

GW - 114

MONITORING REPORTS

DATE:

12/99

REPORT FOR
ADDITIONAL NATURAL ATTENUATION
MONITORING AT DOWELL, A DIVISION
OF SCHLUMBERGER TECHNOLOGY CORPORATION
FACILITY IN ARTESIA, NEW MEXICO

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1.0 INTRODUCTION

1.0 INTRODUCTION

This report represents an update on the effect of natural attenuation (NA) on dissolved-phase constituents in the ground-water at the Dowell, a division of Schlumberger Technology Corporation facility in Artesia, New Mexico (Figure 1). Dowell conducted a study in November 1996 to evaluate the effectiveness of natural attenuation, particularly intrinsic bioremediation, to chemically achieve corrective action goals. Results of the study were presented in a report to the New Mexico Conservation Division (NMOCD) titled "Initial Evaluation of Natural Attenuation" dated April 1997.

Results of the initial NA evaluation in 1996 indicated aromatic hydrocarbon and chlorocarbon concentrations were either stable or declining in both mass and horizontal extent. A sequential change in ground-water conditions occurred over time creating an environment favorable for aerobic and anaerobic microorganisms to biodegrade chlorocarbons and residual aromatic hydrocarbons. In addition, spatial patterns of dissolved-phase constituents across the site suggested subsurface environment conditions conducive to long term biodegradation of hydrocarbon and chlorinated constituents.

1.1 Current Status

The Dowell facility in Artesia was established in 1969 and continues to actively provide specialty products and services to the regional petroleum extraction industry. Since 1989 various investigation and corrective action activities have been performed involving hydrogeologic investigations, removal of underground storage tanks, source area excavation, and soil and ground-water sampling. Presently there are two soil vapor extraction systems operating at the site.

Since the initial evaluation of natural attenuation in 1996, six additional monitoring wells (MW-25 to MW-30) were installed northeast of the facility to define the extent of dissolved-phase constituents in the ground-water (Figure 1). Ground-water monitoring is currently performed quarterly at 12 of the 30 monitoring wells and annually on 29 of the 30 monitoring wells completed in the local surficial aquifer.

1.2 Local Geology and Hydrology

Geology beneath the Artesia facility consists of a regional carbonate gravel unit. Sediments encountered during drilling consist of red clay, silty clay, and clay interbedded with thin (2-4 inch) white and pinkish – cream carbonate or caliche layers. Zones where carbonate/caliche layers are common have been identified in core samples but are difficult to trace laterally between even closely-spaced ground-water monitoring wells. Drilling at the site has reached a maximum depth of 68 feet below surface. A quartzose unit underlying the carbonate gravel unit has not been encountered.

The water-bearing zones in the shallow aquifer are the carbonate/caliche layers in which the permeability apparently has been enhanced by solution of carbonate minerals. Below the water table, many, but not all, of the carbonate/caliche layers are saturated, whereas the clays and silts appear only damp to moist. Zones of unsaturated carbonate/caliche below the water table are present irregularly. Carbonate/caliche zones above and below these dry zones are saturated.

Depth to ground-water has varied from approximately 17 feet below ground surface in 1991 to 13 feet April, 1999 (Table 1). The ground-water flow direction has been consistently to the northeast since monitoring has been conducted. A potentiometric surface map constructed for the April, 1999 water level data shows ground-water continues to flow to the northeast (Figure 1).

1.3 Constituent Status

The highest concentrations of dissolved-phase aromatic hydrocarbon constituents remains localized in the ground-water around MW-3 and MW-12 with residual concentrations around MW-2 and MW-25 (Figure 2). Aromatic hydrocarbon concentrations range from a high of 1.570 parts per million (ppm) in MW-12 to nondetect in most other monitoring wells. Concentrations are either stable or declining at this facility. Historical water quality data is provided as Table 2.

Since the initial natural attenuation evaluation in 1996, concentrations of dissolved-phase chlorocarbons remain in a stabilized or declining trend throughout most of the site with the exception of a slight increase at monitoring wells MW-18, MW-19, and MW-22. The highest concentrations continue to be localized in the ground-water around MW-7 (Figure 3). Concentrations range from a high of 0.607 ppm at MW-7 to nondetect levels in most wells on the perimeter of the facility.

2.0 NATURAL ATTENUATION MONITORING

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On April 22, 1999, Western Water Consultants Inc., (WWC) conducted ground-water sampling at the Artesia facility for the purpose of updating data to evaluate natural attenuation processes. Data collected from the monitoring would be used to assess the chemical and environmental conditions of the aquifer in terms of biodegradation. Assessing these conditions would involve determining available electron acceptors, environmental parameters that control microbiological activity, and evidence of intermediate and end products of contaminant biodegradation.

Field measurements and ground-water samples were collected using a peristaltic pump connected to a flow through cell and Hydrolab mini-sonde 4A. Field measurements were collected for pH, conductivity, oxidation reduction potential (Eh), temperature, and dissolved oxygen (D.O.). Results for the field parameters are presented as Table 3.

Ground-water samples were collected from 17 monitoring wells (MW-2 to MW- 4, MW-7, MW-8, MW-10 to MW-13, and MW-18 to MW-25) for natural attenuation parameters. Each monitoring well was micropurged until field parameters (pH, conductivity, temperature, and Eh) stabilized prior to sample collection. Ground-water samples were analyzed for nitrate-nitrite by EPA Method 353.3, orthophosphate by EPA Method 365.3, sulfate by EPA Method 375.4, total organic carbon (TOC) by EPA Method 415.1, methane, carbon dioxide, ethane, and ethene.

3.0 RESULTS

3.0 RESULTS

Field measurements of the ground-water continue to show evidence of microbial activity in the subsurface. PH values ranged from 6.34 to 7.16 with background values of 6.98 to 7.1. An area of slightly depressed pH values is localized in the ground-water around MW-11 (Figure 4). Organic acids and CO₂ are typically produced as byproducts of the biodegradation of hydrocarbons and can locally lower the pH of ground-water. Eh values which describe the oxidation-reduction (REDOX) potential of the measured ground-water ranged from -216 to 543 millivolts. Plotting of the Eh values indicates ground-water in the vicinity of MW-3 and MW-12 exhibit conditions indicative of a reducing environment while periphery areas are more conducive to an oxidizing environment (Figure 5).

D.O. values ranged from 0.07 to 2.15 mg/L with background levels between 1.15 and 2.15 mg/L. A central area of essentially anaerobic conditions exists in the ground-water around MW-3 and MW-12 (Figure 6). Environmental conditions within this core of low D.O. are anaerobic with aerobic conditions along the periphery.

Nitrate in ground-water ranged from nondetect to 9.1 mg/L. An area depleted in nitrate extends from MW-4 northeast to MW-7 (Figure 7). Water quality data is presented as Table 4. Laboratory data sheets are presented as Appendix A.

Sulfate in ground-water ranged from 400.0 to 3300 mg/L with background levels from 1800 to 3300 mg/L (Figure 8). Concentrations below background levels are present in the ground-water around MW-4 and in the vicinity of MW-3 and MW-12.

Total Organic Carbon (TOC) was present in the ground-water at 14 of 17 monitoring wells. TOC in ground-water ranged from nondetect levels to 58.0 mg/L with the highest concentrations were present in the ground-water around MW-3, MW-11, and MW-12 (Figure 9).

Methane, measured as a gas within ground-water, was present in all 17 monitoring wells and ranged from 0.001 to 14.13 mg/L. The highest concentrations are centered at MW-12 (14.13 mg/L) and decreases in a radial pattern to background levels of 0.001 mg/L (Figure 10).

Carbon dioxide measured as a gas within ground-water was detected in all 17 monitoring wells and ranged from 22.26 to 231.23 mg/L. Areas of high concentrations were centered around MW-3, MW-11, and MW-12 (Figure 11).

Ethane and ethene measured as dissolved gases in ground-water were detected in 10 and 13 of 17 monitoring wells. The highest concentrations of ethane were present in the area of MW-3 and MW-12 (Figure 12). The highest concentrations of ethene were detected in the areas of MW-13, MW-3, MW-11, and MW-12 (Figure 13).

4.0 DISCUSSION

4.0 DISCUSSION

4.1 Biodegradation of Hydrocarbons

Chemical data gathered from the April NA monitoring event supports previous trends that are particularly important with regard to intrinsic bioremediation. PH continues to be depressed in the area with the highest concentrations of dissolved phase constituents around MW-3 and MW-12. D.O. also remains depleted in this area indicating that environmental conditions are in an anaerobic state. Depressed Eh values indicate a reducing environment in the core area with oxidizing conditions along the periphery conducive to biodegradation of aromatic hydrocarbons through aerobic metabolism.

Nitrate and sulfate are utilized as electron acceptors under anaerobic conditions to degrade aromatic hydrocarbons through denitrification and sulfate reduction processes (USEPA guidance document 1998). The absence of nitrate in the ground-water from MW-4 northeast across the site to MW-12 indicates aromatic hydrocarbons were biodegraded by anaerobic microorganisms through denitrification after aerobic respiration of aromatic hydrocarbons created anaerobic conditions. Sulfate concentrations are below background levels in the ground-water at MW-4 and MW-12 and may indicate that anaerobic microorganisms are biodegrading aromatic hydrocarbons through sulfate reduction processes. The low Eh value of -216 millivolts in the ground-water at MW-12 is indicative of geochemical conditions conducive to the biodegradation of aromatic hydrocarbons through sulfate reduction (USEPA guidance document 1998). Additional monitoring events may verify whether this process is in fact occurring.

4.2 Biodegradation of Chlorocarbons

Water quality data for natural attenuation monitoring indicates degradation of chlorocarbons is continuing at this facility. As mentioned previously, D.O. values show a distinct inverse correlation with the area containing the highest concentrations of dissolved-phase constituents. Aerobic respiration of aromatic hydrocarbons over a long period of time has created environmental conditions which are now anaerobic. Negative Eh readings of the ground-water in this same area indicates environmental conditions are in an optimal range for reductive dehalogenation to occur (USEPA Guidance Document 1998).

Elevated methane levels centered around MW-12 represent direct evidence of highly reducing conditions ideal for the reductive dehalogenation of chlorocarbons. Methane also represents an appropriate carbon source for methanotrophic oxidation of chlorocarbons in the soil and ground-water where aerobic conditions persist.

Carbon dioxide is a byproduct of naturally occurring aerobic and anaerobic biodegradation processes that occur in ground-water (USEPA guidance document 1998). Elevated CO₂ levels in the same distribution as methane indicates greater microbial activity than in the surrounding area. The inverse correlation between the concentration of D.O. and CO₂ also indicates that aerobic metabolism is an important process in the subsurface in this area creating anaerobic conditions important for the biodegradation of chlorocarbon constituents.

Microbial degradation of chlorocarbons such as PCE via the process of reductive dechlorination results in the formation of daughter products TCE, isomers of DCE, VC, ethene and finally CO₂ and H₂O. Evidence that the process of reductive dehalogenation has been and is still actively occurring is shown on the spatial distribution of chloroethenes across the site (Figure 14). PCE makes up a large percentage of the total chloroethenes present in the ground-water beneath the facility itself. However, the percentage of PCE in the ground-water decreases from MW-12 toward the northeast. Daughter products such as TCE and DCE isomers begin to make up the larger percentage of the chlorocarbons. In addition the high concentration of ethene and ethane in the area of MW-3 and MW-12 strongly suggests that chlorocarbons such as PCE and TCE have undergone reductive dehalogenation.

The Environmental Protection Agency (EPA) developed a screening process and weighting system to evaluate anaerobic biodegradation processes (reductive dechlorination) using geochemical data at individual sites (USEPA September 1998). The various parameters used by EPA in their weighting system were compared to the field data collected for the additional NA monitoring. The results of the comparison, shown on Table 5, indicate the Dowell facility in Artesia would receive a score of 24. Under the EPA weighting system, a score greater than 20 indicates strong evidence that biodegradation of chlorocarbons through reductive dechlorination processes is occurring at a site.

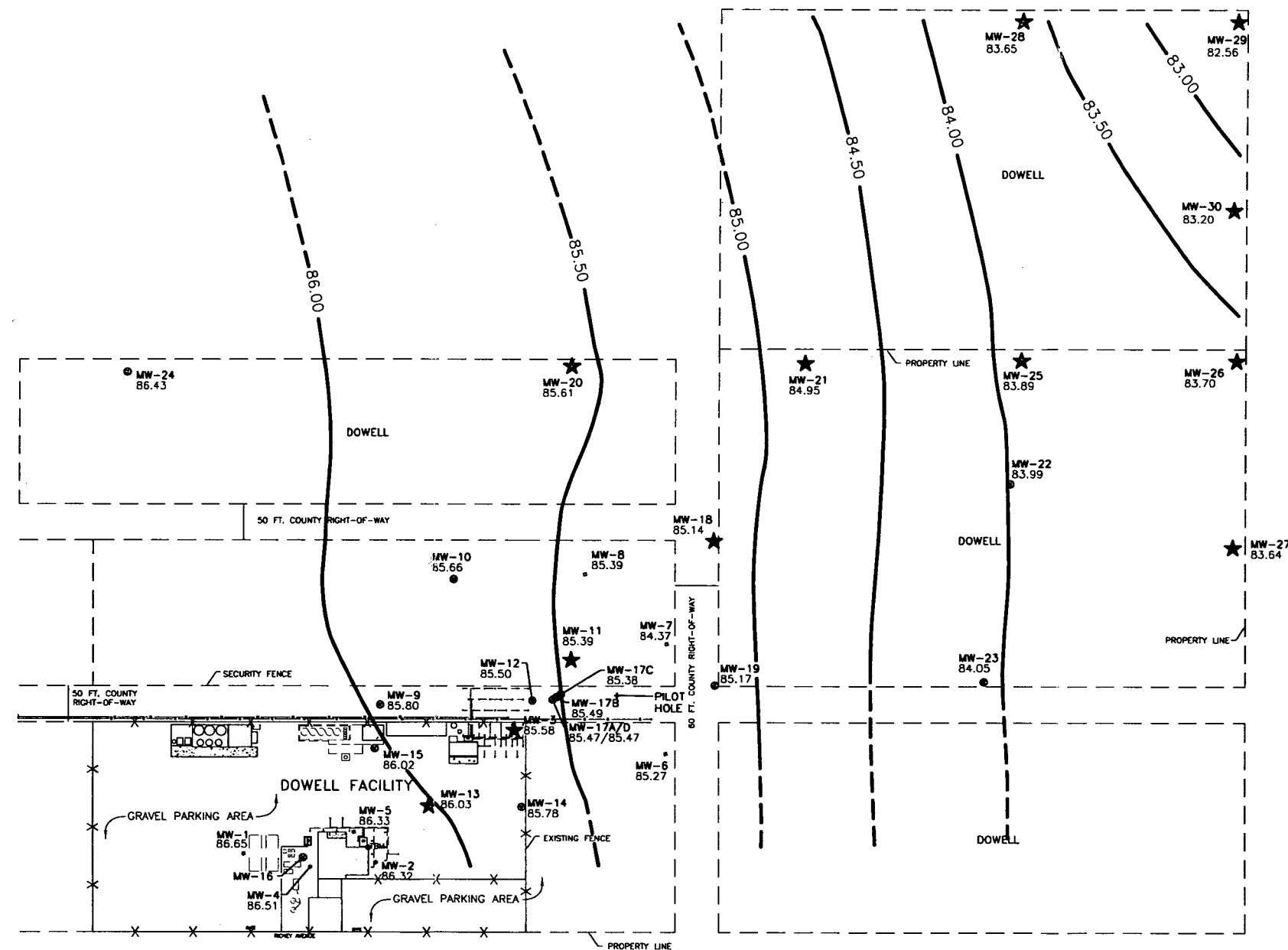
5.0 CONCLUSIONS

5.0 CONCLUSIONS

This evaluation of natural attenuation processes at the Artesia facility confirms the conclusions presented in the "Initial Evaluation of Natural Attenuation" report to the NMOCD in 1996. Chemical and environmental conditions do exist which favor the biodegradation of both aromatic hydrocarbons and chlorocarbons to corrective action levels given time. The appropriate electron acceptors are available for anaerobic biodegradation of residual aromatic hydrocarbons and optimal conditions exist for biodegrading chlorocarbons through the reductive dehalogenation and possibly methanotrophic processes. The spatial distribution of dissolved-phase constituents across the site indicate a subsurface environment conducive to the long term biodegradation of hydrocarbon and chlorinated constituents.

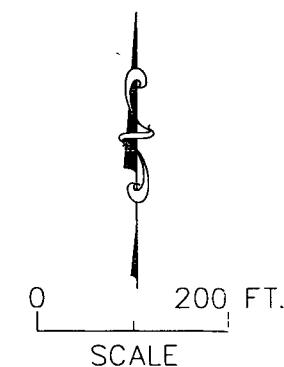
Maintaining the current monitoring program will provide the necessary data to monitor existing dissolved-phase constituents and destruction of the contaminants.

FIGURES



EXPLANATION

- MW-12 84.69 WWC MONITORING WELL LOCATION, IDENTIFICATION, AND POTENTIOMETRIC SURFACE
- MW-6 84.50 REED AND ASSOCIATES MONITORING WELL LOCATION, IDENTIFICATION, AND POTENTIOMETRIC SURFACE
- ★ MONITORING WELLS TO BE SAMPLED QUARTERLY
- 86.00 — POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL



BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 1
SITE MAP WITH
POTENTIOMETRIC SURFACE
(04/21/99)
DOWELL, A DIVISION OF
SCHLUMBERGER TECHNOLOGY CORPORATION
ARTESIA, NEW MEXICO

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Engineering Environmental Mining Water Resources

MW-12 WWC MONITORING WELL LOCATION AND IDENTIFICATION
 85.33 GROUND-WATER ELEVATION
 1.895 ISOCONCENTRATION FOR TOTAL BTEX

MW-6 REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION
 85.07 GROUND-WATER ELEVATION
 ND ISOCONCENTRATION FOR TOTAL BTEX

TBM TEMPORARY BENCH MARK

AIR PIPING

SVE EXTRACTION WELL

-86.00- POTENTIOMETRIC SURFACE CONTOUR

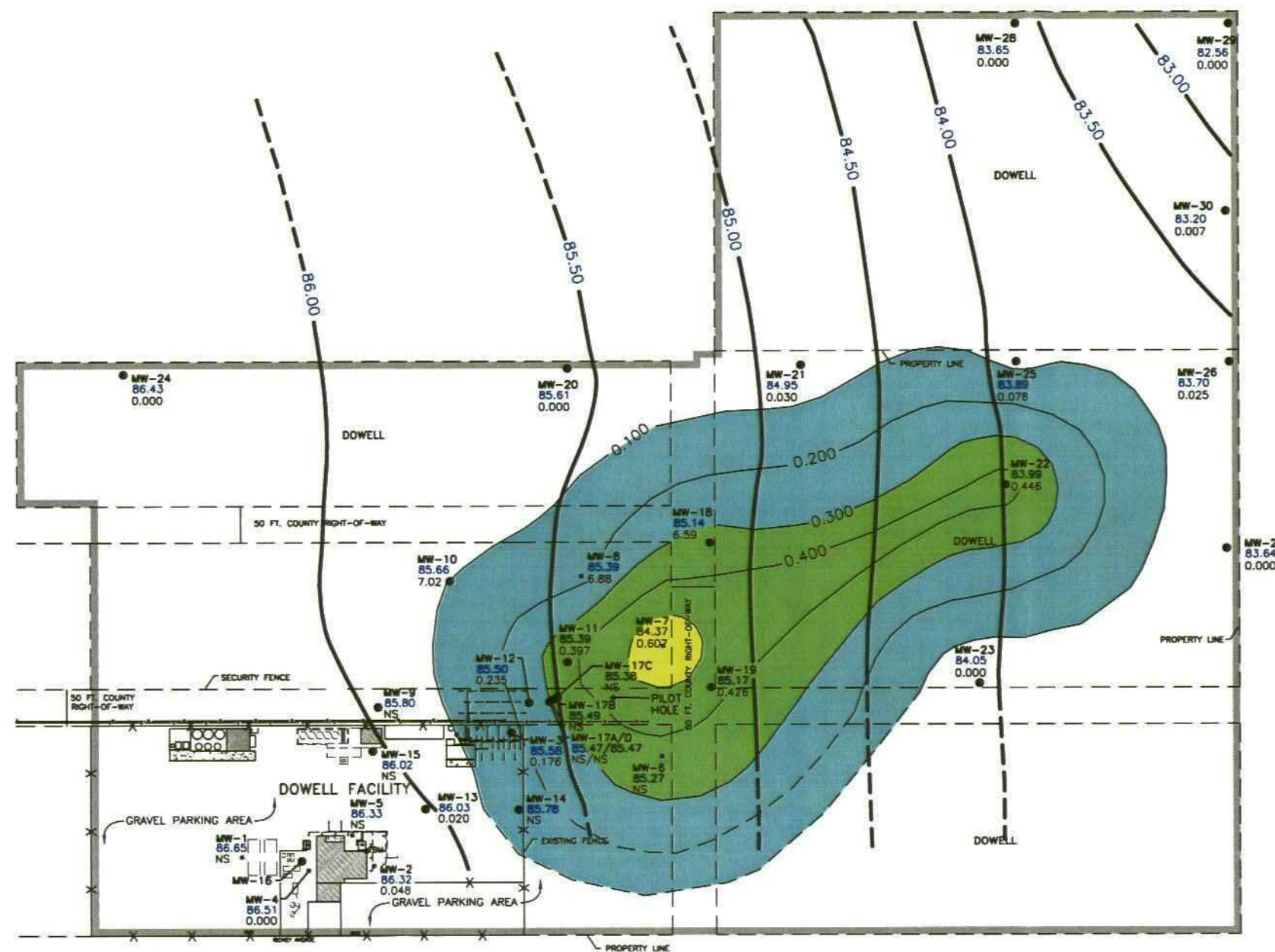


A horizontal scale bar with a vertical tick mark at the left end labeled '0' and another vertical tick mark at the right end labeled '200 FT.'. Below the bar, the word 'SCALE' is centered.

BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 2
POTENTIOMETRIC SURFACE AND
ISOCONCENTRATION MAP FOR
TOTAL BTEX (04/22/99)
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SCHLUMBERGER TECHNOLOGY CORPORATION
ARTESIA, NEW MEXICO

Western Water Consultants, Inc.  **W_WC Engineering**
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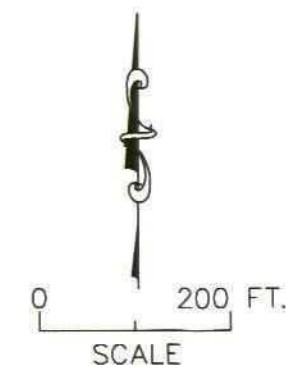


EXPLANATION

- MW-12**
 85.33
 1.895
 WWC MONITORING WELL LOCATION AND IDENTIFICATION
 GROUND-WATER ELEVATION
 ISOCONCENTRATION FOR TOTAL HALOCARBONS
 - MW-6**
 85.07
 ND
 REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION
 GROUND-WATER ELEVATION
 ISOCONCENTRATION FOR TOTAL HALOCARBONS
 - TBW
 TEMPORARY BENCH MARK
 - AIR PIPING
 - SVE EXTRACTION WELL
- ISOCONCENTRATION FOR TOTAL HALOCARBONS

	0.500
	0.300
	0.100

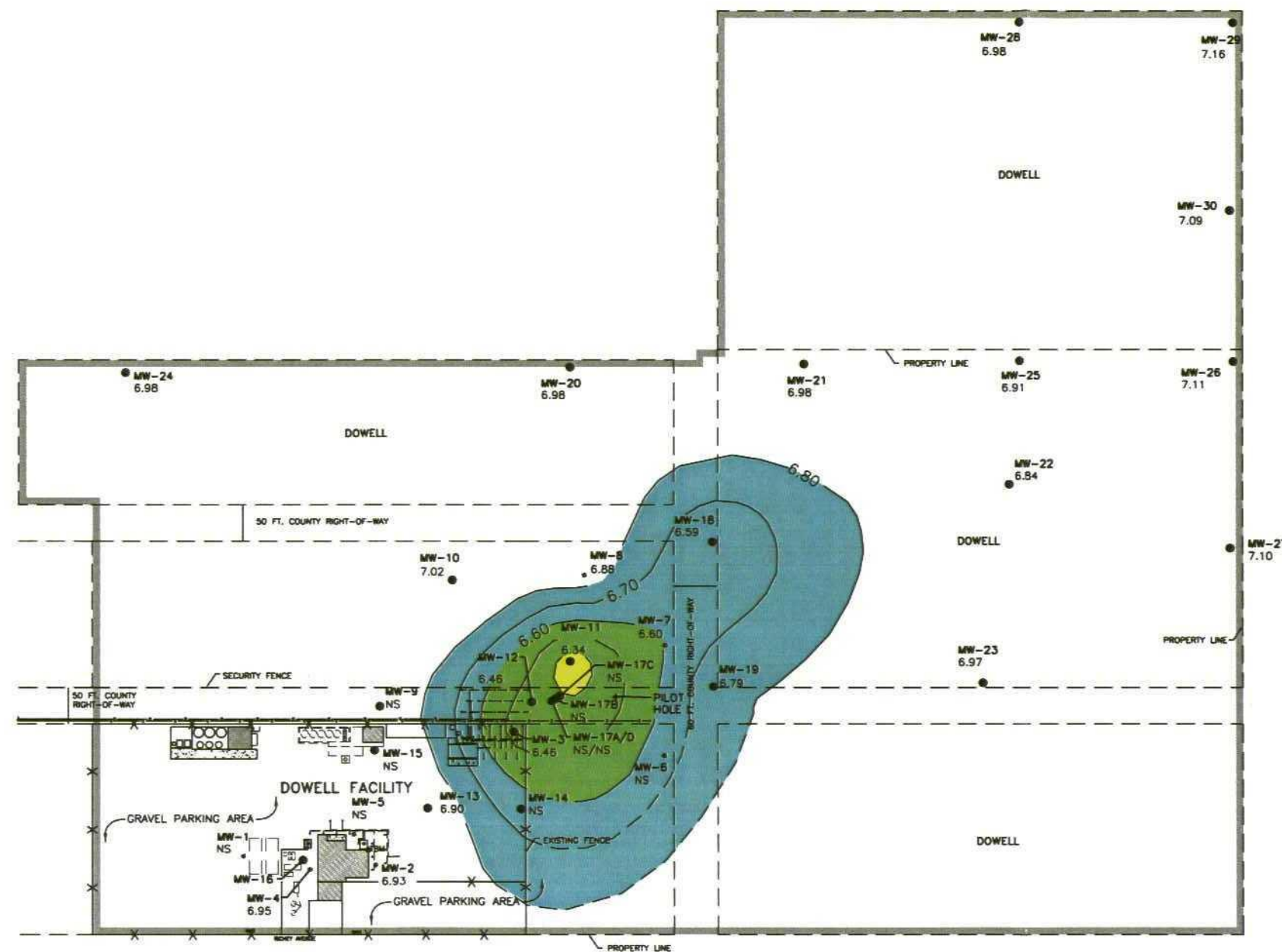
— 86.00 — POTENTIOMETRIC SURFACE CONTOUR



BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 3
 POTENTIOMETRIC SURFACE AND
 ISOCONCENTRATION MAP FOR
 TOTAL HALOCARBONS (04/22/99)
 DOWELL, A DIVISION OF
 SCHLUMBERGER TECHNOLOGY CORPORATION
 ARTESIA, NEW MEXICO

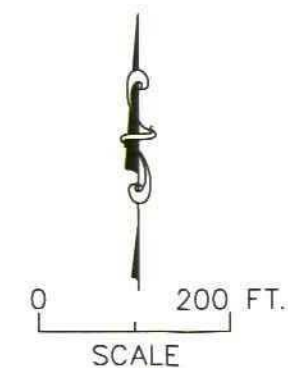
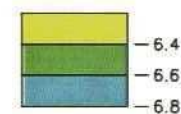
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 Consultants, Inc. **W**
W **C** Engineering
 Engineering Environmental Mining Water Resources



EXPLANATION

- MW-12 1.895 WWC MONITORING WELL LOCATION AND IDENTIFICATION
- MW-6 ND REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL

ISOCONCENTRATION FOR pH

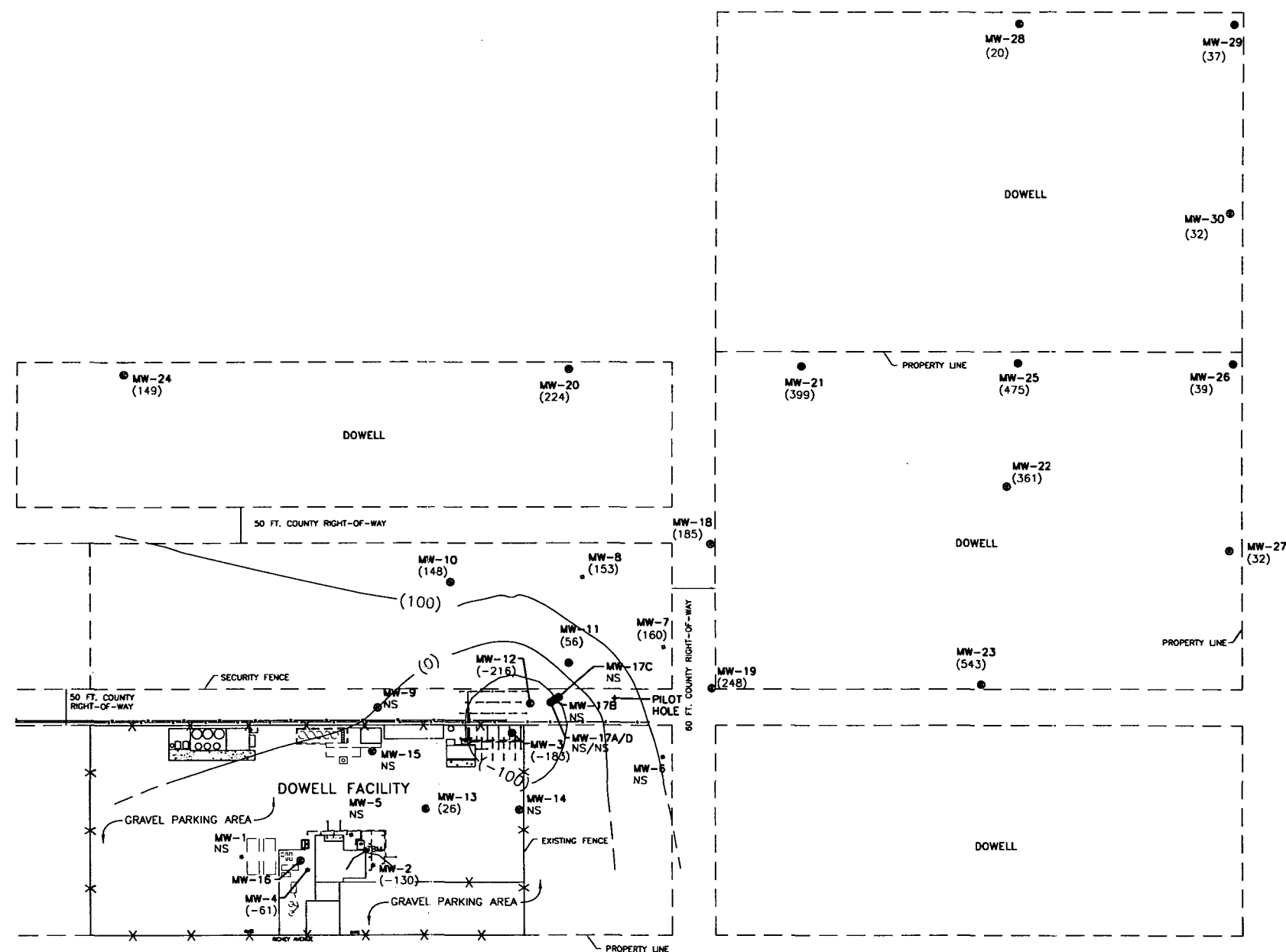


BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 4
ISOCONCENTRATION MAP FOR pH
(04/22/99)

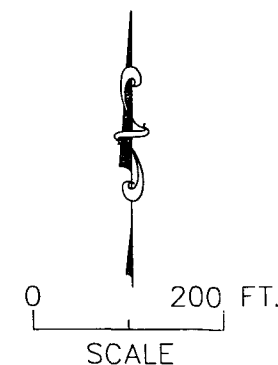
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EXPLANATION

- MW-12 (-216) WWC MONITORING WELL LOCATION AND IDENTIFICATION REDOX POTENTIAL
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION REDOX POTENTIAL
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL

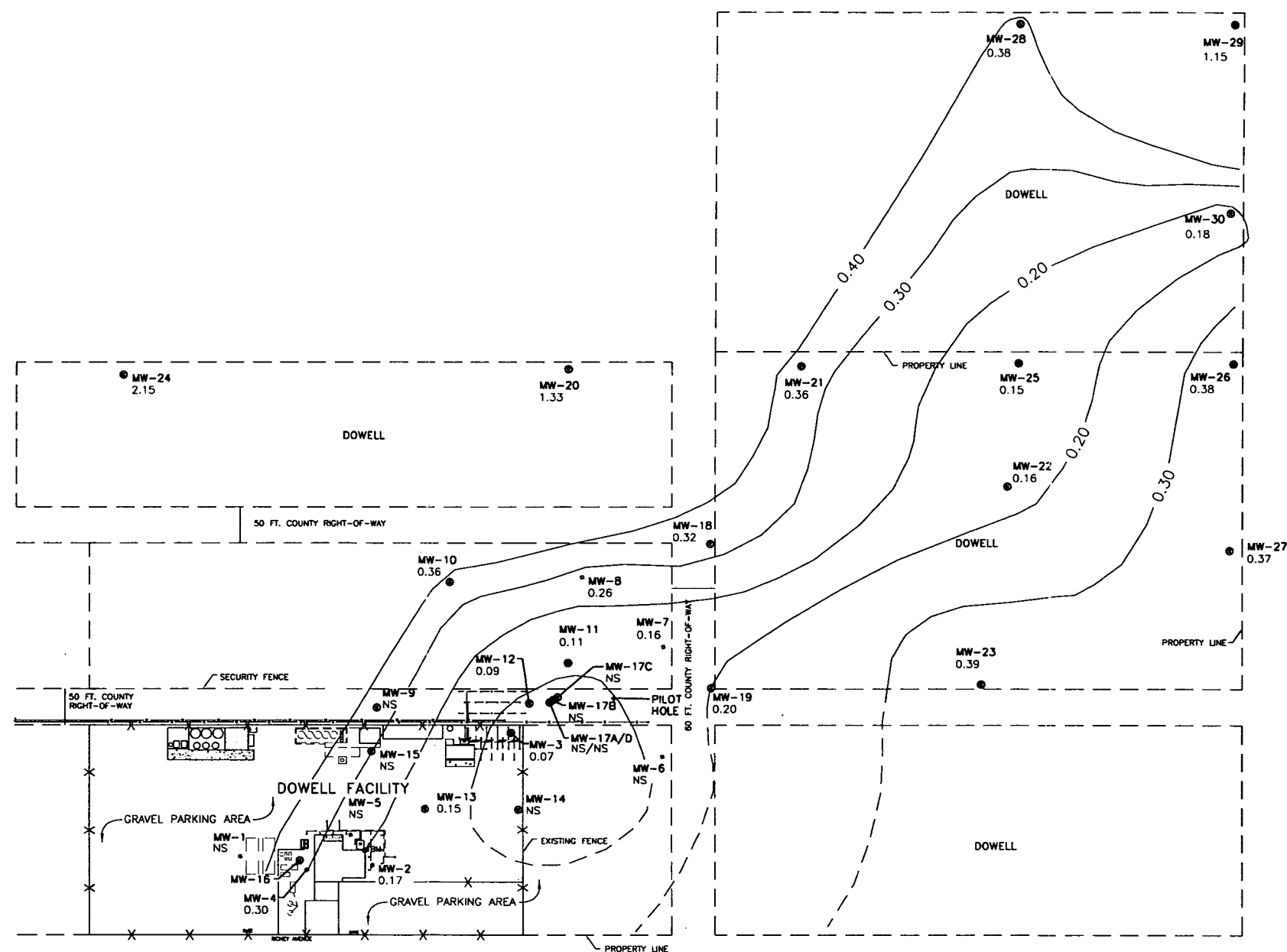


BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 5
REDOX POTENTIAL (Eh)
(04/22/99)

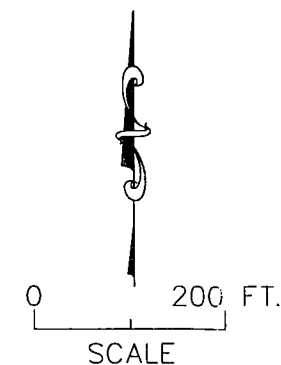
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Consultants, Inc. **W** **W** **C** Engineering
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EXPLANATION

- MW-12 0.09 WWC MONITORING WELL LOCATION AND IDENTIFICATION REDOX POTENTIAL
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION REDOX POTENTIAL
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL



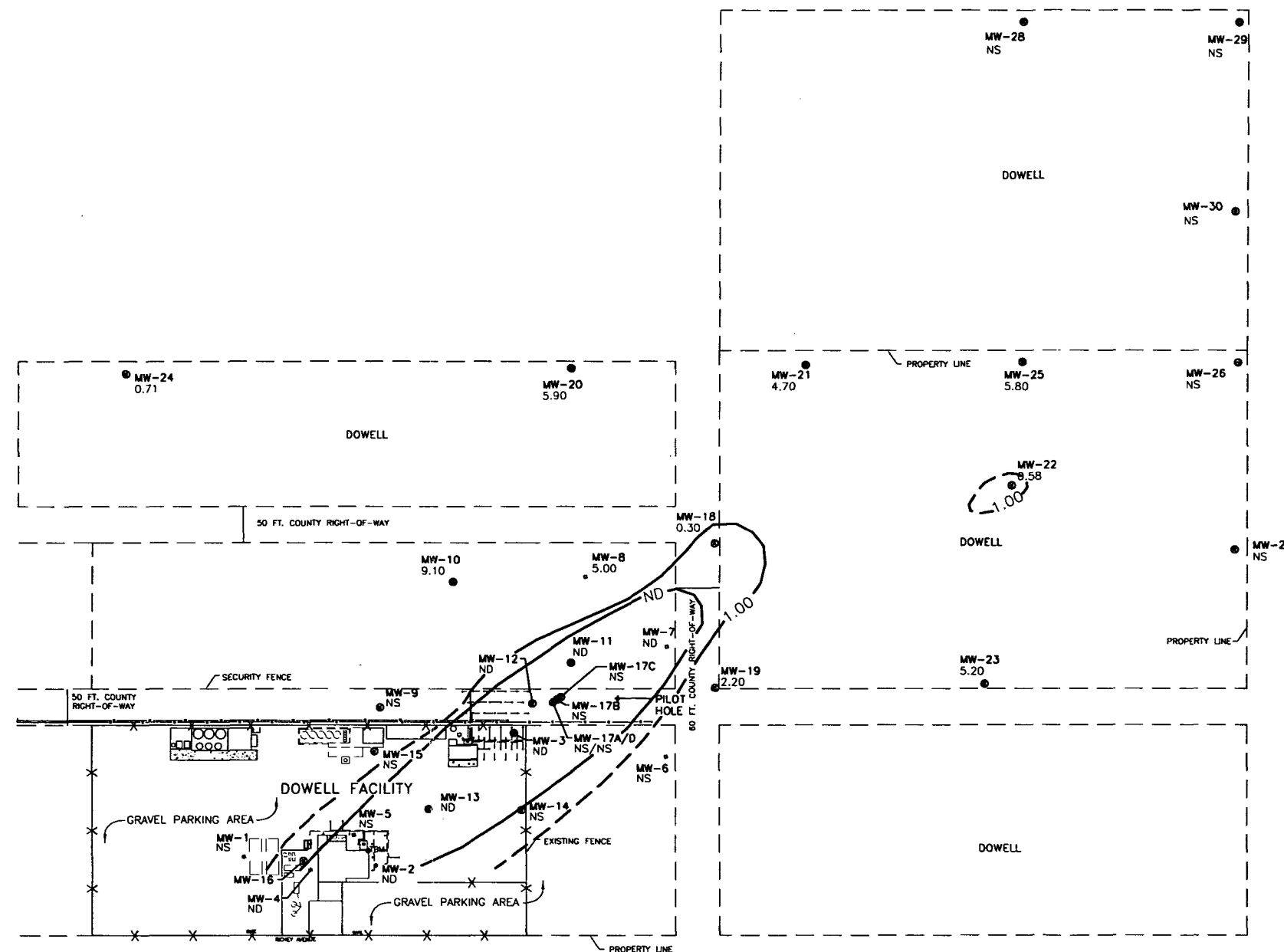
BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 6 DISSOLVED OXYGEN DATA

(04/22/99)

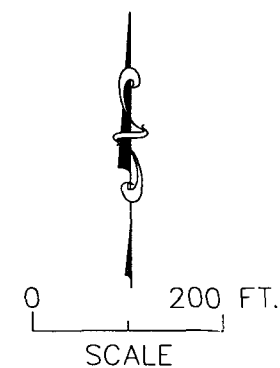
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EXPLANATION

- MW-12 14.130 WWC MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR NITRATE/NITRITE (ng/L)
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR NITRATE/NITRITE (ng/L)
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL
- NS NOT SAMPLED
- ND NONDETECT



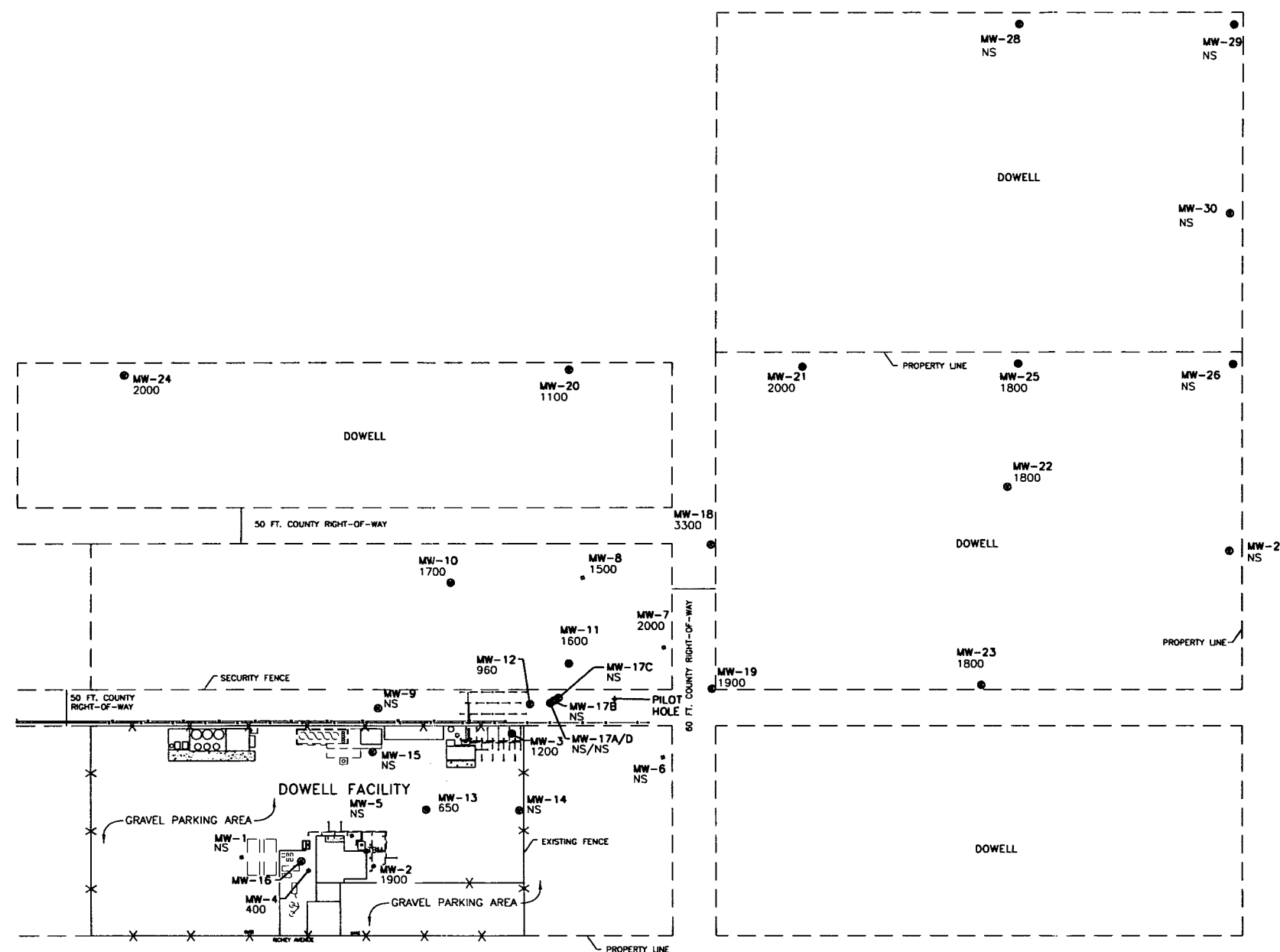
BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 7 NITRATE, NITRITE

(04/22/99)

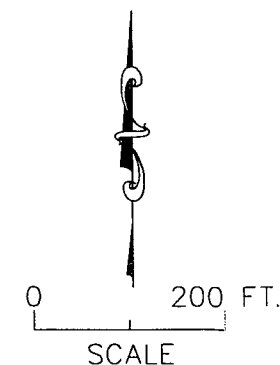
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EXPLANATION

- MW-12 14.130 WWC MONITORING WELL LOCATION AND IDENTIFICATION
ISOCONCENTRATION FOR METHANE
- MW-6 NS REED AND ASSOCIATES MONITORING WELL
LOCATION AND IDENTIFICATION
ISOCONCENTRATION FOR METHANE
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL



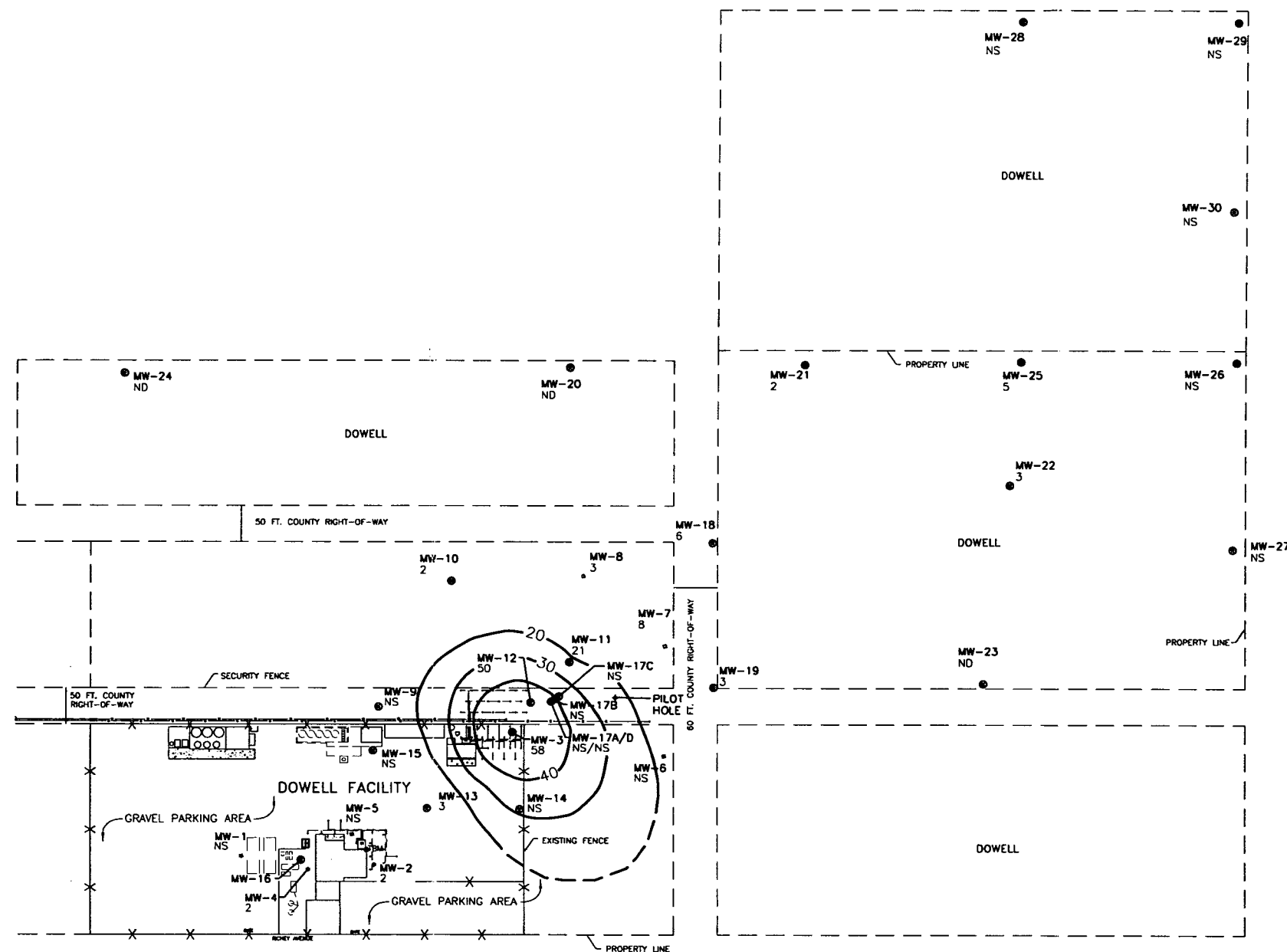
BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 8 SULFATE

(04/22/99)

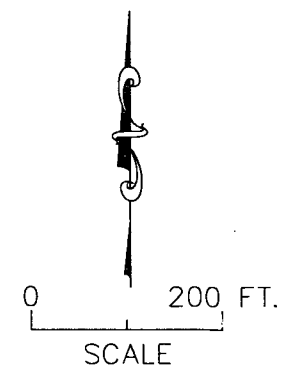
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ARTESIA, NEW MEXICO

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EXPLANATION

- MW-12 14.130 WC MONITORING WELL LOCATION AND IDENTIFICATION
ISOCONCENTRATION FOR TOTAL ORGANIC CARBON (mg/L)
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND
IDENTIFICATION
ISOCONCENTRATION FOR TOTAL ORGANIC CARBON (mg/L)
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL
- NS NOT SAMPLED
- ND NONDETECT



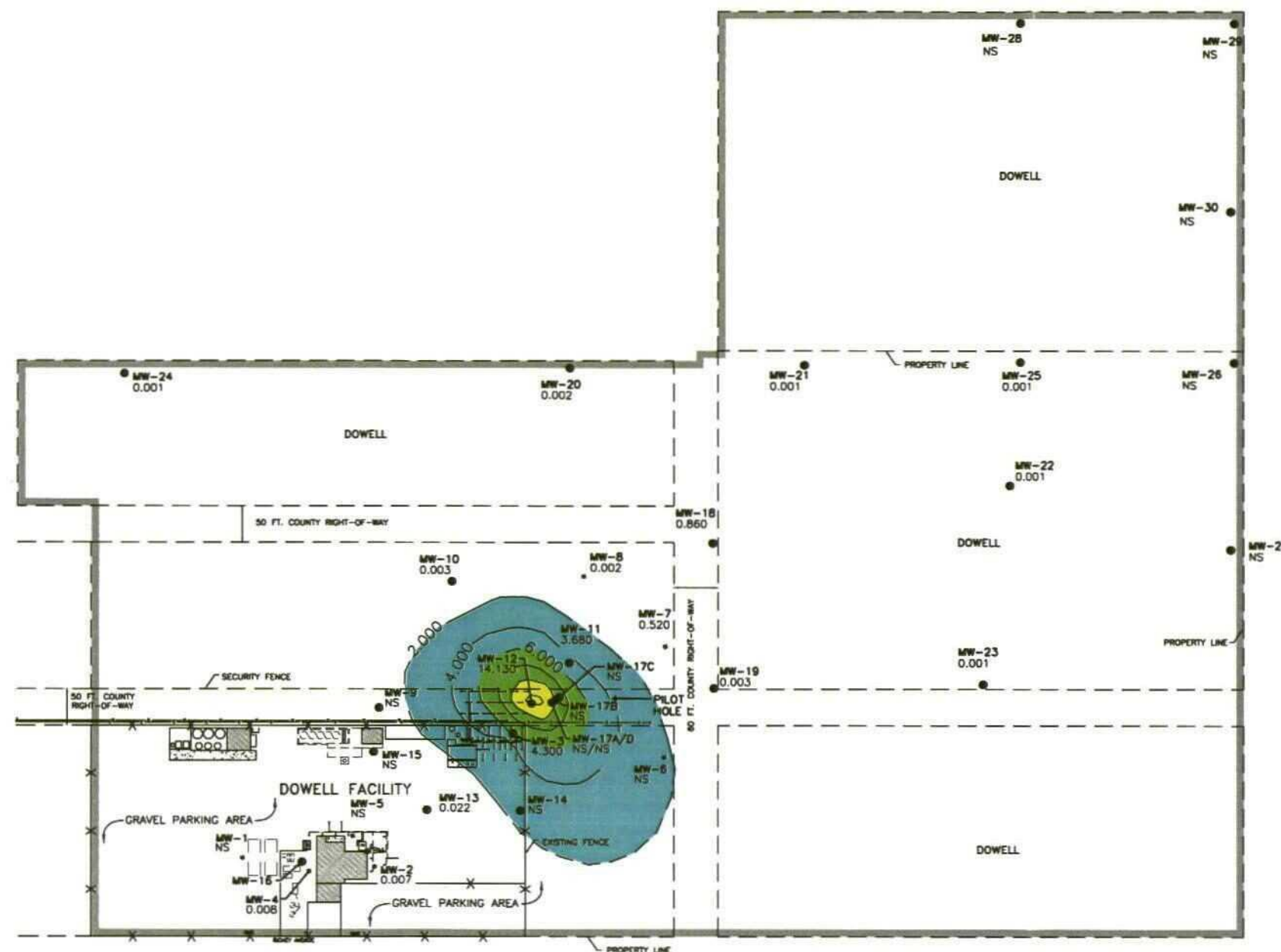
BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 9 TOTAL ORGANIC CARBON

(04/22/99)

DOWELL, A DIVISION OF
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ARTESIA, NEW MEXICO

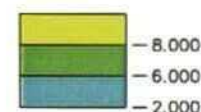
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EXPLANATION

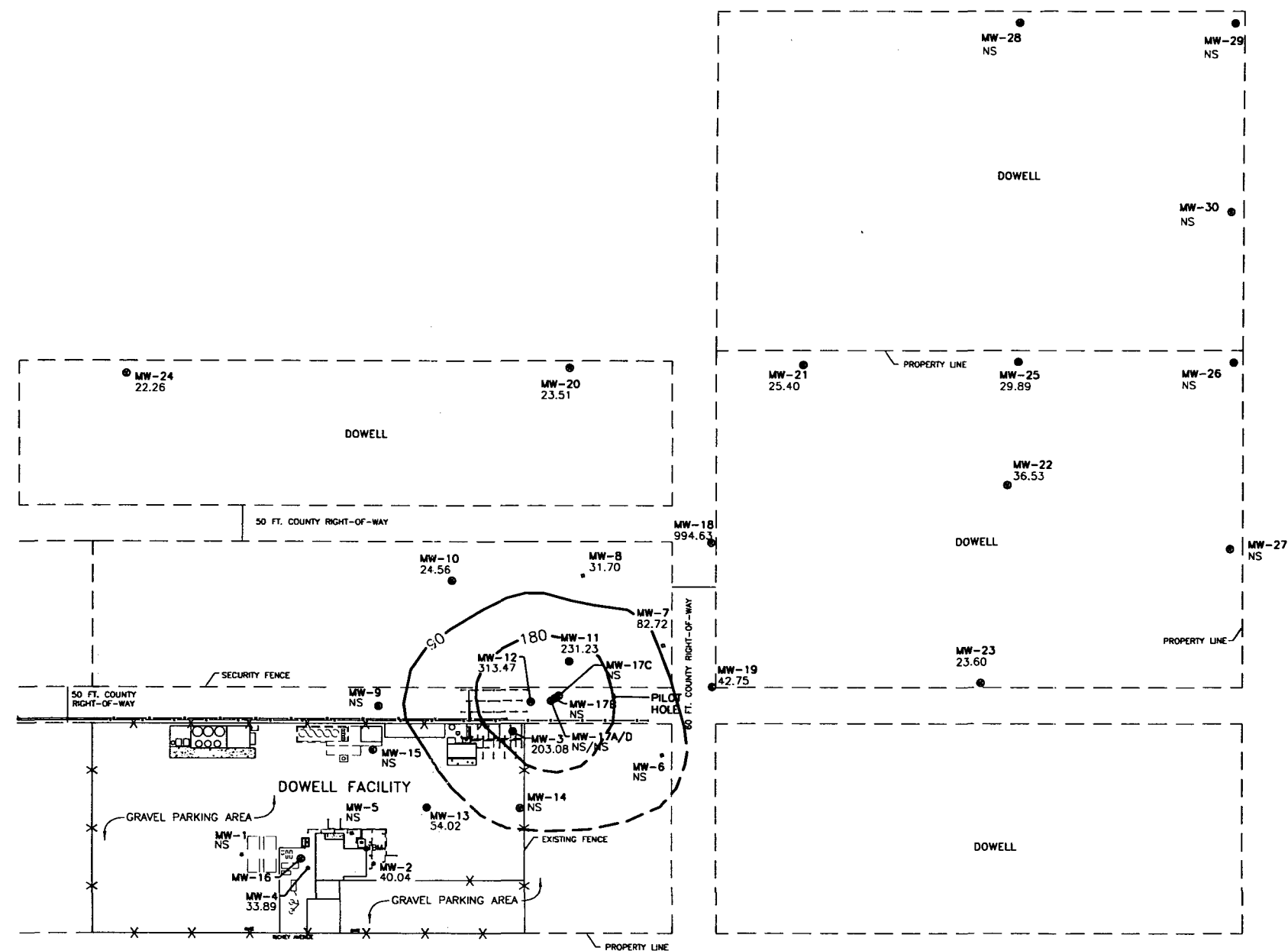
- MW-12 14.130 WWC MONITORING WELL LOCATION AND IDENTIFICATION
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL

ISOCONCENTRATION FOR METHANE



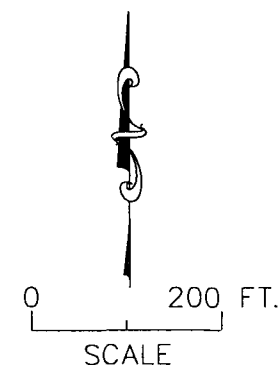
BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 10
ISOCONCENTRATION MAP FOR
METHANE
(04/22/99)
 DOWELL, A DIVISION OF
 SCHLUMBERGER TECHNOLOGY CORPORATION
 ARTESIA, NEW MEXICO



EXPLANATION

- MW-12 14.130 WC MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR CARBON DIOXIDE (mg/L)
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR CARBON DIOXIDE (mg/L)
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL
- NS NOT SAMPLED
- ND NONDETECT



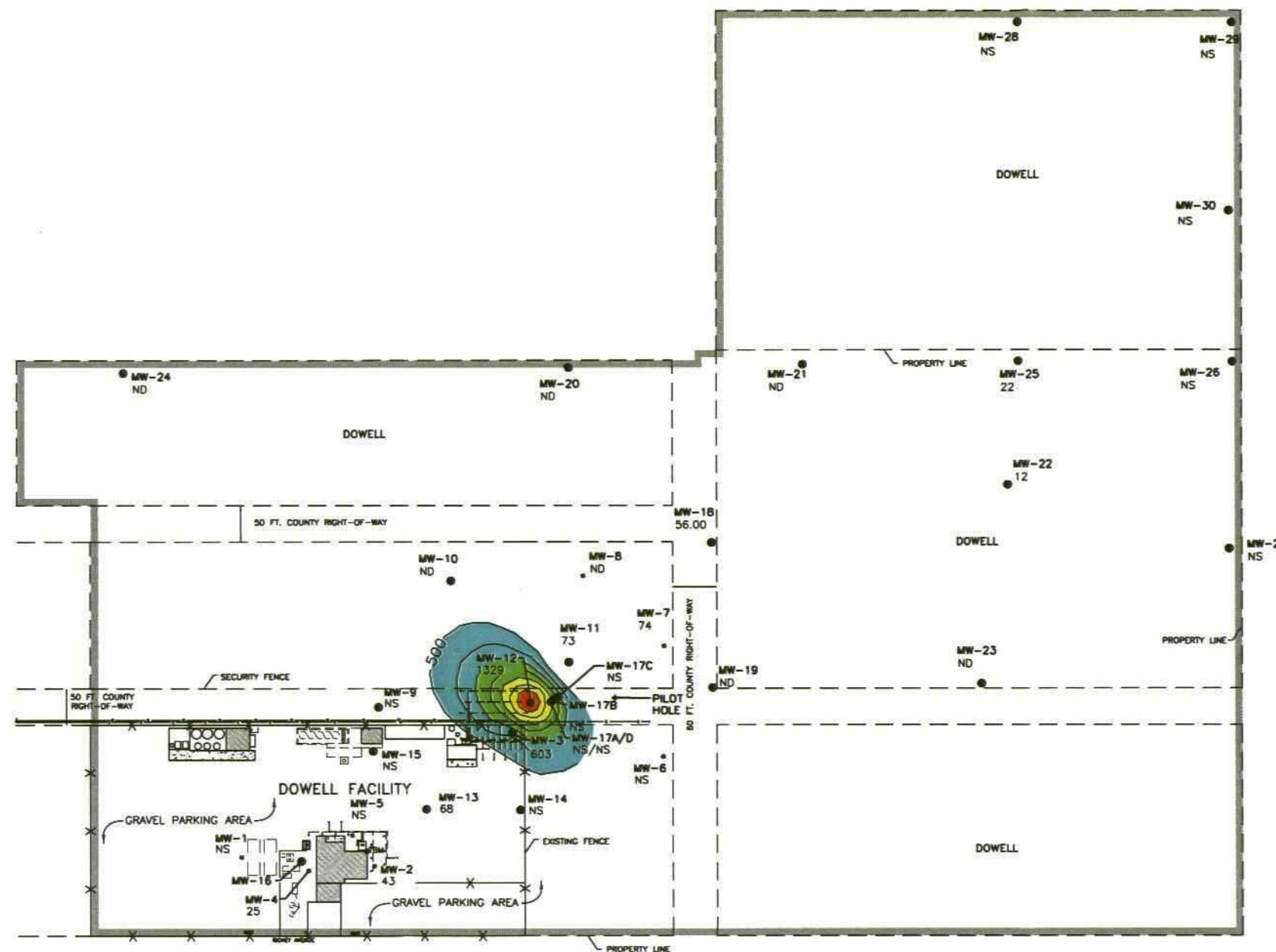
BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 11 CARBON DIOXIDE

(04/22/99)

DOWELL, A DIVISION OF
SCHLUMBERGER TECHNOLOGY CORPORATION
ARTESIA, NEW MEXICO

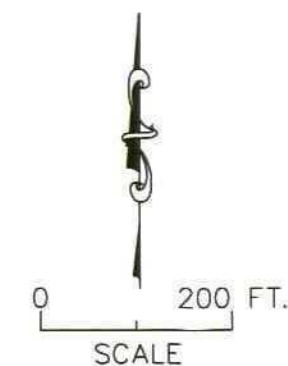
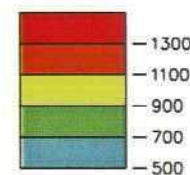
Western Water Consultants, Inc.  Engineering
Engineering Environmental Mining Water Resources



EXPLANATION

- MW-12 1329.00 WWC MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR ETHANE
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR ETHANE
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL

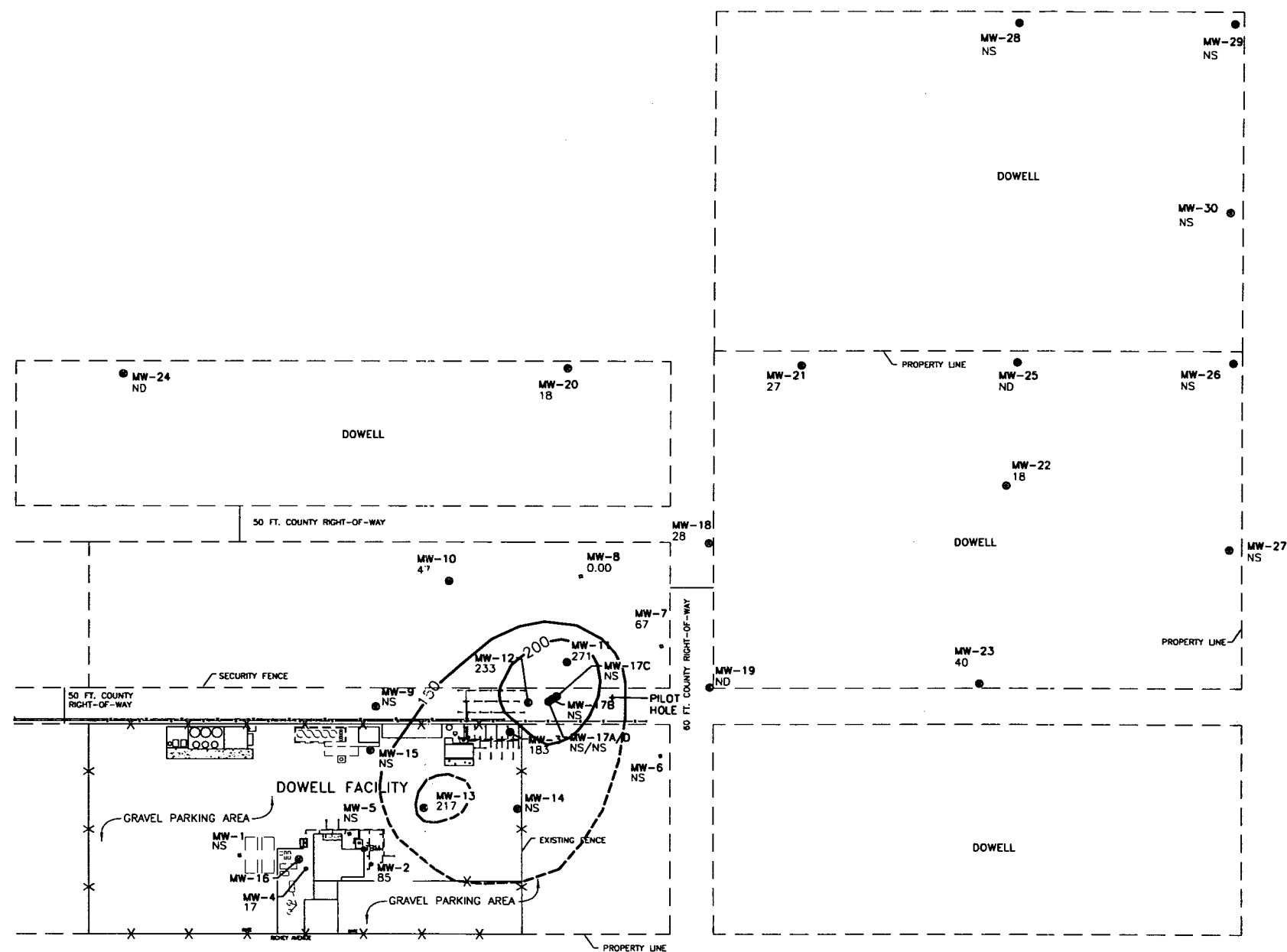
ISOCONCENTRATION FOR ETHANE



BASE MAP MODIFIED FROM REED & ASSOCIATES

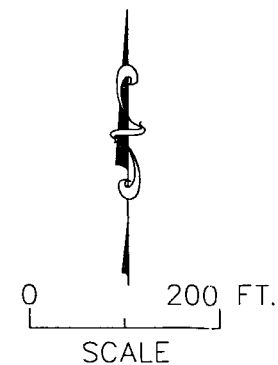
FIGURE 12
ISOCONCENTRATION MAP FOR
ETHANE
(04/22/99)
DOWELL, A DIVISION OF
SCHLUMBERGER TECHNOLOGY CORPORATION
ARTESIA, NEW MEXICO

Western
Water
Consultants, Inc.  WWC Engineering
Engineering Environmental Mining Water Resources



EXPLANATION

- MW-12 14.130 WC MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR ETHENE (ng/L)
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR ETHENE (ng/L)
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL
- NS NOT SAMPLED
- ND NONDETECT



BASE MAP MODIFIED FROM REED & ASSOCIATES

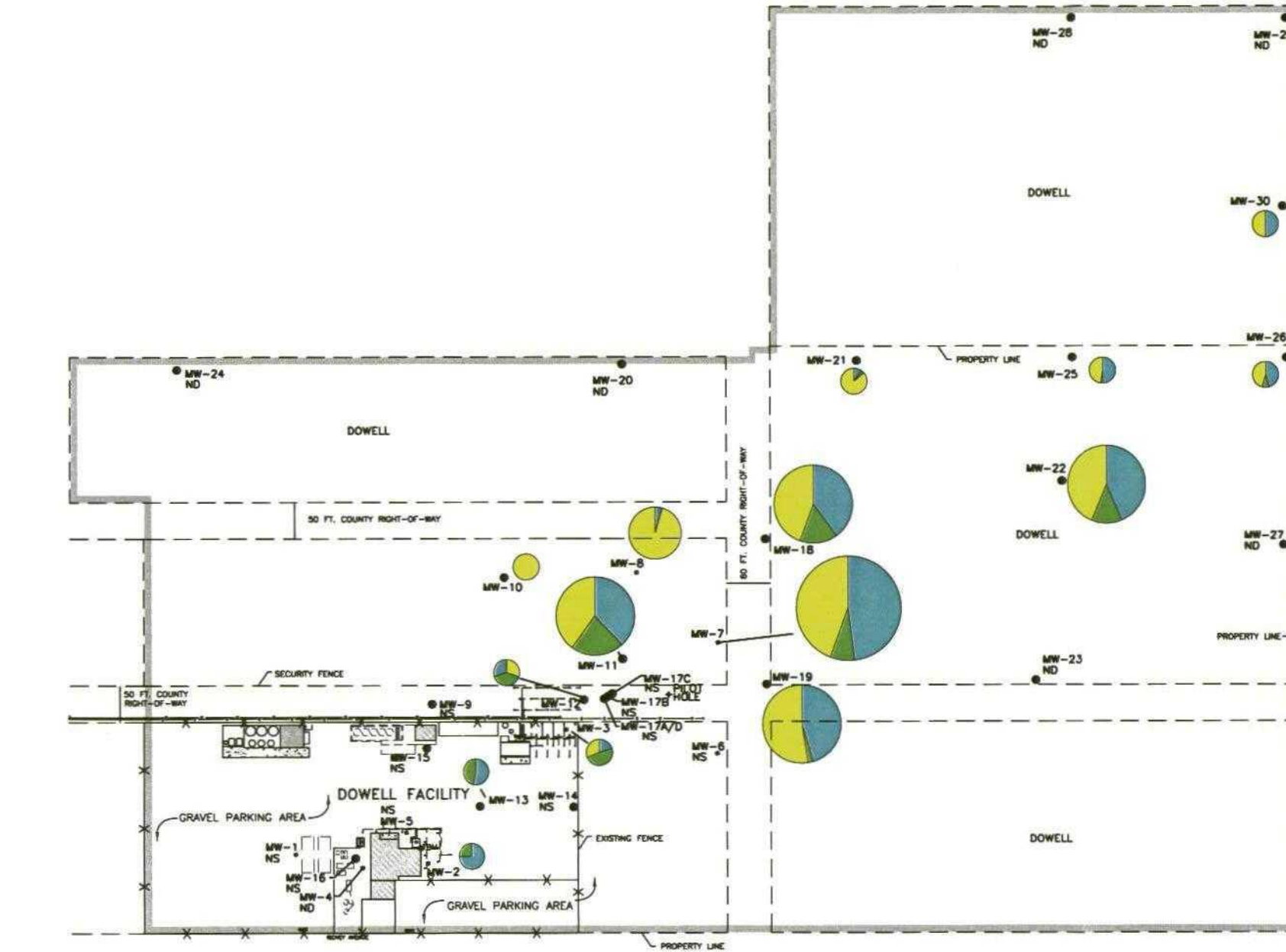
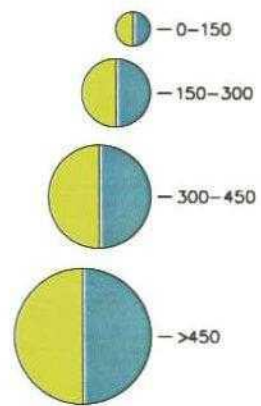
FIGURE 13 ETHENE

(04/22/99)

DOWELL, A DIVISION OF
SCHLUMBERGER TECHNOLOGY CORPORATION
ARTESIA, NEW MEXICO

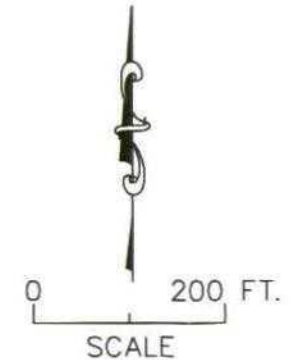
Western
Water
Consultants, Inc.  WWC Engineering

Engineering Environmental Mining Water Resources



EXPLANATION

- | | | | |
|---------|---|---|--|
| ● MW-12 | WWC MONITORING WELL LOCATION AND IDENTIFICATION | NS | NO SAMPLE TAKEN |
| ● MW-6 | REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION | ND | CHEMICAL NOT DETECTED AT CONCENTRATION ABOVE DETECTION LIMIT |
| ● TBM | TEMPORARY BENCH MARK | TOTAL CHLOROETHENES CONCENTRATIONS (mg/L:%) | |
| --- | AIR PIPING | 1,1 DCE | |
| • | SVE EXTRACTION WELL | TCE | |
| | | PCE | |



BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 14
DISTRIBUTION OF CHLOROETHENES
(4/22/99)

DOWELL, A DIVISION OF
SCHLUMBERGER TECHNOLOGY CORPORATION
ARTESIA, NEW MEXICO

Western
Water
Consultants, Inc. WWC Engineering
Engineering Environmental Mining Water Resources

TABLES

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-1	01/23/91	30.00	Protective Casing	100.56	17.41	83.15	
	09/13/91				16.04	84.52	1.37
	11/22/91				14.50	86.06	1.54
	03/16/93				13.72	86.84	0.78
	01/09/94				14.62	85.94	-0.90
	04/19/94				14.48	86.08	0.14
	07/20/94				14.38	86.18	0.10
	10/24/94				14.73	85.83	-0.35
	01/24/95				14.20	86.36	0.53
	04/02/95				14.37	86.19	-0.17
	07/31/95				14.76	85.80	-0.39
	10/16/95				14.64	85.92	0.12
	01/10/96				14.59	85.97	0.05
	04/09/96				14.77	85.79	-0.18
	07/20/96				15.84	84.72	-1.07
	10/21/96				14.07	86.49	1.77
	01/21/97				13.24	87.32	0.83
	04/08/97				12.97	87.59	0.27
	07/29/97				13.87	86.69	-0.90
	10/16/97				12.26	88.30	1.61
	02/09/99				14.34	86.22	-2.08
	04/21/99				13.91	86.65	0.43
MW-2	01/23/91	30.00	Protective Casing	99.56	16.95	82.61	
	09/13/91				15.01	84.55	1.94
	11/22/91				13.76	85.80	1.25
	03/16/93				13.16	86.40	0.60
	01/09/94				13.91	85.65	-0.75
	04/19/94				13.80	85.76	0.11
	07/20/94				13.65	85.91	0.15
	10/24/94				13.88	85.68	-0.23
	01/24/95				13.41	86.15	0.47
	04/02/95				13.67	85.89	-0.26
	07/31/95				13.81	85.75	-0.14
	10/16/95				13.78	85.78	0.03
	01/10/96				13.80	85.76	-0.02
	04/09/96				13.98	85.58	-0.18
	07/20/96				14.92	84.64	-0.94
	10/21/96				13.15	86.41	1.77
	01/21/97				12.41	87.15	0.74
	04/08/97				12.21	87.35	0.20
	07/29/97				13.15	86.41	-0.94
	10/16/97				11.63	87.93	1.52
	01/06/98				10.92	88.64	0.71
	04/14/98				11.02	88.54	-0.10
	07/17/98				13.03	86.53	-2.01
	10/27/98				13.61	85.95	-0.58
	02/09/99				13.69	85.87	-0.08
	04/21/99				13.24	86.32	0.45
MW-3	01/23/91	30.00	Protective Casing	98.33	17.28	81.05	
	09/13/91				14.66	83.67	2.62
	11/22/91				13.63	84.70	1.03
	03/16/93				12.89	85.44	0.74
	01/09/94				13.66	84.67	-0.77
	04/19/94				NM	NM	NM
	07/20/94				13.18	85.15	na
	10/24/94				13.27	85.06	-0.09
	01/24/95				13.23	85.10	0.04
	04/02/95				13.60	84.73	-0.37

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (Ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (Ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-3 Cont.	07/31/95				13.34	84.99	0.26
	10/16/95				13.38	84.95	-0.04
	01/10/96				13.85	84.48	-0.47
	04/09/96				13.91	84.42	-0.06
	07/20/96				14.55	83.78	-0.64
	10/21/96				12.90	85.43	1.65
	01/21/97				12.42	85.91	0.48
	04/08/97				12.43	85.90	-0.01
	07/29/97				13.18	85.15	-0.75
	10/16/97				11.83	86.50	1.35
	01/06/98				11.45	86.88	0.38
	04/14/98				11.44	86.89	0.01
	07/17/98				12.81	85.52	-1.37
	10/27/98				12.60	85.73	0.21
	02/09/99				13.44	84.89	-0.84
	04/21/99				12.75	85.58	0.69
MW-4	01/23/91	50.00	Protective Casing	103.18	20.17	83.01	
	09/13/91				18.54	84.64	1.63
	11/22/91				17.15	86.03	1.39
	03/16/93				16.49	86.69	0.66
	01/09/94				17.28	85.90	-0.79
	04/19/94				17.15	86.03	0.13
	07/20/94				16.99	86.19	0.16
	10/24/94				17.25	85.93	-0.26
	01/24/95				16.78	86.40	0.47
	04/02/95				16.98	86.20	-0.20
	07/31/95				17.26	85.92	-0.28
	10/16/95				17.01	86.17	0.25
	01/10/96				16.95	86.23	0.06
	04/09/96				17.15	86.03	-0.20
	07/20/96				18.08	85.10	-0.93
	10/21/96				16.28	86.90	1.80
	01/21/97				15.37	87.81	0.91
	04/08/97				15.14	88.04	0.23
	07/29/97				16.05	87.13	-0.91
	10/16/97				14.44	88.74	1.61
	01/06/98				13.59	89.59	0.85
	04/14/98				13.91	89.27	-0.32
	07/17/98				16.40	86.78	-2.49
	10/27/98				17.05	86.13	-0.65
	02/09/99				17.08	86.10	-0.03
	04/21/99				16.67	86.51	0.41
MW-5	01/23/91	30.00	Protective Casing	99.87	17.20	82.67	
	09/13/91				15.52	84.35	1.68
	11/22/91				14.19	85.68	1.33
	03/16/93				13.47	86.40	0.72
	01/09/94				14.31	85.56	-0.84
	04/19/94				14.17	85.70	0.14
	07/20/94				13.97	85.90	0.20
	10/24/94				14.21	85.66	-0.24
	01/24/95				13.78	86.09	0.43
	04/02/95				14.05	85.82	-0.27
	07/31/95				14.17	85.70	-0.12
	10/16/95				14.07	85.80	0.10
	01/10/96				14.11	85.76	-0.04
	04/09/96				14.31	85.56	-0.20
	07/20/96				15.20	84.67	-0.89
	10/21/96				13.44	86.43	1.76
	01/21/97				12.69	87.18	0.75
	04/08/97				12.52	87.35	0.17
	07/29/97				13.37	86.50	-0.85
	10/16/97				11.82	88.05	1.55
	01/06/98				11.09	88.78	0.73

GW - 114

MONITORING REPORTS

DATE:

12/99

REPORT FOR
ADDITIONAL NATURAL ATTENUATION
MONITORING AT DOWELL, A DIVISION
OF SCHLUMBERGER TECHNOLOGY CORPORATION
FACILITY IN ARTESIA, NEW MEXICO

December 9, 1999

Prepared For:

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1.0 INTRODUCTION

1.0 INTRODUCTION

This report represents an update on the effect of natural attenuation (NA) on dissolved-phase constituents in the ground-water at the Dowell, a division of Schlumberger Technology Corporation facility in Artesia, New Mexico (Figure 1). Dowell conducted a study in November 1996 to evaluate the effectiveness of natural attenuation, particularly intrinsic bioremediation, to chemically achieve corrective action goals. Results of the study were presented in a report to the New Mexico Conservation Division (NMOCD) titled "Initial Evaluation of Natural Attenuation" dated April 1997.

Results of the initial NA evaluation in 1996 indicated aromatic hydrocarbon and chlorocarbon concentrations were either stable or declining in both mass and horizontal extent. A sequential change in ground-water conditions occurred over time creating an environment favorable for aerobic and anaerobic microorganisms to biodegrade chlorocarbons and residual aromatic hydrocarbons. In addition, spatial patterns of dissolved-phase constituents across the site suggested subsurface environment conditions conducive to long term biodegradation of hydrocarbon and chlorinated constituents.

1.1 Current Status

The Dowell facility in Artesia was established in 1969 and continues to actively provide specialty products and services to the regional petroleum extraction industry. Since 1989 various investigation and corrective action activities have been performed involving hydrogeologic investigations, removal of underground storage tanks, source area excavation, and soil and ground-water sampling. Presently there are two soil vapor extraction systems operating at the site.

Since the initial evaluation of natural attenuation in 1996, six additional monitoring wells (MW-25 to MW-30) were installed northeast of the facility to define the extent of dissolved-phase constituents in the ground-water (Figure 1). Ground-water monitoring is currently performed quarterly at 12 of the 30 monitoring wells and annually on 29 of the 30 monitoring wells completed in the local surficial aquifer.

1.2 Local Geology and Hydrology

Geology beneath the Artesia facility consists of a regional carbonate gravel unit. Sediments encountered during drilling consist of red clay, silty clay, and clay interbedded with thin (2-4 inch) white and pinkish – cream carbonate or caliche layers. Zones where carbonate/caliche layers are common have been identified in core samples but are difficult to trace laterally between even closely-spaced ground-water monitoring wells. Drilling at the site has reached a maximum depth of 68 feet below surface. A quartzose unit underlying the carbonate gravel unit has not been encountered.

The water-bearing zones in the shallow aquifer are the carbonate/caliche layers in which the permeability apparently has been enhanced by solution of carbonate minerals. Below the water table, many, but not all, of the carbonate/caliche layers are saturated, whereas the clays and silts appear only damp to moist. Zones of unsaturated carbonate/caliche below the water table are present irregularly. Carbonate/caliche zones above and below these dry zones are saturated.

Depth to ground-water has varied from approximately 17 feet below ground surface in 1991 to 13 feet April, 1999 (Table 1). The ground-water flow direction has been consistently to the northeast since monitoring has been conducted. A potentiometric surface map constructed for the April, 1999 water level data shows ground-water continues to flow to the northeast (Figure 1).

1.3 Constituent Status

The highest concentrations of dissolved-phase aromatic hydrocarbon constituents remains localized in the ground-water around MW-3 and MW-12 with residual concentrations around MW-2 and MW-25 (Figure 2). Aromatic hydrocarbon concentrations range from a high of 1.570 parts per million (ppm) in MW-12 to nondetect in most other monitoring wells. Concentrations are either stable or declining at this facility. Historical water quality data is provided as Table 2.

Since the initial natural attenuation evaluation in 1996, concentrations of dissolved-phase chlorocarbons remain in a stabilized or declining trend throughout most of the site with the exception of a slight increase at monitoring wells MW-18, MW-19, and MW-22. The highest concentrations continue to be localized in the ground-water around MW-7 (Figure 3). Concentrations range from a high of 0.607 ppm at MW-7 to nondetect levels in most wells on the perimeter of the facility.

2.0 NATURAL ATTENUATION MONITORING

2.0 NATURAL ATTENUATION MONITORING

On April 22, 1999, Western Water Consultants Inc., (WWC) conducted ground-water sampling at the Artesia facility for the purpose of updating data to evaluate natural attenuation processes. Data collected from the monitoring would be used to assess the chemical and environmental conditions of the aquifer in terms of biodegradation. Assessing these conditions would involve determining available electron acceptors, environmental parameters that control microbiological activity, and evidence of intermediate and end products of contaminant biodegradation.

Field measurements and ground-water samples were collected using a peristaltic pump connected to a flow through cell and Hydrolab mini-sonde 4A. Field measurements were collected for pH, conductivity, oxidation reduction potential (Eh), temperature, and dissolved oxygen (D.O.). Results for the field parameters are presented as Table 3.

Ground-water samples were collected from 17 monitoring wells (MW-2 to MW- 4, MW-7, MW-8, MW-10 to MW-13, and MW-18 to MW-25) for natural attenuation parameters. Each monitoring well was micropurged until field parameters (pH, conductivity, temperature, and Eh) stabilized prior to sample collection. Ground-water samples were analyzed for nitrate-nitrite by EPA Method 353.3, orthophosphate by EPA Method 365.3, sulfate by EPA Method 375.4, total organic carbon (TOC) by EPA Method 415.1, methane, carbon dioxide, ethane, and ethene.

3.0 RESULTS

3.0 RESULTS

Field measurements of the ground-water continue to show evidence of microbial activity in the subsurface. PH values ranged from 6.34 to 7.16 with background values of 6.98 to 7.1. An area of slightly depressed pH values is localized in the ground-water around MW-11 (Figure 4). Organic acids and CO₂ are typically produced as byproducts of the biodegradation of hydrocarbons and can locally lower the pH of ground-water. Eh values which describe the oxidation-reduction (REDOX) potential of the measured ground-water ranged from -216 to 543 millivolts. Plotting of the Eh values indicates ground-water in the vicinity of MW-3 and MW-12 exhibit conditions indicative of a reducing environment while periphery areas are more conducive to an oxidizing environment (Figure 5).

D.O. values ranged from 0.07 to 2.15 mg/L with background levels between 1.15 and 2.15 mg/L. A central area of essentially anaerobic conditions exists in the ground-water around MW-3 and MW-12 (Figure 6). Environmental conditions within this core of low D.O. are anaerobic with aerobic conditions along the periphery.

Nitrate in ground-water ranged from nondetect to 9.1 mg/L. An area depleted in nitrate extends from MW-4 northeast to MW-7 (Figure 7). Water quality data is presented as Table 4. Laboratory data sheets are presented as Appendix A.

Sulfate in ground-water ranged from 400.0 to 3300 mg/L with background levels from 1800 to 3300 mg/L (Figure 8). Concentrations below background levels are present in the ground-water around MW-4 and in the vicinity of MW-3 and MW-12.

Total Organic Carbon (TOC) was present in the ground-water at 14 of 17 monitoring wells. TOC in ground-water ranged from nondetect levels to 58.0 mg/L with the highest concentrations were present in the ground-water around MW-3, MW-11, and MW-12 (Figure 9).

Methane, measured as a gas within ground-water, was present in all 17 monitoring wells and ranged from 0.001 to 14.13 mg/L. The highest concentrations are centered at MW-12 (14.13 mg/L) and decreases in a radial pattern to background levels of 0.001 mg/L (Figure 10).

Carbon dioxide measured as a gas within ground-water was detected in all 17 monitoring wells and ranged from 22.26 to 231.23 mg/L. Areas of high concentrations were centered around MW-3, MW-11, and MW-12 (Figure 11).

Ethane and ethene measured as dissolved gases in ground-water were detected in 10 and 13 of 17 monitoring wells. The highest concentrations of ethane were present in the area of MW-3 and MW-12 (Figure 12). The highest concentrations of ethene were detected in the areas of MW-13, MW-3, MW-11, and MW-12 (Figure 13).

4.0 DISCUSSION

4.0 DISCUSSION

4.1 Biodegradation of Hydrocarbons

Chemical data gathered from the April NA monitoring event supports previous trends that are particularly important with regard to intrinsic bioremediation. PH continues to be depressed in the area with the highest concentrations of dissolved phase constituents around MW-3 and MW-12. D.O. also remains depleted in this area indicating that environmental conditions are in an anaerobic state. Depressed Eh values indicate a reducing environment in the core area with oxidizing conditions along the periphery conducive to biodegradation of aromatic hydrocarbons through aerobic metabolism.

Nitrate and sulfate are utilized as electron acceptors under anaerobic conditions to degrade aromatic hydrocarbons through denitrification and sulfate reduction processes (USEPA guidance document 1998). The absence of nitrate in the ground-water from MW-4 northeast across the site to MW-12 indicates aromatic hydrocarbons were biodegraded by anaerobic microorganisms through denitrification after aerobic respiration of aromatic hydrocarbons created anaerobic conditions. Sulfate concentrations are below background levels in the ground-water at MW-4 and MW-12 and may indicate that anaerobic microorganisms are biodegrading aromatic hydrocarbons through sulfate reduction processes. The low Eh value of -216 millivolts in the ground-water at MW-12 is indicative of geochemical conditions conducive to the biodegradation of aromatic hydrocarbons through sulfate reduction (USEPA guidance document 1998). Additional monitoring events may verify whether this process is in fact occurring.

4.2 Biodegradation of Chlorocarbons

Water quality data for natural attenuation monitoring indicates degradation of chlorocarbons is continuing at this facility. As mentioned previously, D.O. values show a distinct inverse correlation with the area containing the highest concentrations of dissolved-phase constituents. Aerobic respiration of aromatic hydrocarbons over a long period of time has created environmental conditions which are now anaerobic. Negative Eh readings of the ground-water in this same area indicates environmental conditions are in an optimal range for reductive dehalogenation to occur (USEPA Guidance Document 1998).

Elevated methane levels centered around MW-12 represent direct evidence of highly reducing conditions ideal for the reductive dehalogenation of chlorocarbons. Methane also represents an appropriate carbon source for methanotrophic oxidation of chlorocarbons in the soil and ground-water where aerobic conditions persist.

Carbon dioxide is a byproduct of naturally occurring aerobic and anaerobic biodegradation processes that occur in ground-water (USEPA guidance document 1998). Elevated CO₂ levels in the same distribution as methane indicates greater microbial activity than in the surrounding area. The inverse correlation between the concentration of D.O. and CO₂ also indicates that aerobic metabolism is an important process in the subsurface in this area creating anaerobic conditions important for the biodegradation of chlorocarbon constituents.

Microbial degradation of chlorocarbons such as PCE via the process of reductive dechlorination results in the formation of daughter products TCE, isomers of DCE, VC, ethene and finally CO_2 and H_2O . Evidence that the process of reductive dehalogenation has been and is still actively occurring is shown on the spatial distribution of chloroethenes across the site (Figure 14). PCE makes up a large percentage of the total chloroethenes present in the ground-water beneath the facility itself. However, the percentage of PCE in the ground-water decreases from MW-12 toward the northeast. Daughter products such as TCE and DCE isomers begin to make up the larger percentage of the chlorocarbons. In addition the high concentration of ethene and ethane in the area of MW-3 and MW-12 strongly suggests that chlorocarbons such as PCE and TCE have undergone reductive dehalogenation.

The Environmental Protection Agency (EPA) developed a screening process and weighting system to evaluate anaerobic biodegradation processes (reductive dechlorination) using geochemical data at individual sites (USEPA September 1998). The various parameters used by EPA in their weighting system were compared to the field data collected for the additional NA monitoring. The results of the comparison, shown on Table 5, indicate the Dowell facility in Artesia would receive a score of 24. Under the EPA weighting system, a score greater than 20 indicates strong evidence that biodegradation of chlorocarbons through reductive dechlorination processes is occurring at a site.

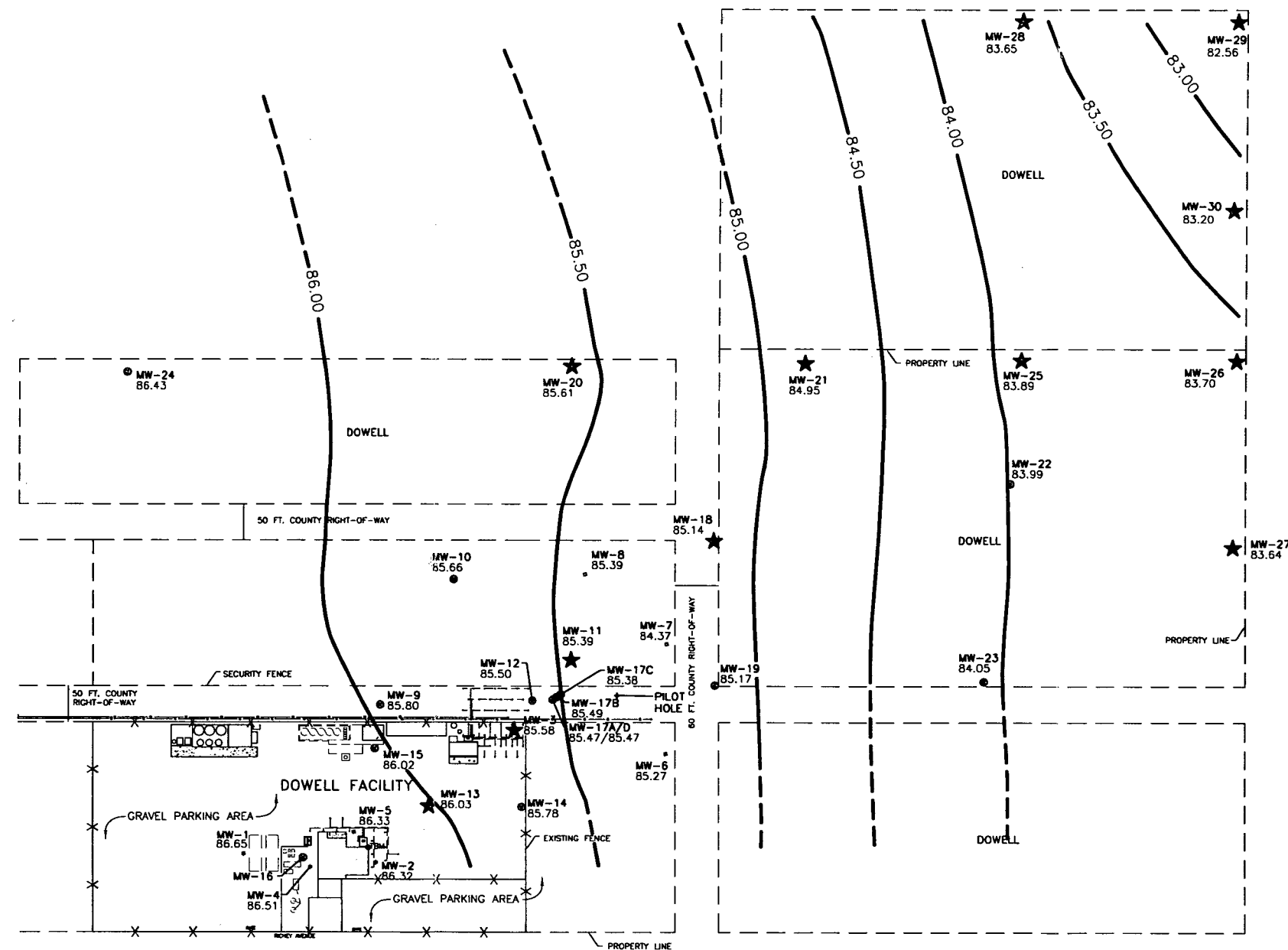
5.0 CONCLUSIONS

5.0 CONCLUSIONS

This evaluation of natural attenuation processes at the Artesia facility confirms the conclusions presented in the "Initial Evaluation of Natural Attenuation" report to the NMOCD in 1996. Chemical and environmental conditions do exist which favor the biodegradation of both aromatic hydrocarbons and chlorocarbons to corrective action levels given time. The appropriate electron acceptors are available for anaerobic biodegradation of residual aromatic hydrocarbons and optimal conditions exist for biodegrading chlorocarbons through the reductive dehalogenation and possibly methanotrophic processes. The spatial distribution of dissolved-phase constituents across the site indicate a subsurface environment conducive to the long term biodegradation of hydrocarbon and chlorinated constituents.

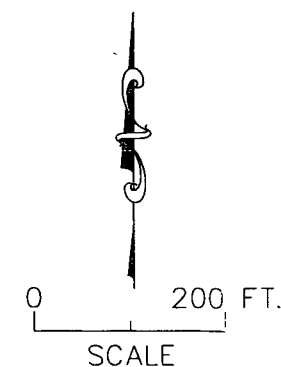
Maintaining the current monitoring program will provide the necessary data to monitor existing dissolved-phase constituents and destruction of the contaminants.

FIGURES



EXPLANATION

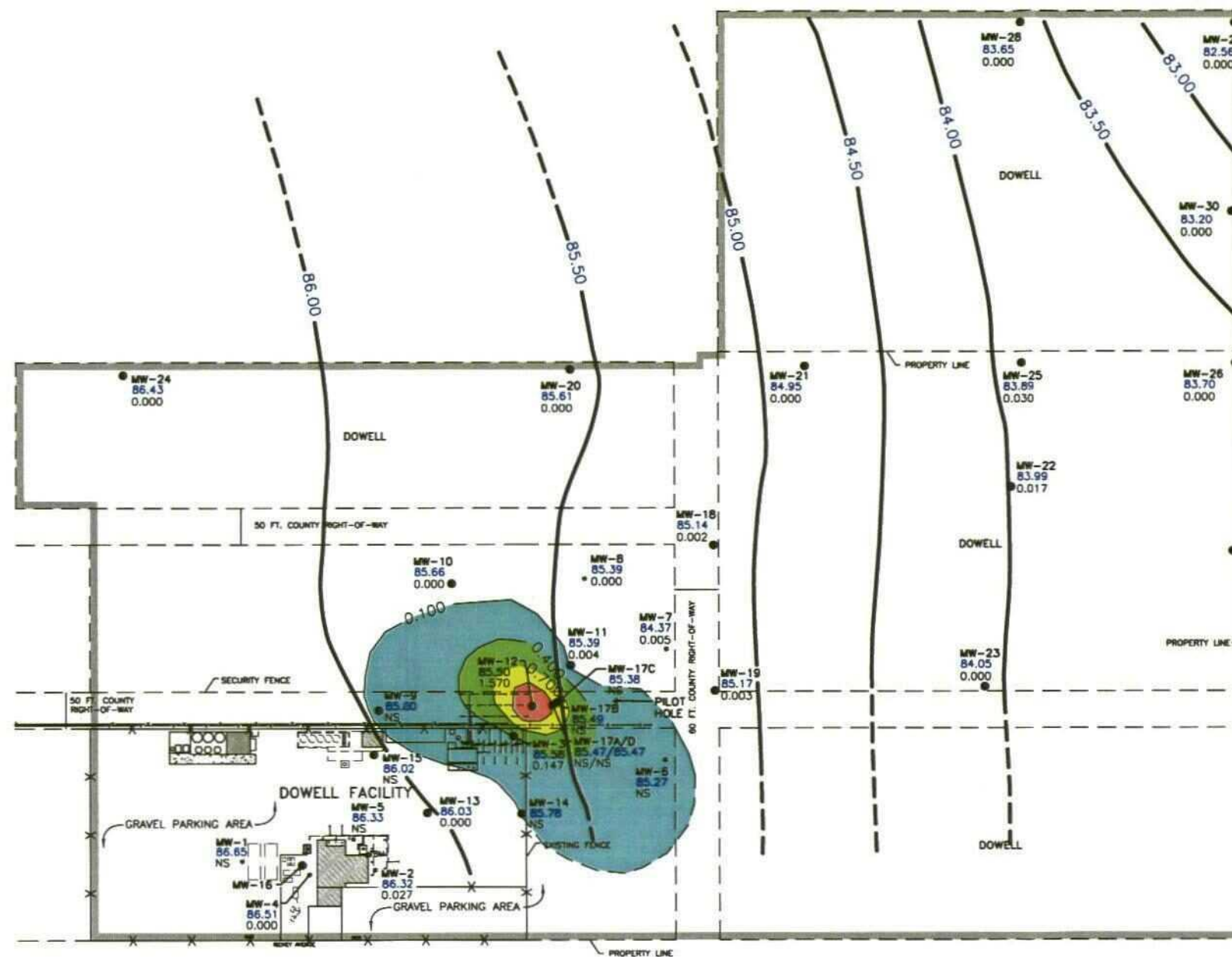
- MW-12 84.69 WWC MONITORING WELL LOCATION, IDENTIFICATION, AND POTENTIOMETRIC SURFACE
- MW-6 84.50 REED AND ASSOCIATES MONITORING WELL LOCATION, IDENTIFICATION, AND POTENTIOMETRIC SURFACE
- ★ MONITORING WELLS TO BE SAMPLED QUARTERLY
- 86.00 — POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL



BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 1
SITE MAP WITH
POTENTIOMETRIC SURFACE
(04/21/99)
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EXPLANATION

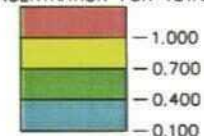
- MW-12
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1.895

WWC MONITORING WELL LOCATION AND IDENTIFICATION
GROUND-WATER ELEVATION
ISOCONCENTRATION FOR TOTAL BTEX
- MW-6
85.07
ND

REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION
GROUND-WATER ELEVATION
ISOCONCENTRATION FOR TOTAL BTEX
- TM

TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL

ISOCONCENTRATION FOR TOTAL BTEX



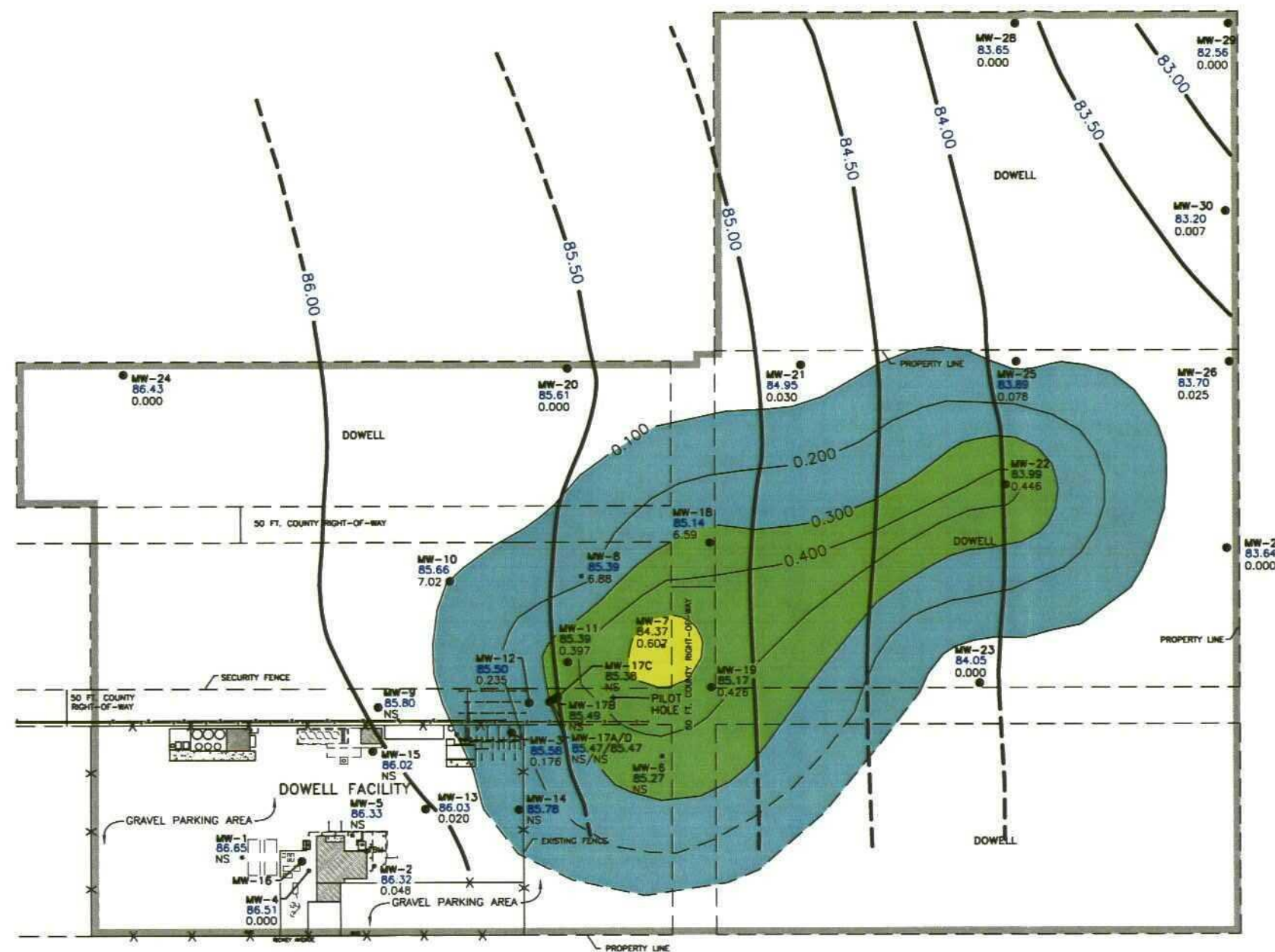
-86.00- POTENTIOMETRIC SURFACE CONTOUR



BASE MAP MODIFIED FROM REED & ASSOCIATES

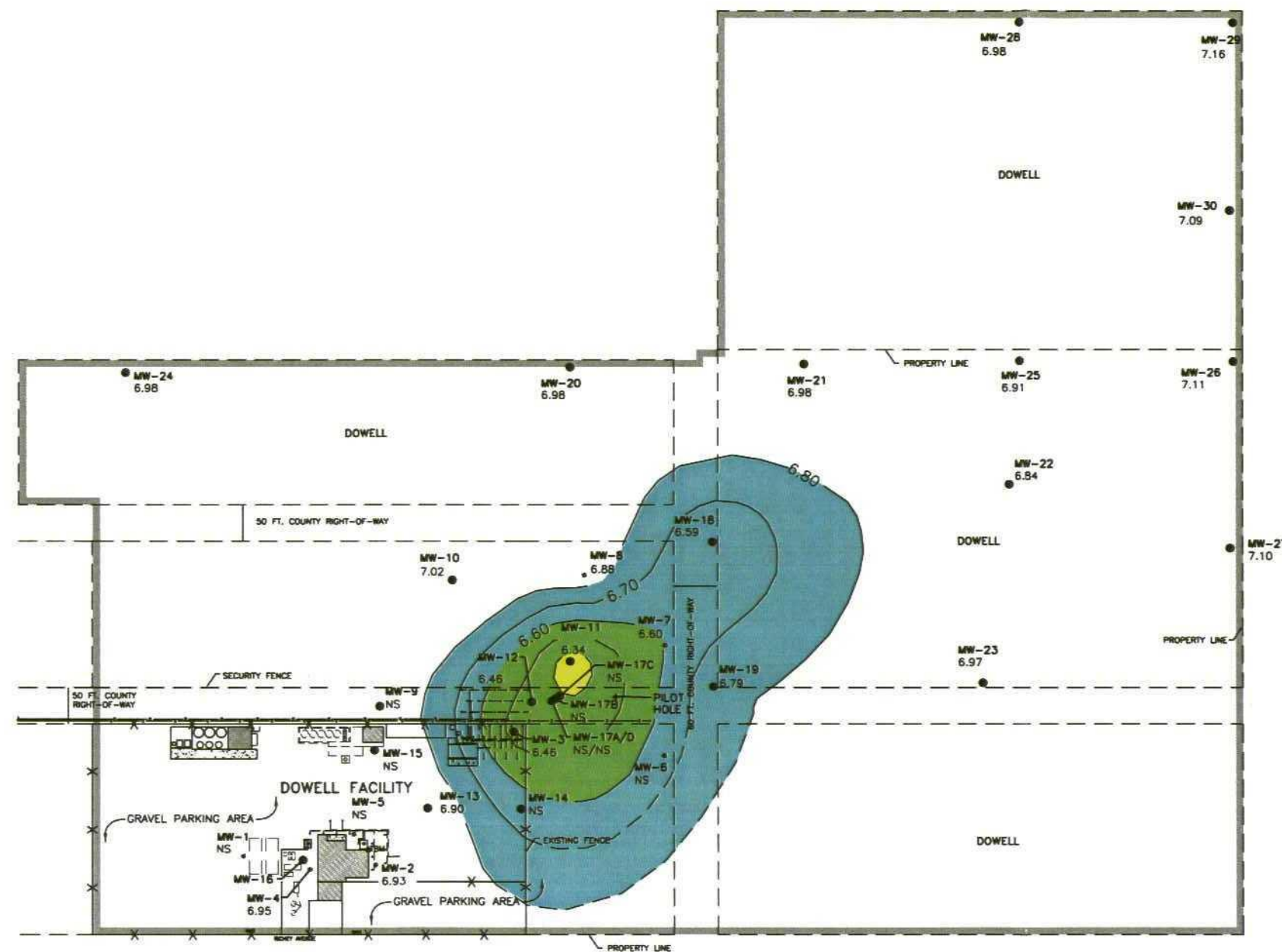
FIGURE 2
POTENTIOMETRIC SURFACE AND
ISOCONCENTRATION MAP FOR
TOTAL BTEX (04/22/99)
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EXPLANATION

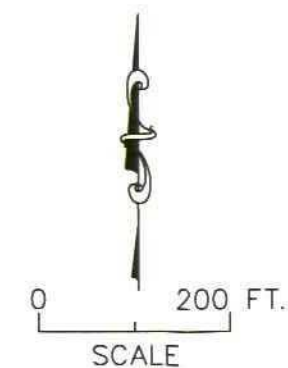
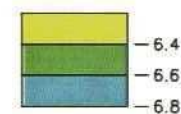
- MW-12**
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 1.895
 WWC MONITORING WELL LOCATION AND IDENTIFICATION
 GROUND-WATER ELEVATION
 ISOCONCENTRATION FOR TOTAL HALOCARBONS
 - MW-6**
 85.07
 ND
 REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION
 GROUND-WATER ELEVATION
 ISOCONCENTRATION FOR TOTAL HALOCARBONS
 - TBW
 TEMPORARY BENCH MARK
 - AIR PIPING
 - SVE EXTRACTION WELL
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EXPLANATION

- MW-12 1.895 WWC MONITORING WELL LOCATION AND IDENTIFICATION
- MW-6 ND REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL

ISOCONCENTRATION FOR pH

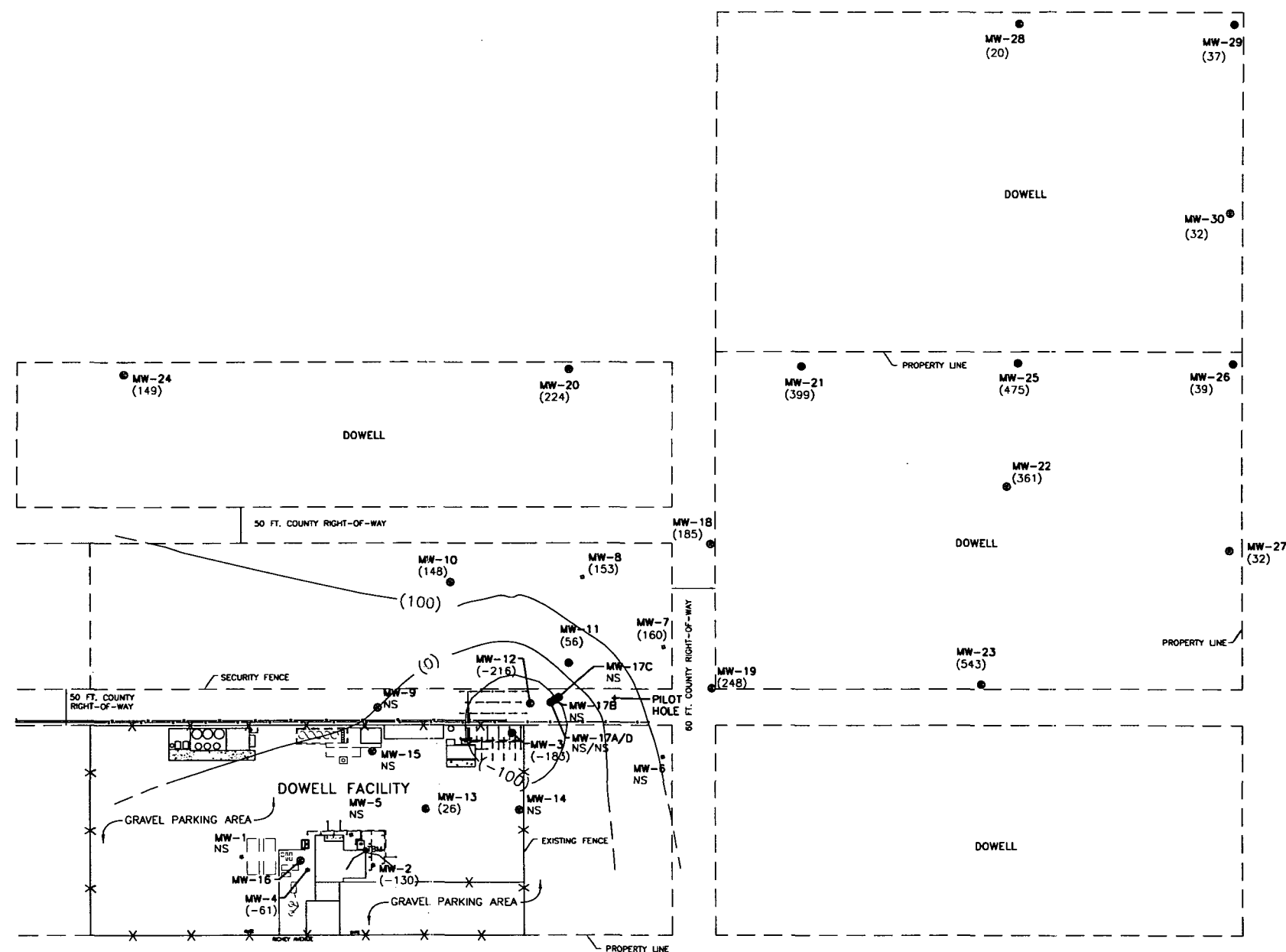


BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 4
ISOCONCENTRATION MAP FOR pH
(04/22/99)

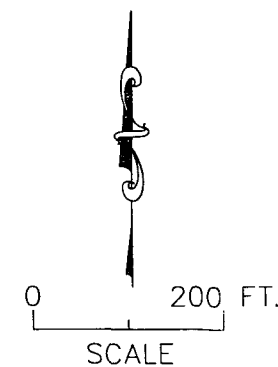
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Western Water Consultants, Inc. **WWC** Engineering
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EXPLANATION

- MW-12 (-216) WWC MONITORING WELL LOCATION AND IDENTIFICATION REDOX POTENTIAL
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION REDOX POTENTIAL
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL

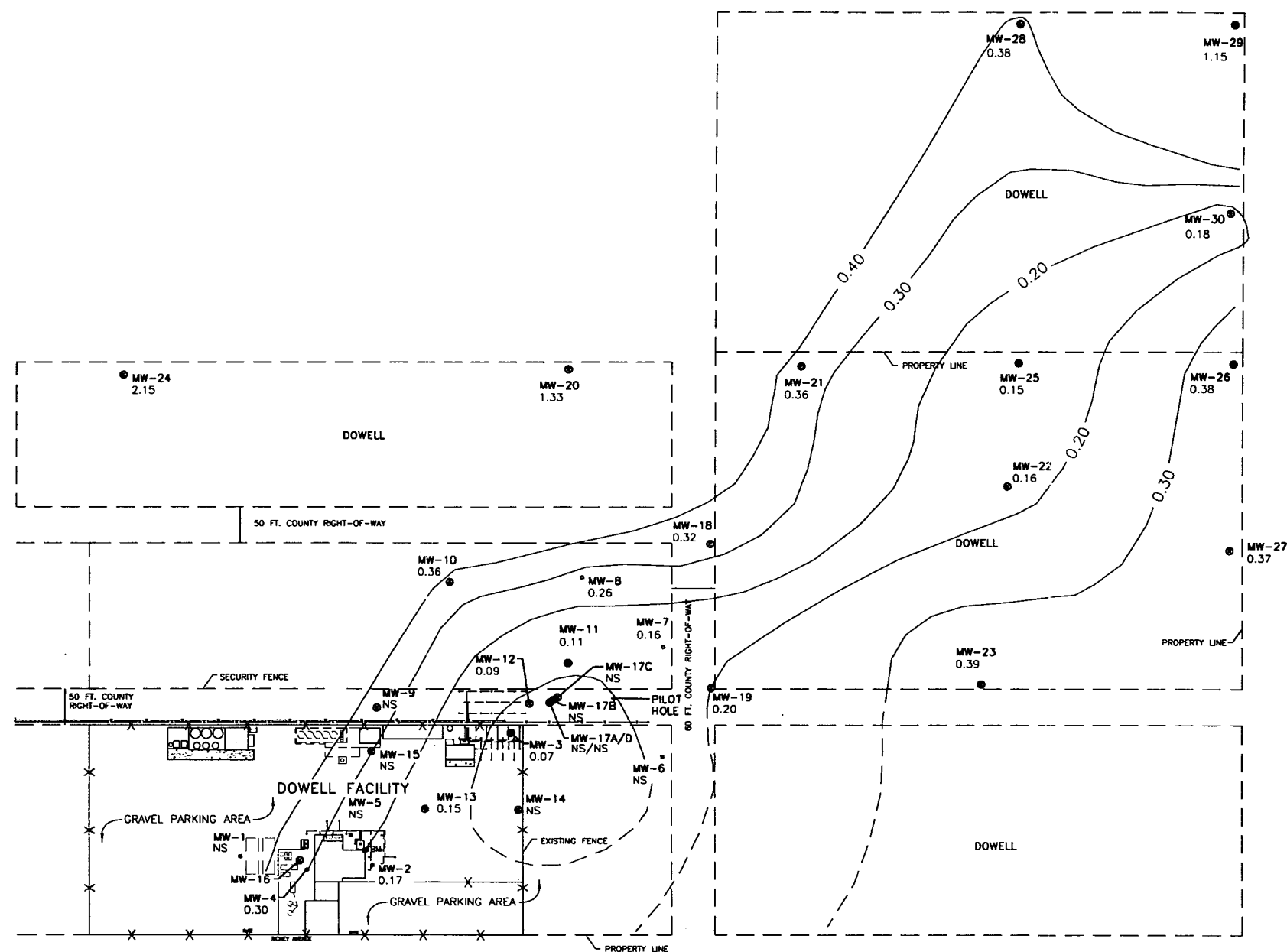


BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 5
REDOX POTENTIAL (Eh)
(04/22/99)

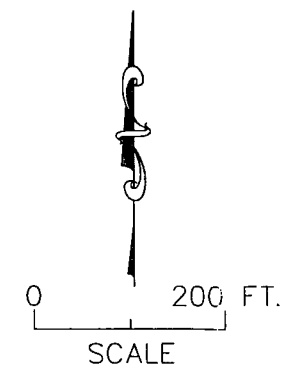
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Consultants, Inc. **W** **W** **C** Engineering
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EXPLANATION

- MW-12 0.09 WWC MONITORING WELL LOCATION AND IDENTIFICATION REDOX POTENTIAL
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION REDOX POTENTIAL
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL



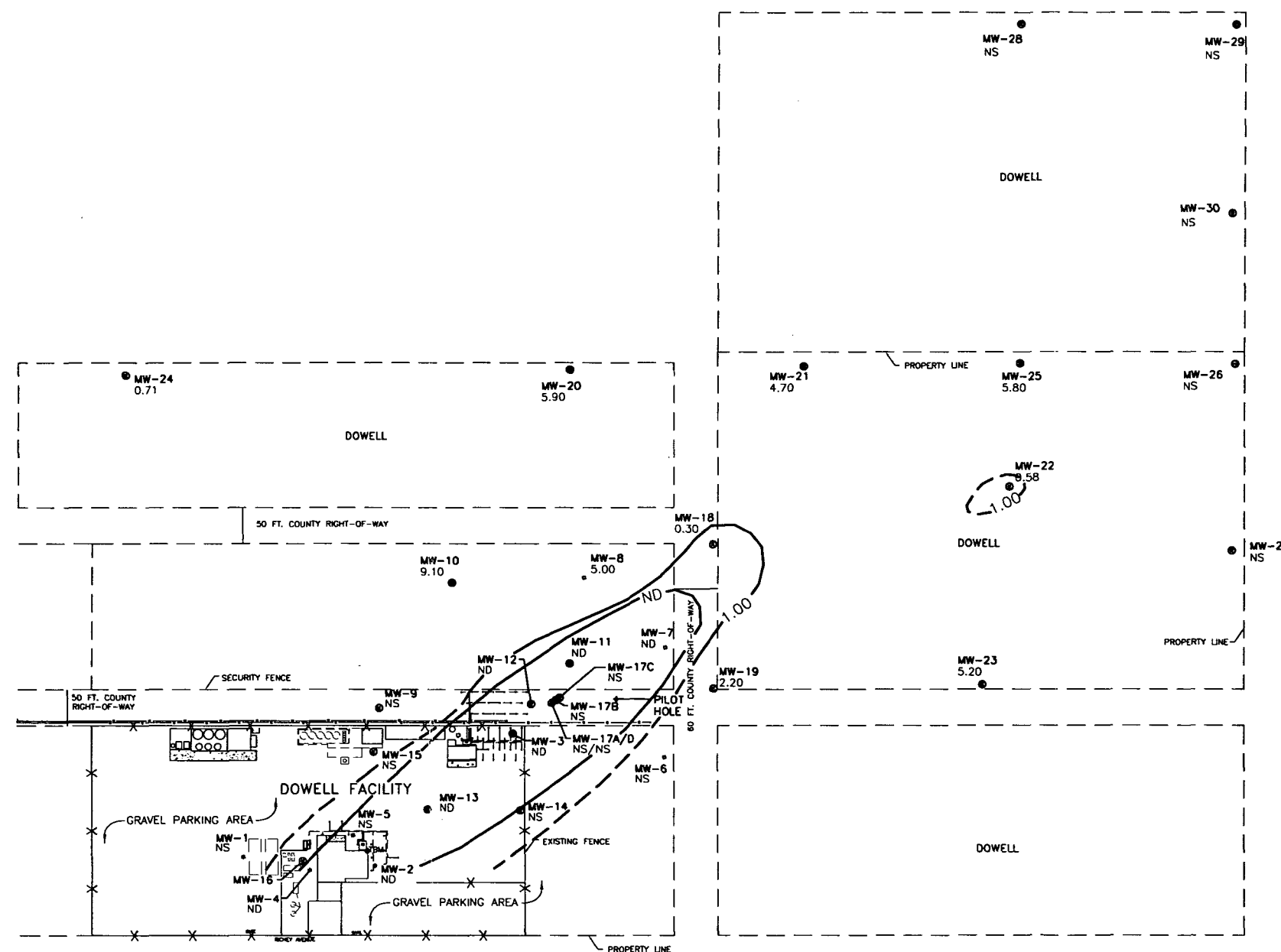
BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 6 DISSOLVED OXYGEN DATA

(04/22/99)

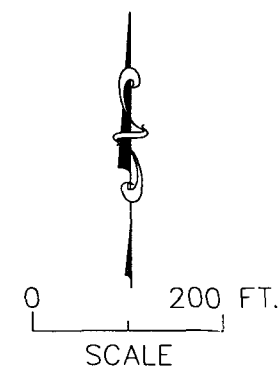
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EXPLANATION

- MW-12 14.130 WWC MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR NITRATE/NITRITE (ng/L)
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR NITRATE/NITRITE (ng/L)
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL
- NS NOT SAMPLED
- ND NONDETECT



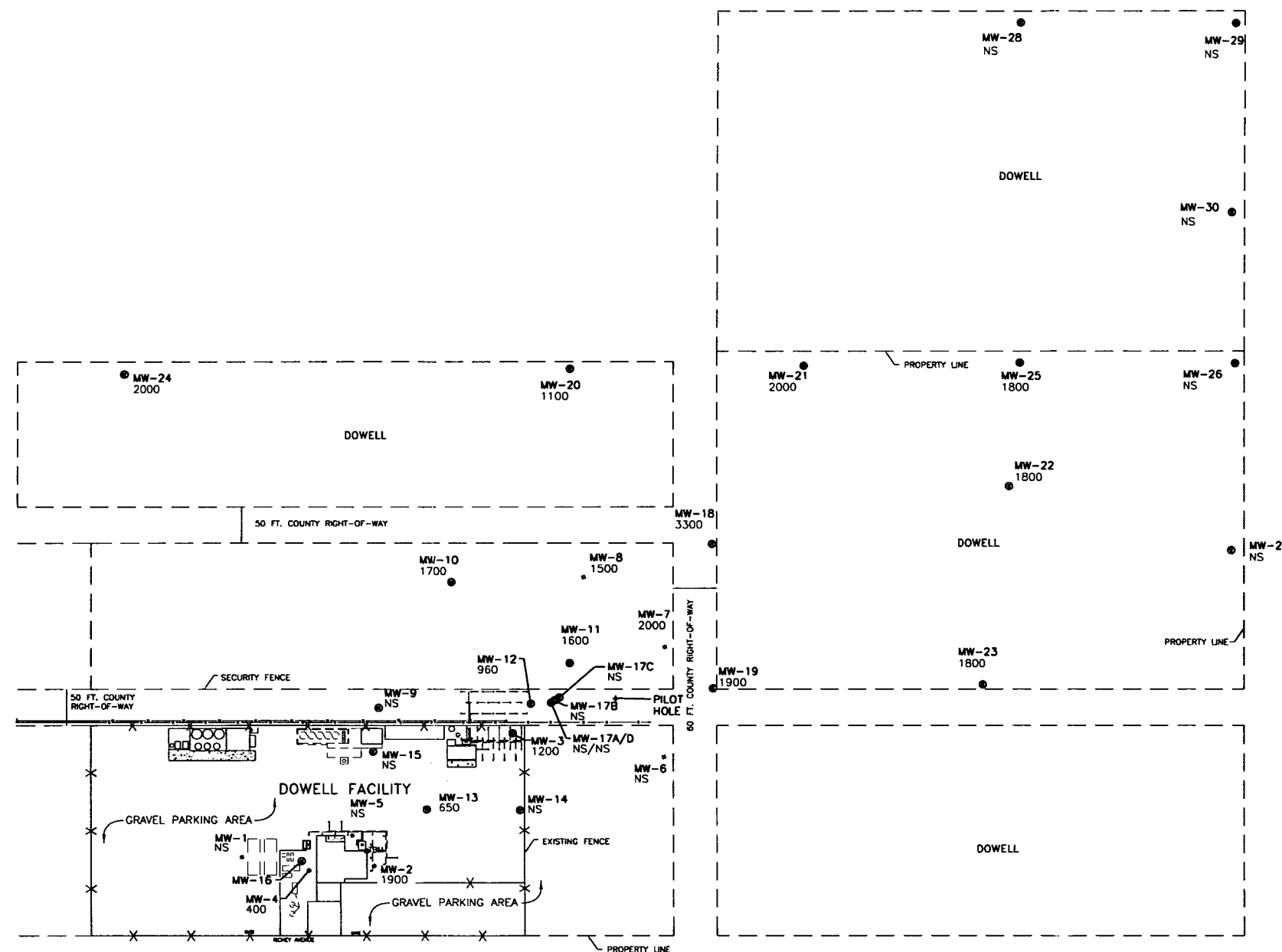
BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 7 NITRATE, NITRITE

(04/22/99)

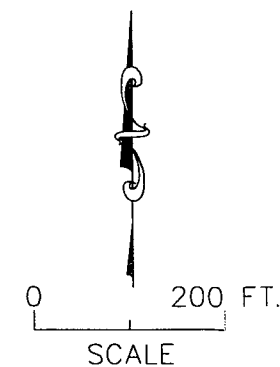
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EXPLANATION

- MW-12 14.130 WWC MONITORING WELL LOCATION AND IDENTIFICATION
ISOCONCENTRATION FOR METHANE
- MW-6 NS REED AND ASSOCIATES MONITORING WELL
LOCATION AND IDENTIFICATION
ISOCONCENTRATION FOR METHANE
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL



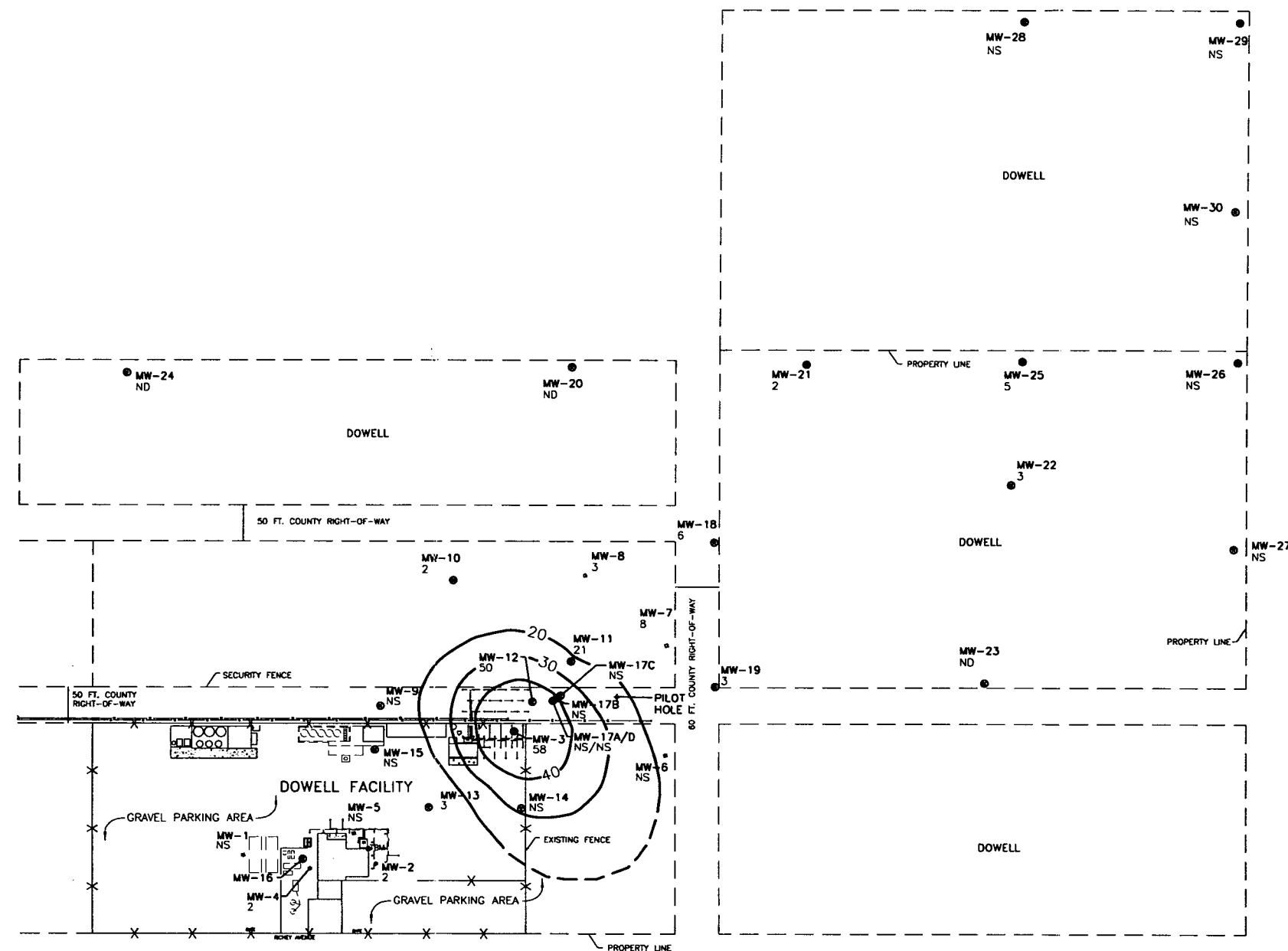
BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 8 SULFATE

(04/22/99)

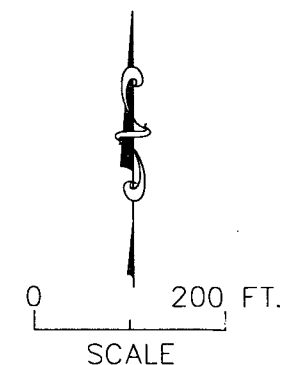
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EXPLANATION

- MW-12 14.130 WC MONITORING WELL LOCATION AND IDENTIFICATION
ISOCONCENTRATION FOR TOTAL ORGANIC CARBON (mg/L)
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND
IDENTIFICATION
ISOCONCENTRATION FOR TOTAL ORGANIC CARBON (mg/L)
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL
- NS NOT SAMPLED
- ND NONDETECT



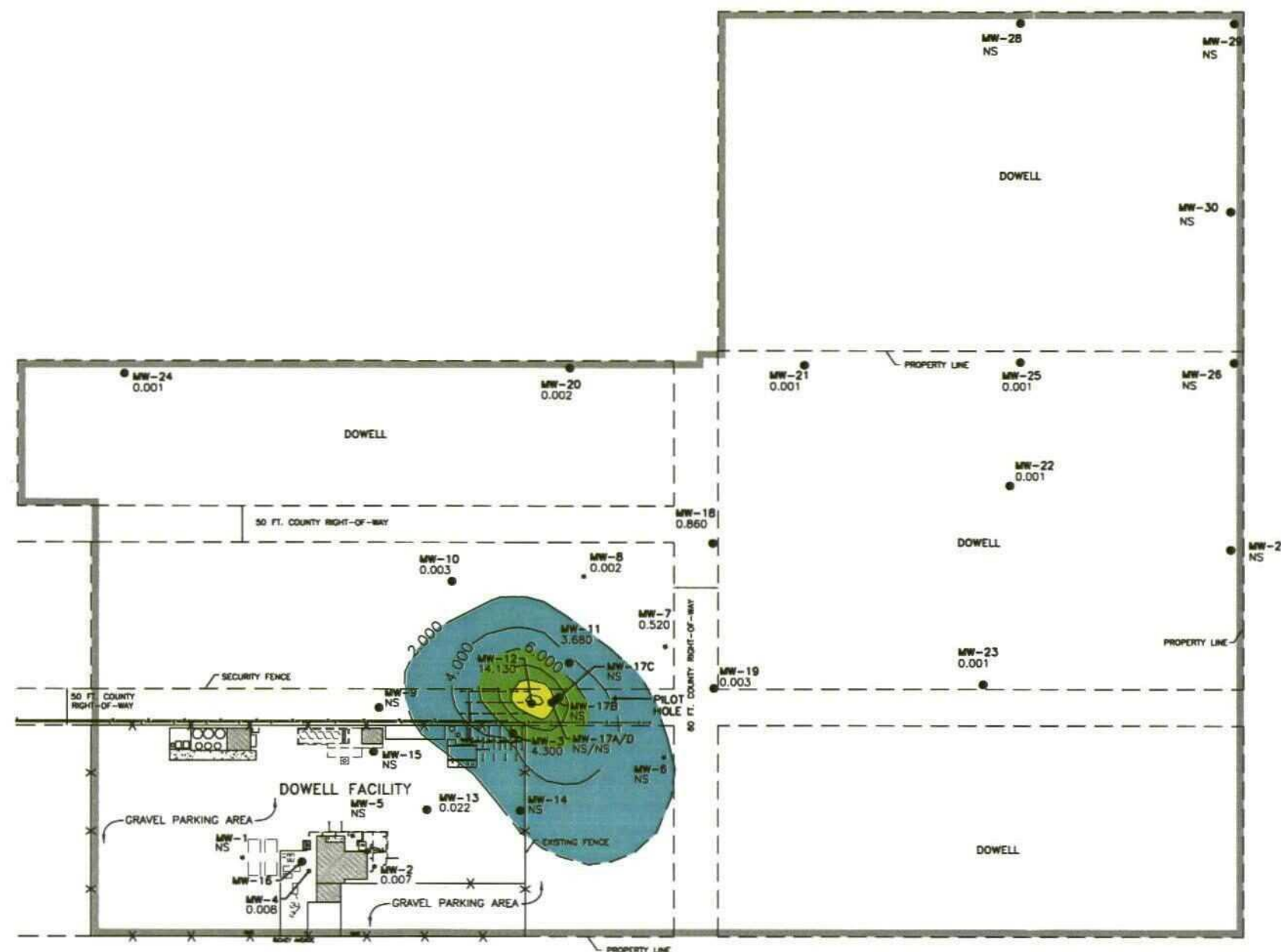
BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 9 TOTAL ORGANIC CARBON

(04/22/99)

DOWELL, A DIVISION OF
SCHLUMBERGER TECHNOLOGY CORPORATION
ARTESIA, NEW MEXICO

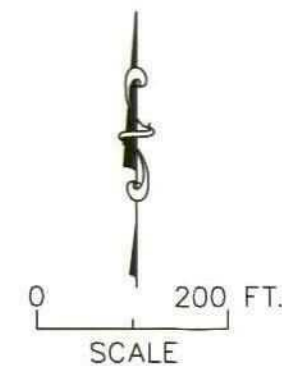
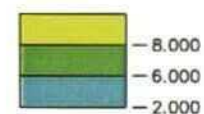
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EXPLANATION

- MW-12 14.130 WWC MONITORING WELL LOCATION AND IDENTIFICATION
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL

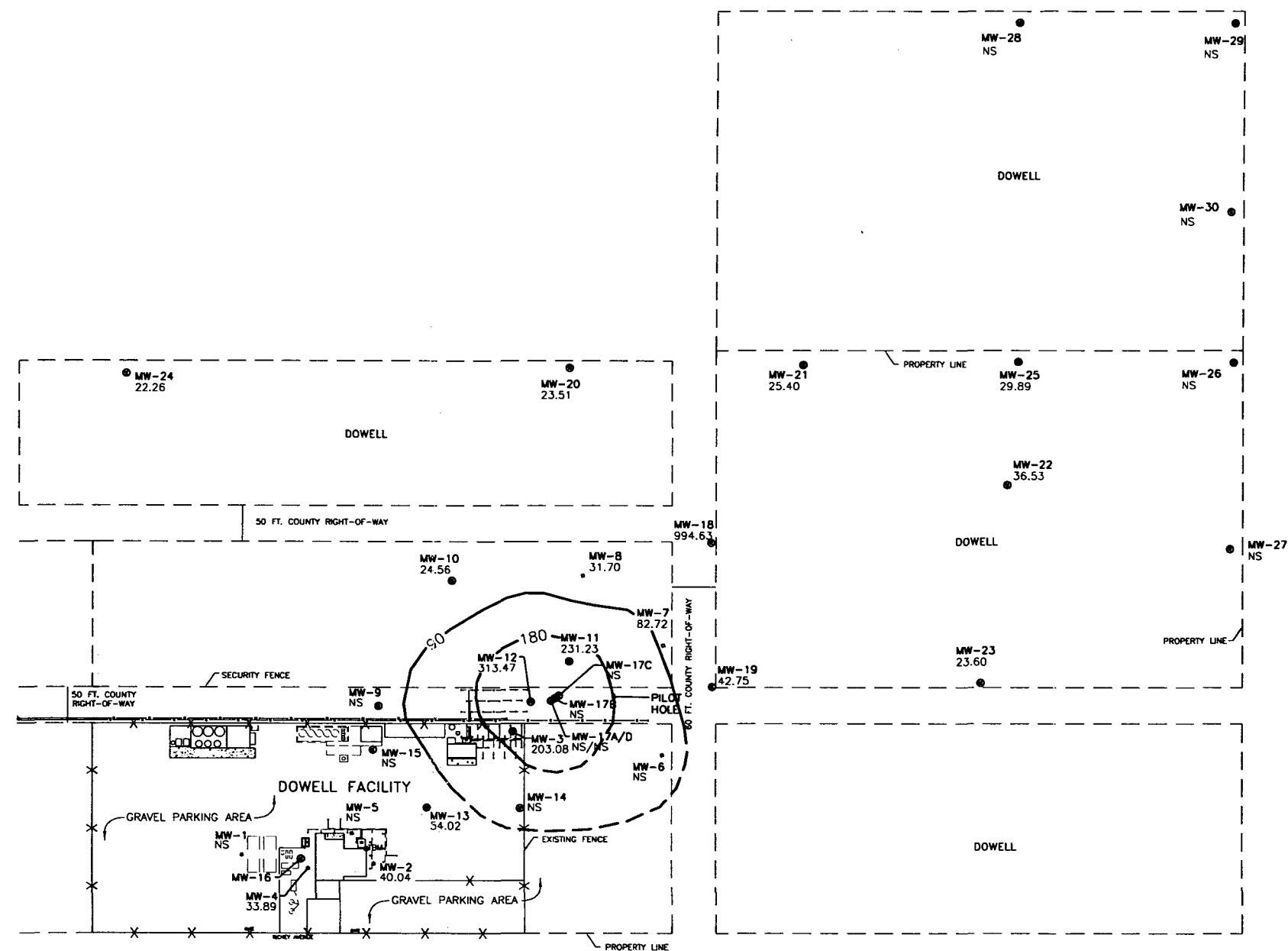
ISOCONCENTRATION FOR METHANE



BASE MAP MODIFIED FROM REED & ASSOCIATES

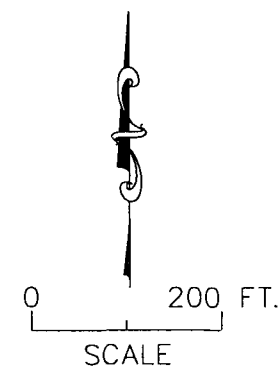
FIGURE 10
ISOCONCENTRATION MAP FOR
METHANE
(04/22/99)
DOWELL, A DIVISION OF
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EXPLANATION

- MW-12 14.130 WC MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR CARBON DIOXIDE (mg/L)
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR CARBON DIOXIDE (mg/L)
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL
- NS NOT SAMPLED
- ND NONDETECT



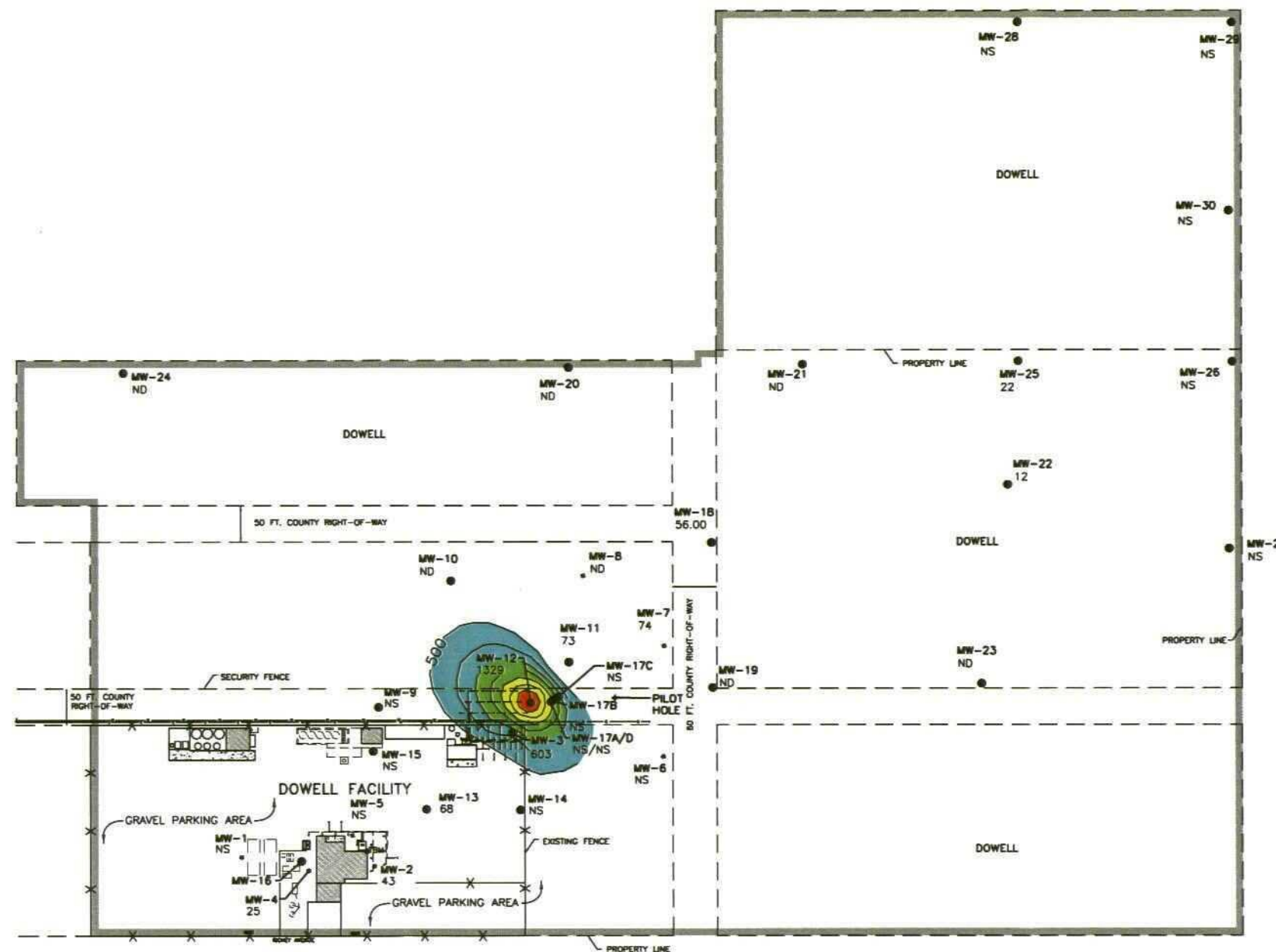
BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 11 CARBON DIOXIDE

(04/22/99)

DOWELL, A DIVISION OF
SCHLUMBERGER TECHNOLOGY CORPORATION
ARTESIA, NEW MEXICO

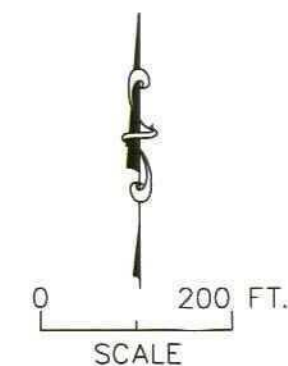
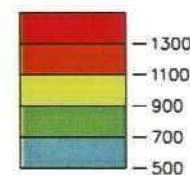
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EXPLANATION

- MW-12 1329.00 WWC MONITORING WELL LOCATION AND IDENTIFICATION
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION
- TEMP. TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL

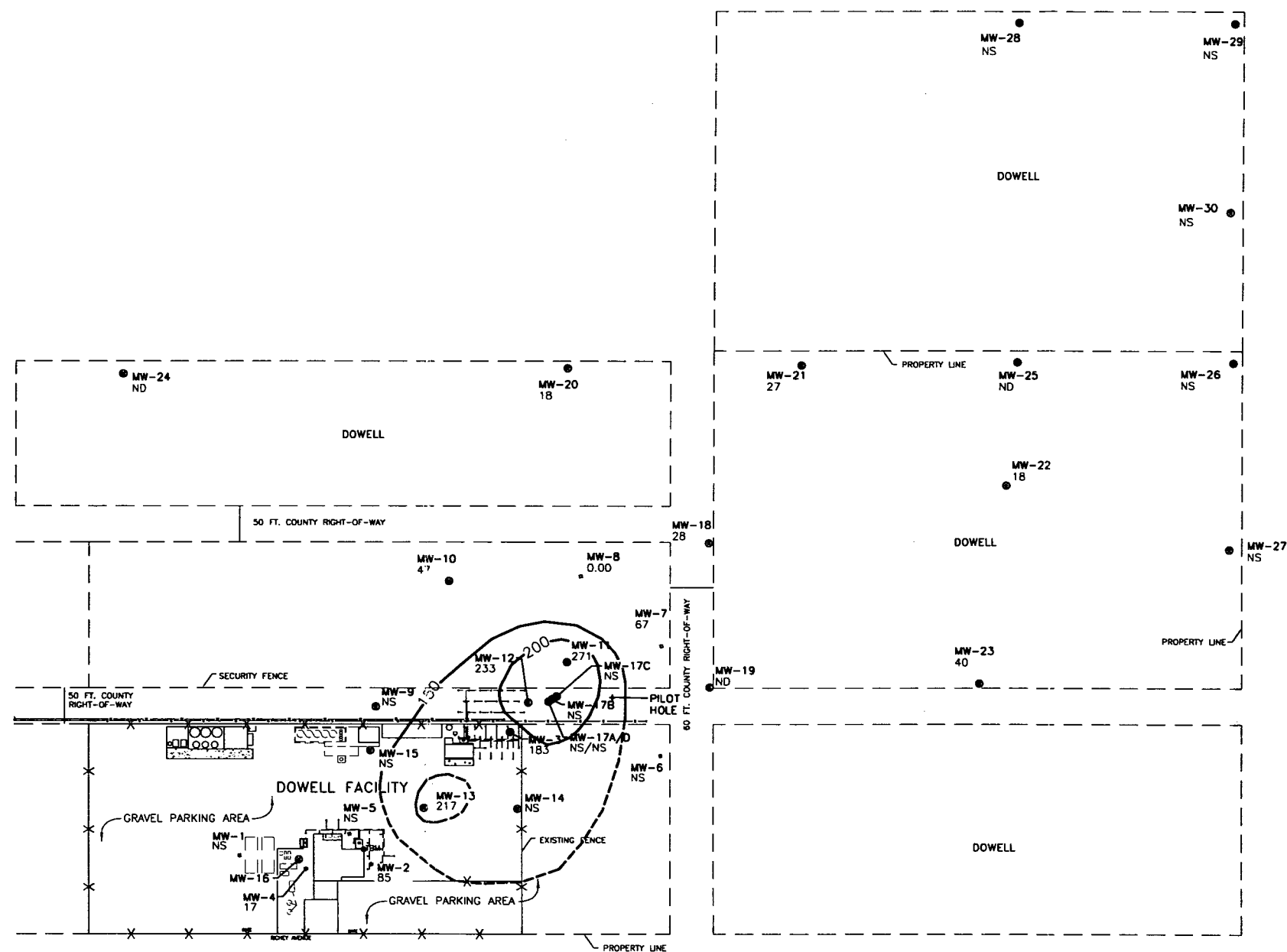
ISOCONCENTRATION FOR ETHANE



BASE MAP MODIFIED FROM REED & ASSOCIATES

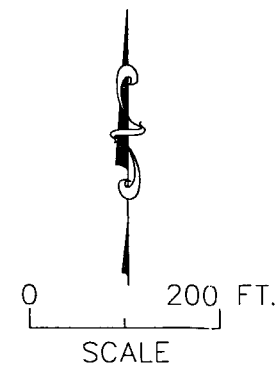
FIGURE 12
ISOCONCENTRATION MAP FOR
ETHANE
(04/22/99)
DOWELL, A DIVISION OF
SCHLUMBERGER TECHNOLOGY CORPORATION
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EXPLANATION

- MW-12 14.130 WC MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR ETHENE (ng/L)
- MW-6 NS REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION ISOCONCENTRATION FOR ETHENE (ng/L)
- TBM TEMPORARY BENCH MARK
- AIR PIPING
- SVE EXTRACTION WELL
- NS NOT SAMPLED
- ND NONDETECT



BASE MAP MODIFIED FROM REED & ASSOCIATES

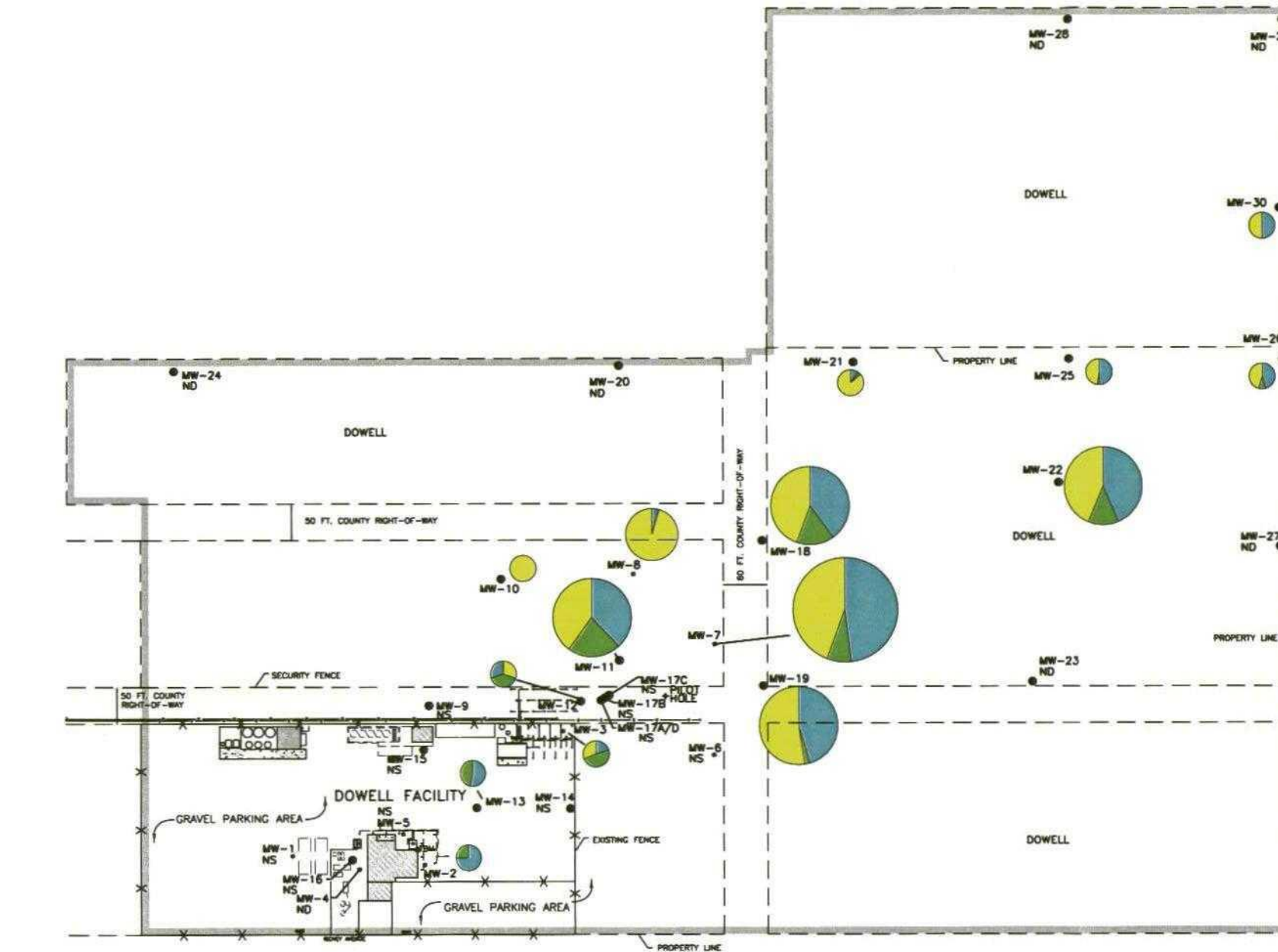
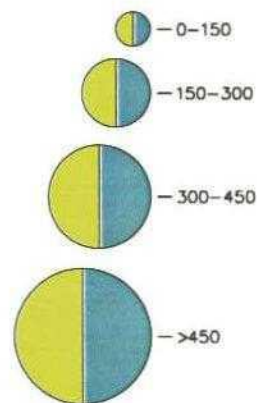
FIGURE 13 ETHENE

(04/22/99)

DOWELL, A DIVISION OF
SCHLUMBERGER TECHNOLOGY CORPORATION
ARTESIA, NEW MEXICO

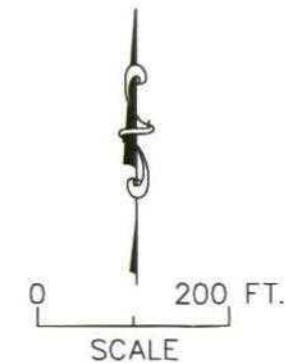
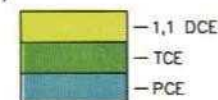
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EXPLANATION

- | | | | |
|---------|---|---|--|
| ● MW-12 | WWC MONITORING WELL LOCATION AND IDENTIFICATION | NS | NO SAMPLE TAKEN |
| ● MW-6 | REED AND ASSOCIATES MONITORING WELL LOCATION AND IDENTIFICATION | ND | CHEMICAL NOT DETECTED AT CONCENTRATION ABOVE DETECTION LIMIT |
| ● TBM | TEMPORARY BENCH MARK | TOTAL CHLOROETHENES CONCENTRATIONS (mg/L:%) | |
| --- | AIR PIPING | | |
| • | SVE EXTRACTION WELL | | |



BASE MAP MODIFIED FROM REED & ASSOCIATES

FIGURE 14
DISTRIBUTION OF CHLOROETHENES
(4/22/99)

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TABLES

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-1	01/23/91	30.00	Protective Casing	100.56	17.41	83.15	
	09/13/91				16.04	84.52	1.37
	11/22/91				14.50	86.06	1.54
	03/16/93				13.72	86.84	0.78
	01/09/94				14.62	85.94	-0.90
	04/19/94				14.48	86.08	0.14
	07/20/94				14.38	86.18	0.10
	10/24/94				14.73	85.83	-0.35
	01/24/95				14.20	86.36	0.53
	04/02/95				14.37	86.19	-0.17
	07/31/95				14.76	85.80	-0.39
	10/16/95				14.64	85.92	0.12
	01/10/96				14.59	85.97	0.05
	04/09/96				14.77	85.79	-0.18
	07/20/96				15.84	84.72	-1.07
	10/21/96				14.07	86.49	1.77
	01/21/97				13.24	87.32	0.83
	04/08/97				12.97	87.59	0.27
	07/29/97				13.87	86.69	-0.90
	10/16/97				12.26	88.30	1.61
	02/09/99				14.34	86.22	-2.08
	04/21/99				13.91	86.65	0.43
MW-2	01/23/91	30.00	Protective Casing	99.56	16.95	82.61	
	09/13/91				15.01	84.55	1.94
	11/22/91				13.76	85.80	1.25
	03/16/93				13.16	86.40	0.60
	01/09/94				13.91	85.65	-0.75
	04/19/94				13.80	85.76	0.11
	07/20/94				13.65	85.91	0.15
	10/24/94				13.88	85.68	-0.23
	01/24/95				13.41	86.15	0.47
	04/02/95				13.67	85.89	-0.26
	07/31/95				13.81	85.75	-0.14
	10/16/95				13.78	85.78	0.03
	01/10/96				13.80	85.76	-0.02
	04/09/96				13.98	85.58	-0.18
	07/20/96				14.92	84.64	-0.94
	10/21/96				13.15	86.41	1.77
	01/21/97				12.41	87.15	0.74
	04/08/97				12.21	87.35	0.20
	07/29/97				13.15	86.41	-0.94
	10/16/97				11.63	87.93	1.52
	01/06/98				10.92	88.64	0.71
	04/14/98				11.02	88.54	-0.10
	07/17/98				13.03	86.53	-2.01
	10/27/98				13.61	85.95	-0.58
	02/09/99				13.69	85.87	-0.08
	04/21/99				13.24	86.32	0.45
MW-3	01/23/91	30.00	Protective Casing	98.33	17.28	81.05	
	09/13/91				14.66	83.67	2.62
	11/22/91				13.63	84.70	1.03
	03/16/93				12.89	85.44	0.74
	01/09/94				13.66	84.67	-0.77
	04/19/94				NM	NM	NM
	07/20/94				13.18	85.15	na
	10/24/94				13.27	85.06	-0.09
	01/24/95				13.23	85.10	0.04
	04/02/95				13.60	84.73	-0.37

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (Ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (Ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-3 Cont.	07/31/95				13.34	84.99	0.26
	10/16/95				13.38	84.95	-0.04
	01/10/96				13.85	84.48	-0.47
	04/09/96				13.91	84.42	-0.06
	07/20/96				14.55	83.78	-0.64
	10/21/96				12.90	85.43	1.65
	01/21/97				12.42	85.91	0.48
	04/08/97				12.43	85.90	-0.01
	07/29/97				13.18	85.15	-0.75
	10/16/97				11.83	86.50	1.35
	01/06/98				11.45	86.88	0.38
	04/14/98				11.44	86.89	0.01
	07/17/98				12.81	85.52	-1.37
	10/27/98				12.60	85.73	0.21
	02/09/99				13.44	84.89	-0.84
	04/21/99				12.75	85.58	0.69
MW-4	01/23/91	50.00	Protective Casing	103.18	20.17	83.01	
	09/13/91				18.54	84.64	1.63
	11/22/91				17.15	86.03	1.39
	03/16/93				16.49	86.69	0.66
	01/09/94				17.28	85.90	-0.79
	04/19/94				17.15	86.03	0.13
	07/20/94				16.99	86.19	0.16
	10/24/94				17.25	85.93	-0.26
	01/24/95				16.78	86.40	0.47
	04/02/95				16.98	86.20	-0.20
	07/31/95				17.26	85.92	-0.28
	10/16/95				17.01	86.17	0.25
	01/10/96				16.95	86.23	0.06
	04/09/96				17.15	86.03	-0.20
	07/20/96				18.08	85.10	-0.93
	10/21/96				16.28	86.90	1.80
	01/21/97				15.37	87.81	0.91
	04/08/97				15.14	88.04	0.23
	07/29/97				16.05	87.13	-0.91
	10/16/97				14.44	88.74	1.61
	01/06/98				13.59	89.59	0.85
	04/14/98				13.91	89.27	-0.32
	07/17/98				16.40	86.78	-2.49
	10/27/98				17.05	86.13	-0.65
	02/09/99				17.08	86.10	-0.03
	04/21/99				16.67	86.51	0.41
MW-5	01/23/91	30.00	Protective Casing	99.87	17.20	82.67	
	09/13/91				15.52	84.35	1.68
	11/22/91				14.19	85.68	1.33
	03/16/93				13.47	86.40	0.72
	01/09/94				14.31	85.56	-0.84
	04/19/94				14.17	85.70	0.14
	07/20/94				13.97	85.90	0.20
	10/24/94				14.21	85.66	-0.24
	01/24/95				13.78	86.09	0.43
	04/02/95				14.05	85.82	-0.27
	07/31/95				14.17	85.70	-0.12
	10/16/95				14.07	85.80	0.10
	01/10/96				14.11	85.76	-0.04
	04/09/96				14.31	85.56	-0.20
	07/20/96				15.20	84.67	-0.89
	10/21/96				13.44	86.43	1.76
	01/21/97				12.69	87.18	0.75
	04/08/97				12.52	87.35	0.17
	07/29/97				13.37	86.50	-0.85
	10/16/97				11.82	88.05	1.55
	01/06/98				11.09	88.78	0.73

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (Ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (Ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-5 Cont.	04/14/98				12.30	87.57	-1.21
	07/17/98				13.32	86.55	-1.02
	10/27/98				13.93	85.94	-0.61
	02/09/99				14.04	85.83	-0.11
	04/21/99				13.54	86.33	0.50
MW-6	01/23/91	35.00	Protective Casing	100.84	19.59	81.25	
	09/13/91				17.43	83.41	2.16
	11/21/91				16.30	84.54	1.13
	03/16/93				15.57	85.27	0.73
	01/09/94				16.42	84.42	-0.85
	04/19/94				16.29	84.55	0.13
	07/19/94				15.79	85.05	0.50
	10/24/94				15.83	85.01	-0.04
	01/24/95				15.94	84.90	-0.11
	04/02/95				16.38	84.46	-0.44
	07/31/95				15.88	84.96	0.50
	10/16/95				16.01	84.83	-0.13
	01/10/96				16.52	84.32	-0.51
	04/09/96				16.70	84.14	-0.18
	07/21/96				17.26	83.58	-0.56
	10/21/96				15.62	85.22	1.64
	01/21/97				15.21	85.63	0.41
	04/08/97				15.30	85.54	-0.09
	07/29/97				16.01	84.83	-0.71
	10/16/97				15.01	85.83	1.00
	01/06/98				14.69	86.15	0.32
	04/14/98				14.45	86.39	0.24
	07/17/98				15.62	85.22	-1.17
	10/27/98				15.77	85.07	-0.15
	02/09/99				16.34	84.50	-0.57
	04/21/99				15.57	85.27	0.77
MW-7	01/23/91	35.00	Protective Casing	100.23	19.01	81.22	
	09/13/91				17.43	82.80	1.58
	11/21/91				16.00	84.23	1.43
	03/16/93				14.91	85.32	1.09
	01/09/94				15.99	84.24	-1.08
	04/19/94				15.83	84.40	0.16
	07/19/94				15.24	84.99	0.59
	10/24/94				15.32	84.91	-0.08
	01/24/95				15.54	84.69	-0.22
	04/02/95				16.00	84.23	-0.46
	07/31/95				15.57	84.66	0.43
	10/16/95				15.61	84.62	-0.04
	01/10/96				16.13	84.10	-0.52
	04/09/96				16.30	83.93	-0.17
	07/21/96				16.81	83.42	-0.51
	10/21/96				15.15	85.08	1.66
	01/21/97				14.81	85.42	0.34
	04/08/97				14.91	85.32	-0.10
	07/29/97				15.48	84.75	-0.57
	10/16/97				14.52	85.71	0.96
	01/06/98				13.27	86.96	1.25
	04/14/98				14.02	86.21	-0.75
	07/17/98				15.10	85.13	-1.08
	10/27/98				15.21	85.02	-0.11
	02/09/99				15.86	84.37	-0.65
	04/21/99				14.96	85.27	0.90

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (Ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (Ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-8	01/23/91	35.00	Protective Casing	101.47	20.16	81.31	
	09/13/91				18.80	82.67	1.36
	11/21/91				17.29	84.18	1.51
	03/16/93				16.03	85.44	1.26
	01/09/94				17.23	84.24	-1.20
	04/19/94				17.05	84.42	0.18
	07/19/94				16.50	84.97	0.55
	10/24/94				16.56	84.91	-0.06
	01/24/95				16.79	84.68	-0.23
	04/02/95				17.24	84.23	-0.45
	07/31/95				16.94	84.53	0.30
	10/16/95				16.88	84.59	0.06
	01/10/96				17.38	84.09	-0.50
	04/09/96				17.54	83.93	-0.16
	07/21/96				18.10	83.37	-0.56
	10/21/96				16.40	85.07	1.70
	11/22/96				16.42	85.05	-0.02
	01/21/97				16.05	85.42	0.37
	04/08/97				16.11	85.36	-0.06
	07/29/97				16.69	84.78	-0.58
	10/16/97				15.69	85.78	1.00
	01/06/98				15.38	86.09	0.31
	04/14/98				15.15	86.32	0.23
	07/17/98				16.29	85.18	-1.14
	10/27/98				16.39	85.08	-0.10
	02/09/99				17.02	84.45	-0.63
	04/21/99				16.08	85.39	0.94
MW-9	01/26/91	30.00	Protective Casing	102.18	20.08	82.10	
	09/13/91				18.93	83.25	1.15
	11/21/91				17.35	84.83	1.58
	03/16/93				16.19	85.99	1.16
	01/09/94				17.31	84.87	-1.12
	04/19/94				17.33	84.85	-0.02
	07/19/94				16.85	85.33	0.48
	10/24/94				17.05	85.13	-0.20
	01/24/95				16.92	85.26	0.13
	04/02/95				17.23	84.95	-0.31
	07/31/95				17.30	84.88	-0.07
	10/16/95				17.16	85.02	0.14
	01/10/96				17.39	84.79	-0.23
	04/09/96				17.58	84.60	-0.19
	07/21/96				18.38	83.80	-0.80
	10/21/96				16.65	85.53	1.73
	01/21/97				16.12	86.06	0.53
	04/08/97				16.04	86.14	0.08
	07/29/97				16.67	85.51	-0.63
	10/16/97				15.29	86.89	1.38
	01/06/98				14.78	87.40	0.51
	04/14/98				14.89	87.29	-0.11
	07/17/98				16.30	85.88	-1.41
	10/27/98				16.62	85.56	-0.32
	02/09/99				17.14	85.04	-0.52
	04/21/99				16.38	85.80	0.76
MW-10	01/26/91	30.00	Protective Casing	101.34	19.68	81.66	
	09/13/91				18.56	82.78	1.12
	11/21/91				16.96	84.38	1.60
	03/16/93				15.64	85.70	1.32
	01/09/94				16.89	84.45	-1.25
	04/19/94				16.73	84.61	0.16
	07/19/94				16.29	85.05	0.44
	10/24/94				16.39	84.95	-0.10
	01/24/95				16.48	84.86	-0.09
	04/02/95				16.88	84.46	-0.40
	07/31/95				16.82	84.52	0.06
	10/16/95				16.65	84.69	0.17

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (Ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (Ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-10 Cont.	01/10/96				17.01	84.33	-0.36
	04/09/96				17.20	84.14	-0.19
	07/21/96				17.85	83.49	-0.65
	10/21/96				16.13	85.21	1.72
	01/21/97				15.73	85.61	0.40
	04/08/97				15.70	85.64	0.03
	07/29/97				16.28	85.06	-0.58
	10/16/97				15.16	86.18	1.12
	01/06/98				14.74	86.60	0.42
	04/14/98				14.65	86.69	0.09
	07/17/98				15.90	85.44	-1.25
	10/27/98				16.04	85.30	-0.14
	02/09/99				16.61	84.73	-0.57
	04/21/99				15.68	85.66	0.93
MW-11	01/26/91	30.00	Protective Casing	100.60	19.27	81.33	
	09/13/91				17.81	82.79	1.46
	11/21/91				16.35	84.25	1.46
	03/16/93				15.20	85.40	1.15
	01/09/94				16.31	84.29	-1.11
	04/19/94				16.17	84.43	0.14
	07/19/94				15.63	84.97	0.54
	10/24/94				15.72	84.88	-0.09
	01/24/95				15.89	84.71	-0.17
	04/02/95				16.33	84.27	-0.44
	07/31/95				16.03	84.57	0.30
	10/16/95				16.00	84.60	0.03
	01/10/96				16.45	84.15	-0.45
	04/09/96				16.62	83.98	-0.17
	07/21/96				17.21	83.39	-0.59
	10/21/96				15.52	85.08	1.69
	01/21/97				15.15	85.45	0.37
	04/08/97				15.19	85.41	-0.04
	07/29/97				15.78	84.82	-0.59
	10/16/97				14.75	85.85	1.03
	01/06/98				14.44	86.16	0.31
	04/14/98				14.22	86.38	0.22
	07/17/98				15.41	85.19	-1.19
	10/27/98				15.50	85.10	-0.09
	02/09/99				16.11	84.49	-0.61
	04/21/99				15.21	85.39	0.90
MW-12	01/26/91	34.00	Protective Casing	100.69	19.24	81.45	
	09/13/91				17.59	83.10	1.65
	11/21/91				16.21	84.48	1.38
	03/16/93				15.22	85.47	0.99
	01/09/94				16.25	84.44	-1.03
	04/19/94				16.13	84.56	0.12
	07/19/94				15.63	85.06	0.50
	10/24/94				15.73	84.96	-0.10
	01/24/95				15.80	84.89	-0.07
	04/02/95				16.23	84.46	-0.43
	07/31/95				15.96	84.73	0.27
	10/16/95				15.93	84.76	0.03
	01/10/96				16.35	84.34	-0.42
	04/09/96				16.52	84.17	-0.17
	07/21/96				17.15	83.54	-0.63
	10/21/96				15.48	85.21	1.67
	01/21/97				15.04	85.65	0.44
	04/08/97				15.10	85.59	-0.06
	07/29/97				15.73	84.96	-0.63
	10/16/97				14.57	86.12	1.16
	01/06/98				14.22	86.47	0.35

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (Ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (Ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-12 Cont.	04/14/98				14.09	86.60	0.13
	07/17/98				15.35	85.34	-1.26
	10/27/98				15.36	85.33	-0.01
	02/09/99				16.00	84.69	-0.64
	04/21/99				15.19	85.50	0.81
MW-13	09/13/91	45.00	Protective Casing	99.25	15.10	84.15	
	11/21/91				13.95	85.30	1.15
	03/16/93				13.22	86.03	0.73
	01/09/94				14.03	85.22	-0.81
	04/19/94				13.90	85.35	0.13
	07/20/94				13.70	85.55	0.20
	10/24/94				13.86	85.39	-0.16
	01/24/95				13.56	85.69	0.30
	04/02/95				13.87	85.38	-0.31
	07/31/95				13.84	85.41	0.03
	10/16/95				13.83	85.42	0.01
	01/10/96				14.02	85.23	-0.19
	04/09/96				14.20	85.05	-0.18
	07/20/96				15.04	84.21	-0.84
	10/21/96				13.31	85.94	1.73
	01/21/97				12.70	86.55	0.61
	04/08/97				12.48	86.77	0.22
	07/29/97				13.43	85.82	-0.95
	10/16/97				12.02	87.23	1.41
	01/06/98				11.44	87.81	0.58
	04/14/98				11.50	87.75	-0.06
	07/17/98				13.10	86.15	-1.60
	10/27/98				13.58	85.67	-0.48
	02/09/99				13.81	85.44	-0.23
	04/21/99				13.22	86.03	0.59
MW-14	09/13/91	35.00	Protective Casing	98.74	14.60	84.14	
	11/21/91				13.61	85.13	0.99
	03/16/93				13.00	85.74	0.61
	01/09/94				13.71	85.03	-0.71
	04/19/94				13.63	85.11	0.08
	07/20/94				13.39	85.35	0.24
	10/24/94				13.48	85.26	-0.09
	01/25/95				13.26	85.48	0.22
	04/02/95				13.61	85.13	-0.35
	07/31/95				13.44	85.30	0.17
	10/16/95				13.52	85.22	-0.08
	01/10/96				13.76	84.98	-0.24
	04/09/96				13.96	84.78	-0.20
	07/20/96				14.74	84.00	-0.78
	10/21/96				13.03	85.71	1.71
	01/21/97				12.47	86.27	0.56
	04/08/97				12.44	86.30	0.03
	07/29/97				13.30	85.44	-0.86
	10/16/97				11.93	86.81	1.37
	01/06/98				11.46	87.28	0.47
	04/14/98				11.48	87.26	-0.02
	07/17/98				12.94	85.80	-1.46
	10/27/98				13.25	85.49	-0.31
	02/09/99				13.59	85.15	-0.34
	04/21/99				12.96	85.78	0.63
MW-15	09/13/91	34.00	Protective Casing	100.05	16.30	83.75	
	11/21/91				15.01	85.04	1.29
	03/16/93				13.95	86.10	1.06
	01/09/94				14.91	85.14	-0.96
	04/19/94				14.80	85.25	0.11
	07/20/94				14.56	85.49	0.24

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (Ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (Ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-15 Cont. **	10/24/94				14.73	85.32	-0.17
	01/24/95				16.00	84.05	-1.27
	04/02/95				14.80	85.25	1.20
	07/31/95				14.82	85.23	-0.02
	10/16/95				14.74	85.31	0.08
	01/10/96				14.95	85.10	-0.21
	04/09/96				15.11	84.94	-0.16
	07/20/96				15.96	84.09	-0.85
	10/21/96				14.22	85.83	1.74
	01/21/97				13.64	86.41	0.58
	04/08/97				13.53	86.52	0.11
	07/29/97				14.32	85.73	-0.79
	10/16/97				12.90	87.15	1.42
	01/06/98				12.30	87.75	0.60
	04/14/98				12.38	87.67	-0.08
	07/17/98				13.93	86.12	-1.55
	10/27/98				14.38	85.67	-0.45
	02/09/99				14.68	85.37	-0.30
	04/21/99				14.03	86.02	0.65
MW-17D	04/02/95	19.00	Protective Casing	101.29	16.80	84.49	
	07/31/95				16.48	84.81	0.32
	10/16/95				16.51	84.78	-0.03
	01/10/96				16.90	84.39	-0.39
	04/09/96				17.10	84.19	-0.20
	07/21/96				17.70	83.59	-0.60
	10/21/96				16.02	85.27	1.68
	01/21/97				15.60	85.69	0.42
	04/08/97				15.64	85.65	-0.04
	07/29/97				16.32	84.97	-0.68
	10/16/97				15.11	86.18	1.21
	01/06/98				14.80	86.49	0.31
	04/14/98				14.68	86.61	0.12
	07/17/98				15.92	85.37	-1.24
	10/27/98				15.95	85.34	-0.03
MW-17A	02/09/99				16.63	84.66	-0.68
	04/21/99				15.82	85.47	0.81
	04/02/95	26.00	Protective Casing	100.57	16.05	84.52	
	07/31/95				15.75	84.82	0.30
	10/16/95				15.77	84.80	-0.02
	01/10/96				16.18	84.39	-0.41
	04/09/96				16.37	84.20	-0.19
	07/21/96				16.98	83.59	-0.61
	10/21/96				15.30	85.27	1.68
	01/21/97				14.88	85.69	0.42
	04/08/97				14.92	85.65	-0.04
	07/29/97				15.59	84.98	-0.67
	10/16/97				14.41	86.16	1.18
	01/06/98				14.09	86.48	0.32
	04/14/98				13.95	86.62	0.14
MW-17B	07/17/98				15.20	85.37	-1.25
	10/27/98				15.23	85.34	-0.03
	02/09/99				15.88	84.69	-0.65
	04/21/99				15.10	85.47	0.78
	04/02/95	34.00	Protective Casing	101.28	16.79	84.49	
	07/31/95				16.50	84.78	0.29
	10/16/95				16.51	84.77	-0.01
	01/10/96				16.92	84.36	-0.41
	04/09/96				17.10	84.18	-0.18
	07/21/96				17.71	83.57	-0.61
	10/21/96				16.02	85.26	1.69
	01/21/97				15.64	85.64	0.38
	04/08/97				15.67	85.61	-0.03
	07/29/97				16.30	84.98	-0.63
	10/16/97				15.16	86.12	1.14

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (Ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (Ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-17B Cont.	01/06/98				14.84	86.44	0.32
	04/14/98				14.70	86.58	0.14
	07/17/98				15.92	85.36	-1.22
	10/27/98				16.00	85.28	-0.08
	02/09/99				16.62	84.66	-0.62
	04/21/99				15.79	85.49	0.83
MW-17C	04/02/95	61.00	Protective Casing	101.33	16.93	84.40	
	07/31/95				16.66	84.67	0.27
	10/16/95				16.64	84.69	0.02
	01/10/96				17.08	84.25	-0.44
	04/09/96				17.25	84.08	-0.17
	07/21/96				17.85	83.48	-0.60
	10/21/96				16.17	85.16	1.68
	01/21/97				15.75	85.58	0.42
	04/08/97				15.80	85.53	-0.05
	07/29/97				16.46	84.87	-0.66
	10/16/97				15.33	86.00	1.13
	01/06/98				15.00	86.33	0.33
	04/14/98				14.85	86.48	0.15
	07/17/98				16.09	85.24	-1.24
	10/27/98				16.17	85.16	-0.08
	02/09/99				16.77	84.56	-0.60
	04/21/99				15.95	85.38	0.82
MW-18	04/02/95	28.00	Protective Casing	98.72	14.77	83.95	
	07/31/95				14.21	84.51	0.56
	10/16/95				14.25	84.47	-0.04
	01/10/96				14.90	83.82	-0.65
	04/09/96				15.05	83.67	-0.15
	07/21/96				15.44	83.28	-0.39
	10/21/96				13.78	84.94	1.66
	11/22/96				13.84	84.88	-0.06
	01/21/97				13.54	85.18	0.30
	04/08/97				13.66	85.06	-0.12
	07/29/97				14.13	84.59	-0.47
	10/16/97				13.34	85.38	0.79
	01/06/98				13.13	85.59	0.21
	04/14/98				12.79	85.93	0.34
	07/17/98				13.75	84.97	-0.96
	10/27/98				13.82	84.90	-0.07
	02/09/99				14.58	84.14	-0.76
	04/21/99				13.58	85.14	1.00
MW-19	04/02/95	28.00	Protective Casing	99.08	14.86	84.22	
	07/31/95				14.29	84.79	0.57
	10/16/95				14.39	84.69	-0.10
	01/10/96				14.98	84.10	-0.59
	04/09/96				15.14	83.94	-0.16
	07/21/96				15.62	83.46	-0.48
	10/21/96				14.00	85.08	1.62
	11/22/96				14.03	85.05	-0.03
	01/21/97				13.69	85.39	0.34
	04/08/97				13.76	85.32	-0.07
MW-19 Cont.	07/29/97				14.37	84.71	-0.61
	10/16/97				13.47	85.61	0.90
	01/06/98				13.21	85.87	0.26
	04/14/98				12.90	86.18	0.31
	07/17/98				13.96	85.12	-1.06
	10/27/98				14.11	84.97	-0.15
	02/09/99				14.74	84.34	-0.63
	04/21/99				13.91	85.17	0.83
MW-20	11/22/96	28.00	Protective Casing	101.09	16.28	84.81	
	01/21/97				16.08	85.01	0.20
	04/08/97				16.04	85.05	0.04
	07/29/97				16.46	84.63	-0.42

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (Ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (Ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-20 Cont.	10/16/97				15.76	85.33	0.70
	01/06/98				15.61	85.48	0.15
	04/14/98				15.13	85.96	0.48
	07/17/98				16.15	84.94	-1.02
	10/27/98				16.07	85.02	0.08
	02/09/99				16.94	84.15	-0.87
	04/21/99				15.48	85.61	1.46
MW-21	11/22/96	25.00	Protective Casing	98.88	14.36	84.52	
	01/21/97				14.26	84.62	0.10
	04/08/97			98.89	14.41	84.48	-0.14
	07/29/97				14.54	84.35	-0.13
	10/16/97				14.18	84.71	0.36
	01/06/98				14.17	84.72	0.01
	04/14/98				13.60	85.29	0.57
	07/17/98				14.21	84.68	-0.61
	10/27/98				14.22	84.67	-0.01
	02/09/99				15.29	83.60	-1.07
	04/21/99				13.94	84.95	1.35
MW-22	11/22/96	24.50	Protective Casing	97.16	12.88	84.28	
	01/21/97				12.94	84.22	-0.06
	04/08/97			97.14	13.42	83.72	-0.50
	07/29/97				13.16	83.98	0.26
	10/16/97				13.23	83.91	-0.07
	01/06/98				13.46	83.68	-0.23
	04/14/98				12.80	84.34	0.66
	07/17/98				12.65	84.49	0.15
	10/27/98				12.90	84.24	-0.25
	02/09/99				14.35	82.79	-1.45
	04/21/99				13.15	83.99	1.20
MW-23	11/22/96	25.00	Protective Casing	97.33	12.72	84.61	
	01/21/97				12.59	84.74	0.13
	04/08/97			97.30	13.07	84.23	-0.51
	07/29/97				13.14	84.16	-0.07
	10/16/97				13.06	84.24	0.08
	01/06/98				13.13	84.17	-0.07
	04/14/98				12.52	84.78	0.61
	07/17/98				12.64	84.66	-0.12
	10/27/98				12.84	84.46	-0.20
	02/09/99				14.16	83.14	-1.32
	04/21/99				13.25	84.05	0.91

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (Ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (Ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-24	11/22/96	27.00	Protective Casing	103.42	17.91	85.51	
	01/21/97				17.56	85.86	0.35
	04/08/97			103.41	17.40	86.01	0.15
	07/29/97				17.72	85.69	-0.32
	10/16/97				16.58	86.83	1.14
	01/06/98				16.01	87.40	0.57
	04/14/98				16.17	87.24	-0.16
	07/17/98				17.49	85.92	-1.32
	10/27/98				17.40	86.01	0.09
	02/09/99				18.09	85.32	-0.69
	04/21/99				16.98	86.43	1.11
MW-25	04/08/97	25.00	Protective Casing	97.64	14.23	83.41	-
	07/29/97				13.77	83.87	0.46
	10/16/97				13.99	83.65	-0.22
	01/06/98				14.37	83.27	-0.38
	04/14/98				13.65	83.99	0.72
	07/17/98				13.26	84.38	0.39
	10/27/98				13.57	84.07	-0.31
	02/09/99				15.17	82.47	-1.60
	04/21/99				13.75	83.89	1.42
MW-26	04/08/97	25.00	Protective Casing	96.11	13.06	83.05	-
	07/29/97				12.23	83.88	0.83
	10/16/97				12.75	83.36	-0.52
	01/06/98				13.40	82.71	-0.65
	04/14/98				12.61	83.50	0.79
	07/17/98				11.64	84.47	0.97
	10/27/98				12.16	83.95	-0.52
	02/09/99				14.13	81.98	-1.97
	04/21/99				12.41	83.70	1.72
MW-27	04/08/97	25.00	Protective Casing	96.17	13.06	83.11	-
	07/29/97				12.21	83.96	0.85
	10/16/97				12.79	83.38	-0.58
	01/06/98				13.56	82.61	-0.77
	04/14/98				12.75	83.42	0.81
	07/17/98				11.53	84.64	1.22
	10/27/98				12.09	84.08	-0.56
	02/09/99				14.29	81.88	-2.20
	04/21/99				12.53	83.64	1.76
MW-28	07/17/98	25.00	Protective Casing	97.93	14.32	83.61	-
	10/27/98				14.43	83.50	-0.11
	02/09/99				15.71	82.22	-1.28
	04/21/99				14.28	83.65	1.43
MW-29	07/17/98	25.00	Protective Casing	97.04	14.07	82.97	-
	10/27/98				14.36	82.68	-0.29
	02/09/99				15.83	81.21	-1.47
	04/21/99				14.48	82.56	1.35

TABLE 1. GROUND-WATER MEASUREMENTS AND ELEVATIONS,
DOWELL, ARTESIA, NEW MEXICO.

WELL NUMBER	DATE MEASURED	TOTAL WELL DEPTH (Ft)	MEASURING POINT	MEASURING POINT ELEVATION* (ft)	DEPTH TO GROUND WATER (ft)	STATIC WATER ELEVATION (Ft)	DIFFERENCE FROM PRIOR MEASUREMENT
MW-30	07/17/98	25.00	Protective Casing	96.58	12.68	83.90	-
	10/27/98				13.12	83.46	-0.44
	02/09/99				14.88	81.70	-1.76
	04/21/99				13.38	83.20	1.50

NOTES:

NM = not measured

* = measured from a temporary benchmark of arbitrary elevation = 100.00 feet.
Benchmark is located on the concrete right up against the east shop wall,
at the northeast corner of the shop.

** = water level measurement may be in error

TABLE 2. SUMMARY OF LABORATORY ANALYTICAL RESULTS - GROUND-WATER SAMPLES,
DOWELL, ARTESIA, NEW MEXICO

WELL NUMBER	SAMPLE DATE	BENZENE (mg/L)	ETHYL- BENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)	p,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	1,1,1- TCA (mg/L)	TCE (mg/L)	PCE (mg/L)
MW-1	01/26/91	0.033	ND(0.005)	0.029	0.130	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	09/15/91	ND(0.001)	ND(0.001)	0.002	0.009	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	11/22/91	0.026	ND(0.001)	0.007	0.014	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	03/16/93	0.016	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	01/10/94	0.006	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/19/94	0.035	0.007	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	07/20/94	0.008	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	10/25/94	0.027	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	01/25/95	0.025	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	04/03/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	08/01/95	0.082	0.008	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	10/18/95	0.064	0.004	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	01/10/96	0.076	0.007	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	04/13/96	0.048	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	07/21/96	0.040	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	10/22/96	0.027	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	01/24/97	0.002	0.007	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/09/97	0.006	0.002	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	07/30/97	0.018	0.004	ND(0.002)	ND(0.004)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
	10/17/97	0.002	0.035	ND(0.002)	0.031	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
MW-2	01/26/91	0.210	0.590	0.071	1.700	0.048	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	0.110
	01/26/91	0.190	0.450	0.062	1.300	0.043	ND(0.01)	ND(0.01)	0.011	ND(0.01)	0.078
	09/15/91	0.120	0.050	0.006	0.690	0.100	ND(0.005)	0.005	0.023	ND(0.005)	0.150
	11/22/91	0.033	0.001	0.001	0.088	0.110	ND(0.001)	0.007	0.016	ND(0.001)	0.064
	03/16/93	0.019	ND(0.001)	ND(0.001)	ND(0.005)	0.060	ND(0.001)	0.002	0.003	ND(0.001)	0.028
	01/10/94	0.024	ND(0.001)	0.001	ND(0.005)	0.039	ND(0.001)	ND(0.001)	ND(0.001)	0.001	0.079
	04/19/94	0.045	0.004	ND(0.005)	ND(0.005)	0.028	ND(0.005)	ND(0.005)	ND(0.005)	0.001	0.048
	07/20/94	0.043	0.005	ND(0.005)	ND(0.005)	0.030	ND(0.005)	ND(0.005)	ND(0.005)	0.001	0.052
	10/25/94	0.045	0.008	ND(0.005)	ND(0.005)	0.026	ND(0.005)	ND(0.005)	ND(0.005)	0.001	0.021
	01/25/95	0.057	0.022	ND(0.005)	ND(0.005)	0.030	ND(0.005)	ND(0.005)	ND(0.005)	0.001	0.037
	04/03/95	0.050	ND(0.005)	ND(0.005)	ND(0.005)	0.024	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.079
	08/01/95	0.032	0.021	ND(0.005)	ND(0.005)	0.026	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.035
	10/18/95	0.078	0.040	ND(0.005)	ND(0.005)	0.027	ND(0.005)	ND(0.005)	ND(0.005)	0.002	0.033
	01/11/96	0.081	0.045	ND(0.005)	ND(0.005)	0.015	ND(0.005)	ND(0.005)	ND(0.005)	0.003	0.088
	04/13/96	0.220	0.200	ND(0.005)	ND(0.005)	0.017	ND(0.005)	ND(0.005)	ND(0.005)	0.003	0.097
	07/21/96	0.095	0.130	ND(0.005)	0.110	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.260
	10/22/96	0.092	0.079	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.140
	01/24/97	0.012	0.018	ND(0.001)	ND(0.002)	0.002	ND(0.001)	ND(0.001)	ND(0.001)	0.003	0.018
	04/09/97	0.015	0.029	ND(0.002)	ND(0.004)	0.003	ND(0.002)	ND(0.002)	ND(0.002)	0.007	0.034
	07/30/97	0.010	0.045	ND(0.002)	ND(0.004)	0.002	ND(0.002)	ND(0.002)	ND(0.002)	0.009	0.050
MW-3	01/26/91	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	09/15/91	0.200	1.200	1.200	14.000	ND(0.2)	ND(0.2)	ND(0.2)	0.330	ND(0.2)	ND(0.2)
	11/22/91	0.110	0.680	0.530	6.800	0.094	0.004	0.190	0.110	0.150	0.057

TABLE 2. SUMMARY OF LABORATORY ANALYTICAL RESULTS - GROUND-WATER SAMPLES,
DOWELL, ARTESIA, NEW MEXICO

WELL NUMBER	SAMPLE DATE	BENZENE (mg/L)	ETHYL- BENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	1,1,1- TCA (mg/L)	TCE (mg/L)	PCE (mg/L)
MW-3 Cont. dup.	03/16/93	ND(0.001)	1.000	0.650	8.600	ND(0.001)	ND(0.001)	ND(0.001)	0.260	ND(0.001)	ND(0.001)
	03/16/93	0.130	0.780	0.540	9.000	ND(0.001)	ND(0.001)	0.044	0.260	0.037	0.330
	07/01/93	0.140	1.000	0.520	9.100	0.140	ND(0.05)	ND(0.05)	0.160	ND(0.05)	ND(0.05)
	01/10/94	0.140	1.000	0.700	11.000	0.190	ND(0.1)	ND(0.1)	0.210	ND(0.1)	ND(0.1)
	04/19/94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	07/20/94	0.092	0.460	0.160	3.000	0.077	0.002	0.036	0.069	0.064	0.011
	10/25/94	0.130	0.960	0.250	4.200	0.200	ND(0.05)	0.064	ND(0.05)	0.130	0.210
	10/25/94	0.110	0.830	0.300	4.700	0.180	ND(0.05)	0.051	ND(0.05)	0.100	0.024
	01/25/95	ND(1)	0.810	ND(1)	7.100	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
	04/03/95	0.047	0.450	ND(0.025)	1.300	0.100	ND(0.025)	0.110	ND(0.025)	0.150	ND(0.025)
dup.	04/03/95	0.047	0.450	ND(0.025)	1.200	0.100	ND(0.025)	0.120	ND(0.025)	0.150	ND(0.025)
	08/01/95	0.088	0.950	0.190	6.500	0.230	ND(0.05)	0.089	ND(0.05)	0.081	ND(0.05)
	10/18/95	0.100	1.100	0.240	8.200	0.280	ND(0.05)	0.066	0.049	0.089	0.042
	01/11/96	0.054	0.620	0.081	4.990	0.150	ND(0.05)	0.076	ND(0.05)	0.100	ND(0.05)
	04/13/96	0.039	0.480	ND(0.005)	3.900	0.051	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	07/22/96	0.060	0.190	0.056	0.890	0.130	ND(0.005)	0.009	0.009	0.054	0.014
	10/22/96	ND(0.1)	0.580	ND(0.1)	3.500	0.150	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
	01/24/97	0.048	0.269	0.012	0.886	0.077	0.004	0.043	ND(0.010)	0.070	0.007
	04/09/97	0.034	0.137	ND(0.010)	0.146	0.065	ND(0.010)	0.064	ND(0.010)	0.107	0.013
	07/30/97	0.019	0.177	ND(0.010)	0.644	0.057	ND(0.010)	0.043	ND(0.010)	0.103	0.035
	10/17/97	0.044	0.464	0.041	3.300	0.069	ND(0.020)	0.016	ND(0.020)	0.018	0.016
dup.	01/07/98	0.042	0.503	0.051	3.720	0.086	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
	04/15/98	0.018	0.078	ND(0.020)	0.431	0.055	ND(0.020)	0.044	ND(0.020)	0.080	ND(0.020)
	04/15/98	0.018	0.077	ND(0.020)	0.416	0.052	ND(0.020)	0.044	ND(0.020)	0.079	ND(0.020)
	07/18/98	0.009	0.036	ND(0.005)	0.027	0.050	ND(0.005)	0.052	ND(0.005)	0.083	0.022
	10/28/98	0.016	0.187	ND(0.020)	1.239	0.053	ND(0.020)	0.029	ND(0.020)	0.056	0.029
	02/09/99	0.016	0.117	0.012	0.763	0.051	0.002	0.036	ND(0.001)	0.051	0.024
	04/22/99	0.009	0.054	ND(0.0025)	0.084	0.049	ND(0.0025)	0.040	ND(0.0025)	0.061	0.026
	01/26/91	0.098	0.011	ND(0.001)	0.025	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	09/15/91	0.260	ND(0.002)	ND(0.002)	0.015	0.006	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
	11/22/91	0.160	0.100	0.001	0.037	ND(0.001)	ND(0.001)	0.019	ND(0.001)	ND(0.001)	ND(0.001)
MW-4	03/16/93	0.072	0.051	ND(0.001)	ND(0.005)	0.001	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	01/10/94	0.064	0.074	ND(0.001)	ND(0.005)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/19/94	0.074	0.085	ND(0.005)	0.003	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	07/20/94	0.100	0.053	ND(0.005)	0.005	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	10/25/94	0.140	0.260	ND(0.005)	0.004	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.005
	01/25/95	0.150	0.400	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)
	04/03/95	0.100	0.190	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	08/01/95	0.069	0.570	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.005	ND(0.005)
	10/18/95	ND(0.005)	0.110	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	01/11/96	ND(0.005)	0.036	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	04/13/96	ND(0.005)	0.008	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
dup. #	04/13/96	ND(0.005)	0.007	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	07/21/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	10/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	01/24/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)

TABLE 2. SUMMARY OF LABORATORY ANALYTICAL RESULTS - GROUND-WATER SAMPLES,
DOWELL, ARTESIA, NEW MEXICO

WELL NUMBER	SAMPLE DATE	BENZENE (mg/L)	ETHYL- BENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	1,1,1- TCA (mg/L)	TCE (mg/L)	POE (mg/L)
MW-4 Cont.	04/09/97	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
	07/30/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	10/17/97	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
	10/28/98	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
	04/22/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
MW-5	01/26/91	0.014	ND(0.001)	ND(0.001)	ND(0.005)	0.004	ND(0.001)	0.002	0.001	ND(0.001)	0.010
	09/15/91	ND(0.001)	0.001	ND(0.001)	ND(0.005)	0.005	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	0.018
	11/22/91	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.005	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	0.018
	03/16/93	0.078	0.007	ND(0.001)	ND(0.005)	0.013	ND(0.001)	0.003	ND(0.001)	0.001	0.026
	01/10/94	0.025	ND(0.001)	ND(0.001)	ND(0.005)	0.008	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	0.026
	04/19/94	0.070	0.011	ND(0.005)	ND(0.005)	0.008	ND(0.005)	ND(0.005)	ND(0.005)	0.002	0.015
	07/20/94	0.220	0.041	ND(0.005)	ND(0.005)	0.011	ND(0.005)	ND(0.005)	ND(0.005)	0.004	0.025
	07/20/94	0.320	0.076	ND(0.005)	0.001	0.026	ND(0.005)	0.002	ND(0.005)	0.006	0.039
	10/25/94	0.240	0.059	ND(0.005)	ND(0.005)	0.020	ND(0.005)	0.002	ND(0.005)	0.008	0.043
	01/25/95	0.460	0.130	ND(0.005)	ND(0.005)	0.023	ND(0.005)	0.002	ND(0.005)	0.018	0.093
	04/03/95	0.390	0.087	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.015	0.062
	08/01/95	0.170	0.082	ND(0.005)	ND(0.005)	0.013	ND(0.005)	ND(0.005)	ND(0.005)	0.018	0.049
	10/18/95	0.200	0.093	ND(0.005)	ND(0.005)	0.011	ND(0.005)	ND(0.005)	ND(0.005)	0.021	0.054
	01/11/96	0.078	0.012	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.008	0.025
	04/13/96	0.068	0.037	ND(0.005)	0.027	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.025
	07/21/96	0.092	0.057	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.025
MW-6	10/22/96	0.066	0.023	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.020
	01/24/97	0.031	0.025	ND(0.001)	ND(0.002)	0.002	ND(0.001)	ND(0.001)	ND(0.001)	0.003	0.019
	04/09/97	0.040	0.040	ND(0.002)	ND(0.004)	0.003	ND(0.002)	ND(0.002)	ND(0.002)	0.004	0.028
	07/30/97	0.018	0.044	ND(0.002)	ND(0.004)	0.002	ND(0.002)	ND(0.002)	ND(0.002)	0.003	0.029
	10/17/97	0.016	0.048	ND(0.002)	ND(0.004)	0.001	ND(0.002)	ND(0.002)	ND(0.002)	0.004	0.033
	10/28/98	0.006	0.009	ND(0.002)	ND(0.004)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	0.006	0.027
	01/26/91	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.007	ND(0.001)	0.170	0.007	ND(0.001)	0.083
	09/15/91	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.006	ND(0.001)	0.084	ND(0.001)	ND(0.001)	0.043
	11/22/91	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.005	ND(0.001)	0.064	ND(0.001)	ND(0.001)	0.035
	03/16/93	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.007	ND(0.001)	0.098	0.001	ND(0.001)	0.056
	01/10/94	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.017	ND(0.001)	0.140	0.002	ND(0.001)	0.120
	04/19/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.013	ND(0.005)	0.070	0.002	ND(0.005)	0.072
	07/20/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.009	ND(0.005)	0.098	0.001	ND(0.005)	0.065
	07/20/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.013	ND(0.005)	0.110	0.001	ND(0.005)	0.073
	10/25/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.012	ND(0.005)	0.079	ND(0.005)	ND(0.005)	0.059
dup.	01/25/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.012	ND(0.005)	0.065	ND(0.005)	ND(0.005)	0.057
	04/03/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.015	ND(0.005)	0.074	ND(0.005)	ND(0.005)	0.048
	08/01/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.013	ND(0.005)	0.060	ND(0.005)	ND(0.005)	0.030
	10/18/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.013	ND(0.005)	0.051	ND(0.005)	ND(0.005)	0.029
	01/11/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.011	ND(0.005)	0.047	ND(0.005)	ND(0.005)	0.022
	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.012	ND(0.005)	0.037	ND(0.005)	ND(0.005)	0.021
	07/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.011	ND(0.005)	0.041	ND(0.005)	ND(0.005)	0.016
	10/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.013	ND(0.005)	0.041	ND(0.005)	ND(0.005)	0.016
	01/24/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.004)	0.010	ND(0.001)	0.025	ND(0.001)	ND(0.001)	0.006
	04/09/97	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	0.010	ND(0.002)	0.025	ND(0.002)	ND(0.002)	0.009
	07/30/97	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	0.006	ND(0.002)	0.016	ND(0.002)	ND(0.002)	0.008
	10/17/97	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	0.011	ND(0.002)	0.023	ND(0.002)	ND(0.002)	0.007
	10/28/98	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	0.007	ND(0.002)	0.016	ND(0.002)	ND(0.002)	0.006

TABLE 2. SUMMARY OF LABORATORY ANALYTICAL RESULTS - GROUND-WATER SAMPLES,
DOWELL, ARTESIA, NEW MEXICO

WELL NUMBER	SAMPLE DATE	BENZENE (mg/L)	ETHYL- BENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	1,1,1- TCA (mg/L)	TCE (mg/L)	PCE (mg/L)
MW-7	01/26/91	0.006	ND(0.001)	ND(0.001)	ND(0.005)	0.021	ND(0.001)	0.260	0.010	0.068	0.200
dup.	09/15/91	0.009	ND(0.001)	ND(0.001)	ND(0.005)	0.038	ND(0.001)	0.320	0.005	0.069	0.270
	09/15/91	0.009	ND(0.001)	ND(0.001)	ND(0.005)	0.034	ND(0.001)	0.310	0.006	0.069	0.280
	11/22/91	0.009	ND(0.005)	ND(0.005)	ND(0.025)	0.035	ND(0.005)	0.360	ND(0.005)	0.053	0.310
dup.	03/16/93	0.007	ND(0.001)	ND(0.001)	ND(0.005)	0.027	ND(0.001)	0.280	0.002	0.050	0.160
	01/10/94	0.005	ND(0.001)	ND(0.001)	ND(0.005)	0.023	ND(0.001)	0.210	0.004	0.046	0.160
	04/19/94	0.007	ND(0.005)	ND(0.005)	ND(0.005)	0.021	ND(0.005)	0.120	0.003	0.038	0.120
	07/20/94	0.006	ND(0.005)	ND(0.005)	ND(0.005)	0.018	ND(0.005)	0.220	0.003	0.040	0.160
	10/25/94	0.007	ND(0.005)	ND(0.005)	ND(0.005)	0.033	ND(0.005)	0.230	ND(0.005)	0.050	0.240
	01/25/95	0.006	ND(0.025)	ND(0.025)	ND(0.025)	0.026	ND(0.025)	0.200	ND(0.025)	0.045	0.230
	04/03/95	0.005	ND(0.005)	ND(0.005)	ND(0.005)	0.027	ND(0.005)	0.210	0.002	0.041	0.330
	08/01/95	0.006	ND(0.005)	ND(0.005)	ND(0.005)	0.029	ND(0.005)	0.290	ND(0.005)	0.038	0.260
	01/18/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.038	ND(0.005)	0.300	ND(0.005)	0.051	0.250
	01/11/96	0.005	ND(0.005)	ND(0.005)	ND(0.005)	0.024	ND(0.005)	0.300	0.002	0.045	0.300
	04/13/96	0.006	ND(0.005)	ND(0.005)	ND(0.005)	0.027	ND(0.005)	0.260	ND(0.005)	0.035	0.250
	07/22/96	0.006	ND(0.005)	ND(0.005)	ND(0.005)	0.029	ND(0.005)	0.280	ND(0.005)	0.030	0.260
MW-8	10/22/96	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.010)	0.028	ND(0.010)	0.350	ND(0.010)	0.023	0.260
	01/24/97	0.005	ND(0.001)	ND(0.001)	ND(0.002)	0.021	0.001	0.244	0.002	0.019	0.203
	04/09/97	0.005	ND(0.002)	ND(0.002)	ND(0.004)	0.022	ND(0.002)	0.186	ND(0.002)	0.017	0.148
	07/30/97	0.005	ND(0.010)	ND(0.010)	ND(0.020)	0.023	ND(0.010)	0.236	ND(0.010)	0.019	0.255
	10/17/97	0.005	ND(0.010)	ND(0.010)	ND(0.020)	0.029	ND(0.010)	0.255	ND(0.010)	0.020	0.153
	10/28/98	0.004	ND(0.010)	ND(0.010)	ND(0.020)	0.024	ND(0.010)	0.193	ND(0.010)	0.031	0.251
	04/22/99	0.005	ND(0.005)	ND(0.005)	ND(0.010)	0.034	ND(0.005)	0.255	ND(0.005)	0.043	0.275
	01/26/91	ND(0.001)	ND(0.001)	ND(0.001)	0.005	ND(0.001)	ND(0.001)	0.015	0.004	0.001	0.003
	09/15/91	0.007	ND(0.001)	ND(0.001)	ND(0.005)	0.017	ND(0.001)	0.101	0.007	0.039	0.050
	11/22/91	0.004	ND(0.001)	ND(0.001)	ND(0.005)	0.020	ND(0.001)	0.087	0.003	0.045	0.063
	03/16/93	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.004	ND(0.001)	0.054	0.005	0.006	0.009
	01/10/94	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.004	ND(0.001)	0.054	0.004	0.006	0.006
	01/10/94	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.005	ND(0.001)	0.073	0.004	0.008	0.010
dup.	04/19/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.004	ND(0.005)	0.039	0.004	0.004	0.007
	07/20/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.004	ND(0.005)	0.069	0.005	0.006	0.011
	10/25/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.008	ND(0.005)	0.082	ND(0.005)	0.010	0.019
	01/25/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.007	ND(0.005)	0.076	0.006	0.011	0.022
	04/03/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.006	ND(0.005)	0.074	ND(0.005)	0.008	0.017
	08/01/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.015	ND(0.005)	0.110	ND(0.005)	0.023	0.053
	10/18/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.009	ND(0.005)	0.081	0.002	0.015	0.044
	01/11/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.069	ND(0.005)	0.006	0.019
	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.007	ND(0.005)	0.099	ND(0.005)	0.011	0.036
	07/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.006	ND(0.005)	0.087	ND(0.005)	0.010	0.035
	10/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.022	ND(0.005)	0.150	ND(0.005)	0.035	0.089
	01/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.020	ND(0.005)	0.140	ND(0.005)	0.030	0.072
	10/22/96	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.019	0.001	0.081	0.002	0.017	0.018
dup.	01/24/97	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.017	0.001	0.088	0.002	0.014	0.017
dup.	04/09/97	0.001	ND(0.002)	ND(0.002)	ND(0.004)	0.015	ND(0.002)	0.097	ND(0.002)	0.019	0.028
dup.	07/30/97	0.001	ND(0.002)	ND(0.002)	ND(0.004)	0.012	ND(0.002)	0.105	ND(0.002)	0.015	0.048
	07/30/97	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	0.011	ND(0.002)	0.106	0.002	0.015	0.055

TABLE 2. SUMMARY OF LABORATORY ANALYTICAL RESULTS - GROUND-WATER SAMPLES,
DOWELL, ARTESIA, NEW MEXICO

WELL NUMBER	SAMPLE DATE	BENZENE (mg/L)	ETHYL- BENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	1,1,1- TCA (mg/L)	TCE (mg/L)	PCE (mg/L)
MW-8 Cont.	10/17/97	0.001	ND(0.002)	ND(0.002)	ND(0.004)	0.010	ND(0.002)	0.104	ND(0.002)	0.010	0.026
	10/28/98	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.010)	0.003	ND(0.005)	0.111	ND(0.005)	ND(0.005)	0.010
dup.	10/28/98	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.02)	0.003	ND(0.01)	0.128	ND(0.01)	ND(0.01)	0.009
	04/22/99	ND(0.0025)	ND(0.0025)	ND(0.0025)	ND(0.005)	0.003	ND(0.0025)	0.152	0.002	ND(0.0025)	0.007
MW-9	01/26/91	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.022	ND(0.001)	0.002	ND(0.001)	ND(0.001)	0.001
	09/15/91	0.002	0.032	ND(0.001)	ND(0.005)	0.035	ND(0.001)	0.002	ND(0.001)	ND(0.001)	ND(0.001)
	11/22/91	0.004	0.170	ND(0.001)	ND(0.005)	0.029	ND(0.001)	0.002	ND(0.001)	ND(0.001)	0.001
	03/16/93	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.012	ND(0.001)	0.001	ND(0.001)	ND(0.001)	ND(0.001)
	01/10/94	ND(0.001)	ND(0.001)	0.002	ND(0.005)	0.012	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/19/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.010	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	07/20/94	ND(0.005)	ND(0.005)	ND(0.005)	0.001	0.017	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	10/25/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.014	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	01/25/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.014	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	04/03/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.015	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	08/01/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.022	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
*	10/18/95	ND(0.005)	0.016	ND(0.005)	ND(0.005)	0.017	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
*	01/10/96	ND(0.005)	0.032	ND(0.005)	ND(0.005)	0.020	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
#	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.020	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	07/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.021	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	10/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.024	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	01/24/97	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.019	ND(0.001)	0.002	ND(0.001)	0.002	0.001
	04/09/97	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.022	ND(0.001)	0.002	ND(0.001)	0.002	0.001
	07/30/97	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	0.020	ND(0.002)	0.001	ND(0.002)	0.001	ND(0.002)
	10/17/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.018	ND(0.001)	0.001	ND(0.001)	0.001	ND(0.001)
	10/28/98	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	0.005	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
MW-10	01/26/91	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.001)	ND(0.001)	0.004	ND(0.001)	ND(0.001)	ND(0.001)
	09/15/91	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.001)	ND(0.001)	0.012	0.002	ND(0.001)	ND(0.001)
	11/22/91	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.001)	ND(0.001)	0.029	0.005	ND(0.001)	ND(0.001)
	03/16/93	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.001)	ND(0.001)	0.025	0.001	ND(0.001)	ND(0.001)
	01/10/94	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.001)	ND(0.001)	0.021	ND(0.001)	ND(0.001)	ND(0.001)
	04/19/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.022	0.001	ND(0.005)	ND(0.005)
	07/20/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.052	0.004	ND(0.005)	ND(0.005)
	10/25/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.051	ND(0.005)	ND(0.005)	ND(0.005)
	01/25/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.042	ND(0.005)	ND(0.005)	ND(0.005)
	04/03/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.057	0.005	ND(0.005)	ND(0.005)
dup.	01/25/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.070	ND(0.005)	ND(0.005)	ND(0.005)
	08/01/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.130	ND(0.005)	ND(0.005)	ND(0.005)
	10/18/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.130	0.007	ND(0.005)	ND(0.005)
	01/10/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.130	0.006	ND(0.005)	ND(0.005)
	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.063	ND(0.005)	ND(0.005)	ND(0.005)
	07/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.170	ND(0.005)	ND(0.005)	ND(0.005)
	10/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.170	ND(0.005)	ND(0.005)	ND(0.005)
	01/24/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.001	ND(0.001)	0.250	ND(0.010)	ND(0.010)	ND(0.010)
	04/09/97	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	0.001	ND(0.001)	0.181	0.005	ND(0.001)	ND(0.001)
	07/30/97	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.010)	0.001	ND(0.005)	0.158	0.004	ND(0.002)	ND(0.002)
	10/17/97	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.020)	ND(0.005)	ND(0.005)	0.156	0.004	ND(0.005)	ND(0.005)
	10/28/98	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.020)	ND(0.010)	ND(0.010)	0.196	0.004	ND(0.010)	ND(0.010)
	04/22/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	0.111	ND(0.010)	ND(0.010)	ND(0.010)
								0.098	0.001	ND(0.001)	ND(0.001)

TABLE 2. SUMMARY OF LABORATORY ANALYTICAL RESULTS - GROUND-WATER SAMPLES,
DOWELL, ARTESIA, NEW MEXICO

WELL NUMBER	SAMPLE DATE	BENZENE (mg/L)	ETHYL- BENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	1,1,1- TCA (mg/L)	TCE (mg/L)	PCE (mg/L)
MW-11	01/26/91	0.010	ND(0.005)	ND(0.005)	ND(0.025)	0.045	ND(0.005)	0.310	ND(0.005)	0.140	0.360
	09/15/91	0.056	ND(0.001)	ND(0.001)	ND(0.005)	0.068	ND(0.001)	0.470	0.017	0.120	0.330
*	11/22/91	0.048	ND(0.001)	ND(0.001)	ND(0.005)	0.052	ND(0.001)	0.390	0.018	0.110	0.320
*	03/16/93	0.005	ND(0.001)	ND(0.001)	ND(0.005)	0.040	ND(0.001)	0.220	0.004	0.074	0.160
	01/10/94	0.005	ND(0.001)	ND(0.001)	ND(0.005)	0.042	ND(0.001)	0.250	ND(0.001)	0.083	0.320
	04/19/94	0.009	ND(0.005)	0.002	ND(0.005)	0.042	ND(0.005)	0.170	0.006	0.079	0.170
	07/20/94	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	0.057	ND(0.025)	0.460	0.010	0.120	0.360
	10/25/94	0.009	ND(0.005)	ND(0.005)	ND(0.005)	0.067	0.001	0.220	ND(0.005)	0.110	0.300
	01/25/95	0.012	ND(0.005)	ND(0.005)	ND(0.005)	0.072	ND(0.005)	0.240	0.014	0.120	0.360
	04/03/95	0.009	ND(0.005)	ND(0.005)	ND(0.005)	0.062	ND(0.005)	0.410	0.013	0.100	0.430
	08/01/95	0.007	ND(0.005)	ND(0.005)	ND(0.005)	0.050	ND(0.005)	0.360	0.014	0.063	0.330
dup.	08/01/95	0.007	ND(0.005)	ND(0.005)	ND(0.005)	0.051	ND(0.005)	0.310	0.015	0.071	0.340
*	10/18/95	0.005	ND(0.005)	ND(0.005)	ND(0.005)	0.043	ND(0.005)	0.270	0.010	0.057	0.330
	01/11/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.033	ND(0.005)	0.230	0.011	0.043	0.310
*	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.240	ND(0.005)	0.020	0.230
	07/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.035	ND(0.005)	0.200	0.008	0.036	0.260
	10/22/96	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.010)	0.034	ND(0.010)	0.230	ND(0.010)	0.029	0.260
	01/24/97	0.002	ND(0.001)	ND(0.002)	ND(0.002)	0.029	0.001	0.157	0.008	0.026	0.212
	04/09/97	0.002	ND(0.002)	ND(0.002)	ND(0.004)	0.033	ND(0.002)	0.128	0.008	0.027	0.180
	07/30/97	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.010)	0.032	ND(0.005)	0.102	0.006	0.032	0.170
	10/17/97	0.003	ND(0.010)	ND(0.010)	ND(0.020)	0.048	ND(0.010)	0.142	0.005	0.031	0.063
	01/07/98	0.004	ND(0.010)	ND(0.010)	ND(0.020)	0.054	ND(0.010)	0.145	0.005	0.049	0.176
dup.	01/07/98	0.004	ND(0.010)	ND(0.010)	ND(0.020)	0.061	ND(0.010)	0.155	0.006	0.053	0.200
	04/15/98	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.020)	0.059	ND(0.010)	0.130	ND(0.010)	0.057	0.151
	07/18/98	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.020)	0.071	ND(0.010)	0.120	ND(0.010)	0.064	0.143
	10/28/98	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.020)	0.072	ND(0.010)	0.110	ND(0.010)	0.065	0.129
	02/09/99	0.004	ND(0.001)	ND(0.001)	ND(0.002)	0.070	0.001	0.130	0.002	0.070	0.157
dup.	02/09/99	0.004	ND(0.001)	ND(0.001)	ND(0.002)	0.083	0.001	0.143	0.002	0.071	0.149
	04/22/99	0.004	ND(0.0025)	ND(0.0025)	ND(0.005)	0.090	ND(0.0025)	0.123	ND(0.0025)	0.067	0.117
MW-12	01/26/91	0.260	0.950	0.230	4.500	0.140	ND(0.025)	ND(0.025)	0.057	0.073	0.042
	09/15/91	0.150	0.620	0.630	2.200	0.120	ND(0.001)	0.300	0.110	0.200	0.061
*	11/22/91	0.110	0.430	0.034	0.810	0.110	0.002	0.240	0.100	0.260	0.051
	03/16/93	0.160	0.800	0.014	1.000	0.120	ND(0.001)	0.039	0.055	0.036	0.018
	01/10/94	0.160	0.870	0.026	0.990	0.150	ND(0.01)	0.075	0.053	0.070	0.024
	04/19/94	0.110	0.110	0.049	0.250	0.110	0.002	0.064	0.065	0.073	0.033
	07/20/94	0.160	0.720	0.071	0.610	0.150	ND(0.025)	0.073	0.075	0.086	0.022
	10/25/94	0.096	0.660	ND(0.025)	0.100	0.160	ND(0.025)	0.085	ND(0.025)	0.120	0.015
*	01/25/95	0.160	0.680	0.089	0.660	0.190	ND(0.005)	0.120	0.095	0.076	0.069
dup.	01/25/95	0.140	0.850	0.075	0.860	0.150	ND(0.005)	0.090	0.075	0.062	0.053
	04/03/95	0.150	0.790	0.200	1.100	0.160	ND(0.005)	0.110	0.096	0.043	0.056
	08/01/95	0.130	0.700	0.280	1.400	0.170	ND(0.025)	0.150	0.079	0.098	0.059
*	10/18/95	0.140	0.990	0.360	2.030	0.170	ND(0.005)	0.100	0.100	0.058	0.050
	01/11/96	0.100	0.680	0.180	1.840	0.140	ND(0.005)	0.097	0.059	0.060	0.048
*	04/13/96	0.098	0.620	0.180	0.690	0.150	ND(0.005)	0.087	ND(0.005)	ND(0.005)	0.023
#	07/22/96	0.130	0.920	0.310	1.790	0.160	ND(0.005)	0.087	0.170	0.045	0.046
	10/22/96	ND(0.1)	0.830	0.190	1.800	0.190	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
	01/24/97	0.093	0.822	0.133	1.738	0.162	ND(0.010)	0.046	0.060	0.037	0.039
	04/09/97	0.086	0.920	0.138	1.869	0.159	ND(0.020)	0.040	0.051	0.046	0.039
dup.	04/09/97	0.079	0.855	0.129	1.837	0.159	ND(0.010)	0.040	0.054	0.047	0.039
	07/30/97	0.090	0.969	0.127	2.294	0.136	ND(0.020)	0.035	0.062	0.036	0.043

TABLE 2. SUMMARY OF LABORATORY ANALYTICAL RESULTS - GROUND-WATER SAMPLES,
DOWELL, ARTESIA, NEW MEXICO

WELL NUMBER	SAMPLE DATE	BENZENE (mg/L)	ETHYL- BENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	1,1,1- TCA (mg/L)	TCE (mg/L)	PCE (mg/L)
MW-12 Cont.	10/17/97	0.178	1.290	0.853	5.540	0.185	ND(0.050)	0.061	0.186	ND(0.050)	0.045
	10/28/98	0.064	1.150	ND(0.1)	0.745	0.141	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
dup.	04/22/99	0.075	1.150	ND(0.025)	0.612	0.171	ND(0.025)	0.031	0.040	0.034	0.034
	04/22/99	0.063	0.953	0.008	0.546	0.140	ND(0.005)	0.017	0.039	0.022	0.017
MW-13	09/15/91	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.030	0.002	0.038	0.005	0.004	0.240
	11/22/91	0.430	ND(0.001)	ND(0.001)	ND(0.005)	0.016	0.001	0.025	0.002	0.002	0.110
	03/16/93	0.033	ND(0.001)	ND(0.001)	ND(0.005)	0.013	ND(0.001)	0.014	ND(0.001)	0.002	0.062
dup.	03/16/93	0.034	ND(0.001)	ND(0.001)	ND(0.005)	0.013	0.001	0.015	ND(0.001)	0.002	0.066
	01/10/94	0.022	ND(0.001)	ND(0.001)	ND(0.005)	0.016	ND(0.001)	0.007	ND(0.001)	0.003	0.055
	04/19/94	0.013	ND(0.005)	ND(0.005)	ND(0.005)	0.011	0.001	0.003	ND(0.005)	0.003	0.032
	07/20/94	0.016	ND(0.005)	ND(0.005)	ND(0.005)	0.016	0.001	0.005	ND(0.005)	0.004	0.034
	10/25/94	0.011	ND(0.005)	ND(0.005)	ND(0.005)	0.013	ND(0.005)	0.004	ND(0.005)	0.004	0.040
	01/22/95	0.008	ND(0.005)	ND(0.005)	ND(0.005)	0.015	ND(0.005)	0.002	ND(0.005)	0.005	0.029
	04/03/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.013	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.022
	08/01/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.017	ND(0.005)	ND(0.005)	ND(0.005)	0.007	0.025
	10/18/95	0.003	ND(0.005)	ND(0.005)	ND(0.005)	0.015	ND(0.005)	ND(0.005)	ND(0.005)	0.008	0.020
	01/11/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.011	ND(0.005)	ND(0.005)	ND(0.005)	0.005	0.015
	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.011
	07/21/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.009	ND(0.005)	ND(0.005)	ND(0.005)	0.007	0.013
	10/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.007	ND(0.005)	ND(0.005)	ND(0.005)	0.006	0.010
	01/24/97	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.005	0.001	0.001	ND(0.001)	0.003	0.003
	04/09/97	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.004	ND(0.001)	0.001	ND(0.001)	0.005	0.005
dup.	04/09/97	0.002	ND(0.001)	ND(0.001)	ND(0.002)	0.005	ND(0.001)	0.001	ND(0.001)	0.006	0.005
	07/30/97	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.004	ND(0.001)	ND(0.001)	ND(0.001)	0.007	0.009
	10/17/97	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.003	ND(0.001)	ND(0.001)	ND(0.001)	0.006	0.009
dup.	10/17/97	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	0.003	ND(0.002)	ND(0.002)	ND(0.002)	0.006	0.007
	01/07/98	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.004	ND(0.001)	ND(0.001)	ND(0.001)	0.008	0.011
	04/15/98	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.003	ND(0.001)	ND(0.001)	ND(0.001)	0.007	0.009
	07/18/98	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.005	ND(0.001)	ND(0.001)	ND(0.001)	0.010	0.016
	10/28/98	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.003	ND(0.001)	ND(0.001)	ND(0.001)	0.009	0.015
	02/09/99	0.002	ND(0.001)	ND(0.001)	ND(0.002)	0.007	ND(0.001)	0.001	ND(0.001)	0.019	0.026
	04/22/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.003	ND(0.001)	ND(0.001)	ND(0.001)	0.008	0.009
MW-14	09/15/91	0.022	ND(0.001)	ND(0.001)	ND(0.005)	0.130	0.002	0.300	0.014	0.002	0.460
	11/22/91	0.002	ND(0.001)	ND(0.001)	ND(0.005)	0.140	0.002	0.310	0.009	0.002	0.400
dup.	11/22/91	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.110	0.002	0.320	0.010	ND(0.001)	0.440
	03/16/93	0.020	ND(0.001)	ND(0.001)	ND(0.005)	0.080	0.001	0.180	0.004	0.002	0.210
	01/10/94	0.011	ND(0.001)	ND(0.001)	ND(0.005)	0.057	ND(0.001)	0.100	ND(0.001)	0.002	0.300
	04/19/94	0.005	ND(0.005)	ND(0.005)	ND(0.005)	0.058	ND(0.005)	0.056	0.001	ND(0.005)	0.160
	07/20/94	0.010	ND(0.025)	ND(0.025)	ND(0.025)	0.072	ND(0.025)	0.110	ND(0.025)	ND(0.025)	0.210
	10/25/94	0.010	ND(0.005)	ND(0.005)	ND(0.005)	0.079	0.001	0.094	ND(0.005)	ND(0.005)	0.230
	01/25/95	0.004	ND(0.005)	ND(0.005)	ND(0.005)	0.083	ND(0.005)	0.070	ND(0.005)	ND(0.005)	0.022
	04/03/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.063	ND(0.005)	0.058	ND(0.005)	ND(0.005)	0.130
	08/01/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.074	ND(0.005)	0.072	ND(0.005)	ND(0.005)	0.098
	10/18/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.062	ND(0.005)	0.044	ND(0.005)	ND(0.005)	0.087
	01/11/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.051	ND(0.005)	0.038	ND(0.005)	ND(0.005)	0.061
dup.	01/11/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.053	ND(0.005)	0.040	ND(0.005)	ND(0.005)	0.064
	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.051	ND(0.005)	0.045	ND(0.005)	ND(0.005)	0.057
	07/21/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.048	ND(0.005)	0.037	ND(0.005)	ND(0.005)	0.055
dup.	07/21/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.052	ND(0.005)	0.043	ND(0.005)	ND(0.005)	0.064

TABLE 2. SUMMARY OF LABORATORY ANALYTICAL RESULTS - GROUND-WATER SAMPLES,
DOWELL, ARTESIA, NEW MEXICO

WELL NUMBER	SAMPLE DATE	BENZENE (mg/L)	ETHYL- BENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	1,1,1- TCA (mg/L)	TCE (mg/L)	PCE (mg/L)
MW-14 Cont.	10/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.056	ND(0.005)	0.049	ND(0.005)	ND(0.005)	0.062
dup.	01/24/97	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.040	0.001	0.023	ND(0.001)	ND(0.001)	0.014
	01/24/97	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.045	0.001	0.027	ND(0.001)	ND(0.001)	0.010
	04/09/97	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.010)	0.039	ND(0.005)	0.023	ND(0.005)	ND(0.005)	0.024
	07/30/97	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.010)	0.036	ND(0.005)	0.021	ND(0.005)	ND(0.005)	0.043
	10/17/97	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.010)	0.039	ND(0.005)	0.019	ND(0.005)	ND(0.005)	0.048
	10/28/98	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.010)	0.045	ND(0.005)	0.019	ND(0.005)	ND(0.005)	0.074
MW-15	09/15/91	0.002	0.010	ND(0.001)	0.006	0.026	0.001	0.005	ND(0.001)	ND(0.001)	0.004
	11/22/91	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	0.033	0.001	0.009	ND(0.001)	0.003	0.006
	03/16/93	0.001	0.002	ND(0.001)	ND(0.005)	0.082	0.001	0.013	ND(0.001)	0.006	0.009
dup.	01/10/94	ND(0.001)	0.008	ND(0.001)	ND(0.005)	0.048	ND(0.001)	0.009	ND(0.001)	0.004	0.013
	01/10/94	0.001	0.009	0.002	ND(0.005)	0.054	ND(0.001)	0.010	ND(0.001)	0.004	0.015
	04/19/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.027	ND(0.005)	0.005	ND(0.005)	0.003	0.008
	07/20/94	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.049	0.001	0.006	ND(0.005)	0.004	0.005
	10/25/94	0.001	ND(0.005)	ND(0.005)	ND(0.005)	0.029	ND(0.005)	0.006	ND(0.005)	0.004	0.006
	01/25/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.027	ND(0.005)	0.006	ND(0.005)	0.005	0.008
	04/03/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.020	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	08/01/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.022	ND(0.005)	0.006	ND(0.005)	ND(0.005)	ND(0.005)
	10/18/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.015	ND(0.005)	0.001	ND(0.005)	0.004	0.002
	01/10/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.013	ND(0.005)	0.003	ND(0.005)	ND(0.005)	ND(0.005)
	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.009	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	07/21/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.011	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
dup.	10/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.010	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	10/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.010	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
	01/24/97	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.012	0.001	0.001	ND(0.001)	ND(0.001)	ND(0.001)
	04/09/97	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.012	0.001	0.002	ND(0.001)	0.001	ND(0.001)
	07/30/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.005	ND(0.001)	0.001	ND(0.001)	ND(0.001)	ND(0.001)
	10/17/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.013	0.001	0.001	ND(0.001)	ND(0.001)	ND(0.001)
	10/28/98	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.013	ND(0.001)	0.001	ND(0.001)	ND(0.001)	ND(0.001)
MW-17D	04/03/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.062	ND(0.005)	0.018	0.012	0.019	0.014
*	08/01/95	0.013	ND(0.005)	ND(0.005)	ND(0.005)	0.095	ND(0.005)	0.058	0.020	0.052	0.028
*	10/18/95	0.007	ND(0.005)	ND(0.005)	ND(0.005)	0.067	ND(0.005)	0.044	0.015	0.047	0.054
	01/11/96	0.006	ND(0.005)	ND(0.005)	ND(0.005)	0.066	ND(0.005)	0.036	0.012	0.046	0.043
dup. *	01/11/96	0.006	ND(0.005)	ND(0.005)	ND(0.005)	0.050	ND(0.005)	0.032	0.009	0.036	0.039
#	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.064	ND(0.005)	0.046	0.009	0.049	0.032
	07/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.077	ND(0.005)	0.053	0.009	0.060	0.037
	10/22/96	0.007	ND(0.005)	ND(0.005)	ND(0.005)	0.066	ND(0.005)	0.041	ND(0.005)	0.059	0.033
	01/24/97	0.004	ND(0.001)	ND(0.001)	ND(0.002)	0.052	0.001	0.023	0.004	0.039	0.022
	04/09/97	0.003	ND(0.001)	ND(0.001)	ND(0.002)	0.030	ND(0.001)	0.020	0.003	0.026	0.022
	07/30/97	0.003	ND(0.002)	ND(0.002)	ND(0.004)	0.029	ND(0.002)	0.013	0.002	0.028	0.018
	10/17/97	0.004	ND(0.002)	ND(0.002)	ND(0.004)	0.056	ND(0.002)	0.015	0.001	0.038	0.011
	10/28/98	0.006	ND(0.005)	ND(0.005)	ND(0.01)	0.050	ND(0.005)	0.009	ND(0.005)	0.045	0.012
MW-17A	04/03/95	0.009	ND(0.005)	ND(0.005)	ND(0.005)	0.079	ND(0.005)	0.061	0.029	0.025	0.066
*	08/01/95	0.010	ND(0.005)	ND(0.005)	ND(0.005)	0.085	ND(0.005)	0.075	0.025	0.037	0.064
	10/18/95	0.009	ND(0.005)	ND(0.005)	ND(0.005)	0.073	ND(0.005)	0.059	0.019	0.041	0.090
dup. *	10/18/95	0.010	ND(0.005)	ND(0.005)	ND(0.005)	0.078	ND(0.005)	0.059	0.019	0.042	0.086
	01/11/96	0.009	ND(0.005)	ND(0.005)	ND(0.005)	0.077	ND(0.005)	0.068	0.019	0.042	0.076
*	04/13/96	0.006	ND(0.005)	ND(0.005)	ND(0.005)	0.075	ND(0.005)	0.069	ND(0.005)	0.043	0.065

TABLE 2. SUMMARY OF LABORATORY ANALYTICAL RESULTS - GROUND-WATER SAMPLES,
DOWELL, ARTESIA, NEW MEXICO

WELL NUMBER	SAMPLE DATE	BENZENE (mg/L)	ETHYL- BENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	1,1- TCA (mg/L)	TCE (mg/L)	PCE (mg/L)
# MW-17A Cont.	07/22/96	0.008	ND(0.005)	ND(0.005)	ND(0.005)	0.076	ND(0.005)	0.069	0.012	0.051	0.077
	10/22/96	0.006	ND(0.005)	ND(0.005)	ND(0.005)	0.069	ND(0.005)	0.058	ND(0.005)	0.050	0.054
	01/24/97	0.006	ND(0.001)	ND(0.001)	0.001	0.058	ND(0.001)	0.044	0.007	0.045	0.049
	04/09/97	0.007	ND(0.001)	ND(0.001)	ND(0.002)	0.065	0.001	0.051	0.008	0.051	0.051
	07/30/97	0.004	ND(0.005)	ND(0.005)	ND(0.010)	0.051	ND(0.005)	0.045	0.004	0.045	0.062
	10/17/97	0.006	ND(0.005)	ND(0.005)	ND(0.010)	0.079	ND(0.005)	0.050	0.003	0.052	0.053
	10/28/98	0.009	ND(0.005)	ND(0.005)	ND(0.010)	0.075	ND(0.005)	0.018	ND(0.005)	0.044	0.033
	04/03/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.036	ND(0.005)	0.180	0.019	ND(0.005)	0.180
	08/01/95	0.006	ND(0.005)	ND(0.005)	ND(0.005)	0.040	ND(0.005)	0.190	0.020	0.026	0.180
	08/01/95	0.008	ND(0.005)	ND(0.005)	ND(0.005)	0.049	ND(0.005)	0.250	0.023	0.030	0.320
dup. *	10/18/95	0.006	ND(0.005)	ND(0.005)	ND(0.005)	0.046	ND(0.005)	0.210	0.024	0.034	0.370
	01/11/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.034	ND(0.005)	0.170	0.014	0.022	0.190
	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.030	ND(0.005)	0.160	ND(0.005)	0.013	0.270
	07/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.030	ND(0.005)	0.150	ND(0.005)	0.016	0.250
	07/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.030	ND(0.005)	0.150	0.015	0.016	0.280
	10/22/96	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	0.038	ND(0.01)	0.190	ND(0.01)	0.030	0.250
	01/24/97	0.002	ND(0.001)	ND(0.001)	ND(0.002)	0.038	0.001	0.110	0.008	0.019	0.070
	04/09/97	0.004	ND(0.002)	ND(0.002)	ND(0.004)	0.035	0.001	0.115	0.005	0.021	0.132
	07/30/97	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.010)	0.026	ND(0.005)	0.080	0.004	0.017	0.141
	10/17/97	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.02)	0.053	ND(0.01)	0.103	ND(0.01)	0.027	0.149
	10/28/98	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.02)	0.073	ND(0.01)	0.072	ND(0.01)	0.045	0.178
MW-17C * 2nd *	04/03/95	0.032	0.060	0.005	0.054	0.058	ND(0.005)	0.099	ND(0.005)	0.091	0.013
	04/03/95	0.034	0.057	ND(0.005)	0.045	0.063	ND(0.005)	0.110	ND(0.005)	0.095	0.017
	08/01/95	0.022	0.047	ND(0.005)	ND(0.005)	0.073	ND(0.005)	0.140	ND(0.005)	0.120	0.012
	10/18/95	0.019	0.026	ND(0.005)	ND(0.005)	0.063	0.003	0.120	ND(0.005)	0.140	0.024
	01/11/96	0.020	0.035	ND(0.005)	ND(0.005)	0.058	ND(0.005)	0.120	ND(0.005)	0.120	0.015
	04/13/96	0.011	0.009	ND(0.005)	ND(0.005)	0.057	ND(0.005)	0.130	ND(0.005)	0.100	0.013
	07/22/96	0.016	ND(0.005)	ND(0.005)	ND(0.005)	0.058	ND(0.005)	0.130	ND(0.005)	0.120	0.014
	10/22/96	0.015	ND(0.005)	ND(0.005)	ND(0.005)	0.045	ND(0.005)	0.120	ND(0.005)	0.100	0.012
	01/24/97	0.009	ND(0.001)	ND(0.001)	ND(0.002)	0.051	0.003	0.099	ND(0.001)	0.078	0.005
	04/09/97	0.011	ND(0.002)	ND(0.002)	ND(0.004)	0.049	0.002	0.105	ND(0.002)	0.100	0.008
#	07/30/97	0.010	ND(0.005)	ND(0.005)	ND(0.010)	0.043	0.003	0.093	ND(0.005)	0.097	0.010
	10/17/97	0.031	ND(0.01)	ND(0.01)	ND(0.02)	0.066	0.003	0.115	ND(0.01)	0.086	0.013
	10/28/98	0.011	ND(0.01)	ND(0.01)	ND(0.02)	0.050	ND(0.01)	0.105	ND(0.01)	0.110	0.018
	04/03/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.017	ND(0.005)	0.093	ND(0.005)	0.034	0.071
	08/01/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.024	ND(0.005)	0.170	ND(0.005)	0.039	0.087
	10/18/95	0.003	ND(0.005)	ND(0.005)	ND(0.005)	0.018	ND(0.005)	0.150	ND(0.005)	0.042	0.130
	01/11/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.017	ND(0.005)	0.130	ND(0.005)	0.037	0.097
	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.016	ND(0.005)	0.170	ND(0.005)	0.034	0.120
	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.018	ND(0.005)	0.200	ND(0.005)	0.043	0.110
	07/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.170	ND(0.005)	0.043	0.120
dup.	10/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.020	ND(0.005)	0.190	ND(0.005)	0.042	0.120
	01/24/97	0.003	ND(0.001)	ND(0.001)	ND(0.002)	0.024	0.001	0.180	0.002	0.047	0.097
	04/09/97	0.003	ND(0.001)	ND(0.001)	ND(0.002)	0.022	0.001	0.155	0.002	0.044	0.116
	07/30/97	0.002	ND(0.002)	ND(0.002)	ND(0.004)	0.020	ND(0.002)	0.140	0.001	0.044	0.121
	10/17/97	0.002	ND(0.01)	ND(0.01)	ND(0.02)	0.028	ND(0.01)	0.157	ND(0.01)	0.044	0.071
	01/07/98	0.002	ND(0.01)	ND(0.01)	ND(0.02)	0.029	ND(0.01)	0.163	ND(0.01)	0.054	0.133
	04/15/98	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.02)	0.029	ND(0.01)	0.155	ND(0.01)	0.053	0.145

TABLE 2. SUMMARY OF LABORATORY ANALYTICAL RESULTS - GROUND-WATER SAMPLES,
DOWELL, ARTESIA, NEW MEXICO

WELL NUMBER	SAMPLE DATE	BENZENE (mg/L)	ETHYL- BENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	TCA (mg/L)	TCE (mg/L)	PCE (mg/L)
MW-18 Cont.	07/18/98	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.02)	0.030	ND(0.01)	0.146	ND(0.01)	0.052	0.151
	10/28/98	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.02)	0.028	ND(0.01)	0.142	ND(0.01)	0.052	0.149
	02/09/99	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.01)	0.030	ND(0.005)	0.143	ND(0.005)	0.052	0.148
	04/22/99	0.002	ND(0.0025)	ND(0.0025)	ND(0.005)	0.031	ND(0.0025)	0.135	ND(0.0025)	0.045	0.121
MW-19	04/03/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.011	ND(0.005)	0.150	ND(0.005)	ND(0.005)	0.110
	08/01/95	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.014	ND(0.005)	0.170	ND(0.005)	ND(0.005)	0.140
	10/18/95	0.002	ND(0.005)	ND(0.005)	ND(0.005)	0.010	ND(0.005)	0.170	ND(0.005)	0.004	0.150
	01/11/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.010	ND(0.005)	0.110	ND(0.005)	ND(0.005)	0.100
	04/13/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.150	ND(0.005)	ND(0.005)	0.100
	07/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.009	ND(0.005)	0.150	ND(0.005)	ND(0.005)	0.110
	10/22/96	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	0.008	ND(0.005)	0.130	ND(0.005)	ND(0.005)	0.094
	01/24/97	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.009	ND(0.001)	0.122	0.001	0.003	0.093
	04/09/97	0.002	ND(0.001)	ND(0.001)	ND(0.002)	0.010	ND(0.001)	0.116	0.001	0.004	0.087
	07/30/97	0.002	ND(0.002)	ND(0.002)	ND(0.004)	0.009	ND(0.002)	0.116	ND(0.002)	0.005	0.096
	10/17/97	0.003	ND(0.01)	ND(0.01)	ND(0.02)	0.010	ND(0.01)	0.124	ND(0.01)	0.007	0.066
	10/28/98	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.02)	0.017	ND(0.01)	0.167	ND(0.01)	0.009	0.150
	04/22/99	0.003	ND(0.0025)	ND(0.0025)	ND(0.005)	0.023	ND(0.0025)	0.212	ND(0.0025)	0.009	0.182
MW-20	11/20/96	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	01/24/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/09/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	07/30/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	10/17/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	01/07/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/15/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	07/18/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	10/28/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	02/09/99	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.001)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
	04/22/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
MW-21	11/20/96	0.002	ND(0.001)	ND(0.001)	ND(0.001)	0.002	ND(0.001)	0.012	ND(0.001)	0.003	0.006
	01/24/97	0.002	ND(0.001)	ND(0.001)	ND(0.002)	0.003	ND(0.001)	0.019	ND(0.001)	0.004	0.006
	03/04/97	0.002	ND(0.001)	ND(0.001)	ND(0.002)	0.004	ND(0.001)	0.025	ND(0.001)	0.007	0.011
	04/09/97	0.001	ND(0.002)	ND(0.002)	ND(0.004)	0.003	ND(0.002)	0.021	ND(0.002)	0.005	0.008
	07/30/97	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	0.001	ND(0.002)	0.011	ND(0.002)	0.003	0.007
	10/17/97	0.001	ND(0.002)	ND(0.002)	ND(0.004)	0.001	ND(0.002)	0.007	ND(0.002)	0.001	0.004
	01/07/98	0.001	ND(0.002)	ND(0.002)	ND(0.004)	0.002	ND(0.002)	0.021	ND(0.002)	0.003	0.005
	04/15/98	0.001	ND(0.002)	ND(0.002)	ND(0.004)	0.002	ND(0.002)	0.028	ND(0.002)	0.003	0.006
	07/18/98	0.001	ND(0.002)	ND(0.002)	ND(0.004)	0.002	ND(0.002)	0.022	ND(0.002)	0.002	0.005
	10/28/98	0.001	ND(0.002)	ND(0.002)	ND(0.004)	0.001	ND(0.002)	0.015	ND(0.002)	0.001	0.004
	02/09/99	0.001	ND(0.001)	ND(0.001)	ND(0.002)	0.002	ND(0.001)	0.031	ND(0.001)	0.002	0.005
	04/22/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.001	ND(0.001)	0.025	ND(0.001)	0.001	0.003
MW-22	11/20/96	0.014	ND(0.001)	ND(0.001)	ND(0.001)	0.010	ND(0.001)	0.063	ND(0.001)	0.012	0.053
	01/24/97	0.010	ND(0.001)	ND(0.001)	ND(0.002)	0.009	ND(0.001)	0.065	ND(0.001)	0.013	0.050
dup.	01/24/97	0.011	ND(0.001)	ND(0.001)	ND(0.002)	0.011	ND(0.001)	0.099	ND(0.001)	0.013	0.065

TABLE 2. SUMMARY OF LABORATORY ANALYTICAL RESULTS - GROUND-WATER SAMPLES,
DOWELL, ARTESIA, NEW MEXICO

WELL NUMBER	SAMPLE DATE	BENZENE (mg/L)	ETHYL- BENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	1,1,1- TCA (mg/L)	TCE (mg/L)	POE (mg/L)
MW-22 Cont.	04/09/97	0.013	ND(0.001)	ND(0.001)	ND(0.002)	0.014	0.001	0.084	ND(0.001)	0.021	0.080
	07/30/97	0.014	ND(0.002)	ND(0.002)	ND(0.004)	0.012	ND(0.002)	0.092	ND(0.002)	0.024	0.104
	10/17/97	0.016	ND(0.005)	ND(0.005)	ND(0.01)	0.014	ND(0.005)	0.107	ND(0.005)	0.028	0.117
	10/28/98	0.016	ND(0.01)	ND(0.01)	ND(0.02)	0.017	ND(0.01)	0.129	ND(0.01)	0.037	0.150
	04/22/99	0.017	ND(0.0025)	ND(0.0025)	ND(0.005)	0.024	ND(0.0025)	0.185	ND(0.0025)	0.053	0.184
MW-23	11/20/96	ND(0.001)	ND(0.001)	0.001	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	01/24/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	03/04/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/09/97	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
	07/30/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	10/17/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	10/28/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/22/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
MW-24	11/20/96	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	01/24/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/09/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	07/30/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	10/17/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	10/28/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/22/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
MW-25	03/04/97	0.021	ND(0.001)	ND(0.001)	ND(0.001)	0.014	0.001	0.035	ND(0.001)	ND(0.001)	0.030
dup.	04/09/97	0.015	ND(0.001)	ND(0.001)	ND(0.002)	0.015	0.001	0.035	ND(0.001)	0.006	0.020
	04/09/97	0.014	ND(0.001)	ND(0.001)	ND(0.002)	0.015	0.001	0.034	ND(0.001)	0.005	0.019
	07/30/97	0.023	ND(0.002)	ND(0.002)	ND(0.004)	0.011	0.001	0.031	ND(0.002)	0.005	0.035
dup.	10/17/97	0.026	ND(0.002)	ND(0.002)	ND(0.004)	0.011	0.001	0.027	ND(0.002)	0.004	0.035
	10/17/97	0.026	ND(0.002)	ND(0.002)	ND(0.004)	0.013	0.001	0.028	ND(0.002)	0.004	0.028
	01/07/98	0.027	ND(0.002)	ND(0.002)	ND(0.004)	0.014	0.001	0.030	ND(0.002)	0.004	0.033
	04/15/98	0.025	ND(0.002)	ND(0.002)	ND(0.004)	0.013	ND(0.002)	0.028	ND(0.002)	0.004	0.034
	07/18/98	0.022	ND(0.002)	ND(0.002)	ND(0.004)	0.012	ND(0.002)	0.024	ND(0.002)	0.004	0.026
	10/28/98	0.030	ND(0.002)	ND(0.002)	ND(0.004)	0.012	ND(0.002)	0.030	ND(0.002)	0.005	0.038
	02/09/99	0.027	ND(0.001)	ND(0.001)	ND(0.002)	0.013	ND(0.001)	0.031	ND(0.001)	0.003	0.039
	04/22/99	0.030	ND(0.001)	ND(0.001)	ND(0.002)	0.013	ND(0.001)	0.031	ND(0.001)	0.002	0.032
MW-26	03/04/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
dup.	03/04/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/09/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	07/30/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.001	ND(0.001)	0.004	ND(0.001)	ND(0.001)	0.002
	10/17/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.001	ND(0.001)	0.004	ND(0.001)	0.001	0.004
	01/07/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.001	ND(0.001)	0.004	ND(0.001)	0.001	0.004
	04/15/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.002	ND(0.001)	0.006	ND(0.001)	0.001	0.006
	07/18/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.004	ND(0.001)	0.013	ND(0.001)	0.002	0.011
	10/27/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.004	ND(0.001)	0.011	ND(0.001)	0.002	0.013
dup.	10/27/98	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	0.003	ND(0.002)	0.010	ND(0.002)	0.002	0.014
	02/09/99	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.001)	0.003	ND(0.0005)	0.008	ND(0.0005)	0.002	0.011
	04/22/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.003	ND(0.001)	0.010	ND(0.001)	0.002	0.010

TABLE 2. SUMMARY OF LABORATORY ANALYTICAL RESULTS - GROUND-WATER SAMPLES,
DOWELL, ARTESIA, NEW MEXICO

WELL NUMBER	SAMPLE DATE	BENZENE (mg/L)	ETHYL- BENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	1,1,1- TCA (mg/L)	TCE (mg/L)	PCE (mg/L)
MW-27	03/04/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/09/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	07/30/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	10/17/97	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.004)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
	01/07/98	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	04/15/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	07/18/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	10/27/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	02/09/99	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.001)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
	04/22/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
MW-28	04/15/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	07/18/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	10/27/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	02/09/99	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.001)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
	04/22/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
MW-29	04/15/98	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
	07/18/98	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
	10/27/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	02/09/99	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.001)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
	04/22/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
	07/13/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
MW-30	04/15/98	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.004)	0.002	ND(0.002)	0.002	ND(0.002)	ND(0.002)	0.002
	07/18/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.000	ND(0.001)	0.002	ND(0.001)	ND(0.001)	0.001
	07/18/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.001	ND(0.001)	0.002	ND(0.001)	ND(0.001)	0.002
	10/27/98	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.001	ND(0.001)	0.002	ND(0.001)	ND(0.001)	0.003
	02/09/99	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.001)	0.001	ND(0.0005)	0.002	ND(0.0005)	<0.001	0.002
	02/09/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.002	ND(0.001)	0.002	ND(0.001)	ND(0.001)	0.003
dup.	04/22/99	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.002)	0.001	ND(0.001)	0.003	ND(0.001)	ND(0.001)	0.003

Analytical method used prior to 10/95 = EPA Method 8240
Analytical method used during and after 10/95 = EPA Method 8260

NOTES:

mg/L = milligrams per liter (equivalent to parts per million)

dup. = duplicate sample

ND(0.001) = chemical not detected at concentration above detection limit shown in parentheses

J = chemical detected at concentration above instrument detection limit but below method detection limit

* = other chemicals also detected (see previous laboratory reports)

= other chemicals also detected (see laboratory analytical reports - Appendix A)

italicized value - is below the method detection limit.

< - analyte detected above the method detection limit but table is reported only to 1 part per billion

CHEMICAL ABBREVIATIONS:

1,1-DCA = 1,1-dichloroethane

1,2-DCA = 1,2-dichloroethane

1,1-DCE = 1,1-dichloroethene

1,1,1-TCA = 1,1,1-trichloroethane

1,1,2-TCA = 1,1,2-trichloroethane

TCE = trichloroethene

PCE = tetrachloroethene

Table 3. Field Parameters at the Dowell, a division of Schlumberger Technology Corporation Facility Artesia, New Mexico

Location	Date	pH standard	Conductivity uM/cm	Temperature Celcius	Dissolved Oxygen mg/l	Redox Potential mv
MW-2	4/22/99	6.93	1453	20.13	0.17	-130
MW-3	4/22/99	6.46	6430	20.54	0.07	-183
MW-4	4/22/99	6.95	1690	20.46	0.30	-61
MW-7	4/22/99	6.60	7467	19.05	0.16	160
MW-8	4/22/99	6.88	4148	19.13	0.26	153
MW-10	4/22/99	7.02	4084	18.77	0.36	148
MW-11	4/22/99	6.34	7825	19.47	0.11	56
MW-12	4/22/99	6.46	5575	19.74	0.09	-216
MW-13	4/22/99	6.90	1611	20.70	0.15	26
MW-18	4/22/99	6.59	6150	18.64	0.32	185
MW-19	4/22/99	6.79	6432	19.25	0.20	248
MW-20	4/22/99	6.98	4043	18.11	1.33	224
MW-21	4/22/99	6.98	3954	18.98	0.36	399
MW-22	4/22/99	6.84	6187	18.79	0.16	361
MW-23	4/22/99	6.97	4443	18.62	0.39	543
MW-24	4/22/99	6.98	3102	18.86	2.15	149
MW-25	4/22/99	6.91	4961	19.17	0.15	475
MW-26	4/22/99	7.11	3223	18.93	0.38	39
MW-27	4/22/99	7.10	3702	18.92	0.37	32
MW-28	4/22/99	6.96	4074	19.03	0.38	20
MW-29	4/22/99	7.16	4692	19.12	1.15	37
MW-30	4/22/99	7.09	3925	18.94	0.18	32

Note: mg/l = milligrams per liter
uM/cm = micro moses per centimeter
mv = millivolts

TABLE 4. Water Quality Results for Natural Attenuation Monitoring at the Dowell Facility in Artesia, New Mexico

WELL NUMBER	SAMPLE DATE	SULFATE (mg/l)	NITRATE NITRITE (mg/l)	TOTAL ORG. CARBON (mg/l)	ORTHO PHOSPHATE (mg/l)	Dissolved Gases		Light Hydrocarbons	
						METHANE (mg/l)	CARBON DIOXIDE (mg/l)	ETHANE (ng/L)	ETHENE (ng/L)
MW-2	4/22/99	1900	ND(0.05)	2	0.39	0.007	40.04	43	85
MW-3	4/22/99	1200	ND(0.05)	58	0.38	4.300	203.08	603	183
MW-4	4/22/99	400	ND(0.05)	2	0.54	0.008	33.89	25	17
MW-7	4/22/99	2000	ND(0.05)	8	1.00	0.520	82.72	74	67
MW-8	4/22/99	1500	5.00	3	0.23	0.002	31.70	ND(5.0)	ND(5.0)
MW-10	4/22/99	1700	9.10	2	0.65	0.003	24.56	ND(5.0)	47
MW-11	4/22/99	1600	ND(0.05)	21	0.55	3.680	231.23	73	271
MW-12	4/22/99	960	ND(0.05)	50	0.86	14.130	313.47	1329	233
MW-13	4/22/99	650	ND(0.05)	3	2.40	0.022	54.02	68	217
MW-18	4/22/99	3300	0.30	6	0.69	0.860	94.63	56	28
MW-19	4/22/99	1900	2.20	3	0.17	0.003	42.75	ND(5.0)	ND(5.0)
MW-20	4/22/99	1100	5.90	ND(2.0)	0.36	0.002	23.51	ND(5.0)	18
MW-21	4/22/99	2000	4.70	2	0.33	0.001	25.40	ND(5.0)	27
MW-22	4/22/99	1800	0.58	3	0.70	0.001	36.53	12	18
MW-23	4/22/99	1800	5.20	ND(2.0)	0.50	0.001	23.60	ND(5.0)	40
MW-24	4/22/99	2000	0.71	ND(2.0)	0.84	0.001	22.26	ND(5.0)	ND(5.0)
MW-25	4/22/99	1800	5.80	5	0.71	0.001	29.89	22	ND(5.0)

Note: ND = not detected at concentrations indicated in parentheses

mg/L = milligrams per liter

ng/L = nanograms per liter

Table 5. Analytical Parameters and Weighting for Preliminary Screening for Anaerobic Biodegradation Processes

Analysis	Concentration in most Contaminated Zone	Interpretation	EPA Value	WWC Value
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	3	3
Oxygen*	>5 mg/L	Not tolerated, however, VC may be oxidized aerobically	-3	
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	2	2
Iron II	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III) reducing conditions	3	
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	2	
Sulfide	>1 mg/L	Reductive pathway possible	3	
Methane*	<0.5 mg/L	VC oxidizes	0	
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC accumulates	3	3
ORP*	<0.5 mV	Reductive pathway possible	1	1
ORP*	<-100 mV	Reductive pathway likely	2	2
pH*	5<pH<9	Optimal range for reductive pathway	0	
pH*	5>pH>9	Outside optimal range for reductive pathway	-2	
TOC*	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	2	2
Temperature*	>20°C	At T>20°C biochemical process is accelerated	1	
Carbon Dioxide*	>2X background	Ultimate oxidative daughter product	1	1
Alkalinity	>2X background	Results from interaction between CO ₂ and aquifer minerals	1	
Chloride	>2X background	Daughter product of organic chloride	2	
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	3	
Hydrogen	<1 nM	VC oxidizes	0	
Volatiles Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of more complex compounds; carbon and energy source	2	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	2	2
Tetrachloroethene*		Material released	0	
Trichloroethene*		Material released	0	
Trichloroethene*		Daughter Product of PCE	2	2
DCE*		Material released	0	
DCE*		Daughter product of TCE; if cis is > 80% of total DCE it is likely a daughter product	2	
VC*		1,1-DCE can be chemical reaction product of TCA		
VC*		Material released	0	
1,1,1-Trichloroethane*		Daughter product of DCE	2	2
DCA*		Material released	0	
Carbon Tetrachloride*		Daughter product of TCA under reducing conditions	2	2
Chloroethane*		Material released	0	
Ethane*	>0.01 mg/L	Daughter product of DCA or VC under reducing conditions	2	2
Ethane*	>0.1 mg/L	Daughter product of VC/ethene	2	
Chloroform*		Material released	3	
Chloroform*		Daughter product of Carbon Tetrachloride	0	
Dichloromethane*		Material released	2	
Dichloromethane*		Daughter Product of Chloroform	0	
Total			24	24

Note:

* = parameter's analyzed for by WWC DCE = dichloroethene
 BTEX = benzene, toluene, ethylbenzene, xylenes VC = vinyl chloride
 Table adopted from the EPA document "EPA/600/R-98/128, September 1998
 Bold = parameters meeting EPA criteria for reductive dechlorination

APPENDIX A

LABORATORY DATA SHEETS

MICROSEEPS

Client: Western Water Consult.
611 Skyline Road
Laramie, WY 82070

Page 1 of 7
Date: 05/28/99
Report No: 29360
Cocid No: 150719

Attention: Kevin Mattsson

ANALYTICAL REPORT

This report contains information for the following samples:

Microseeps Sample No	Client Sample ID	Client Group ID	Microseeps Sample No	Client Sample ID	Client Group ID
3619/0001	2.4/99	90-125L	3619/0002	3.4/99	90-125L
3619/0003	4.4/99	90-125L	3619/0004	7.4/99	90-125L
3619/0005	8.4/99	90-125L	3619/0006	10.4/99	90-125L
3619/0007	11.4/99	90-125L	3619/0008	12.4/99	90-125L
3619/0009	13.4/99	90-125L	3619/0010	18.4/99	90-125L
3619/0011	19.4/99	90-125L	3619/0012	20.4/99	90-125L
3619/0013	21.4/99	90-125L	3619/0014	22.4/99	90-125L
3619/0015	23.4/99	90-125L	3619/0016	24.4/99	90-125L
3619/0017	25.4/99	90-125L			

Approved: Rebecca J. Hano

MICROSEEPS

Western Water Consult. Date:05/28/99 Lab C-o-C No.:150719 Report No.:29360 Page 2 of 7

Samp.#: 3619/0001 Samp.ID: 2.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:08:45

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	< 0.05	mg/l	EPA 353.3
Orthophosphate	0.39	mg/l as P	EPA 365.3
Sulfate	1900	mg/l	EPA 375.4
Total Organic Carbon	2	mg/l	EPA 415.1

Samp.#: 3619/0002 Samp.ID: 3.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:16:25

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	< 0.05	mg/l	EPA 353.3
Orthophosphate	0.38	mg/l as P	EPA 365.3
Sulfate	1200	mg/l	EPA 375.4
Total Organic Carbon	58	mg/l	EPA 415.1

Samp.#: 3619/0003 Samp.ID: 4.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:09:25

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	< 0.05	mg/l	EPA 353.3
Orthophosphate	0.54	mg/l as P	EPA 365.3
Sulfate	400	mg/l	EPA 375.4
Total Organic Carbon	2	mg/l	EPA 415.1

Samp.#: 3619/0004 Samp.ID: 7.4/99 Group ID: 90-125L Date Received: 04/24/99

Continued on next page.....

MICROSEEPS

Western Water Consult. Date:05/28/99 Lab C-o-C No.:150719 Report No.:29360 Page 3 of 7

Samp.#: 3619/0004 Samp.ID: 7.4/99 Group ID: 90-125L Date Received: 04/24/99
Continued from previous page.

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	< 0.05	mg/l	EPA 353.3
Orthophosphate	1.0	mg/l as P	EPA 365.3
Sulfate	2000	mg/l	EPA 375.4
Total Organic Carbon	8	mg/l	EPA 415.1

Samp.#: 3619/0005 Samp.ID: 8.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:14:30

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	5	mg/l	EPA 353.3
Orthophosphate	0.23	mg/l as P	EPA 365.3
Sulfate	1500	mg/l	EPA 375.4
Total Organic Carbon	3	mg/l	EPA 415.1

Samp.#: 3619/0006 Samp.ID: 10.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:15:30

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	9.1	mg/l	EPA 353.3
Orthophosphate	0.65	mg/l as P	EPA 365.3
Sulfate	1700	mg/l	EPA 375.4
Total Organic Carbon	2	mg/l	EPA 415.1

Samp.#: 3619/0007 Samp.ID: 11.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:15:00

Continued on next page.....

MICROSEEPS

Western Water Consult. Date:05/28/99 Lab C-o-C No.:150719 Report No.:29360 Page 4 of 7

Samp.#: 3619/0007 Samp.ID: 11.4/99 Group ID: 90-125L Date Received: 04/24/99
Continued from previous page.

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	< 0.05	mg/l	EPA 353.3
Orthophosphate	0.55	mg/l as P	EPA 365.3
Sulfate	1600	mg/l	EPA 375.4
Total Organic Carbon	21	mg/l	EPA 415.1

Samp.#: 3619/0008 Samp.ID: 12.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:15:50

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	< 0.05	mg/l	EPA 353.3
Orthophosphate	0.86	mg/l as P	EPA 365.3
Sulfate	960	mg/l	EPA 375.4
Total Organic Carbon	50	mg/l	EPA 415.1

Samp.#: 3619/0009 Samp.ID: 13.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:10:00

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	< 0.05	mg/l	EPA 353.3
Orthophosphate	2.4	mg/l as P	EPA 365.3
Sulfate	650	mg/l	EPA 375.4
Total Organic Carbon	3	mg/l	EPA 415.1

Samp.#: 3619/0010 Samp.ID: 18.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:13:30

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MICROSEEPS

Western Water Consult. Date:05/28/99 Lab C-o-C No.:150719 Report No.:29360 Page 5 of 7

Samp.#: 3619/0010 Samp.ID: 18.4/99 Group ID: 90-125L Date Received: 04/24/99
Continued from previous page.

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	0.3	mg/l	EPA 353.3
Orthophosphate	0.69	mg/l as P	EPA 365.3
Sulfate	3300	mg/l	EPA 375.4
Total Organic Carbon	6	mg/l	EPA 415.1

Samp.#: 3619/0011 Samp.ID: 19.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:13:10

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	2.2	mg/l	EPA 353.3
Orthophosphate	0.17	mg/l as P	EPA 365.3
Sulfate	1900	mg/l	EPA 375.4
Total Organic Carbon	3	mg/l	EPA 415.1

Samp.#: 3619/0012 Samp.ID: 20.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:10:55

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	5.9	mg/l	EPA 353.3
Orthophosphate	0.36	mg/l as P	EPA 365.3
Sulfate	1100	mg/l	EPA 375.4
Total Organic Carbon	< 2.0	mg/l	EPA 415.1

Samp.#: 3619/0013 Samp.ID: 21.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:12:00

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MICROSEEPS

Western Water Consult. Date:05/28/99 Lab C-o-C No.:150719 Report No.:29360 Page 6 of 7

Samp.#: 3619/0013 Samp.ID: 21.4/99 Group ID: 90-125L Date Received: 04/24/99
Continued from previous page.

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	4.7	mg/l	EPA 353.3
Orthophosphate	0.33	mg/l as P	EPA 365.3
Sulfate	2000	mg/l	EPA 375.4
Total Organic Carbon	2	mg/l	EPA 415.1

Samp.#: 3619/0014 Samp.ID: 22.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:12:40

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	0.58	mg/l	EPA 353.3
Orthophosphate	0.7	mg/l as P	EPA 365.3
Sulfate	1800	mg/l	EPA 375.4
Total Organic Carbon	3	mg/l	EPA 415.1

Samp.#: 3619/0015 Samp.ID: 23.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:11:40

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	5.2	mg/l	EPA 353.3
Orthophosphate	0.5	mg/l as P	EPA 365.3
Sulfate	1800	mg/l	EPA 375.4
Total Organic Carbon	< 2.0	mg/l	EPA 415.1

Samp.#: 3619/0016 Samp.ID: 24.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:10:30

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MICROSEEPS

Western Water Consult. Date:05/28/99 Lab C-o-C No.:150719 Report No.:29360 Page 7 of 7

Samp.#: 3619/0016 Samp.ID: 24.4/99 Group ID: 90-125L Date Received: 04/24/99
Continued from previous page.

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	0.71	mg/l	EPA 353.3
Orthophosphate	0.84	mg/l as P	EPA 365.3
Sulfate	2000	mg/l	EPA 375.4
Total Organic Carbon	< 2.0	mg/l	EPA 415.1

Samp.#: 3619/0017 Samp.ID: 25.4/99 Group ID: 90-125L Date Received: 04/24/99

Field Parameters-> Date Sampled:04/22/99 Time Sampled:12:20

Parameter	Result	Units	Method Reference
Nitrate-Nitrite	5.8	mg/l	EPA 353.3
Orthophosphate	0.71	mg/l as P	EPA 365.3
Sulfate	1800	mg/l	EPA 375.4
Total Organic Carbon	5	mg/l	EPA 415.1

WWC1-992598

----- WESTERN WATER CONSULTANTS, INC. -----
 ----- PROJECT: 90-125L -----

Sample Names	Carbon Dioxide			Methane	Methane	Ethane	Ethylene	Lab ID	Date		Analyst
	mg/l	mg/l	mg/l	ug/l	ng/l	ng/l	ng/l		Sampled	Received	
90125-2.4/99	40.04	*	7.235	43	85	T19 349	04/22/99	04/26/99	05/06/99	BC	
90125-3.4/99	203.08	4.30	*	603	183	T19 350	04/22/99	04/26/99	05/06/99	BC	
90125-4.4/99	33.89	*	7.488	25	17	T19 351	04/22/99	04/26/99	05/06/99	BC	
90125-7.4/99	82.72	0.52	*	74	67	T19 352	04/22/99	04/26/99	05/06/99	BC	
90125-8.4/99	31.70	*	1.469	<5	<5	T19 353	04/22/99	04/26/99	05/06/99	BC	
90125-10.4/99	24.56	*	2.832	<5	47	T19 354	04/22/99	04/26/99	05/06/99	BC	
90125-11.4/99	231.23	3.68	*	73	271	T19 355	04/22/99	04/26/99	05/06/99	BC	
90125-12.4/99	313.47	14.13	*	1329	233	T19 356	04/22/99	04/26/99	05/06/99	BC	
90125-13.4/99	54.02	*	22.267	68	217	T19 357	04/22/99	04/26/99	05/06/99	BC	
90125-18.4/99	94.63	0.86	*	56	28	T19 358	04/22/99	04/26/99	05/06/99	BC	
90125-19.4/99	42.75	*	3.067	<5	<5	T19 359	04/22/99	04/26/99	05/06/99	BC	
90125-20.4/99	23.51	*	1.999	<5	18	T19 360	04/22/99	04/26/99	05/06/99	BC	
90125-21.4/99	25.40	*	1.426	<5	27	T19 361	04/22/99	04/26/99	05/06/99	BC	
90125-22.4/99	36.53	*	1.348	12	18	T19 362	04/22/99	04/26/99	05/06/99	BC	
90125-23.4/99	23.60	*	0.864	<5	40	T19 363	04/22/99	04/26/99	05/06/99	BC	
90125-24.4/99	22.26	*	0.627	<5	<5	T19 364	04/22/99	04/26/99	05/06/99	BC	
90125-25.4/99	29.89	*	0.874	22	<5	T19 365	04/22/99	04/26/99	05/06/99	BC	

DETECTION LIMITS 0.60mg/l 0.07mg/l 0.015ug/l 5ng/l 5ng/l

* Methane result obtained from alternate detector

ANALYST INITIALS WREVIEW W

WWC1-992598

----- QUALITY CONTROL -----
----- WESTERN WATER CONSULTANTS, INC. -----
----- PROJECT: 90-125L -----

CONTINUING CALIBRATION STANDARDS 05/06/99

COMPOUND	FILE ID	TRUE CONC.	MEASURED	% DIFF.
METHANE (FID)	T19 345	2.460	2.434	1.06
ETHANE	T19 345	476	473	0.63
ETHYLENE	T19 345	533	543	1.88
CARBON DIOXIDE	T19 347	159.62	145.95	8.56
METHANE (TCD)	T19 347	5.48	5.21	4.93

HE IN LOOP 05/06/99

COMPOUND	FILE ID	DET. LIMIT	MEASURED
METHANE (FID)	T19 348	0.015ug/l	ND
ETHANE	T19 348	5ng/l	ND
ETHYLENE	T19 348	5ng/l	ND
CARBON DIOXIDE	T19 348	0.60mg/l	ND
METHANE (TCD)	T19 348	0.07mg/l	ND

ANALYST INITIALS AL

REVIEW MB