DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 27TH COMBAT SUPPORT GROUP (TAC)
CANNON AIR FORCE BASE, NM 88103

ENTERED

08 AUG 1991

Dr. Bruce A. Swanton
New Mexico Environment Department
Hazardous and Radioactive Waste Bureau
1190 St. Francis Drive
Santa Fe, New Mexico 87502

RE: NM7572124454, Compliance Agreement/Schedule of 13 Jul 90

Dear Dr Swanton

Enclosed for your review is the Drilling and Installation Plan for Monitoring Well M at Landfill 5 per Item 3 of the Compliance Agreement. Your timely review of this plan will facilitate Cannon's funding and contracting efforts to expedite the installation of Well M.

Insufficient funds are available from HQ TAC to drill Well M as a dry hole concurrently with well L (Monthly Progress Report, July 1991). Well M will therefore be installed after the completion of Well L.

You may contact Mr. Jim Richards at (505) 784-4639 if you have any questions regarding this work plan.

Sincerely

Thomas N. Chapman

THOMAS N. CHAPMAN, Colonel, USAF
Deputy Commander

1 Atch
Work Plan

cc: HQ TAC/DEV
AFRCE/CR, Ronald Jahns

AUG 1991
RECEIVED
HAZARDOUS WASTE
PROGRAM

Readiness is our Profession

DRILLING AND INSTALLATION PLAN

FOR

MONITORING WELL M

AT

LANDFILL 5

CANNON AIR FORCE BASE
NEW MEXICO

Prepared By
U.S. Army Corps of Engineers
Tulsa District
July 1991

DRILLING AND INSTALLATION PLAN
FOR MONITORING WELL M

AT
LANDFILL 5

CANNON AIR FORCE BASE
NEW MEXICO

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DRILLING AND INSTALLATION PLAN
FOR MONITORING WELL M

AT
LANDFILL 5

CANNON AIR FORCE BASE
NEW MEXICO

1.0 Purpose. The purpose of this work plan is to present the location and details of the proposed construction of well M at Landfill 5, Cannon Air Force Base, New Mexico. This well is being installed in accordance with terms of the Resource Conservation and Recovery Act (RCRA) Compliance Agreement signed July 13, 1990 between Cannon Air Force Base and the New Mexico Environmental Improvement Division. Well M will be drilled and installed based on information gained during the completion of well L. Currently, unknown conditions exist at the landfill site including hardness of the caliche, perched water, and chemical contaminants. The drilling and installation procedures for well L will include three alternative methods which may be used depending upon what conditions are encountered at the site during the drilling of well L.

2.0 Site Description.

2.1 General Location and Land Use. Cannon Air Force Base (AFB) is located about 7 miles west of Clovis, New Mexico, as shown on Figure 2-1. The major land use in this part of Northeastern New Mexico is ranching and agriculture. The land surrounding Cannon Air Force Base consists of irrigated pasture

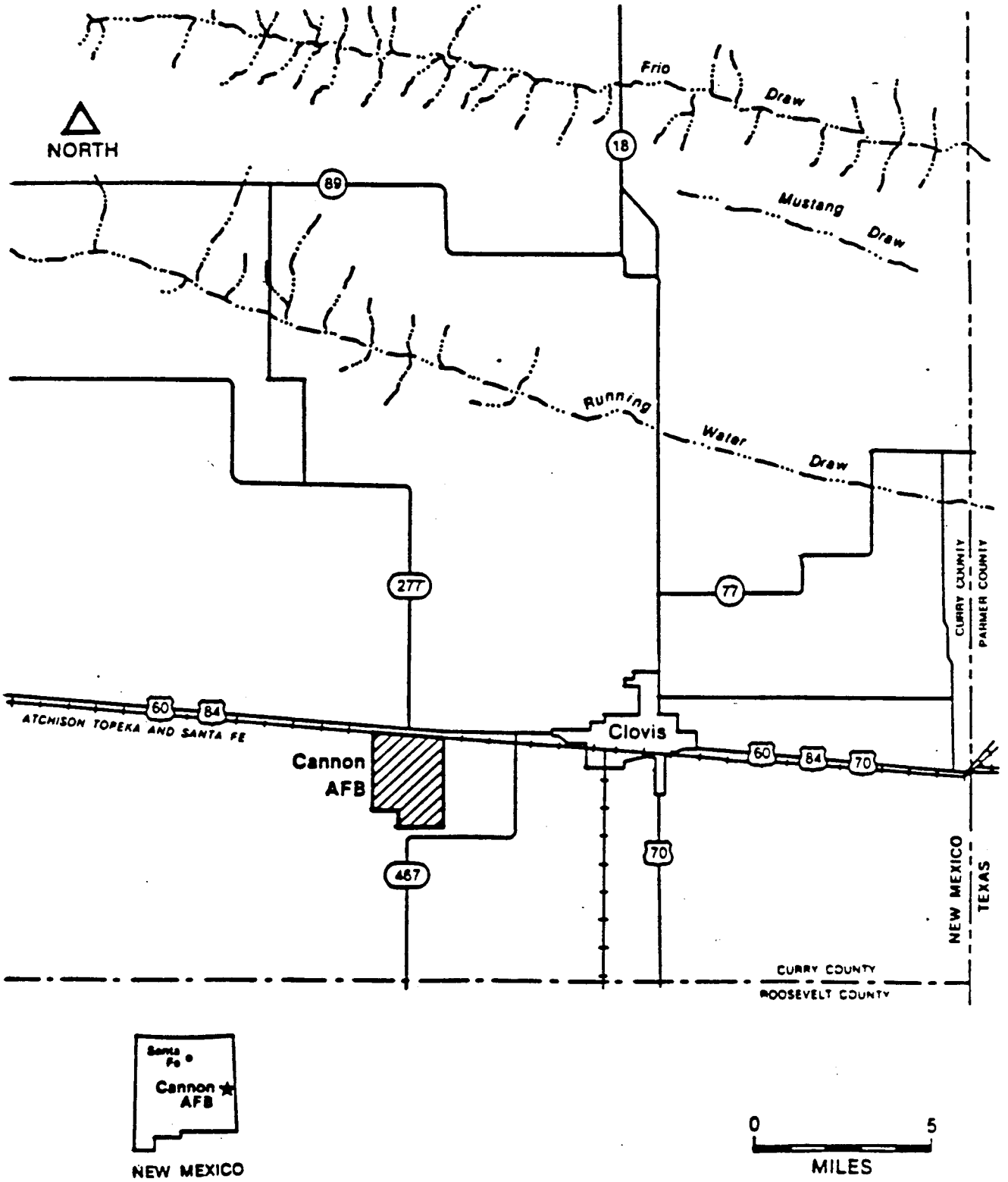

Figure 2-1. General location map of Cannon Air Force Base.

land used in the cattle ranching business.

2.2 History. Cannon AFB has been assigned to the Tactical Air Command since 1951. Since 1971, the primary mission of Cannon AFB has been to develop and maintain an F-111 tactical fighter wing, capable of day, night, and all-weather combat operations and to provide replacement training of combat aircrews for tactical organizations worldwide.

2.3 Landfill 5 Description.

a. **History.** Landfill 5 was first used in 1968 but is no longer an active disposal site. The site covers approximately 30 acres in the southeast corner of the base. From 1968 to 1972, the mode of operation at this landfill was burn and bury in trenches. Since 1972, unburned waste has been buried. An estimated 24 covered trenches exist at the site. One trench, designated Cell 3, received hazardous waste after the effective date of RCRA. The location of Landfill 5 on the Base is shown in Figure 2-2, and the approximate locations of the trenches in the landfill are shown in Figure 2-3.

b. **Geology.** Based on drilling information from existing wells B, C, and D, the following conditions exist at Landfill 5. Soil consisting of fine to medium grained sand exists from the ground surface to 4.5 feet. From 4.5 to 65 feet a caliche is present. Within the caliche profile are layers of silt and weakly cemented sand. From 65 to 185 feet, unconsolidated sands

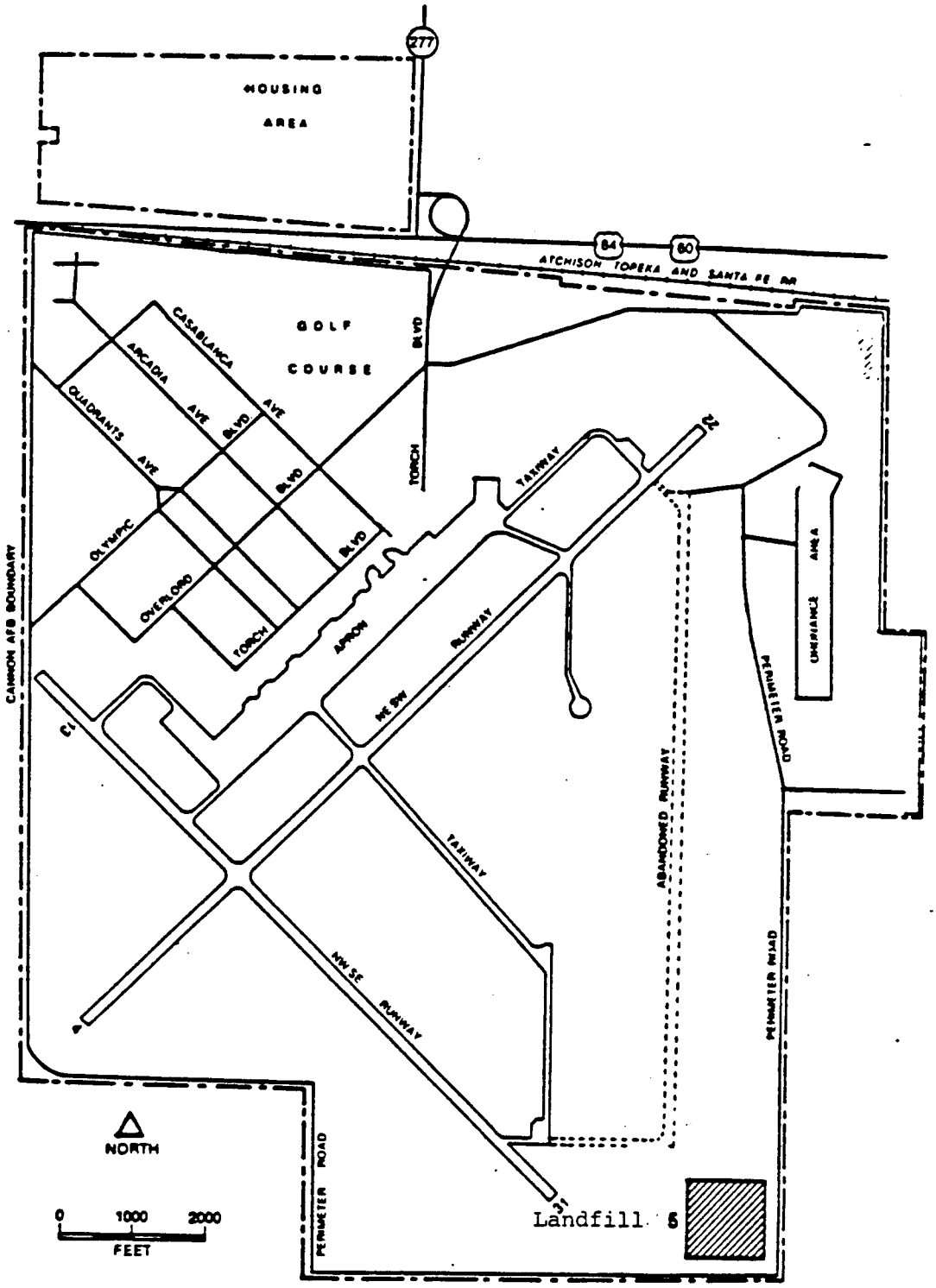

Figure 2-2. Location of Landfill 5 on Cannon Air Force Base.

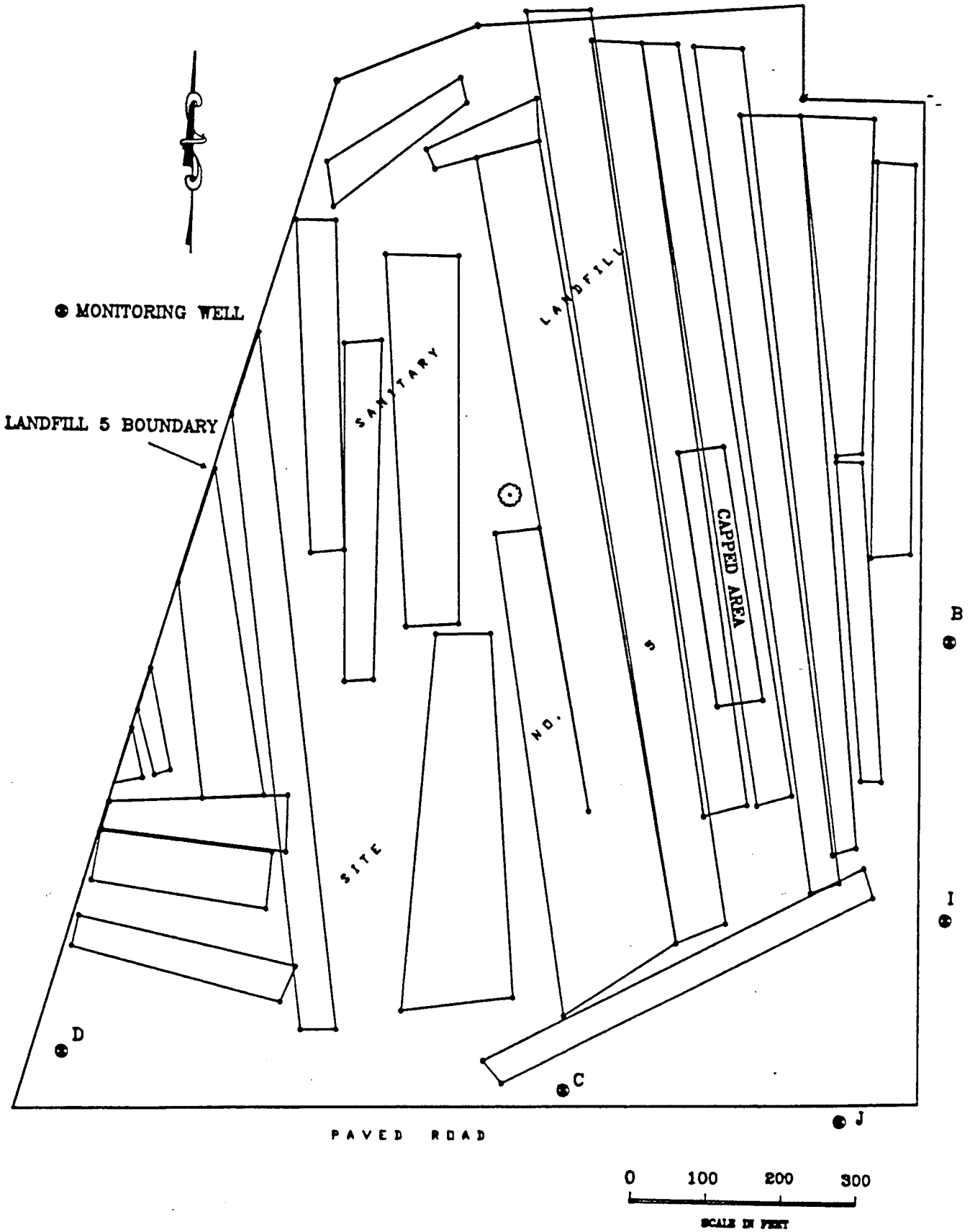

Figure 2-3. Approximate Locations of the Trenches at Landfill 5.

are present. A clay lens is present from 190 to 195 feet in depth. Beneath that are thickly bedded, fine to coarse grained, unconsolidated sands, silts and gravels. The ground surface elevation in the vicinity of the landfill is approximately 4263 feet MSL. The water table is approximately 263 feet below ground surface and flows to the southeast. Figure 2-4 shows the elevation contours of the water table in the vicinity of Landfill 5 as determined in January of 1990. This agrees with earlier contour maps of the water table.

3.0 Location of Well M. The proposed well location is shown on Figure 3-1. The location of well M is based on the proposed location of well L, the location of Cell 3 within the landfill, groundwater flow direction, and discussions with representatives of the New Mexico Environmental Improvement Division. The well designation proposed is "M", as a continuation to the well numbering system on Cannon Air Force Base. Well M will be located north of well L on a southwest-northeast trending line which is perpendicular to the hydraulic gradient. The exact location of well M will be determined in the field before drilling begins. The effect of pumping nearby irrigation wells on the shape of the potentiometric surface in the vicinity of Landfill 5 was evaluated using a simple model. A brief discussion of the assumptions made in the model and results are provided in Appendix A. Although Figure A-1 shows that the pumping might produce drawdown in the vicinity of Wells D and B,

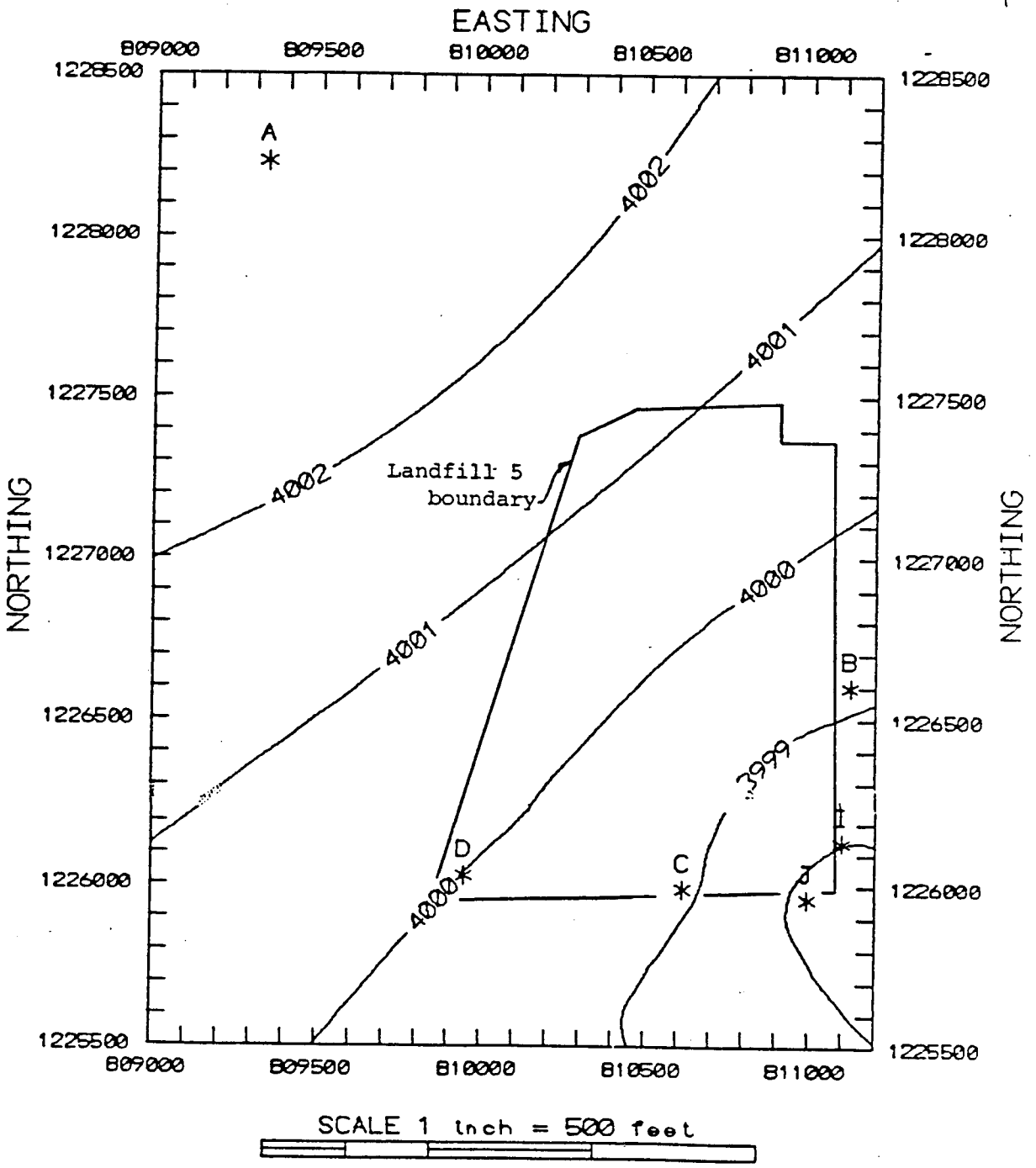

Figure 2-4. Elevation contours of the water table in the vicinity of Landfill 5 as determined in Januray of 1990.

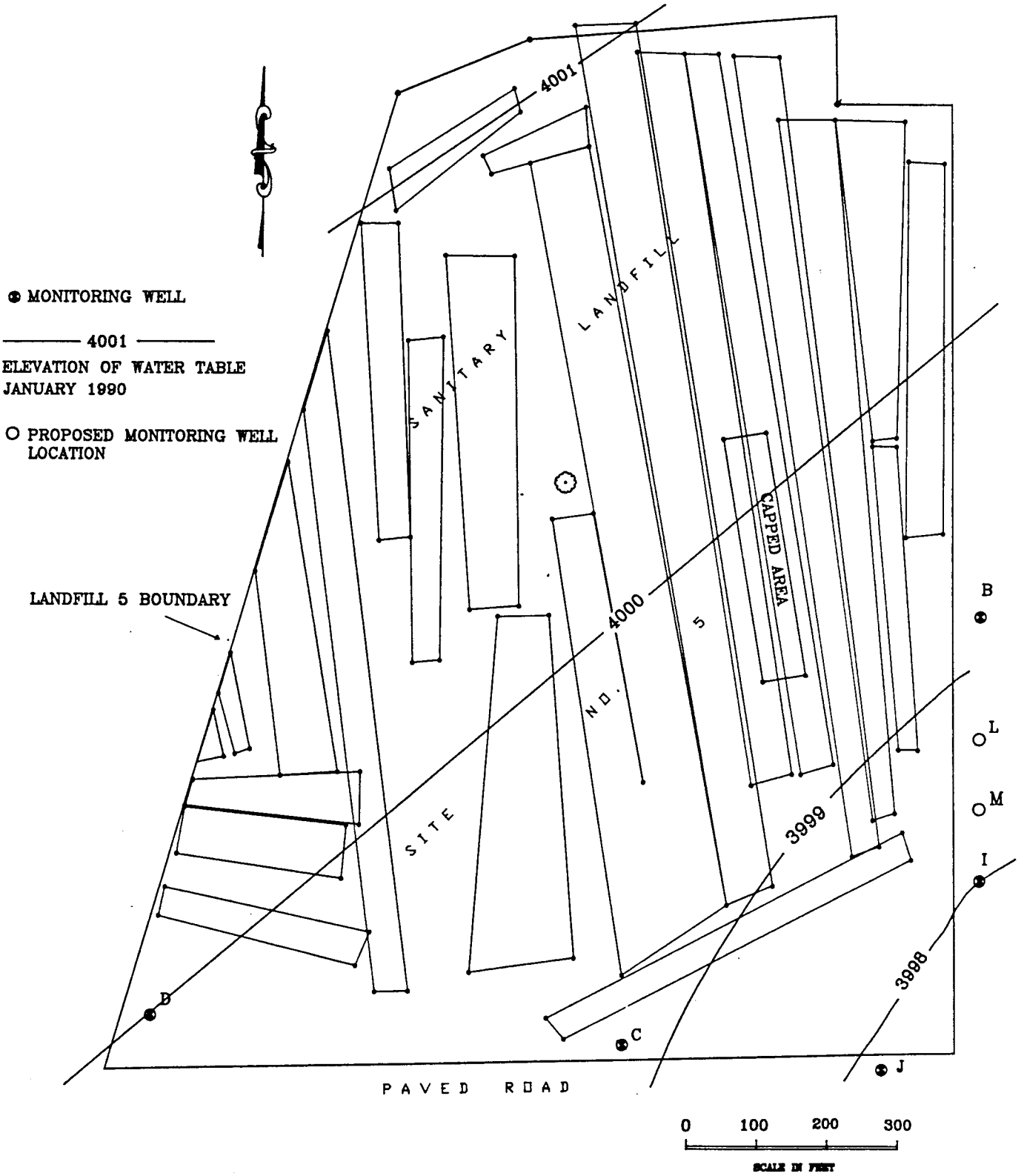

Figure 3–1. Proposed Well Locations, Landfill 5.

it appears that effects would be marginal. The water level information summarized in Appendix B does not indicate any effect of pumping on water levels. Therefore, the proposed locations of well M should be downgradient to Cell 3.

4.0 Depth of Wells and Screen, Sump, Filter, and Seal Locations.

4.1 Depth of Wells. The depth of the wells will be determined in the field. The criteria for this determination will be based on the depth at which water is encountered. The total drilled depth of the well will be 20 feet deeper than the depth at which water is encountered. Based on historic water levels it is anticipated that water will be encountered in well M at a depth of approximately 265 feet. The depth for well M is therefore estimated to be approximately 285 feet. Table B-1 of Appendix B provides a Monitoring Well Summary which includes pertinent information for the 6 existing wells at Landfill 5. Table B-2 of Appendix B provides historic water level data and figure B-1 presents groundwater hydrographs for the 6 existing wells at Landfill 5. The water level information for January, April, July and October of 1989 is not included because of the problems experienced with the water level probes during that period of time.

4.2 Screen and Sump Locations. The proposed screen length for the well is 20 feet. The screen will be positioned with 5

feet above the water table and 15 feet below the water table. A 5-foot solid casing sump and end cap will be attached below the screen. The justification for proposing a 15 foot intake portion of the well rather than the 10 foot intake portion in the RCRA Groundwater Monitoring System Design, Construction, and Certification Requirements is that a 3-foot fluctuation in the water levels is evident in historical readings summarized in Table B-2 of Appendix B, and this additional 5 foot length will allow sufficient depth of water in the well, even during low water levels, to sample the well. A schematic showing proposed well construction details is shown in Figure 4-1.

4.3 Filter and Seal Locations. A two to three foot bentonite pellet seal will be placed adjacent to the lower 3 feet of the casing sump. The annular space above the bottom seal between the screen and borehole will be filled with filter sand and shall extend at least 2 feet above the well screen. The buffer zone of fine sand is not considered necessary because of the fine nature of the filter sand, discussed in paragraph 8.0. A five foot bentonite pellet seal will be placed above the filter pack. Above the upper bentonite seal, a bentonite-cement seal will be placed to within 3 feet of the surface.

5.0 Drilling and Installation Methods for Well M. The drilling and installation methods used in the construction of this monitoring well will be dependant on the characterization of the

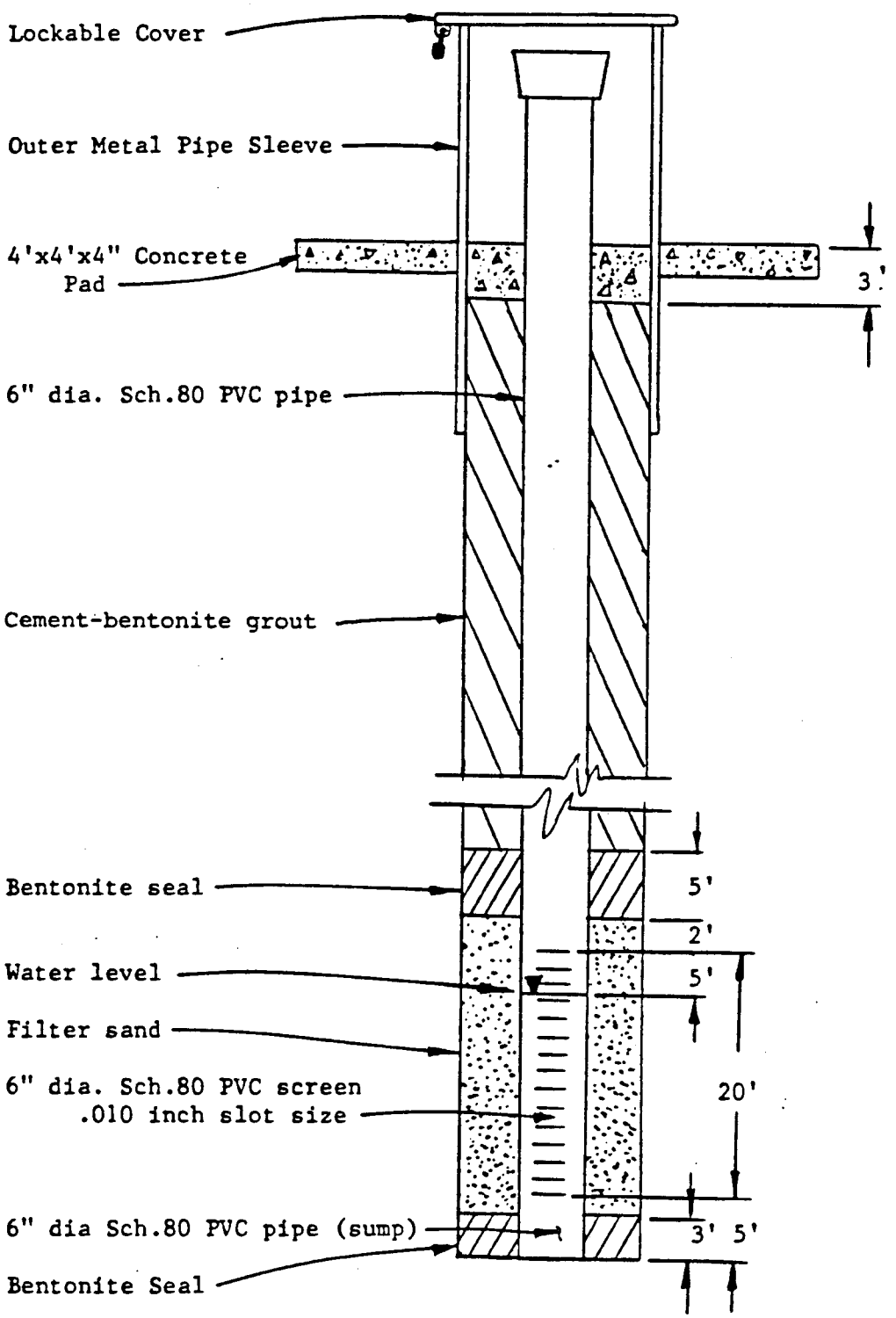

Figure 4-1. Schematic showing proposed well construction details.

materials encountered during the drilling of well L. These factors include the hardness of the caliche material, the absence or presence of perched water, and the detection of any chemical contaminants found within the geologic units. In the determination of the type of drilling to be used, three distinct scenarios can be considered for the possible conditions encountered at the Landfill 5 site. These include:

a.) no perched water present, no chemical contaminants detected,
b.) either perched water present or low levels of chemical contamination found in the upper zone of the formation,
c.) significant contamination present in the vadose, perched zone, or throughout the boring.

If condition a.) is encountered when Monitoring Well L is installed, the type of drilling to be used for the installation of this monitoring well should consist of using a rockbit and potable water or air. There would be no requirement that steel or PVC intermediate casing should be set for this situation.

If condition b.) is encountered, the boring should be drilled with air until the lower confining zone of the perched aquifer or the lower extent of the contamination is encountered. The 10" steel or PVC casing would then be set into that lower confining zone. The casing would effectively isolate the borehole from the perched water or any chemical contamination. From this point, drilling could continue using a rockbit and potable water or air until total depth has been reached.

If condition c.) is encountered, the boring should be drilled dry using drive casing throughout the entire boring. Drilling fluids will not be used. Drill fluids could enhance the migration of

the contaminants downward towards the aquifer.
If the caliche material is very hard, some foam may be used in order to recover all of the cuttings from the boring. If foam is used, all of this material must be removed from the boring before drilling can continue.

6.0 Collection of Fluids and Cuttings. Drilling fluids and cuttings (if applicable) for Monitoring Well M shall be containerized and analyzed using SW-846 methods for volatile, semivolatile, pesticide/PCBs, and metals. Metals to be analyzed will include arsenic, barium, cadmium, chromium, lead, mercury, silver, and selenium.

7.0 Materials of Construction.

7.1 Drive Casing. The drive casing used (if necessary) in the drilling of well M will be made of a low-carbon steel or other material capable of being driven through the caliche at the site. The diameter will be approximately 12 inches. Every attempt to remove the casing after well installation will be made, so the casing will not affect water quality results.

7.2 Intermediate Casing. If the use of casing is required for shallow contaminants or a perched water zone, an intermediate 10" steel or schedule 40 PVC may be used. This casing would be extended through the contamination or into the lower confining

zone of the perched aquifer. Upon completion of the drilling and the installation of the well, this casing may be either removed or grouted into place.

7.3 Well Casing. The monitoring wells will consist of 6-inch, schedule 80, rigid-wall PVC casing and screen with flush-threaded joints. The screen opening size will be .010 inch. The PVC casing will be approved by the National Sanitation Foundation for potable water applications or by the American Society of Testing Materials. The PVC, rather than stainless steel or PTFE, casing is being proposed because the existing monitoring wells A through D and I and J are constructed of PVC, and comparisons of water quality are more appropriately performed on wells constructed of the same materials.

7.4 Centralizers. Centralizers made of PVC will be used at intervals as described in paragraph 8.1 to keep the well string centered in the hole.

7.5 Bentonite Pellets (Alternate bentonite grout). Certified, additive-free bentonite pellets will be used as the bentonite seal around the lower 3 feet of the casing sump and in the five foot seal above the filter sand. If bridging is suspected, a certified, additive-free bentonite powder will be mixed at an approximate ratio of 1 100-pound bag of bentonite to 7 gallons of water such that the mixture is workable for tremie

placement.

7.6 Filter Sand. The filter sand will consist of a 40-60 sand, which will adequately filter the fine to medium grained formation sand and still not enter a 0.010-inch screen opening.

7.7 Cement-Bentonite Grout. The annular space above the bentonite seal will be sealed with a cement-bentonite grout. The cement shall be an API Class G cement. The bentonite shall be a certified, additive-free sodium bentonite. The water shall be potable water. The bentonite shall be mixed in the amount of 5 to 8 percent by weight of cement. Five gallons of water will be used per sack of cement with an additional 0.65 gallons of water added per sack for each percent of bentonite by weight added to provide a mixture that is workable for tremie placement. The API Class G cement is adequate in that bentonite will retard shrinkage and heat of hydration for the small thickness of annular seal will be negligible.

8.0 Well Construction Procedures.

8.1 Well Casing. The well casing string will be lowered to the bottom of the hole and centered in the borehole using centralizers just below and above the well screen section and at each 50-foot section of casing from there upward, with the last centralizer set approximately 50 feet from the surface.

8.2 Lower Bentonite Pellet Seal. The bentonite pellets comprising the seal around the lower three feet of casing sump will be emplaced with a tremie line. The approximate volume of pellets necessary to form the 3-foot thick seal will be calculated and a tag line used to physically measure the depth to the top of bentonite. Quantities of bentonite used, and tag line measurements will be recorded. No hydration time will be required for the lower bentonite seal since small amounts of sand infiltrating this seal will not affect its integrity.

8.3 Filter Sand Placement. The filter sand will be placed from above the lower bentonite seal to 2 feet above the screen. All sand will be emplaced with a tremie line. The approximate volume of filter sand necessary to form the 24-foot long filter will be calculated and a tag line used to physically measure the depth to the top of sand. Quantities of sand used, and tag line measurements will be recorded.

8.4 Upper Bentonite Seal. The bentonite pellets comprising the 5-foot seal above the filter sand will be emplaced with a tremie line. The approximate volume of pellets necessary to form the seal will be calculated and a tag line used to physically measure the depth to the top of bentonite. Quantities of bentonite used, and tag line measurements will be recorded. Sufficient water volume will be placed into the tremie line to insure proper swelling of the pellets and to successfully flush

all the pellets out of the tremie line. A hydration time of 4-hours will be required prior to placement of the bentonite-cement seal.

8.5 Bentonite-Cement Seal. The bentonite-cement seal above the upper bentonite seal shall be placed continuously using a tremie line, and brought to within 3 feet of the ground surface.

8.6 Withdrawal of Drive Casing. The drive casing, if used, will be removed and kept slightly above the depth at which materials are being placed in the annulus, so the withdrawal does not create voids between the annular sealants and the formation materials.

All attempts will be made to completely retrieve the drive casing, but the well will still be considered acceptable if the bottom of the drive casing is moved more than seven feet above the top of the screened section of the well.

9.0 Well Development. The wells will be surged with a surge block and bailed or pumped to remove any fines brought through the screen during the surging. Any fluids or foams introduced during drilling and an additional 5 times the amount of water present in each well and filter pack will be removed. Pumping of the well will continue until the water in the discharge is less than 5 Nephelometric Turbidity Units (NTUs), or until such time as it appears that the well can not be developed to this

standard. In that case, Cannon Air Force Base will request a variance from the 5 NTU standard. In addition, if drilling foam was used, a sample of the water will be collected and analyzed for constituents in the drilling foam.

10.0 Finishing Wellhead. The wellheads will consist of an outer metal pipe sleeve of suitable diameter, and at least 5 feet long, to protect the PVC casing with a minimum of 2 feet and a maximum of 3 feet stickup above ground level. The base of the wells will consist of a 4 feet by 4 feet by 4-inch thick concrete pad sloped away from the well for surface runoff protection. The concrete pad and upper three feet of annular sealant will be formed continuously. The metal sleeve will have a lockable cap to provide security from random entry. A well number will be permanently marked on the top of the 6" PVC casing, and on the protective pipe sleeve.

11.0 Surveying. A survey will be conducted to provide horizontal coordinates for the well and the elevation at the base of the wells and the elevation on the top of the 6" PVC casing. The casing will be marked with a permanent black marker on the circumference of the casing where the top of the casing is elevated. The elevation of the top of the wells will be recorded with a black permanent marker on the inside cover of the metal protective sleeve. The elevation will be accurate to 0.01 foot.

12.0 Certification. A certification report will be submitted which will include the location of the wells, geologic logs, and well construction logs and a "Monitor Well Identification Report".

12.1 Location. The location of the wells will be by state plane coordinates.

12.2 Geologic Log. The geologic logs will thoroughly describe and depict the drilling information, location of sample collection, moisture conditions, and soil and lithology descriptions encountered in the boring of the well.

12.3 Construction log. The construction logs will depict the dimension, elevation, materials of construction and depths of the filter pack, bentonite seal, bentonite-cement, seal, sumps, casing, screen, total depth, screen slot size, filter pack grain size, and surveyed elevation of the top of the casing.

12.4 Monitor Well Identification Report. The Monitoring Well Identification Report included in Appendix C will be submitted.

APPENDIX A

Evaluation of effect of pumping irrigation wells on the potentiometric surface of the aquifer

EVALUATION OF EFFECT OF PUMPING IRRIGATION WELLS ON THE POTENTIOMETRIC SURFACE OF THE AQUIFER

The influence of pumping nearby irrigation wells on the potentiometric surface of the aquifer was evaluated using a simple model simulation (Dream Model) for two postulated combined pumping rates. The pumping rates used are shown in Tables A-1 and A-2. The resulting effects on the potentiometric surface are shown on Figures A-1 and A-2.

An approximate transmissivity range for the unconfined aquifer based on specific capacity data from Base water supply well #8 was estimated to be between 27,000 and 42,000 gallons per day/foot (gpd/ft). A low value of 35,000 gpd/ft was used for the first model run (Table A-1 and Figure A-1). A high value of 50,000 gpd/ft was used for the second model run (Table A-2 and Figure A-2). A specific yield of 0.16 was used on both cases.

Date: 08-05-1990
Time: 21:01:05

Grid:
x = 800000.000 to 816000.000 feet
y = 1225000.000 to 1241000.000 feet
x grid spacing = 500.000 feet
y grid spacing = 500.000 feet

Well #	x feet	y feet	Flow Rate gallons / min.	Pumping Time days
1	807718.00	1237954.00	250.000	30.00
2	802629.00	1240071.00	250.000	30.00
3	806835.00	1238071.00	250.000	30.00
4	805306.00	1238653.00	250.000	30.00
5	805600.00	1239365.00	250.000	30.00
6	811012.00	1236424.00	50.000	30.00
7	804188.00	1228777.00	100.000	30.00
8	802600.00	1237012.00	500.000	30.00
9	805835.00	1239836.00	500.000	30.00
10	808188.00	1229895.00	100.000	30.00
11	804366.00	1225700.00	750.000	30.00
12	807704.00	1225495.00	750.000	30.00
13	814653.00	1228697.00	1000.000	30.00

Storage coefficient = 0.160000
Transmissivity = 0.3500D+05 gallons / foot-day

The following data files have been created:
CANWW2.dat = x, y, drawdown
Maximum Drawdown = 15 ft
Number of points in plot = 1,141

Table A-1. Pumping case 1. Transmissivity equals 35,000 gpd/ft.

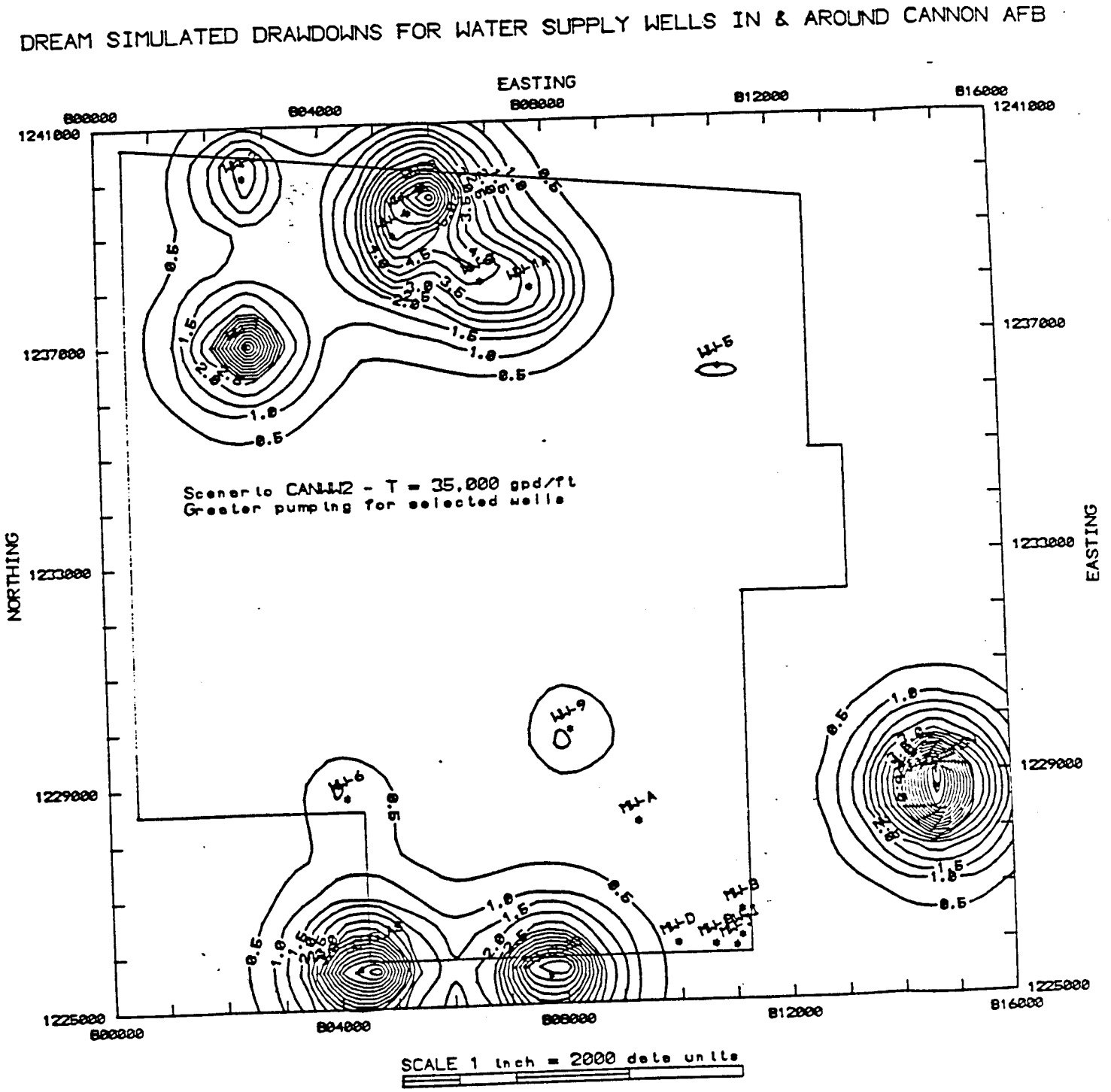

Figure A-1. Dream simulated drawdowns for water supply wells in and around Cannon Air Force Base. Case 1.

***** CANWW1.doc *****

Date: 08-05-1990
Time: 19:25:21

Grid:
x = 800000.000 to 816000.000 feet
y = 1225000.000 to 1241000.000 feet
x grid spacing = 500.000 feet
y grid spacing = 500.000 feet

Well #	x feet	y feet	Flow Rate gallons / min.	Pumping Time days
1	807718.00	1237954.00	100.000	30.00
2	802629.00	1240071.00	50.000	30.00
3	806835.00	1238071.00	50.000	30.00
4	805306.00	1238653.00	100.000	30.00
5	805600.00	1239365.00	250.000	30.00
6	811012.00	1236424.00	50.000	30.00
7	804188.00	1228777.00	50.000	30.00
8	802600.00	1237012.00	500.000	30.00
9	805835.00	1239836.00	500.000	30.00
10	808188.00	1229895.00	50.000	30.00
11	804366.00	1225700.00	500.000	30.00
12	807704.00	1225495.00	500.000	30.00
13	814653.00	1228697.00	700.000	30.00

Storage coefficient = 0.160000
Transmissivity = 0.5000D+05 gallons / foot-day

The following data files have been created:
CANWW1.dat = x, y, drawdown

Maximum drawdown = 7.5 ft
Number of points in plot = 1,141

Table A-2. Pumping case 2. Transmissivity equals 50,000 gpd/ft.

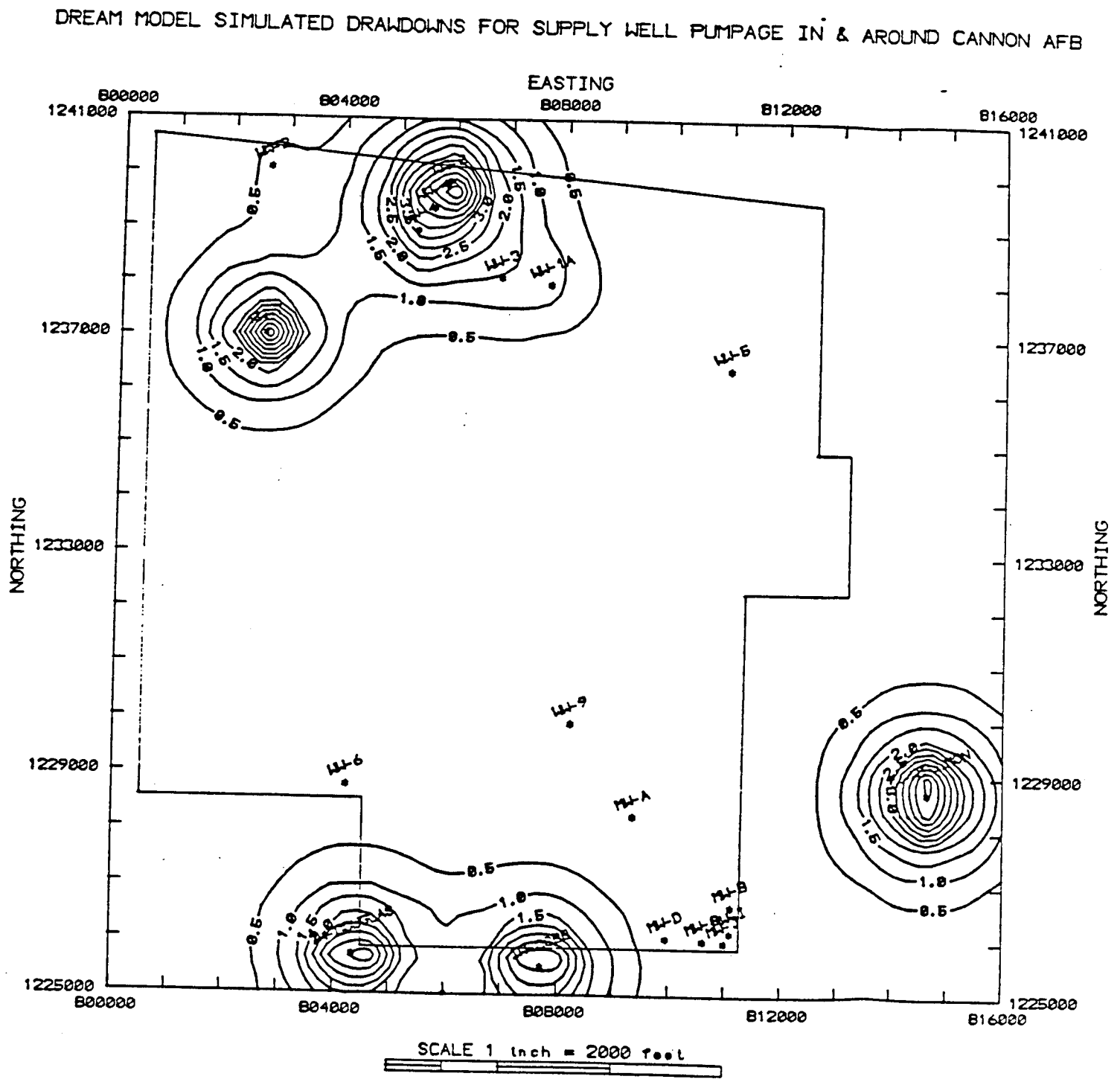

Figure A-2. Dream simulated drawdowns for water supply wells in and around Cannon Air Force Base. Case 2.

APPENDIX B

Existing well summary
Historic water level summary
Landfill 5 groundwater hydrographs

Table B-1 Landfill 5 Monitor Well Summary.

Well ID ----------)	Well A (Upgradient)		Well B (Downgradient)		Well C (Downgradient)		Well D (Downgradient)	
Location:								
Grid Coord: Northing (ft) =	1228226.5		1226602.3		1225992.1		1226031.4	
Grid Coord: Easting (ft) =	809339.0		811122.7		810616.5		809950.3	
Ref Elevation (ft,msl)* =	4267.46		4266.04		4267.90		4265.90	
Pad top Elev. (ft, msl) =	4265.11		4263.24		4264.94		4263.23	
Screen Interval depth (ft) =	328.0	343.0	347.3	362.3	347.0	362.0	341.8	356.8
Screen Elev (ft, msl) =	3937.11	3922.11	3915.94	3900.94	3917.94	3902.94	3921.48	3906.48
Gravel Pack Interval (ft) =	325.0	343.0	342.3	362.3	344.0	362.0	336.8	356.8
Gravel Pack Elev. (ft, msl) =	3940.11	3922.11	3920.94	3900.94	3920.94	3902.94	3926.48	3906.48
Total Depth Drilled (ft) =	365.0		362.3		362.0		356.8	
Total Depth Elev (ft, msl) =	3900.11		3900.94		3902.94		3906.48	
Well Diameter; Slot size (in)	4	0.010	4	0.010	4	0.010	4	0.010
Casing; Screen Type	Sch 80 PVC		Sch 80 PVC		Sch 80 PVC		Sch 80 PVC	
Date Drilled (from-to)	04-Jan-85	07-Jan-85	25-Nov-84	30-Nov-84	09-Jan-85	11-Jan-85	10-Dec-84	16-Dec-84

Table B-1 (continued).

Well ID ----------)	Well I (Downgradient)		Well J (Downgradient)	
Location:				
Grid Coord: Northing (ft) =	1226140.0 (e)		1225962.0 (e)	
Grid Coord: Easting (ft) =	811100.0 (e)		810996.0 (e)	
Ref Elevation (ft,msl)* =	4265.15		4264.85	
Pad top Elev. (ft, msl) =	4262.77 Cannon*		4262.36 Cannon**	
Screen Interval depth (ft) =	273.3	293.3	261.0	281.0
Screen Elev (ft, msl) =	3989.47	3969.47	4001.36	3981.36
Gravel Pack Interval (ft) =	255.0	305.0	245.0	305.0
Gravel Pack Elev. (ft, msl) =	4007.77	3957.77	4017.36	3957.36
Total Depth Drilled (ft) =	305.0		305.0	
Total Depth Elev (ft, msl) =	3957.77		3957.36	
Well Diameter; Slot size (in)	6	0.010	6	0.010
Casing; Screen Type	PVC		PVC	
Date Drilled (from-to)	10-Aug-88	12-Aug-88	16-Aug-88	16-Aug-88

* COE value 4262.36 ft, msl
** COE value 4262.70 ft, msl
(e) denotes estimated, must verify

Table B-2 Water level data for Landfill 5, Cannon AFB, New Mexico, 1985 - 1990.

DATE MEASURED (d/m/y)	Well A Depth to Water (ft)	Well A Water Elev (ft, msl)	Well B Depth to Water (ft)	Well B Water Elev (ft, msl)	Well C Depth to Water (ft)	Well C Water Elev (ft, msl)	Well D Depth to Water (ft)	Well D Water Elev (ft, msl)	Well I Depth to Water (ft)	Well I Water Elev (ft, msl)	Well J Depth to Water (ft)	Well J Water Elev (ft, msl)
25-Jan-85	262.20	4005.26	265.41	4000.63	267.60	4000.30	264.83	4001.07				
22-Apr-85	262.50	4004.96	265.15	4000.89	267.32	4000.58	264.40	4001.50				
06-Aug-85	262.72	4004.74	265.72	4000.32	267.87	4000.03	265.16	4000.74				
25-Sep-85	264.08	4003.38	267.53	3998.51	271.83	3996.07	264.81	4001.09				
08-Nov-85	263.04	4004.42	267.85	3998.19	269.78	3998.12	266.50	3999.40				
03-Dec-85	263.52	4003.94	267.60	3998.44	269.61	3998.29	266.63	3999.27				
11-Dec-85	263.69	4003.77	267.85	3998.19	269.78	3998.12	266.72	3999.18				
15-Jan-86	263.92	4003.54			269.92	3997.98	266.82	3999.08				
04-Mar-86	264.08	4003.38	267.94	3998.10	269.72	3998.18	266.85	3999.05				
08-Jul-86	263.54	4003.92	267.43	3998.61	269.35	3998.55	266.28	3999.62				
26-Jan-87	263.54	4004.42	266.93	3999.11	269.01	3998.89	266.09	3999.81				
21-Jul-87	263.04	4004.03	267.62	3998.42	270.05	3997.85	266.44	3999.46				
24-Jan-88	263.43	4004.31	266.58	3999.46	268.83	3999.07	265.25	4000.65	Constructed in August 1988			
31-Aug-88									266.50	3995.86	265.30	3997.40
25-Oct-88	263.15	4003.45	267.96	3998.08								
30-Jan-89	Water level meter not functioning											
07-Feb-89	"	"	"	"	"							
25-Apr-89	"	"	"	"	"							
26-Jul-89	"	"	"	"	"							
30-Oct-89	"	"	"	"	"							
06-Dec-89	269.66	4003.02	267.71	3998.33	269.35	3998.55	266.13	3999.77	265.31	3997.15	265.75	3996.95
30-Jan-90	264.44	4003.61	266.83	3999.21	268.71	3999.19	265.92	3999.98	265.21	3998.00	264.93	3997.77
31-Jul-90	263.98	4003.48	269.04	3997.00	271.40	3996.50	268.02	3997.88	266.05	3996.31		

*Top of metal pipe
Surveyed by R. R. Pettigrew, 26 Feb 85, Clovis, NM
BLANK SPACE - denotes not measured

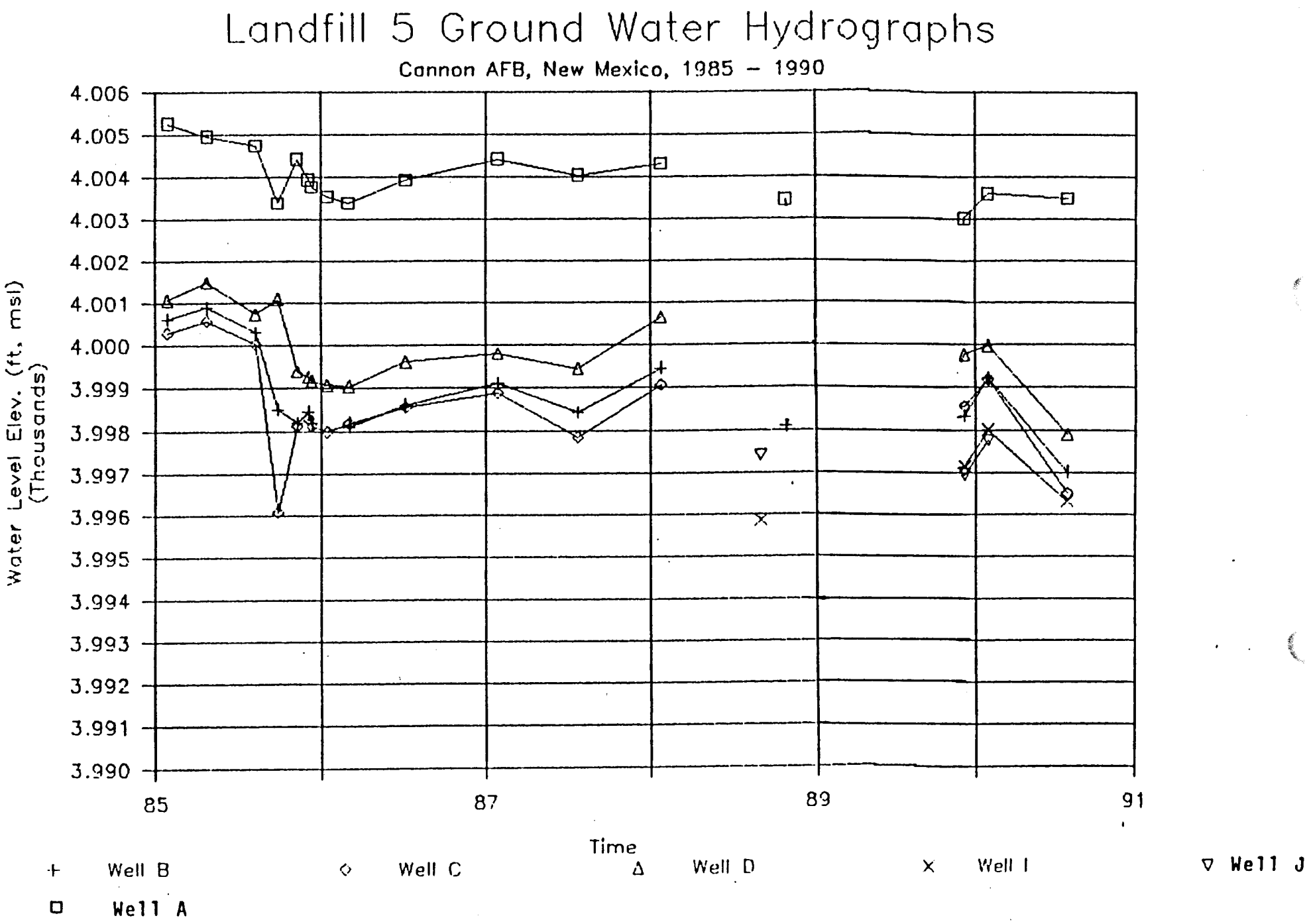

Figure B-1. Landfill 5 groundwater hydrographs.

APPENDIX C

Monitoring well identification report

APPENDIX C

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE SECTION
1190 ST. FRANCIS DR./HAROLD RUNNELS BLDG.
SANTA FE, NEW MEXICO 87503

FACILITY NAME _____

EPA I.D. NUMBER _____

COUNTY _____

WELL NUMBER _____

WELL LOCATION (LONGITUDE) _____

WELL LOCATION (LATITUDE) _____

AQUIFER NAME _____

AQUIFER CONFINED _____ UNCONFINED _____

WELL INSTALLATION DATE _____

DRILLING METHOD _____

INNER CASING DIAMETER _____

BOREHOLE DIAMETER _____

CASING MATERIAL _____

METHOD OF DEVELOPMENT _____

ELEV BOTTOM OF BOREHOLE _____

ELEV BOTTOM OF WELL CASING _____

ELEV BOTTOM OF SCREENED INT _____

ELEVATION OF SCREENED INT _____

SURVEYED ELEV OF CASING TOP _____

DATE OF REPORT _____ SIGNATURE _____

NAME (TYPED) _____