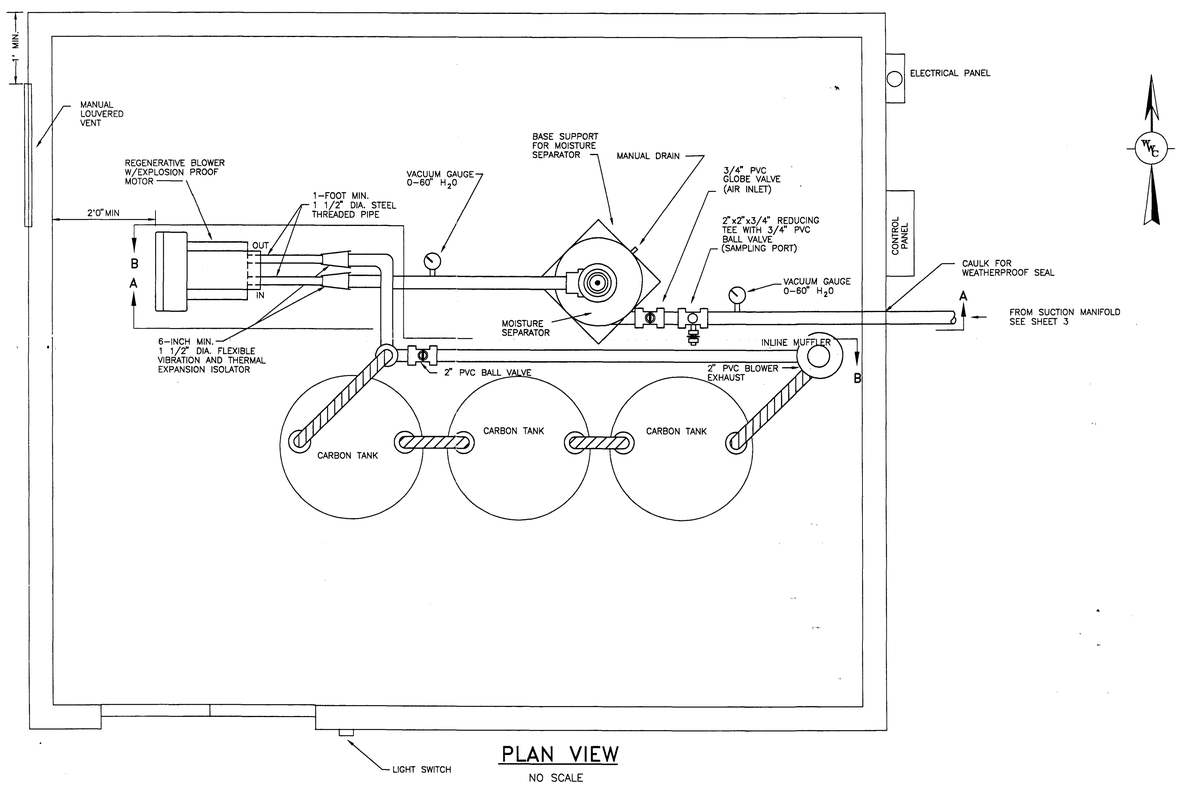
Western Water Consultants, Inc.

611 SKYLINE ROAD
LARAMIE, WY. 82070
(307)742-0031
FAX (307)721-2913

701 ANTLER DR., SUITE 233
CASPER, WY. 82601
(307)473-2707
FAX (307)237-0828

1949 SUCARLAND DR., SUITE 134
SHERIDAN, WY. 82801
(307)672-0761
FAX (307)674-4265

DESIGNED BY:	DATE:
DRAWN BY:	DATE:
SDH	1/93
CHECKED BY:	DATE:
JOB NO:	
0125	
DEPARTMENT:	
LW	
SHEET NO:	



PLAN VIEW

NO SCALE

MECHANICAL EQUIPMENT	QUANTITY	PART SPECIFICATION
BLOWER	1 EACH	EG & G ROTRON REGENERATIVE BLOWER, MODEL DR505, WITH EXPLOSION PROOF MOTOR (NEMA CLASS 7), 230/3/60.
CARBON TANKS	3 EACH	CAMERON – YAKIMA
INLINE MUFFLER	1 EACH	EG & G ROTRON DUAL CONNECTION INLINE MUFFLER, PART NUMBER 500184
INLINE PARTICULATE FILTER	1 EACH	H2 OIL RECOVERY SYSTEMS
REPLACEABLE AIR FILTER ELEMENTS	2 EACH	H2 OIL RECOVERY SYSTEMS
MOISTURE SEPARATOR	1 EACH	H2 OIL RECOVERY SYSTEMS
0-60" H_2O VACUUM GAUGE	3 EACH	EG & G ROTRON OR EQUAL

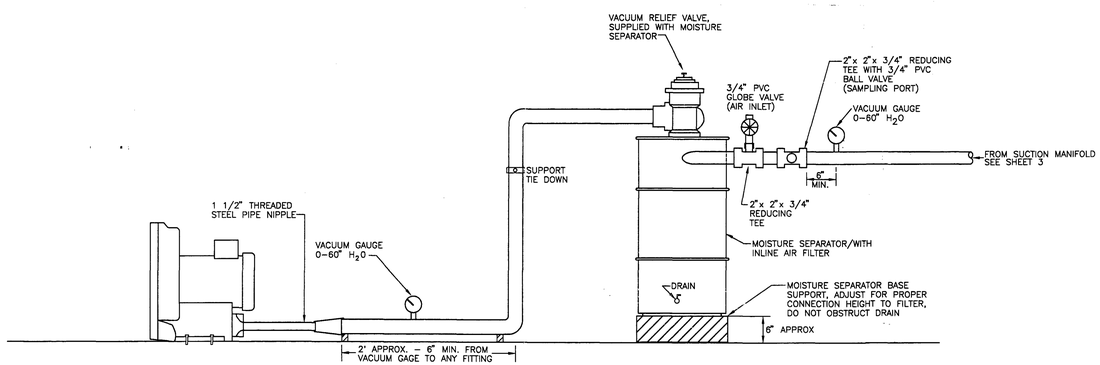
FITTINGS SUCH AS TEES, ADAPTORS AND ELBOWS NECESSARY TO CONSTRUCT THE EQUIPMENT IN THE CONFIGURATION SHOWN SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. NOT ALL FITTINGS NECESSARY TO PROPERLY CONSTRUCT THE SYSTEM ARE SPECIFICALLY IDENTIFIED ON THE CONSTRUCTION DRAWINGS.

ANY EQUIPMENT MAY BE SUBSTITUTED WITH EQUIVALENT EQUIPMENT IF APPROVED BY ENGINEER IN ACCORDANCE WITH THE PROCEDURE ESTABLISHED IN THE SPECIFICATIONS. ADDITIONAL PERFORMANCE REQUIREMENTS ARE CONTAINED IN THE SPECIFICATIONS.

PROVIDE 2"X 4" COLUMNS AS NEEDED FOR SUPPORT OF EQUIPMENT. ALL EQUIPMENT SHALL BE SUPPORTED BY HANGERS, WHERE APPROPRIATE.

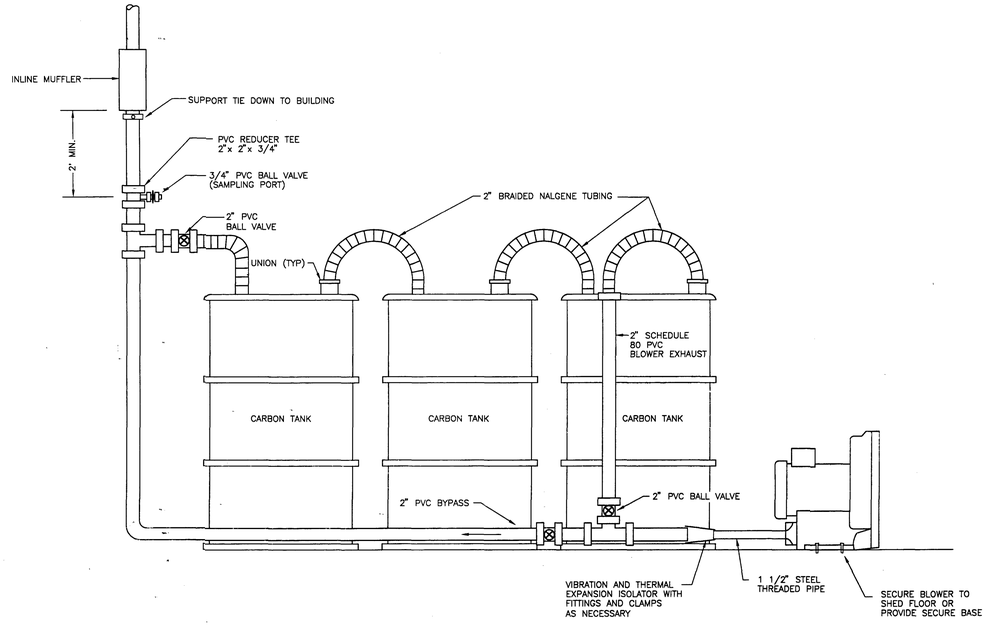
EQUIPMENT CAN BE LAYED OUT MIRROR IMAGE IF NECESSARY.

UNIONS TO BE SUPPLIED AT ALL MAJOR EQUIPMENT TO ALLOW FOR REMOVAL.



SECTION A–A

NO SCALE



SECTION B–B

NO SCALE

AS–BUILTS

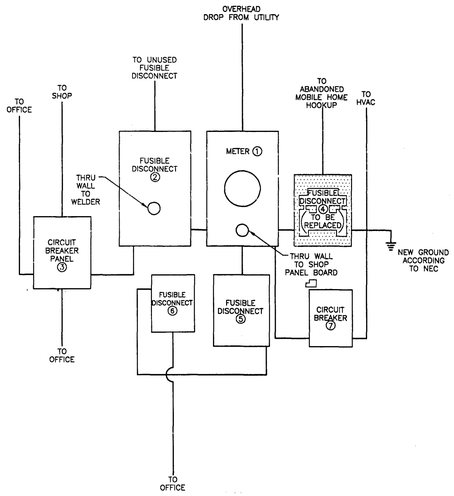
MECHANICAL DETAILS

DOWELL SCHLUMBERGER INCORPORATED
ARTESIA, NEW MEXICO

REVISED BY:	DATE:
SDH	6/93
SDH (AS BUILTS)	3/94

Western Water Consultants, Inc.
511 SKYLINE ROAD, LARAMIE, WY. 82070, (307)742-0031, FAX (307)721-2913
701 ANTLER DR., SUITE 233, CASPER, WY. 82601, (307)473-2707, FAX (307)237-0828
1949 SUGARLAND DR., SUITE 134, SHERIDAN, WY. 82801, (307)672-0761, FAX (307)674-4265

DESIGNED BY:	DATE:
DRAWN BY:	DATE:
SDH	1/93
CHECKED BY:	DATE:
JOB NO:	
0125	
DEPARTMENT:	
LW	
SHEET NO:	
4 OF 5	



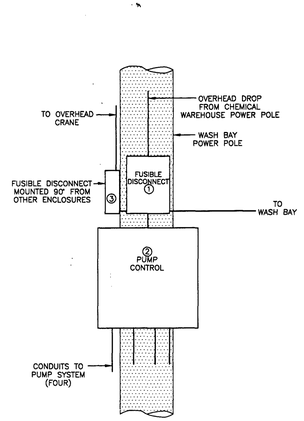
SHOP/OFFICE ELECTRICAL CONTROLS

NOTES:

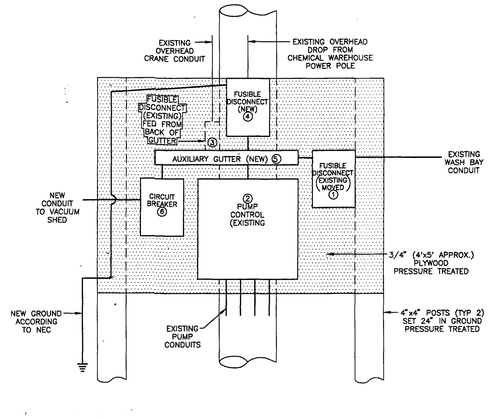
REMOVE FUSIBLE DISCONNECT #4, ASSOCIATED CONDUIT, AND CONDUCTORS

REPLACE FUSIBLE DISCONNECT #4 WITH NEW 100 AMP, 240 V. AC, 4 WIRE (3 BLADES AND FUSEHOLDERS, 1 S/N), 40 AMP FUSES, NEMA BR. RUN NEW CONDUIT AND CONDUCTORS ALONG BUILDING EXTERIOR TO VACUUM SHED. CONDUCTORS TYPE THWN, MINIMUM #8 FOR 3-PHASE CONDUCTORS AND NEUTRAL, PLUS GROUND. CONDUIT 1" MIN. RGS, IMC, OR EMT.

ALL WORK TO MAKE CONNECTION OF THE NEW FUSIBLE DISCONNECT ACCORDING TO NEC WILL BE DONE FORCE ACCOUNT (TIME AND MATERIALS). THE OWNER REALIZES THERE ARE CODE VIOLATIONS WITH THE EXISTING SYSTEM BUT WANTS TO MAKE SURE THE NEW INSTALLATION IS ACCORDING TO NEC. OTHER VIOLATIONS WILL BE CORRECTED UNDER A DIFFERENT PROJECT.



EXISTING WASH BAY POWER POLE



MODIFIED WASH BAY POWER POLE

NOTES:

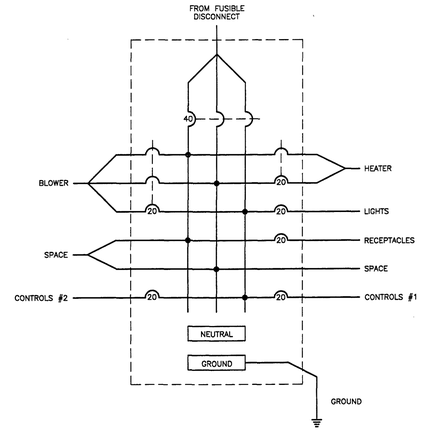
ADD PLYWOOD SUPPORT FOR ELECTRICAL PANELS. DISCONNECT #3 TO REMAIN ON POLE AT PRESENT LOCATION. PUMP CONTROL #2 TO REMAIN AT SAME LOCATION, SLIDE PLYWOOD BETWEEN POLE AND PANEL.

ADD FUSIBLE DISCONNECT #4 AS MASTER SWITCH. NEW 100 AMP, 240 V AC, 4-WIRE (3 BLADE & FUSEHOLDERS, IS/N), 60 AMP FUSES, NEMA 3R. ADD 2 FT. MINIMUM OF AUXILIARY GUTTER (#5) FOR CONNECTIONS AND SPLICES, NEMA 3R.

MOVE FUSIBLE DISCONNECT #1. REPLACE FUSES WITH 40 AMP. THIS DISCONNECT WILL NOW ONLY SERVICE THE WASH BAY.

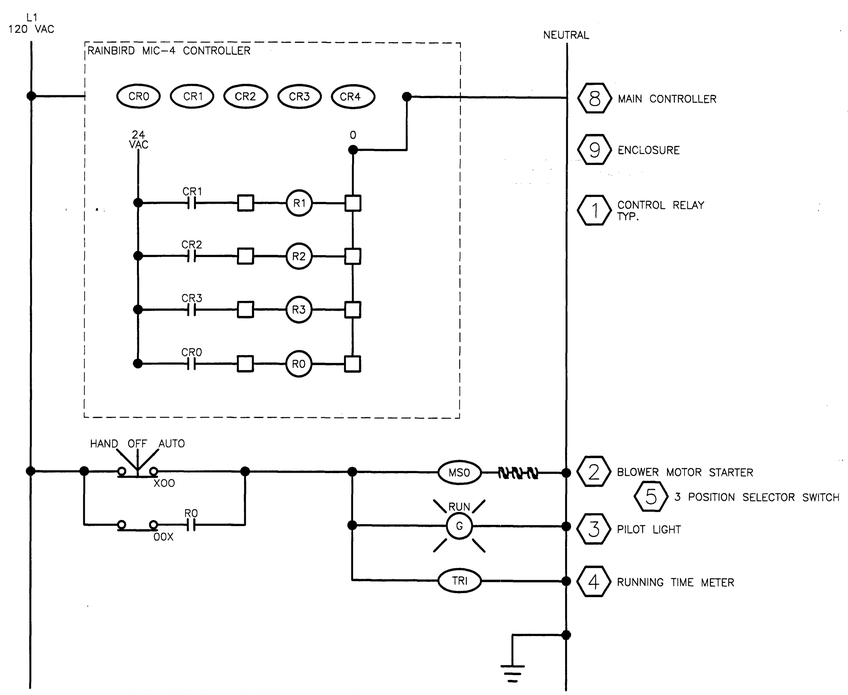
ADD FUSIBLE DISCONNECT #6 FOR VACUUM SHED. NEW 100 AMP, 240 V AC, 4-WIRE (3 BLADES & FUSE HOLDER, IS/N), 40 AMP FUSES, NEMA 3R.

ADDITIONAL WORK NECESSARY TO MAKE THE NEW INSTALLATION IN ACCORDANCE WITH NEC WILL BE DONE FORCE ACCOUNT (TIME & MATERIALS)

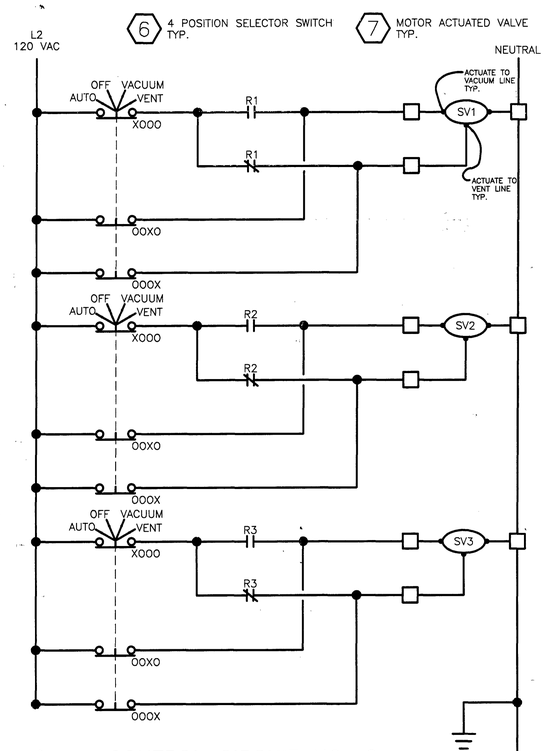


PANEL
100A, 240/120V, 3ø, 4W
MAIN BREAKER
12 SPACES MINIMUM

ONE LINE DIAGRAM



CONTROL CIRCUIT NO. 1



CONTROL CIRCUIT NO. 2

MARK	MANUF.	PART NO.
1	SQUARE D	CLASS 8501, TYPE KU-12, W/ TYPE NR-82 SOCKETS
2	SQUARE D	CLASS 8502, TYPE PD2.10E W/ CLASS 906 5 TYPE TD 5.5 BIMETALLIC OVERLOAD RELAY
3	SQUARE D	CLASS 9001, TYPE KP-1G31 W/ TYPE KN-724SP LEGEND PLATE
4	CRAMER	635 K, TO 99999.9 HOURS
5	SQUARE D	CLASS 9001, TYPE KS-43BH13 W/ TYPE KN-760SP LEGEND PLATE
6	SQUARE D	CLASS 9001, TYPE KS-88BH2 W/ TYPE KN-799SP LEGEND PLATE
7	HARRINGTON PLASTICS	EA 0200180H
8	RAINBIRD	MIC-4
9	GE, SQUARE D	NEMA 3R; SIZED TO HOLD ALL DEVICES ① THRU ⑥ ABOVE; PILOT DEVICES ③ THRU ⑥ TO BE MOUNTED ON FRONT, HINGED, LOCABLE COVER.

AS-BUILTS

ELECTRICAL

DOWELL SCHLUMBERGER INCORPORATED
ARTESIA, NEW MEXICO

REVISED BY:	DATE:
SDH	6/93
SDH (AS BUILTS)	3/94

Western Water Consultants, Inc.
611 SKYLINE ROAD LARAMIE, WY. 82070 (307)742-0031 FAX (307)721-2913
701 ANTLER DR., SUITE 233 CASPER, WY. 82601 (307)473-2707 FAX (307)237-0828
1949 SUGARLAND DR., SUITE 134 SHERIDAN, WY. 82801 (307)672-0761 FAX (307)674-4265

DESIGNED BY:	DATE:
DRAWN BY:	DATE:
SDH	1/93
CHECKED BY:	DATE:
JOB NO: 0125	
DEPARTMENT: LW	
SHEET NO:	5 OF 5